

# Deconstruction & Construction Waste Recycling



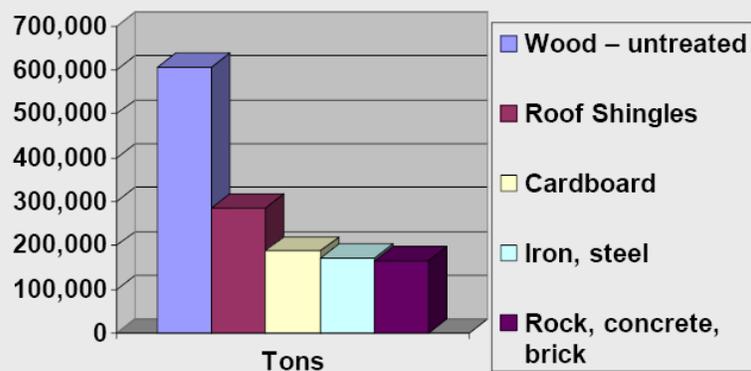
## What is Deconstruction?

- Selective disassembly of structures and removal of contents to preserve the value of recovered materials for reuse or recycle
- Can be considered Reverse Construction

# Why? Benefits?

- **Community Benefits**
  - Materials Reused = reduced waste – historical salvage
  - Reduced Wastes = reduced green house gases
- **Green Building Recycling Goals**
- **Saving Money** less waste = less costs
- **Safer Job Site**
- **Local Ordinances**
- **Project Requirements**

## Construction wastes



# Basic Deconstruction Process

- Structural & Hazardous Materials Audit
- Materials Management Plan
- Specifications
- Deconstruction
- Metrics

# Materials Audit

- Sample Collection and Analysis
  - Asbestos Containing Materials
  - Lead Paint
  - Hazardous Materials (mercury, PCBs, inorganic and organic compounds)
- Measure and Quantify Materials
  - Concrete
  - Brick
  - Steel
  - Wood
  - Glass
  - Light bulbs
  - Transformer, capacitors, ballasts
- Identify Architecturally Valuable Materials
  - Doors
  - Fixtures

# Landscape

## ■ Mature Landscape Plantings

- On-site reuse
- Off-site nurseries

## ■ Trees

- Reclaim Urban Forest



# Sample Collection and Analysis



Asbestos Containing Material



Lead paint

# Sample Collection and Analysis



Concrete sample collection for hazardous materials analysis

## Materials Management Plan

- Identify markets for materials
  - Existing markets
  - New markets
- Specify fate of recovered materials\*
  - Specific materials to be reused or recycled
  - Materials targeted for disposal
- Economics
  - \$ restored lumber > \$ mulch > \$ disposal
  - Decontamination & reuse or recycle vs. disposal
  - Reuse/recycle is not always cost effective for all materials

\* Also applies to new construction

# Concrete Decontamination



# Specifications

- Require material reuse or recycle
  - Contracts
  - Requests for Proposals
  - Grants
- Specify reuse/recycle requirements
  - Define specific materials
  - Define reuse/recycle rates - quantity/percentage

# Deconstruction



## Metrics

- Monitor
  - Material reuse consistent with goals?
- Track Progress
  - Progress reports, invoices, receipts
  - Weights, volumes, percentages
- Final Documentation
  - Materials reuse log
    - Total quantities
    - How materials were reused
    - Goals achieved

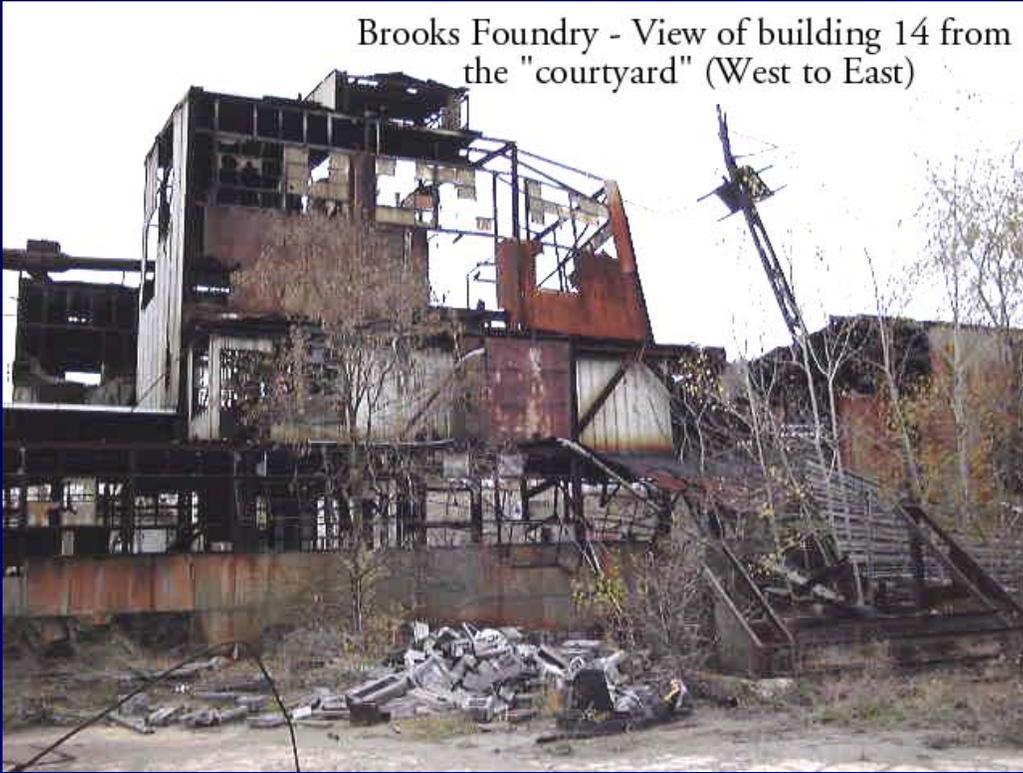
# Relative Cost



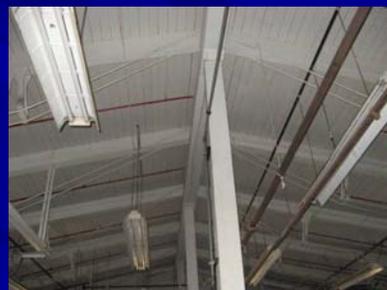
# Unlikely Candidates for Deconstruction



Brooks Foundry - View of building 14 from the "courtyard" (West to East)



## Candidates for Deconstruction or Renovation



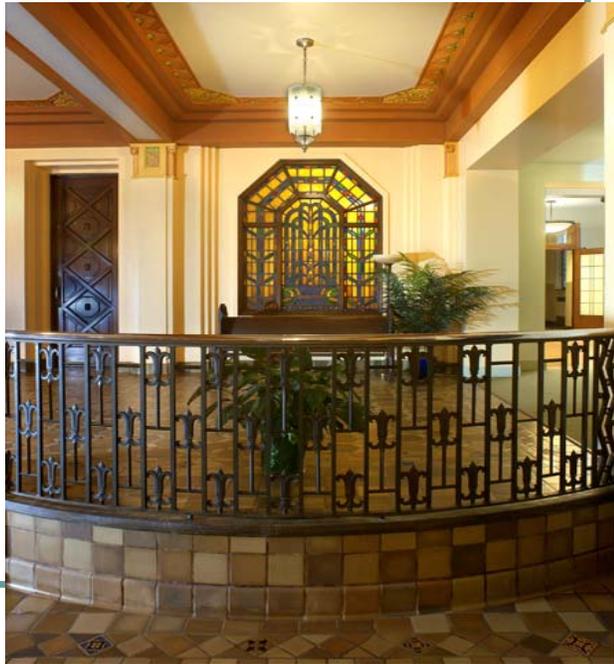


## Success Stories



Shakespeare

# IHM Motherhouse



# Motherhouse Renovation



- Recycled
  - 800 windows
  - 500 cherry doors
  - 45,236 sqft carpet
  - 100 period lights
  - Marble bath walls to sills & countertops



# Accident Fund Ins - Lansing



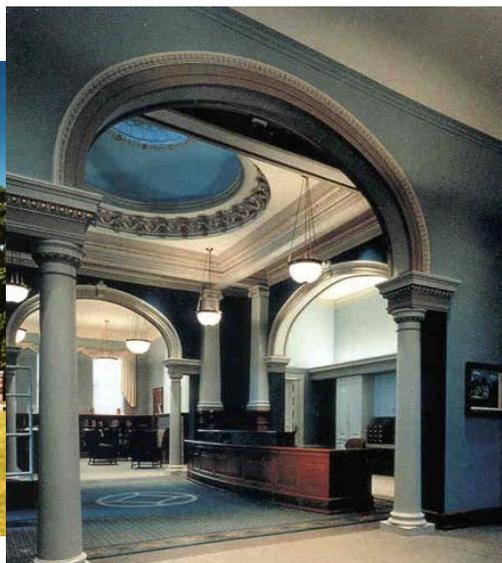
# Muskegon Performing Arts



# Christman Mutual Building



# Howell Carnegie Library



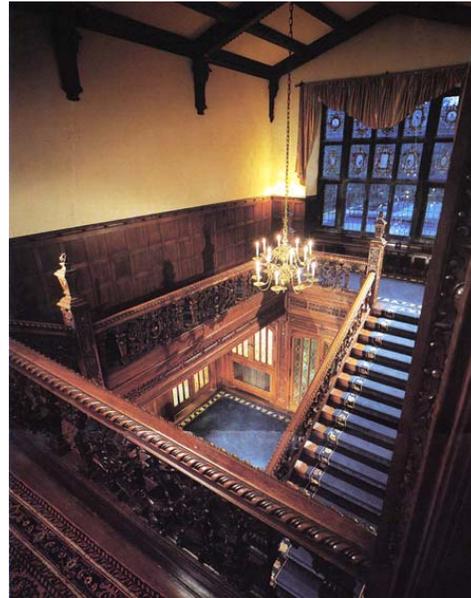
# Holland City Hall



# Detroit Public Library – Rose Branch



# UM – Henry Ford Estate



## Recycling - Reuse

Step 1. Audit - know what you have



## Recycling - Reuse

### Step 1. Audit - know what you have



As noted at the beginning, before you can begin to do any deconstruction, you must know what you have and what you want to target for recycling. Focus on the largest volumes, the most money makers like metal and cardboard, or the most costly to dispose, like mercury. Currently, in Michigan you can dispose of mercury free if its separated\*. You contaminate a load and the entire load is now a hazardous waste.

Saying you'll recycle everything could result in failure. Knowing what you have, what's best to target and having a management plan is key.

Mercury is collected free at about 20 CleanSweep sites across the state so there isn't one in every county. Note also that the collection sites are not open all year round but may open for special cases such as finds during cleaning estate properties or a crisis. A list of the sites is available at [www.michigan.gov/mda/0,1607,7-125-1568\\_2390\\_45388-11759--,00.html](http://www.michigan.gov/mda/0,1607,7-125-1568_2390_45388-11759--,00.html) or open [www.michigan.gov/deqmercuryp2](http://www.michigan.gov/deqmercuryp2) then open the link "Where to take Mercury..." then open the link "Mercury Clean Sweep Sites – MDA website"

## Recycling - Reuse

### Step 2. Plan – Know your options

- Waste Exchanges – Material Reuses
- Non-profit contacts
- Building Material ReStores
- Local demand -green glass? community project?
- Recycling options - **DNRE Website**

After identifying what you have and what you want to recycle, you need to identify local markets. If there is no market, you can not recycle. Some market resources to consider include:

Be as creative as you can. If you have a building with a lot of mirrors, contact a dance studio, university if they can use them for restrooms or hair salon connection. If you have an old upscale building that has tile, maybe this is pewabic tile and a collectors item. If the building is old, the wood may be old growth timber that carpenters would pay well for. On and on

Enriching our whole community through a legacy of affordable home ownership.

**Habitat for Humanity®**  
Huron Valley

**ReStore**

**Surplus and Used:**

- Building Supplies
- Furniture
- Appliances
- Tools

**Furniture:** bookcases, entertainment centers, hutches, coffee tables, dressers, end tables, tables and chairs, couches, recliners, file cabinets, desks, framed mirrors

**Appliances:** washers, dryers, ranges, ovens, microwaves, refrigerators, dishwashers, range hoods, ac units

**Brighton HFH - 1.5 yrs ending April 2007**  
**Diverted 670 tons from landfill**

Building ReStores are excellent contacts for small jobs and have a warehouse and network for some larger resources. Donations qualify for tax benefits. They're also great for putting the donated materials back into the community at lower prices thus helping communities rebuild and maintain quality homes and fight blight.

In addition, if a community is dealing with foreclosed homes that have furnishings left behind, sending these items to goodwill or the restores would benefit the community rather than landfilling as most cleaning contractors are currently doing.

# Material Reuse



Here are 3 online exchanges specifically designed for building materials. Planet Reuse, CMDEpot and Building Surplus They're excellent for locating materials or selling. The better the description of the material, the better they work.

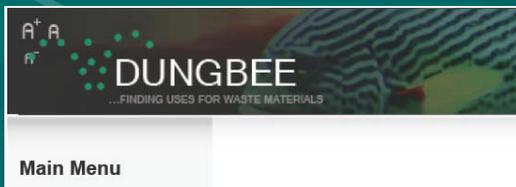
## Material Reuse (cont)

County Recycling Guides



211

Community Contacts



Additional resources to consider include these.

Check with your county recycling representative – they may have a list of county recycling contacts (Clinton, Washtenaw)

If you have usable materials, you can get a tax benefit and help the community by calling 211. This connects you to a central contact for the area's non-profit organizations. Tell them what you have and they can get the details out to all the area non-profits. This is particularly helpful for soft deconstruction items like carpeting, lights, appliances, etc.

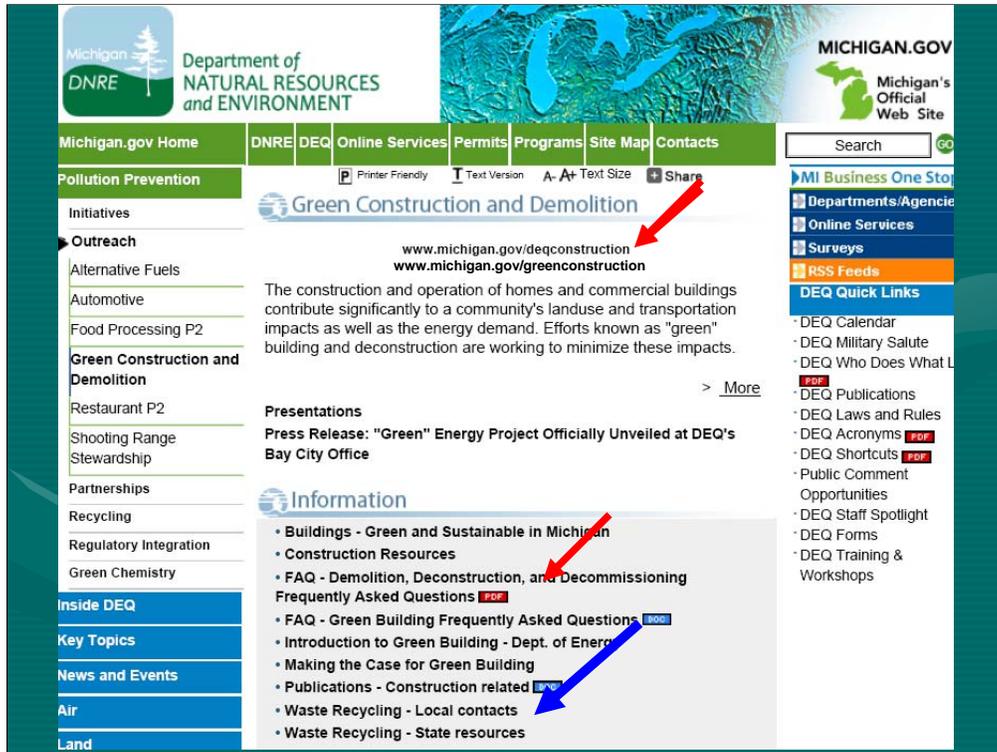
Dungbee is another waste exchange some have used successfully. And of course, don't forget

Freecycle and Craigslist.

Another option is to create an area near the road for "Free" items.

Make sure several things

- your community is OK with this
- it doesn't create any liability for you and
- your dumpsters aren't near the road or you'll get unwanted donations as well.



Now for the good stuff – the DNRE website resources

-The DEQ shortcut listed still works. It will be changing to [www.michigan.gov/greenconstruction](http://www.michigan.gov/greenconstruction)

-A copy of this deconstruction presentation is available here.

-Answers to many of the questions you have on regulations regarding deconstruction are found in the FAQ.

-The most useful recycling resources will be found under the “Waste Recycling – State resources” located at the bottom under Information. Clicking on this link will open... (next slide)

The screenshot shows the Michigan Department of Natural Resources and Environment website. The main content area is titled "Waste Recycling - State resources". Under the "Initiatives" section, there are several sub-sections: Outreach, Alternative Fuels, Automotive, Food Processing P2, Green Construction and Demolition, Restaurant P2, Shooting Range Stewardship, Partnerships, Recycling, Regulatory Integration, and Green Chemistry. The "Recycling" sub-section is highlighted with a red arrow. Below this, there is a section titled "Material Donations / Reuse" with a red arrow pointing to it. The text under this section reads: "Consider donations of uncontaminated waste materials to: boy/girl scout projects; theater groups; community rebuilding efforts; vo-tec construction classes; etc. Building items can be donated to or purchased from re-stores. Most accept and re-sell usable items such as: windows; paint; lamps; flooring; cabinets; doors; etc. These stores are also good resources for small jobs that need building and home decorating materials at economical prices." Below this text is a link for "Building Material Restores" with a red arrow pointing to it. At the bottom of the page, there is a highlighted box with the heading "Recycling" and a red arrow pointing to it. The text in this box reads: "Recycling success is dependent upon available local resources. Below are lists to help identify those local resources."

Reuse what you can and as mentioned, a good reuse option are the building restores. There link here lists all the known restores in Michigan.

Below that is recycling...(next slide)

Recycling

Recycling success is dependent upon available local resources. Below are lists to help identify those local resources.

- [Construction waste recycling companies and information \(doc\)](#)
- Also check your local contacts and yellow pages.

**ADDITIONAL RESOURCES:**

**Brownfield Redevelopment**

**Compliance - see Environmental Compliance**

**Construction Recycling Resources**

- [Brownfield Resources](#)
  - [EPA CD Resources for Brownfield Projects](#)
- [Building Material Recycling Resources\(doc\)](#)
- [Chicago Construction Recycling Requirements](#)
- [EPA Building Savings- case studies](#)

**Deconstruction Resources**

- [Deconstruction Companies](#)  
(Also check the yellow pages)
- [Building Design Standards](#)
  - [Awards for deconstruction designs - Lifecycle Building Challenge](#)
  - [Design for Deconstruction](#)
  - [Design for Disassembly](#)
- [Deconstruction - Feasibility of](#)
- [Deconstruction Guide - Deconstruction Institute](#)
- [Deconstruction Guide - HUD](#)

The green box contains the most commonly used link for locating recycling resources.

Note that scrolling further down, there are some links on brownfields and deconstruction.

If we open the construction company link we get....(next slide)

**Construction Waste Recycling**

**Material Recycling**

Construction & Demolition (C&D) debris is waste resulting from construction, building remodeling, repair, deconstruction or demolition operations. Below is a list of some of the materials with links to company listings, resources and frequently asked questions. (Also check your local contacts and yellow pages.)

<i>Material</i>	<i>Recycling Companies</i>	<i>Additional Resources</i>
Asphalt	<a href="#">RMMMD</a>	<a href="#">1,000 yds notification</a> <a href="#">Asphalt Shingle Recycling Best Practices</a>
Brick	<a href="#">RMMMD</a> <a href="#">Bldg Matl List</a>	<a href="#">FAQ</a> <a href="#">1,000 yds notification</a>
Cardboard	<a href="#">RMMMD</a>	
Carpet	<a href="#">RMMMD</a> <a href="#">Bldg Matl List</a>	<a href="#">FAQ</a>
Toxics –mercury, pesticides, etc	<a href="#">Household Commercial</a>	<a href="#">FAQ</a>
Vinyl / PVC	<a href="#">RMMMD</a> <a href="#">Building Matl list</a> <a href="#">PVC Resources</a>	
Wood	<a href="#">Pallet Recycling</a> <a href="#">RMMMD</a> <a href="#">Wood Recycling</a>	<a href="#">FAQ</a> <a href="#">Scrap Wood Burning</a>

This document contains links to recycling resources and requirements on different materials.

Where there are several links under recycling companies check both.

For many, wood is a major issue. If that's the case, be certain to check out the bottom link on wood recycling. This has a variety of ideas such as –contacts if your removing old growth timber wood from buildings, barn organizations, wood collection sites for wood to energy usage, etc.

If you click on any of the “RMMMD” links you’ll see this... (next slide)

Michigan Department of NATURAL RESOURCES and ENVIRONMENT MICHIGAN.GOV Michigan's Official Web Site

Michigan.gov Home DNRE DEQ Online Services Permits Programs Site Map Contacts Search GO

P Printer Friendly T Text Version A- A+ Text Size Share

**Pollution Prevention**

Initiatives

Outreach

Partnerships

Recycling

Electronics Reuse and Recycling

Regulatory Integration

Green Chemistry

Inside DEQ

Key Topics

News and Events

Air

Land

Waste

Water

Climate Change

## RMMD Frequently Requested Lists

Contact: [Lucy Doroshko](#) 517-373-1322  
Agency: Energy, Labor & Economic Growth

**Construction & Demolition Debris**

- [Asphalt & Concrete](#)
- [Bark, Sawdust, Trees & Other](#)
- [Bricks](#)
- [Carpet/Padding](#)
- [Ceiling Tiles](#)
- [Construction Waste](#)
- [Demolition](#)
- [Fluorescent Bulbs](#)
  - [Regulatory Guidance Document Available](#)
- [Mercury](#)
  - See [Mercury P2 website](#) for more information
- [Paint](#)
- [Pallets](#)
- [Polyvinyl Chloride-Vinyl \(PVC\) #3](#)

**Oils, Solvents and Other Liquids**

- [Antifreeze](#)
  - [Regulatory Guidance Document Available](#)
- [Used Oil](#)
  - [Regulatory Guidance Document Available](#)

RMMD stands for Recycled Materials Market Directory

Opening any of these will give you a state wide list of sites that accept those materials.

Recycling Companies for Construction & Deconstruction Materials			
(This is not an endorsement of any company listed – This is provided for informational purposes only.)			
Name	Address	Phone	Website / Comments
<b>Carpet Recycling</b> Note: there may be a minimum quantity required.			
Collins & Aikman Tandus		800-248-2878	Program discussed but no guidance <a href="http://www.tandus.com/sustainability/recycling.aspx">www.tandus.com/sustainability/recycling.aspx</a>
Columbia Recycling		800-992-0255	Contact: <a href="mailto:columbiarecycling@windstream.net">columbiarecycling@windstream.net</a> The carpet must have latex backing, not foam or rubber.
Covanta		317-299-8412	A waste to energy company. <a href="http://www.covantaholding.com">www.covantaholding.com</a>
ERCS		978-621-9540	Environmental Recovery, Consolidation Services <a href="http://www.recyclecarpets.com">www.recyclecarpets.com</a>
Great Lakes Recycling	Roseville, Mi	586-218-3605	Partnership with Shaw Carpets <a href="http://www.go-glr.com">www.go-glr.com</a>
Interface		888-733-6873	<a href="http://www.interfaceinc.com/us/services/Reclamation/">www.interfaceinc.com/us/services/Reclamation/</a> <a href="http://www.interfaceflooring.com/libray/PDF/ReEntry.pdf">www.interfaceflooring.com/libray/PDF/ReEntry.pdf</a>
Invista		877-446-8478	<a href="http://antron.invista.com/content/how_to_ar02_07.shtml">http://antron.invista.com/content/how_to_ar02_07.shtml</a> <a href="http://antron.invista.com/reclamation">http://antron.invista.com/reclamation</a>
Kruse Carpet Recycling		317-337-1950	They work with Covanta, to use old carpet for waste to energy. <a href="http://www.krusecarpetrecycling.com">www.krusecarpetrecycling.com</a>
Polymer Solutions Inc		269.384.2000 Ext: 203	Contact: <a href="mailto:info@polymer-solutions.com">info@polymer-solutions.com</a> <a href="http://www.polymer-solutions.com">www.polymer-solutions.com</a>
Resource Commercial Flooring Network	Michigan sites		<a href="http://www.rcfn.com">www.rcfn.com</a> 
Shaw Contract Carpet		800-434-9887	<a href="http://www.shawfloors.com/About-Shaw/Carpet-Recycling">www.shawfloors.com/About-Shaw/Carpet-Recycling</a> <a href="http://www.ecosolutions.com/html/sustainability_recycle.html">www.ecosolutions.com/html/sustainability_recycle.html</a>
<b>Ceiling Recycling (&amp; Acoustical Walls)</b>			
Armstrong Ceiling Tile Recycling	Shipping may be free	1-877- Armstrong	<a href="#">Local Recycling Network</a> Michigan sites  <a href="#">Commercial recycling program</a> <a href="#">Armstrong Sustainability</a>

If you had opened the link for building materials, this is what you'd see on page 2. Important to note here that there are local resources for recycling carpet and ceiling tiles. In the past, this was only possible if you had over 30,000 sqft of either and shipped long distances. Now there are outlets to collect smaller amounts and they arrange the shipping. You still need to call first as the carpet sites only accept certain types.

## Shingle Recycling

<p>Ideal Recycling, Inc.            Todd Foster            19300 West Eight Mile Road  <b>Southfield, MI</b>            248-390-8768            WDS# - <a href="#">485568</a></p>	<p>Crutchall Resource Recycling LLC            Jim Herman            6301 North Dort Highway  <b>Flint, MI</b>            810-618-5755            WDS # - <a href="#">485546</a></p>	<p>Payne &amp; Dolan, Inc.            James Mertes            11135 Thumm Road  <b>Elmira, MI</b>            231-546-2055            WDS# - <a href="#">486190</a></p>
<p>Crutchall Resource Recycling LLC            Bryan Hall            631 Chestnut Street, SW  <b>Grand Rapids, MI</b>            616-241-5553            WDS # - <a href="#">396319</a></p>	<p>Crutchall Resource Recycling LLC            24250 Mound Road  <b>Warren, MI</b>            586-206-6968            WDS # - <a href="#">484958</a></p>	<p>Emmet County DPW            Lindsey Walker            7363 Pleasantview Road  <b>Harbor Springs, MI</b>            231-348-0648            WDS# - <a href="#">470363</a></p>
<p>Crutchall Resource Recycling LLC            Matt Teesdale            2127 West Willow Street  <b>Lansing, MI</b>            517-899-1560            616-262-7418            WDS # - <a href="#">485547</a></p>	<p>Crutchall Resource Recycling LLC            3303 Gembrit Circle            John Lieter  <b>Kalamazoo, MI</b>            269-720-4206            WDS # - <a href="#">485724</a></p>	<p>American Waste            Colleen Allen            3947 US 131 North  <b>Kalkaska, MI</b>            231-499-7050            WDS# - <a href="#">483764</a></p>
<p>Arrow Sanitation LLC            Dave Matelski            254 Little League Drive  <b>Gaylord, MI</b>            989-732-4243            WDS# - <a href="#">486189</a></p>	<p>Crutchall Resource Recycling LLC            Scott McDowell            4365 Evanston Avenue  <b>Muskegon, MI</b>            231-740-0976            616-402-7878            WDS# - <a href="#">486239</a></p>	

This is just a reminder that the DNRE has recently approved used roofing shingle recycling. These are the approved locations.

# DNRE

## Deconstruction Contacts:



**Maggie Fields**

**517-335-6250**

**[FieldsM@michigan.gov](mailto:FieldsM@michigan.gov)**

**Mark DuCharme**

**269-567-3529**

**[DucharmeM@michigan.gov](mailto:DucharmeM@michigan.gov)**

**DNRE**

**Office of Pollution Prevention &  
Compliance Assistance**

**CH 1N**

**PO Box 30457**

**Lansing, MI 48909**

**DNRE**

**Remediation and  
Redevelopment Division**

**Kalamazoo District Office**

**7953 Adobe Road**

**Kalamazoo, MI 49009**

**[www.michigan.gov/deqconstruction](http://www.michigan.gov/deqconstruction)  
[www.michigan.gov/greenconstruction](http://www.michigan.gov/greenconstruction)**

**THANK YOU!**