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# BEST MANAGEMENT PRACTICES

## WASTE REDUCTION, CONSTRUCTION AND DEMOLITION DEBRIS

*A Guide for Building, Construction and Environmental Professionals*

***Revised November 2008***

*Hosted by*

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Rebuild Iowa Office

DNR

IOWA WASTE REDUCTION CENTER
UNIVERSITY OF NORTHERN IOWA

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# Contents:

# INTRODUCTION

This document is intended to lay the foundation for resource reduction strategies in new construction, renovation and demolition. If you have an innovative idea or information that you believe should be included in future updates of this manual please email Shelly Codner at scodner@region12cog.org or Jan Loyson at Jan.Loyson@Iowalifechanging.com.

Throughout this manual, we use the term "waste reduction" to define waste management initiatives that will result in less waste going to the landfill. In accordance with the waste management hierarchy these practices include reducing (waste prevention), reusing (deconstruction and salvage), recycling and renewing (making old things new again) - in that order. This manual will explain what these practices are and how to incorporate them into your projects.

# FIRST AND FOREMOST

Follow all Federal, State and Local regulatory guidelines and compliance requirements when undertaking any construction or demolition resource reduction project. Areas of consideration should include but are not limited to the following:

- Asbestos (See Appendix A)
- Beneficial Reuse of Solid Waste (See Appendix B)
- Hazardous Materials (See Appendix C)
- Storm Water Permitting (See Appendix D)
- Universal Waste (See Appendix E)

The regulatory summaries that appear in the appendices above were prepared by the Iowa Waste Reduction Center/University of Northern Iowa. For a complete listing of other regulatory summaries that might be applicable to your individual project(s), please see Appendix F. You may access these regulatory summaries online at www.iwrc.org/regsums.

## CONSTRUCTION AND DEMOLITION WASTE DEFINED

Construction and Demolition debris (C&D) is defined as all non-hazardous solid waste resulting from construction and demolition activities. C&D materials that can be reused or recycled include but are not limited to the following:

- Acoustical ceiling tiles
- Asphalt
- Asphalt shingles
- Bricks
- Cardboard
- Carpet and pad
- Concrete
- Dirt
- Drywall
- Field office waste (paper, cans, glass, plastic bottles and cardboard)
- Fluorescent lights and ballasts
- Insulation
- Landclearing debris
- Metals
- Paint
- Plastic film from packaging
- Porcelain
- Window glass
- Wood

# DISASTER DEBRIS – SPECIAL CONSIDERATIONS

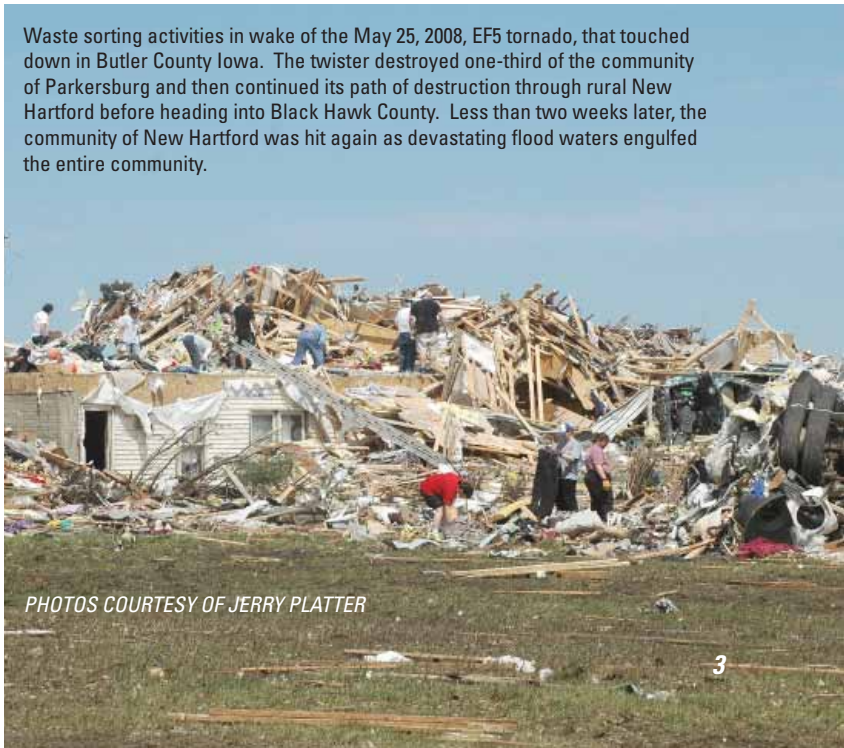
Every year, natural disasters destroy residential and commercial buildings across Iowa. In a crisis, emergency management of debris places yet another burden on property owners and emergency managers. Typically, a great deal of demolition debris needs to be managed in a short period of time.

All Iowans should be concerned with public health, safety and environmental impacts when demolition debris is mismanaged and offers assistance to communities in managing storm-generated debris. In the wake of a natural disaster please contact your IDNR field office before undertaking cleanup activities. You may access contact information for your specific field office at www.iowadnr.gov/fo/index.html.

Typical types of waste generated from natural disasters are listed below.

**Appliances**

Appliances frequently contain hazardous materials such



Waste sorting activities in wake of the May 25, 2008, EF5 tornado, that touched down in Butler County Iowa. The twister destroyed one-third of the community of Parkersburg and then continued its path of destruction through rural New Hartford before heading into Black Hawk County. Less than two weeks later, the community of New Hartford was hit again as devastating flood waters engulfed the entire community.

*PHOTOS COURTESY OF JERRY PLATTER*

as refrigerants, mercury-containing devices and PCB capacitors. IDNR requires that all discarded appliances be demanufactured by a permitted appliance demanufacturer prior to disposal.

Demanufacturers remove the hazardous components and dispose of them in an environmentally sound manner prior to recycling the metal. For a listing of permitted collectors and demanufacturers visit www.iowadnr.gov/waste/recycling/appliance.html.

**Asbestos Containing Materials - Siding, Flooring, Roofing and Insulation**

Asbestos containing items normally require special handling by licensed personnel and proper disposal. Contact IDNR for details on proper identification and handling of materials containing asbestos. You may find contact information and guidelines at www.iowadnr.gov/air/prof/asbestos/asbestos.html.

**Brick, building stone, concrete, broken asphalt pavement, wood waste from downed trees and unpainted or untreated wood**

The term "clean" refers to material that is unpainted, untreated and not contaminated with petroleum or other contaminants. Clean items may be disposed of without prior approval as long as the site selected does not impact surface waters, wetlands, floodplains and critical habitat areas. For more information contact your local solid waste agency. Contacts may be found at www.iowadnr.gov/waste/sw/files/planareacontacts.pdf.

Communities should consider composting or chipping smaller clean wood waste for use in landscapes damaged by the storm event or offering clean wood waste for use as firewood. Clean brick, building stone, concrete and asphalt may be stockpiled for crushing and reusing in future building projects.

**Contaminated Materials**

Items such as glass, asphalt and fiberglass roofing, carpeting and pad, insulation, pvc piping, siding, drywall, plaster, clothing and furniture that cannot be reused or recycled due to contamination must be disposed of in a permitted landfill.

**Electronics**

Electronics or e-waste (also known as brown goods), refers to electronic equipment including computers, printers, televisions, cellular phones, digital cameras, MP3 players, DVD players and electronic games.

Some electronics contain hazardous materials. If disposed of improperly, they pose a potential threat to human health and the environment and therefore must be handled by permitted facilities. For a listing of permitted facilities visit www.iowadnr.gov/waste/recycling/howto.html.

**Hazardous Materials**

Many municipalities have collection programs for handling hazardous materials generated from residents and Conditionally Exempt Small Quantity Generators (CESQG). If your community does not have a household hazardous waste program or your business is not conditionally exempt, arrangements can be made with an outside contractor for collection and proper disposal. Residents or exempt small quantity generators may contact their Regional Collection Center. Contact information may be found at www.iowadnr.gov/waste/hhm/index.html. Large quantity generators and areas that do not have a Regional Collection Center may obtain a listing of contractors by contacting their Iowa Waste Exchange Area Resource Specialist. Contact information may be found at www.iowadnr.gov/waste/iwe/index.html.

Conditionally Exempt Small Quantity Generators (CESQG) status is, in general, limited to businesses that generate 220 pounds (100 kg) of hazardous waste or less during a calendar month. In addition, CESQGs may only store up to 2200 pounds (1000 kg) of hazardous waste on-site during a calendar month. Other conditions may apply depending on the type of hazardous waste generated (i.e. acutely hazardous waste).

**Roofing Metals and Siding**

This material may be easily recycled and therefore should be stockpiled and hauled to a scrap metal recycler.

**Open Burning**

Open burning of trees, wood, brush and other clean wood waste requires prior DNR approval or concurrence. Open burning is not the best option and results in the release of contaminants to the air, water and land, and may have an adverse impact on human health and the environment. Also, a fire spreading out of control is always a serious concern and stretches needed emergency personnel even thinner. For more information visit www.iowadnr.gov/air/citizen/burn/burn.html.

Chipping, composting, and using clean wood waste for firewood should be the options considered first.

# DISASTER PLANNING IS KEY

There is no substitute for careful planning before a disaster occurs. Emergency planning should include a current list of IDNR contacts that can assist communities in an emergency. These plans may also identify the location and transportation routes to permitted disposal facilities and household hazardous waste collection facilities. Similarly, communities should identify areas where clean wood wastes, metals and clean concrete, block, brick and other materials may be segregated for proper management once the emergency has subsided.

## Online Disaster and Recovery Resources

The Iowa Department of Natural Resources has consolidated popular informational items that may relate to flooding situations at www.iowadnr.gov/flood.html.

Senator Tom Harkin's office has created a handbook to assist Iowans who have been affected by severe storms, tornadoes and flooding. The handbook contains information regarding registering with FEMA, federal housing assistance, long-term, low interest loans, state grants for those living in governor-declared disaster areas and filing property damage claims with an insurance company. The handout can be obtained downloaded at harkin.senate.gov/documents/pdf/2008DisasterHandout.pdf.

Governor Chet Culver has established a disaster resource site that provides information on financial assistance, volunteer opportunities, donations, road closures, disaster proclamations and a variety of other related resources. Visit this site at flood2008.iowa.gov.

Many Regional Collection Facilities offer products such as paint and cleaning supplies through their onsite Swap Shop. For contact information for those facilities visit www.iowadnr.gov/waste/hhm/index.html.

The Iowa Waste Exchange maintains a database of over 13,000 available and wanted materials. To access this database visit: www.iowadnr.gov/waste/iwe/index.html.

The ReUseIt Network allows residents to post household items they no longer need or post items they need. This interactive forum is free of charge. Visit their website at www.reuseitnetwork.org.

FreeCycle allows residents to post household items they no longer need or post items they need. This interactive forum is free of charge. Visit their website at www.freecycle.org.

**Approximately 91% of all C&D waste is from renovation and demolition.**

**The biggest opportunities for waste reduction come from remodeling, demolishing and renovating commercial, institutional and multi-family projects and tenant improvement projects.**

**(Source: LifeCycle Building Challenge)**

# WHY PREVENT WASTE AND RECYCLE?

Around the country and the world there's increasing emphasis on reducing the environmental footprint in building renovation and new construction. Ranking systems such as U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED™), the National Association of Home Builders (NAHB) Green Building Program and the Environmental Protection Agency's (EPA) Green Communities Program are gaining tremendous momentum and attention. Here are just a few reasons why:

**Cost Reduction**

Minimizing materials through appropriate planning, reuse and in some cases recycling, reduces material expense, waste disposal and hauling costs as well as potentially harmful transportation related emissions.

**Public Relations**

A company's experience in waste prevention and recycling is essential in marketing their services to the growing number of potential clients interested in participating in LEED™ and other environmental rating programs and initiatives.

Make the public and potential clients aware of your commitment and successes through targeted media releases, workshops and other related educational campaigns.

**Certification**

Your efforts to prevent waste, reuse salvaged materials, recycle and renew materials on a project can help the project earn points toward qualifying for green building certification programs such as the following:

LEED™ (Leadership in Energy and Environmental Design) is a nationally recognized green building rating program sponsored by the U.S. Green Building Council. LEED™ awards projects one, two or three points for achieving a 50 percent, 75 percent or 90 percent recycling rate respectively. A project can also earn one or two points for using salvaged, refurbished or reused materials for 5 percent or 10 percent of building materials respectively. Some waste reduction and recycling strategies (e.g., returning wastes to the site in the form of new products - renewing) can also qualify for additional innovation points if it has an educational component. For more information visit www.usgbc.org.

National Association of Home Builders Green Building Program includes resources that NAHB and the NAHB Research Center have made available to builders, home buyers and others interested in green building an online scoring tool that builders can use to count up the green features in each of seven categories and then certify their homes by arranging for inspection by an approved list of Green Verifiers. For more information visit www.nahbgreen.org.

U.S. Environmental Protection Agencies Green Communities Program provides the first national green building program developed for affordable housing. They focus on the use of environmentally sustainable materials, reduction of negative environmental impacts and increased energy efficiency. They emphasize designs and materials that safeguard the health of residents and locations that provide easy access to services and public transportation. In addition they provide developers and other construction professionals with a cost effective option. For more information visit www.greencommunitiesonline.org.

**Tax Deduction**

When you hire a deconstruction service to remove reusable building materials, the client can take a tax deduction when and if they donate the materials to a nonprofit organization. In addition, there is a lot of marketing potential surrounding "good deeds" such as this.

**Environmental Footprint Reduction**

By reducing, reusing, recycling and renewing waste you:

- Reduce the depletion of our invaluable natural resources
- Create less pollution by reducing manufacturing and transportation-related emissions
- Use less energy and water compared to the manufacturing with virgin materials
- Reduce greenhouse gasses by using less energy for manufacturing and transportation

# GETTING STARTED

## Create a Blueprint

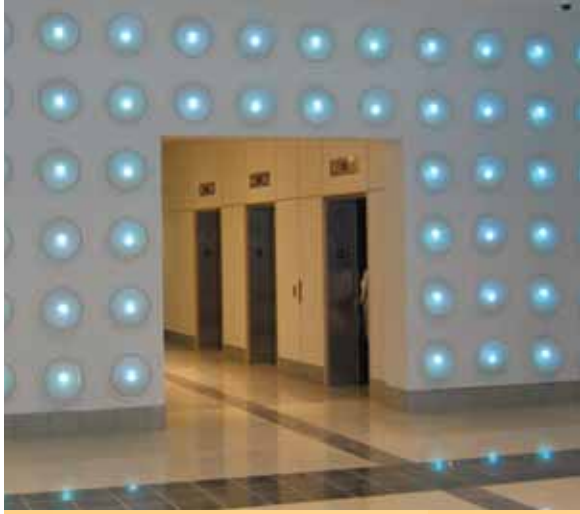
Planning is the single most important aspect regarding construction and demolition. Your Waste Management Plan is as important to your project as your other project schematics (See Appendix G - Sample Waste Management Plan). It is prepared directly from your site drawings and specifications and should include the following:

- **Waste Reduction Goals.** Set specific waste reduction goals for each project and assemble a team of qualified professionals experienced in environmentally sound design and construction practices. Clearly define the roles and responsibilities of each member of your project team. Include your goals and requirements for experience in requests for proposals (RFPs) and other contract documents.
- **Waste Reduction Requirements.** Make waste reduction a priority throughout all phases of the project including inception, design, construction, installation and occupancy. Clearly state this priority in your project documents.
- **Monitoring Tools and Reports.** Monitor the progress of waste reduction efforts by requiring contractors to submit waste management progress reports (See Appendix H - Waste Management Progress Report) and supporting invoices for recycling and hauling. Support these efforts by identifying and clearly marking locations to collect and store recyclables on-site that are conveniently accessible to both the contractor and your team. If possible, use containers with low sides and place them relative to where the materials are being generated. Monitor the success of the program and potential barriers by including a discussion about the waste reduction program during project meetings. Communicate, communicate and communicate – it is that important.
- **Select architects, general contractors, subcontractors and construction managers with proven waste reduction experience.** Unfortunately when it comes to outside staff, poor planning on their part could create a catastrophe on yours. An architect, general contractor, subcontractor or construction manager with solid waste reduction experience will be able to come in on bid or in some cases under bid. If the contractor or subcontractor is inexperienced, this could end up costing you additional labor, expense and frustration.
- **Construction Waste Management Specification.** A Construction Waste Management Specification written with legally enforceable language is your most effective tool in ensuring a successful waste reduction project. (See Appendix I – Waste Management Specification).

# ADDRESSING THE 4R'S

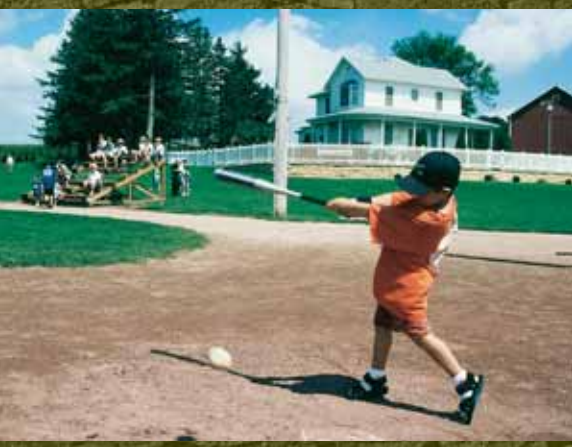

Following the steps as outlined in the waste management hierarchy is the most effective way to reduce both your expense and your environmental footprint. When developing your plan you should look at these steps in the order that follows and address each one thoroughly:

1. **Reduce.** Look for ways waste can be prevented in the first place by identifying potential wastes early in the design process.
2. **Reuse.** After determining how to prevent waste, identify waste that can be salvaged for reuse on your current project, on another project or donated.
3. **Recycle.** Determine which waste materials can be recycled.
4. **Renew.** Take a look at all materials and see if they can be made new and be innovatively incorporated into your design. Examples most generally include commissioned artwork or landscaping materials such as aggregate, compost and mulch.



The artwork pictured here was created from 190 front-load, domed washing machine windows and was a result of assistance provided by the Iowa Waste Exchange. Stretch Rumaner, a commissioned artist of Moberg Gallery in Des Moines, created and installed this 56' x 26' wall comprised of these windows. Each dome has colored, LED lights behind it and can be programmed with infinite colors and patterns.

The artwork was executed for the Davis Brown Tower's street level interior lobby in downtown Des Moines and the domes were a result of an off spec shipment received by Electrolux of Webster City. For more information about the Iowa Waste Exchange visit www.iowadnr.gov/waste/iwe/index.html. For more information about Stretch Rumaner visit www.stretchsculpture.com. For more information regarding Moberg Gallery visit www.moberggallery.com.



***"If you build it, they will come," reference from the 1989 blockbuster movie Field of Dreams. Shot in Dyersville, Iowa, the site has become an Iowa "must see" tourist attraction. For additional Iowa tourist information visit the Iowa Department of Economic Development's website at www.iowalifechanging.com.**

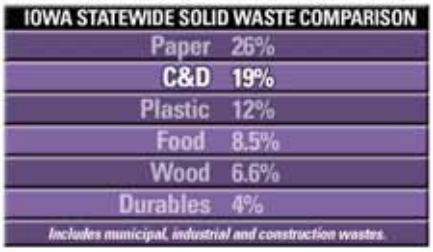
# REDUCE

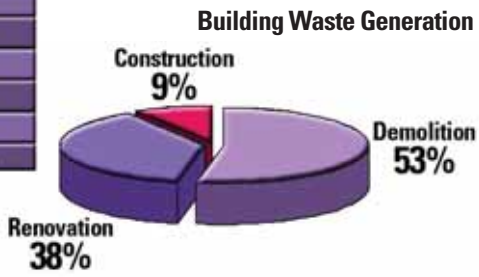
## Waste Prevention

Waste prevention is more beneficial and cost effective than recycling. Identifying potential waste early in the design process decreases waste generated during construction. If you don't build it (mountains of waste), they won't come* (waste haulers) and you won't have to plan or budget for reuse or recycling.

- **Design with standard sizes for all building materials.** This avoids creating waste when standard sized materials are cut to unusual lengths.
- **Design spaces to be flexible and adaptable to changing uses.** When possible limit permanent enclosed structures to eliminate waste created by removing walls during future remodeling. Consider using open spaces as opposed to "cubes." Consider reuse and recycling options for architectural (cubicle) walls. Are they necessary?
- **Design for deconstruction.** Wouldn't it be great if 30 years ago architects would have had ease of deconstruction in mind when they were designing their structures? It would certainly save labor and expense now. We can extend that courtesy to future builders by keeping deconstruction in mind when we are planning our current projects: These principles include the disentanglement of systems, materials bolted together instead of glued, a construction and deconstruction blueprint, built-in tie-offs and connection points for workers and machinery, not using hazardous materials and using highly recyclable materials. (For a host of deconstruction resources including a cost calculator visit the Deconstruction Institute's website at www.deconstructioninstitute.com)

**Iowa Department of Natural Resources Waste Characterization Study**




# REUSE

## Salvage and reuse of building materials

To choose the best option for managing a project's waste, consider the value of the various materials. For instance, there may be materials on a project that have a greater value "as is" for salvage compared to their value as material for recycling. Some of these materials may be valuable to reuse on-site; others may be donated or sold to a used building material retailer or charitable organization. The initial costs for deconstruction services may be offset by returns from salvaged materials or reduced purchasing costs. Some deconstruction services may also give a tax deduction for materials that are donated. In some cases, reused materials may also provide functional or aesthetic features not available with new materials. For example, salvaged wood or vintage woodwork is often of a quality and a variety that is difficult to find in the market place. (See Appendix J).

There are two ways to recover materials for salvage and reuse: Deconstruct the building or conduct a selective salvage operation prior to demolition. Deconstruction involves the careful dismantling of a whole structure in reverse order of assembly, usually by hand, to re-harvest materials for reuse. Salvage is the removal of certain valuable reusable building materials before demolition.

## Deconstruction

For demolition projects that involve removing a large portion of a structure or an entire building, deconstruction may be the best option. Deconstruction is a specific type of demolition work that is growing in popularity and that poses the greatest potential for waste recovery on a wide range of construction projects. Deconstruction contractors take apart the entire structure, separating out resources that can be salvaged, recycled or reused. Although the early efforts of deconstruction contractors focused on residential projects, a growing number of commercial projects are now being deconstructed. The feasibility and cost-effectiveness of deconstruction is determined by how the building was constructed and what building materials were used. Deconstruction can be used in most wood-frame and some metal-frame buildings. The building components, their condition and the manner in which they are secured to the structure can affect the cost-effectiveness of salvaging materials. Another factor to consider is whether site conditions allow for mechanical versus demolition by hand, which will add labor costs. To be cost-competitive with conventional demolition, the added costs of deconstruction (primarily, the extra labor of disassembly and removal) must be offset by the value of the salvaged building material and the avoided cost of disposal. (For a host of deconstruction resources visit the Deconstruction Institute's website at www.deconstructioninstitute.com.)

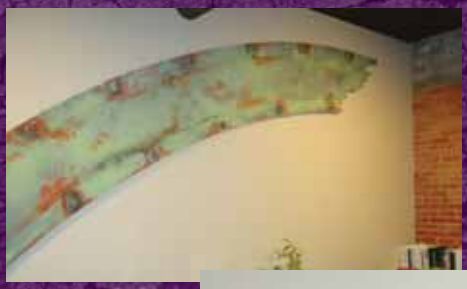
For successful deconstruction follow these guidelines:

- Review the "Yes-No" list of materials that are desirable for reuse for what you have to offer from your project. (See Appendix K)
- Call a salvage company to assess your building. It may not look like much to you, but you'll be surprised by what still has value in the reuse market. (See Appendix J)
- Call as soon as possible before the project start date. (Bidders need to schedule an on-site evaluation, complete their responses, and schedule crews to do the work.) As deconstruction continues to gain momentum, you may find difficulty in scheduling.
- Keep the scheduler up to date about any changes.
- Complete any environmental and compliance requirements in advance, such as obtaining required permits, testing for asbestos and required abatement activities. (Please review Appendix F for other applicable regulations and permitting requirements.)

## Salvage

Salvage is the removal of reusable building materials before demolition. In many cases, it may not be feasible or cost-effective to fully deconstruct a building, but there may be materials on a project that can be salvaged instead of recycled or discarded. This is also a very good cost saving strategy for a remodeling or tenant improvement project. Most demolition contractors are practicing some level of salvage on selected buildings. In many cases, demolition contractors will subcontract with deconstruction contractors or specialty subcontractors or non-profits to conduct salvage operations before demolishing specific components or materials.

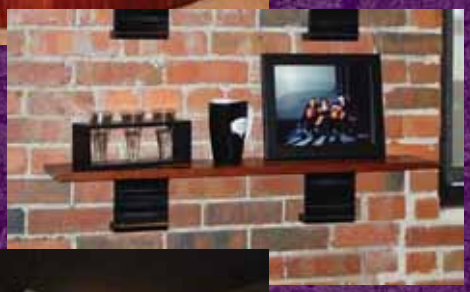
**The East Central Iowa Council of Governments (ECICOG) offices are located in the Shores-Mueller Building in Cedar Rapids, Iowa. Constructed in 1911, the structure has housed a variety of commercial and industrial functions during its long history. In addition to reusing this historic building, ECICOG implemented many strategies to reduce the amount of materials used in remodeling their current offices.**



**Artwork salvaged from underground passages within the building**

**100% Post-consumer paint**

**Reception desk salvaged from a remodeling project**



**Shelves made from salvaged wood**

**Insulated windows, high efficiency flour-escent bulbs**

**Post industrial/ consumer recycled content carpet**

# Strategies for reusing and salvaging building materials:



## 1. Assess the potential

Advanced planning for deconstruction and salvage before demolition is crucial for success.

Conduct a walk-through with the owner's representative and a deconstruction contractor to determine the feasibility and level of salvage possible. Identify logistical accessibility to the site. Determine materials and job phases where recovery, recycling and salvage opportunities are the greatest. The walkthrough can also serve to identify materials that could be salvaged, reused on-site or renewed. (See Appendix J)

To compare costs, require estimates for full deconstruction of the structure, targeted salvage prior to demolition and traditional demolition as well as potential revenues resulting from purchase of salvaged materials.

Based on the walk-through and cost comparison, determine if full deconstruction of the structure is an option or if salvage prior to demolition would be more feasible.

## 2. Establish goals

Establish goals for deconstruction salvage and recycling and include these goals in specifications. (For an example goal, see the Performance Requirements section of the sample Construction Waste Management Specification – Appendix I)

## 3. Identify materials

Based on the walk-through, develop a list of materials to be salvaged.

Identify materials to be reused on-site. For materials that will be sold or donated off-site, contact salvage companies that accept reused building materials. (See Appendix J)

## 4. Use specific language

Use very explicit language in the construction waste management specification to address deconstruction or salvage prior to demolition. The language should include goals or measurable standards for the level of salvage and/or a list of materials to be salvaged. (See Appendix I)

## 5. Allow adequate time

Deconstruction and salvage prior to demolition are usually more time-consuming than traditional demolition. It is important that sufficient time be allowed to dismantle the building or to salvage reusable items before demolition.

Determine in advance how much time is available to complete the demolition phase of the project. The bid and contract process is the best place to assure that adequate time is available. Contracting mechanisms may include decoupling demolition from the design/build phase of construction contracts. The demolition aspect of the project can be delayed while the terms of the larger design/build agreement are worked out, thus allowing time for deconstruction and salvage prior to completing demolition.

Other alternatives to ensure adequate time to complete deconstruction and salvage include issuing an early notice to proceed for the demolition phase of the project or creating a separate request for proposal or bid and contract for deconstruction and demolition.

## 6. Remove barriers to salvage

It is also important for the architect to identify and remove barriers to salvage and reuse by eliminating language in contracts that prohibit rather than control activities such as on-site salvage, storage of salvaged materials or processing operations that might create noise pollution like on-site concrete crushing. However, before rewriting contract language be cognizant of applicable regulations.

## 7. Require a plan

Require the contractor to develop a reuse and salvage plan as part of the waste management plan for the project by including this requirement in the specification language.

The reuse and salvage plan should include a list of items being reused in place or elsewhere on-site; a list of items for reuse off-site through salvage, resale or donation; a plan for protecting, dismantling, handling, storing and transporting the reused items and a communications plan describing the salvage plan to all involved in the process.

## 8. Communicate the priorities

Require the contractor to provide clear and consistent communication on the job site to be sure the crew is informed of the salvage plans, procedures and expectations.

Careful removal and handling of the reuse and salvage materials is crucial to their usability and marketability - the key to success is communicating the priorities, making detailed plans and carefully monitoring progress.

# RECYCLE

After all the options to prevent waste, salvage and reuse materials have been incorporated into the project, the next step in the waste management hierarchy is to recycle as much of the remaining debris as possible. Recycling construction materials can potentially save money by cutting disposal costs. Recycling reduces waste going to the landfill, facilitates a cleaner and safer construction site and improves community relations. This is dependent upon logistics in the recycling process and access to recycling facilities.

### There are four types of facilities where C&D waste is processed:

**Source-separated recycling facilities –** Some of these recycling facilities are and end market for materials and some broker materials. They take a wide variety of materials that have been separated at the job site for recycling (i.e., cardboard, wood, metal, drywall). Facilities of this type are the most cost effective handling option. Depending on the type and quantity, some may even pay for the material. (See Appendix J)

**Material recovery facilities (MRFs) —** Material recovery facility (MRF) is the general term used to describe a waste-sorting facility where a variety of co-mingled C&D materials are sorted for recycling. At a MRF, a combination of mechanical and hand-separation procedures are used to sort co-mingled recyclables such as wood, cardboard and metals. (See Appendix J)

**Transfer stations –** A transfer station is a facility where waste is moved from collection vehicles to larger trucks for longer distance transport to a landfill, source-separated recycling facility or material recovery facility.

**Landfills –** The least desirable method of waste disposal is at a landfill, where waste is buried. However, hazardous waste materials are better handled by permitted and qualified processors. (For Hazardous Waste information review Appendix C)

### There are 2 methods of recycling waste:

**Source-Separated Recycling:** Recyclable C&D materials are collected in separate drop boxes as they are generated. The recycling hauler takes the materials directly to a recycling facility or a transfer station that accepts source-separated materials for recycling.

**Co-mingled Recycling:** Recyclable C&D materials are collected in one drop box as they are generated. The recycling hauler takes the materials to a material recovery facility where they are sorted for recycling.

### Pros and Cons of Source-Separated and Co-mingled Recycling

- Source-separated recycling facilities have a 99.9% recycling rate.
- The recycling rate at co-mingled facilities varies between 12 percent and 99 percent. Before you choose which facility to have your co-mingled C&D hauled, contact them to find out exactly how much material is getting recycled and where recyclables are being marketed – it is best to get these assurances in writing. In Iowa, we are logistically limited in accessing existing facilities of this type because of location and availability.
- An extra step is involved to calculate a project's recycling rate when co-mingled recycling is used because the amount recycled is less than 100 percent.
- Source-separated recycling facilities are the most cost effective option as they have the lowest tip fees, they may accept some materials at no charge and they may pay for various marketables.
- More administrative time is required on the job site to educate crew and sub-contractors on which materials to put in which containers; however, the cost of this administrative time might be offset by the revenue generated by the material or the avoided cost of other disposal options.
- Depending on where your job site is located, there may be logistical challenges in assessing facilities for certain recyclable materials. Contact your area resource specialist to assist in identifying potential outlets. Locate your area resource specialist at www.iowadnr.gov/waste/iwe/index.html.

## Strategies for recycling building materials:

### 1. Set a goal
### 2. Select a contractor with proven recycling experience
### 3. Use a Construction Waste Management Specification
### 4. Monitor the waste reduction program

### 1. Set a goal

Set a waste reduction goal for the project that establishes a minimum level of performance required. Write this goal in the Performance Requirements section of the Construction Waste Management Specification. For example, the goal may be to divert a minimum of 75 percent C&D waste, by weight or volume, from the landfill by one or a combination of the following activities: salvage, reuse, source-separated or co-mingled C&D recycling. The goal also may include using recycled or salvaged building materials.

**Concrete recycling is becoming an increasingly popular way to utilize aggregate left behind when structures or roadways are demolished. In the past, this rubble was disposed of in landfills, but with more attention being paid to environmental concerns, concrete recycling allows reuse of the rubble while also keeping construction costs down. Rock Hard Concrete Recycling of West Branch is pictured here crushing concrete materials in Cedar Rapids in an occupied apartment complex. Fugitive dust is minimal from this operation.**

## 2. Select a contractor with proven recycling experience

Include a requirement for proven waste reduction experience in requests for proposals (RFPs) and as part of pre-qualification for potential contractors. Determine if they have a track record of past performance by looking at the waste management plans and documentation verifying the recycling rate on past projects.

Construction companies who are members of the U.S. Green Building Council, the Iowa Center on Sustainable Communities and Iowa Master Builders Association are more than likely experienced in waste reduction.

## 3. Use a Construction Waste Management Specification

A Construction Waste Management Specification written with legally enforceable language is your most effective tool to ensure waste reduction happens successfully on your project. (See Appendix I)

Specify the co-mingled recycling facility. Require that if co-mingled recycling is used that the materials are hauled to a material recovery facility with the highest recycling rate and is the one that you have specified. It is wise to get assurances regarding recycling rate and end markets in writing.

Require a construction waste management plan. (See the sample plan Appendix G) Require that the plan your contractor submits include the following:

- Restates the project's waste reduction goal.
- Designates a recycling coordinator responsible for implementing the plan.
- Identifies the waste materials expected, their disposal method and handling procedures.
- Defines how the plan will be communicated to the crew and subcontractors.

**Review the contractor's construction waste management plan**

- Evaluate the waste materials expected, their disposal method and handling procedures to ensure they will achieve your project's waste reduction goal.
- Require waste management reports. Require the contractor to submit this report with the application for progress payment. (See the sample report Appendix H)
- Require recycling education. Require your contractor to educate the crew regarding the waste reduction program.

## 4. Monitor the program

Require the contractor to submit a waste management report with the application for progress payment.

Monitor the success of the program and potential barriers by including a discussion about the waste reduction program during the project meetings. Communicate, communicate and communicate.

# RENEW

Renewing is similar to reusing, you still reuse the materials salvaged from the work site, but you bring them back to the site and incorporate them into the project design. Examples of this could include commissioned artwork made from onsite metals, aggregate – ground for building base or roadways, compost or mulch – ground from clean wood materials. The only difference from salvage is that the material would be redirected to a processing company and returned to the site or processed right at the site and returned to service in another form.

# APPENDIX A

## Asbestos NESHAP

*Prepared by:*
**Iowa Waste Reduction Center/University of Northern Iowa**
319.273.8905 or 800.422-3109
www.iwrc.org

40 CFR Part 61, November 2005

### *Do these regulations apply to my operation?*

The asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) applies to any facility that is an institutional, commercial, public or industrial installation or building, including chips, active and inactive waste disposal sites. Residential buildings are also subject if they are demolished or renovated as part of a commercial, public, industrial or institutional project. The NESHAP requirements apply to the renovation and/or demolition of these facilities.

## GENERAL REQUIREMENTS

The Asbestos NESHAP applies to all renovation or demolition projects. The NESHAP requirements exist to prevent the release of asbestos into the outdoor air. For this reason, most requirements apply before renovation and/or demolition occurs. The Asbestos NESHAP requirements fall into the following categories:

**INSPECTION**

- All buildings must be thoroughly inspected for asbestos containing material (ACM) prior to renovation or demolition.
- A thorough inspection requires all suspect ACM to be sampled and analyzed in a laboratory for asbestos percentage. If they are not sampled and tested, they must be assumed to contain asbestos.
- Testing will determine if the project is above or below the established regulatory thresholds for all material being disturbed.
- The entire area to be renovated or demolished must be inspected.
- The inspector must be an AHERA trained and licensed inspector with thorough knowledge of asbestos, sampling techniques, and asbestos regulations.
- If the total amount of Regulated Asbestos Containing Material (RACM) removed at a facility throughout a calendar year exceeds any of the following threshold amounts, all notification and emission control and waste disposal requirements discussed in this summary apply.
  - 260 linear feet of RACM on pipes;
  - 160 square feet of RACM on other facility components; or
  - 35 cubic feet of RACM off of facility components (presumed to be removed from pipes and other facility components that could not be measured before stripping).
- If the combined amount of RACM meets or exceeds any of the following threshold amounts, all notification, emission control and waste disposal requirements will apply:
  - 160 square feet of surfacing, RACM;
  - 260 linear feet of RACM-insulated pipes; or
  - 35 cubic feet of RACM debris.

**DEMOLITIONS**

- Demolitions are defined as the wrecking or removing of any load-supporting structural member of the facility, together with any related material handling operations, or the intentional burning of a facility. This includes facility components.
- All demolitions require submission of a complete, timely and accurate demolition notification form to DNR, even if no asbestos is found.
- The notification form must be postmarked 10 working days (holidays that fall between Monday and Friday count as a working day) before the start date given in the notification. This allows adequate time for DNR inspectors to ensure the initial asbestos testing was thorough.

**RENOVATIONS**

- Renovation is defined as an operation that alters a facility or any facility component in any way, including the stripping or removal of asbestos from a facility. Operations in which load supporting structural members are wrecked or removed are demolitions (see above section).
- If the total amount of RACM is less than these thresholds, the Asbestos NESHAP requirements do not apply.
- The notification form should be submitted at least 10 working days (holidays that fall between Monday and Friday count as a working day) before asbestos stripping or removal work commences (or other activities such as site preparation that would break up, dislodge or similarly disturb asbestos material).

# APPENDIX A *(Continued)*

**ASBESTOS REMOVAL**

- All RACM must be removed from the facility being demolished or renovated before any activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal.
- An onsite supervisor or foreman trained in the NESHAP requirements and able to comply with them must be present during the removal of RACM.
- All RACM must be adequately wet prior to and during removal to prevent asbestos dust.
- Adequately wet means: no visible emission discharges are visible to the outside air from the collection, mixing, wetting and handling operations.

**DISPOSAL OF ASBESTOS CONTAINING WET MATERIAL (ACWM)**

- ACWM disposal is usually included in the contract made with the asbestos removal company.
- All ACWM wastes generated in Iowa must be disposed of at a permitted sanitary landfill.
- All municipal solid waste landfills are required to abide by the Asbestos NESHAP for the disposal of asbestos-containing wastes.
- A landfill is NOT required to accept ACWM, however they must provide alternative disposal options should they choose not to accept it.
- The asbestos removal company is strongly urged to contact the landfi ll prior to ACWM transit to ensure that the landfill will accept the ACWM.
- The transporter should supply the receiving landfi ll with a waste shipment manifest. A waste shipment record containing the following information should accompany the transport and disposal of ACWM:
  - The name, address and telephone number of the waste generator.
  - The name and address of the office responsible for administering the asbestos NESHAP program (Iowa Department of Natural Resources, Air Quality Bureau, 7900 Hickman Road, Suite 1, Urbandale, IA 50322, 515.281.8930).
  - The approximate quantity in cubic meters (cubic yards).
  - The name and telephone number of the disposal site operator.
  - The name and physical site location of the disposal site.
  - The date of waste transportation.
  - The name, address and telephone number of the waste transporter(s); and

  Certification that the contents of the consignment are fully and accurately described by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.
- A copy of this waste shipment record must be provided to the disposal site owner at the time the asbestos-containing material is delivered.
- A copy of this waste shipment record, signed by the disposal site owner or operator must be returned to the waste generator within 45 days of the date the waste was accepted by the initial transporter.
- The disposal of ACWM does not require an individual special waste authorization.

## ADDITIONAL INFORMATION

For a list of accredited analytical laboratories that can test for asbestos-containing material, contact National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) at 301.975.4016.

For a list of accredited asbestos removal companies, contact Ellen Hester at the Iowa Department of Labor at 515.281.6175 or visit the IWRC vendor database at www.iwrc.org.

For additional guidance, visit the EPA website at www.epa.gov or contact Marion Burnside, Iowa Department of Natural Resources, Marion.Burnside@dnr.iowa.gov at 515.281.8443.

# APPENDIX B

**Please note that the following regulatory summary was applicable at the time of publication (November 2008), for specific guidelines, regulatory changes and other information please contact the Iowa Department of Natural Resources.**

## Beneficial Reuse of Solid Wastes

*Prepared by:*
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www.iwrc.org

IAC 567-108, August 20, 2003

**APPLICABILITY**

Beneficial reuse options apply to industrial, commercial, and institutional generators and users of solid by-products (waste) and sanitary landfills utilizing alternative cover material. Reuse is available to solid by-products that are being disposed of as solid waste in an Iowa landfill, and that meet certain requirements as described in this summary.

Wastes/operations that are not eligible include: waste that has already been landfill disposed, land application of solid waste, solid waste processing operations or solid waste composting.

**BENEFITS OF SOLID WASTE REUSE**

Utilization of solid by-products as resources when such use improves, or at a minimum does not adversely affect, human health and the environment is economically beneficial to both the generator of the waste and the end user. Reuse also decreases the amount of solid waste entering Iowa's landfills.

Issuance of a beneficial use determination by the department relieves the generator and user(s) of all Iowa solid waste requirements specifically noted in the written determination.

**GENERAL REQUIREMENTS**

The following by-products may be utilized for the purposes listed below without additional approval from the Department of Natural Resources (DNR) unless used for fill material*, if the by-product is used for some purpose other than alternative cover at a sanitary landfill and is foundry sand or a coal combustion by-product (see applicable sections):

- **Alumina** *(including refractory brick)*: Raw material in the manufacture of cement or concrete products
- **Asphalt Shingles** *(certified as not having more than one percent asbestos):* Raw material in the manufacture of asphalt products, subbase for hard-surface road construction, or road surfacing granular material. May also be used as alternative cover at a sanitary landfill if ground to an average size of three inches or less and mixed with soil in a 50/50 volume.
- **Cement Kiln Dust:** Raw material in the manufacture of absorbents, cement or concrete products, subbase for hard-surface road construction, soil or compost amendment, stabilizer for manure and waste sludge, soil stabilizer for construction purposes, and fill material*.
- **Coal Combustion By-Products:** Coal combustion fly ash and flue gas desulfurization by-products may be used as: Raw material in manufactured gypsum, wallboard, plaster or similar product, or in calcium chloride or absorbents, or fill material*. Coal combustion fly ash, bottom ash or boiler slag may be used as: Raw material in the manufacture of cement or concrete products, asphalt products or plastic products, raw material used in mineral recovery, subbase for hard-surface road construction, soil stabilization for construction purposes, or fill material*. Coal combustion bottom ash may also be used as: A traction agent for surfaces used by vehicles or sandblasting abrasive. All coal combustion by-products may also be used as alternative cover at a sanitary landfill when mixed with soil in a 50/50 volume.
- **Foundry Sand:** Raw material in the manufacture of asphalt products, cement or concrete products, leachate control drainage material at a sanitary landfill, subbase for hard-surface road construction, emergency flood control use for sandbags, or fill material*. May also be used as alternative cover at a sanitary landfill when mixed with soil in a 50/50 volume.
- **Glass** *(uncontaminated, unleaded glass):* Raw material in the manufacture of asphalt products, sandblasting or other abrasive, leachate control drainage material at a sanitary landfill, filter media, subbase for hard-surface road construction, or fill material*. May also be used as alternative cover at a sanitary landfill when ground to an average size of ½-inch and mixed with soil in a 10/90 volume.
- **Gypsum and Gypsum Wallboard:** All gypsum and gypsum wallboard may be used as: Raw material in the manufacture of absorbents, other gypsum products, wallboard, plaster or similar products. Gypsum and gypsum wallboard that have not been treated to be water resistant or fire retardant may be used as: Calcium additive for agricultural use, or soil or compost amendment. All gypsum and gypsum wallboard may be used as alternative cover at a sanitary landfill when ground to an average size of 3 inches and mixed with soil in a 50/50 volume.
- **Lime** *(produced from public water supplies):* Soil amendment or raw material in the manufacture of calcium carbonate or similar substances.
- **Lime Kiln Dust:** Raw material in the manufacture of absorbents, cement or concrete products, subbase for hard-surface road construction, soil or compost amendment, stabilizer for manure and waste sludge, soil stabilizer for construction purposes or fill material*.

# APPENDIX B *(Continued)*

- **Paper Mill Sludge** *(uncontaminated and dewatered):* Fuel or energy source, bulking agent or carbon source for composting, animal bedding, or raw material in the manufacture of absorbents. May also be used as alternative cover at a sanitary landfill when mixed with soil in a 50/50 volume.
- **Rubble** *(uncontaminated, such as concrete, brick, asphalt pavement, soil and rock):* Substitute for conventional aggregate.
- **Sandblasting Abrasives** *(not containing lead-based paint):* Raw material in the manufacture of cement or concrete products, asphalt products or abrasive products, subbase for hard-surface road construction, or fill material*. May also be used as alternative cover at a sanitary landfill when mixed with soil in a 50/50 volume.
- **Soil** *(uncontaminated):* Fill, landscaping, excavation, grading or other suitable purpose, or alternative cover at a sanitary landfill.
- **Petroleum-Contaminated Soil** *(decontaminated to the satisfaction of the DNR):* Fill material at the original excavation site or alternative cover material at a sanitary landfill.
- **Wastewater Filter Sand:** Fill material* or subbase for hard-surface road construction.
- **Wood** *(uncontaminated or untreated):* Fuel or energy source, bulking agent for composting, mulch, animal bedding, raw material in the manufacture of paper products, particle board, or similar materials.
- **Wood Ash** *(from the combustion of uncontaminated, untreated or raw wood):* Soil amendment, carbon source for composting, raw material in the manufacture of cement or concrete products, or fill material*.

By-products other than those listed above may be issued beneficial use determination after submitting the following information to the DNR.

- Contact information for the owner of the site where the project will be located, applicant for the beneficial use determination, person responsible for the project, Professional Engineer (PE) retained for the project, if any, and agency/responsible official of agency to be served by the project, if any.
- A description of the by-product and its proposed use(s), as well as a chemical and physical description of the by-product and proposed products.
- Demonstration that there is a known or reasonably probable market for the intended use of the by-product including a contract to purchase or utilize the by-product, a description of how it will be used, a demonstration that the by-product complies with industry standards for a product and/or other documentation that a market exists.
- Demonstration that the by-product is not dangerous to the health of the environmental or people, including, but not limited to TCLP and total metals test results.
- A by-product management plan.

**** Requirements for reuse as fill material***

All by-products (other than rubble and soil) intended for reuse as fill material must meet the following requirements, unless a variance is obtained from the DNR:

- Less than 10 times the maximum contaminant level for drinking water (IAC 567 Chapter 41) measured by the synthetic precipitation leaching procedure (SPLP, EPA Method 1312). (Foundry sand and coal combustion by-products may limit SPLP testing to total metals for drinking water.)
- Total metals testing results, including thallium, equal to statewide standards for soil.
- Specific pH range depending on the future intended use of the fill.
- Fill will not be placed in a waterway, wetland, below or within five feet of the high water table, within the 100-year flood plain, or closer than 200 feet to a sinkhole or well that is, or could be, used for livestock or human consumption.
- The fill will not be putrescible.

## By-Product Management Plans

Any entity proposing a new by-product for reuse (not listed above), and generators of foundry sand and coal combustion by-products must develop and maintain a by-product management plan containing the following:

- List of the sources of the by-product
- Procedure for periodic testing of the by-product to ensure chemical and physical composition has not changed significantly
- Description of storage procedures including location(s), maximum anticipated inventory, including dimensions of stockpiles, run-on and run-off controls (which may include an NPDES permit), management practices to minimize uncontrolled dispersion, and maximum storage time, not to exceed 6 months.

# APPENDIX B *(Continued)*

## Record Keeping Requirements

Any entity engaging in the beneficial use of a by-product (other than alternative cover) who satisfies at least one of the following criteria must meet the record keeping requirements listed:

- Entity has been granted a beneficial use determination,
- The by-product is not rubble or soil, and is being used as fill material,
- The by-product is foundry sand or a coal combustion by-product.

## Requirements

- Maintain all records related to the by-product management plan for a minimum of five years.
- A copy of the by-product management plan will be submitted to the DNR and applicable DNR field office whenever the plan is revised, or within 60 days of the end of the calendar year, whichever is earlier.
- Generators whose by-product is being reused as fill material must submit in writing the location and tons of by-product used for each project within 60 days of the end of the calendar year.

# APPENDIX C

**Please note that the following regulatory summary was applicable at the time of publication (November 2008), for specific guidelines, regulatory changes and other information please contact the Iowa Department of Natural Resources.**

**In addition, if your business is a Conditionally Exempt Small Quantity Generator (CESQG) (generates less than 220 pounds (100 kg) of hazardous waste or less during a calendar month) you may be able to dispose of your hazardous materials at your local Regional Collection Facility (RCC). A listing of RCCs may be found at www.iowadnr.gov/waste/hhm/index.html.**

## What is a Hazardous Waste?

*Prepared by:*
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(319) 273-8905 or (800) 422-3109
www.iwrc.org

40 CFR 261, October 2005

## Does my business generate a hazardous waste?

A waste is hazardous if it exhibits a hazardous characteristic or if it is found on any of four specific hazardous waste lists.

What are the benefits of knowing my business generates hazardous waste?

Every business is responsible for characterizing its wastes. Knowing which wastes are hazardous and the amount of hazardous wastes generated and stored at your facility will indicate the level of regulation that applies to your business. The benefit of knowing this information provides the opportunity for compliance with federal environmental regulations.

## Characteristics of Hazardous Waste

According to Environmental Protection Agency (EPA) regulations, there are four characteristics that can make a waste hazardous: ignitability; corrosivity, reactivity; and toxicity.

**Ignitability -** If liquid waste has a flash point of less than 140° F, it is an ignitable hazardous waste. Some solid wastes are characterized as ignitable hazardous wastes if they spontaneously combust and/or meet certain ignition/burning testing criteria. Ignitable hazardous wastes have the EPA waste code of D001. Examples are:

- Petroleum parts washer solvents;
- Solvent-based paint waste;
- Waste kerosene or gasoline; and
- Spent paint booth exhaust filters.

**Corrosivity -** Aqueous wastes that have a pH less than or equal to 2.0, or greater than or equal to 12.5, are considered corrosive hazardous wastes. Corrosive hazardous wastes have the EPA waste code D002. Examples are:

- Acid or alkaline cleaning solutions;
- Rust removers;
- Battery acid; and
- Caustic hot tanks waste.

**Reactivity -** A waste is reactive if it reacts violently with water, forms potentially explosive mixtures with water, generates toxic gases when mixed with water, contains cyanides, or sulfides that are released when exposed to acid or alkaline materials, or is explosive. Reactive hazardous wastes have the waste code D003. Examples are:

- Cyanide plating wastes;
- Waste concentrated bleaches;
- Pressurized aerosol cans; and
- Metallic sodium and potassium.

**Toxicity -** A waste is toxic if it fails the Toxicity Characteristic Leaching Procedure (TCLP) lab test for any one of 40 parameters. Examples are:

- Painting wastes that contain toxic metal based pigments and/or certain solvents (i.e., MEK);
- Treated wood waste where the treatment was done with “penta”, or pentachlorophenol;
- Oily wastes, such as used oil filters that exceed the levels for benzene and/or lead.

# APPENDIX C *(Continued)*

## Characteristics of Hazardous Waste

## Listed Hazardous Wastes

The federal EPA has designated four "lists" of hazardous wastes, designated by the letters "F", "K", "P", and "U". If a material is found on one or more of these lists, it is considered a "listed hazardous waste". Each of these lists is explained briefly below:

**F Listed Wastes -** The F listed wastes include a wide variety of commonly found wastes, ranging from solvents to wastewater treatment sludges to dioxin contaminated materials. The F listed wastes are designated below.

**K Listed Wastes -** These are hazardous wastes from specific processes, many of which are chemical or pesticide manufacturing. Examples are "distillation bottoms from the production of aniline" or " wastewater treatment sludge from the production of toxaphene". K listed wastes are relatively uncommon in Iowa.

**P Listed Wastes -** These are known as "acute" hazardous wastes because they are highly toxic. Many are unusual chemicals that are not likely to be found. Some, especially the pesticides, are still in use or were formerly used and may be stored as unusable materials. Examples include endrin, arsenic trioxide (gopher bait), and warfarin (rat poison).

**U Listed Wastes -** U listed wastes are less toxic commercial chemicals, off-specification products, or manufacturing chemical intermediates. They are normally waste materials only if they can't be used (off-specification) and must be discarded. Examples include benzene, DDT, formaldehyde, and vinyl chloride.

## Examples of F Listed Hazardous Wastes

**F001 -** Spent halogenated solvents used in degreasing, or the still bottoms from the recovery of the spent solvents. Solvents include:

- Tetrachloroethylene, or perchloroethylene (perc)
- Trichloroethylene
- Methylene Chloride
- 1,1,1-trichloroethane
- Carbon tetrachloride
- Chlorinated fluorocarbons (freons)

**F002 -** Spent halogenated solvents, and still bottoms, from uses other than degreasing.

- Tetrachloroethylene, or perc
- Methylene chloride
- Trichloroethylene
- 1,1,1-trichloroethane
- Chlorobenzene
- 1,1,2-trichloro-1,2,2-trifluoroethane, or freon 112
- Ortho-dichlorobenzene
- Trichlorofluoromethane (freon)
- 1.1.2-trichloroethane

**F003 -** Spent non-halogenated solvents, and still bottoms, that are ignitable.

- Xylene
- Acetone
- Ethyl acetate
- Ethyl benzene
- Ethyl ether
- Methyl isobutyl ketone (MIBK)
- n-butyl alcohol
- Cyclohexanone
- Methanol

**F004 -** Spent non-halogenated solvents and still bottoms.

- Cresols and cresylic acid
- Nitrobenzene

**F005 -** Spent non-halogenated solvents and still bottoms.

- Toluene
- Methyl ethyl ketone (MEK)
- Carbon disulfide
- Isobutanol
- Pyridine
- Benzene
- 2-ethoxyethanol
- 2-nitropropane

# APPENDIX D

## Understanding Storm Water NPDES Permits

*Prepared by:*
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319.273.8905 or 800.422.3109
www.iwrc.org

40 CFR 122.26
IAC 567-64.13, October 2005

***Effective October 1, 2002 to October 1, 2012***

## General Summary

The intent of storm water regulation is to improve water quality by reducing or eliminating contaminants in storm water. Storm water is defined as precipitation runoff, surface runoff and drainage, street runoff, and snow melt runoff. Contaminants commonly found in storm water discharges include oil, grease, fertilizers, sediment from construction sites, lead, zinc, solvents, etc. Contaminants introduced into a storm sewer or other conveyance may impact drinking water sources, ground water sources and waters protected for recreation, aquatic life, and other beneficial uses.

**Applicability -** Who must apply for a storm water discharge permit?

- Facilities that "discharge storm water associated with industrial activity;"
- Facilities that "discharge storm water associated with industrial activity from asphalt plants, concrete batch plants, and rock crushing plants;"
- Facilities that "discharge storm water associated with industrial activity for construction;"
- Large and medium municipal separate storm sewer systems (MS4s) with a population of 100,000 or greater;
- All publicly owned treatment works (POTWs) with a design flow rate larger than one million gallons per day.

**What is "Storm water discharge associated with industrial activity"?** What permit is required?

- The discharge from any conveyance (road, yard, ditch, pipe, storm sewer, etc.) which collects and conveys storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. Industries that meet this definition are:
  - Any facility already regulated by another Clean Water Act limitation or permit;
  - Facilities which have SIC 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285), 29, 311, 32 (except 323), 33, 3441, and 373 (SIC code is a four digit number for classifying establishments by type of economic activity - SIC code is reported on income tax, IRS form 1120. A list of applicable SIC code numbers is found in Attachment A;)
  - Mineral industry with SIC 10, 11, 12, 13, and 14;
  - All permitted hazardous waste treatment, storage, and disposal facilities (TSDFs);
  - Landfills, land application sites, and open dumps which receive industrial wastes from the previously specified industrial activities;
  - Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards, also including those classified as SIC 5015 and SIC 5093;
  - Steam electric powered generating facilities including coal handling sites;
  - Transportation facilities classified as SIC 40, 41, 42 (except 4221, 4222, 4223, 4224 and 4225), 43, 44, 45, and 5171 that also perform vehicle maintenance, equipment cleaning operations, or airplane deicing operations. Only those areas of the facility where maintenance, cleaning operations, deicing operations, or otherwise specified industrial activities take place are subject to the permit requirements;
  - All publicly owned treatment works (POTWs) with a design flow rate larger than one million gallons per day;
  - Construction activities that disturb one or more acres of land;
  - SIC 20, 21, 22, 23, 2434, 25, 265, 267, 27, 28, 285;
  - SIC 30, 31 (except 311), 34 (except 3441), 35, 36, 37 (except 373), 38, 39, and 323;
  - SIC 4221, 4222, 4223, 4224 and 4225.

# APPENDIX D *(Continued)*

**A Storm Water Permit is required for the following areas:**

- Plant yards;
- Immediate access roads and rail lines used or traveled by carriers of raw materials;
- Material handling sites;
- Refuse sites;
- Sites used for the application or disposal of process waste waters;
- Sites used for residual treatment, storage or disposal;
- Shipping and receiving areas;
- Manufacturing buildings;
- Storage areas (including tank farms) for raw materials, and intermediate and finished products;
- Areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water.

The permit includes only storm water discharges from the areas (except access roads and rail lines) that are listed above, where material handling equipment or activities, raw material, intermediate products, final products, waste materials, by-products, or industrial machinery is exposed to storm water. A list of applicable SIC codes and their definitions is found in Attachment A.

A Storm Water General Permit # 1 is required for industrial storm water discharge.

**What is the No-Exposure Exclusion and Who May File a No-Exposure Certification?**

If a discharger (except construction activities) can certify that a condition of no-exposure exists at the industrial facility it is eligible for the no-exposure exclusion.

A condition of no-exposure exists at any industrial facility when all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, byproducts, final products, or waste production. Material handling activities include the storage, loading and unloading, transportation or conveyance of any raw material, intermediate product, final product or waste product.

A form is used to certify that a condition of no-exposure exists at the facility. This certification is applicable only where Iowa is the NPDES permitting authority and must be re-submitted once every five years.

The industrial facility operator must maintain a condition of no-exposure at its facility or site in order for the no-exposure exclusion to remain applicable. If condition change resulting in the exposure of materials or activities to storm water, the facility operator must obtain coverage under an NPDES storm water permit immediately.

**What is "Storm water discharge associated with industrial activity for construction"?** What permit is required?

Storm water discharge from construction activity including, clearing, grading, and excavation operations, that result in the disturbance of one or more acres.

A Storm Water General Permit #2 is required for storm water discharge from construction activity.

**What is "Storm water discharge associated with industrial activity from asphalt plants, construction sand & gravel, concrete batch plants and rock crushing plants"?** What permit is required?

Storm water associated with industrial activity from facilities:

- Manufacturing asphalt paving mixtures and which are classified under SIC 2951;
- Primarily engaged in manufacturing Portland cement concrete delivered to a purchaser in a plastic and unhardened state and which is classified under SIC 3273.

Facilities that are classified under SIC 1422, or 1423, which are primarily engaged in the crushing, grinding or pulverizing of limestone or granite.

Storm Water General Permit # 3 is required for these types of facilities and activities.

**What is the storm water permit called?** Are there different types?

The permit is called National Pollutant Discharge Elimination System (NPDES) permit. Most frequently, the general permit is used in Iowa. General Permit 1, General Permit 2, and General Permit 3 are for discharges that are composed of storm water only.

In special circumstances, the IDNR or the industry may request an application for an Individual Permit. Individual Permits are for storm water mixed with process wastewater from new or existing sources and non-process wastewater.

# APPENDIX D *(Continued)*

## Description of GENERAL PERMIT #1, #2 and #3:

**General Permit No. 1 -** For storm water discharge associated with industrial activity.

**General Permit No. 2 -** For storm water associated with construction activity disturbing greater than 1 acres of land and/or is part of a larger plan of development.

**General Permit No. 3 -** For storm water discharge associated with industrial activity from asphalt plants, concrete batch plants, rock crushing plants, construction sand, and gravel facilities.

## INDIVIDUAL PERMIT:

An individual permit may be required for facilities with special circumstances, for example, facilities that already have a NPDES permit for a waste water discharge, etc.

How do I get a NPDES storm water permit? What does it cost? How do I renew or cancel a permit?

**GENERAL PERMIT 1 - 3**

For an existing storm water discharge you must submit a completed Notice of Intent (NOI).

For a new storm water discharge associated with industrial activity, you must submit a complete NOI at least 24 hours prior to the start of the operation.

Failure to notify the IDNR of a discharge of pollutants to waters of the state is a violation of the Clean Water Act and Code of Iowa, and is subject to civil penalties not to exceed $25,000 per day.

Applicable fees must accompany the completed NOI. Fees are based on the following:

***ATTENTION*** **-**

All storm water general permit applications postmarked on or after August 1, 2008, must be accompanied by the increased fees as follows:

| 1 year | 3 years | 4 years | 5 years |
|---|---|---|---|
| $175.00 | $350.00 | $525.00 | $700.00 |

If a facility opts to pay fees on an annual, three-, four-, or five-year basis, the appropriate fee should be submitted to the IDNR on the anniversary of obtaining the permit.

**INDIVIDUAL PERMITS**

Application for an individual permit requires completing EPA or IDNR Form 1 and EPA Form 2F and/or IDNR Form 2, IDNR Form 3, IDNR Form 4. NPDES permit approval will depend on the information contained in these forms and are issued on a case-by-case basis by the IDNR. Contact the IDNR at 515/281-7017 for instruction when requesting coverage under an Individual Permit.

Applicable fees for the Individual Permit are:

| | |
|---|---|
| **Annual** | $300 |
| **Five-year** | $1,250 |

If you are renewing a permit, you do not need to post a public notice again, but you will need to file a new NOI. Applicable fees will need to accompany the completed NOI.

**NOTICE OF DISCONTINUATION**

A notice of discontinuation (NOD) must be made in writing to the IDNR within 30 days of the discontinuance of a storm water discharge. General Permits 1, 2, and 3 each have a separate NOD form that must be filed. For guidance on filing a NOD for an Individual Permit, contact the IDNR or the Iowa Waste Reduction Center.

**NOTICE OF RELOCATION**

The Notice of Relocation (NOR) form is to notify the IDNR of a new site location(s) not included in a previous NOI and is applicable to General Permit 3 permit holders only.

**PERMIT RENEWAL**

Prior to the expiration of an authorization issued under this general permit, the permitee is required to resubmit a NOI (no public notice required) with the Department of Natural Resources for coverage under the new general permit. If a new general permit has not been reissued prior to the expiration of the current permit, the provision and coverage of the current permit are extended until replaced by the adoption of a new general permit.

**Where do I send the NOI? How do I get other information?**

Submit all applicable forms and information to:

**Storm Water Coordinator**
Iowa Department of Natural Resources
Environmental Protection Division
502 East 9th Street
Des Moines, IA 50319-0034

Questions may be directed to the Storm Water Coordinator at 515.281.7017, or to the IWRC at 319.273.8905 or 800.422.3109.

**What else do I need to do?**

You must develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The plan should identify potential sources of pollution which may reasonable be expected to affect the quality of storm water. Facilities must implement provisions of the SWPPP required under the permit.

# APPENDIX D *(Continued)*

***The SWPPP shall be completed before the NOI is submitted to the IDNR and must be fully implemented concurrently with operation at the facility (or if a new facility, with the start of operation).

The SWPPP does not need to be submitted with the NOI. However, the facility shall make the SWPPP available upon request to the IDNR or to the municipal separate storm sewer system operator.

The SWPPP must be amended whenever there is a change in design, construction, operations, or maintenance that has a significant potential for discharge of pollutants.

The SWPPP shall include and/or address the following issues:

- Description of potential pollutant sources;
- Storm water management controls;
- Visual inspections;
- If applicable - special requirements for storm water discharge in cities serving a population of 100,000 or more;
- Consistency with other plans;
- If applicable - additional requirements for facilities subject to SARA Title III Section 313 requirements;
- Salt storage;
- Non-storm water discharges.

Step-by-step summary guidance documents and a sample SWPPP for General Permit #1, is available on the IWRC website at www.iwrc.org or by contacting the IWRC. Submittal forms and guidance documents are available from the IDNR and can be downloaded from their website at www.iowadnr.gov.

**What about monitoring and reporting?**

Monitoring requirements are delineated for specific facilities that fall under Section 313 of SARA Title III; primary metal industries; land disposal units/incinerators; wood treatment; coal pile runoff; airports; animal handling/meat packing; battery reclaimers; coal fired steam electric facilities and additional facilities. Specific instructions are found in the Permit.

Permittees that are subject to monitoring requirements are NOT required to submit monitoring results to the IDNR, however, monitoring results must be retained and be available to the IDNR upon request.

# ATTACHMENT A

**FACILITIES OR ACTIVITIES DEFINED AS "INDUSTRIAL ACTIVITIES" SUBJECT TO THE STORM WATER DISCHARGE APPLICATION REQUIREMENTS**

1. Facilities subject to storm water effluent limitation guidelines, new performance standards, or toxic pollutant effluent standards under 40 CFR subchapter N except facilities with toxic pollutant effluent standards which are exempted under category (11) of this definition.

2. Facilities classified as:

   SIC 24 Lumber and Wood products Except Furniture (except 2434)
   SIC 26 Paper and Allied Products (except 265 and 267)
   SIC 28 Chemicals and Allied Products (except 283 and 285)
   SIC 29 Petroleum Refining and Related Industries
   SIC 311 Leather Tanning and Finishing
   SIC 32 Stone, Clay, Glass and Concrete Products (except 323)
   SIC 33 Primary Metal Industries
   SIC 3441 Fabricated Structural Metal Products
   SIC 373 Ship and Boat Building and Repairing

3. Facilities classified as SIC 10 through 14 (mineral industry) including active or inactive mining operations and oil and gas exploration, production, processing or treatment operations, or transmission facilities that discharge storm water contaminated by contact with, or that has come in contact with, any overburden, raw material, intermediated products, finished products, by products or waste products located on the site of such operations.

   SIC 10 Metal Mining
   SIC 12 Coal Mining
   SIC 13 Oil and Gas Extraction
   SIC 14 Mining and Quarrying of Nonmetallic Minerals, Fuels

4. Hazardous waste treatment, storage or disposal facilities, including those that are operating under interim status or a permit under subtitle C or RCRA.

5. Landfills, land application sites and open dumps that receive or have received any industrial wastes (wastes from any of the facilities described under this definition including those that are subject to regulation under subtitle D of RCRA.

6. Facilities involved in the recycling of materials which are classified as:

   SIC 5015 Motor Vehicle Parts, Used

   SIC 5093 Scrap and Waste Materials

7. Steam electric power generating facilities, including coal handling sites.

8. Those portions of transportation facilities that are either involved with vehicle maintenance, equipment cleaning operation or airport deicing operations, or which are otherwise identified as industrial activities in other sections of this definition.

   SIC 40 Railroad Transportation
   SIC 41 Local and Suburban Transit/Interurban Highway Passenger Transportation
   SIC 42 Motor Freight Transportation and Warehousing (except 4221-4225)
   SIC 43 U.S. Postal Service
   SIC 44 Water Transportation
   SIC 45 Transportation by Air
   SIC 5171 Petroleum Bulk Stations and Terminals

9. Treatment works treating domestic sewage or other sewage sludge with a design flow of 1.0 MGD or more, or required to have an approved treatment program under 40 CFR Part 403.

10. Construction activity including cleaning, grading and excavation activities except operations that result in the disturbance of less than one acre of total land area which are not part of the larger common plan or development or sale.

11. Facilities where material handling equipment or activities, raw material, intermediate products, final products, waste materials, by-products or industrial machinery are exposed to storm water.
   SIC 20 Food and Kindred Products
   SIC 21 Tobacco Products
   SIC 22 Textile Mill Products
   SIC 23 Apparel and Other Finished Products Made From Fabrics and Similar Materials
   SIC 2434 Wood Kitchen Cabinets
   SIC 25 Furniture and Fixtures
   SIC 265 Paperboard Containers and Boxes
   SIC 267 Converted Paper Except Containers and Boxes
   SIC 27 Printing, Publishing and Allied Industries
   SIC 28 Chemicals
   SIC 285 Paint, Varnishes, Lacquers, Enamels and Allied Products
   SIC 30 Rubber and Miscellaneous Plastic Products
   SIC 31 Leather and Leather Products (except 311)
   SIC 323 Glass Products, Made from Purchased Glass
   SIC 34 Fabricated Metal Products, Except Machinery and Transportation Equipment (except 3441)
   SIC 35 Industrial and Commercial Machinery and Computer Equipment
   SIC 36 Electronic and other Electrical Equipment and Components, Except Computer Equipment
   SIC 37 Transportation Equipment (except 373)
   SIC 38 Measuring, Analyzing, and Controlling Instruments; Photographic, Medial and Optical Goods; Watches and Clocks
   SIC 39 Miscellaneous Manufacturing Industries
   SIC 4221 Farm Product Warehousing and Storage
   SIC 4222 Refrigerated Warehousing and Storage
   SIC 4225 General Warehousing and Storage

# APPENDIX E

**Please note that the following regulatory summary was applicable at the time of publication (November 2008), for specific guidelines, regulatory changes and other information please contact the Iowa Department of Natural Resources.**

## Universal Waste Rule

*Prepared by:*
Iowa Waste Reduction Center/University of Northern Iowa
319.273.8905 or 800.422.3109
www.iwrc.org

40 CFR 273, August 2005

## Do these regulations apply to my operation?

If your facility generates spent batteries (non lead-acid), mercury containing equipment, universal waste lamps (e.g.: fluorescent tubes), or excess pesticides, it is subject to the universal waste requirements outlined below.

**General Requirements**

- Generators of Universal Waste cannot dispose of it on-site and dilute or treat the waste.
- Generators must train employees in the proper handling and storage of Universal Wastes.
- All releases/spills of Universal Waste must immediately be contained and clean up materials properly disposed.

## What are the benefits of using the Universal Waste Rule?

The Universal Waste (UW) Rule was put into place to ease the regulatory burden for businesses dealing with common hazardous wastes. It allows a longer collection time (one year) making recycling these wastes more feasible. The UW Rule also has fewer record keeping, training and reporting requirements compared to those for other hazardous wastes.

**Definitions**

**Battery -** Devices that receive, store and deliver energy including the consumer products which contain them (if battery cannot be removed). Lead-Acid batteries are not included in the Universal Waste Rule definition as they are specifically regulated under other Environmental Protection Agency (EPA) rules.

**Pesticide -** Any hazardous substance or mixture intended for preventing, destroying, repelling or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant, except those disposed of by a farmer (on-site) in a manner consistent with the label instructions.

**Mercury Containing Equipment -** Consists of devices, items or articles that contain varying amounts of elemental mercury integral to its function. Some devices include: thermostats, barometers, manometers and mercury switches.

**Universal Waste Lamps (Lamps) -** The bulb or tube portion of an electric lighting device. Examples of common UW lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high-pressure sodium and metal halide lamps.

**Universal Waste Handler -** Generator (person that produces the waste) and/or the owner or operator of a facility that receives/accumulates/sends UW.

**Small Quantity Handler of UW (SQHUW) -** Never accumulates more than 11,000 pounds of UW (total of all types of UW) at any one time.

**Large Quantity Handler of UW (LQHUW) -** Accumulates more than 11,000 pounds of UW (total of all types of UW) at any one time.

**Universal Waste Transporter -** A person engaged in off-site transportation of universal waste by air, rail, highway or water.

**Destination Facility-** A facility that treats, disposes of or recycles a UW. Destination facilities are required to comply with regulations beyond the scope of this summary.

**IDNR 24 HOUR EMERGENCY RESPONSE UNIT 515.281.8694**

# APPENDIX E *(Continued)*

## Requirements

### What are the special handling requirements for UW?

- All UW must be handled in a way that prevents release during accumulation, storage and disposal.
- All spills and residues of UW must immediately be contained.
- All materials (including clean-up materials) resulting from spills of a UW must be handled in compliance with applicable federal, state and local regulations.
- If a release of one pound or more of a UW occurs please contact the IWRC.

**Batteries**

- Showing signs of leakage, damage or spillage must be contained
- May be sorted by type or mixed in one container
- May be discharged or regenerated and packs may be disassembled
- May be removed from consumer products
- Electrolytes may be removed provided batteries are immediately resealed

**Pesticides**

- Immediately clean up and place in a container any container that shows evidence of leakage, breakage, of damage.

**Mercury Containing Equipment**

- Mercury containing equipment showing signs of leakage, damage or spillage must be contained
  - Mercury ampules may be removed provided:
  - It is done in a manner that prevents breakage over a collection device
  - A mercury clean-up kit is readily available
  - The removal area is well ventilated and monitored for OSHA compliance
  - Spilled or leaked mercury is immediately transferred to a storage container
  - Employees are thoroughly trained in proper handling and emergency procedures.
  - Removed ampules are stored in closed, structurally sound, non-leaking containers in a manner that prevents breakage upon shipment

**Universal Waste Lamps**

- Immediately clean up and place in a container any lamp that is broken, shows evidence of leakage, breakage or damage.

### What are the Labeling, Record Keeping, and Storage Quantity Requirements?

Handlers of UW cannot accumulate UW for more than one year unless it is done for the sole purpose of feasible recycling.

Store UW in a container that remains closed, is structurally sound, compatible with the waste, prevents breakage, and lacks evidence of leakage or damage.

Clearly identify the length of time the waste has been accumulated (i.e., labeling containers or waste, inventory system, etc.).

**Batteries -** Label each battery or container "Universal Waste - Batteries," "Waste Batteries," "Used Batteries."

**Pesticides -** Label each storage container, vessel or tank with the label that accompanied the product and "Universal Waste - Pesticides" or "Waste Pesticides."

**Mercury Containing Equipment -** Label each piece of equipment or container: "Universal Waste - Mercury Containing Equipment"; "Waste Mercury-Containing Equipment"; or "Used Mercury-Containing Equipment."

**Universal Waste Lamps -** Label each lamp or container "Universal Waste - Lamps," "Waste Lamps" or "Used Lamps."

# APPENDIX E *(Continued)*

## What are the testing requirements?

TCLP testing may be required to determine if clean-up materials and/or removed components/parts are considered hazardous wastes.

## What permits or registrations are required and how do I obtain them?

SQHUW are not required to obtain a hazardous waste identification number from the EPA if only universal hazardous wastes are generated.

LQHUW must obtain an EPA ID number prior to accumulating more than 11,000 pounds of UW.

EPA notification to obtain the number (LQHUW only) must include at least:

- Your facility's name and address and the UW contact's name and phone
- Address of the physical location of the UW
- Types of UW handled
- A statement that more that 11,000 pounds of UW is accumulated at one time

**LQHUW that already have an EPA ID number do not need to notify the EPA of UW activities but must maintain their existing number.**

## What training requirements apply?

SQHUW must train all employees that handle UW in proper handling and emergency procedures.

LQHUW must formally train (including documentation) all employees in proper handling and emergency procedure(s) for UW related to their responsibilities during normal facility operations and emergencies.

## How do I ship/transport universal waste(s)?

**Shipping**

UW waste must be sent to a UW handler, destination facility or foreign market.

Shipments must be packaged, labeled, marked, and placarded in a manner that prevents releases and follows all DOT requirements.

The receiving party must agree to accept the waste.

Handlers may self-transport universal waste, however, the handler must also comply with UW transporter regulations. *summarized below:*

- Exporting UW to a foreign market requires compliance with export regulations including notification of EPA and consent of the receiving country
- UW handlers that also receive quantities of UW from other facilities should contact the IWRC

**Transport**

Transporters cannot dispose of, dilute, or treat UW (except when responding to a release).

Transporters of UW must comply with all DOT regulations.

UW can only be stored at a transfer site for 10 days without further regulation.

Transporters must immediately contain and clean up all releases/spills of UW and properly dispose of clean-up materials.

Transporters must take UW to a destination facility, handler, or foreign market agreed upon by the generator/handler.

## What records do I need to keep and for how long?

SQHUW are not required to keep records of shipments, however, as with all hazardous wastes, tracking quantities, dates of disposal and destination facilities is advisable.

LQHUW must track shipment of all UW

Must maintain a log, manifest, bill-of-lading, or other shipping documents that include at least the quantity of each type of UW, date of shipment of UW, and the name and address of destination facility for at least three years.

SQHUW that accumulate more than 11,000 pounds of UW at one time, become a LQHUW and must then comply with LQHUW regulations for the remainder of the calendar year.

# APPENDIX F

**IOWA WASTE REDUCTION CENTER/UNIVERSITY OF NORTHERN IOWA**

**ONLINE REGULATORY SUMMARIES BY TOPIC**

Summaries may be accessed at www.iwrc.org/regsums

If you need further assistance call 319.273.8905 or 800.422.3109

## Air Emissions

- One Gallon Permit By Rule
- Three Gallon Permit By Rule
- Asbestos NESHAP
- DNR Permit-by-Rule Form
- Permit by Rule Log
- Prevention of Significant Deterioration

## Appliances

- Appliance Demanufacturing
- DNR Form 542-8005

## Audit Policies

- EPA Audit Law
- Small Business Compliance Policy
- Iowa Self-Audit Law

## EPCRA

- Emergency Notification
- Emergency Planning and Community Right-To-Know Act
- List of Iowa LEPCs
- List of Lists
- Tier 2 Form
- Tier 2 Instructions
- Toxic Release Inventory Reporting
- TRI Form A Only
- TRI Form R Only
- TRI Reporting Complete Forms and Instructions
- TRI Reporting for Lead
- Iowa DNR Spill Response Guide

## Hazardous Waste

- Categories of Hazardous Waste Generators
- Common Hazardous Wastes
- Conditionally Exempt Small Quantity Generators o Hazardous Waste
- Hazardous Waste Storage Checklist
- Large Quantity Generators of Hazardous Waste
- Regional Collection Centers
- Small Quantity Generators of Hazardous Waste
- What is a Hazardous Waste?
- Notification of Regulated Waste Activity-EPA Instructions and Form
- Department of Transportation (DOT) Hazardous Material Training, Registration, and Security Requirements

## Household Hazardous Materials

- DNR HHM FAQ
- DNR HHM Permit Application
- Retail Sales of Household Hazardous Materials

## Metals

- Precious Metal Reclamation

## Oil

- Used Oil Management Standards
- DNR Used Oil Collection Center Notification Form
- OSR Staff Resources
- DNR Energy/Waste Mgmnt. Bureau Staff Roster
- Iowa Code References
- IWE Reps and Areas
- Stormwater/Wastewater Flow Chart

## P2 Equipment Tax Exemption

- P2 Equipment Tax Exemption Application Form
- Tax Exemption for P2 Equipment
- Iowa Tax Credit for Soy Oil

## Paint-Related Wastes

- Paints, Solvents and Related Wastes

## Refrigerants

- Motor Vehicle Air Conditioning(MVAC)Service
- Refrigerant Recovery from Appliances/Stationary Sources
- Refrigerant Recovery or Recycling Device Acquisition Certification Form

## Solid Waste

- Beneficial Reuse of Solids Waste

## SPCC

- Spill Prevention Control and Countermeasures Plan
- Special Waste Authorization
- Disposal of Special Wastes in Iowa

# APPENDIX F *(Continued)*

DNR SWA Form

## Storage Tanks

Aboveground Storage Tanks

DNR Notice of Intent to Install UST Form

DNR UST Closure by Filling Report

DNR UST Closure by Removal Report

DNR UST Closure Notification Form

DNR UST Registration Form

DNR UST Temporary Closure Form

Requirements of Underground Storage Tanks

USTs - What Do I Have To Do?

## Storm Water

Understanding Storm Water NPDES

Water Priority Chemicals List

IWRC SWPPP Blank General Permit #1

IWRC Guide to Developing a SWPPP General Permit #1

IWRC SWPPP Blank General Permit #2

IWRC Guide to Developing a SWPPP General Permit #2

IWRC SWPPP Blank General Permit #3

IWRC Guide to Developing a SWPPP General Permit #3

DNR NOI Form

DNR Public Notice Form

DNR No-Exposure Certification Form

DNR GP1 Instructions

DNR GP1 NOD Form

DNR GP1 SWPPP Guidance

DNR GP2 Instructions

DNR GP2 NOD Form

DNR GP2 SWPPP Guidance

DNR GP3 Instructions

DNR GP3 SWPPP Guidance

DNR GP3 NOD Form

DNR GP3 Relocation Form

## TCLP

Common TCLP Testing Parameters

Guideline for Environmental Testing Costs

Toxicity Characteristic Leaching Procedure Testing Parameters

How to Take a Representative Sample of Waste

Requesting TCLP Analysis on Antifreeze Waste

## Universal Waste

Universal Waste Rule

## Waste Tires

Waste Tires

## Wastewater

DNR Wastewater Treatment Agreement Form

Septic Tanks/Leach Fields

Total Toxic Organics

Wastewater Pretreatment Standards for the Metal Finishing Industry

# APPENDIX G

## SAMPLE WASTE MANAGEMENT PLAN

**Company:** Iowa's Best Construction Company
**Project:** Iowa's Best Building, Everytown, Iowa
Designated Recycling Coordinator: Mr. Field O'Dreams

**Waste Management Goals:**
- This project will recycle or salvage for reuse XX percent [e.g. 75 percent] by weight of the waste generated on-site.

**Communication Plan:**
- Waste prevention and recycling activities will be discussed at each safety meeting.
- As each new subcontractor comes on-site; the recycling coordinator will present him/her with a copy of the Waste Management Plan and provide a tour of the recycling areas.
- The subcontractor will be expected to make sure all their crews comply with the Waste Management Plan.
- All recycling containers will be clearly labeled.
- Lists of acceptable/unacceptable materials will be posted throughout the site.

**Expected Project Waste, Disposal, and Handling:**

| MATERIAL | QUANTITY | DISPOSAL METHOD | HANDLING PROCEDURE |
|---|---|---|---|
| Asphalt from parking lot | 100 tons | Ground on-site, reuse as fill | |
| Wood Framing | 6 tons | Recycle – ABC Recycling | Separate "clean wood" in clean wood bin |
| Decorative Wood Beams | 300 bd. Ft. | Salvage – Habitat for Humanity ReStore Remove by hand, store on-site, palletize for pickup | |
| Remaining Materials | 8 tons | Landfill – ABC County Landfill | Dispose in Trash Dumpster |

**Construction Phase**

| MATERIAL | QUANTITY | DISPOSAL METHOD | HANDLING PROCEDURE |
|---|---|---|---|
| Concrete | 2 tons | Recycle – ABC Recycling | Rebar OK |
| Forming Boards | | Reuse as many times as possible then recycle – ABC Wood Recycler | Stack next to supply of new form boards for reuse. Recycle clean unusable forms in wood recycling bin |
| Clean Wood Scrap | 12 tons | Scraps reused for formwork, fire breaks, etc. Remaining recycled – ABC Wood Recyclers | Stack reusable pieces next to saw for reuse. Place unusable clean wood in wood recycling container |
| Scrap Metal | 5 tons | Recycle – ABC Metal Recyclers | Deposit all metal in metal container |
| Drywall | 10 tons | Subcontractor will recycle and submit receipt | Either provide container or collect in vehicle for recycling |
| All other wastes | 14 tons | Landfill – ABC Landfill | Dispose of in trash dumpster |

# APPENDIX H

**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) | | | | |
| | Total (In Weight) _____ | Total (In Weight) _____<br>Percentage of Waste Diverted _____%<br>**(Total Waste/Total Diverted)** | | |

# APPENDIX I

## CONSTRUCTION WASTE MANAGEMENT SPECIFICATION

**PART 1 – GENERAL**

**1.1 SUMMARY**

A. Section includes: Administrative and procedural requirements for construction waste management activities.

**1.2 DEFINITIONS**

A. **Construction and Demolition (C&D) Waste:** Includes all non-hazardous solid wastes resulting from construction, remodeling, alterations, repair, demolition and landclearing. Includes material that is recycled, reused, salvaged or disposed as garbage.

B. **Salvage:** Recovery of materials for on-site reuse or donation to a third party.

C. **Reuse:** Making use of a material without altering its form. Materials can be reused on-site or reused on other projects off-site. Examples include, but are not limited to the following: Grinding of concrete for use as subbase material. Chipping of landclearing debris for use as mulch.

D. **Recycling:** The process of sorting, cleaning, treating, and reconstituting materials for the purpose of using the material in the manufacture of a new product.

E. **Source-Separated C & D Recycling:** The process of separating recyclable materials in separate containers as they are generated on the job-site. The separated materials are hauled directly to a recycling facility or transfer station.

F. **Co-mingled C & D Recycling:** The process of collecting mixed recyclable materials in one container on-site. The container is taken to a material recovery facility where materials are separated for recycling.

G. **Approved Recycling Facility:** Any of the following:

1. A facility that can legally accept C & D waste materials for the purpose of processing the materials into an altered form for the manufacture of a new product.
2. Material Recovery Facility: A general term used to describe a waste-sorting facility. Mechanical, hand-separation, or a combination of both procedures, are used to recover recyclable materials. Take co-mingled containers to <insert name of approved Material Recovery Facility(s)>

**1.3 SUBMITTALS**

A. Waste Management Plan**:** Submit [3] <Insert number> copies of plan within [7] [14] [30] <Insert number> days of date established for [commencement of the Work] [the Notice to Proceed] [theNotice of Award].

B. Waste Management Report**:** Concurrent with each Application for Payment, submit [3] <Insert number> copies of report. [Include separate reports for demolition and construction waste.]

**1.4 PERFORMANCE REQUIREMENTS**

A. General**:** Divert a minimum of [50 percent] [75 percent] <insert number> C & D waste, by weight, from the landfill by one, or a combination of the following activities:

1. Salvage
2. Reuse
3. Source-Separated C & D Recycling
4. Co-mingled C & D Recycling

B. C & D waste materials that can be salvaged, reused or recycled include, but are not limited to, the following:

1. Acoustical ceiling tiles
2. Asphalt
3. Asphalt shingles
4. Cardboard packaging
5. Carpet and carpet pad
6. Concrete
7. Drywall
8. Fluorescent lights and ballasts
9. Landclearing debris (vegetation, stumpage, dirt)
10. Metals
11. Paint (through hazardous waste outlets)
12. Wood
13. Plastic film (sheeting, shrink wrap, packaging)
14. Window glass
15. Wood
16. Field office waste, including office paper, aluminum cans, glass, plastic and office cardboard.

# APPENDIX I *(Continued)*

**1.5 QUALITY ASSURANCE**

A. Regulatory Requirements: Conduct construction waste management activities in compliance with Iowa Department of Natural Resources rules and regulations and other applicable laws and ordinances.

B. Preconstruction Conference: Schedule and conduct meeting at Project site prior to construction activities.

1. Attendees: Inform the following individuals, whose presence is required, of date and time of meeting.

a. Owner

b. Architect

c. Contractor's superintendent

d. Major subcontractors

e. <Insert the appropriate municipality representative>

f. Other concerned parties

2. Agenda Items: Review methods and procedures related to waste management including but not limited to the following:

a. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.

b. Review requirements for documenting quantities of each type of waste and its disposition.

c. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.

d. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.

e. Review waste management requirements for each trade.

**1.6 WASTE MANAGEMENT PLAN**

A. General: Develop plan consisting of waste types, quantity by weight, methods of disposal, handling and transportation procedures. Include separate sections in plan for demolition and construction waste.

B. Organize the waste management plan in accordance with the sample plan included at end of Part 3, including the following information:

1. Types and estimated quantities, by weight, of C & D waste expected to be generated during demolition and construction.

2. Proposed methods for C & D waste salvage, reuse, recycling and disposal during demolition including, but not limited to, one or more of the following:

a. Contracting with a deconstruction specialist to salvage materials generated,

b. Selective salvage as part of demolition contractor's work,

c. Reuse of materials on-site or sale or donation to a third party.

3. Proposed methods for salvage, reuse, recycling and disposal during construction including, but not limited to, one or more of the following:

a. Requiring subcontractors to take their C & D waste to a recycling facility,

b. Contracting with a recycling hauler to haul recyclable C &D waste to an approved recycling or material recovery facility,

c. Processing and reusing materials on-site,

d. Self-hauling to a recycling or material recovery facility.

4. Name of recycling or material recovery facility receiving the C & D wastes.

5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling and designated location on Project site where materials separation will be located.

**1.7 WASTE MANAGEMENT REPORT**

A Waste Management Report: Submit a cumulative waste management report on the form included at end of Part three with each Application for Payment with the following attachments:

1. A record of the type and quantity, by weight, of each material salvaged, reused, recycled or disposed.

2. Total quantity of waste recycled as a percentage of total waste.

3. Disposal Receipts: Copy of receipts issued by a disposal facility for C & D waste that is disposed in a landfill.

4. Recycling Receipts: Copy of receipts issued by an approved recycling facility.

a. For co-mingled materials, include weight tickets from the recycling hauler or material recovery facility and verification of the recycling rate for co-mingled loads at the facility.

5. Salvaged Materials Documentation: Types and quantities, by weight, for materials salvaged for reuse on site, sold or donated to a third party.

**PART 2 - PRODUCTS** (Not Used)

# APPENDIX I *(Continued)*

**PART 3 - EXECUTION**

**3.1 CONSTRUCTION WASTE MANAGEMENT, GENERAL**

A. Provide containers for C & D waste that is to be recycled clearly labeled as such with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.

B. The collection containers for recyclable C & D waste must contain no more than 10 percent non-recyclable material, by volume.

C. Provide containers for C & D waste that is disposed in a landfill clearly labeled as such.

D. Use detailed material estimates to reduce risk of unplanned and potentially wasteful cuts.

E. To the greatest extent possible, include in material purchasing agreements a waste reduction provision requesting that materials and equipment be delivered in packaging made of recyclable material, that they reduce the amount of packaging, that packaging be taken back for reuse or recycling, and to take back all unused product. Insure that subcontractors require the same provisions in their purchase agreements.

F. Conduct regular visual inspections of dumpsters and recycling bins to remove contaminants.

**3.2 SOURCE SEPARATION**

A. General: Separate recyclable materials from C & D waste to the maximum extent possible. Separate recyclable materials by type.

1. Provide containers, clearly labeled, by type of separated materials or provide other storage method for managing recyclable materials until they are removed from Project site.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from weather.

**3.3 CO-MINGLED RECYCLING**

A. General: Do not put C & D waste that will be disposed in a landfill into a co-mingled C & D waste recycling container.

**3.4 REMOVAL OF CONSTRUCTION WASTE MATERIALS**

A. Remove C & D waste materials from project site on a regular basis. Do not allow C & D waste to accumulate on-site.

B. Transport C & D waste materials off Owner's property and legally dispose of them.

C. Burning of C & D waste is not permitted.

# APPENDIX J

**MARKET LISTING**

The following is provided as a listing of potential markets that exist in and around Iowa. For more information on any specific markets that may exist in your area contact your Area Resource Specialist. Contact information may be found at www.iowadnr.gov/waste/iwe/index.html.

Please ensure that companies that you work with are in compliance with applicable Federal, State and Local regulations and hold applicable permits. If applicable, request copies of permits to include with your project documents and reports. Additional permitting and regulatory information may be found at www.iowadnr.gov/waste/sw/index.html.

Your local Solid Waste Agency is a fantastic resource for markets within your area and may be a market for recycling and/or reuse of some of the materials generated by construction and demolition activities. A listing of planning area contacts can be accessed at www.iowadnr.gov/waste/sw/files/planareacontacts.pdf or by contacting your Area Resource Specialist listed at www.iowadnr.gov/waste/iwe/index.html.

## ARCHITECTURAL SALVAGE/DECONSTRUCTION/RECYCLING

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| A & T Wrecking & Lumber Co. | 16461 Wood St. | Markham, IL 60426-5824 | 708.333.4700 | | |
| A & T Wrecking & Lumber Co. | 1550 W 88th St | Chicago, IL 60636 | 773.445.3100 | | |
| All State Salvage, Inc. | 1354 Jackson Street | St. Paul, MN 55101 | 651.488.6675 | | |
| American Barn Company | 3808 N Clark St | Chicago, IL 60613 | 773.327.1560 | | |
| American Demolition Corp. | 305 Ramona Ave | Elgin, IL 60120 | 847.608.0010 | | |
| American Resource Recovery | 9168 N 124th Street | Milwaukee, WI 53224 | 414.355.8500 | | |
| Anderson Fine Carpentry and Salvage | 228 W. 4th St | Kansas City, MO 64111 | 816.531.5976 | TheThaine@aol.com | |
| Archaic Architectural | 4304 S Michigan Avenue | Chicago, IL 60653 | 773.268.0100 | | |
| Architectual Antiques | 1330 Quincy St NE | Minneapolis, MN 55413 | 612.332.8344 | sales@arch antiques.com | www.arch antiques.com |
| Architectural Artifacts | 4325 North Ravenswood Avenue | Chicago, IL 60613 | 773.348.0622 | | |
| Architectural Elements | 818 E 8th St. | Sioux Falls, SD 57103 | 605.339.9646 | architecturalelements@ mail.com | |
| Asset Recovery Contracting | 5441 Fargo Ave | Skokie, IL 60077 | 847.674.3366 | | |
| Azarian, Sam Wrecking | 726 Water St | Racine, WI 53403 | 262.637.4153 | | |
| Barnwood Products | | Black River Falls, WI 54615 | 715.284.2469 | ctrywdcrft@ discover-net.net | www.barnwood products.com |
| Bauer Brothers Salvage | 2432 2nd St North | Minneapolis, MN 55411 | 612.331.9492 | | |
| Beaver Wrecking and Salvage | W8025 State Road 33 | Beaver Dam, WI 53916 | 920.887.7030 | | |
| Ben Tarbe Used Brick, Inc. | 1202 Genessee St | Kansas City, MO 66102 | 913.432.9726 | | |
| Brandenburg Industrial Service Company | 2625 S. Loomis St | Chicago, IL 60608 | 312.326.5800 | moowila@ brandenburg.info | www.branden burg. info/ Default.html |
| Builders Salvage | 30347 US 150 Hwy | Farmer City, IL 61842 | 309.928.2344 | | |
| Building Hope | 2108 Western Avenue | Eau Claire, WI 54703 | 715.271.4673 | craigp@home gospelmission.org | www.hopegos pelmission.org |
| Building Savers | 3301 Main Street | Emmetsburg, IA 50536 | 712.852.3057 | | |
| Carlson's Barnwood Company | 8066 N 1200 Ave | Cambridge, IL 61238 | 309.522.5550 | info@carlsons barnwood.com | www.carlsons barnwood.com |

# APPENDIX J *(Continued)*

**MARKET LISTING**

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| Cedar Valley Recovery and Demolition | 553 Reed St | Waterloo, IA 50703 | 319.234.3075 | | |
| Century Construction Co., Inc. | 820 N Concord St Ste 101 | South St. Paul, MN 55075 | 651.451.1020 | info@century construct.com | www.century construct.com |
| Century Used Brick | 12982 Maurer Industrial Drive | Sappington, MO 63127 | 314.843.1213 | | |
| Chuck's Stone and Brick Co. | 2955 S Brentwood | St Louis, MO 63144 | 314.968.2230 | cbrickston@aol.com | |
| City Salvage Antiques | 505 1st Ave NE | Minneapolis, MN 55413 | 612.627.9107 | mail@city salvage.com | www.city salvage.com |
| Colonial Brick, Inc. | 2222 S Halstead St | Chicago, IL 60608 | 312.733.2600 | | www.colonial brick chicago.com |
| Coughlin Contractors, Inc. | Welch Road | Watertown, WI 53098 | 920.261.7637 | rjcmvc@execpc.com | |
| Darrah-Barns | 104 N Prairie St | Rockton, IL 61072 | 815.624.4434 | darrahbarns@hotmail.com | |
| Deco Companies | 2101 Manchester Traffic Way | Kansas City, MO 64126 | 816.483.5656 | judir@deco.com | www.deco-kc.com |
| Deconstruction Services | 2316 East Lake Street | Minneapolis, MN, 55407 | 612.728.9388 | | |
| DeConstruction, Inc. | 1010 Walsh Rd | Madison, WI 53714 | 608.244.8759 | deconstruct@mailbag.com | |
| Delta Demolition, Inc. | 1230 N. Kostner | Chicago, IL 60651 | 773.252.6370 | | |
| Dix Lumber and Recycling | 202 E Washington St | Dix, IL 62830 | 618.266.7665 | | |
| Duluth Timber Company | P.O. Box 16717 | Duluth, MN 55816 | 218.727.2145 | info@duluth timber.com | www.duluth timber.com |
| Eckert Wrecking, Inc. | 4743 US Highway 8 | Rhinelander, WI 54501 | 715.362.6550 | | |
| Ecologic, Inc. | 1140 Elizabeth Ave | Waukegan, IL 60085 | 800.899.8004 | | |
| Elmwood Reclaimed Timber | P.O. Box 10750 | Kansas City, MO 64188-0750 | 816.532.0300 x 205 | wolf@elmwood reclaimed timber.com | www.elmwood reclaimed timber.com |
| Environmental Cleansing Corporation | 16602 S. Crawford Ave | Markham, IL 60426 | 708.532.7000 | | |
| F.M. Frattalone Excavating | 3066 Spruce Street | St. Paul, MN 55117 | 651.484.0448 | jimw@fm frattalone.com | www.fm frattalone.com |
| Fellenz Antiques and Architectural Artifacts | 439 N. Euclid Avenue | St. Louis, MO 63108 | 314.367.0214 | | |
| Fuller Salvage and Wrecking | 2113 E Mitchell Ave | Waterloo, IA 50702 | 319.233.2546 | | |
| Gavin Historical Bricks | 2050 Glendale Rd | Iowa City, IA 52245 | 319.354.5251 | info@historical bricks.com | www.historical bricks.com |
| Gerovac Wrecking Company | 11836 W Saint Martins Rd | Franklin, WI 53132 | 414.425.1500 | | |
| Glenville Timber Wrights | S5390 St Rd 13 | Baraboo, WI 53913 | 608.355.9950 | www.woodshop@ tds.com | www.glenville timberwrights com |
| Guilded Salvage Antiques | 4430 Lyndale Ave N | Minneapolis, MN 55412 | 612.789.1680 | | www.guilded salvage.com |
| Hardico | 112 West Jefferson Suite 130 | Kirkwood, MO 63122 | 314.965.3535 | hardico@swbell.net | |
| Heartwood Associates Int'l. | 5068 Tholozan Ave | St. Louis, MO 63109 | 314.352.9242 | | |
| Heneghan Wrecking Co. Inc. | 1321 W Concord Place | Chicago, IL 60622 | 773.342.9009 | | www.heneghan wrecking.com |

# APPENDIX J *(Continued)*

**MARKET LISTING**

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| Homesource Center | 3701 W Lisbon Ave | Milwaukee, WI 53208 | 414.344.4142 | | |
| House and Garden Restoration Specialties | 1410 19th Street | Des Moines, IA 50314 | 515.243.3985 | | |
| I M Salvage Company | 4025 W Loomis Rd | Milwaukee, WI 53221 | 414.281.8733 | | |
| Iowa Demolition and Recycling Services | 6400 Seminole Ct NE | Cedar Rapids, IA 52411 | 319.393.9013 | | |
| J. Hoffman Co. | 1919 Cherry Hill Rd | Joilet, IL 60433 | 630.513.6680 | | |
| J. Myron Olson & Son Inc. | 1718 18th Street | Sioux City, IA 51105 | 712.258.5615 | | |
| Jan's Antiques | 225 N Racine Ave | Chicago, IL 60607 | 312.563.0275 | | |
| Jim's Small Demolition | PO Box 1235 | Dubuque, IA 52004 | 563.583.8673 | | |
| Keetagilly | 528 Suni Ave | Baltic, SD 57003 | 605.529.6152 | salvage@keetagilly.com | |
| Kellington. Construction, Inc | 20110 Auger Ave | Corcoran, MN 55340 | 612.416.3200 | rlewis@kellington.com | www.kellington.com |
| Ken Hunt Building Supply & Salvage | 2050 E Army Post Road | Des Moines, IA 50320 | 515.287.0007 | | |
| Lockett's Lumber & Salvage | 2104 Baker Ave | East St Louis, IL 62207 | 618.274.1884 | | |
| Lowder Construction Architectural Salvage | 116 E State St | Waverly, IL 62692 | 217.435.9618 | | |
| Mack Circle Used Brick and Wrecking | 1414 Marcus Ave | St. Louis, MO 63113 | 314.531.2997 | | |
| Madget & Griffin, Inc. | 2425 S. 6th St | St. Joseph, MO 64501 | 816.232.6210 | | |
| Materials Clearance and Salvage | 1109 Creek Drive | Rapid City, SD 57701 | 605.343.1993 | | |
| Mendota Mantels | 1896 Norfolk Ave | St. Paul, MN 55116 | 651.271.7544 | | |
| Mid-America Architectural Salvage | P.O. Box 926 | Grayslake, IL 60030 | 847.223.5772 | | |
| Milwaukee Timber Company | 585 Kossow Rd | Milwaukee, WI 53186 | 262.798.8986 | david@reclaimed-timbers.com | www.reclaimed-timbers.com |
| Minnesota Timber Salvage | 13737 100th St | Foreston, MN 56330 | 320.369.4507 | | |
| MT Salvage | 3717 S 66th St | Omaha, NE 68106 | 402.391.5315 | | |
| Murco Recycling Enterprises Inc. | 347 N Kensington St | LaGrange Park, IL 60526 | 708.352.4111 | jodi@murco.net | www.murco.net |
| N.F. Demolition | 4333 S Knox Ave | Chicago, IL 60632 | 773.284.8300 | | |
| New Creation Historical Lumber Co. | 113 Meadowbruck LN | Belleville, IL 62221 | 618.660.7463 | nclumberco@yahoo.com | www.new creation lumberco.com |
| North Shore Architectural Antiques | 521 7th St | Two Harbors, MN 55616 | 218.834.0018 | jmccarthy@frontiernet.net | www.north-shore architectural-antiques.com |
| Old Growth Trading Company | 115 Mill Street | Hampshire, IL 60140 | 847.683.9040 | Oldgrowthtraders@aol.com | www.oldgrowth tradingco.com |
| Old Growth Woods | 1896 Norfolk Ave. | St. Paul, MN 55116 | 651.271.7544 | | |
| Old House Heaven | 602 E State St | Jacksonville, IL 62650 | 217.479.8020 | oldhouse@csi.net | www.oldhouse heaven.com |
| Old House Salvage | 4404 Stewart Ave | Wausau, WI 54401 | 715.849.5077 | delirevanceman@aol.com | |
| Omega Demolition Corporation | 1536 Brandy Parkway | Stearmwood, IL 60107 | 630.837.3000 | chuckg@omega demolition.com | www.omega demolition.com |

# APPENDIX J *(Continued)*

**MARKET LISTING**

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| Perhat Lumber Co | 6023 South Broadway | St Louis, MO 63111 | 314.481.9302 | | |
| Peterson Wrecking Used Lumber | 2008 Aull Lane | Lexington, MO 64067 | 660.259.6500 | | |
| Pitchpine Lumber | 19864 Gore Dr | Sainte Genevieve, MO 63670 | 573.747.1733 | lloyd@pitchpine.com | www.pitchpine.com |
| PPL Shop | 850 15th Avenue NE | Minneapolis, MN 55413 | 612.789.3322 | | |
| Reclaimed Lumber Company | 585 Kossow Rd | Waukesha, WI 53186 | 262.798.8986 | david@old-barn-wood.com | www.old-barn-wood.com |
| ReStore, IA City | 2401 Scott Blvd. SE | Iowa City, IA 52240 | 319.337.8949 | markpatton@ivhtfh.org | www.ivhfh.org |
| ReStore, Des Moines | 2341 2nd Ave | Des Moines, IA 50313 | 515.309.0224 | | |
| ReStore, Mason City | 1411 S Taft Commercial Park Rd | Mason City, IA 50401 | 319.641.1688 | | |
| ReStore, Quad Cities | 3629 Mississippi Ave Ste B | Davenport, IA 52807-1905 | 563.391.4949 | cindy@restoreqc.org | www.restore.org |
| ReStore, Sioux City | 645 9th Ave | Council Bluffs, IA 51501-6281 | 712.255.6244 | info@SiouxlandHabitat.org | |
| ReStore, Waterloo | 803 W 5th St | Waterloo, IA 50702 | 319.235.9946 | devdir@heartlandhfh.org | |
| River City Demolition | PO Box 726 | Peoria, IL 61602 | 309.655.0447 | | |
| Robinette Demolition, Inc. | 0 S. 560 Hwy 83 | Oakbrook Terrace, IL 60181 | 630.833.7997 | info@rdidemolition.com | www.rdidemolition.com/home.php |
| Rock Creek Tree and Building Salvage | 1538 325th St | Osage, IA 50461 | 641.732.4025 | | |
| RPM Salvage Recovery | 1109 Bellevue Blvd | Omaha, NE 68005 | 402.346.4470 | | |
| Rural Resource | 1320 Jefferson Avenue | Saint Paul, MN 55105 | 651.695.1732 | info@ruralresourcerecovery.org | www.ruralresourcerecovery.org |
| Salvage Barn | 3900 Hebl Ave SW | Iowa City, IA 52246 | 319.351.1875 | salvagebarn@ic-fhp.org | www.ic-fhp.org/salvagebarn.html |
| Salvage Heaven, Inc. | 206 E Lincoln Ave | Milwaukee, WI 53207 | 414.329.7170 | | |
| Salvage One | 1524 South Sangamon St | Chicago, IL 60608 | 312.733.0098 | salvoone@aol.com | www.salvageone.com |
| Sanders Enterprise, Inc. | 3019 Nash Rd | Scott City, MO 63780 | 314.334.9600 | | |
| Scarboro River Barn and Lumber | | Green Bay, WI 54301 | 920.498.1755 | | |
| Schuler's Country Store and Workshop | 533 N Main St | Janesville, WI 53545 | 608.754.4052 | info@schulercountry.com | www.schulercountry.com |
| Second Chance Lumber | | Viborg, SD 57070 | 605.766.5145 | mellamy001@yahoo.com | |
| SKB Environmental | 251 Starkey St | St Paul, MN 55107 | 651.224.6329 | info@skbinc.com | www.skbinc.com |
| Spiess Architectural Antiques | 230 E Washington St | Joliet, IL 60433 | 815.722.5639 | spiessantq@aol.com | |
| Spirtas Wrecking Company | 951 Skinker Parkway | St. Louis, MO 63112 | 314.862.9800 | | |
| Stockton Heartwoods Limited | 624 Holly Hills Ave | St. Louis, MO 63101 | 800.788.4828 | heartwoods@earthlink.net | www.heartwoods.com |
| The Green Institute - BMRA member | 2801 21st Ave S | Minneapolis, MN 55407 | | jheipel@greeninstitute.org | www.thereusecenter.com |

# APPENDIX J *(Continued)*

**MARKET LISTING**

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| The Renovation Source Inc. | 3512 N Southport Ave | Chicago, IL 60657 | 773.327.1250 | | |
| The Restoration Place | 305 20th St | Rock Island, IL 61201 | 309.786.0004 | | |
| | | | | | |
| The Reuse Center | 2216 E Lake St | Minneapolis, MN 55407 | 612.724.2608 | | |
| The Salvage Man Ltd | 7441 Townline Rd. | Waterford, WI 53185 | 414.881.1268 | | |
| The Storehouse | 5001 W. Harrison | Chicago, IL 60644 | 773.921.3900 ext. 315 | sjpincham@thestorehouse.org | www.worldvision.org/get_involved.nsf/child/us_storehouse?Open |
| Timeless Timber | 2200 E Lake Shore Dr | Ashland, WI 54806 | 888.653.5647 | sales@timelesstimber.com | www.timelesstimber.com |
| Traditional Woodworks and Lumber Company | 1679 38th St | Somerset, WI 54025 | 800.882.2718 | | www.tradwood.com |
| United Demolition Incorporated | 2123 Oxford Rd | Des Plaines, IL 60018 | 847.296.2600 | | |
| Urban Evolutions | 867 Valley Rd | Menasha, WI 54952 | 920.380.4149 | | www.urbanevolutions.com |
| US Army Corps of Engineers, Const. Engineering Research Lab | PO Box 9005 | Champaign, IL 61821 | 217.373.3497 | t-napier@cecer.army.mil | |
| USDA Forest Service, Forest Products Laboratory | One Gifford Pinchot Dr. | Madison, WI 53705 | 608.231.9255 | | |
| West End Architectural Salvage | 22 9th Street | Des Moines, IA 50309 | 515.223.0499 | | www.westendarchsalvage.com/index php |

## ASPHALT/CONCRETE REUSE RECYCLING

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| A-Line Crushing | 808 Dearborn Ave | Waterloo, IA 50703 | 800.760.1222 | | |
| Concrete Recyclers Ltd | 110 Main Street | Ossian, IA 52161 | 583 532.9215 | | |
| Corell Recycling | 200 South 13th | West Des Moines, IA 50265 | 515.223.8010 | | |
| Des Moines Asphalt & Paving | PO Box 3365 | Des Moines, IA 50316-0365 | 515.262.8296 | | |
| Schmillen Construction, Inc. | 4772 C Ave | Marcus, IA 51035 | 712.376.2249 | schmilleninc@midlands.net | www.concrete-recycling.com |
| Rock Hard Concrete Recycling | P.O. Box 217 | West Branch, IA 52358 | 319.643.4222 | | www.rockhardrecycling.com |

# APPENDIX J *(Continued)*

**MARKET LISTING**

## ASPHALT SHINGLES

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| Bituminous Roadways Inc | 9050 Jefferson Trl | Inver Grove Heights, MN 55077 | 651.686.7001 | | www.bitroads.com |
| Buckingham Recycles | 5980 Credit River Rd | Prior Lake, MN 55372-3306 | 952.226.6444 | | www.buckinghamcompanies.co |
| Hoffman Construction Co | 2232 S Broadway | New Ulm, MN 56073 | 507.359.4444 | | |
| Onyx Central Minnesota | 2355 12th St SE | St Cloud, MN 56304 | 320.251.8919 | | www.onyxna.com |
| SKB Environmental | 251 Starkey St | St Paul, MN 55107 | 651.224.6329 | | www.skbinc.com |
| The Reuse Center | 2216 E Lake St | Minneapolis, MN 55407 | 612.724.2608 | | www.greeninstitute.org |
| TUBS Inc. | 1431 W 32nd St | Minneapolis, MN 55419 | 612.825.8827 | | |
| Veit Disposal Systems | 14000 Veit Place | Rogers, MN 55374 | 763.422.3867 | | www.veitpanies.com |
| Waste Commission of Scott County | 11555 110th Ave. | | 563.381.1300 | kmorris@wastecom.com | www.wastecom.com |

## CARPET/CARPET PAD

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| Bro-Tex, Inc. | 800 Hampden Ave | St. Paul, MN 55114 | 651.645.5721 | | www.brotex.com |
| Bro-Tex, Inc. | 4907 S. Howell Ave. | Milwaukee, WI 53207 | 414.481.6655 | | www.brotex.com |
| CP Recovery | 7534 “F” Street | Omaha, NE 68127 | 402.331.1630 | | www.cprecovery.com |
| CP Recovery | 6555 N.W. Beaver Road | Johnston, IA 50131 | 515.276.2600 | | www.cprecovery.com |
| Kruse Carpet Recycling | 4800 W 96th Street | Indianapolis, IN 46268 | 317.337.1950 | | |
| Sergenians | 2001 Fish Hatchery Road | Madison, WI 53713 | 608.273.6300 | | www.sergenians.com |

## COMINGLED MATERIALS RECOVERY FACILITIES

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| Phoenix C & D Recycling, Inc. | 4764 NE 22nd Street | Des Moines, IA 50313 | 515.323.5888 | | www.phoenixrecycling.net |

# APPENDIX J *(Continued)*

## COMPOSTING/MULCH FACILITIES – WOOD/GYPSUM/LAND CLEARING DEBRIS

| Company | Address | City, State Zip | Telephone | Email | Website |
|---|---|---|---|---|---|
| Addoco, Inc. | 12640 Industrial Ct. | Peosta, IA 52068 | 563.557.1555 | | www.addoco.com/aboutus.htm |
| B&B Bedding, Inc. | 2745 275th Street | Oskaloosa, IA 52577 | 641.673.0226 | | www.bandbbedding.com |
| Bill Miller Logging, Inc. | 380 East 4th Street | Dubuque, IA 52001 | 319.583.9441 | | |
| Chamness Technologies | 24820 160th Street | Eddyville, IA 52553 | 515.969.5702 | | www.chamnesstechnology.com |
| Golden Valley Hardscapes | 3072 380th Street | Story City, IA 50248 | 866.455.1086 | caragv@iowatelecom.net | |
| Great River Regional Waste Authority | 2092 303rd Ave. | Fort Madison, IA 52627 | 319.372.6140 | grwaeco@interl.net | www.grrwa.com |
| Landfill of North Iowa | 15942 Killdeer Ave | Clear Lake, IA 50428 | 877.LANDFIL | | www.landfillnorthiowa.org |
| Mulch Mart | 600 Hwy 6 | Waukee, IA 50263 | 515.978.6852 | mulchmart@hickorytech.net | www.mulchmartofiowa.com |
| Pro Earth Environmental | 11720 210 Street | West Union, IA 52175 | 563.422.3012 | proearth@qwestoffice.net | |
| Thomas Brothers | P.O. Box 1619 | Fort Dodge, IA 50501 | 515.571.6243 | | |
| Wieland & Sons Lumber Corporation | 644 220th Street West | Winthrop, IA 50682-9333 | 319.935.3936 | | www.wlumber.com |

## GENERAL RECYCLING (PAPER, CARDBOARD, TIN, PLASTIC)

Because of the vast number of companies in this category, please contact your Area Resource Specialist to find the companies nearest to your job site. Contact information may be found at www.iowadnr.gov/waste/iwe/index.html.

## HAZARDOUS MATERIALS

For any of the following materials please contact your Area Resource Specialist. Contact information may be found at www.iowadnr.gov/waste/iwe/index.html or exempt small quantity generators may contact their Regional Collection Center. Contact information may be found at www.iowadnr.gov/waste/hhm/index.html.

**Asbestos -** found in boiler rooms (HVAC duct insulation, etc), flooring (vinyl flooring, etc), electrical (panels, wiring, insulation), pipe and other insulation (aircell, millboard, blown-in, etc), surfacing materials (some types of plaster), roofing (shingles, felt, base flashing), cement materials (transite), ceiling materials and siding materials.

**Chlorofluorocarbons (CFCs) -** man-made refrigerants, these can be found in fire extinguishers, air conditioners (rooftop, room, and central), walk in coolers (refrigeration or cold storage areas), water fountains, dehumidifiers and heat pumps.

**Lead -** mainly found in older buildings Pre-1978. Lead can be found in the following areas: lead based paint (woodwork and walls), lead-acid batteries (lighting exit signs security systems), lead flashing molds and roof vents, lead pipes and solder.

**Mercury -** switches, light bulbs, thermostats, thermometers, batteries, lighting boilers, furnaces, heaters & tanks, electrical relays.

**Poly-Chlorinated BiPhenyls (PCBs)** - mainly found in electrical equipment such as light ballasted, transformers, transistors, capacitors.

## METAL RECYCLING

Because of the vast number of companies in this category, please contact your Area Resource Specialist to find the companies nearest to your job site. Contact information may be found at www.iowadnr.gov/waste/iwe/index.html.

# APPENDIX K- Salvage Check List

| YES – Building Materials Generally accepted for Reuse | NO – Generally Not Acceptable |
|---|---|
| ❑ Architectural Features | ❑ Appliances Older than 5 years |
| ❑ Banisters | ❑ Ceiling Fans |
| ❑ Bath Fixtures | ❑ Commercial 200 volt electrical equipment |
| ❑ Bathtubs | ❑ Commercial bath fixtures |
| ❑ Bath Vanities | ❑ Commercial ducting and vent covers |
| ❑ Bookcases, files, library shelves | ❑ Commercial flashing |
| ❑ Brick and Paving Stones | ❑ Commercial shelving missing parts |
| ❑ Cabinetry – Wood | ❑ Countertops – L-shaped or dated colors |
| ❑ Claw-foot or antique tubs | ❑ Doors – damaged |
| ❑ Columns, Pillars and Posts | ❑ Electric Baseboard Heaters |
| ❑ Concrete Blocks and Products | ❑ Fireplace Doors |
| ❑ Corbels | ❑ Fluorescent light fixtures |
| ❑ Countertops, straight, neutral colors | ❑ Gutters – leaking/rotted |
| ❑ Displays and display fixtures | ❑ Mini-blinds |
| ❑ Doors - Solid Wood | ❑ Open bags of cement/mortar/drywall |
| ❑ Doors – Patio/French | ❑ Room dividers missing parts |
| ❑ Electrical and HVAC Supplies | ❑ Shower doors, except high-end |
| ❑ Faucets and plumbing fixtures | ❑ Sinks – wall hung, cultured marble, dated colors |
| ❑ Fencing | ❑ Tile with heavy grout |
| ❑ Flooring – Carpet and Vinyl | ❑ Windows – Aluminum |
| ❑ Flooring – Wood | ❑ Wood shorter than 4', rotten/damaged |
| ❑ Glass, Sheet and Plexiglass | ❑ Wood-burning equipment (unless antique) |
| ❑ Gutters | |
| ❑ Hinges and other hardware | |
| ❑ Insulation | |
| ❑ Kitchen Cabinet Sets | |
| ❑ Kitchen Fixtures | |
| ❑ Lighting Fixtures | |
| ❑ Lockers | |
| ❑ Lumber (Clean – Denailed) | |
| ❑ Mirrors and Mirror Tiles | |
| ❑ OSB and Masonite | |
| ❑ Plywood and Chipboard | |
| ❑ Radiators and Registers | |
| ❑ Roof Tiles | |
| ❑ Sandstone | |
| ❑ Shelving and Racking | |
| ❑ Siding and Shutters | |
| ❑ Sinks – Kitchen/Bath | |
| ❑ Slate, Granite, Marble | |
| ❑ Stained Glass | |
| ❑ Store Fixtures | |
| ❑ Tile | |
| ❑ Tile Board | |
| ❑ Toilets | |
| ❑ Trim and Molding | |
| ❑ Windows | |
| ❑ Wood Beams | |

# ADDITIONAL RESOURCES

## CASE STUDIES

Executive Hills Deconstruction and Demolition Project, Des Moines, Iowa
www.iowadnr.gov/waste/recycling/files/iowacase.pdf

Iowa State University, Ames, Iowa – Morrill Hall Renovation
www.iastate.edu/Inside/05/1007/green.shtml

Kingsley Pierson Middle School Project, Pierson, Iowa
www.iowadnr.gov/waste/recycling/files/iowacase.pdf

Principal Financial Group Demonstration Project, Des Moines, Iowa
www.iowadnr.gov/waste/recycling/files/iowacase.pdf

National Mississippi River Museum and Aquarium, Dubuque, Iowa
www.iowadnr.gov/energy/sustainable/files/conn.pdf

## WEB LINKS

**Association of General Contractors** provides Green Construction Resources that include state and local Green Building Programs, AGC Environmental Solution Series and Green construction Bible, and others in their Environmental section. Users can access these resources by clicking on the "Research a Topic" option at the top of AGC home page and then choosing "Environmental". www.agc.org

**Building Materials Reuse Calculator** calculates results based on data from **BEES®** *(Building for Environmental and Economic Sustainability)* version 3.0, a software program developed by the NIST (National Institute of Standards and Technology) Building and Fire Research Laboratory. **BEES** enables users to compare the environmental and economic performance of different building materials, based on certain assumptions about how those products are manufactured, shipped, installed, and maintained. www.wastematch.org/calculator/calculator.htm

**Center on Sustainable Communities** serves as a resource for the residential homebuilding marketplace. COSC educates consumers and professionals, empowering them to take steps toward more sustainable building practices and provides community-networking forums for professionals and experts to engage with peers and homeowners on various aspects of residential green building. www.icosc.com

**Construction Industry Compliance Assistance Center** offers an overview of green building and links to related resources www.cicacenter.org

**Construction Materials Recycling Association** Promoting the safe and economically feasible recycling of the more than 325 million tons of recoverable construction and demolition materials that are generated in the United States annually www.cdrecycling.org

**Deconstruction Institute** provides educational materials, tools and techniques, networking, case studies, articles, facts about the environmental impacts of deconstructing, and many other downloadable and interactive modules. Where to start? Begin with The Learning Center below. www.deconstructioninstitute.com

**Dollars and Sense of Green Construction.** www.aia.org/static/state_local_resources/adv_sustainability/Green%20Economics/Dollars_Cents_Green_Construction.pdf

**Drywall Recycling** information regarding reuse and recycling of drywall materials. www.ciwmb.ca.gov/condemo/wallboard/default.htm#Existing

**EPA's Green Communities Program** provides the first national green building program developed for affordable housing. They focus on the use of environmentally sustainable materials, reduction of negative environmental impacts and increased energy efficiency. They emphasize designs and materials that safeguard the health of residents and locations that provide easy access to services and public transportation. In addition they provide developers and other construction professionals with a cost effective option. For more information visit www.greencommunitiesonline.org

**EPA's Green Building** resources are focused on how to reduce environmental impact of buildings and create more resource-efficient models of construction, renovation, operation, maintenance, and demolition. www.epa.gov/greenbuilding

**EPA's Planning for Disaster Debris –** Construction and Demolition Materials: www.epa.gov/osw/conserve/rrr/imr/cdm/pubs/disaster.htm

**GSA LEED Cost Study** commissioned by the U.S. General Services Administration (GSA), reviews the costs to develop "green" federal facilities using the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Building Rating System, Version 2.1. www.wbdg.org

**Greensburg, Building Better, Stronger, Greener** contains a host of resources for disaster recovery and green construction in the wake of a natural disaster including access to Greensburg's recovery plan, comprehensive master plan and a host of sustainable resources. www.greensburgks.org

**Lifecycle Building Challenge**, sponsored by EPA and its partners, is a web-based competition open to professionals and students. www.lifecyclebuilding.org

## WEB LINKS

**National Association of Home Builders Green Building Program** includes resources that NAHB and the NAHB Research Center have made available to builders, home buyers and others interested in green building. An online scoring tool that builders can use to count up the green features in each of seven categories and then certify their homes by arranging for inspection by an approved list of Green Verifiers. For more information, visit www.nahbgreen.org

**Powell Center for Construction and Environment** primarily a research organization dedicated to the resolution of environmental problems associated with architectural planning and the determination of optimum materials and methods for use in minimizing environmental damage. www.cce.ufl.edu/aboutus.html

**Shingle Recycling**, provides a dialogue for the continuation and innovation in the reuse of asphalt shingles. www.shinglerecycling.org

**Solid Waste Alternatives Program**, a financial assistance program of the Iowa Department of Natural Resources that works to reduce the amount of solid waste generated and landfilled in Iowa. Through a competitive process, financial assistance is available for a variety of projects, including source reduction, recycling and education. www.iowadnr.gov/waste/financial/financialswap.html

**United States Green Building Council** is a coalition of leaders from across the building industry working to promote environmentally responsible buildings. USGBC runs Greenbuild, an outreach program that promotes green building at USGBC's Annual International Green Building Conference and Expo. www.usgbc.org

**Used Building Materials Association** is a non-profit educational organization whose mission is to facilitate building deconstruction and the reuse/recycling of recovered building materials. www.ubma.org

**Waste Cap** provides construction and demolition resources, case studies, educational opportunities and training media. www.wastecapwi.org/candd.htm

**WasteSpec: Model Specifications for Construction Waste Reduction, Reuse and Recycling** is a downloadable manual that provides architects and engineers with both model specifications and background information addressing waste reduction, reuse, and recycling before and during construction and demolition. WasteSpec was produced by the Construction and Demolition Waste Task Force of Triangle J Council of Governments in Research Triangle Park, North Carolina. www.tjcog.dst.nc.us/regplan/wastspec.htm


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