

Badger Army Ammunition Plant Deconstruction Feasibility Study

Brad Guy, Penn State University
Tim Williams, University of Florida
Bill Bowman, Austin Habitat for Humanity

on behalf of
USDA Forest Products Laboratory
Madison, WI
March 2004

Index	page
Executive Summary _____	2
Introduction and Methodology _____	5
Characterization of Buildings _____	6
Major Assumptions _____	7
Building Descriptions _____	9
Detailed Building Analyses _____	16
Appendix _____	34

Executive Summary

This deconstruction feasibility study analyzed a representative sample of building types at Badger AAP using a two-stage approach. The first stage was a preliminary qualitative assessment of the principal building types based upon visual surveying, and then a quantitative analysis was conducted on the more highly rated buildings using detailed materials take-offs, assigning dismantling methods to building assemblies based upon the building type and an estimate of salvageable materials. Techniques for building dismantling by assembly ranged from hand deconstruction to mechanized demolition and hybrids of mechanical and hand deconstruction techniques. The buildings that were studied were those that never contained any energetics (coded "0") or may have contained energetics, but have been cleaned and reclassified as "5x".

It is estimated that at Badger AAP there are:

- 442,000 ft² of "5X"
- 1.2 million ft² of "0"
- 2.4 million ft² of "3X" (considered contaminated by energetic agents)
- 173,000 ft² with some sort of chemical contamination

Most buildings that were examined had concrete slabs, that may or may not be removed under a deconstruction contract and for which landfill space is available at the facility at no-cost disposal or stockpile for eventual recycling. Given the potential for a non-profit work force development program or Habitat for Humanity deconstruction program to conduct deconstruction activities, it was also meaningful to analyze the above-slab wood structures or entire wood structures that might be more amenable to hand deconstruction using less-skilled labor apart from use of heavy equipment for either dismantling or concrete removal. The summary of ratings of the buildings that were examined for deconstruction potential are as listed below, considering the whole building with concrete slabs and foundations, or without concrete slabs and foundations.

Deconstruction with Concrete Slabs

Excellent Candidates for Selective Dismantling
Buildings 275, 1750, 305

Moderate Candidates for Selective Dismantling
Buildings 1885, 3036, 6401, 700

Poor Candidates for Selective Dismantling
Buildings 224, 1906 w/ barricade, 3555, 1906 / 3-sided berm

Deconstruction without Concrete Slabs

Excellent Candidates for Selective Dismantling
Buildings 3555, 1885, 700, 275

Moderate Candidates for Selective Dismantling

Buildings 1906 / 3-sided berm, 6401, 305, 1750

Poor Candidates for Selective Dismantling

Buildings 224, 1906 w/ barricade, 3036

These relative rankings of deconstruction potential are based upon the following costs and quantities summary estimates for each building. The specific method of deconstruction is outlined in the section devoted to the detailed analysis for each building. The costs of deconstruction are direct costs, not including additional overhead, insurance, bonding requirements, contingencies, etc. The wage rates used are estimates of direct labor wage plus a 25% “burden” for workers compensation and insurance. The equipment costs are based upon anecdotal information gleaned from conversations with local equipment rental companies. Salvage values are based upon local lumber prices and taking ½ of retail value for equivalent materials and then “best estimate” for larger timbers that are not typically available through a retail lumber yard (See Appendix). This best estimate is based upon conversations with local timber framers and other experts.

The buildings in the tables below are arranged by the lowest net cost of building materials salvage by selective dismantling to the highest. Net cost is the cost of deconstruction minus the estimated salvage value. It is worth noting that the amount of salvageable lumber does not necessarily relate to net cost, as value of the lumber is based upon dimensional sizes not raw board feet, and the deconstruction effort can be low for certain high value items like finish flooring and conversely high for other high value items like structural timbers which are also used in lower quantities and have limits for removal based upon their use as structure.

Optimal Deconstruction with Slabs

Bldg	Salvage \$	Board Feet	Net Cost	Net Cost/SF	Salvage %
275	\$41,521	196,094	\$31,506	\$1.73	23.4%
1750	\$5,675	21,685	\$4,099	\$2.10	36.1%
3036	\$4,315	13,784	\$7,203	\$3.10	6.6%
1885	\$17,387	63,709	\$39,734	\$3.82	7.2%
305	\$16,294	99,875	\$52,194	\$3.84	10%
700	\$8,830	95,599	\$51,386	\$4.22	7.8%
6401	\$10,937	60,082	\$77,732	\$4.74	4%
3555	\$10,867	39,204	\$27,595	\$5.89	5.5%
1906/berm	\$1,068	7,155	\$10,397	\$6.42	3.1%
224	\$13,116	64,094	\$125,120	\$7.30	2.3%
1906/barricade	\$2,708	14,932	\$49,314	\$25.01	1.2%

NOTE: Figures include demolition and disposal of all concrete and masonry including walls, slabs, piers, stem walls, footings, etc. Figures do not include contingency, overhead and profit. Contingency should be set at least 25% of gross cost.

Optimal Deconstruction w/Out Slabs

Bldg	Salvage \$	Board Feet	Net Cost	Net Cost/SF	Salvage %
3555	\$10,867	39,204	\$1,956	\$0.42	49.0%
1885	\$17,387	63,709	\$7,004	\$0.67	43.8%
700	\$8,830	95,599	\$10,435	\$0.86	44.2%
275	\$41,521	196,094	\$18,297	\$1.00	65.0%
1906/berm	\$1,068	7,155	\$1,635	\$1.01	68.3%
6401	\$10,937	60,082	\$21,680	\$1.32	50.0%
305	\$16,294	99,875	\$18,531	\$1.36	59.4%
3036	\$4,315	13,784	\$3,599	\$1.55	35.3%
1750	\$5,675	21,685	\$3,560	\$1.83	59.4%
1906/barricade	\$2,708	14,932	\$4,038	\$2.05	54.5%
224	\$13,116	64,094	\$72,190	\$4.21	4.3%

NOTE: Figures do not include demolition and disposal of concrete and masonry slabs, piers, stem walls, footings, etc. Figures do not include contingency, overhead and profit. Contingency should be set at least 25% of gross cost.

The buildings most feasible for deconstruction in general are those that have:

- Minimal interiors partitions and finishes
- Larger wood members, i.e. buildings 3555, 1885, 275, and 700.

Several conclusions from this study provide a general approach to considering deconstruction at Badger AAP in terms of the specific building assemblies and the most cost-effective techniques.

Concrete slabs, stem walls, footings, etc. are a high percentage of mass in a building that is framed in wood, therefore the disposal of this material greatly limits the percentage of reuse / recycling of the entire building regardless of salvage achievable from the wood portion of the building. Considering the building with removal of the slabs lowers the total percentage of diverted materials disproportionately to the percentage of salvage of the wood portion of the building. The analysis of the buildings with and without concrete foundation components provides a description of the difference.

The highest quantities of salvageable materials are typically in roofs and floors, however roofs are relatively more expensive to deconstruct when compared to wall systems, particularly those that have exposed framing. Two reasons that roofs are more expensive is the time involved in moving people and materials to and from heights, and the need for more care when working at height, which also translates into more time. Wood floor systems must support heavier loads hence more structural mass of materials, typically have higher-value finish flooring and are easier to work on in terms of height, a flat surface and ease of movement. Therefore, floor systems are the most cost-effective to

salvage in isolation from the other building assemblies. The highest return on investment for salvage by building assemblies in order is for:

1. Raised wood floor systems
2. Interior solid wood finishes (unpainted)
3. Unfinished exterior wood-framed walls - framing and exterior sheathing
4. Roofs

Roofs typically provide a large quantity of lumber per square foot, but at a higher per square foot cost than the other assemblies.

Excluding slabs and foundations, the buildings analyzed for this study can reasonably yield from 40% to 70% wood salvage using optimal methods and cost-controls (i.e. mechanical assistance, and demolition for low return-on-investment assemblies)

Introduction

This report describes the methods used for the deconstruction feasibility analysis, the assumptions for the analysis including costs, and then a description of each building considered in the study along with a proposed method for dismantling and the detailed deconstruction and salvage cost and quantities estimates for each building.

Methodology for Study

The method for the analysis was as follows:

A qualitative survey form was created (see Appendix) to use by the surveyors to rapidly assess the target buildings and determine those that seemed to justify the additional effort to quantify materials and deconstruction methods. The surveyors performed site visits and photographic documentation and then rated each building on an 1 to 10 scale.

Buildings that rated at least a 6 or higher were further analyzed using site measurements and existing construction drawings and deconstruction techniques for which baseline labor and equipment requirements have been established from previous project experience. The material quantification was performed organized by building assembly. A spreadsheet model was used that translated unit measurements at the building to unit measurements of materials and units of mass and weight for the purposes of calculating waste disposal. The waste disposal fraction was based upon estimates of actual salvage per the building assembly. This fraction can range from 0 for materials without reuse or recycling potential at Badger, to 1 for individual components that are only salvaged in their entirety such as a door. Deconstruction methods range from hand deconstruction to “panelization” of large sections of building for disassembly in a staging area to demolition of portions of the buildings deemed un-cost-effective for salvage.

The outputs of this analysis were dollar costs for deconstruction and waste disposal, dollar value of salvage, board feet of estimated lumber salvage, net cost per square feet of building (deconstruction cost minus salvage value), the total mass of the building, the total salvage mass and the building salvage percentage based on mass. Based upon net cost, the buildings are then ranked for deconstruction potential in economic terms. It is important to note that some buildings have larger quantities of salvageable materials but also higher net costs per square feet of building. With subsidized labor such as through Habitat for Humanity or grants, these buildings might be more suitable for deconstruction on an “un-economic” basis. In all cases many of the buildings studied would appear to be cost-effective for deconstruction based on *net cost* when compared to demolition.

Characterization of Buildings

In order to compare specific buildings to others that were extremely similar and hence avoid having to analyze every building regardless of extent of variations, the actual buildings that were analyzed were assigned a Type number. The types and the buildings that represent that type are indicated below.

- Type 1** – Bldg 224 one-story w/ interior walls and concrete walls with concrete slab.
- Type 2** – Bldg 275 one-story open warehouse with minimal interior partitions and finishes, with raised wood floor.
- Type 2 alt** – Bldg 6401 one-story open warehouse minimal interior partitions and finishes, with concrete slab.
- Type 2 sim** – Bldg 507-4 same as Bldg 275 except rectangular footprint.
- Type 3** – Bldg 305 open warehouse with concrete slab.
- Type 4** – Bldg 700 large open warehouse with concrete slab.
- Type 5** – Bldg 1750 small one-story rectangular building with interior finish with raised wood floor.
- Type 5 alt** – Bldg 1750-26 same as Bldg 1750 except metal building with concrete slab.
- Type 6** – Bldg 1885-2 large open warehouse with minimal to no interiors with concrete slab.
- Type 6 sim** – Bldg 3000 same as Bldg 1885
- Type 7** – Bldg 1906 no berm, small rectangular wood framed building with concrete slab.
- Type 7 alt** – Bldg 1906 bermed, concrete on 3 sides, wood roof and concrete slab.
- Type 7 sim** – Bldg 1932-32 small rectangular wood framed building with concrete slab.
- Type 8** – Bldg 3036 one-story with interior partitions with concrete slab.
- Type 9** – Bldg 3555 large manufacturing building with post and beam with concrete slab.
- Type 10** – Bldg 6822 one story wood frame minimal interior finish with concrete slab.

The types of buildings that ranked highest for deconstruction feasibility were:

1. Type 2 – 275, 6401, similar to 507-4
2. Type 5 – 1750, similar to 1906
3. Type 3 – 305
4. Type 6 – 1885, similar to 3000
5. Type 4 – 700

Major Assumptions

The study is an estimate of potential costs and salvage at Badger Army Ammunition Plant based upon previous labor and equipment utilization rates. In order to obtain dollar values and make judgments about the dismantling techniques to be employed, a series of assumption were made. These assumptions are included below:

- The cost of disposal is hauling only @ \$150.00 per haul using 40 cubic yard containers to reflect. Cost of disposal at the landfill is not included as a cost.
- Labor is not paid non-Davis Bacon Wages, or in other words, standard private business labor rates for the location.
- Lumber value is calculated per lineal foot x dimension, or per square foot in the case of sheathing, decking and flooring.
- Dismantling scenarios are based upon an estimated optimal deconstruction process using both hand and mechanical assistance as needed. This includes select demolition on certain parts of a building.
- Recovery for recycling of concrete or asphalt shingles is not included.
- All major processing equipment is removed beforehand and not included in the cost.
- All labor costs and salvage values were estimated based on local Madison / Baraboo, WI information and are used consistently throughout.
- Time constraints are not a limiting factor.

Crew Types

As with any construction project, specific tasks may require a crew of laborers with different skills and including the operation and use of heavy equipment. For the purposes of describing techniques that involved more than a set of individual laborers using hand tools, a series of crew types were established. These crew types are then assigned to the assemblies and techniques to be employed. The basic crew types used in this study are listed below:

- Crew A – Excavator + Bobcat (2 persons)
- Crew B – Skilled Laborer(s) (any number of persons)
- Crew C - Excavator + 2 Laborer (3 persons)
- Crew D – Bobcat + 1 Laborer (2 persons)
- Crew E – Excavator + 2 Laborers (3 persons)
- Crew F – Excavator + 2 Man-lifts (3 persons)

Supervisor @ 8% of labor (1 person)

Crew Wage / Equipment Costs

Each crew also has a wage rate per hour based upon the average of labor wages being paid to each person in the crew. The crew is connected to specific removal techniques and are working simultaneously, therefore the wage per hour is not the addition of each laborers wage rate but the average of all labor wages paid and the hourly rate paid for the specific piece(s) of heavy equipment used by that crew type. **The individual skilled laborer for this project is estimated to cost the deconstruction firm \$18.75 per hour. If a different wage is paid for the actual project this hourly wage can be changed and reflected in the overall deconstruction analysis.**

Crew A – \$ 95.63 / hour

Crew B – \$ 18.75 / hour

Crew C – \$ 56.25 / hour

Crew D – \$ 45.00 / hour

Crew E – \$ 52.50 / hour

Crew F – \$ 72.50 / hour

Supervisor - \$37.50 / hour

All wages include direct + 25% indirect costs

Figures include equipment rentals pro-rated based on weekly rates.

Crews and Methods

The specific crews and the methods and assemblies that require this crew are listed below.

Crew A – Mechanical Demolition Concrete / Selective Mechanical Demolition of Walls

Crew B - Hand Deconstruction Any Building Assembly and Process Materials

Crew C - Panelize and Remove Roof Sections

Crew D - Separate Roof Purlins / Joists With Bobcat

Crew E – Low Lift of Roof Trusses

Crew F – High Lift of Roof Trusses

Building Descriptions

3022 Beater House



This building had water damage, high degree of entanglement of MEP systems and all wood surfaces were painted, assumed to be lead-based paint.

Building 3022 was qualitatively rated a three (3) for deconstruction potential, and therefore not considered for further analysis.

6586-5 Inert Storage



Building 6586-5 had 3 of 4 exterior walls that were poured concrete, the roof structure was salvageable, and sheathing on the one wood-framed wall was asbestos-containing materials.

Building 6586-5 was qualitatively rated a three (3) for deconstruction potential, and therefore not considered for further analysis.

6543-5 Gatehouse



Building 6543-5 was a simple one-story building with high proportion of interior finishes to salvageable lumber. Good building for volunteer or low-skill laborers.

This building was qualitatively rated a four (4) for deconstruction potential and was not considered for further analysis.

6864-1 Cementing House



This building had light wood frame exterior walls and interior walls entirely cast-in-place concrete. It had minimal salvage and was qualitatively rated a two (2) and therefore not considered for further analysis.

Type 1 - 224 Ballistic House and Range



Building 224 had large sized lumber unpainted lumber trusses in the roof with concrete or CMU first-story exterior walls and a large amount of non-salvageable interior finishes.

This building was qualitatively rated a four (4) for deconstruction potential, and although a low score, it was considered for further analysis for a roof-only deconstruction.

Type 2 - Building 275



Building 275 was a large one-story warehouse with raised wood floor structure and minimal interior partitions and finishes.

This building was qualitatively rated an eight (8) for deconstruction potential and was considered for further analysis.

Type 2 similar 507-4 - Warehouse



This building has a raised wood floor structure with minimal interior partitions and finishes.

Building 507-4 was qualitatively rated a eight (8) for deconstruction potential, and was considered for further analysis.

Type 2 alternate - 6401 Bulk Storage



This building is identical to 275 Warehouse, with the exception that the floor here is a raised slab.

Building 6401 was qualitatively rated a seven (7) for deconstruction potential, and was considered for further analysis.

Type 3 - 305 Gun Storage and Repair



Building 305 had a light wood frame exterior, exposed roof structure, 2x sheathing and minimal interior finishes. There were significant numbers of openings in the exterior walls and a concrete slab.

Building 305 was qualitatively rated a seven (7) for deconstruction potential, and was considered for further analysis.

Type 4 - 700 Compressor House



Building 700 had an exposed roof structure and walls and large dimensional lumber with minimal interior finish. All wood appeared to be lead-based paint, salvage % dependent on reuse options or stripping of LBP. It had a concrete slab and concrete pits.

Building 700 was qualitatively rated a three (3) for deconstruction potential based upon the presence of LBP, but otherwise would be highly ranked, and for this reason was considered for further analysis.

Type 5 - 1750 Rest House



Building 1750 is small one-story with raised wood floor and interior wood finishes.

This building was qualitatively rated an eight (8) for deconstruction potential and was considered for further analysis.

Type 5 alternate - 1750-26 Rest House



Building 1750-26 is a metal frame and cladding on concrete slab. Slab contains mastic may be asbestos containing material. Metal frame and exterior skin are either entirely recyclable or able to be dismantled and reassembled elsewhere

This building was qualitatively rated an eight (8) for deconstruction potential but was not considered for further analysis due to lack of data for dismantling metal buildings.

Type 6 - 1885-2 Box Storehouse



Building 1885-2 has exposed roof and walls and large dimensional lumber columns and reuses with minimal interior finishes and concrete slab and stem walls.

This building was qualitatively rated a seven (7) for deconstruction potential and was considered for further analysis.

Type 6 similar - 3000 Pulp & Cotton Warehouse



Building 3000 had large dimensional lumber in roof trusses no interior partitions or debris on a raised concrete slab.

This building was qualitatively rated an eight (8) for deconstruction potential and was considered for further analysis.

Type 7 - 1906 Magazine, Standard – Berm



Building 1906 w/ berm has unpainted novelty siding on interior ceiling and a roof rafter structure and wood-framed front wall with concrete slab.

This building was qualitatively rated a nine (9) for deconstruction potential and was considered for further analysis.

Type 7 similar - 1932-32 Magazine, Cannon



Building 1932-32 interior is entirely unpainted, salvageable lumber with concrete slab. Excellent building for volunteer or low-skill laborers.

This building was qualitatively rated a nine (9) for deconstruction potential and was considered for further analysis.

Type 8 - 3036 Change House



Building 30306 is framed in small dimensional lumber with ceiling and interior wall drywall and concrete slab.

This building was qualitatively rated an four (4) for deconstruction potential and was considered for further analysis due to its small scale and potential for unskilled labor.

Type 9 - 3555 ACR Building



Building 3555 had unpainted large timbers in the roof structure and post and beam walls with considerable entanglement of various pipes.

This building was qualitatively rated a seven (7) for deconstruction potential and was considered for further analysis.

Type 10 - 6822 Maintenance Shop



Building 6822 had an exposed roof structure with plywood sheathing with concrete slab. Exterior sheathing is granule asphalt material over suspect friable asbestos fiber board.

This building was qualitatively rated a six (6) for deconstruction potential and was considered for further analysis.

Detailed Building Analyses Building Breakdown

Building 224

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
17,136 SF										
Slab/Footings	A	\$33,696	\$19,234	\$0	0	\$52,930	\$3.09	1282	0.00	0.00%
Exterior Walls	A	\$17,793	\$10,174	\$0	0	\$27,967	\$1.63	678	0.00	0.00%
Interior Walls	A	\$17,248	\$9,805	\$0	0	\$27,053	\$1.58	643	0.00	0.00%
Roof 1	B + D + E	\$8,650	\$483	\$2,787	16,607	\$6,346	\$0.37	39	16.18	41.47%
Gable 1&2	A	\$77	\$53	\$0	0	\$130	\$0.01	2	0.00	0.00%
Ceiling 1	B	\$3,078	\$247	\$780	5,957	\$2,545	\$0.15	13	5.80	44.63%
Roof 2	B + D + E	\$4,377	\$252	\$2,233	9,676	\$2,396	\$0.14	21	9.42	44.88%
Ceiling 2	B	\$1,163	\$34	\$440	4,724	\$757	\$0.04	6	4.60	76.69%
Roof 3	B + D + E	\$7,184	\$416	\$5,162	17,466	\$2,438	\$0.14	36	17.01	47.25%
Ceiling 3	B	\$3,149	\$211	\$1,527	8,600	\$1,833	\$0.11	17	8.38	49.27%
Gable 3	A	\$135	\$60	\$0	0	\$195	\$0.01	4	0.00	0.00%
Gable 3&4	A	\$135	\$97	\$0	0	\$232	\$0.01	4	0.00	0.00%
Roof 4	B + D + E	\$333	\$17	\$127	724	\$223	\$0.01	1.5	0.71	47.01%
Ceiling 4	B	\$126	\$9	\$60	340	\$75	\$0.00	0.7	0.33	47.31%
Total		\$97,144	\$41,092	\$13,116	64,094	\$125,120	\$7.30	2747.2	62.43	2.27%
w/out Slab/Footings		\$63,448	\$21,858	\$13,116	64,094	\$72,190	\$4.21	1,465	62	4.26%

Does not include Contingency, O&P
Average wood value \$00.20 / BF

Building Assembly Summary

Building 224

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
17,136 SF										
Slab/Footings	A	\$33,696	\$19,234	\$0	0	\$52,930	\$3.09	1282	0.00	0.00%
Exterior Walls	A	\$17,793	\$10,174	\$0	0	\$27,967	\$1.63	678	0.00	0.00%
Interior Walls	A	\$17,248	\$9,805	\$0	0	\$27,053	\$1.58	643	0.00	0.00%
Gable Ends	A	\$347	\$210	\$0	0	\$557	\$0.03	10	0.00	0.00%
Roofs/Ceilings	B+D+E	\$28,060	\$1,669	\$13,116	64,094	\$16,613	\$0.97	134	62	46.27%

Building 224 Deconstruction Method

- Panelize Roofs for Building Removal
- Mechanical Deconstruct Salvage Purlins
- Disposal Sheathing and Shingles
- Hand Demolition Ceiling Finishes
- Lift Trusses / Hand Deconstruct Salvage Lumber
- Hand Deconstruct Salvage Ceiling Joists
- Mechanical “Soft” Demolition and Salvage Gable End Studs
- Mechanical Demolition Concrete Walls and Interiors
- Mechanical Demolition Slab and Foundation(s)

Building Breakdown

Building 275

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
18,249 SF										
Foundation	A	\$5,358	\$7,851	\$0	0	\$13,209	\$0.72	523	0.00	0.00%
N Wing N Wall	B	\$1,337	\$127	\$868	5,096	\$596	\$0.03	11	4.96	45.12%
N Wing S Wall	B	\$1,498	\$124	\$736	4,740	\$886	\$0.05	10	4.62	46.17%
N Wing E Wall	B	\$197	\$18	\$113	672	\$102	\$0.01	1.5	0.65	43.63%
East Gable	B	\$105	\$9	\$64	390	\$50	\$0.00	0.8	0.38	47.48%
W Wall	B	\$72	\$2	\$52	451	\$22	\$0.00	0.5	0.44	87.85%
W Gable	B	\$105	\$9	\$64	390	\$50	\$0.00	0.8	0.38	47.48%
S Wing S Wall	B	\$1,384	\$101	\$862	5,067	\$623	\$0.03	10.5	4.94	47.00%
S Wing N Wall	B	\$1,494	\$131	\$739	4,398	\$886	\$0.05	10	4.28	42.84%
E Wall	B	\$216	\$23	\$100	606	\$139	\$0.01	1.6	0.59	36.89%
E Gable	B	\$105	\$9	\$64	390	\$50	\$0.00	0.8	0.38	47.48%
S Wing W Wall	B	\$72	\$2	\$52	486	\$22	\$0.00	0.6	0.47	78.89%
W Gable	B	\$105	\$9	\$64	390	\$50	\$0.00	0.8	0.38	47.48%
Passage W Side	B	\$125	\$12	\$72	430	\$65	\$0.00	0.9	0.42	46.54%
Passage E Side	B	\$128	\$13	\$68	409	\$73	\$0.00	0.95	0.40	41.93%
Bath E Ext Wall	B	\$99	\$8	\$44	267	\$63	\$0.00	0.6	0.26	43.34%
Bath S Ext Wall	B	\$155	\$13	\$76	457	\$92	\$0.01	1	0.45	44.51%

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
W Wall Adj Off	B	\$25	\$1	\$21	148	\$5	\$0.00	0.2	0.14	72.08%
Office E Ext Wall	B	\$51	\$5	\$24	147	\$32	\$0.00	0.35	0.14	40.91%
Office W Ext Wall	B	\$585	\$53	\$232	1,413	\$406	\$0.02	3.6	1.38	38.23%
Office S Ext Wall	B	\$203	\$18	\$85	519	\$136	\$0.01	1.3	0.51	38.88%
South Gable	B	\$94	\$7	\$53	328	\$48	\$0.00	0.65	0.32	49.15%
N Ext Wall	B	\$203	\$18	\$85	519	\$136	\$0.01	1.3	0.51	38.88%
North Gable	B	\$94	\$7	\$53	328	\$48	\$0.00	0.65	0.32	49.15%
Roof S Wing	B	\$13,183	\$303	\$3,936	22,832	\$9,550	\$0.52	37	22.24	60.10%
Roof N Wing	B	\$13,156	\$311	\$4,117	24,247	\$9,350	\$0.51	39	23.62	60.55%
Roof Office	B	\$4,664	\$107	\$1,377	7,993	\$3,394	\$0.19	13	7.79	59.89%
Roof Passage	B	\$357	\$7	\$77	425	\$287	\$0.02	0.77	0.41	53.76%
Roof Bathroom	B	\$426	\$9	\$104	616	\$331	\$0.02	1	0.60	60.00%
Int Fin N Warehouse	B	\$763	\$28	\$1,964	4,568	-\$1,173	-\$0.06	5.6	4.45	79.45%
Int Fin S Warehouse	B	\$518	\$17	\$1,398	2,872	-\$863	-\$0.05	3.5	2.80	79.92%
Int Fin 3 Office	B	\$1,417	\$100	\$2,465	2,430	-\$948	-\$0.05	6.9	2.37	34.30%
Int Fin 4 Office 2	B	\$728	\$51	\$939	1,225	-\$160	-\$0.01	3.5	1.19	34.09%
Int Fin 4a Office 2	B	\$102	\$5	\$52	270	\$55	\$0.00	0.46	0.26	57.17%
Int Fin 5 Bath Closet	B	\$153	\$25	\$0	0	\$178	\$0.01	1.13	0.00	0.00%
Wood Floors N Wing	B	\$5,777	\$265	\$7,590	43,885	-\$1,548	-\$0.08	53	42.74	80.65%
Wood Floors S Wing	B	\$5,777	\$265	\$7,590	43,885	-\$1,548	-\$0.08	53	42.74	80.65%
Wood Floors Passage	B	\$134	\$5	\$292	759	-\$153	-\$0.01	0.9	0.74	82.14%
Wood Floors Bath	B	\$191	\$9	\$652	1,539	-\$452	-\$0.02	1.9	1.50	78.89%
Office	B	\$1,731	\$63	\$4,377	10,507	-\$2,583	-\$0.14	12.8	10.23	79.95%
Total		\$62,887	\$10,140	\$41,521	196,094	\$31,506	\$1.73	817	191	23.38%
w/out Footings		\$57,529	\$2,289	\$41,521	196,094	\$18,297	\$1.00	294	191	65.00%

Does not include Contingency, O&P

Average wood value \$00.21 / BF

Building Assembly Summary

Building 275

18,249 SF	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Foundation	A	\$5,358	\$7,851	\$0	0	\$13,209	\$0.72	523	0.00	0.00%
Walls and Gables	B	\$8,452	\$719	\$4,591	28,041	\$9,170	\$0.50	60.4	27.31	45.22%
Roofs	B	\$31,786	\$737	\$9,611	56,113	\$22,912	\$1.26	91	55	60.21%
Int Finishes	B	\$3,681	\$226	\$6,818	11,365	-\$2,911	-\$0.16	21	11	52.49%
Floors	B	\$13,610	\$607	\$20,501	100,575	-\$6,284	-\$0.34	122	98	80.56%

275 Warehouse Deconstruction Method

- Hand Demolition Sheathing/Shingles
- Hand Deconstruct Trusses
- Hand Demolition Drywall Finishes
- Hand Deconstruct Interior Wood Finishes
- Hand Demolition Siding
- Hand Deconstruction Exterior Studs/Sheathing
- Hand Deconstruction Wood Floor Structure
- Mechanical Demolition Stem Walls and Foundation(s)

Building Breakdown
Building 6401

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
16,401 SF										
Foundation/Slab	A	\$35,695	\$20,357	\$0	0	\$56,052	\$3.42	1357	0.00	0.00%
E Wing E Wall	B	\$945	\$89	\$628	2,650	\$406	\$0.02	7.2	2.58	35.85%
E Wing W Wall	B	\$963	\$74	\$449	2,498	\$588	\$0.04	6.1	2.43	39.89%
E Wing N Wall	B	\$197	\$19	\$105	580	\$111	\$0.01	1.4	0.56	40.35%
E Wing N Gable	B	\$101	\$9	\$57	318	\$53	\$0.00	0.7	0.31	44.25%
E Wing S Wall	B	\$65	\$2	\$42	255	\$25	\$0.00	0.4	0.25	62.09%
E Wing S Gable	B	\$43	\$2	\$31	288	\$14	\$0.00	0.3	0.28	93.50%
W Wing W Wall	B	\$945	\$71	\$628	3,458	\$388	\$0.02	7.2	3.37	46.78%
W Wing E Wall	B	\$854	\$71	\$456	2,278	\$469	\$0.03	5.4	2.22	41.09%
W Wing N Wall	B	\$197	\$19	\$105	580	\$111	\$0.01	1.4	0.56	40.35%
W Wing N Gable	B	\$101	\$9	\$57	318	\$53	\$0.00	0.7	0.31	44.25%
W Wing S Wall	B	\$65	\$2	\$42	363	\$25	\$0.00	0.5	0.35	70.71%
W Wing S Gable	B	\$42	\$2	\$31	188	\$13	\$0.00	0.3	0.18	61.04%
Passage S Side	B	\$121	\$11	\$65	361	\$67	\$0.00	0.9	0.35	39.07%
Passage N Side	B	\$46	\$3	\$27	164	\$22	\$0.00	0.3	0.16	53.25%
Receiv Off N Side	B	\$108	\$10	\$60	164	\$58	\$0.00	0.75	0.16	21.30%
Bath N Ext Wall	B	\$96	\$8	\$40	225	\$64	\$0.00	0.57	0.22	38.45%
Bath E Ext Wall	B	\$149	\$13	\$68	377	\$94	\$0.01	0.94	0.37	39.06%
Bath S Wall Adj Off	B	\$25	\$1	\$21	104	\$5	\$0.00	0.13	0.10	77.92%
Office N Ext Wall	B	\$55	\$4	\$18	104	\$41	\$0.00	0.28	0.10	36.18%
Office S Ext Wall	B	\$551	\$48	\$199	1,115	\$400	\$0.02	3	1.09	36.20%
Office E Ext Wall	B	\$189	\$17	\$72	404	\$134	\$0.01	1.1	0.39	35.77%
Office E Gable	B	\$89	\$7	\$47	265	\$49	\$0.00	0.57	0.26	45.28%
Office W Ext Wall	B	\$189	\$17	\$72	404	\$134	\$0.01	1.11	0.39	35.45%
Office W Gable	B	\$89	\$7	\$47	265	\$49	\$0.00	0.57	0.26	45.28%
Roof E Wing	B	\$9,801	\$223	\$2,882	16,561	\$7,142	\$0.44	27	16.13	59.74%
Roof W Wing	B	\$9,801	\$223	\$2,882	16,561	\$7,142	\$0.44	27	16.13	59.74%
Roof Office	B	\$3,826	\$88	\$1,182	6,840	\$2,732	\$0.17	11	6.66	60.56%
Roof Passage/Receiv	B	\$169	\$39	\$490	1,597	-\$282	-\$0.02	2	1.56	77.77%

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Roof Bathroom	B	\$427	\$9	\$104	616	\$332	\$0.02	1	0.60	60.00%
Int Fin W Wareh	B	\$69	\$11			\$80	\$0.00	0.5	0.00	0.00%
Int Fin E Wareh	B	\$41	\$82	\$0	0	\$123	\$0.01	0.6	0.00	0.00%
Int Fin Office	B	\$523	\$86	\$0	0	\$609	\$0.04	4	0.00	0.00%
Int Receiv Office	B	\$207	\$34	\$0	0	\$241	\$0.01	1.6	0.00	0.00%
Bath and Closet	B	\$192	\$26	\$30	181	\$188	\$0.01	1.4	0.18	12.59%
Total		\$66,976	\$21,693	\$10,937	60,082	\$77,732	\$4.74	1475	59	3.97%
w/out Footings		\$31,281	\$1,336	\$10,937	60,082	\$21,680	\$1.32	118	59	49.63%

**Does not include Contingency,
O&P**

Average wood value \$00.21 / BF

Building Assembly Summary

Building 6401

16,401 SF	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Foundation/Slab	A	\$35,695	\$20,357	\$0	0	\$56,052	\$3.42	1357	0.00	0.00%
Ext Walls/Gables	B	\$6,225	\$515	\$3,367	17,726	\$3,373	\$0.21	42	17	40.48%
Roofs	B	\$24,024	\$582	\$7,540	42,175	\$17,066	\$1.04	68	41	60.29%
Int Finish	B	\$1,032	\$239	\$30	161	\$1,241	\$0.08	8	0.16	2.00%

Building 6401 Deconstruction Method

- Hand Demolition Sheathing/Shingles
- Hand Deconstruct Trusses
- Hand Deconstruct Interior Walls
- Hand Demolition Siding
- Hand Deconstruction Exterior Studs/Sheathing
- Mechanical Demolition Floor and Foundation(s)

Building Breakdown

Building 305

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
13,592 SF										
Foundation/Slabs	A	\$21,437	\$12,226	\$0	0	\$33,663	\$2.48	815	0.00	0.00%
Ext N1 Wall	B	\$328	\$29	\$157	1,098	\$200	\$0.01	2.3	1.07	46.50%
Ext N1 Gable	B	\$199	\$18	\$74	412	\$143	\$0.01	1.2	0.40	33.44%
Ext W1 Wall	B	\$667	\$57	\$368	2,486	\$356	\$0.03	4.9	2.42	49.42%
Ext N2 Wall	B	\$162	\$15	\$57	314	\$120	\$0.01	0.94	0.31	32.54%
Ext W2 Wall	B	\$252	\$17	\$232	1,484	\$37	\$0.00	2.2	1.45	65.70%
Ext S1 Wall	B	\$162	\$15	\$57	314	\$120	\$0.01	0.94	0.31	32.54%
Ext W3 Wall	B	\$488	\$44	\$208	1,302	\$324	\$0.02	3.2	1.27	39.63%
Ext W3 Gable	B	\$198	\$18	\$74	412	\$142	\$0.01	1.2	0.40	33.44%
Ext S2 Wall	B	\$1,634	\$147	\$768	4,995	\$1,013	\$0.07	11.1	4.87	43.83%
Ext E2 Wall	B	\$414	\$41	\$126	700	\$329	\$0.02	2.4	0.68	28.41%
Ext E2 Gable	B	\$198	\$18	\$74	412	\$142	\$0.01	1.2	0.40	33.44%
Ext N3 Wall	B	\$1,221	\$106	\$642	4,299	\$685	\$0.05	8.7	4.19	48.13%
Ext E1 Wall	B	\$1,221	\$132	\$492	3036	\$861	\$0.06	8.5	2.96	34.79%
Roof NE Wing	B	\$9,859	\$310	\$5,096	30432	\$5,073	\$0.37	44.1	29.64	67.21%
Roof SW Wing	B	\$12,028	\$385	\$6,412	38352	\$6,001	\$0.44	55.2	37.35	67.67%
Roof Office 2&3	B	\$951	\$20	\$206	1,207	\$765	\$0.06	2.2	1.18	53.44%
Int Fin Office 1	B	\$195	\$16	\$92	611	\$119	\$0.01	1.24	0.60	47.99%
Int Fin Office 2	B	\$146	\$12	\$50	298	\$108	\$0.01	0.76	0.29	38.19%
Int Fin Office 3	B	\$83	\$6	\$33	199	\$56	\$0.00	0.43	0.19	45.08%
Int Fin Office 4	B	\$268	\$35	\$72	440	\$231	\$0.02	1.34	0.43	31.98%
Comp Stor Room	B	\$154	\$5	\$74	454	\$85	\$0.01	0.64	0.44	69.09%
Small lavatory	B	\$102	\$8	\$41	250	\$69	\$0.01	0.56	0.24	43.48%
Case Resizing Room	B	\$360	\$12	\$137	755	\$235	\$0.02	1.2	0.74	61.28%
Gun Repair Room	B	\$234	\$9	\$54	327	\$189	\$0.01	0.7	0.32	45.50%
S Gun Storage Room	B	\$374	\$13	\$122	677	\$265	\$0.02	1.2	0.66	54.95%
Lavatory	B	\$42	\$1	\$29	176	\$14	\$0.00	0.2	0.17	85.71%
Locker Room	B	\$116	\$3	\$81	491	\$38	\$0.00	0.6	0.48	79.71%
Loft 1 & 2	B	\$1,257	\$20	\$466	3,942	\$811	\$0.06	4.65	3.84	82.57%

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Total		\$54,750	\$13,738	\$16,294	99,875	\$52,194	\$3.84	979	97	9.94%
w/out Footings/Slab		\$33,313	\$1,512	\$16,294	99,875	\$18,531	\$1.36	164	97	59.39%
Does not include Contingency, O&P										
Average wood value \$00.16 / BF										

Building Assembly Summary

Building 305

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
13,592 SF										
Foundation/Slabs	A	\$21,437	\$12,226	\$0	0	\$33,663	\$2.48	815	0.00	0.00%
Ext Walls	B	\$7,144	\$657	\$3,329	21,264	\$4,472	\$0.33	49	21	42.86%
Roofs	B	\$22,838	\$715	\$11,714	69,991	\$11,839	\$0.87	102	68	66.67%
Interior Walls/Loft	B	\$3,331	\$140	\$1,251	8,620	\$2,220	\$0.16	14	8	57.14%

Building 305 Deconstruction Method

- Hand Demolition Sheathing/Shingles
- Hand Deconstruct Trusses
- Hand Deconstruct Interior Walls
- Hand Demolition Siding
- Hand Deconstruction Exterior Studs/Sheathing
- Mechanical Demolition Floor and Foundation(s)

Building Breakdown

Building 700

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
12,191 SF										
Foundation/Slab	A	\$26,078	\$14,873	\$0	0	\$40,951	\$3.36	991.5	0.00	0.00%
Ext Wall N	A + B	\$1,418	\$738	\$1,135	32,808	\$1,021	\$0.08	62.8	31.95	50.88%
Ext Wall W	A + B	\$598	\$234	\$0	2,230	\$832	\$0.07	12	2.17	18.10%
Ext Wall W Gable	A + B	\$68	\$23	\$49	277	\$42	\$0.00	1.22	0.27	22.11%
Ext Wall S	A + B	\$1,366	\$721	\$1,111	32,644	\$976	\$0.08	62	31.80	51.28%
Ext Wall E	A + B	\$607	\$0	\$322	2,230	\$285	\$0.02	12	2.17	18.10%
Ext Wall E Gable	A + B	\$68	\$23	\$49	277	\$42	\$0.00	1.2	0.27	22.48%
Center Columns	B	\$723	\$5	\$369	776	\$359	\$0.03	0.94	0.76	80.41%
Roof 1 Sheathing	B + D + E	\$10,659	\$687	\$2,771	15,043	\$8,575	\$0.70	47	14.65	31.17%
Roof 1 Trusses	B + E	\$1,271	\$56	\$3,024	9,314	-\$1,697	-\$0.14	11.3	9.07	80.28%
Total		\$42,856	\$17,360	\$8,830	95,599	\$51,386	\$4.22	1202	93	7.75%
w/out Footings/Slab		\$16,778	\$2,487	\$8,830	95,599	\$10,435	\$0.86	210	93	44.24%

Does not include Contingency,
O&P

Building Assembly Summary

Building 700

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
12,191 SF										
Foundation/Slab	A	\$26,078	\$14,873	\$0	0	\$40,951	\$3.36	991.5	0.00	0.00%
Ext Walls / Columns	A + B	\$4,848	\$1,744	\$3,035	71,242	\$3,557	\$0.29	152	69	45.39%
Roof	B + D + E	\$11,930	\$743	\$5,795	24,357	\$6,878	\$0.56	58	24	41.38%

Building 700 Deconstruction Method

- Panelize roof for dismantling on the ground
- Lift out trusses and dismantle on the ground
- Gentle demolition and pick out timbers and framing lumber
- Mechanical Demolition Floor and Foundation(s)

Building Breakdown

Building 1750

1,950 SF	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	MT=tons Mass MT	Salvage MT	% Salvage
Foundation	A	\$192	\$347	\$0	0	\$539	\$0.28	23	0.00	0.00%
Floor Structure	B	\$1,208	\$42	\$1,224	8,586	\$26	\$0.01	10.1	8.36	82.80%
Ext Wall N	B	\$553	\$77	\$123	849	\$507	\$0.26	4.1	0.83	20.17%
Ext Wall W	B	\$137	\$13	\$29	204	\$121	\$0.06	0.76	0.20	26.14%
West Gable	B	\$57	\$6	\$22	154	\$41	\$0.02	0.41	0.15	36.58%
Ext S Wall	B	\$432	\$48	\$100	692	\$380	\$0.19	2.74	0.67	24.60%
Ext E Wall	B	\$137	\$13	\$29	204	\$121	\$0.06	0.76	0.20	26.14%
East Gable	B	\$57	\$6	\$22	154	\$41	\$0.02	0.41	0.15	36.58%
Roof	B	\$3,510	\$0	\$1,062	6,102	\$2,448	\$1.26	10	5.94	59.43%
Int Finishes	B	\$2,897	\$42	\$3,064	4,740	-\$125	-\$0.06	6.3	4.62	73.28%
Total		\$9,180	\$594	\$5,675	21,685	\$4,099	\$2.10	59	21	36.06%
w/out Foundation		\$8,988	\$247	\$5,675	21,685	\$3,560	\$1.83	36	21	59.36%

Does not include Contingency,
O&P

Average wood value \$00.26 / BF

Building Assembly Summary

Building 1750

1,950 SF	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Foundation	A	\$192	\$347	\$0	0	\$539	\$0.28	23	0.00	0.00%
Floor Structure	B	\$1,208	\$42	\$1,224	8,586	\$26	\$0.01	10.1	8.36	82.80%
Ext Walls / Gables	B	\$1,371	\$163	\$325	\$2,257	\$1,211	\$0.62	9.18	2.20	23.97%
Roof	B	\$3,510	\$0	\$1,062	6,102	\$2,448	\$1.26	10	5.94	59.43%
Int Finishes	B	\$2,897	\$42	\$3,064	4,740	-\$125	-\$0.06	6.3	4.62	73.28%

Building 1750 Deconstruction Method

- Hand Demolition Sheathing/Shingles
- Hand Deconstruct Trusses
- Hand Deconstruct Interior Wood Finishes
- Hand Demolition Siding
- Hand Deconstruction Exterior Studs/Sheathing
- Hand Deconstruction Wood Floor Structure
- Mechanical Demolition Foundation(s)

Building Breakdown

Building 1885

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
10,400 SF										
Foundation	A	\$18,492	\$10,546	\$0	0	\$29,038	\$2.79	703	0.00	0.00%
Porch Foundation	A	\$394	\$224	\$0	0	\$618	\$0.06	15	0.00	0.00%
Ext E Wall	A + B	\$951	\$354	\$915	3,227	\$390	\$0.04	17	3.14	18.49%
Ext N Wall	A + B	\$252	\$95	\$76	485	\$271	\$0.03	4.5	0.47	10.50%
N Gable	A + B	\$104	\$40	\$25	163	\$119	\$0.01	1.84	0.16	8.63%
W Wall	A + B	\$1,041	\$357	\$1,275	2,348	\$123	\$0.01	17.3	2.29	13.22%
S Wall	A + B	\$252	\$95	\$76	485	\$271	\$0.03	4.5	0.47	10.50%
S Gable	A + B	\$104	\$38	\$25	163	\$117	\$0.01	1.74	0.16	9.12%
Roof 1 Sheathing	B+D+F	\$17,647	\$461	\$9,844	38,611	\$8,264	\$0.79	62.1	37.61	60.56%
Roof 1 Trusses	B + F	\$2,337	\$61	\$3,487	10,042	-\$1,089	-\$0.10	12.2	9.78	80.17%
Room 1 Int Fin	B	\$196	\$6	\$185	1,061	\$17	\$0.00	1.3	1.03	79.49%
Room 2 Int Fin	B	\$1,423	\$116	\$380	2,485	\$1,159	\$0.11	8.43	2.42	28.71%
Porch Floor	B	\$1,357	\$152	\$1,068	4,506	\$441	\$0.04	10.5	4.39	41.80%
Stair	B	\$25	\$1	\$31	133	-\$5	\$0.00	0.2	0.13	64.77%
Total		\$44,575	\$12,546	\$17,387	63,709	\$39,734	\$3.82	860	62	7.22%
w/out Foundation		\$22,884	\$1,507	\$17,387	63,709	\$7,004	\$0.67	142	62	43.82%

Does not include Contingency, O&P

Average wood value \$00.28 /BF

Building Assembly Summary

Building 1885

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
10,400 SF										
Foundation	A	\$18,492	\$10,546	\$0	0	\$29,038	\$2.79	703	0.00	0.00%
Porch	A + B	\$1,776	\$377	\$1,099	4,639	\$1,054	\$0.10	25.7	4.52	17.59%
Ext Walls	A + B	\$2,704	\$979	\$2,392	6,871	\$1,291	\$0.12	46.88	6.69	14.27%
Roof	B+D+F	\$19,984	\$522	\$13,331	48,653	\$7,175	\$0.69	74.3	47.39	63.78%
Int Finishes	B	\$1,619	\$122	\$565	3,546	\$1,176	\$0.11	10	3	30.00%

Building 1885 Deconstruction Method

- Panelize Roofs for Building Removal
- Mechanical Deconstruct Salvage Purlins and 2x Sheathing
- Disposal Shingles
- Hand Demolition Ceiling Finishes
- Lift Trusses / Hand Deconstruct Salvage Lumber
- Hand Deconstruct Salvage Ceiling Joists
- Mechanical “Soft” Demolition and Salvage Wall Studs
- Hand Deconstruct Porch
- Mechanical Demolition Slab and Foundation(s)

Building Breakdown

Building 1906 w/ barricade

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
1,972 SF										
Foundation/Barricade	A	\$29,635	\$12,747	\$0	0	\$42,382	\$21.49	1134	0.00	0.00%
Slabs	A	\$1,843	\$1,051	\$0	0	\$2,894	\$1.47	70	0.00	0.00%
Ext Wall N	B	\$437	\$45	\$183	1,091	\$299	\$0.15	3	1.06	35.42%
Ext Wall W	B	\$259	\$26	\$109	652	\$176	\$0.09	1.8	0.64	35.28%
W Gable	B	\$131	\$13	\$57	341	\$87	\$0.04	0.9	0.33	36.90%
S Wall	B	\$437	\$45	\$183	1,091	\$299	\$0.15	3	1.06	35.42%
E Wall	B	\$252	\$27	\$104	624	\$175	\$0.09	1.8	0.61	33.77%
E Gable	B	\$131	\$13	\$57	341	\$87	\$0.04	0.9	0.33	36.90%
Roof Sheathing	B	\$3,079	\$57	\$445	1,906	\$2,691	\$1.36	4.9	1.86	37.89%
Roof Trusses	B	\$507	\$33	\$842	5,413	-\$302	-\$0.15	6.6	5.27	79.88%
Room Int Fin	B	\$1,136	\$20	\$564	3,098	\$592	\$0.30	3.8	3.02	79.41%
Porch Ext Walls	B	\$11	\$1	\$98	181	-\$86	-\$0.04	0.2	0.18	88.15%
Porch Roof	B	\$85	\$1	\$66	194	\$20	\$0.01	0.3	0.19	62.98%
Total		\$37,943	\$14,079	\$2,708	14,932	\$49,314	\$25.01	1231	14.54	1.18%
w/out Barricade/Slab		\$6,465	\$281	\$2,708	14,932	\$4,038	\$2.05	27	14.54	54.47%

Does not include Contingency, O&P

Average wood value \$00.18 / BF

Building Assembly Summary

Building 1906 w/ barricade

1,972 SF	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Foundation / Barricade	A	\$31,478	\$13,798	\$0	0	\$45,276	\$22.96	1,204	0	0.00%
Ext Walls and Gables	B	\$1,647	\$169	\$693	4,140	\$1,123	\$0.57	11	4	36.36%
Roof	B	\$3,586	\$90	\$1,287	7,319	\$2,389	\$1.21	12	7	58.33%
Int Finishes	B	\$1,136	\$20	\$564	3,098	\$592	\$0.30	3.8	3.02	79.41%
Porch	B	\$96	\$2	\$164	375	-\$66	-\$0.03	1	0	74.00%

Building 1906 w/ barricade Deconstruction Method

- Hand Deconstruct Sheathing / Shingles
- Hand Deconstruct Trusses
- Hand Deconstruct Interior Wood Wall Finish
- Hand Demolition Siding
- Hand Deconstruction Exterior Studs/Sheathing
- Mechanical Demolition Slab and Foundation(s)

Building Breakdown

Building 1906 w/ 3-sided berm

1,620 SF	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Retaining Walls/Slab/Footings	A	\$5,580	\$3,182	\$0	0	\$8,762	\$5.41	212	0.00	0.00%
Ext Wall W & Gable	B	\$213	\$27	\$121	736	\$119	\$0.07	1.9	0.72	37.73%
Ext Wall E Gable	B	\$79	\$7	\$46	277	\$40	\$0.02	0.6	0.27	44.97%
Roof	B	\$1,960	\$63	\$590	4,213	\$1,433	\$0.88	7.2	4.10	56.99%
Int Fin	B	\$342	\$12	\$311	1,929	\$43	\$0.03	2.4	1.88	78.28%
Total		\$8,174	\$3,291	\$1,068	7,155	\$10,397	\$6.42	224	6.97	3.11%
w/out Retaining/Slab/Footings		\$2,594	\$109	\$1,068	7,155	\$1,635	\$1.01	10	6.97	68.32%

Does not include Contingency, O&P

Average wood value \$00.15 / BF

Building Assembly Summary

Building 1906 w/ 3-sided berm

1,620 SF	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Retaining Walls/Slab/Footings	A	\$5,580	\$3,182	\$0	0	\$8,762	\$5.41	212	0.00	0.00%
Ext Walls & Gables	B	\$292	\$34	\$167	1,013	\$159	\$0.10	3	1	39.47%
Roof	B	\$1,960	\$63	\$590	4,213	\$1,433	\$0.88	7.2	4.10	56.99%
Int Fin	B	\$342	\$12	\$311	1,929	\$43	\$0.03	2.4	1.88	78.28%

Building 1906 w/ berm Deconstruction Method

- Hand Deconstruct Sheathing/Shingles
- Hand Deconstruct Trusses
- Hand Deconstruct Interior Wood Ceiling Finish
- Hand Demolition Siding
- Hand Deconstruction Exterior Studs/Sheathing End Walls
- Mechanical Demolition Slab and Foundation(s)

Building Breakdown

Building 3036

2,320 SF	Crew	Labor/Equip	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Foundation/Slab	A	\$1,098	\$2,506	\$0	0	\$3,604	\$1.55	167	0.00	0.00%
Int / Ext Walls	A + B	\$657	\$415	\$0	0	\$1,072	\$0.46	19	0.00	0.00%
Lockers	B	\$2,393	\$0	\$3,000	6,227	-\$607	-\$0.26	6	6.07	100.00%
Roof	B	\$4,200	\$98	\$1,233	7,062	\$3,065	\$1.32	11.7	6.88	58.79%
Gables	B	\$132	\$19	\$82	495	\$69	\$0.03	1.3	0.48	37.09%
Total		\$8,480	\$3,038	\$4,315	13,784	\$7,203	\$3.10	205	13	6.55%
w/out Found/Slab		\$7,382	\$532	\$4,315	13,784	\$3,599	\$1.55	38	13	35.33%

Does not include Contingency, O&P

Average wood value \$00.31 / BF

Building Assembly Summary

Building 3036

2,320 SF	Crew	Labor/Equip	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Foundation/Slab	A	\$1,098	\$2,506	\$0	0	\$3,604	\$1.55	167	0.00	0.00%
Int / Ext Walls	A + B	\$657	\$415	\$0	0	\$1,072	\$0.46	19	0.00	0.00%
Lockers	B	\$2,393	\$0	\$3,000	6,227	-\$607	-\$0.26	6	6.07	100.00%
Roof / Gables	B	\$4,332	\$117	\$1,315	7,557	\$3,134	\$1.35	13	7	53.85%

Building 3036 Deconstruction Method

- Hand Deconstruct Sheathing/Shingles
- Hand Demolition Ceiling Finishes
- Hand Deconstruct Trusses
- Salvage Lockers
- Mechanical Demolition Exterior Walls
- Mechanical Demolition Slab and Foundation(s)

Building Breakdown

Building 3555

	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
4,684 SF										
Slab/Masonry	A	\$16,324	\$9,315	\$0	0	\$25,639	\$5.47	621	0.00	0.00%
Ext Wall N 1	A + B	\$420	\$114	\$1,292	3,667	-\$758	-\$0.16	9.5	3.57	37.60%
North Gable 1	A + B	\$98	\$27	\$169	784	-\$44	-\$0.01	1.9	0.76	40.19%
Ext Wall W 1	A + B	\$489	\$155	\$1,627	5,821	-\$983	-\$0.21	12.3	5.67	46.09%
Ext Wall W 2	A + B	\$70	\$22	\$122	398	-\$30	-\$0.01	1.5	0.39	25.84%
Ext Wall E 3	A + B	\$71	\$22	\$122	398	-\$29	-\$0.01	1.5	0.39	25.84%
Ext Wall E 2	A + B	\$489	\$155	\$1,627	5,821	-\$983	-\$0.21	12.3	5.67	46.09%
Ext Wall S 3	A + B	\$61	\$16	\$70	432	\$7	\$0.00	1.1	0.42	38.25%
Ext Wall S 4	A + B	\$61	\$16	\$70	432	\$7	\$0.00	1.1	0.42	38.25%
Ext Wall S 5	A + B	\$240	\$66	\$637	1,736	-\$331	-\$0.07	5.3	1.69	31.90%
South Gable 5	A + B	\$36	\$7	\$42	275	\$1	\$0.00	0.56	0.27	47.83%
Wall 2 N	A + B	\$207	\$11	\$471	853	-\$253	-\$0.05	2.33	0.83	35.66%
Wall 2 N Gable	A + B	\$36	\$1	\$42	204	-\$5	\$0.00	0.25	0.20	79.48%
Roof Main Sheathing	B+D+F	\$7,574	\$190	\$3,672	14566	\$4,092	\$0.87	23	14.19	61.68%
Roof Main Trusses	B + F	\$657	\$5	\$278	831	\$384	\$0.08	1	0.81	80.94%
Roof S High Sheathing	B+D+F	\$773	\$20	\$391	1571	\$402	\$0.09	2.5	1.53	61.21%
Roof S High Structure	B	\$88	\$4	\$101	621	-\$9	\$0.00	0.76	0.60	79.59%
Roof S Low W	B	\$307	\$4	\$67	397	\$244	\$0.05	0.54	0.39	71.61%
Roof S Low E	B	\$307	\$4	\$67	397	\$244	\$0.05	0.54	0.39	71.61%
Total		\$28,308	\$10,154	\$10,867	39,204	\$27,595	\$5.89	699	38.18	5.46%
w/out Slab/Masonry		\$11,984	\$839	\$10,867	39,204	\$1,956	\$0.42	78	38.18	48.97%

Average wood value \$00.27 / BF

Building Assembly Summary

Building 3555

4,684 SF	Crew	Labor	Disposal	Salvage	BF	Net Costs	Per SF	Mass MT	Salvage MT	% Salvage
Slab/Masonry	A	\$16,324	\$9,315	\$0	0	\$25,639	\$5.47	621	0.00	0.00%
Ext Walls	A + B	\$2,278	\$612	\$6,291	20,821	-\$3,401	-\$0.73	50	20	40.00%
Roofs	B+D+F	\$9,706	\$227	\$4,576	18,838	\$5,357	\$1.14	28	18	64.29%

Building 3555 Deconstruction Method

- Panelize roofs and dismantle on the ground
- Lift out trusses and dismantle on the ground
- Hand deconstruct low roofs and non-truss roof structure
- Demolish walls and pick-out timbers and framing lumber
- Demolish masonry walls and slabs

**APPENDIX - EXAMPLE
QUALITATIVE FORM**

Date: 11/21/02
Surveyor: Brad Guy
Building #: 275
Contamination Rating: 0

Building Dimensions

Length: See Beau's information list
Width: _____
Height: _____
of Stories: 1
Roof Slope: 6/12

Amount and Location of Asbestos

Suspect: _____
Survey: _____
Friable: _____
Non-friable: siding

Basic Construction

Concrete or Masonry: _____
Wood Frame: Yes w/ raised floor
Metal Frame: _____

Materials and Salvage Rate

Roof: 2x10 beams, 2x8 rafter, 2x6 joist @ 24" on half and 2x10 rafter, 2x6 joist on other half

Salvage %: 75 **Recycle %:** ____
% Lead-Based Paint on Wood: No

Floor: 2x6 T&G, 12x12 beams @ 5 bays, 2x12 joist @ 24" 2x6 subfloor
Salvage %: 75 **Recycle %:** ____
% Lead-Based Paint on Wood: No

Interior Finish: 1x6 T&G on perimeter walls
Salvage %: 75 **Recycle %:** ____

% Lead-Based Paint on Wood: No

Exterior Wall: 2x4 @ 24", 1x8 @ 45 degree exterior sheathing, horizontal lap siding

Salvage %: 75 **Recycle %:** ____
% Lead-Based Paint on Wood: No

Fixtures: No, some warehouse doors

Salvage %: N/A **Recycle %:** ____
% Lead-Based Paint on Wood: No

Equipment: N/A

Salvage %: _____ **Recycle %:** ____
% Lead-Based Paint on Wood: _____

Overall Salvage Value: 9 out of possible 10

% Salvage: 90
% Recycle: 5
% Disposal: 5

Descriptive Factors

Building Complexity: Low
Interior Partitions and Finishes: Low

Labor

Volunteer Hand Labor %: 90
Professional Hand Labor %: 5
Mechanical Labor %: 5

Entanglement Factor

Mechanical: 0 out of 10
Electrical: 3 out of 10
Plumbing: 0 out of 10
Equipment: 0 out of 10
(High # is High Degree of Entanglement)

Site Accessibility: High
Interior Accessibility: High
Safety Factor: Low
Mobilization Factor: High

