December 2009

PRE-DEMOLITION REUSE AND RECYCLING ASSESSMENT

T.C. Esser Paint Co. Building

1542 N. 32nd Street

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Introduction

On October 9, 2009, the following individuals participated in a WasteCap Resource Solutions pre-demolition reuse and recycling assessment conducted for the purpose of helping the City of Milwaukee develop a Demolition Waste Management Plan for the Esser Paint Building:

City of Milwaukee	Tory Kress, P.E., AICP
City of Milwaukee	Benjamin Timm
City of Milwaukee	Chris Kraco
The Sigma Group	Ross Creighton
WasteCap Resource Solutions, Inc.	John Lottes

City of Milwaukee staff were interested in identifying demolition materials which may have reuse or recycling value so that these materials, and steps needed to be taken to recycle them, can be identified in bid documents. In addition, City staff were interested in identifying construction materials which may have recycling value so that a plan can be developed for the recovery of these materials during the construction phase. Based on the information gathered during and after the site visit, the following will be identified: (1) recommendations and potential markets (2) contacts and resources and (3) next steps.

The project is the deconstruction of the Esser Paint Building located at 1542 N. 32nd Street in Milwaukee, WI. According to Sigma, "the building appears to have been constructed in various phases between the 1890s and mid-1900s." The buildings from the 1930's are primarily poured concrete structure with block and brick interior partitions. The roof is constructed of wood Joists with wood tongue and groove decking and a built-up roof. The older 1890 and 1910 building is constructed of heavy timber construction, wood tongue and groove decking with wood strip flooring. The roof construction is similar to the newer 1930's building. Some areas of the building have steel support columns. Internal walls are also made of concrete, brick or block and there are few walls made of other materials. There is almost no drywall, lathe, fixtures, etc. to remove. The buildings are built on a hill abutting a bridge and railroad tracks. Due to this construction, parts of the building are five stories and parts are two stories. There are a variety of materials in the building. This site visit report will address those materials so that in the event the materials are left, reuse and recycling strategies are identified. The building is expected to be available for demolition in the Winter/ Spring of 2009 with demolition expected to be completed by Summer, 2010. Typically, WasteCap Resource Solutions demolition site visit reports include information on reuse of materials from the building. However, due to the materials available and the condition of the materials, there is limited opportunity for reuse.

I. Recommendations For City of Milwaukee

The site visit and discussion revealed several opportunities to explore during deconstruction. These recommendations represent a compilation of the recommendations provided at the site visit and after, and provide options you can pursue. Deconstruction differs from 'demolition' in that it is a painstaking process involving the selective dismantlement of building components that are worth salvaging. The deconstruction contractor can carefully dismantle the building to preserve items that have salvage value. Beams, posts and floor joists should be removed whole to maintain the superior widths and lengths of these antique timbers.

Demolition, on the other hand, is unfortunately the more common method of taking down a building. Implosion or 'wrecking-ball' style demolition is relatively inexpensive and offers a quick method of clearing sites for new structures. Consequently this process results in significant waste and unusable material.

II. Material Specific Recommendations

1) Concrete and Concrete Block

A) Much of the structure of the buildings is concrete, brick and/or block, including the floors, ceilings, walls, etc., and this will be by far the largest material by weight and volume available for recycling.

B) Most of the concrete, brick and block is available to be recycled. There is very little asbestos-containing material on the concrete/brick/block and very little lead bearing paint which exceeds DNR levels for recycling paint. As discussed at the site visit, the friable asbestos-containing material and the type 2 non-friable asbestos must be removed by appropriately trained State of Wisconsin certified abatement personnel whether or not the concrete is recycled. The category 1 non-friable asbestos-containing material only needs to be removed if recycling will occur. WasteCap recommends proper removal by abatement personnel of materials from the building with friable and non-friable asbestos, LBP and other hazardous materials and recycling of the rest of the structure. In addition, there are other environmental and safety rules related to lead bearing paint referenced in Sigma's reports which should be noted by demolition contractors (but do not affect the ability to recycle the material).

C) On-site crushing is possible at this site. Care should be taken about dust, noise and physical hazards to neighborhood. Also, the availability of local markets for these materials should be taken into consideration. However, the possibility exists that on-site crushing could be utilized to reduce hauling costs if the material could be stockpiled and used as fill on the project site or new construction project.

D) Lead based paint on concrete is another issue to address related to the recycling of the concrete, brick and block. ***See Appendix G - Concrete Recycling and Disposal Fact Sheet*** DNR (publication number WA-605 2004). If there is no lead based paint on the concrete, it may be crushed for recycling. If there is lead based paint present that contains more than 0.06% by weight (for laboratory testing), or 0.7 mg/ cm2 of paint surface (as measured by an XRF instrument), a low hazard exemption must be retained by the Department of Natural Resources in order for recycling to occur. Contact:

Nancy Gloe, Waste Management Specialist
Department of Natural Resources
(414) 263-8369
Nancy.gloe@wisconsin.gov

Here are some local concrete recycling markets. As with steel, the best economic value is likely to haul directly (City trucks or contractor) to the end market:

Northwest Asphalt / Stark Asphalt
Don Stark
11710 W. Hampton Ave.
Milwaukee, WI 53225
414-466-0644
www.starkasphalt.com
They may not want the brick. No dirt or organic material such as branches, grass, etc.

Johnson Sand & Gravel
20685 W. National Avenue
New Berlin, WI 53146
262-679-4400
They can accept concrete, block and brick together. No dirt or organic material such as branches, grass, etc.

2) Brick

A) Brick can be crushed and used on the site as fill. However, you may find a better price and higher end use by reusing the brick. Check the yellow pages under

"brick" and contact the companies to see if they can take the brick from the demolition process for reuse. Some companies will come in and recover the brick for reuse after the wall is knocked down. The following companies will also accept brick:

Antique Brick and Granite
7516 N 107th St
Milwaukee, WI 53224-3708
(414)355-7940
www.antiquebrickandgranite.com
Full brick only (not scraps)

The Brickyard Inc.
Art Leinweber
(414) 481-9600
thebrickyard@att.net

3) Asphalt Paving

A) Recycling asphalt is a cost-effective and well-established process, so you should have little trouble finding a market for recycling the asphalt paving, particularly if it can be reused on site. When you bid for the removal and hauling of the asphalt, require that it be recycled.

4) Fluorescent Lamps

A) Fluorescent lamps are not allowed in the trash and must be kept separate and recycled per state law. Fluorescent tube recycling information and markets lists are attached to this report and can be found at http://www.wastecapwi.org/fluorescent.htm.

B) The metal fixtures can be recycled with scrap metal, but ballasts must be kept separate and treated as hazardous waste.

5) Metal

A) There are extensive metal materials available for reuse or recycling throughout the building including:

1) Metal columns, beams, purlins.

2) Metal window frames and sashes.

3) Metal mechanical and electrical systems (excluding electrical boxes with asbestos)

4) HVAC Units or Ductwork.

5) Fire Extinguisher Cabinets.

6) Metal Roll-Up and sliding Fire Doors.

B) Note that windows, though steel, may have asbestos-containing mastic on them and therefore will have to be disposed with other asbestos-containing materials

C) It is always better to reuse than recycle, economically and environmentally. See "Reusable Items" below.

D) There are two options for handling the metal recycling:

1) Segregate all scrap metal into one dumpster. This includes metal from windows , copper and iron from plumbing, metal doors and light fixtures, metal shelving, steel railings, sheet metal from HVAC equipment, metal cabinets, metal mechanical systems, and other scrap metal.

2) To get a higher market-value, keep steel, aluminum and copper in separate dumpsters. The more segregation into grades that can be done, the higher end value. Due to the value of this material, if possible, metal dumpsters should be at least behind a fence and ideally inside the building. Most haulers can take metal as well as other materials, or you can directly contract with a scrap metal recycler for hauling and recycling services in order to get the best price. Check the yellow pages or the Wisconsin Recycling Markets Directory at:http://dnr.wi.gov/org/aw/wm/markets/ for scrap metal recyclers. Here are some local metal recycling markets:

Miller Compressing
Phil Heston
1640 W Bruce St.
Milwaukee, WI 53204
(414) 671-5980
www.millercompressing.com

United Milwaukee Scrap, LLC
Jack Donahue
3232 W. Fond Du Lac Avenue
Milwaukee, WI 53210
(414) 449-2121
www.unitedmilwaukeescrapllc.com

Industrial Recyclers
9400 N. 124th Street
Milwaukee, WI 53224
(414) 449-2121
www.indrecyclers.com

6) Materials that have Reuse Value

A) Habitat for Humanity Restore possibly has an interest in salvaging items from this building. Habitat has a deconstruction crew which has full insurance and capability to remove and salvage items which could be sold as antique building materials. WasteCap staff has contacted Restore staff and discussed the salvage of items from the Esser Paint Company building. The Restore staff would possibly tour the building to determine if any materials would interest them in an salvage effort.

Restore

Geri Kavanaugh
801 S. 60th Street
Milwaukee, WI 53214
(414) 257-9078
www.milwaukeerestore.org

B) Specifications should allow for time for deconstruction crews to:

1) Identify reusable items.

2) Remove reusable items after hazardous abatement is done and before demolition occurs.

C) Potentially-reusable items include:

1) Wood Columns and Beams.

2) Stair Railings, Newel Posts, and Balusters.

3) Wood Doors.

4) Wood flooring

5) Factory Pallets. ***See Appendix G***

6) Metal Fire Doors. ***See Appendix H***

7) Factory Window Sash (If it does not contain Asbestos)

8) Pea gravel from the roof. Ask the demolition contractor if this material could be scraped and reused on another project.

9) Miscellaneous Wood tables, benches and chairs.

7) Hazardous Items

A) Recycle additional materials required by law. These materials that must be recycled include:

1) **Mercury**- Mercury relays and other items with mercury switches must be recovered. See http://www.dnr.state.wi.us/org/caer/cea/mercury/ for more information.

2) **Other Hazardous Materials**- may include radioactive material in Exit signs and PCB capacitors. Dave Misterek of the DNR can provide regulatory and market information for other hazardous material, if found.

3) **Refrigerants** from air-conditioners, refrigerators, or other equipment on site must be properly recovered by a DNR-registered company. For more information or to find registered companies, contact Lance Green, Wisconsin Department of Natural Resources, Stratospheric Ozone Protection Specialist, 608-264-6049, lance.green@wisconsin.gov, or see: http://dnr.wi.gov/air/

III. Reuse Prior to Deconstruction

A) Challenges to reuse include labor charges in the removal, the possibility of damaging items in their removal, time availability and liability concerns. However, many of the strategies below can be successfully utilized as long as these challenges are addressed.

1) **Utilize Local Contacts**. WasteCap Resource Solutions and possibly City of Milwaukee staff have connections with reuse possibilities within the City of Milwaukee. These and other local contacts would be an excellent first-source for finding reuse markets.

2) **Set up a Site Visit with Potential Reuse Markets.** This step may be unnecessary due to the small quantity of reusable items anticipated to be left in the building. City of Milwaukee Staff can arrange site visits which bring together individuals representing reuse and recycling businesses, nonprofit

representatives who could bid on or accept the materials from the building, and members of the community. We recommend the following process:

a) Identify potentially-reusable items (See 9 above)

b) Determine reuse process

   i. Will you remove items which are attached such as wood flooring, etc. or will you ask those who remove items to do so?

   ii. Will you place all items in one area or allow people to go through the entire building? For Esser Paint, it would not be advisable to allow access to unsafe areas of the building.

   iii. Will you set prices for items or let those who come take the items at no cost or bid on the item(s)?

   iv. Will you provide different opportunities for different audiences? For example, you could set one "sale" weekend and then after things are sold, allow non-profits to pick up whatever is left. *Note: if you let others remove items, ensure they have proper insurance and that you have everyone who removes items sign a liability waiver*.

c) Brainstorm who in the community may want those items.

   i. Select reuse day(s).

   ii. Contact potential reuse markets– call, put an ad in the local paper, email lists etc.

   iii. Consider setting up a "tagging" day where nonprofit organizations and salvage dealers select what items form the building they want and then removing those items and a separate day for the nonprofit organizations to pick up the items.

   iv. Implement your plan and take pictures.

   v. Document. Ask those who receive the items to estimate the value and weight and/or volume of material they reuse from the building. Include these numbers in publicity and in totals for LEED documentation (and make sure to document the materials that are landfilled as well for LEED).

3) **List reusable items on sites like E-Bay, Craig's List or the Wisconsin Waste Exchange**. More and more contractors and other are using these e-services for building materials reuse. For materials that may have value, consider listing on these or other web-based services whereby companies can list and look up materials they would like to give away or acquire. http://wisconsin.wastebank.net

4) **List reusable items on the Business Material Exchange of Wisconsin.** For materials that may have value, try the Business Materials Exchange of Wisconsin. This a web-based service whereby companies can list and look up materials they would like to give away or acquire. www.bmex.org.

5) As noted above, Habitat for Humanity Restore in Milwaukee possibly has a deconstruction crew that can remove reusable items and haul them away and a ReStore to house materials for resale. In addition, the value of the material donated to Habitat for Humanity is tax deductible.

IV. On-Site Recycling Recommendations

A) Include recycling in specifications and all contracts. ***See Appendix A*** for a sample specification language.

B) Select a coordinator– designate a staff member (typically the demolition project manager with the cooperation of the site superintendent) to promote, monitor and enforce the recycling program and educate staff and subcontractors about the requirements of the program.

C) Write a demolition waste management plan and a construction waste management plan. ***See Appendix C*** for examples of a demolition waste management plan and Recycling Evaluation Tools. The plan should include the following:

1) Description of building, site and waste management plan manager.

2) Description of waste management goals including reduction and reuse.

3) Estimate of the job site waste to be generated, including types and quantities and when the material will be generated.

4) Meetings to be held with job site crews to discuss waste management and other methods that will be used to educate staff and subcontractors regarding recycling.

5) List of materials from the project to be separated for reuse, salvage or recycling.

6) Identification of the proposed markets for each material.

7) Description of materials-handling, separation and storage requirements for recycling and reuse.

8) Identification of licensed haulers and processors of trash and recyclables.

9) Description of waste auditing procedures.

10) Description of documentation procedures. Some specifications tie progress documentation to Applications for Payment. Note that for LEED you will need documentation of all solid waste that leaves the site. ***See Appendix D*** - for a form to be used by the contractor to track materials that leave the site.

1) Select Hauler(s) and Make Arrangements for Dumpsters

A) Let haulers know that you will need monthly reports of numbers of dumpsters collected, weight and volume of each material collected, and where the materials went (recycling or landfill).

B) Determine end uses of your materials. When you contact potential recycling markets, ask what they will do the recyclable material (e.g. Will it be recycled? If so, into what?).

2) Placement of Waste Receptacles and Recycling Containers

A) WasteCap Resource Solutions recommends placing recycling and trash dumpsters adjacent to one another. Aside from minimizing the amount of space taken up by the dumpsters, you will cut down on contamination significantly if a trash container is always placed by recycling containers. This also is the case for commingled recyclable containers placed near the job trailer or break room. When no other option is readily available for trash, recycling bins become trash receptacles. You may want to consider containers for recyclables that clearly distinguish themselves as different than trash containers by their color, shape, or both. Ideally, the recycling containers would all be a uniform color that is different than the color of the trash containers.

3) Label Recycling Bins Clearly

A) This is essential to the success of your reuse and recycling program. In order to provide a consistent, visible recycling message, label all of the recycling bins and dumpsters with uniform signs. Signs must be placed where a person looks as they are putting materials into the container. Thus, put the sign on top of small containers, and on all sides of large, open top containers. Or, you can put a very large sign in front of or hanging on the dumpster. When designing signs, keep in mind that when dumpsters are exchanged, you will get a different dumpster. WasteCap has successfully used sandwich board signs on several construction and demolition sites. Consider attaching pictures/drawings of the items you want placed into the containers next to the word on the sign (particularly if there may a language barrier with workers). Your hauler may be able to provide you with signs.

4) Use a Time-Based Management Approach to Recycling

A) To minimize contamination, numbers of dumpsters on site, illegal dumping, and costs, keep track of what materials will be generated at what point in the project. Then, provide recycling containers only during the time when the majority of a material is generated.

5) Educate

A) Set aside time to explain the program to all of the workers at the site, and instill in the foremen that it is their responsibility to ensure that their employees participate in the program.

B) Bring up waste management at every job site meeting. Reminders are important and may bring up new issues that need to be addressed.

C) Make sure that every new person that comes onto the site is educated about the recycling program. Include waste in your new employee orientation to the site. The best way to educate crews is verbally, however, you may want to create a sheet to post to remind crews of separation requirements. Your hauler may also be able to provide you with this type of handout.

D) Post clear signs that explain which materials go into which dumpsters.

E) Ask for suggestions from workers. Workers' ideas can be your best resource for waste reduction and recycling solutions. Ask for their suggestions through meetings or whatever other method is available to you. They may find creative

solutions for diverting materials out of the waste stream. Many companies have saved thousands of dollars by implementing waste reduction ideas from employees. An award could be given to the worker or team of workers who come up with the best idea to reduce specific materials from the waste stream.

6) Conduct Random Waste Audits

A) Periodically check the containers to ensure that the proper materials are going into them. If problems exist, find the person or people responsible and instruct them how to properly participate. Make someone on the site responsible for these audits – often the site superintendent or a designated recycling coordinator.

7) Document Solid Waste Management Program

A) Require of your hauler(s) that all waste/recyclables that leaves the site be weighed, volumes estimated and reports given to DSF and BSA or designated subcontractor, such as WasteCap Resource Solutions for documentation.

B) Track economic impact of recycling. Make sure to track avoided disposal costs For example, if a recycling dumpster costs $200, but a trash dumpster of that same size costs $350, you save $150 in avoided disposal costs for each recycling container.

C) Write monthly diversion reports to let contractors, the owner, other participants and partners know how you are doing. Consider offering rewards to contractors who do a good job of recycling. Tracking month-by-month progress can help to motivate crews to reach your recycling goals.

D) Do a final analysis which tells you whether you saved or spent extra in disposal costs by recycling and tells you exactly how many tons and cubic yards of resources you saved.

8) Let Workers and the Public Know How You Are Doing

A) Promote success in the program to managers, subcontractors, clients, and the public. Waste reduction and environmental stewardship make for good public relations. Consider creating a sign for the fence which promotes success in the program to the public and reminds crews every time they come onto the site that yours is a recycling site.

V. Conclusion

We wish to thank the City of Milwaukee, Sigma staff and all site visit participants for participating in a WasteCap site visit. This has been a valuable experience for us and we hope it has been a beneficial experience for you and the city of Milwaukee. If you have any questions or would like more detailed information, we encourage you to contact WasteCap Resource Solutions.

VI. Contact Information

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Milwaukee, WI 53202
(414) 286.2756
btimm@milwaukee.gov

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841 N. Broadway
Milwaukee, WI 53202
(414) 286.2515
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[Waste/ Recycling Consultation]

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APPENDIX

Appendix A- Sample Recycling Specification

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
BASED ON DSF MASTER SPECIFICATION DATED 12/11/2007

INDEX:

PART 1 - GENERAL

DESCRIPTION

Applicable provisions of Division 01 shall govern all work under this Section.

This Section specifies requirements for salvaging, recycling and disposing of construction waste.

RELATED DOCUMENTS

The following related resource documents are available on the DSF website:

1. Recycling Evaluation Tools
2. Construction Waste Management Appendix

PRECONSTRUCTION AND PREBID MEETINGS

The Pre-bid Conference (if conducted) and Preconstruction Conference will include discussion of construciton waste management requirements. Prior to the commencement of the Work, the Lead Contractor should schedule and conduct a meeting with DSF and the Architect to discuss the proposed Construction Waste Management Plan to develop a mutual understanding regarding details of construction waste management implementation.

WASTE MANAGEMENT GOALS

The recycling goal (including reuse) to be achieved at Substantial Completion of the Project shall be at least [50 percent] [75 percent] by weight or volume of total waste generated by the Project and includes reuse. ***[Edit % goal, as appropriate.]***

Reduce: The Project shall generate the least amount of waste and methods shall be used that minimize waste due to error, poor planning, breakage, mishandling, contamination, or similar factors. Promote the resourceful use of materials to the greatest extent possible.

Reuse: All Prime Contractors and Subcontractors shall reuse materials to the greatest extent possible. Salvage reusable materials for resale, for reuse on this Project, or for storage for use on future projects. Return reusable items (e.g., pallets or unused products) to the material suppliers.

Recycle: As many of the waste materials not able to be eliminated in the first place or salvaged for reuse shall be recycled. Waste disposal in landfills shall be minimized to greatest extent possible.

SUBMITTALS

Construction Waste Management Plan: Prior to commencing demolition or construction activities, the Lead Contractor, with input from all Prime & Subcontractors, shall develop and submit a Construction Waste Management Plan to DSF for approval within 15 working days after Contract award or prior to any waste removal.

Summary of Waste Progress Reports: Throughout the duration of the Project, the Lead Contractor shall report to DSF with their periodic Applications for Payment a Summary of Waste including the quantity of each material recycled, reused, or salvaged, the receiving party, and the applicable diversion rates. Lead Contractor and Prime Contractors shall maintain a record of related weight tickets, manifests, receipts, and invoices for review by DSF on request.

Summary of Waste Final Documentation: At Substantial Completion of the Project, the Lead Contractor shall submit a final summary of reuse and recycling results for all Prime & Subcontractors, including the quantity of each material recycled, reused, or salvaged, the receiving party and the applicable diversion rates.

CONSTRUCTION WASTE MANAGEMENT PLAN

The purpose of the Construction Waste Management Plan is to achieve successful reuse and recycling with the highest possible reuse and recycling rates. The Plan shall include the following:

A schedule identifying milestones and key reporting dates of Construction Waste Management.

A list of waste materials expected to be generated from the Project as debris.

A list of each material proposed to be salvaged, reused, recycled and discarded. Identify applicable markets for reuse and/or recycling. At a minimum, all materials required by State law to be recycled shall be recycled (e.g., cardboard, cans, bottles, office paper, fluorescent tubes, refrigerants, mercury, etc.) and scrap metal shall be recycled.

Separation and Materials Handling Procedures: Description of how waste materials identified above will be separated, cleaned (if necessary) and protected from contamination.

Educational and Motivational Procedures: Meetings to be held and other proposed methods for educating construction personnel regarding waste reduction and recycling.

Waste Auditing Procedures: Methods of monitoring and enforcing the Plan.

Documentation Procedures: Methods of documenting materials leaving the Project site as waste, for reuse or recycling to allow Summary of Waste Progress Reports to be submitted with Applications for Payment.

The Lead Contractor shall distribute copies of the Construction Waste Management Plan to DSF's Project Manager & Project Representative, each Prime Contractor, and the Architect.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

CONSTRUCTION WASTE MANAGEMENT PLAN IMPLEMENTATION

The Lead Contractor shall be responsible for coordinating the separation, handling, recycling, salvage, reuse, and return methods to be used by all construction personnel. The Lead Contractor shall be responsible for reporting the results of the Construction Waste Management Plan. The Lead Contractor shall designate a "Waste Manager" who is responsible for instructing construction personnel and overseeing and documenting results of the Construction Waste Management Plan.

Instruction: The Lead Contractor shall provide on-site instruction regarding appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all construction personnel throughout the duration of the Project.

Separation Facilities: The Lead Contractor shall lay out and identify a specific area on the Project site for separating materials for recycling, salvage, reuse, and return. The Lead Contractor shall provide waste bins and shall keep these bins & the recycling area neat, clean and clearly marked to avoid contamination of materials.

Sorting: The following sorting methods are acceptable:

Sorting recyclable materials at the Project site and transporting them to recycling markets directly from the Project site.

Employing haulers who make use of a materials-recovery facility or a transfer station where recyclable materials are sorted from the waste and recycled before disposing of the remainder. If using a hauler or recycling facility to sort out recyclables, verify that the hauler sorts out all construction waste loads and is not limited to those that are not acceptable at the landfill. Also, verify that the hauler or recycling facility recycles at least three types of materials.

Hazardous Waste: Hazardous waste shall be disposed of according to General Requirements Article 31 "Cleaning and Waste Disposal." (Hazardous Waste is a separate category and not part of the basis on which the recycling percentage is calculated.)

Application for Payments: The Contractor shall submit the Summary of Waste with the Applications for Payment according to a schedule outlined in the Construction Waste Management Plan approved by DSF. Failure to submit this information shall render the Application for Payment null and void, thereby delaying the Progress Payment.

The following resources are provided for information only, to aid the Contractor in managing the Project's construction waste:

The Wisconsin DNR, Bureau of Waste Management
http:/www.dnr.state.wi.us/org/aw/wm/

The UW-Extension's Solid and Hazardous Waste Education Center
http://www1.uwex.edu/ces/shwec/ , email shwec@uwm.edu or telephone: 608-262-0385.

WasteCap Wisconsin, Inc.
http://www.wastecapwi.org or telephone: 414-961-1100 or 608-245-1100.

[Prior to finalizing specs A/E shall check the above internet links, and update as required]

* * *

DSF Project No.
01 74 19 - 3

Appendix B- Recycling Evaluation Tools

3/10/08 Revision

Recycling Evaluation Tools

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for the evaluation of recycling operations.

1.3 CONSTRUCTION OR DEMOLITION WASTE MANAGEMENT PLAN FORM

A. The purpose of the Construction Waste Management Plan Form is to identify construction waste reduction goals, identify targeted materials, and explain specific waste reduction actions to be taken, by whom, and when.

1.4 SITE MONITORING FORM

The most effective construction waste management programs include methods for providing feedback on how successful the program has worked. Tracking project costs may indicate whether money is being saved, but may not indicate why money is being saved. Furthermore, it cannot indicate whether the savings are the maximum possible. Waste audits, on the other hand, reveal opportunities for increased savings, such as significant amounts of recyclables ending up in waste bins, or non-recyclables ending up in bins designated for recyclables. Waste audits provide feedback throughout the duration of the Project.

A. Allows the Contractor to quantify the amount of recyclables being discarded and to identify missed opportunities.

B. Guides the Contractor through the removal and sorting process of materials.

C. Provides a listing of potential categories of materials for sorting the waste dumpster.

D. A photographic record taken during a waste audit of recyclables found in the waste dumpster can be very effective.

E. Requires the Contractor to identify major subcontractors on site contributing to the waste stream.

F. Takes approximately 15 minutes to fill out.

G. Should be used weekly, or at a minimum, during major shifts in construction activities.

H. Identifies specific items that may be hindering the recycling program and can be addressed for immediate results.

I. Creates a record over time to show improvements in sorting or identifies phases of the Project that need extra attention.

1.5 MONITORING RESULTS

Waste audit results indicate whether a change in the Construction Waste Management Plan is necessary. An audit may indicate that more of a particular material waste is being generated than originally anticipated. If so, the material should be targeted for the remainder of the Project. The waste audit serves as a reminder to seek new recycling options that have become available since the commencement of the Project.

DSF Project No.
01 74 19 – RET-1

Appendix C- Example Construction or Demolition Waste Management Plan

3/10/08 Revision

Construction or Demolition Waste Management Plan Form

Project Name:_____

Contractor: _____

Construction Waste Management Plan Manager (Contractor's Representative):

_____

Project Location: _____

Estimated Construction Dates: _____

PROJECT SCOPE - indicate type of structure (e.g., steel, concrete, etc.), building size, project cost, space constraints, etc.

RECYCLING GOAL - To recycle ____ % of waste generated on the site by weight. (Minimum goal 50%)

Goals and Intent:

Reduce: The Project shall generate the least amount of waste and methods shall be used that minimize waste due to error, poor planning, breakage, mishandling, contamination, or similar factors. Promote the resourceful use of materials to the greatest extent possible.

Reuse: The Contractor and Subcontractors shall reuse materials to the greatest extent possible. Reuse includes the following:

1. Salvage reusable materials for resale, for reuse on this Project, or for storage for use on future projects.
2. Return reusable items (e.g., pallets or unused products) to the material suppliers.

Recycle: As many of the waste materials not able to be eliminated in the first place or salvaged for reuse shall be recycled. Waste disposal in landfills shall be minimized to greatest extent possible.

ANALSYS OF ESTIMATED CONSTRUCTION WASTE TO BE GENERATED

A. Projected waste materials

- ☐ Asphalt
- ☐ Brick
- ☐ Cans and bottles
- ☐ Cardboard
- ☐ Carpet
- ☐ Carpet pad
- ☐ Ceiling tile scrap
- ☐ Concrete
- ☐ Glass
- ☐ Gypsum board
- ☐ Insulation scrap
- ☐ Land clearing wood
- ☐ Metal – wire, pipe cutoffs, etc.
- ☐ Pallets
- ☐ Paper
- ☐ Plastics including stretch wrap, plastic bags and Styrofoam
- ☐ Untreated wood, plywood, OSB, particleboard
- ☐ Structural steel
- ☐ Vinyl
- ☐ Other (specify) _____

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B. Produce a preliminary list of materials that may be targeted for reuse or recycling (based on size and type of construction and other relevant information). Complete the list based on the availability of recycling and waste reduction services and on feedback from key Subcontractors who will be working on the Project. Focus recycling efforts on high potential materials and practices. Select materials that are generated in greatest volume, that have the most market value, that can be easily separated and that are recycled locally.

C. Estimated quantities of waste materials, by type (use Project estimates or commercial construction weight estimates below, compiled by WasteCap Wisconsin based on WI State Averages and commercial construction projects. Actual percentages will vary based on the project and type of construction.)

Material	Estimated % (by weight)	Estimated Tons
Total Estimated		
Trash (25%)		
Cans & Bottles (2%)		
Cardboard (5%)		
Concrete/masonry (21%)		
Drywall (11%)		
Metal (11%)		
Wood (25%)		
Reuse (0%)		
Other		
Total (100%)		

TYPE OF RECYCLING SERVICE PROVIDERS AND TARGETED MATERIALS
(Refer to Construction Waste Management Appendix)
Evaluate Cost and Services Offered Service Provider Agreements in Place

Company #1 _____
Company #2 _____
Company #3 _____

Company #	**Material**	**How and where waste is disposed or diverted**
	Trash	
	Cans & Bottles	
	Cardboard	
	Concrete/Masonry	
	Scrap Metal	
	Wood	
	Other	
	Other	
	Other	

MATERIALS-HANDLING PROCEDURES

Contractors and Subcontractors will separate and handle materials as stated below.

Example: Cardboard: Separate and flatten clean cardboard and boxboard and place in designated containers on the Project site. Do not include waxed cardboard, tissue, paper plates or towels, pizza boxes or any item that is not paper. Separate plastic, Styrofoam and other items which may be stuck to the cardboard boxes. Staples may be left in cardboard. Cardboard that is over 50% covered in mud, paint or other contaminants should be disposed of as trash. The cardboard will be sorted, sold and made into new paper products.

RECYCLING OPERATIONS

Action *** Who

Order dumpsters - oversee delivery _____

Site dumpsters/collection sites for optimum convenience _____

Educate Project site personnel on recycling requirements _____

Order signs for dumpsters and other recycling bins _____

Sort or process recyclables on site _____

Take trash and recyclables to the dumpsters _____

Schedule dumpster pickups/drop offs _____

Monitor dumpsters for contamination _____

Document recycling results _____

*** Depending on the service option chosen, these may be the responsibility of the field personnel, construction waste manager, the hauler, a recycling contractor, or the Subcontractors.

EDUCATIONAL AND MOTIVATIONAL PLAN – Check all items intended to be used

Actions

- ❒ Complete Construction Waste Management Plan
- ❒ Hold Orientation/Kick Off Meeting
- ❒ Update & Progress in Weekly Project-Site Meetings
- ❒ Encourage Just-in-time deliveries
- ❒ Post Targeted Materials (signage)
- ❒ Distribute tip sheets to Project-site personnel
- ❒ Post goals/progress (signage)
- ❒ Use formal agreements committing subs to program
- ❒ Require those who contaminate dumpsters to re-sort
- ❒ Provide stickers, t-shirts, hats or other incentives
- ❒ Public recognition of participating subs
- ❒ Take photos to document progress and share
- ❒ At site visits, discuss waste management with Project-site personnel
- ❒ Conduct periodic presentations for Project-site personnel on waste issues
- ❒ _____

WASTE AUDITING PROCEDURES – Describe how the recycling program will be monitored so that recycling and trash containers are kept free of contamination. Include frequency of monitoring

DOCUMENTATION PROCEDURES

Who

- ❒ Perform monthly cost and materials tracking (required) _____
- ❒ Perform final evaluation (required) _____

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Trash/ Recyclables/Reused Materials Hauling Log

Project Name: _____

Date	Material (Trash, Wood, Concrete, Et	Hauled By	Ticket No.	Dumpster Size/ Weight/ Volume

Recycling Coordinator: Complete for all materials that leave the Project site.
Project Manager: Verify hauling invoices with information on this log.

❒ Log Faxed To Construction Waste Manager ❒ Log Faxed To Project Manager Date:_____

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Appendix E- Concrete Recycling and Disposal Fact Sheet

Concrete Recycling and Disposal Fact Sheet

WA-605 2004

WISCONSIN
DEPT. OF NATURAL RESOURCES
P.O. Box 7921
Madison, Wisconsin
53707-7921

What is the purpose of this fact sheet?

This fact sheet is intended to help property owners, renovation and demolition contractors and used concrete handlers determine what painted concrete can be recycled or how it must be disposed. "Clean" concrete is exempt by rule from most regulations. With certain location limitations, clean concrete may be crushed and used as fill, aggregate in road beds or concrete to concrete recycling. Most painted concrete can be used for these purposes in accordance with rule exemptions. This fact sheet explains when painted concrete is considered clean and is exempt for use vs. when painted concrete is not considered clean and where a specific approval is required by the Department of Natural Resources.

On what basis is painted concrete considered clean vs. not clean?

Painted concrete is considered to be clean if the concrete has not been coated with lead-bearing paint. "Lead-bearing paint" is defined by s. 254.11(8), Wis. Stats., and s. HFS 163.03(61), Wis. Adm. Code, to mean:

> Paint that contains more than 0.06% by weight (for laboratory testing), or 0.7 mg/cm^2 of paint surface (as measured by an XRF instrument).

Note: Latex-based paint does not contain lead and, therefore, concrete coated only with latex-based paint is considered clean.

Who is responsible to determine what type of paint is on the concrete and whether it is lead-bearing?

The generator or owner of the painted concrete has the responsibility to determine if the paint on the concrete is latex or oil-based and if it has been coated with lead-bearing paint. The responsible individuals include:

- The property owner
- Individuals carrying out a renovation or demolition project
- Individuals that later take ownership or control of painted concrete materials for recycling or disposal

So, tell me again, exactly what painted concrete should have the paint tested for lead?

Paint on concrete should be tested for lead if the paint is not latex-based and all of the following are true:

1. The painted concrete will be processed and/or used under a rule exemption for fill, aggregate or concrete to concrete recycling, and
2. The structure was built before 1978.

These criteria apply to painted concrete from all structures, whether used for residential, farm, commercial, industrial or other purposes. Information below explains how to sample and test paint for lead to determine if the painted concrete is clean for exempt use.

Paint other than latex-based paint manufactured before 1978 may contain lead at concentrations that

define lead-bearing paint and the paint must be tested for lead to determine if the painted concrete is clean for exempt use. Because an owner of a structure older than 25 years won't usually know if only latex paint was used over the entire life of the building, lead testing is normally needed for all pre-1978 structures.

Note: If the painted concrete is disposed in a landfill approved by DNR, the paint doesn't have to be tested.

What management options are available for concrete coated with paint that isn't lead-bearing?

Concrete coated with paint that is not lead-bearing paint may be used as fill, aggregate or concrete to concrete recycling in accordance with the following rule exemptions:

- Reuse of clean concrete is exempt under s. NR 500.08(2)(a), Wis. Adm. Code. Certain environmental performance, location and operational requirements apply. Please review these requirements (s. NR 504.04(3)(c) and s.NR 504.04(4), Wis. Adm. Code) before placing used concrete on the land. For more information about this disposal exemption, refer to a separate Frequently Asked Question (FAQ), *What is defined as "clean fill" that does not have to be taken to a landfill?*, on the DNR Waste Program website at

  http://dnr.wi.gov/org/aw/wm/faq/solidwaste/swfaq11.htm.

Concrete coated with paint that is not lead-bearing may also be disposed in a landfill.

What management options are available for concrete coated with lead-based paint?

Landfill disposal is an available management option for concrete coated with lead-based paint. The landfill must be either a construction and demolition landfill approved under ch. NR 503, Wis. Adm. Code, or a municipal solid waste landfill approved under ch. NR 504, Wis. Adm. Code.

Concrete that is coated with lead–bearing that is used as a fill, etc. will require a written exemption or approval from DNR. A written exemption or approval may be issued under any of the following rules:

- s. NR 500.08(5)(a), Wis. Adm. Code, Beneficial Reuse under the Low Hazard Waste Exemption
- s. NR 500.08(4), Wis. Adm. Code, Exemption from Solid Waste Rules
- s. NR 500.08, Wis. Adm. Code, Solid Waste Processing Facilities

Please contact your local Department of Natural Resource office for further information at the locations specified in this fact sheet.

Who should I contact if I have questions about painted concrete recycling and disposal?

Questions about disposal of painted concrete should be directed to the DNR Waste Management Program. Contact your local DNR office, listed in the telephone directory, or find the DNR Waste Management Program individual by county from the DNR website at http://dnr.wi.gov/org/aw/wm/contacts/

Is the paint sampling recommended by DNR the same as what's required by Department of Health and Family Services (DHFS)?

No. The lead sampling and testing for paint on concrete for recycling and disposal purposes isn't subject to the same (more rigorous) DHFS requirements that may apply to occupied structures, especially schools and residences.

If a structure will be used for residential purposes after the project is complete, DHFS rules require sampling by a certified individual. Also, according to federal law, a seller (or landlord) of a home built before 1978 is required to provide information to a buyer (or renter) about whether the home contains lead-bearing paint or any lead poisoning hazards. For more information about this, see http://dhfs.wisconsin.gov/lead/Purchase.htm.

Who can sample and test paint samples from concrete for recycling and disposal purposes?

There is no specific requirement or certification required for an individual sampling paint from concrete for recycling and disposal purposes to determine if the painted concrete is clean for exempt use. An individual may take their own samples or a DHFS certified individual may be hired to do the sampling. However, unless an XRF instrument is used by a qualified individual to determine lead concentrations on site, the paint samples must be sent to a certified laboratory for analysis.

Lists of certified lead-bearing paint inspectors, risk assessors and laboratories are available from DHFS at http://dhfs.wisconsin.gov/dph_boh/lead/companyList/index.htm.

If you contact a DHFS certified individual but you only need to determine lead levels in paint on concrete to comply with recycling and disposal requirements, be sure to say this. The following summarizes sampling and testing options for lead-bearing paint for recycling and disposal purposes:

- Hire a Lead Inspector: A lead inspector may test paint using XRF (x-ray) instruments that "peer" through layers of paint to determine lead content immediately. A lead inspector can also collect samples for laboratory analysis. If immediate results are desired, be sure to inquire about on site testing with a x-ray instrument.
- Hire a Risk Assessor: A risk assessor will collect paint samples and send them to a laboratory for lead testing. Normally, a week or more may be needed for a laboratory to complete testing and additional time for a risk assessor to review results and get back to you. For time sensitive projects, it may be possible to obtain an "expedited" laboratory analysis and results interpretation, which may cost more, and may still require several days.
- Self-Sampling: For recycling and disposal purposes only, a DHFS certified individual isn't required to do the sampling. Instead, an individual may take their own samples and send the samples to a certified laboratory for testing. One or two samples are unlikely to be enough since multiple layers of paint types may be present in different areas. Sampling recommendations for recycling and disposal purposes are listed below.

The US Environmental Protection Agency hasn't approved and doesn't recommend do-it-yourself lead test kits that do not include laboratory analysis because they may not be sufficiently accurate to identify lead-bearing paint. For example, one lead test kit manufacturer claims their product can reliably detect lead levels down to only 0.5% lead, almost 10 times the level used to define "lead-bearing paint" in Wisconsin.

If I want to take my own samples of paint from concrete for recycling and disposal purposes, how many samples should I take?

Take at least 1 sample from each area of painted concrete, based on consideration of the different areas of a structure:

- Interior
- Exterior
- Foundation
- Upper walls
- Each room, or other area, where differences in coatings is visually apparent or seems likely

Each sample should be taken as a composite (mixture) of all paint layers at that location. Use a sharp knife to cut down to the concrete and a sharp scraper to release the paint from the concrete. (Thoroughly wash your hands after collecting paint samples.) Prior to collecting a sample, contact a certified laboratory to find out what cost is charged, how much paint sample is needed and what type of sample container is recommended. Normally, a sealable plastic bag or clean and dry jar is suitable.

These sampling recommendations are not intended for assessment of lead hazard to occupants but are only for recycling and disposal purposes to determine if painted concrete is clean for exempt disposal.

What are the concerns about disposal of concrete coated with lead-bearing paint and where can I get more information?

Paint that contains lead poses potential risks. In the environment, paint from concrete will chip and lead can leach from the paint over time where the painted concrete is disposed. The lead could leach into groundwater or be carried to surface water by soil erosion. If the concrete is crushed, windblown dust carrying the lead is an additional concern. Further information is available from the following sources:

- DHFS Lead homepage, http://dhfs.wisconsin.gov/lead/
- National Lead Information Center, 800-424-5323 or http://www.epa.gov/opptintr/lead/nlic.htm
- Environmental Health Center, A Division of the National Safety Council http://www.nsc.org/ehc/indoor/lead.htm

NOTE: This document is intended solely as guidance and does not include any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any manner addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of Interior, Washington, D.C. 20240.

This publication is available in alternative format upon request. Please call (608) 266-2111 for more information.

Appendix F- Reuse Example For Wood Beams and Columns

Antique reclaimed Douglas fir beams are recovered from selected factories and warehouses around North America and thereafter re-sawn to custom sizes for the use in timber framing. The incredible tight vertical grain and structural strength is only one of the many reasons why builders prefer working with this type of wood.

There are several reasons why it's a good idea to use reclaimed wood for the interior finishes of your home, office, or retail outlet:

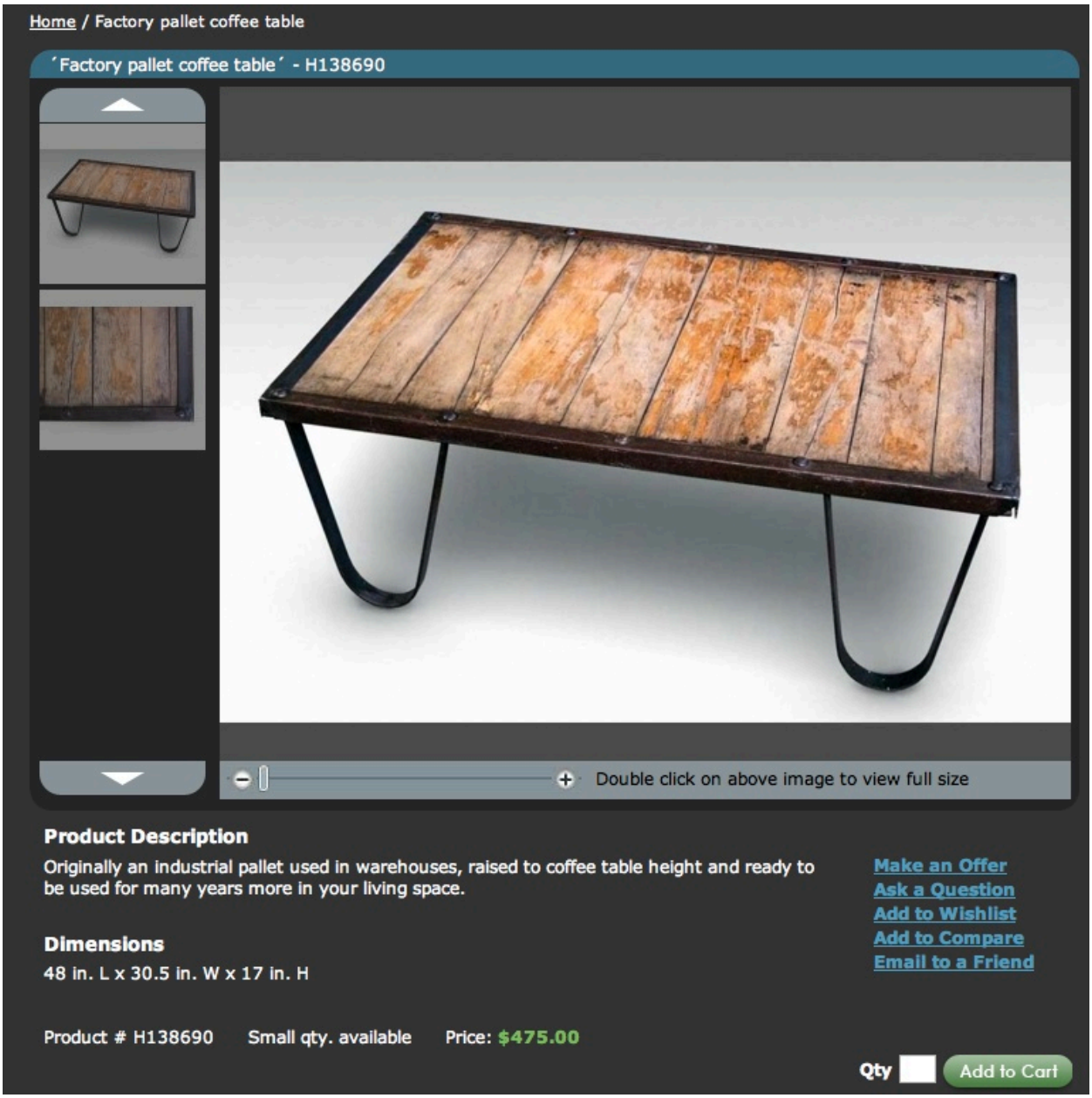
A) A floor made from antique wood has a unique beauty and defining character that cannot be found in newly sawn timber. Recycling wood is an environmentally responsible alternative to cutting down trees.

B) Reclaimed wood has been transformed by nature and time into something unique that links us to our past.

C) Only the most stable timbers were used to build the original structures, supporting them for sometimes hundreds of years; so, you can be confident of the wood's continued stability in the next phase of its life as a floor.

D) Projects can earn points for LEED credits by using materials salvaged from other structures for a certain fraction of their building materials.

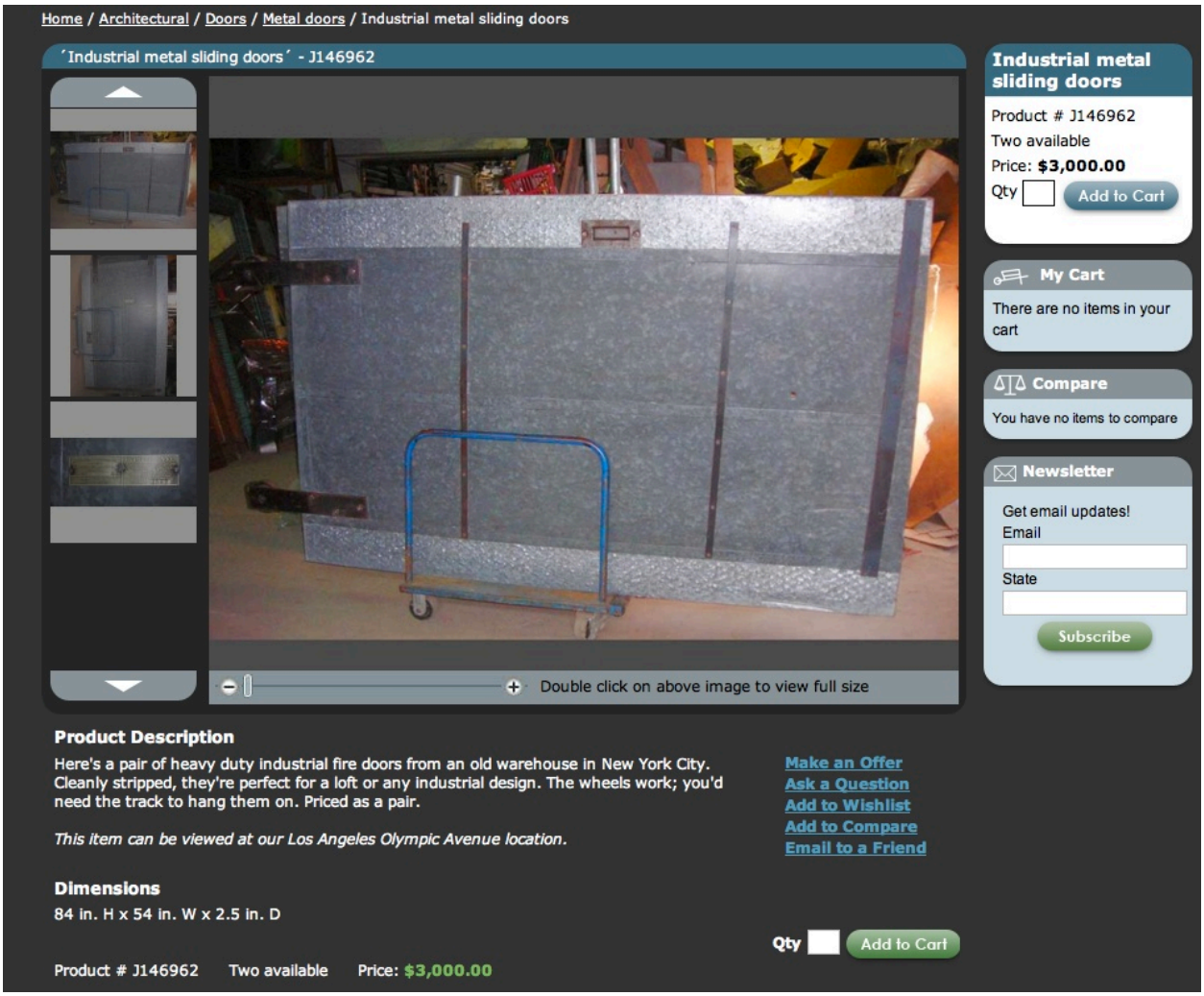
Appendix G- Reuse Example For Industrial Steel/Wood Pallets



An internet search provided examples of reuse for the large quantity of wood and steel factory pallets left in the building. In the example above the pallet has been modified slightly by adding longer legs to make it function as a coffee table. The possibility exists that the large number of pallets in the Esser paint building could re reused and not landfilled.

Appendix H- Example of Reuse for Steel Fire Doors

An internet search provided examples of steel fire doors for sale. Although stripped of paint, they are similar to the fire doors in the Esser Paint Building. There is most likely a greater demand in larger urban areas for this unique type of door. However, Chicago with its close proximity to Milwaukee and might provide a market for the graffiti covered doors.



Appendix J- Websites for Further Information

- Website A-**Pre-Demolition Environmental Checklist Wisconsin Department of Natural Resources**. Publication WA-651-03. http://www.dnr.state.wi.us/org/aw/wm/publications/demolition/predemo.pdf
- Website B- **Safe Lamp And Bulb Management Wisconsin Department of Natural Resources.** Publication WA 195-03.http://www.wastecapwi.org/resources/electronics-recycling/fluorescent-lamp-and-bulb-recycling/
- Website C- Wisconsin Recycling Markets Directory at **WasteCap DIRECT**. www.wastecapdirect.org
- Website D- **WasteCapTRACE**- Online Waste and Recycling tool Developed by WasteCap Resource Solutions, Inc.. www.wastecaptrace.org