

**Documentation for Responsible Waste Management  
Overture Project Deconstruction Phase**  
For  
Overture Foundation &  
WasteCap Wisconsin

Final Report  
August 2001

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## Table of Contents

1. Introduction.....	1
Background Information on the Overture Project	
2. Summary of Results.....	2
3. Coordination Process.....	4
Meeting with Partners	
Coordinating Reuse Activities	
Reuse Days with Nonprofits	
Reuse Buyers	
Stone Façade	
Coordinating Recycling Activities	
4. Documentation Process.....	6
Documenting Reusable Materials	
Estimating Values	
Estimating Weights and Volumes	
Documenting Recycled and Landfilled Materials	
Photograph Documentation	
5. Evaluating the Process through Interviews.....	7
6. Assisting with Press Opportunities.....	9
7. Financial Considerations.....	10
Responsible Hazardous Waste Management of Hazardous Materials	
Asbestos	
Ballasts and Freon	
8. Contacts.....	13
9. List of Attachments.....	14

## 1. Introduction

WasteCap Wisconsin (a nonprofit organization which helps business with waste reduction and recycling) was hired by the Overture Foundation to coordinate and document the reuse and recycling efforts of the Overture Deconstruction Project. The deconstruction, planned to create space for a new 400,000 square foot art center took place between March 1 – June 1, 2001. Six buildings including, Bank One, Yost, Teen Loft, Rosino's, Army/Navy, and Miller's were deconstructed with responsible waste management procedures. WasteCap Wisconsin subcontracted with Madison Environmental Group, Inc. (an environmental consulting company) to conduct the work described in this report which includes: 1) Coordinating the reuse activities, 2) Coordinating the recycling activities, 3) Documenting the reuse and recycling results, 4) Documenting the process through pictures and description, 5) Evaluating the process through interviews, and 6) Assisting with press opportunities. After a short background description, the report begins with highlighting the outstanding results – 74% of all the deconstructed building materials were reused and recycled. The document concludes with 19 pages of pictures to visually demonstrate the extensive efforts that took place.

### Background Information on the Overture Project

Jerry Frautschi created the Overture Foundation in 1996 for the primary purpose of supporting arts and culture in Madison and Dane County. The development of the Overture Project is the Foundation's major focus. In July of 1998, Mr. Frautschi announced a major civic gift to benefit the cultural arts in downtown Madison. The Overture Project will promote excellence in the arts and stimulate a downtown Madison renaissance. Mr. Frautschi has donated approximately \$100,000,000 for this project, which is the largest building project in recent history of Madison, Wisconsin.

The project consists of two phases of construction, together totaling approximately 400,000 square feet. The project is located on Block 65 in downtown Madison, Wisconsin. Phase 1 construction commenced June 2001 and will be completed by January 1, 2004. Phase 1 work consists of the construction for the new Overture Hall performing arts center, rehearsal rooms and circulation space. Phase 2 construction is expected to commence January 1, 2004 and be completed by January 1, 2006. Phase 2 work consists of renovation of Oscar Mayer Theater, Isthmus Theater, and construction of the new Madison Arts Center. The grand lobby and level of finishes will establish these buildings as a world-class facility for the performing arts.

In order to begin building the new arts center, six buildings along N. Fairchild Street were deconstructed in the spring of 2001. The next section summarizes the reuse and recycling efforts that took place, representing the responsible waste management practices of this process.



Overture Center, Fairchild St. from State St.



Buildings to Deconstruct, Fairchild St. from Mifflin St.

## 2. Summary of Results

Seventy percent of the materials from the deconstructed buildings were recycled, 4% were reused, and 26% were landfilled (Table 1). Concrete accounted for the majority of the recycled materials (4920 tons). The remaining materials recycled included metals (166 tons), carpet (7 tons), and ceiling tiles (9 tons). The majority of the reusable materials consisted of a 267-ton stone façade salvaged from the Bank One building. The remaining reusable materials were either donated to local nonprofit organizations or sold to salvage companies, and are detailed in Table 2.

**Table 1:** Truck Loads, Volumes, and Weights of Reusable, Recycled, and Landfilled Materials from Deconstruction Phase of Overture Project.

<b>Material</b>	<b>Truck Loads</b>	<b>Estimated Volume (Cubic Yards)*</b>	<b>Weight (Tons)</b>	<b>Percent of Total Weight</b>
<u>Reusable:</u>				
Fixtures & Furniture	19	272.1	25.9	0.3%
Stone Façade	NA	118.5	267.0	3.7%
<b>Total Reusable</b>	<b>19</b>	<b>390.6</b>	<b>292.9</b>	<b>4.0%</b>
<u>Recycled:</u>				
Ceiling Tile	1	24.7	8.8	0.1%
Carpet	2	3,513.0	7.0	0.1%
Metal	67	2,215.7	166.2	2.3%
Concrete	358	9,839.0	4,919.5	67.6%
<b>Total Recycled</b>	<b>428</b>	<b>15,592.4</b>	<b>5,101.5</b>	<b>70.2%</b>
<u>Landfilled:</u>				
Construction Debris	319	2,687.4	1,881.2	25.8%
<b>Total Landfilled</b>	<b>319</b>	<b>2,687.4</b>	<b>1,881.2</b>	<b>25.8%</b>
<b>Grand Total</b>	<b>766</b>	<b>18,670.4</b>	<b>7,275.6</b>	<b>100.0%</b>

\* Cubic yards were calculated using the following conversion figures:

Reusable Fixtures and Furniture Items: see description below (Sources: U-Haul Co., Penske Truck Rental)

Stone Façade: 2.23 tons/cubic yard (Source: J.H. Findorff & Son)

Ceiling Tile: 0.36 tons/cubic yard (Source: Armstrong Floors & Ceiling Systems)

Carpet: 0.002 tons/cubic yard (Source: DuPont Flooring)

Metals: 0.075 tons/cubic yard (Source: Samuel's Recycling)

Concrete: 0.5 tons/cubic yard (Source: J.H. Findorff & Son)

Construction Debris: 0.70 tons/cubic yard (Source: J.H. Findorff & Son)

Seven nonprofit organizations and two salvage companies participated in two “Reuse Days” coordinated on February 26 and April 4, 2001 (“Reuse Days” are described in Section 3). The nonprofit organizations received approximately 22.3 tons of reusable items, with an estimated value of \$18,131. Values of received items ranged from \$145 (Goodwill) to \$6,061 (Teen Loft), and quantities ranged from 0.7 tons (Goodwill) to 8.4 tons (Saint Vincent de Paul). The salvage companies received items with a value of \$325 and estimated weight of 3.6 tons. Table 2 details the values, weights, and volumes of reusable materials.

**Table 2:** Values, Weights, and Volumes of Reusable Materials (Fixtures & Furniture) Received by Nonprofit Organizations and Reuse Buyers from Overture Project.

<b>Recipient</b>	<b>Estimated Value</b>	<b>Truck Loads</b>	<b>Estimated Weight (Tons)*</b>	<b>Estimated Volume (Cubic Yards)*</b>
<b>Nonprofit Organizations:</b>				
Atwood Community Center	\$ 2,515	2	2.6	37.0
Design Coalition	\$ 1,434	3	2.1	36.0
Goodwill Industries	\$ 145	1	0.7	7.9
Habitat for Humanity	\$ 1,979	3	4.7	59.2
Saint Vincent de Paul	\$ 1,997	3	8.4	95.2
Teen Loft	\$ 6,061	2	2.0	10.5
Woodland School	\$ 4,000	1	1.8	3.6
<b>Nonprofit Total</b>	<b>\$18,131</b>	<b>15</b>	<b>22.3</b>	<b>249.4</b>
<b>Reuse Buyers:</b>				
Pieter Godfrey	\$ 175	3	2.6	16.0
Dan Wietz	\$ 150	1	1.0	6.7
<b>Reuse Buyer Total</b>	<b>\$ 325</b>	<b>4</b>	<b>3.6</b>	<b>22.7</b>
<b>Grand Total</b>	<b>\$18,456</b>	<b>19</b>	<b>25.9</b>	<b>272.1</b>

\* Weights and volumes were estimated using the capacities of moving trucks. See description in Section 4.

### 3. The Coordination Process

#### Meeting with Partners

In December 2000, PL&F Architects (the local architect firm for the Overture Project) invited WasteCap Wisconsin to conduct a volunteer site visit to identify recycling and reuse opportunities for the deconstruction phase of the Overture Project. WasteCap wrote a report of recommendations following the site visit, which was presented to the Overture team at a January 2001 meeting hosted by PL&F. At this meeting, Findorff (the general contractor) agreed to pursue the reuse and recycling activities suggested in the report. WasteCap submitted a proposal to coordinate and document these activities, using Madison Environmental Group, Inc. as a subcontractor due to their expertise and proximity to the job site. The Overture Foundation generously approved WasteCap's proposal. Following is a description of the reuse and recycling process.



Pictured from left to right:  
Mark Jenssen (PL&F Architects), Sherrie Gruder (UW Extension), Mike Huffman (Overture Foundation), Jenna Kunde (WasteCap WI), Jim Yehle (Findorff), Sonya Newenhouse (Madison Environmental Group).

#### Coordinating Reuse Activities

##### Reuse Days with Nonprofits

Madison Environmental Group and WasteCap Wisconsin organized two "Reuse Days" to donate reusable items from the deconstructed buildings to local nonprofit organizations. Nonprofits with the capacity to collect, transport, and store the items were invited to participate. These organizations included Habitat for Humanity, Goodwill Industries, St. Vincent de Paul, and the New Teen Loft. Organizations that learned about this process through word-of-mouth were also invited and include: Design Coalition, Atwood Community Center, and the Woodland School. The Overture Foundation and Findorff provided the support and labor for processing the items.

On February 26, 2001, the participating nonprofit organizations identified and marked items in the Bank One Building for reuse. Participating organizations also completed a form listing the items and location of the materials they wished to reuse. See Attachment A: Reuse Tagging Terms and Form. In order to reduce liability, Findorff deconstructed the items (such as detaching doors and light fixtures) and neatly placed them into separate storage areas for each organization. The following week the organizations collected the materials with trucks and volunteers. On April 4, 2001, this process was repeated for items in the Yost Building (a former department store).



The organizations were able to reuse more than 1,000 items, including 80 solid oak doors, hundreds of light fixtures, oak flooring, cabinets, counter tops, drinking fountains, bathroom soap dispensers, 18 large boxes of wooden hangers, and more. See Attachment B: Reusable Materials List.

## Reuse Buyers

In addition to the seven nonprofit organizations, Madison Environmental Group and WasteCap Wisconsin worked with two salvage buyers. After the nonprofits had selected materials for reuse, the buyers identified and bid on a few remaining items. The buyer from Milwaukee bid on building materials such as wood paneling, trim, and counter top laminate. The buyer from Madison bid on the iron stair case railing from the Yost building and a few furniture items. The first buyer's insurance policy allowed him to deconstruct and remove the items without Findorff's assistance.



## Stone Façade

The University of Wisconsin-Extension Solid and Hazardous Waste Education Center coordinated the Bank One stone façade reuse efforts. The 267-ton Indiana limestone façade from the Bank One building was removed piece by piece and is currently stored in a protected location. Prior to deconstruction, each stone was labeled and the façade was mapped and professionally photographed, so that it can be erected on another building.

The University of Wisconsin-Extension contacted a number of potential buyers regarding the limestone façade.

Madison Gas & Electric, former owner of the Bank One building, seriously considered reusing the façade at their transformer station on Park and Dayton Streets and at their downtown office building. However, MG&E's architect advised against using the stone, feeling that it did not fit the design intent. The Children's Museum expressed interest in the stone, but does not yet have a site for it. Several downtown developers were called who do not currently have a project appropriate for its use.

Currently, the stone has potential to be used in the two façades of the new Dane County Justice Center on E. Wilson and S. Hamilton Streets. This building will be designed and constructed as a green building according to the US Green Building Council LEED (Leadership in Energy and Environmental Design) standards. Reuse of the limestone architectural elements is appropriate both for the green building requirements and for a civic structure in downtown Madison. The Justice Center Planning Oversight Committee has urged the architects, Durrant and Leonard Parker and Associates, to incorporate the architectural elements into the design of this civic building. PL&F Architects sent a copy of the stone digital drawings to the architects for their use. The Justice Center project is currently stalled in the concept phase so no preliminary designs are drafted. It is expected that this will be reconciled in Fall 2001.

## **Coordinating Recycling Activities**

With the assistance of WasteCap Wisconsin's extensive network, Madison Environmental Group facilitated locating markets to recycle the carpet and ceiling tile. In fact this is the first project in Wisconsin to recycle ceiling tile and one of the first to recycle carpet. The ceiling tile was carefully removed, stacked onto pallets, shrink wrapped, and transported to Armstrong Floor & Ceiling Systems. Armstrong will recycle the tile into new ceiling tile. The carpet was removed and hauled to dumpsters on site and then transported to Nonn's Flooring in Middleton. Nonn's is working with Dupont who will recycle the carpet into other flooring products or automobile parts.

## 4. The Documentation Process

### Documenting Reusable Materials

#### Estimating Values

Madison Environmental Group sent each of the nonprofit recipients a list of the items they received, and requested that they estimate the used retail value for each object. Totals are reported in Table 2 in Section 2.

#### Estimating Weights and Volumes

Madison Environmental Group recorded the number of truckloads and size of truck for each recipient. Truck rental companies provided the maximum load capacity of various size trucks. Assuming that a full load of reusable materials represented 75% of the load capacity, weights were calculated by multiplying number of truckloads by 75% capacity. For example, Atwood Community Center had two full loads of a 15-foot truck. The maximum load capacity of a 15-foot truck is 3500 lbs. Therefore, the estimated total weight of Atwood's reusable items =  $2 * .75(3500 \text{ lbs}) = 5250 \text{ lbs}$ . The volumes of reusable materials were based on truck dimensions and a similar assumption of 75% capacity.



St. Vincent de Paul Truck.

This method applied to all organizations except Woodland School, who received 18 large, high quality windows. In this case, volume was calculated using the windows' dimensions, and an employee at United Building Center estimated provided the weight estimate. All weights and volumes of reusable materials are reported in Table 2.

### Documenting Recycled and Landfilled Materials



Recycling Metal from Bank One Building.

Materials recycled and landfilled were documented using monthly hauling records from Madison Crushing & Excavating (deconstruction subcontractor to Findorff). Tons and truckloads of each type of material were entered into a spreadsheet, and totals for the entire deconstruction period were calculated. Totals are reported in Table 1 in Section 2. Volumes of each material were also calculated, using conversion figures provided by team members and vendors. For details see Attachment C: Waste Audit Tracking Form and Attachment D: Hauling Records.

### Photograph Documentation

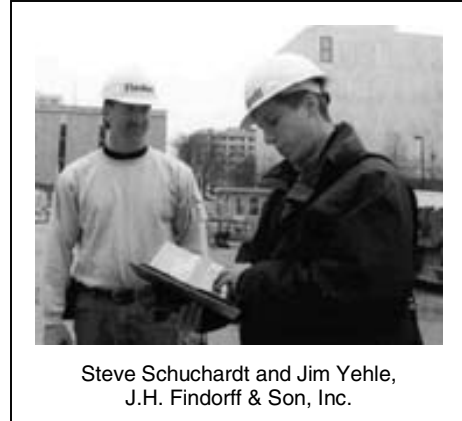
Throughout the deconstruction phase, March 1 – June 1, Madison Environmental Group staff took photographs to document the responsible waste management process. More than 120 photographs are included in Attachment F.



## 5. Evaluating the Process through Interviews

Madison Environmental Group interviewed seven people involved with the Overture Project deconstruction phase. The interviewees represented the Overture Foundation (1), PL&F Architects (2), Findorff (3), and WasteCap Wisconsin (1). They were asked to describe the most satisfying, challenging, and unique parts of the project, as well as suggestions for improvement to the reuse and recycling efforts, and how they felt about the communication process among the partners.

All partners reported satisfaction with the process, viewing it as a successful and innovative reuse/recycling effort. Three people described the satisfaction that came from witnessing a positive change in the construction industry and giving a good name to construction. Another three interviewees felt satisfied that the project facilitated the reuse of materials to local nonprofit organizations. Other satisfying aspects included the high profile nature of the project, that it will serve as a model for future deconstruction projects, that it was the first ceiling tile recycling in the state of Wisconsin, and simply seeing materials being reused rather than discarded.



Steve Schuchardt and Jim Yehle,  
J.H. Findorff & Son, Inc.

The interviewees faced various challenges depending on their role in the waste management project. Partners on the organizing end of the project mentioned time management, coordination, and the uncertainty of cost effectiveness as challenges. Construction managers experienced difficulties in working with subcontractors and felt that educating the construction workers as to the reasons for their extra efforts would be helpful. Two of the interviewees mentioned the difficulty of finding markets for the materials, specifically for the carpet, ceiling tile, wood, and the Bank One stone. Finally, the construction worker we interviewed reported that physically removing the carpet was a challenge.



Jenna Kunde,  
WasteCap Wisconsin

The partners identified several unique aspects of the project, including the community involvement with the “Reuse Days”, the ceiling tile and carpet recycling, the positive press and visibility of the project, the documentation of the entire process, and the reuse of the stone façade. One interviewee pointed out the uniqueness of piloting a large deconstruction effort in Wisconsin. Another mentioned the uniqueness of having a contractor who was flexible and cooperative and to have an owner willing to provide community groups access to the site to reuse materials.

Based on their experience during the deconstruction phase of the Overture Foundation project, the interviewees offered suggestions for improving the recycling and reuse activities. Suggested improvements for recycling include better organization for the ceiling tile pick-up, and better communication among partners regarding responsibility for contacting the carpet and ceiling tile recycling companies.

Regarding the reuse activities, three partners suggested that more time scheduling and organizing the “Reuse Days” would have been helpful. More specifically, two people thought that the nonprofits organizations should have been better briefed ahead of time, so they would know what more specifically what types of items were available from the buildings. One person

involved in the reuse days suggested excluding the salvage companies from future reuse events. Another suggestion was to better identify industrial users for some of the building items. Two people thought that the “Reuse Days” ran smoothly, and offered no suggestions for improvement.

Two interviewees expressed disappointment that it was not possible to reuse the concrete as aggregate backing for the new building, as planned. They could not think of an idea for improvement, recognizing that it was not cost effective and not suitable from an engineering aspect to reuse this material in the new building.

Finally, the interview addressed the communication process among the partners in the waste management project. Four of the seven people interviewed expressed the need for more formal agreements in order for everyone to fully understand their roles and responsibilities from the beginning. Specifically, two people mentioned that it was not clear whose responsibility it was to contact the carpet recycler. Communication difficulties were also identified with the abatement contractor.

Overall, the partners were very pleased that a new and untested process had proceeded smoothly and yielded such high results – recycling and reusing 74% of the deconstructed building materials – in a limited time frame. The challenges and suggestions listed above can easily be improved upon for future projects, and the Overture Foundation hopes that this experience will assist others in conducting responsible reuse and recycling deconstruction efforts.

Following are some quotations that capture the partners’ satisfaction with the project:

“It was nice to see the work that [Madison Environmental Group] and WasteCap put into [the reuse activities], at the tagging day ceremonies. That was clearly a step above what we were able to do on earlier projects.”

“Just like the Milwaukee County stadium, [Overture] is a very visible and successful project that makes people aware of it. It’s kind of in the air and people realize there’s an expectation for that. It can’t be ignored now.”

“[The most satisfying part of the project was] pulling together the building materials reuse organizations with the contractor and owner to ... turn what was an economic and environmental liability into an economic, community, and environmental asset.”

“I think it’s really great that you took all the photos and now have the photo album to share. A picture is worth a thousand words, and I think that photo album will be useful at all sorts of things – presentations and sharing the story with others.”

“Now I know for future projects that I’m already paying for them to separate out [the materials]. So if we have to separate it out, we can just take different materials to different places for recycling. It makes it easier for the owner to make the decision to do recycling.”

“[The most satisfying part of the project was] giving a good name to construction, instead of just doing demolition, and knocking it down... It’s satisfying that it is a little bit more caring, giving a better name to the industry.”

“It’s nice to have a cooperative owner who allows the time and money to let this happen.”

## 6. Assisting with Press Opportunities

WasteCap Wisconsin and Madison Environmental Group, Inc. assisted Overture's Communications Specialist, Roberta Gassman, with information and photographs for several articles and two press conferences about the deconstruction project. Thanks to Roberta's efforts, the press conferences also resulted in multiple television reports on this project. To date, the responsible waste management practices of the Overture Deconstruction Project have been highlighted in 10 articles in local press, one article in a national company newsletter, and one article in a national magazine. The WasteAge and Atwood Community Center articles were unsolicited. Sonya Newenhouse also presented the results of this project at the Great Lakes Pollution Prevention Roundtable on July 13, 2001 in Madison, WI. For copies of some of the following articles and a copy of the power point presentation see Attachment G, Press.

In addition to the positive press received, Jerry Frautschi received an "Orchid" award for the deconstruction efforts by the Environmental Decade – a Wisconsin nonprofit organization. This is a high honor among the environmental community in Wisconsin.

Overture offers recycling bonanza. The Capital Times, Madison, WI. March 8, 2001. Page 1B.

Overture is recycling pieces of Downtown's architecture. Wisconsin State Journal, Madison, WI. March 8, 2001.

Loop of fortune. Isthmus, Madison, WI. March 16, 2001. Page 7.

WasteCap ReCap. The BMEEx Files, Beloit, WI. Volume 3, Issue 2, March-April 2001. Page 7.

Update: Deconstructing Downtown Madison, WasteAge. Volume 32, Number 5, May 2001. Page 38.

Overture Saving and Recycling Reusable Materials During Construction. Countdown to Overture!, Madison, WI. Issue 1, Spring 2001.

Atwood Greenhouse Gives Up To Air National Guard Without A Fight. Eastside News, Madison, WI. Volume 130, Number 3, May-June 2001. Page 2.

Krupp Construction Donates Use of Building. Eastside News, Madison, WI. Volume 130, Number 3, May-June 2001. Page 20.

Overture Facts. Countdown to Overture!, Madison, WI. Issue 2, Summer 2001.

Good use from old materials. Capital Times, Madison, WI. August 1, 2001.

A handy do it yourself idea. The Habitat for Humanity Restore will feature used construction supplies. Wisconsin State Journal, Madison, WI. August 9, 2001.

Tons of Trash Turn to Treasure in the Overture Project. Leaflet (Flad & Associates National Newsletter). Issue Three, August, 2001

## 7. Financial Considerations

Table 3 presents the costs associated with waste management for the Overture Deconstruction Project. The total waste management costs are estimated at \$320,007. Removing the stone façade accounted for more than one third of the total cost, at \$113,409. Hauling and tipping fees for construction debris also accounted for a third of the total cost. The labor to remove reusable fixtures and furniture cost \$3,000. Though the labor cost for removing ceiling tile and carpet are identified as \$36,025, interviews suggest that some of this cost would have occurred regardless of recycling activities.

**Table 3: Waste Management Costs for Deconstruction Phase of Overture Project.**

Material	Tons	Labor Cost	Equipment Cost	Hauling Cost*	Tipping Fees **	Material Revenue***	Total Cost	Cost per Ton
<u>Reusable:</u>								
Fixtures & Furniture	25.9	\$ 3,000	\$ 0	\$ 0	\$ 0	\$ 325	\$ 2,675	\$103.28
Stone Façade	267.0	\$ 76,915	\$33,819	\$ 0	\$ 0	\$0	\$110,734	\$414.73
<b>Total Reusable</b>	<b>292.9</b>	<b>\$ 79,915</b>	<b>\$33,819</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 325</b>	<b>\$113,409</b>	<b>\$387.19</b>
<u>Recycled:</u>								
Ceiling Tile & Carpet	15.8	\$ 36,025	\$ 3,741	\$ 2,360	\$ 0	\$ 0	\$ 42,126	
Metal	166.2	--	--	\$ 8,375	\$ 0	\$1,662	\$ 6,713	\$40.39
Concrete	4919.5	--	--	\$44,750	\$ 5,411	\$ 0	\$ 50,161	\$10.20
<b>Total Recycled</b>	<b>5101.5</b>	<b>\$ 36,025</b>	<b>\$ 3,741</b>	<b>\$55,485</b>	<b>\$ 5,411</b>	<b>\$1,662</b>	<b>\$ 99,000</b>	<b>\$19.41</b>
<u>Landfilled:</u>								
Construction Debris	1881.2	--	--	\$39,875	\$67,723	\$ 0	\$107,598	\$57.20
<b>Total Landfilled</b>	<b>1881.2</b>	<b>--</b>	<b>--</b>	<b>\$39,875</b>	<b>\$67,723</b>	<b>\$ 0</b>	<b>\$107,598</b>	<b>\$57.20</b>
<b>Grand Total</b>	<b>7275.6</b>	<b>\$115,940</b>	<b>\$37,560</b>	<b>\$95,360</b>	<b>\$73,134</b>	<b>\$1,987</b>	<b>\$320,007</b>	<b>\$43.98</b>

\*Hauling costs for concrete, metal, and construction debris were calculated by multiply \$125 (Madison Crushing & Excavating's hauling fee) by the number of truckloads (358 loads concrete, 67 loads metal, 319 loads construction debris). Hauling fees for carpet were paid to Dupont Flooring Co.: \$420 for container delivery and \$1,940 hauling fee for each load (2 loads). Armstrong Floor & Ceiling Systems charged no hauling fee for ceiling tiles.

\*\* Dane County Landfill's tipping fee is \$36.00 per ton (Findorff took 96% of construction debris to Dane County Landfill). Wingra Stone Co. charges \$1.10 per ton tipping fee for concrete.

\*\*\* Samuels's Recycling pays \$10 per ton for sheet metal bought from contractors.

**Table 4: Avoided Landfill Tipping Fees and Hauling Costs.**

Material	Tons	Landfill Tipping Fee / Ton*	Avoided Tipping Fee	Avoided Hauling Cost (\$21.20/ton)**	Total Avoided Landfill Costs
Fixtures & Furniture	25.9	\$36.00	\$ 932.40	\$ 549.08	\$1,481.48
Stone Façade	267.0	\$36.00	\$ 9,612.00	\$ 5,660.40	\$15,272.40
Ceiling Tile	8.8	\$36.00	\$ 316.80	\$ 186.60	\$503.40
Carpet	7.0	\$36.00	\$ 252.00	\$ 148.40	\$400.40
Metal	166.2	\$36.00	\$ 5,983.20	\$ 3,523.44	\$9,506.64
Concrete	4,919.5	\$24.00	\$118,068.00	\$104,293.40	\$222,361.40
<b>Total</b>	<b>5,394.4</b>		<b>\$135,164.40</b>	<b>\$114,361.32</b>	<b>\$249,525.72</b>

\* Findorff took 96% of the total tons of construction debris to Dane County Landfill, whose tipping fee is \$36.00/ton (the other 4% went to Madison Prairie Landfill, who charges a tipping fee of \$38.50/ton). Madison Prairie Landfill charges a lower tipping fee for concrete, \$24.00/ton.

\*\* Hauling Cost per ton = \$39,875 / 1881.2 tons = \$21.20 / ton

Had all of the above materials been taken to the landfill rather than recycled or reused, the cost to Findorff would have been \$249,525.72. This calculation is based on the assumption that if the concrete was not recycled, it would have been responsibly disposed of in a construction site landfill at \$24 per ton.

Adding the avoided landfill costs to the project's actual landfill costs (construction debris; Table 3) yields the potential total waste management cost of the project, had all materials been landfilled:

<u>Actual Landfill Cost</u>	+	<u>Avoided Landfill Cost</u>	=	<b><u>Potential Total Cost</u></b>
\$107,598.00	+	\$249,525.72	=	<b>\$357,123.72</b>

Subtracting the actual total waste management costs (Table 3) from the potential total cost yields the amount of money that the project saved by recycling and reusing materials:

<u>Potential Total Cost</u>	-	<u>Actual Total Cost</u>	=	<b><u>Project Savings</u></b>
\$357,123.72	-	\$320,007.00	=	<b>\$37,116.72</b>

The project savings do not include consulting costs to coordinate and document the reuse and recycling efforts. WasteCap Wisconsin's consulting fees totaled \$8,250.00. These savings also do not include potential revenue from the sale of the stone façade.

## Responsible Hazardous Waste Management of Hazardous Materials

### Asbestos

Asbestos was found in six of the seven buildings that were deconstructed: Bank One, Teen Loft, Rosino's, Army/Navy, Miller's, and Yost's. No asbestos was found in Dotty Dumplings Dowry. Within the buildings, the largest quantities of asbestos were discovered in the black and brown mastic, floor tile, carpet, ceiling tile, and mastic on plywood. Smaller amounts were detected in pipe insulation, pipe fittings, wall demolition, concrete infill, and transite. Total asbestos abatement costs per building are presented below in Table 5. For a detailed break-down of the costs, see Attachment E: Asbestos Abatement Costs.

### Ballasts and Freon

Ballasts from florescent light fixtures were removed and recycled. The total cost for ballast removal and recycling was \$19,181. Removal of freon from large appliances cost \$4,833. See Table 5.

**Table 5:** Hazardous Waste Abatement and Recycling Costs.

<b>Type of Hazardous Material</b>	<b>Cost</b>
<u>Asbestos Abatement:</u>	
Bank One	\$ 90,382.00
Teen Loft	\$ 20,677.50
Rosino's	\$ 11,145.00
Army/Navy	\$ 1,405.00
Miller's	\$ 16,190.50
Yost's	\$ 66,633.00
Dotty Dumplings Dowry	\$ 0.00
<b>Total Asbestos Abatement</b>	<b>\$206,433.00</b>
<u>Ballast and Freon Removal/Recycling:</u>	
Ballast	\$ 19,181.00
Freon	\$ 4,833.00
<b>Total Ballast and Freon Recycling</b>	<b>\$ 24,014.00</b>
<b>Grand Total</b>	<b>\$230,447.00</b>

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**9. List of Attachments** (37 pages)

**Attachment A** Reuse Tagging Terms and Form

**Attachment B** Reusable Materials List

**Attachment C** Waste Audit Tracking Form

**Attachment D** Hauling Records

**Attachment E** Asbestos Abatement Costs

**Attachment F** Photographs

**Attachment G** Press

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