

# **Report on Deconstruction Activities in the City of Milwaukee**

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**Art Dahlberg, City of Milwaukee’s  
Department of Neighborhood Services**



**By Dave Bennink, Re-Use Consulting  
Bellingham, WA  
2-21-14**



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# Report on Deconstruction Activities in the City of Milwaukee

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**Created for COMMISSIONER,  
ART DAHLBERG,  
CITY OF MILWAUKEE  
Department of Neighborhood Services**



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## Deconstruction Report- Outline –City of Milwaukee, DNS

Date: 2-21-14

### i. Executive summary – A brief summary of issues, findings, results, and conclusions

To move this program forward, the City must encourage others to participate. This can come in the form of demanding deconstruction instead of demolition, or in the form of using reclaimed materials in projects. Deconstruction companies doing more volume often work more efficiently and this allows them to lower their prices. When deconstruction companies recognize there is a demand for reclaimed materials, they will be more likely to go out and get them, knowing that they may be paid for them the same day (the driving force that encourages demolition contractors to recycle metal).

Re-Use Consulting is beginning to connect with contractors, architects, sustainability managers, and others in Wisconsin that would be more likely to demand deconstruction and/or purchase reclaimed materials. The website, [www.decon.us](http://www.decon.us), is being temporarily used to distribute information and collect requests from the public. The City can also do the following to see that the local deconstruction companies succeed:

1. Hand out a flyer with the available deconstruction companies listed
2. Sift through the existing blighted building stock for good candidates for salvage/deconstruction
3. Contract out CBOs to deconstruct whenever possible
4. Bid out work in packages instead of single buildings.
5. Listen to what the deconstructors' needs are including more time to find buyers, seasonal availability issues, etc.

It is important to note that existing local contractors are not choosing to do deconstruction. This is likely because deconstruction is the 'hard road' and demolition is the 'easy road'. Unfortunately, this 'easy road' isn't solving any problems for the community. If the City is going to convince contractors to take this 'hard road', they may have to incentivize it, and will have to base this on the good these companies are doing for the inner-city neighborhoods they reside in.

### I. Introduction- A background of local conditions and a summary of how deconstruction companies function inside the greater community

This report is made to the Milwaukee Department of Neighborhood Services (DNS) to advise the group on issues related to building deconstruction and building material reuse. Milwaukee has contracted RE-USE Consulting to assist in assessing the deconstruction potential of local buildings including various types of wood and other materials, job creation potential, and other tasks to help build up a local deconstruction industry. Work completed included helping 4 Community Based Organizations in Milwaukee. Their workers were trained up and helped to complete the removal of building materials from a number of homes and garages.

This study is meant to see the viability of returning to the process of deconstruction, something that was very common in the past, at least prior to large machine driven demolition. The whole issue of deconstruction being competitive with demolition can be summed up with three points. The deconstruction companies must keep their costs down in order to be more competitive with

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demolition pricing, as well as limiting the time needed to deconstruct in order to meet client schedule limitations and perform enough volume (economies of scale). The final point is that the deconstruction operation must ‘reclaim’ as much money as possible from sales of items from the structures in order to off-set the added costs of deconstruction compared to demolition. Not every building will be a good choice for deconstruction, and therefore a system must be developed to help determine which buildings are the best candidates for salvage or full deconstruction, and another system must be set up to efficiently handle materials once they are sourced.

The key to any effort in Milwaukee would be to maximize the benefit to the community. The jobs created, the landfill diversion, and the lower-income homeowners that are helped are just some of the benefits that the community should expect from this type of operation. This worthy effort is hinging on concerns about how an operation of this type could survive in the Milwaukee area. We like to summarize things in this way: if you collect good quality reclaimed materials, they will come. The ‘they’ are customers with money ready to spend and support the operation, and this theory has been proven all over the United States. There is a place for reclaimed building materials operations in most any city with a population over 20,000, assuming materials can be sourced and customers understand how the operation will save them money while benefitting the community.

Image: Milwaukee’s Greatest Resource – Young Workers Looking For Opportunities



II. The Building Selection- A report on the buildings surveyed as part of this project

There were a number of sites visited and worked on during the Milwaukee worker training. Re-Use Consulting surveyed over two dozen buildings, and was able to perform work on ten of them. All of the materials that were surveyed at the sites fit into three distinct categories: 1. recyclable materials, 2. reusable materials, and 3. debris. The following includes a brief description of many of the structures, an accounting of the main building materials found in each building, and a brief summary of what reusable materials were present at those sites. None of the buildings surveyed could be completely ruled out for deconstruction, but they were ranked to determine which ones would be good as training buildings. As deconstruction contractors gain experience, they could attempt more difficult buildings.

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### Building #1: 1312 W. Cottage

This home was a 1 ½ story structure with an unfinished attic. It had no attic floor in the front section of the home, and an internal stairwell in the middle of the building. The home also had decent access on the north and west sides of the building, and a side lot that extended far behind the building. Inside, it only had a couple of noteworthy surface items. The structure contained quality wood from about 80-100 years ago that, if marketed properly, would sell for thousands of dollars. The building was selected due to the combination of value and access compared to other available buildings.

		Salvage list for: 1312 W. Cottage Milwaukee, WI								
		Date: 5-16-13								
		Home is 32' x 21', 1.5 story with unfinished knee wall areas on 2nd floor								
		Home has open side, borders the sidewalk, has a driveway on the east side, and butts up against another vacant property								
		It has very few nice salvage items..								
		Interior walls: 185' exterior: 165' basement 0								
<b>Itemized Materials:</b>		List by: Dave Bennink, Re-Use Consulting								
		<a href="tel:360-201-6977">360-201-6977</a>								
Inventory Description	Type	Quantity	Unit type	Assessed Value	Tot. Value	Unit Weight (lbs)	Total Weight (lbs)	Reuse	Recycle	Disposal
<b>House Materials</b>										
<b>ITEMS</b>										
Roofing	asphalt x2?+ cedar	800	sq ft	\$ -	\$ -	4.5	3600.0	0.0	3500.0	100.0
Tar paper	tar paper	800	sq ft	\$ -	\$ -	0.3	240.0	0.0	220.0	20.0
Roof sheathing	skip sheeting	800	sq ft	\$ 1.00	\$ 800.00	1.5	1200.0	1000.0	128.0	72.0
Rafters	2x6	640	lineal ft	\$ 0.27	\$ 172.80	2.7	1728.0	1650.0	50.0	28.0
Attic insulation/walls	batts	1	set	\$ -	\$ -	500.0	500.0	0.0	0.0	500.0
Attic decking	none	50	lineal ft	\$ 1.00	\$ 50.00	1.5	75.0	75.0	0.0	0.0
Chimney brick	brick	540	each	\$ 0.30	\$ 162.00	5.0	2700.0	2250.0	260.0	190.0
block mortar	mortar between blocks	540	each	\$ -	\$ -	1.1	594.0	0.0	580.0	14.0
Attic floor joists	2x4	211.2	lineal ft	\$ 0.27	\$ 57.02	1.8	380.2	360.0	15.0	5.2
Misc items in attic	minimal	1	set	\$ -	\$ -	35.0	35.0	8.0	8.0	19.0
Facia board	6"	90	lineal ft	\$ 0.35	\$ 31.50	1.3	117.0	110.0	0.0	7.0
Gutter	aluminum	80	lineal ft	\$ 0.75	\$ 60.00	0.8	60.0	60.0	0.0	0.0
Downspout	missing?	30	lineal ft	\$ 0.75	\$ 22.50	0.5	15.0	15.0	0.0	0.0
Soffit materials	set	1	set	\$ 120.00	\$ 120.00	285.0	285.0	150.0	100.0	35.0
Gable end walls/dormers		3	set	\$ -	\$ -	350.0	1050.0	250.0	350.0	450.0
furniture		1	set	\$ 50.00	\$ 50.00	75.0	75.0	15.0	25.0	35.0



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### Building #2:1316 W. Chambers

This home was a 1 ½ story structure with an unfinished attic. It had no attic floor in the home, and an external stairwell at the north end of the building. The home also had decent access on the south and west sides of the building, and a side lot that extended far behind the building. Inside, it had a couple of noteworthy surface items like the maple wood flooring. The structure contained quality wood from about 80-100 years ago that, if marketed properly, would sell for thousands of dollars. The building was selected due to the combination of value and access compared to other available buildings, including the side lot that both it and the home on Cottage shared.

		Salvage list for: 1316 W. Chambers Milwaukee, WI									
		Date: 5-16-13									
Sustainable Alternatives to Demolition www.reuseconsulting.com		Home is 42' x 20', 1.5 story with unfinished knee wall areas on 2nd floor									
		Home has open side, borders the sidewalk, has a neighbor's yard on the east side, and butts up against another vacant property									
Itemized Materials:		It has very few nice salvage items..and some minor fire damage									
		Interior walls: 170' exterior: 165' basement 0									
		List by: Dave Bennink, Re-Use Consulting									
		<a href="tel:360-201-6977">360-201-6977</a>									
Inventory Description	Type	Quantity	Unit type	Assessed Value	Total Value	Unit Weight (lbs)	Total Weight (lbs)	Reuse	Recycle	Disposal	
House Materials											
<b>ITEMS</b>											
Roofing	asphalt x2?+ cedar	1050	sq ft	\$ -	\$ -	4.5	4725.0	0.0	4500.0	225.0	
Tar paper	tar paper	1050	sq ft	\$ -	\$ -	0.3	315.0	0.0	300.0	15.0	
Roof sheathing	skip sheeting	1050	sq ft	\$ 1.00	\$ 1,050.00	1.5	1575.0	1200.0	200.0	175.0	
Rafters	2x4	840	lineal ft	\$ 0.18	\$ 151.20	1.8	1512.0	1400.0	100.0	12.0	
Attic insulation/walls	balts	1	set	\$ -	\$ -	800.0	800.0	0.0	0.0	800.0	
Attic decking	none	50	lineal ft	\$ 1.00	\$ 50.00	1.5	75.0	75.0	0.0	0.0	
Chimney brick	brick	630	each	\$ 0.30	\$ 189.00	5.0	3150.0	2500.0	500.0	150.0	
block mortar	mortar between blocks	630	each	\$ -	\$ -	1.1	693.0	0.0	670.0	23.0	
Attic floor joists	2x6	604.8	lineal ft	\$ 0.27	\$ 163.30	2.7	1633.0	1600.0	30.0	3.0	
Misc items in attic	minimal	1	set	\$ -	\$ -	35.0	35.0	8.0	8.0	19.0	
Facia board	6"	125	lineal ft	\$ 0.35	\$ 43.75	1.3	162.5	150.0	0.0	12.5	
Gutter	aluminum	80	lineal ft	\$ 0.75	\$ 60.00	0.8	60.0	60.0	0.0	0.0	
Downspout	missing?	30	lineal ft	\$ 0.75	\$ 22.50	0.5	15.0	15.0	0.0	0.0	
Soffit materials	set	1	set	\$ 120.00	\$ 120.00	285.0	285.0	150.0	50.0	85.0	
Gable end walls/dormers		3	set	\$ -	\$ -	300.0	900.0	300.0	300.0	300.0	
furniture		1	set	\$ 50.00	\$ 50.00	75.0	75.0	0.0	35.0	40.0	
Lights		11	each	\$ 3.00	\$ 33.00	3.0	33.0	33.0	0.0	0.0	
cabinets		3	each	\$ 20.00	\$ 60.00	55.0	165.0	100.0	25.0	40.0	
doors		16	each	\$ 12.00	\$ 192.00	25.0	400.0	275.0	100.0	25.0	
windows/sashes	mix	25	each	\$ 4.00	\$ 100.00	35.0	875.0	275.0	250.0	350.0	
window leaded sashes		0	each	\$ 15.00	\$ -	35.0	0.0	0.0	0.0	0.0	
window coverings		17	each	\$ -	\$ -	5.0	85.0	0.0	0.0	85.0	
plumbing fixtures		4	each	\$ 15.00	\$ 60.00	75.0	300.0	200.0	100.0	0.0	
mirrors		1	each	\$ 5.00	\$ 5.00	25.0	25.0	25.0	0.0	0.0	
shelving		80	lineal ft	\$ 0.25	\$ 20.00	3.0	240.0	240.0	0.0	0.0	
doweling		12	lineal ft	\$ 0.35	\$ 4.20	0.7	7.8	7.8	0.0	0.0	
trim - all	crown, casing, base	1400	lineal ft	\$ 0.20	\$ 280.00	0.4	560.0	300.0	200.0	60.0	
appliances		1	each	\$ -	\$ -	125.0	125.0	0.0	125.0	0.0	

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Building #2:1316 W. Chambers

Inventory Description	Type	Quantity	Unit type	Assessed Value	Total Value	Unit Weight	Total Weight	Reuse	Recycle	Disposal
						(lbs)	(lbs)			
stair sets	central	1	set	\$ -	\$ -	250.0	250.0	0.0	250.0	0.0
wall/ceiling paneling		840	sq ft	\$ 1.00	\$ 840.00	2.0	1680.0	1250.0	250.0	180.0
deck structures/posts/flooring	porch	1	set	\$ 150.00	\$ 150.00	700.0	700.0	500.0	100.0	100.0
wood flooring - usable	maple	1176	sq ft	\$ 1.50	\$ 1,764.00	2.2	2587.2	2300.0	200.0	87.2
wood floor - unusable	mix	504	sq ft	\$ -	\$ -	2.0	1008.0	100.0	200.0	708.0
carpet	rough	300	sq ft	\$ -	\$ -	0.6	180.0	0.0	0.0	180.0
vinyl or ceramic tile		175	sq ft	\$ -	\$ -	2.0	350.0	0.0	0.0	350.0
hardware/electric	fan,	3	set	\$ 5.00	\$ 15.00	75.0	225.0	150.0	75.0	0.0
hvac items	forced air	1	set	\$ 45.00	\$ 45.00	1000.0	1000.0	250.0	650.0	100.0
misc materials		1	set	\$ 100.00	\$ 100.00	3500.0	3500.0	1250.0	1650.0	600.0
wall/ceiling finishes	lathe/plaster	3810	sq ft	\$ -	\$ -	6.5	24765.0	0.0	5000.0	19765.0
wall/ceiling finishes	sheetrock	250	sq ft	\$ -	\$ -	2.6	650.0	0.0	600.0	50.0
vinyl siding		1050	sq ft	\$ 0.25	\$ 262.50	1.3	1365.0	1250.0	0.0	115.0
asphalt siding	?	1050	sq ft	\$ -	\$ -	3.5	3675.0	0.0	0.0	3675.0
sheathing	with base siding	1050	sq ft	\$ 1.00	\$ 1,050.00	2.7	2835.0	1000.0	500.0	1335.0
exterior/interior wall studs/plates		3082	lineal ft	\$ 0.18	\$ 554.76	1.8	5547.6	2500.0	1500.0	1547.6
floor joists 2nd	2x8	672	lineal ft	\$ 0.38	\$ 255.36	3.6	2419.2	2400.0	15.0	4.2
floor joists 1st	2x8	672	lineal ft	\$ 0.38	\$ 255.36	3.6	2419.2	2400.0	15.0	4.2
floor sheathing	9-10" plank	1680	sq ft	\$ 1.00	\$ 1,680.00	1.5	2520.0	2000.0	375.0	145.0
support beams	8x8	42	lineal ft	\$ 2.50	\$ 105.00	14.4	604.8	604.0	0.0	0.8
support posts		30	lineal ft	\$ 1.00	\$ 30.00	14.4	432.0	432.0	0.0	0.0
foundation	block	n/a	set	\$ -	\$ -	n/a	0.0	0.0	0.0	0.0
slab	y	n/a	set	\$ -	\$ -	n/a	0.0	0.0	0.0	0.0
bath terrazzo floor		0	sq ft	\$ -	\$ -	6.0	0.0	0.0	0.0	0.0
household materials	low/med.	1	set	\$ 100.00	\$ 100.00	500.0	500.0	125.0	125.0	250.0
materials in yard	tires	1	each	\$ -	\$ -	250.0	250.0	100.0	75.0	75.0
fencing		n/a	lineal ft	\$ -	\$ -	n/a	0.0	0.0	0.0	0.0
fireplace mantle		0	set	\$ -	\$ -	50.0	0.0	0.0	0.0	0.0
oil tank		0	each	\$ -	\$ -	200.0	0.0	0.0	0.0	0.0
basement walls	ceiling materials here	1	set	\$ -	\$ -	500.0	500.0	350.0	125.0	25.0
vapor barrier	resin paper	1050	sq ft	\$ -	\$ -	0.2	210.0	0.0	0.0	210.0
laundry sink - plastic		0	each	\$ 20.00	\$ -	25.0	0.0	0.0	0.0	0.0
concrete step sets	2 step	0	each	\$ -	\$ -	n/a	0.0	0.0	0.0	0.0
raked brick foundation veneer	raked brick	0.0	each	\$ -	\$ -	5.0	0.0	0.0	0.0	0.0
brick mortar		0.0	each	\$ -	\$ -	1.1	0.0	0.0	0.0	0.0
Summary: The building was selected as a great training building more than focusing on material value or diversion percentage. The products inside the structure would total between \$9000-\$12,000 depending on how well set up the deconstruction team is for maximizing sales value.										
					\$ 9,860.93		78999.3	27874.8	19198.0	31926.5
								35%	24%	40%

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Building #3:2512 N. 7<sup>th</sup>

This home was a 1 ½ story structure with an unfinished attic. It had no attic floor in the home, and two internal stairwells at the ends of the building. The home also had decent access on the south and west sides of the building, and no side lot and a small lot behind the building. Inside, it had only a couple of noteworthy surface items. The structure contained quality wood from about 80-100 years ago that, if marketed properly, would sell for thousands of dollars. The building was selected due to the combination of value and access compared to other available buildings, including the upper story floor joists that turned out to be 2x14’s up to 24 feet in length.

		Salvage list for: 2512 N. 7th Milwaukee, WI Date: 5-14-13  Home is 40' x 22', 1.5 story with an unfinished attic Home has little room on one side, some room to street in front, back yard and side yard are open A few nice salvage items.. Interior walls: 125' exterior: 180' basement 0								
Itemized Materials:		List by: Dave Bennink, Re-Use Consulting <a href="tel:360-201-6977">360-201-6977</a>								
Inventory Description	Type	Quantity	Unit type	Assessed Value	Total Value	Unit Weight (lbs)	Total Weight (lbs)	Reuse	Recycle	Disposal
House Materials										
ITEMS										
Roofing	asphalt x2?	1040	sq ft	\$ -	\$ -	4.5	4680.0	0.0	4600.0	80.0
Tar paper	tar paper	1040	sq ft	\$ -	\$ -	0.3	312.0	0.0	300.0	12.0
Roof sheathing	skip sheeting	1040	sq ft	\$ 1.00	\$ 1,040.00	1.5	1560.0	1200.0	300.0	60.0
Rafters	2x6	832	lineal ft	\$ 0.27	\$ 224.64	2.7	2246.4	2200.0	40.0	6.4
Attic insulation/walls	batts	1	set	\$ -	\$ -	800.0	800.0	0.0	0.0	800.0
Attic decking	6" flooring	60	lineal ft	\$ 1.00	\$ 60.00	1.5	90.0	90.0	0.0	0.0
Chimney brick	brick	672	each	\$ 0.30	\$ 201.60	5.0	3360.0	2600.0	600.0	160.0
block mortar	mortar between blocks	672	each	\$ -	\$ -	1.1	739.2	0.0	700.0	39.2
Attic floor joists	2x6	384	lineal ft	\$ 0.27	\$ 103.68	2.7	1036.8	1000.0	30.0	6.8
Misc items in attic	minimal	1	set	\$ -	\$ -	35.0	35.0	5.0	9.0	21.0
Facia board	6"	104	lineal ft	\$ 0.35	\$ 36.40	1.3	135.2	100.0	0.0	35.2
Gutter	aluminum	80	lineal ft	\$ 0.75	\$ 60.00	0.8	60.0	60.0	0.0	0.0
Downspout	missing?	30	lineal ft	\$ 0.75	\$ 22.50	0.5	15.0	15.0	0.0	0.0
Soffit materials	set	1	set	\$ 120.00	\$ 120.00	285.0	285.0	150.0	100.0	35.0
Gable end walls/dormers		3	set	\$ -	\$ -	325.0	975.0	300.0	300.0	375.0
furniture		1	set	\$ 50.00	\$ 50.00	75.0	75.0	25.0	0.0	50.0
Lights		11	each	\$ 3.00	\$ 33.00	3.0	33.0	33.0	0.0	0.0
cabinets		7	each	\$ 20.00	\$ 140.00	55.0	385.0	100.0	100.0	185.0
doors		16	each	\$ 12.00	\$ 192.00	25.0	400.0	150.0	150.0	100.0
windows/sashes	mix	24	each	\$ 4.00	\$ 96.00	35.0	840.0	250.0	250.0	340.0
window leaded sashes		0	each	\$ 15.00	\$ -	35.0	0.0	0.0	0.0	0.0
window coverings		17	each	\$ -	\$ -	5.0	85.0	0.0	0.0	85.0
plumbing fixtures		4	each	\$ 15.00	\$ 60.00	75.0	300.0	125.0	125.0	50.0
mirrors		1	each	\$ 5.00	\$ 5.00	25.0	25.0	25.0	0.0	0.0
shelving		30	lineal ft	\$ 0.25	\$ 7.50	3.0	90.0	90.0	0.0	0.0
doweling		10	lineal ft	\$ 0.35	\$ 3.50	0.7	6.5	6.5	0.0	0.0
trim - all	crown, casing, base	1250	lineal ft	\$ 0.20	\$ 250.00	0.4	500.0	250.0	125.0	125.0
appliances		1	each	\$ -	\$ -	125.0	125.0	0.0	125.0	0.0

Building #3:2512 N. 7<sup>th</sup>



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Building #4: 2762 N. 9<sup>th</sup>

Summary: One highly ranked building was 2762 N. 9<sup>th</sup>. The home was a two-story structure with an unfinished attic. It had an attic floor, a tacked-on stairwell on the back of the building. The home also had decent access on the north side of the building, and direct alley access behind the building. Inside, it had a nice wooden cabinet set, a set of doors, and over 700 sq. ft. of maple flooring. The structure contained quality wood from about 80-100 years ago that, if marketed properly, would sell for thousands of dollars. The building was selected due to the combination of value and access compared to other available buildings. This building had more value than most. The maple flooring and cabinets were obvious examples of this, where the standard rustic lumber and sheathing were also available. The building was of fairly standard construction, but unfortunately it contained a fair amount of blown-in insulation.

		Salvage list for: 2762 N 9th Milwaukee, WI						
		Date: 5-12-13						
		Home is 45' x 23', 1.5 story with an unfinished attic						
		Home has little room on one side, slope to street in front, back yard and side yard are open						
		Some water damage in 2 rooms/attic						
		A few nice salvage items..						
		Interior walls: 165' exterior: 210' basement 0						
<b>Itemized Materials:</b>		List by: Dave Bennink <a href="tel:360-201-6977">360-201-6977</a>						
Inventory Description	Type	Quantity	Unit type	Assessed Value	Total Value	Assessed Value	Total Value	Wood
				Low est.*	Low est.*	High est.*	High est.*	Only High est.*
<b>House Materials</b>		* Values are not marked prices but an average between marked price, discounted price for damage, and broken/short pieces						
<b>ITEMS</b>								
Roofing	asphalt	1260	sq ft	\$ -	\$ -	\$ -	\$ -	
Tar paper	tar paper	1260	sq ft	\$ -	\$ -	\$ -	\$ -	
Roof sheathing	skip sheeting	1260	sq ft	\$ 0.35	\$ 441.00	\$ 1.00	\$ 1,260.00	\$ 1,260.00
Rafters	2x4	1008	lineal ft	\$ 0.20	\$ 201.60	\$ 0.33	\$ 332.64	\$ 332.64
Attic insulation/walls	balts	1	set	\$ -	\$ -	\$ -	\$ -	
Attic decking	6" flooring	675	lineal ft	\$ 1.00	\$ 675.00	\$ 2.00	\$ 1,350.00	\$ 1,350.00
Chimney brick	brick	714	each	\$ 0.30	\$ 214.20	\$ 0.40	\$ 285.60	
block mortar	mortar between	714	each	\$ -	\$ -	\$ -	\$ -	
Attic floor joists	2x6	540	lineal ft	\$ 0.27	\$ 145.80	\$ 0.50	\$ 270.00	\$ 270.00
Misc items in attic	minimal	1	set	\$ -	\$ -	\$ -	\$ -	
Facia board	6"	108	lineal ft	\$ 0.35	\$ 37.80	\$ 0.50	\$ 54.00	\$ 54.00
Gutter	aluminum	75	lineal ft	\$ 0.75	\$ 56.25	\$ 0.80	\$ 60.00	
Downspout	missing?	36	lineal ft	\$ 0.75	\$ 27.00	\$ 0.80	\$ 28.80	
Soffit materials	set	1	set	\$ 80.00	\$ 80.00	\$ 100.00	\$ 100.00	
Gable end walls/dormers		3	set	\$ -	\$ -	\$ -	\$ -	
furniture		1	set	\$ 50.00	\$ 50.00	\$ 75.00	\$ 75.00	
Lights		11	each	\$ 3.00	\$ 33.00	\$ 4.00	\$ 44.00	
cabinets		7	each	\$ 30.00	\$ 210.00	\$ 40.00	\$ 280.00	
doors		16	each	\$ 15.00	\$ 240.00	\$ 25.00	\$ 400.00	
windows/sashes	mix	24	each	\$ 2.50	\$ 60.00	\$ 3.00	\$ 72.00	
window leaded sashes		0	each	\$ -	\$ -	\$ -	\$ -	
window coverings		17	each	\$ -	\$ -	\$ -	\$ -	
plumbing fixtures		4	each	\$ 15.00	\$ 60.00	\$ 65.00	\$ 260.00	
mirrors		1	each	\$ 5.00	\$ 5.00	\$ 10.00	\$ 10.00	
shelving		30	lineal ft	\$ 0.25	\$ 7.50	\$ 0.50	\$ 15.00	\$ 15.00
doweling		10	lineal ft	\$ 0.35	\$ 3.50	\$ 0.50	\$ 5.00	

Building #4: 2762 N. 9<sup>th</sup>

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Inventory Description	Type	Quantity	Unit type	Assessed Value	Total Value	Assessed Value	Total Value	Wood
				Low est.*	Low est.*	High est.*	High est.*	Only High est*
trim - all	crown, casing,base	1450	lineal ft	\$ 0.20	\$ 290.00	\$ 0.30	\$ 435.00	\$ 435.00
appliances		1	each	\$ -	\$ -	\$ -	\$ -	
stair sets	central	1	set	\$ -	\$ -	\$ -	\$ -	
wall/ceiling paneling		50	sq ft	\$ -	\$ -	\$ -	\$ -	
deck structures/posts/flooring	porch/ext stairwell	2	set	\$ 75.00	\$ 150.00	\$ 200.00	\$ 400.00	
wood flooring - usable	maple	700	sq ft	\$ 1.75	\$ 1,225.00	\$ 3.00	\$ 2,100.00	\$ 2,100.00
wood floor - unusable	mix	900	sq ft	\$ -	\$ -	\$ -	\$ -	
carpet	rough	350	sq ft	\$ -	\$ -	\$ -	\$ -	
vinyl or ceramic tile		200	sq ft	\$ -	\$ -	\$ -	\$ -	
hardware/electric	fan,	3	set	\$ 5.00	\$ 15.00	\$ 12.00	\$ 36.00	
hvac items	forced air	1	set	\$ 45.00	\$ 45.00	\$ 55.00	\$ 55.00	
misc materials		1	set	\$ 125.00	\$ 125.00	\$ 200.00	\$ 200.00	
wall/ceiling finishes	lathe/plaster	5611.5	sq ft	\$ -	\$ -	\$ -	\$ -	
wall/ceiling finishes	sheetrock	400	sq ft	\$ -	\$ -	\$ -	\$ -	
vinyl siding	vinyl/foam	1176	sq ft	\$ 0.25	\$ 294.00	\$ 0.35	\$ 411.60	
asbestos siding	transite	1176	sq ft	\$ -	\$ -	\$ -	\$ -	
sheathing		1176	sq ft	\$ 0.20	\$ 235.20	\$ 1.10	\$ 1,293.60	\$ 1,293.60
exterior/interior wall studs/plates		3450	lineal ft	\$ 0.20	\$ 690.00	\$ 0.25	\$ 862.50	\$ 862.50
floor joists 2nd	2x8	828	lineal ft	\$ 0.38	\$ 314.64	\$ 1.00	\$ 828.00	\$ 828.00
floor joists 1st	2x8	828	lineal ft	\$ 0.38	\$ 314.64	\$ 1.00	\$ 828.00	\$ 828.00
floor sheathing	1x6 plank	2070	sq ft	\$ 1.00	\$ 2,070.00	\$ 1.25	\$ 2,587.50	\$ 2,587.50
support beams	8x8	45	lineal ft	\$ 2.50	\$ 112.50	\$ 5.00	\$ 225.00	\$ 225.00
support posts		30	lineal ft	\$ 1.00	\$ 30.00	\$ 3.00	\$ 90.00	\$ 90.00
foundation	block	n/a	set	\$ -	\$ -	\$ -	\$ -	
slab	y	n/a	set	\$ -	\$ -	\$ -	\$ -	
bath terrazzo floor		0	sq ft	\$ -	\$ -	\$ -	\$ -	
household materials	low/med.	1	set	\$ 75.00	\$ 75.00	\$ 100.00	\$ 100.00	
materials in yard	tires	1	each	\$ -	\$ -	\$ -	\$ -	
fencing		n/a	lineal ft	\$ -	\$ -	\$ -	\$ -	
fireplace mantle		1	set	\$ -	\$ -	\$ -	\$ -	
oil tank		0	each	\$ -	\$ -	\$ -	\$ -	
basement walls		0	set	\$ -	\$ -	\$ -	\$ -	
vapor barrier	resin paper	1176	sq ft	\$ -	\$ -	\$ -	\$ -	
laundry sink - plastic		0	each	\$ -	\$ -	\$ -	\$ -	
concrete step sets	2 step	0	each	\$ -	\$ -	\$ -	\$ -	
raked brick foundation veneer	raked brick	0.0	each	\$ -	\$ -	\$ -	\$ -	
brick mortar		0.0	each	\$ -	\$ -	\$ -	\$ -	
					Low Estimate		High Estimate	Wood Only
					\$ 8,533.63		\$ 15,354.24	\$ 12,531.24

Summary: Over \$8000 of the total value would be from sales of flooring, subflooring, and floor joists.  
 It is important for the deconstruction companies to take selling this material seriously if they want to keep their bids reasonable.

Work was also conducted on a number of garages and the City has received some encouragingly competitive bids for garage deconstruction compared to demolition. The following is a list and some images of one such garage that was deconstructed.

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 <p><b>RE-USE Consulting</b> Say "No!" To The Trash/Hoe Sustainable Alternatives to Demolition www.reuseconsulting.com</p>	<p>Salvage list for: 3347 N. 20th St. Milwaukee, WI - garage Date: 5-7-13</p> <p>Garage is 20' x 22', 1 story mostly unfinished Off alley with some slab around building Small trees growing from base of walls</p> <p>Interior walls: 0' exterior: 84'</p> <p>Itemized Materials: List by: <a href="tel:360-201-6977">360-201-6977</a></p>									
<b>Inventory Description</b>	<b>Type</b>	<b>Quantity</b>	<b>Unit type</b>	<b>Assessed Value</b>	<b>Total Value</b>	<b>Unit Weight</b>	<b>Total Weight</b>	<b>Reuse</b>	<b>Recycle</b>	<b>Disposal</b>
House Materials										
<b>ITEMS</b>										
Roofing	asphalt (likely 1x)	484	sq ft	\$ -	\$ -	3.3	1597.2	0.0	1500.0	97.2
Tar paper	tar paper	484	sq ft	\$ -	\$ -	0.3	145.2	0.0	140.0	5.2
Roof sheathing	plank - wide	484	sq ft	\$ 1.50	\$ 726.00	1.5	726.0	600.0	100.0	26.0
Rafters	2x6	387.2	lineal ft	\$ 0.18	\$ 69.70	2.7	1045.4	1000.0	40.0	5.4
Facia board	1x3	45	lineal ft	\$ 0.40	\$ 18.00	2.0	90.0	90.0	0.0	0.0
Gutter	none	0	lineal ft	\$ 0.75	\$ -	0.8	0.0	0.0	0.0	0.0
Downspout	none	0	lineal ft	\$ 0.75	\$ -	0.5	0.0	0.0	0.0	0.0
Soffit materials	none	0	set	\$ 100.00	\$ -	275.0	0.0	0.0	0.0	0.0
Gable end walls/dormers	2 gable ends	2	set	\$ 15.00	\$ 30.00	90.0	180.0	60.0	60.0	60.0
furniture		0	set	\$ 15.00	\$ -	50.0	0.0	0.0	0.0	0.0
Lights		2	each	\$ 2.00	\$ 4.00	1.0	2.0	2.0	0.0	0.0
cabinets		0	each	\$ 50.00	\$ -	85.0	0.0	0.0	0.0	0.0
doors		2	each	\$ 25.00	\$ 50.00	150.0	300.0	300.0	0.0	0.0
windows/sashes	none	0	each	\$ 5.00	\$ -	25.0	0.0	0.0	0.0	0.0
window leaded sashes	none	0	each	\$ 15.00	\$ -	12.0	0.0	0.0	0.0	0.0
window coverings	none	0	each	\$ -	\$ -	5.0	0.0	0.0	0.0	0.0
plumbing fixtures	none	0	each	\$ 35.00	\$ -	120.0	0.0	0.0	0.0	0.0
shelving		6	lineal ft	\$ 1.00	\$ 6.00	3.0	18.0	18.0	0.0	0.0
doweling		0	lineal ft	\$ 0.50	\$ -	0.7	0.0	0.0	0.0	0.0
trim - all	misc plain	300	lineal ft	\$ 0.25	\$ 75.00	0.4	120.0	100.0	20.0	0.0
wall/ceiling paneling		15	sq ft	\$ 1.00	\$ 15.00	2.0	30.0	5.0	25.0	0.0
hardware/electric		1	set	\$ 5.00	\$ 5.00	45.0	45.0	30.0	10.0	5.0
hvac items	none	0	set	\$ 100.00	\$ -	0.0	0.0	0.0	0.0	0.0
misc materials		1	set	\$ 35.00	\$ 35.00	500.0	500.0	100.0	150.0	250.0
wall/ceiling finishes	none		sq ft	\$ -	\$ -	4.2	0.0	0.0	0.0	0.0
wall/ceiling finishes	misc plain	0	sq ft	\$ -	\$ -	2.8	0.0	0.0	0.0	0.0
siding	barn board siding	578	sq ft	\$ 0.25	\$ 144.50	1.5	867.0	800.0	50.0	17.0
wood siding	4" bevel	0	sq ft	\$ 0.20	\$ 75.00	1.3	0.0	0.0	0.0	0.0
sheathing	plank - wide	578	sq ft	\$ 1.25	\$ 722.50	1.5	867.0	700.0	125.0	42.0
exterior/interior wall studs/plates	2x4	772.8	lineal ft	\$ 0.18	\$ 139.10	1.8	1391.0	1000.0	300.0	91.0
foundation	none	n/a	set	\$ -	\$ -	n/a	0.0	0.0	0.0	0.0
slab	n/a	n/a	set	\$ -	\$ -	n/a	0.0	0.0	0.0	0.0
household materials	low	1	set	\$ 10.00	\$ 10.00	25.0	25.0	5.0	5.0	15.0
vapor barrier		0	sq ft	\$ -	\$ -	0.2	0.0	0.0	0.0	0.0
						2124.8	7948.9	4810.0	2525.0	613.9
								61%	32%	8%



III. Ranking Buildings- Parameters on which deconstruction potential is based

Hundreds of buildings are taken down every day in the United States, most via demolition. Not all of these buildings are worthy of a deconstruction contractor's time. Therefore, it is prudent to rank available options for building deconstruction and find the best projects. The 'best' are projects that provide for a safe work environment, yield valuable materials, and can be done in an economically viable way.

The following is the set of parameters used to measure the relative deconstructability of the buildings surveyed in Milwaukee. They are not necessarily in order of importance:

1. Number of stories – mainly a parameter used for groups training to do deconstruction – 2 stories and smaller for groups learning how to perform this work.
2. Square foot footprint – this parameter is also related to the training operation in this case, but it is being looked at to determine how deconstruction bids compare to demolition bids relative to the size of the building.
3. Square foot total – same as square foot footprint
4. Wall length – walls generally have the lowest return on investment of labor – if covered in paneling with no plaster etc. that is factored in
5. Ratio of wall length to square feet: the lower the ratio of walls to square feet, the better (i.e. bigger average room size)
6. Value or Value/Square foot – This is a very important parameter as it involves generating much needed revenue to supplement the bid price
7. Weight or Weight/Square foot – This parameter is tied into other parameters such as value and reuse %. There is no easy answer to how weight relates to deconstructability, but it does contribute to the decision making process
8. Reuse %, Recycle %, Disposal % or Disposal/Square foot - These parameters all relate to each other and should encompass 100% of the total weight of the structure. The most important is often the reuse% and how that relates to the value of reclaimed materials
9. Access – Easier to access buildings help keep deconstruction costs down
10. Roof layers/sheathing – Often the hardest to access and most unsafe work is on the roof. More layers (we have seen up to 7 layers on a roof in the past) of roofing is more of a problem for deconstruction workers than it is for demolition machines. Roofing installed on sheet goods is often easier to remove than when on shiplap or skip sheathing.
11. Unfinished attic space – finished attic spaces often simply yield more debris and recyclables that do not help deconstruction efforts.
12. Attic decking worth saving – flooring and decking have a value and another layer in the attic is worth putting a 'value' to
13. Blown-in insulation – this is a pure expense for deconstruction groups. Demolition contractors do not struggle as much with how to handle and remove it compared to deconstruction workers.
14. Sheetrock – this is an upgrade from lathe/plaster, but a down grade from sheet paneling etc.
15. Extra wall finishes – Deconstructing a home that has been poorly renovated can be an added challenge. The more layers of a product that has no value, the worse the cost/benefit ratio for the project becomes.
16. Extra ceiling finishes – same as extra wall finishes



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waste or wastefulness. New higher rates would stimulate the recycling industry, reduce waste, and make deconstruction more competitive with demolition pricing.

The benefits of recycling vs. disposal are great, but deconstruction businesses trying to compete with demolition pricing are more interested in how to reduce costs. Disposal is one cost center where deconstruction contractors always spend less than demolition contractors, but they must achieve this without adding too much to their labor costs. The costs of disposal drop when recycling/reuse rates increase, while the labor rates increase with increased landfill diversion. The key is to find a ‘middle ground’ where the benefits of diversion are balanced with the costs of diversion.

The focus of local deconstruction efforts may not be solely focused on landfill diversion, but the occasional project may come along where landfill diversion is important (example: L.E.E.D. green building projects). The following is a chart of materials that a co-mingled recycling facility accepts and shows the depth of the materials that can be removed from the waste stream.

Table 4a: Example of Recyclables accepted at a recycling yard.

Materials They Accept		Materials They Don't Accept	
Metals		Large Appliances	
Lumber/wood		Furniture	
Concrete		Bedding	
Brick and concrete block		Auto parts	
Plaster		Tires	
Ceiling tiles		Sludge	
Glass/window frames		Municipal garbage	
Piping		Paper	
Roofing		Car fuel, propane, etc	
Stone/rock		Fuel oil	
Wiring and fixtures		Street sweepings	
Insulation		Industrial solid waste	
Soil		Oil soaked wood/creosoted	
Landclearing materials		55-gallon drums	
asphalt			
plastics			

Metal – Recycled - The metal in each building could be separated out to a large degree. Much of it would be separated by hand and hauled separately. The benefit of sorting metal is the combination of avoiding dump fees (per pound disposed of) and the payment collected for the scrap metal (per pound recycled). The total ‘swing’ between throwing all metal away and recycling all of it via deconstruction would usually total about \$300-\$500 per building.

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Concrete – Recycled - All of the concrete would be recycled at a private commercial site that accepts broken up concrete for recycling and dispenses clean fill for filling in the foundation holes etc. One local example is Cream City Wrecking.

Brick – Recycled/Reused - The operation would quickly develop a market for unbroken brick, focusing on making sales prior to hauling it from the jobsite. The broken brick would likely be mixed in with the concrete. There are limited markets for recycling brick, but the reusable intact ‘Cream City’ style of brick goes for around \$0.50 each.

Scrap Wood – Recycled – All of the scrap wood that could be easily sorted out would be sent to a recycling yard’s bio-mass area for a much reduced fee compared to construction waste. There are options for recycling in the Milwaukee area, and the deconstruction crew should consider sorting scrap wood into its own dumpster or piles versus co-mingling it with other recyclables. Painted wood isn’t always accepted, and the unpainted wood could be processed into a more valuable product for the recycling facility so keeping the painted and unpainted scrap wood separated would result in lower disposal costs.

Vinyl Siding, foam carpet pad, porcelain, various other recyclables – Recycled – All of these items are recyclable. If there are not recycling options available today, the increase in deconstruction activity may play a role in jump-starting these recycling efforts. All of these items are easily separated during deconstruction activities, but there would have to be an efficient way of sorting/hauling these materials combined with a savings over disposal.

Reusable materials – Reused – These materials are more carefully removed and hauled from the site separately and kept out of both the landfill and recycling stream. Examples are lights, mirrors, windows, hardware, stair parts, claw foot tubs, and more. These materials have an estimated resale value of approximately \$1500-\$7500 per building, but require additional sales labor to divert them (and buyers to pay for them). The total swing of doing this versus disposing of it would depend on the structure, but after viewing many of Milwaukee’s structures, we have come up with the following estimate. A 2000 sq. ft. building is estimated to weigh 120,000 pounds or 60 tons and deconstruction often diverts about 35% of a building by weight in reusable materials. This would save about \$1400+ in disposal costs at the current disposal fees for all reusable materials including wood.

Reusable wood materials – Recycled – The 2x4, 2x6, 2x8, 2x10, beams, and other types of wood that could be saved for reuse make up the majority of the reusable materials category. The markets, storage, and other issues related to diverting it for reuse have to be worked out so the materials produce the maximum revenue at the minimum costs to the sales operation.

The following is a set of pictures taken from the various sites around the Milwaukee area highlighting reusable materials present there:

Images: Decorative hutch cabinets, door pediments, paneled doors, and kitchen cabinet sets are salvageable depending on the item’s condition.

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Images: Lumber and flooring are two of the most commonly salvaged items and on average would hold the greatest reuse value when deconstructing blighted buildings.



Images: The City is encouraged by competitive bids for deconstruction of garages. The payments for deconstruction and sales of reclaimed materials help fund inner-city job creation.

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Images: The empty warehouse shown here will soon be a reusable building materials store in Cleveland. The large outdoor yard attached to the warehouse is already filling up with reclaimed materials from deconstruction jobsites. The City of Cleveland helped the group obtain the space in order to encourage deconstruction and job creation.



It is important to note that building deconstruction and building salvage jobsites are focused on maximizing the amount of material that can be reused first, and recycled second. The reason for this revolves around two main points (beyond the benefits to the environment). One reason is that when the material is diverted from the landfill or from the recycling stream, the contractor avoids paying to get rid of those materials. A second reason is that wholesaling (or retailing) reusable materials generates income for the contractor and offsets added labor costs. The systems needed to set this up are not all currently in place, but could be put in place relatively quickly. The buildings studied would have likely generated \$3000+/-building while saving \$1400+ in disposal costs. A larger concentrated project would be well suited for bulk sales of lumber, and two potential buyers have expressed interest in traveling to the area to buy materials by the semi-truck load.

Asphalt shingles – The shingles were not well tracked at the sites, primarily due to the difficulty in determining how many layers of roofing each building had. This material is thin but heavy, usually weighing 4000-8000 lbs. per home. Buildings deconstructed in the past have had up to 6 layers of roofing on them, something that is usually not allowed, but is done by some roofing companies and home owners. Asphalt shingle recycling is sweeping the nation, with state department of transportation officials allowing recycled asphalt shingles to be mixed in with

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asphalt road bed materials. Deconstruction is very effective at separating out this material, and in that case, the more layers of roofing the more avoided disposal costs, assuming there are recycling options in the region and that they cost less than disposal.

Construction Waste – The balance of the materials would be treated as waste. Items like plaster, vinyl tile, carpet, and mixed materials are often sent to the dump. Mixed materials refers to items that are combined together, usually including an adhesive, making both items a disposal item. An example would be vinyl floor tile glued to wood flooring. The lower disposal costs are in the area, the more of the lower value materials that are reusable will likely have to be disposed of and some of the recyclable materials will also be disposed of. This is because recycling options often don't cost much less than disposal and the costs of transporting recyclables may require driving longer distances and this will make recycling more expensive than disposal.

Table 4b: The following is a summary of the primary materials that were surveyed in the buildings using a typical 2-story, 50'x20' with an unfinished attic:

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<b>Inventory of building Materials</b>							
Typical 50x20 2 story		Est.		Est.	Est.	Est.	Est.
Item Description	Location	Lbs./unit	Unit Type	Quantity	Tot. Weight	Reuse	Recycle
brick chimney(s)	roof	6.0	each	1632.0	9792	6500	3292
asphalt shingles/tar paper	roof	4.0	sq ft	1450.0	5800	0	5800
skip sheeting	roof	1.6	sq ft	1450.0	2320	0	2320
roof rafters 2x6 (assumed and 16" center assumed)	roof	2.8	lineal ft	960.0	2640	2640	0
attic floor joists	attic	2.8	lineal ft	800.0	2200	2200	0
attic decking	attic	1.6	sq ft	1000.0	1600	0	1600
insulation	attic	1250.0	set	1.0	1250	0	0
various ceiling coverings	ceiling	3.0	sq ft	3000.0	9000	0	0
doors	all areas	75.0	each	15.0	1125	1125	0
cabinets and fixtures	all areas	1200.0	set	1.0	1200	850	150
siding	walls	2.5	sq ft	1600.0	4000	500	1000
wall sheathing under siding	walls	1.6	sq ft	1600.0	2560	0	1000
porch structures	porch	4000.0	each	1.0	4000	0	2000
windows	walls	50.0	each	15.0	750	250	0
wall sheetrock	walls	2.8	sq ft	3500.0	9800	0	0
2x4 studs	walls	2.8	lineal ft	3600.0	9900	3500	1000
all wood flooring	floor	2.5	sq ft	2000.0	5000	3000	700
all sub flooring	floor	1.6	sq ft	2000.0	3200	0	3200
all floor joists	floor	4.5	lineal ft	1920.0	8640	8000	640
misc floor coverings	floor	2000.0	set	1.0	2000	0	0
wood paneling/ misc. wood	all areas	2500.0	set	1.0	2500	1500	850
misc materials, fixtures, debris	all areas	25000.0	set	1.0	25000	4000	12000
slab floor + foundation walls	basement	3750.0	cubic yards	42.8	160639	0	160639
<b>TOTALS</b>					<b>274916</b>	<b>34065</b>	<b>196191</b>
PERCENTAGES (not including asbestos- if any)						<b>12%</b>	<b>71%</b>
Note: These are estimates. There was no information available regarding hazardous materials like asbestos. The owner had moved out.							
Total potential diversion including the concrete is 83% (not including asbestos) given our hybrid deconstruction techniques.							
					<b>Tot. Weight</b>	<b>Reuse</b>	<b>Recycle</b>
Totals (estimated - not including slab + foundation walls + asbestos)					<b>114277</b>	<b>34065</b>	<b>35552</b>
Percentages of est. total						<b>30%</b>	<b>31%</b>
Total from debris (estimated - not including asbestos + slab + foundation walls)					<b>44660.00</b>	<b>or</b>	<b>39%</b>
Summary:							
1. Potential diversion including concrete but excluding asbestos and disposing of all items like recyclable sheetrock is likely around 83%							
2. Potential diversion excluding the concrete is likely 61%							
3. Potential diversion is low due to decisions to recycle less in exchange for controlling labor costs.							

Note: The weights and quantities shown are estimates. They are used to calculate the estimated totals and should not be used by contractors to calculate deconstruction bids.

### V. Material Sales and Pricing – Thoughts on selling reclaimed materials in the City of Milwaukee/WI

#### **Material Sales**

Normally, sales would be a mix of on-site and off-site sales (on-site = where customers wouldn't necessarily go to the site, but the materials may be delivered directly to them from the site). The sales would consist of wholesaling and retailing as deemed appropriate. In our research, as well as our daily experiences, we found that the wholesale market for these salvaged materials may not yield enough revenue to balance out the costs. Each wholesale buyer is balancing their own demand with dozens of potential supply streams. At times, the supply of a particular item will correspond with a reduced demand period, thus making sales impossible or only possible at an unacceptably low price. The idea of materials

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leaving the City and benefitting other communities may also be an unpopular concept, but it is much better than throwing it away.

Setting up a new limited retail sales operation is one way that the materials can be handled in these quantities, conditions, and variety. These operations can be expensive to run and involve some risk to start, but most of that risk is in labor costs that hopefully the CBOs could control. Operations often start with the ‘Saturday Sale’ approach. This is where materials are collected during the week, possibly packaged for bulk sales, and the warehouse is then opened up on Saturdays to allow for retail sales to occur.

It is advisable to start by accepting only the better quality materials at first to ‘test the waters’ of the retail sales market. The key to this operation compared to other reuse stores is that the buildings awaiting deconstruction, salvage, and demolition contain a ‘standing inventory of materials that can be inventoried and marketed without removing them. This allows for demand to be built up and for more efficient sales of items like brick. For example, before a brick structure is taken down, buyers for brick are found, and the materials are transferred directly to the buyers versus the extra costs and handling required to place them at the retail store. It is important to note that the retail store is the main tool for building up and documenting that demand for materials. This is done through a variety of means, including electronic ‘wish-lists’ where customers’ needs are documented and materials to meet this demand are found from buildings that have been inventoried.

Appendix B is a list of websites that are online material exchanges. The local retail sales would be supplemented by online sales to buyers visiting these websites. The sites often have a ‘materials wanted’ section, similar to the store’s wish-list. The sites also offer the deconstruction operation a chance to post material sale details on the site, thus exposing the material to hundreds of individuals that never would have known about it otherwise, especially those in the surrounding communities of Chicago, Madison, and smaller markets like Green Bay and Fond du Lac.

Appendix C is a list of companies in the Wisconsin region that may be interested in buying materials wholesale. This may be more important early in the process when local demand has not been built up yet. These companies are expected to take larger quantities and not ‘cherry-pick’ the available materials, but in exchange for that they expect a significantly lower price than retail prices. An example of an exception may be the rough-sawn lumber that was viewed in many Milwaukee area buildings. Retail sales for this item may be sluggish at first, due to the CBOs having trouble finding the limited numbers of buyers for this item. The interested retail buyers often are simply using the lumber to build a doghouse, etc., and therefore do not want to pay any more for a rough-sawn 2x6 than a regular nominal 2x6. The wholesale buyers have clients willing to pay for the rustic look of the rough-sawn materials and often make wholesale purchases at two times the price of new nominal lumber.

VI. Job creation- A summary of observations from CBO activities and a report on the job creation potential

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Since about 2000, the Federal Government has spent thousands of dollars trying to get the deconstruction industry to create jobs in inner-city neighborhoods around the Country. This has proven to be very difficult and the results are inconclusive. Many of the projects involve groups that are in charge of training others even though they have no real experience or success conducting deconstruction operations themselves. Perhaps they were selected because they wrote a persuasive grant proposal. Re-Use Consulting came to Milwaukee and took a crew (Running Rebels) that had never deconstructed a home and helped them take down two homes in just over 5 days. This shows that the techniques are sound and one must ask if a new crew could accomplish this feat, what that crew could do after one year and dozens of buildings worth of practice.

One way to view inner-city blighted homes is that those selected as good candidates for deconstruction have a value to groups looking to create inner-city jobs. If three of these buildings are deconstructed, the fees and revenue generated from this and related activity (sales etc.) should be enough to create 1 Full Time Equivalent (FTE) inner-city job.

The obvious question is how this money could pay for expenses, equipment, etc. and still leave enough money for a living wage job of around \$12.50/hr. The following is a brief accounting of the dollars.

1. The first assumption is that once deconstruction activities are underway, the deconstruction company will be able to obtain and complete private work using the inner-city workers they hired to complete City work
2. It does not take 1 FTE to complete 3 homes. If we are conservative and say it takes 10 workers three weeks to complete 3 homes (400 hours per house) including other necessary related work, this is the equivalent of 30 weeks or three-fifths of a FTE. This means that 1 FTE should be able to complete 5 homes per year ( $400 \times 5 = 2000$  hours) and still have time to complete other work each week since the jobs actually take about 3.5-4 days.
3. Metal recycled from each job will generate revenue.
4. Job creation programs offer incentives, subsidies, and breaks for groups employing inner-city workers so this may help pay for the labor expenses (labor is the highest expense).
5. Once deconstruction crews are formed, available workers will be able to perform other services in the private sector. For example, if the deconstruction job ends at noon on a Wednesday, the workers could then pick-up valuable surplus building materials from a construction site before ending the day. The next day they could charge a fee to gut a kitchen in preparation for a remodel, and then sell the cabinets for additional income.
6. The workers returning from the deconstruction sites could stock the group's shelves at their reuse store. They could also help with sales as needed, often from the jobsite.
7. Value-added work involves taking reclaimed materials and forming them into a new product. For example, if antique lumber is reclaimed, the boards could be used form a table, bench, or other furniture or items that would sell for far more than the individual boards they are made from. One such operation often took \$7.00 worth of product and fabricated a \$70 item out of it.

Table 1a: This table shows a more optimistic view of 2 homes creating one job (FTE)

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<b>How to create 1 Full-Time Equivalent (FTE) inner-city job by deconstructing blighted homes</b>				
<b>Expense:</b>				
1 FTE = 2000 hours x \$20/hr loaded wage = \$40,000				
Note: Workers don't deconstruct homes by themselves, but an FTE can equal 12 workers working for one month or 6 working for 2 months, etc.				
				Portion of year
<b>Revenue:</b>				<b>(based on 1FTE)</b>
	<u>Quantity</u>	<u>Unit Value</u>	<u>Total Value</u>	
Labor portion of deconstruction bid: assume 1 week for 10 workers	2	\$ 7,500.00	\$ 15,000.00	20
Material retail sales of 75% of reclaimed materials:	2	\$ 3,250.00	\$ 6,500.00	10
Value-added products produced using these reclaimed materials:	2	\$ 6,000.00	\$ 12,000.00	18
Metal recycling income:	2	\$ 250.00	\$ 500.00	0
Subsidy for employing an inner-city unemployed worker:	1	\$ 1,000.00	\$ 1,000.00	0
Misc income from other related projects:	1	\$2,500	\$ 5,000.00	2
<b>Total:</b>			<b>\$ 40,000.00</b>	<b>50</b>

In summary, deconstruction companies that control the amount of labor required to deconstruct an inner-city home will make their crew available to perform other revenue generating tasks. The deconstruction of City of Milwaukee homes provides a base layer of work to justify hiring workers, and other tasks like pick-ups, salvage work, sales, and shop time will make hiring these workers profitable.

VII. Bidding and Regulatory Environment - A discussion on what changes may be required to promote deconstruction.

## Deconstruction Report- Outline –City of Milwaukee, DNS

Some estimate that 98% of buildings scheduled to be fully removed from a property are demolished. This wasn't always true as in the past many more deconstruction companies or individuals would take advantage of the resources held inside of the structure. This likely peaked during the Great Depression, but tapered off after World War II. The equipment available to demolition contractors today can quickly and efficiently remove structures. The labor available is less reliable and more costly than in the past. Contractors do not need any more reasons to shy away from the more labor intensive process of deconstruction. The question then is how the City can help encourage and support the fledgling deconstruction companies they helped start. A way must be found that is as fair to all as possible, but changes the status-quo approach to building removal. The following addresses this point and serves as the beginning of a much longer conversation.

The City needs deconstruction bids to come in closer to the standard demolition pricing. There are many more costs to deconstruction, and there are benefits that can offset these costs. The costs are immediate, but the benefits often develop over time. Therefore, the City may want to incentivize deconstruction by removing costs and by making deconstruction less complicated for the CBOs.

1. The City may already be tasked with shutting off utilities. Gas, electricity, and water are the three main utilities that slow down or complicate a project. The City likely has a process to see that these three are shut off AND disconnected. [For both demo and decon]
2. Permits – City workers surely know the ins and outs of obtaining permits and could help the new deconstruction companies through the process. The City should consider the benefits of deconstruction versus the benefits of collecting a small amount of income from permit fees. We recommend that permit fees for building removal, asbestos removal, and other things like parking and sidewalk permits be waived for the CBOs. [For only decon not demo]
3. Hazardous Materials – Government agencies often find that separating out asbestos removal from the building removal is more cost effective. It would benefit the CBO groups not to have to deal with this on top of challenging tasks like hiring inner-city workers, disassembling buildings, and finding buyers/uses for the salvaged materials. If the City controls the removal of these hazards, they should also control how the abatement contractors conduct themselves. A typical asbestos abatement job results in windows, doors, flooring and other objects needlessly damaged or destroyed due to aggressive work practices like kicking in the front door instead of using a key. Also, if the City allows the deconstruction groups to remove select items (like cabinets sitting on an asbestos floor) without disturbing the hazards, the abatement contractor will have an easier time and will likely bid lower.
4. Historical preservation efforts – Preservation groups are fighting to save buildings and put them back together as they originally were built. They cannot go to a new big-box store and buy vintage materials. The City staff involved in historic preservation may want to work together with staff inventorying vacant buildings to that needed building materials can be identified, deconstructed, and used in the historic preservation project. This is a way to identify a value that justifies the added expense of deconstruction, and helps cancel out or balance out this cost.

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5. Salvage rights – many deconstruction companies will pay for salvage rights or the right to remove and haul only the materials they want from a structure prior to demolition. Although this is a cost center, it is controlled and yields a direct benefit compared to other costs. The deconstruction operations that are making efforts to find buyers and build up demand will then look to find a supply of the needed materials. If one of the CBOs has a buyer waiting for pay \$3250 for 1000 sq. ft. of reclaimed maple flooring, the CBO should be willing to pay the City \$325 for the right to salvage these materials prior to demolition. The City could then try to earmark this revenue to help pay for deconstruction projects in the future.
6. Recycling and disposal costs – It is not clear whether the City can help the CBOs with disposal costs. There may be a way to remove City taxes on loads of debris and comingled recycling dumpsters, or extending some benefits to the disposal companies for reducing their fees to the CBO. Waiving the fees for recycling of materials at the City recycling yard may be a great benefit to the CBOs, especially if the City has ideas on assisting them on getting the materials to the yard or placing City dumpsters at the CBO jobsite instead of the City yard (thus encouraging more recycling). This is an example of how reducing the amount the CBO has to pay out to for-profit companies based in the suburbs will allow them to invest in creating more inner-city jobs (someone has to recycle/ fill that dumpster)
7. Time limitations – Placing a limit on the time allowed to deconstruct is necessary, but adds costs to the deconstruction operation. If we use the example of two buildings scheduled for deconstruction and separated by an empty lot, we see that the City would likely want one building worked on at a time. If both were taken down over a longer period of time, the work could be done more efficiently and cheaply, especially work involving removal of the foundation. Also, allowing the deconstruction group more time to find buyers prior to starting the work would result in more efficient handling of materials and immediate income to offset the group's labor.
8. Hauling/storage – The CBOs cannot sell everything from the site. To reach the level of sales revenue they should receive for their materials, the CBOs will likely have to find affordable storage that does not involve excess hauling costs. The City likely has a building or property that could help with this problem. The economic development arm of the City should be asked to contribute a property or properties that the CBOs might share or lease for themselves. Low or no rent should be offered for a time of 1-2 years to help the CBOs get started.
9. General costs – They are an array of general costs that the deconstruction groups are faced with. Every job is different and many costs are hard to detail in this report, but the next section will attempt to focus on this issue and how to avoid many costs.

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City of Milwaukee Deconstruction Program	
Ideas for Regulatory and Other Changes To Help Promote Deconstruction	
<b>Ideas to reduce costs for deconstruction contractors bidding</b>	
<b>COST CENTER</b>	<b>Action by City</b>
1 Gas shut off	Taken care of by City prior to decon bids
2 Permits acquired	Permit fees waived for first two years
3 Environmental testing - building 1	Taken care of by City prior to decon bids
4 Asbestos removal - (10 day waiting period)	Taken care of by City prior to decon bids
5 Electrical shut off	Taken care of by City prior to decon bids
6 Plumbing cuts	Completed by contractor
7 Sales commissions/Salvage rights	Allow CBOs to bid on salvage rights
8 Historic preservation	Coordinate efforts to benefit preservation community
9 Sidewalk permits	Waive fees
10 Parking meter bought by the day/week ('bagged meter')	Waive fees
11 Recycling costs	Offer free drop-off at City recycling yard
12 Time limitations	Offer extensions on time allowed
13 Disposal	Require minimum landfill diversion rates
14 Hauling/storage	Haul to a City run facility for City surplus sales
15 General costs	Place demo/decon contractors on even playing field

Sometimes the direct approach to a project or to competing with demolition bids is not the right approach. The following is a list of ideas that came up during the surveying of buildings in Milwaukee that detail ways to make deconstruction more efficient or more competitive.

1. Access – Deconstructing a home that is tightly placed between two other homes offers no real advantage to deconstruction groups. The City should select out a home that has an empty and available side lot that would make deconstruction easier to complete. If there are two buildings separated by an empty lot(s) slated for removal, it would be better for the deconstruction group. A third example is if there are two homes side-by-side slated for removal, then removing the lesser of the two via demolition (prior to the deconstruction of the better home) would help the deconstruction group with access.
2. The ‘Salvage Bank’ is a concept we came up with where salvage groups (or deconstruction groups) pay for salvage rights prior to demolition. The revenue generated is earmarked to help pay the delta between demolition and deconstruction bids on future projects. It is likely in some projects that the salvage work of even partial deconstruction of the building will save the demolition contractor time and money and may result in a lower bid to the City.
3. During the deconstruction work, neighbors often thank deconstruction workers for finally taking down a problematic home that blighted their neighborhood. Sometimes these people are willing to allow workers to draw water from an outside faucet or borrow some power. They also may allow a dumpster to be dropped on their property/garage slab/etc. if that would help complete the work faster. The contractor may decide to place a container in the parking strip so the City may want to waive any fees related to parking a dumpster along the street

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4. Not all projects involve full building removal. The CBOs and the City may consider helping with renovation projects where the CBOs skills at gutting the structure are taken advantage of.
5. Two different teams could tackle the same home. One team with a store may want to take the finish materials. The other with the outdoor yard may decide to take the lumber and plywood/sheathing separately.
6. Demo contractors worried about a chimney tipping over or a roof structure may want to have the deconstruction group remove these parts of the structure before they start the job.

City of Milwaukee Deconstruction Program									
Ideas for Regulatory and Other Changes To Help Promote Deconstruction									
<b>Brainstorming ideas - City promotion of the deconstruction process</b>									
1	Are nearby empty lots available for use?								
2	If there are two homes together, salvage/demo one first then use extra space to decon the other								
3	Salvage for 'salvage bank' credit may help with decon costs								
4	Salvage and partial decon can help the demo contractor								
5	Could the neighbor's garage slab be used to stage a dumpster etc?								
6	Are dumpsters allowed to be left on the street - waive fees?								
7	Bidding out gutting a building prior to renovation to increase work available for decon crews								
8	Have a salvage team go through first with a zero dollar contract to remove most items								
9	Contractors left with only the house frame, may found it better to simply handle lumber or lumber+flooring								
10	Who owns that empty lot beside the building to decon? Can it to used? Return it to what state								
11	Roof/chimney/salvage bids may help with demo bid costs in areas with less access								
12	Home decon inspections - match with other data collection activities conducted by DNS staff								
13	Deconstructing vacant buildings on either side of a vacant lot can be more efficient to remove								

7. Treating the vacant buildings scheduled for removal as a ‘standing inventory’ may help make deconstruction and salvage activities work. The inventory in 100 homes would rival that of any existing reuse store in North America. The materials could be cross referenced with existing demand or future demand that comes prior to building removal thus preventing the salvage and deconstruction groups from needing to carry a large inventory to make larger sales. If a group was approached about 10,000 sq. ft. of maple flooring, the City’s process of photographing structures would tell the group where to find the materials and what the condition the flooring is in. The group would then bid to the City and claim the salvage rights to only the flooring in those structures.

VIII. Images from the field – Images taken from City of Milwaukee building removal projects



Image: Antique Hardware



Image: Maple Flooring



Image: Vinyl Siding



Image: Blighted Home Pulling Down Neighbors



Image: Door Pediment to Salvage

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Image: Window Weights



Image: Everybody's working



Image: Good Choice for Deconstruction?



Image: One Day Garage Deconstruction



Image: \$500+ cabinet abandoned

Deconstruction Report- Outline –City of Milwaukee, DNS



Image: Plain Building worth it?



Image: Simple Roof Structure



Image: Rustic Old Floor Joists



Image: 2.5 Stories adds challenges



Image: Asbestos Pipe Insulation



Image: Metal Cabinets Not Just Scrap

Deconstruction Report- Outline –City of Milwaukee, DNS



Image: Aerial View of N. 9<sup>th</sup> – End of Day Clean Up



Image: Structurally Damaged Home Taken Down Successfully/Safely



Image: One Story to Go



Image: Foundation Removed/Filled Post-Decon



Image: Light Streaming Through Wooden Lathe



Image: Hybrid Deconstruction Speeding Up the Process



Image: Antique Wooden Cabinets



Image: Salvaging 2x4s Yields Little Payoff

Deconstruction Report- Outline –City of Milwaukee, DNS



Image: Equipment Doing the Heavy Lifting



Image: Looking for homes that were gutted, but not rotted out and collapsing!



Image: Illegal dumping a problem at these sites      Image: Blown-in insulation removal

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Image: The payoff – 2x14's at \$100/each



Image: Empty side lot allows for dumpster



Image: The less debris the better



Image: The simpler the roof the better



Image: Invest in jobs (deconstruction), not landfills (demolition)



Image: Challenging Roof

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Image: Can a deconstruction job-site be too clean?

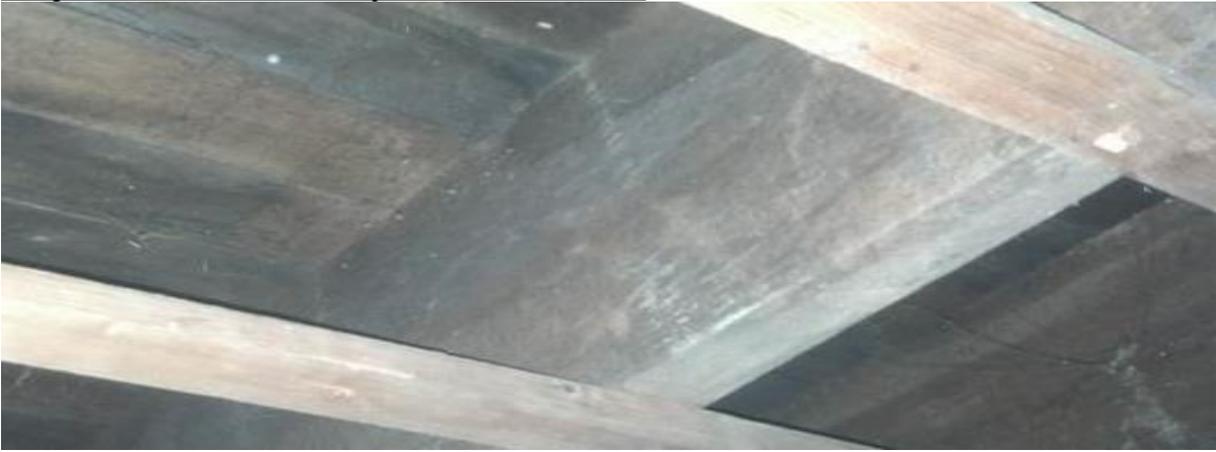


Image: Unfinished basement ceilings are a plus (less debris/work)



Image: Wood recycling



Image: \$100 joists



Image: Asbestos removed

IX. Methods – Methods the City’s CBOs may use to deconstruct buildings

Discussing methods for deconstructing buildings is always difficult as every building is different from the next. These discussions should focus on key themes. The bottom line theme is how the CBOs make deconstruction work for them. How do they overcome the main challenge of keeping costs down in order to be cost competitive so the City can afford to deconstruct more buildings. Here are some strategies they may want to follow:

1. Focus on safety – Deconstruction’s core theme is about benefitting society and the environment and an accident at the jobsite can immediately cancel out any benefits and possibly end deconstruction efforts for that group. Safety is critical!
2. Focus on long term survival not short term results – a group focusing on the shock and awe of diverting 95% from the landfill will find themselves overbidding and dragging down deconstruction efforts instead of building them up.
3. Focus on selling the materials – Reusable materials are not a ‘pain in the neck’ or an added burden, but they are an opportunity and often the answer to making deconstruction affordable. To begin, the CBOs may focus on finding wholesale buyers that represent a quick and easy way to sell materials and receive immediate revenue. Later, mixing in retail sales will boost this revenue and create more jobs.
4. Focus on building up demand – CBOs should be focused on building up the demand for their materials and services. The more people waiting to buy brick the better. The more people wanting their structure deconstructed the more structures the CBO will have to choose from.
5. Focus on finding the balance between labor and value – The materials in a structure have many values including garage-sale value, wholesale value, retail value, and the value derived from using the materials to fabricate another product, such as a table made from reclaimed wood. Each of these yield different amounts of revenue and have different inputs of labor to complete the sales. The balance we are looking for is where revenue is maximized at the lowest cost to the CBO.
6. Focus on handling things one time. It is difficult to handle things only one time to get them off the jobsite, but if this is a focus, the CBO should not see materials being handled 3 or more times as we saw them being done during the training projects. More handling equals more cost and they cannot afford it.
7. Proper tools and more effective tools should be used. A simple example is that when using pry bars that are 2-3 feet long, workers are less efficient at doing the major prying that at times full building deconstruction requires. There are pry bars that range from 3.5 to 5.5 feet that will make the workers more effective. There are other examples that the CBOs may want to invest in if they plan to continue this work.
8. A focus on value-added products must be considered. The way to unlock the value of the rustic antique lumber that they are saving is to look at how other deconstruction groups are getting the most money from them. One way is to make furniture and other objects out of the reclaimed materials. This method can quickly take \$3000 worth of lumber and turn it into \$11,000 worth of products. Once the costs of doing this are deducted, the CBOs should find that slowly and carefully growing this aspect of their operations yields more revenue and more job creation while making them more competitive and providing ample marketing opportunities.

X. List of recommendations for the City of Milwaukee DNS Deconstruction Program- Recommendations to run a successful deconstruction and job creation program

Recommendations for the Milwaukee CBO Deconstruction Training Program:

The following is a list of recommendations for forming the building materials reuse operations:

1. The City needs the bids to be lower so they need the CBOs to take the sales of materials more seriously. One drastic option may be to threaten to or to actually keep the reclaimed materials the City is essentially paying for anyway. The City then could sell the materials in a surplus store setting to recoup some of the deconstruction costs.
2. Longer days are critical to this type of deconstruction work. The CBOs internal structure is often complicated and inflexible, but the CBOs may have to become more flexible in order to put out reasonable bid prices. Some of the CBO crews were only averaging 6.5 to 6.75 hours out 8 useful hours in a day. It is no surprise that these groups would have such a high total labor hours. Longer days mean less unpacking/packing and unboarding/boarding up the homes and less transportation costs.
3. The operation would start with securing a storage building that would be a home base for the operations, staff, and for storing materials. It would likely be between 10,000 and 40,000 sq. ft.

***IDEA: the City or County may have a building that they could lease to the CBOs for \$1/year. Facility costs are second only to labor in operational expenses.***

4. A General Manager of this new operation would be brought on as soon as possible (there is likely a question of how to fund the position) to oversee the set-up of this new business. Their main responsibilities would be sales, retail/warehouse training, and marketing/administration.

***IDEA: A manager that has experience in construction, retail, and training is hard to find. This person hopefully would be from the local community, and they would have to be able to quickly solve problems, plow through a to-do list, and surround themselves with a dedicated staff.***

5. A Field Manager would be brought on once projects are starting to line up. This person would oversee collection of materials, safety, collection and transportation/processing training.

***IDEA: This manager would hopefully be able to run equipment like an excavator or reach-forklift. They would have years of experience at jobsites and have managed workers in the past.***

6. The hope would be that trainees that rise to the top would be retained as staff. Each cohort of trainees would temporarily supplement the operations staff, and perhaps one or two would become regular staff members for the ever growing operation. Examples of staff expansion include: Assistant store manager, cashier, warehouse worker, truck driver, stocker, jobsite foreperson, deconstruction crew lead, training/volunteer coordinator.

***IDEA: The training possibilities of this operation are varied and rich. Retail, construction, safety, transportation, warehouse, and even manufacturing could be training topics with plenty of real life OTJ training opportunities.***

7. There may be the need to add additional staff members with specific experience as the operation grows. The need for a trained bookkeeper would be one example. Much of the

work (by volume) is entry-level. The trainees could be rotated through the operation in order to experience all of the main categories of work. They include: deconstruction/salvage, processing/transportation, warehouse/retail, and value-added/re-manufacturing.

***IDEA: Each trainee could serve an internship at the end of their training where they would be given the choice of which of the four divisions they would like additional experience in***

- 8.** When Milwaukee DNS staff members are looking at upcoming buildings that end up being selected for removal, they would quickly photograph the existing conditions with a focus on the parameters related to deconstruction (like value and debris). Once completed, the materials for collection would be identified, the sales team would begin pre-marketing them in order to build up demand prior to physical collection. This would reduce the amount of time that materials would be retained by the operation, and it would reduce the handling costs/efforts.

***IDEA: DNS staff would collect information from field sites and this information would be stored electronically and transferred to the deconstruction companies. The key would be to streamline this process and bring it in line with current DNS procedures. For example, DNS staff already survey buildings and take images of existing conditions, so we have created a one page sheet for them to make observations on while performing this work. The information would be used in several ways to help streamline the operation.***

- 9.** Milwaukee staff and CBOs would leverage the benefits the operation would be providing to the community to help capture additional funding/grants. The operation would be tied into other programs conducted by the City.

***IDEA: The reuse operation is designed to be a win-win for the community. This opens up the possibility of other groups, foundations, and government wanting to associate themselves with the operation. Grant opportunities would increase due to the variety of positive activities going on at the reuse operation.***

- 10.** The materials collected may be sold by the CBOs or in some unique cases retained by the City to justify paying more for deconstruction. If the City was to retain reclaimed maple flooring to be used in a new public space, this ‘owner-reuse’ would represent an opportunity to avoid paying for new materials. If the City had a use for the maple flooring at 2672 N. 9<sup>th</sup>, the 750 sq. ft. of solid maple flooring would cost \$4.69/sq. ft. at Home Depot pushing its price over \$3700.

***IDEA: The act of deconstructing a building involves the input of labor to remove things like maple flooring, and it is this input that causes deconstruction to cost more than demolition. The City needs to find ways to harness this labor and job creation and reusing some of the materials generated is one way to accomplish this.***

- 11.** The CBOs or any other deconstruction operation will have a hard time making this work without the City’s help. The City has ways to publicize this new effort and the good that is coming out of it. They can promote the benefits of deconstruction over demolition and the value of the materials being generated. The City must become an advocate for deconstruction and building material reuse if these CBOs are going to be successful in the short term.

***IDEA: The City could attach a brochure with every demolition permit, discuss this on their website, and promote it through the mayor’s office and press releases. The City could use some of the materials themselves to encourage others to do so, and could promote this internally to get other City departments on board with the idea.***

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**12.** The City has the opportunity to select out the best buildings for deconstruction instead of demolition and that is very helpful. The next steps for the City to promote deconstruction is to consider grouping buildings together into larger packages, to waive permit fees, to allow free drop-off of recyclables at the City facility, and allow more time to complete the work. These ideas and more will help take the cost and risk out of conducting deconstruction operations and give these new companies a chance to get their programs off the ground.

***IDEA: The City could work with the CBOs to help erase as many costs and to make them as efficient as possible to encourage lower deconstruction bids. The larger the bid package, the more the CBOs will invest in the deconstruction operation to make it work long term. Allowing more time allows the CBOs to seek buyers before inputting labor and keeps them from needing to handle the materials multiple times.***

XI. Results – Results from the field projects

Re-Use Consulting assisted in the deconstruction of four garages and 5 homes, far more than originally contracted for. One reason for this was the success of the Cream City Wrecking / Running Rebels team. They were able to quickly complete buildings and that allowed for more buildings to be completed (they deconstructed 4 buildings in 10 days). The following is an accounting of the projects taken on and completed:

Table: The green highlighting means labor hours are low, yellow is medium, and red is high for the buildings listed here.

Results from the Milwaukee Deconstruction Trainings					
<u>Home</u>	<u>Crew</u>	<u>Days</u>	<u># of Crew</u>	<u>Total Est. crew days</u>	<u>Total Est. hours (8/day)</u>
1315 W. Chambers	Running Rebels	3.5	8	28	224
1312 W. Cottage	MCC/MCSC/NC	11.5	12	138	1104
2512 N. 7th	Running Rebels	2.5	9	22.5	180
2762 N. 9th	MCC/MCSC/NC	12	12	144	1152
3028 N. 10th*	Running Rebels	3	9	27	216

\* this project was stopped by the contractor and demolished after 2 days so the total required hours are an estimate based on progress to that point

Garages:

The following is information on the garages selected out for deconstruction and completed.

Garage #1: 3452 N. 15<sup>th</sup> Milwaukee, WI



NOTES FROM THE FIELD:

MCSC agreed to go first while other contractors were able to learn from their mistakes. The group is obviously capable of handling garages. They will add the required tools to increase efficiency, come better prepared for the work, and work on hauling issues. The experiment of staying off of the roof worked, but not as quickly as we would have liked. The hip style 4-plane roof had about 3-5 layers of roofing and that made it hard to push up from the inside. The materials were ordinary as we expected, but little rot or bug damage was found and the siding was of high quality and hopefully it will be saved. It is milled from old-growth wood that is not sold or harvested anymore. The style is common on many old buildings and is not milled anymore. The City's self-haul facility limited the recycling options, as it required the contractor to separate the roofing and sheathing. We do not believe this would have been required at the Waste Management facility\*. The vegetation took a while to remove via Sawzall and took up a fair amount of truck space.

Note\*: Waste management does require separation and has a limit on how small the loads can be

Garage #2: 3347 N. 20<sup>th</sup> Milwaukee, WI



Notes from the field:

MCC agreed to go second and was able to learn from the first day. The group is obviously capable of handling garages. They should add the required tools to increase efficiency, come better prepared for the work, and work on hauling issues. The experiment of staying off of the roof was not conducted. The gable-end roof had about 2 layers of roofing so it could have been worse, but it was still hard to push up from the inside, especially with the pipe we used that was too heavy. The materials were ordinary as we expected, but little rot or bug damage was found and the siding seem worthy of being saved. It is rough-sawn on one side and is 1x12 pine. The style is common on many old barns and is a popular choice for those hoping to create a rustic paneling or siding look. The City's self-haul facility limited the recycling options as it closed early. The vegetation didn't take too long to remove via Sawzall, and leaving it at the site worked out fine. The main lesson from this group seemed to be avoiding handling things so many times. The plan should be thought out next time so that everything 'lands' where it should be. An example would be that if the siding was to be put in the house, don't pile it up around the site but instead open the house and pile it directly in the house so less labor is used for the same result.

Garage #3



Notes from the field:

The Northcott Neighborhood Deconstruction team tackled this structure and it was the only concrete block walled structure available. The data from this project was not available, but it was a unique building compared to the other three. The walls weighed thousands of pounds, but all of this material was recyclable. The roof was the only significant wooden structure. The roofing was unable to be recycled as it was ‘torch-down’ roofing. The concrete materials are normally hauled separately on projects like this and can take less time to take down and apart than stick-framed buildings. Milwaukee garages that have brick walls and large roof joists may end up being the most profitable for deconstruction companies due to higher demolition pricing to compare to and more materials to resell.

Garage #4

Garage #4: 2812 N. 19<sup>th</sup> Milwaukee, WI



The Running Rebels group took on the fourth garage and completed the job in short order. They benefitted from observing some of the work that preceded them, but in the end, they had to complete the work alone using their own people and resources. This group toppled the garage and worked on the roof while it was on the ground. This technique eliminates fall issues but can only be attempted when sufficient room is available around the structure. The materials were removed and sorted and then hauled all in one day. The crew size may have been a little bigger than what is efficient, but the more workers getting experience on the first building the better.

House #1: 1315 W. Chambers Milwaukee, WI



Summary:

This was the first house completed and it was worked on by the Cream City/Running Rebels team. The home was a 1 ½ to 2 story home with an unfinished attic space. The access was good on the west side of the home and the materials were rated as plain or ordinary for a home like this.

The crew completed the deconstruction after 3.5 days with crews of about 8-9 workers. Heavy equipment was brought in to help move materials around during deconstruction and to clean up and remove/fill in the foundation after deconstruction. This was Running Rebels first home and they suffered from some tool issues and some staffing issues, but all in all 3.5 days was a great time for the first home.

House #2: 1312 W. Cottage Milwaukee, WI



Summary:

This was the second house completed and it was worked on by the MCSC/MCC/Northcott team. The home was a 2 story home with an unfinished attic space. The access was good on the west side of the home and the materials were rated as plain or ordinary for a home like this.

The crew completed the deconstruction after 11.5 days with crews of about 10-12 workers. Heavy equipment was brought in to help clean up and remove/fill in the foundation after deconstruction. The three crews working together occasionally clashed and were not on the same work schedule. Lead-based paint was a major concern for this group and we believe that all painted materials were disposed of.

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House #3: 2512 N. 7<sup>th</sup> Milwaukee, WI



Summary:

This was the third house completed and it was worked on by the Cream City/Running Rebels team. The home was a 2 story home with an unfinished attic space. The access was good on the south side of the home and the materials were rated as plain or ordinary, except the lumber included some 2x14s.

The crew completed the deconstruction after 2.5 days with crews of about 8-9 workers. Heavy equipment was brought in move materials around the site and to help clean up and remove/fill in the foundation after deconstruction. The crew came more organized and with some better tools. The work was completed faster despite the building being slightly bigger than the first.

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House #4: 2762 N. 9<sup>th</sup> Milwaukee, WI



Summary:

This was the fourth house completed and it was worked on by the MCSC/MCC/Northcott team. The home was a 2 story home with an unfinished but decked attic space. The access was good on the north side of the home and most of the materials were rated as plain or ordinary for a home like this, but there were nice cabinets, 700+ square feet of maple flooring, and a couple of other items of value in the structure.

The crew completed the deconstruction after 11.5 days with crews of about 10-12 workers. Heavy equipment was brought in to help clean up and remove/fill in the foundation after deconstruction. The crew continued to struggle to mesh together the three companies' crews. The extra handling of material was a problem here, and we noticed that the workers were not spending a full eight hours on-site working.

Milwaukee, WI



**Summary:**

This was the fifth house completed and it was worked on by the Cream City/Running Rebels team. The home was a 2 story home with an unfinished attic space. The previous crew that had gutted the home with the plan of renovating it, removed ALL of the collar-ties, a form of ceiling joist, and destabilized the structure (thus essentially removing the attic space). The access was good on the south side of the home. The building had been gutted prior to our start, so there were no doors, cabinets, flooring, etc. to salvage. The lumber was the main value derived from the structure.

The crew wrapped up the deconstruction after 2.0 days with crews of about 8-9 workers. This was unfortunate as the building was not fully deconstructed. Heavy equipment was brought in to move materials around the site and to help clean up and remove/fill in the foundation after deconstruction. Unfortunately, the poor condition of the home slowed the deconstruction crew and required extensive shoring and care in each step. It is believed that if the building had not been taken down, the lack of care taken by the renovation crew in removing structural members would have caused the building to collapse in a north-south direction thus endangered people and property nearby.

Summary of results: The Running Rebels team quickly and efficiently removed 3 of the five homes deconstructed. They were able to remove these using only one fifth of the labor hours compared to the MCC/MCSC/Northcott group. This second group methodically and safely completed their two buildings in around 24 days. The results were similar in what they were able to divert for reuse, the materials that were sorted and hauled for recycling, and the materials both groups chose to dispose of. The bids received from the groups were also very similar. The question then is why would the Cream City/Running Rebels team's bid be the same if it used so much less labor to complete the work. The answer in part may be the equipment and equipment hauling for this group. Each day they brought in a forklift and hauled it away less than 8 hours later. This was due to the potential for vandalism, but it made for the inefficient use of the

equipment and crew. Neither group seemed to have a set plan for the materials being diverted. In summary, both groups worked hard and the Running Rebels group seemed to dominate, but in the end didn't save the City any money and made an unknown amount of profit whereas the MCC/MCSC/NC group seemed to struggle, but came in with competitive bids and may have lost money on the projects.

## XII. Next Steps – What does the City do next to move this program forward

If all of the buildings were stuffed full of 2x14s that are 24 feet long, this effort would be more straightforward. Unfortunately, it isn't going to be that easy. To move this program forward, the City must encourage others to participate. This can come in the form of demanding deconstruction instead of demolition, or in the form of using reclaimed materials in projects. Deconstruction companies doing more volume often work more efficiently and this allows them to lower their prices. When deconstruction companies recognize there is a demand for reclaimed materials, they will be more likely to go out and get them, knowing that they may be paid for them the same day (the driving force that encourages demolition contractors to recycle metal).

Re-Use Consulting is beginning to connect with contractors, architects, sustainability managers, and others in Wisconsin that would be more likely to demand deconstruction and/or purchase reclaimed materials. The website, [www.decon.us](http://www.decon.us), is being temporarily used to distribute information and collect requests from the public. The City can also do the following to see that the local deconstruction companies succeed:

6. Hand out a flyer with the available deconstruction companies listed
7. Sift through the existing blighted building stock for good candidates for salvage/deconstruction
8. Contract out CBOs to deconstruct whenever possible
9. Bid out work in packages instead of single buildings.
10. Listen to what the deconstructors' needs are including more time to find buyers, seasonal availability issues, etc.

It is important to note that existing local contractors are not choosing to do deconstruction. This is likely because deconstruction is the 'hard road' and demolition is the 'easy road'. Unfortunately, this 'easy road' isn't solving any problems for the community. If the City is going to convince contractors to take this 'hard road', they may have to incentivize it, and will have to base this on the good these companies are doing for the inner-city neighborhoods they reside in.

Appendix A: Reuse groups in the Milwaukee Area

# Assessment Report On Reuse Operations in the Milwaukee Area

Prepared for the City of Milwaukee

By David Bennink, Re-Use Consulting

Date: 8-2-13

## **Introduction**

There are a number of different types of reuse businesses in Wisconsin. The following report includes a listing of them with a brief description of how they might be involved in making deconstruction successful in Milwaukee. The City needs to create a naturally occurring and growing reuse industry in the Milwaukee area where supply and demand are in balance as the City ramps up the supply side by deconstructing structures via their deconstruction program. This report will discuss issues the local deconstructors are facing with and how the city may help them overcome some of the barriers to starting up a deconstruction operation and reuse sales operation.

## **Reuse Store**

A reuse store is a retail location that is similar to an Ace Hardware, True Value or Home Depot store, only they sell mainly reclaimed materials. They often accept all sorts of building materials from lamps to lumber, or other materials like windows and doors trim etc. The stores range in size from 4000 square feet to 80,000 square feet. Some choose to sell all types and ages of materials, and others select primarily new surplus materials, primarily pre-1940 materials, etc.

## **Reclaimed Lumber Yard**

There are a number of operations that simply focus on reclaimed lumber. They have lumber sheds or simply leave the lumber outside under tarps. These operations focus on many different kinds of reclaimed lumber, but are unlikely to take a shower stall, vinyl windows or cabinet sets. They collect and resell de-nailed boards and structural lumber, beams and posts. Many of them are capable of re-sawing lumber into custom orders including flooring, trim, and paneling. These groups are focused on selling materials that have more character than new wood, and use terms like ‘distressed’, ‘rough-sawn’, or ‘hand-hewn’ to describe their products look. Like antiques, this material is often one of a kind.

## **Wrecking Contractors**

Demolition contractors are each capable of destroying over one hundred buildings each year. They move quickly and efficiently, sending most materials to the landfill. Some metal is diverted for recycling, and concrete is easily separated and recycled, but most reusable products are destroyed. When a job comes up that has some valuable and easily reclaimed materials, a wrecking or demolition contractor may choose to save and sell it. Several of these businesses are listed below. They are unlikely to employ many people or buy anything removed by others, but may prove to be a resource for the City in some other way.

## **Summary of Findings**

It isn't enough to have the skills to take a building apart; you must know what to do with the parts. The disposal of materials and recycling of materials is more straightforward and predictable, but the reuse of materials is often much harder to set up and predict. We researched

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the available reuse businesses in the Milwaukee area and found that the majority of them are not able or willing to purchase materials generated by the new deconstruction operations. This is a critical point for the success of this deconstruction program. A CBO that is generating a supply of reusable materials must find a destination for this product that has some sort of positive return for their operation. This could be in the form of a trade, cash, a supply for a value-added product that they produce, or other benefit to their organization. In order to keep deconstruction costs down for the City, the economics of the situation requires that the labor costs incurred by the CBO be balanced out somehow, and the sales of reclaimed materials produced by this labor is the primary way to accomplish this.

The Milwaukee business, I.M. Salvage seemed willing to purchase materials, as do several reclaimed lumber dealers in other parts of the State, but the CBOs need to ensure that they have an unrestricted outlet for their materials. The CBOs may need to sell some of the materials and sell them retail, perhaps through Craigslist or other means. The CBOs may use some of the materials themselves if they engage in neighborhood repairs or building renovation. The key finding is that the demand for these materials should be generated prior to when the supply is in hand. When the demand is built up, usually through a recorded list of interested buyers, the retention time is reduced as is the handling costs.

The operations will need to consider having a location to store and organize/sell materials from. The City may want to donate a space, perhaps one that is shared between several CBOs to help with cost sharing and increase volume of inventory in one location, a move that will attract more customers.

The boards and lumber that were surveyed on average seemed to be valuable and generally in good shape. This is the material with the most existing demand via reuse businesses in the State. The problem or challenge for the local CBOs will be the other items like doors, cabinets, etc., especially the plain or ordinary/rough materials that are on the border of being diverted for reuse or being recycled or disposed of. Finally, the City should consider these points while moving this program forward. If the City can find a way to improve the CBOs ability to sell their own materials, they should be able to keep deconstruction costs down and ensure that the CBOs will continue to be interested in bidding on deconstruction projects.

Appendix B:  
Websites Selling Reclaimed Materials:

<b><u>WEBSITES SELLING USED MATERIALS:</u></b>	
<a href="http://www.sticktrade.com/">www.sticktrade.com/</a>	Reclaimed lumber A website that shows buyers and sellers of reclaimed wood in OH, PA, and around the world. The listings allow you to list your materials and view the 'wanted' section of buyer's listings showing what flooring, lumber, etc, they are looking to pay for.
<a href="http://www.woodplanet.com/">www.woodplanet.com/</a>	Reclaimed lumber A website that allows you to buy/sell reclaimed lumber, etc. It also allows you to view RFP's that others have entered where they are asking for a specific quantity and type of material and would like a proposal based on what you have and what your selling it for
<a href="http://www.woodanew.com">www.woodanew.com</a>	Reclaimed lumber A website whose primary purpose is to sell reclaimed wood. Most listings were 'selling' not 'buying' ads.
<a href="http://www.woodweb.com">www.woodweb.com</a>	Reclaimed lumber A site that is more learning about the wood/woodworking industry or information oriented than focused on buying/selling.
<a href="http://www.reclaimed-lumber.com">www.reclaimed-lumber.com</a>	Reclaimed lumber A single business based website focused on selling that business' materials. Treat as a contact for possible wholesaling or brokering.
<a href="http://www.altruwood.com">www.altruwood.com</a>	Reclaimed lumber A single business based website focused on selling that business' materials. Treat as a contact for possible wholesaling or brokering.

Websites Selling Reclaimed Materials (continued):

<a href="http://www.planetreuse.com">www.planetreuse.com</a>	All reclaimed materials								
<u>A national website selling all sorts of reusable building materials.</u>									
<u>It is focused on connecting LEED projects and architects and designers in general with reclaimed materials of all kinds.</u>									
<a href="http://www.cmdepot.com">www.cmdepot.com</a>	All reclaimed materials								
<u>A national website selling all sorts of reusable building materials.</u>									
<u>Has a fair amount of liquidation and surplus new materials.</u>									
<a href="http://www.salvo.us">www.salvo.us</a>	All reclaimed materials								
<u>An International website selling all sorts of reusable building materials.</u>									
<u>Promising website connecting buyers and sellers in an effective way. Well known site.</u>									
<a href="http://www.buildingsurplus.com">www.buildingsurplus.com</a>	All reclaimed materials								
<u>A national website selling all sorts of reusable building materials.</u>									
<u>Has a fair amount of liquidation and surplus new materials.</u>									
<a href="http://www.americanbuildingsurplus.com">www.americanbuildingsurplus.com</a>	All reclaimed materials								
<u>A national website selling all sorts of reusable building materials.</u>									
<u>Has a fair amount of liquidation and surplus new materials.</u>									
<a href="http://www.craigslist.org">www.craigslist.org</a>	All reclaimed materials								
<u>A national website selling all sorts of reusable building materials and other materials.</u>									

## Appendix C:

The following is a list of reuse operations that we looked up in Wisconsin. The materials being generated via deconstruction may have enough value that buyers would travel to Milwaukee to purchase it, but as always we promote boosting local businesses first and keeping the materials in the area if possible.

## **The Stores/Operations:**

### **I.M. Salvage – Reuse store**

737 W. Cleveland Ave

Milwaukee

(414) 645-8733

(Note: They buy certain materials; source others from their demolition company arm)

### **Habitat For Humanity ReStore –Reuse store**

3015 N. 114<sup>th</sup> St.

Wauwatosa

(414) 257-9078

(Note: They buy very little or no materials from deconstruction sites; use almost all volunteers)

### **Community Warehouse –Reuse Store**

521 S. 9<sup>th</sup> St.

Milwaukee, WI

(414) 383-7792

(Note: They buy very little or no materials from deconstruction sites; use almost all volunteers)

### **The Barn Wood Company – Other**

W16454 State Rd 54

Galesville, WI

(608) 396-1520

(Note: They are based out of the Timber Ridge Reclaimed Barnwood Yard and only buy from them)

### **Timber Ridge Reclaimed Barnwood-**

Reclaimed Lumber Yard

W16454 State Rd 54

Galesville, WI

Rudy Beachy

608 624 3990

(Note: They are an Amish business with limited communication/transportation options- possible buyer of wood materials)

### **Beaver Wrecking and Salvage –Wrecking Contractor**

W8025 State Rd 33

Beaver Dam, WI

(920) 887-7030

Blaine – cell 920-210-0302

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(Note: Wrecking contractor that also salvages materials)

**Coughlin Contractors –Wrecking contractor**

N1096 Welsh Rd.

Watertown, WI

(920) 261-7637

(Note: Wrecking contractor that also salvages materials)

**Cream City Wrecking**

N91W13905 Warren St

Menomonee Falls, WI 53051

Phone: 262-251-5100

Contact: Ed Scaro

(Note: This business already is involved in deconstructing in the Milwaukee area.)

**Eckert Wrecking Inc. – Wrecking contractor**

4743 US Highway 8

Rhineland Wisconsin

54501 USA

Contact Person:

Phone: 715 362-6550

(Note: Wrecking contractor that also salvages materials)

**Gerovac Wrecking Company – Wrecking contractor**

11836 W Saint Martins Rd

Franklin Wisconsin

53132 USA

Contact Person:

Phone: 414 425-1500

(Note: Wrecking contractor that also salvages materials)

**Glenville TimberWrights**

S5390 St Rd 13

Baraboo Wisconsin

53913 USA

Contact Person:

Phone: 608 355-9950

**Habitat for Humanity ReStore- Reuse store**

3000 East College Ave

Appleton Wisconsin

54915 United States

Contact Person: Craig Fink

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Phone: 920-830-8400

(Note: They buy very little or no materials from deconstruction sites; use almost all volunteers)

### **HfH ReStore – Reuse Store**

208 Cottage Grove Rd  
Madison Wisconsin  
53716 USA

Contact Person:

Phone: 608 661-2813

(Note: They buy very little or no materials from deconstruction sites; use almost all volunteers - Restore east and west)

### **Homesource Center**

3701 W Lisbon Ave  
Milwaukee Wisconsin  
53208 USA

Contact Person:

Phone: 414 344-4142

### **Great Lakes Lumber Company- Reclaimed Lumber Yard**

1911 Draper St  
Baraboo Wisconsin  
53913 USA

Contact Person:

Phone: 608-356-8849

david@old-growth-lumber.com

(Note: They retail and purchase wood, and make some furniture, sells to Chicago, coasts, and the Milwaukee area)

### **Old House Salvage – Reuse Store**

4404 Stewart Ave  
Wausau Wisconsin  
54401 USA  
Phone: 715 849-5077

### **Pagenkopf S**

Green Bay Wisconsin  
54301 USA

Contact Person:

Phone: 920 498-1755

### **Reclaimed Lumber Company – Reclaimed lumber yard**

585 Kossow Rd  
Waukesha Wisconsin  
53186 USA

Contact Person:

Phone: 262 798-8986

### **Salvage Heaven Inc. Reuse store**

206 E Lincoln Ave  
Milwaukee Wisconsin  
53207 USA

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Contact Person:  
Phone: 414 329-7170

### **Scarboro River Barn and Lumber – Reclaimed lumber yard**

Green Bay Wisconsin  
54301 USA  
Contact Person:  
Phone: 920 498-1755

### **Schuler's Country Store and Workshop**

533 N Main St  
Janesville Wisconsin  
53545 USA  
Contact Person:  
Phone: 608 754-4052

### **Scs of Wisconsin Inc.**

4001 W Loomis Rd  
Milwaukee Wisconsin  
53221 USA  
Contact Person:  
Phone: 414 281-8733

### **Timeless Timber – Reclaimed lumber yard**

2200 E Lake Shore Dr.  
Ashland Wisconsin  
54806 USA  
Contact Person:  
Phone: 888 653 5647

### **Traditional Woodworks and Lumber Company**

1679 38th St  
Somerset Wisconsin  
54025 USA  
Contact Person:  
Phone: 800 882-2718

### **Urban Evolutions**

867 Valley Rd  
Menasha Wisconsin  
54952 USA  
Contact Person:  
Phone: 920 380-4149

### **Habitat For Humanity ReStores in Wisconsin:**

**Appleton, Wisconsin**  
Fox Cities Area HFH ReStore,  
3000 E College Ave  
Appleton, Wisconsin 54915  
**Phone: (920) 830-8400**

**Baraboo, Wisconsin**  
**Phone: (608) 356-0332**

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Sauk-Columbia Area ReStore, HFH 1212 8th St Baraboo, Wisconsin 53913	
<b>Beaver Dam, Wisconsin</b> Washington 1022 Madison St Beaver Dam, Wisconsin 53916	<b>Phone:</b> (920) 885-4518
<b>Cameron, Wisconsin</b> Barron County HFH ReStore 309 N 1st St Cameron, Wisconsin 54822	<b>Phone:</b> (715) 458-4222
<b>Fond du Lac, Wisconsin</b> Fond du Lac County ReStore, HFH 150 S Brooke St Fond du Lac, Wisconsin 54935	<b>Phone:</b> (920) 921-2893
<b>Fort Atkinson, Wisconsin</b> Jefferson County Wisconsin HFH ReStore 1525 Smt Dr Unit 2 Fort Atkinson, Wisconsin 53538	<b>Phone:</b> (920) 568-9345
<b>Green Bay, Wisconsin</b> Greater Green Bay HFH ReStore 2965 Ramada Way Green Bay, Wisconsin 54304	<b>Phone:</b> (920) 338-1650
<b>Hayward, Wisconsin</b> Sawyer County ReStore, HFH of 16220 W Highway 63 S Hayward, Wisconsin 54843	<b>Phone:</b> (715) 634-1340
<b>Janesville, Wisconsin</b> Rock County HFH ReStore 320 E Milwaukee St Janesville, Wisconsin 53545	<b>Phone:</b> (608) 754-1228
<b>La Crosse, Wisconsin</b> La Crosse Area HFH ReStore 434 3rd St S La Crosse, Wisconsin 54601	<b>Phone:</b> (608) 785-2375
<b>Madison, Wisconsin</b> Dane County ReStore East, HFH of 208 Cottage Grv Rd Madison, Wisconsin 53716	<b>Phone:</b> (608) 661-2813
<b>Madison, Wisconsin</b> Dane County ReStore West, HFH 5906 Odana Rd Madison, Wisconsin 53719	<b>Phone:</b> (608) 661-2813
<b>Marinette, Wisconsin</b> River Cities HFH ReStore 2990 Cleveland Ave Ste C Marinette, Wisconsin 54143	<b>Phone:</b> (715) 732-6290
<b>Mauston, Wisconsin</b>	<b>Phone:</b> (608) 847-2000

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Adams County ReStore, HFH of N 3696 Highway 12/16 Mauston, Wisconsin 53948	
<b>Milwaukee, Wisconsin</b> Milwaukee HFH ReStore East 420 S 1st Milwaukee, Wisconsin 53204	<b>Phone:</b> (414) 257-9078
<b>Milwaukee, Wisconsin</b> Milwaukee HFH ReStore West 3015 N 114th Milwaukee, Wisconsin 53222	<b>Phone:</b> (414) 257-9078
<b>New Richmond, Wisconsin</b> St. Croix Valley HFH ReStore 901B N Knowles Ave New Richmond, Wisconsin 54017	<b>Phone:</b> (715) 246-4441
<b>Oshkosh, Wisconsin</b> Oshkosh HFH ReStore 1640 S Koeller St Oshkosh, Wisconsin 54902	<b>Phone:</b> (920) 230-3535
<b>Plymouth, Wisconsin</b> Lakeside ReStore-Plymouth, HFH 3003 Eastern Ave Plymouth, Wisconsin 53073	<b>Phone:</b> (920) 892-4175
<b>Racine, Wisconsin</b> Racine HFH ReStore 2302 De Koven Ave Racine, Wisconsin 53403	<b>Phone:</b> (262) 898-2929
<b>Saint Croix Falls, Wisconsin</b> Wild River HFH ReStore 2201 US Highway 8 Saint Croix Falls, Wisconsin 54024	<b>Phone:</b> (715) 483-2700
<b>Sheboygan, Wisconsin</b> Lakeside ReStore-Sheboygan, HFH 1911 N 8th St Sheboygan, Wisconsin 53081	<b>Phone:</b> (920) 452-4175
<b>Sturgeon Bay, Wisconsin</b> Door County HFH ReStore 410 N 14th Ave Sturgeon Bay, Wisconsin 54235	<b>Phone:</b> (920) 743-2869
<b>West Bend, Wisconsin</b> Washington & Dodge Counties Restore #1 508 N Main St West Bend, Wisconsin 53090	<b>Phone:</b> (262) 334-1801

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Appendix D: Pricing guide: The following list is of commonly found building materials, appliances, and other materials from homes viewed in the area. It is crucial that value be derived from the process of salvage and/or deconstruction, this list will help estimate what could be expected.

<b>General Used Building Materials Pricing Guide</b>						
The following is an average price for materials surveyed at the jobsites (plus some seen on adjacent homes):						
<u>Material Type:</u>	<u>Category</u>	<u>Price/unit</u>	<u>Unit type</u>	<u>Ease of wholesale on average*</u>	<u>Aver Qty**</u>	<u>Est. value**</u>
refrigerators	appliance	\$ 125.00	each	medium to wholesale	0 \$	-
ranges	appliance	\$ 75.00	each	medium to wholesale	1 \$	75.00
microwaves	appliance	\$ 25.00	each	hard to wholesale	0 \$	-
dishwashers	appliance	\$ 35.00	each	hard to wholesale	0 \$	-
range hood	appliance	\$ 15.00	each	hard to wholesale	1 \$	15.00
garbage disposal	appliance	\$ 15.00	each	hard to wholesale	0 \$	-
hot water heater	appliance	\$ 45.00	each	hard to wholesale	1 \$	45.00
furnace	appliance	\$ 25.00	each	medium to wholesale	0 \$	-
boiler	appliance	\$ 250.00	each	medium to wholesale	1 \$	250.00
radiator - 3'	appliance	\$ 75.00	each	easy to wholesale	10 \$	750.00
washer	appliance	\$ 75.00	each	medium to wholesale	0 \$	-
dryer	appliance	\$ 75.00	each	medium to wholesale	0 \$	-
built-in hutch cabinet	cabinet	\$ 150.00	each	medium to wholesale	1 \$	150.00
kitchen base cabinet 3'	cabinet	\$ 40.00	each	hard to wholesale	1 \$	40.00
kitchen upper cabinet 30"	cabinet	\$ 30.00	each	hard to wholesale	2 \$	60.00
book shelf	cabinet	\$ 50.00	each	hard to wholesale	1 \$	50.00
cubby cabinet	cabinet	\$ 75.00	each	medium to wholesale	0 \$	-
wardrobe storage cabinet	cabinet	\$ 100.00	each	medium to wholesale	0 \$	-
bath vanities	cabinet	\$ 35.00	each	hard to wholesale	1 \$	35.00
stone countertops	cabinet	\$ 10.00	sq ft	medium to wholesale	0 \$	-
lamineate countertops	cabinet	\$ 2.00	sq ft	hard to wholesale	0 \$	-
carpet - berber	carpet	\$ 0.35	sq ft	hard to wholesale	5 \$	1.75
shelving	closet	\$ 1.00	lineal ft	hard to wholesale	25 \$	25.00
doweling	closet	\$ 0.50	lineal ft	hard to wholesale	25 \$	12.50
treated decking 2x4	decks	\$ 0.30	lineal ft	medium to wholesale	0 \$	-
treated decking joists 2x8	decks	\$ 0.55	lineal ft	medium to wholesale	0 \$	-
treated decking joists 2x10	decks	\$ 1.00	lineal ft	medium to wholesale	0 \$	-
treated posts 4x4	decks	\$ 0.75	lineal ft	medium to wholesale	0 \$	-
pocket dbl door set	doors	\$ 150.00	each	easy to wholesale	0 \$	-
byfolding doors hollow	doors	\$ 8.00	each	hard to wholesale	0 \$	-
bypass doors hollow	doors	\$ 8.00	each	hard to wholesale	0 \$	-
hollow core interior door	doors	\$ 12.00	each	hard to wholesale	3 \$	36.00

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Appendix D: Pricing guide: (continued)

Material Type:	Category	Price/unit	Unit type	Ease of wholesale on average*	Aver Qty**	Est. value**
exterior steel door - prehung	doors	\$ 45.00	each	medium to wholesale	1	\$ 45.00
craftsman front door - 3 lite	doors	\$ 100.00	each	easy to wholesale	1	\$ 100.00
craftsman front door - 9 lite	doors	\$ 175.00	each	easy to wholesale	0	\$ -
sliding glass doors	doors	\$ 125.00	each	medium to wholesale	0	\$ -
french dbl. door set	doors	\$ 250.00	each	easy to wholesale	0	\$ -
garage doors	doors	\$ 150.00	each	hard to wholesale	0	\$ -
aluminum gutter	exterior	\$ 0.30	lineal ft	hard to wholesale	80	\$ 24.00
aluminum downspout	exterior	\$ 0.25	lineal ft	hard to wholesale	60	\$ 15.00
fencing section 8' wide x 6' high	exterior	\$ 25.00	each	hard to wholesale	4	\$ 100.00
shutters- exterior	exterior	\$ 20.00	each	hard to wholesale	0	\$ -
mirror	glass	\$ 2.50	sq ft	hard to wholesale	2	\$ 5.00
decorative door hardware	hardware	\$ 40.00	each	easy to wholesale	4	\$ 160.00
glass door knob set	hardware	\$ 35.00	each	easy to wholesale	0	\$ -
insulation batts	insulation	\$ 0.10	lineal ft	hard to wholesale	0	\$ -
ceiling mount lighting plain	lighting	\$ 8.00	each	hard to wholesale	4	\$ 32.00
ceiling mount lighting antique	lighting	\$ 35.00	each	easy to wholesale	2	\$ 70.00
crystal chandelier	lighting	\$ 150.00	each	easy to wholesale	0	\$ -
exterior motion light	lighting	\$ 15.00	each	hard to wholesale	1	\$ 15.00
ceiling fans	lighting	\$ 35.00	each	hard to wholesale	1	\$ 35.00
2x2	lumber	\$ 0.15	lineal ft	medium to wholesale	0	\$ -
2x3	lumber	\$ 0.18	lineal ft	medium to wholesale	0	\$ -
2x4 rough sawn	lumber	\$ 0.30	lineal ft	easy to wholesale	500	\$ 150.00
2x6 rough sawn	lumber	\$ 0.50	lineal ft	easy to wholesale	650	\$ 325.00
2x8 rough sawn	lumber	\$ 0.80	lineal ft	easy to wholesale	650	\$ 520.00
2x10 rough sawn	lumber	\$ 1.25	lineal ft	easy to wholesale	650	\$ 812.50
2x12 rough sawn	lumber	\$ 1.75	lineal ft	easy to wholesale	0	\$ -
6x6	lumber	\$ 2.75	lineal ft	medium to wholesale	0	\$ -
8x8 rough sawn	lumber	\$ 5.00	lineal ft	easy to wholesale	40	\$ 200.00
4x12	lumber	\$ 4.00	lineal ft	medium to wholesale	0	\$ -
attic ladder	misc. interior	\$ 65.00	each	medium to wholesale	0	\$ -
wooden blinds	misc. interior	\$ 20.00	each	hard to wholesale	0	\$ -
t-n-g paneling	paneling/flooring	\$ 1.00	sq ft	medium to wholesale	300	\$ 300.00
oak t-n-g flooring 3/4"	paneling/flooring	\$ 1.50	sq ft	easy to wholesale	450	\$ 675.00
oak top-nail flooring 5/16"	paneling/flooring	\$ 1.50	sq ft	easy to wholesale	0	\$ -
maple t-n-g flooring 3/4"	paneling/flooring	\$ 2.75	sq ft	easy to wholesale	0	\$ -
steel bathtubs	plumbing	\$ 35.00	each	hard to wholesale	1	\$ 35.00

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Material Type:	Category	Price/unit	Unit type	Case of wholesale on average*	Aver Qty**	Est. value**
lav sinks	plumbing	\$ 20.00	each	hard to wholesale	1	\$ 20.00
kitchen sinks	plumbing	\$ 25.00	each	hard to wholesale	1	\$ 25.00
pedestal sinks	plumbing	\$ 85.00	each	medium to wholesale	1	\$ 85.00
low flow toilet	plumbing	\$ 35.00	each	hard to wholesale	1	\$ 35.00
lav sink faucet	plumbing	\$ 10.00	each	hard to wholesale	1	\$ 10.00
kitchen sink faucet	plumbing	\$ 20.00	each	hard to wholesale	1	\$ 20.00
claw foot tubs	plumbing	\$ 250.00	each	easy to wholesale	0	\$ -
cast iron bathtubs	plumbing	\$ 75.00	each	hard to wholesale	0	\$ -
shower stall	plumbing	\$ 85.00	each	hard to wholesale	0	\$ -
dbl. drainboard sink	plumbing	\$ 175.00	each	easy to wholesale	0	\$ -
Slate roofing	roof	\$ 1.50	each	easy to wholesale	0	\$ -
Metal roofing	roof	\$ 0.50	sq ft	medium to wholesale	0	\$ -
Concrete/clay tile roofing	roof	\$ 2.25	each	hard to wholesale	0	\$ -
plywood	sheet goods	\$ 12.50	sheet	medium to wholesale	2	\$ 25.00
osb	sheet goods	\$ 7.00	sheet	medium to wholesale	0	\$ -
panelling sheets	sheet goods	\$ 6.00	sheet	medium to wholesale	5	\$ 30.00
cedar bevel siding 8"	siding	\$ 1.25	sq ft	medium to wholesale	0	\$ -
antique siding	siding	\$ 1.50	sq ft	hard to wholesale	250	\$ 375.00
stair bannister w/ turned spindles	stair	\$ 8.00	lineal ft	medium to wholesale	1	\$ 8.00
oak stair treads	stair	\$ 10.00	each	medium to wholesale	10	\$ 100.00
foundation stone	stone/brick	\$ 200.00	pallet	easy to wholesale	10	\$ 2,000.00
brick red	stone/brick	\$ 0.28	each	easy to wholesale	700	\$ 196.00
brick - paver	stone/brick	\$ 0.50	each	easy to wholesale	0	\$ -
field stone	stone/brick	\$ 5.00	each	easy to wholesale	0	\$ -
door casing 3.5" molded	trim	\$ 0.50	lineal ft	hard to wholesale	200	\$ 100.00
crown trim 3"	trim	\$ 1.00	lineal ft	hard to wholesale	0	\$ -
base molding 7" unpainted	trim	\$ 1.00	lineal ft	hard to wholesale	150	\$ 150.00
aluminum slider window 5x3	window	\$ 30.00	each	hard to wholesale	1	\$ 30.00
wood 6 pane window sash	window	\$ 10.00	each	hard to wholesale	6	\$ 60.00
vinyl sash window 2x4'h	window	\$ 50.00	each	medium to wholesale	0	\$ -
vinyl casement window 2x4'h	window	\$ 65.00	each	medium to wholesale	0	\$ -
aluminum skylight 2'x4'	window	\$ 60.00	each	medium to wholesale	0	\$ -
<b>Established' retail value</b>						<b>\$ 8,432.75</b>
<b>Wholesale value</b>						<b>\$ 2,782.81</b>
<b>Mixed value</b>						<b>\$ 5,059.65</b>
	** for a typical 1800 sq ft home similar to those surveyed			* assumes that materials are in good shape and worth reusing		