

Integrating Deconstruction and Recycling
Into the Demolition Process
In Buffalo, NY

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Executive Summary

Buffalo's Comprehensive Plan currently calls for the demolition of 10,000 buildings over a period of ten years.¹ While demolition contractors may recycle a small percentage of the waste created from demolitions, the process generates a great deal of waste that ends up in landfills. Many of the materials that are thrown away after a building is demolished are either reusable or recyclable. In order to lessen the negative environmental impact of building demolition, Buffalo needs to encourage demolition contractors to reuse and recycle more building materials. Even more effective than encouragement is requirement. Buffalo should require a minimum level of recycling in all its demolition contracts.

Buffalo should incorporate criteria into the building inspection process preceding demolition that will allow building inspectors to evaluate a building's potential for material reuse and recycling. When the initial inspection reveals that a building contains a larger than average amount of reusable and recyclable materials, the city should incorporate partial deconstruction into the demolition contract. Some buildings may lend themselves very well to complete deconstruction. In these instances, Buffalo should enter into deconstruction contracts with deconstruction or demolition contractors. Overall, incorporating recycling and deconstruction practices into the building demolition process in Buffalo will result in environmental, economic, and health benefits for the city and its residents.

¹ Queen City in the 21st Century: Buffalo's Comprehensive Plan (2004).

Current Demolition Practices

Demolition contractors currently recycle some of the waste that is created during the demolition process. Some demolition contractors in the Buffalo area publicize that they incorporate recycling into the demolition process. Ontario Specialty Contracting, LTD cites asset recovery and metals recycling as part of its demolition services.² This provides evidence that demolition contractors are capable of recovering assets from buildings that may have reuse value and of recycling certain waste materials. However, the demolition contractors do not publicize recycling as a primary goal, and it appears to be a fairly minimal part of the process. It is likely that demolition contractors recycle certain materials, such as metal, that have a very high value when recycled. For example, recycling facilities pay a significant fee for copper piping. However, demolition contractors' cost-benefit analysis does not include the health and environmental benefits of recycling to the public. If Buffalo wants to reap the economic, health, and environmental benefits of building material reuse and recycling, it will have to take additional steps to increase the amount of recycling done by demolition contractors.

Reusable and Recyclable Materials

Many of the materials that are thrown away after building demolition can easily be reused or recycled. Reusable materials include doors and door frames, windows, radiators, sinks, cabinetry, appliances such as stoves, furniture such as tables and desks, and hardware such as door knobs and hinges. Buffalo ReUse is a nonprofit deconstruction company that salvages these types of materials and sells them in a

² Ontario Specialty Contracting, LTD. Services. Available online at: <http://www.ontariospecialty.com/services.html>.

storefront location.³ Demolition contractors could sell the reusable materials that they salvage during the demolition process, or they could donate these items to other places that would sell them. Habitat for Humanity has a ReStore that accepts donations of these types of items and then sells them and uses the profits to fund Habitat for Humanity projects.⁴

Recyclable materials include metals, concrete, asphalt, drywall, carpet, and wood.⁵ Among these materials, concrete, wood, and drywall are found in the greatest volume when demolishing or deconstructing buildings.⁶ While these materials are sometimes recycled by demolition contractors because of their cost benefits, more recycling of these types of materials could be done. For example, metals and concrete are profitable to recycle because of their value and weight.

Encouraging Demolition Contractors to Recycle

At the very least, Buffalo should be encouraging demolition contractors to recycle salvageable building materials as much as possible when completing demolition projects. This encouragement could come in several forms. For example, the City could put language into demolition contracts that reads:

The City of Buffalo strongly prefers that building material waste resulting from demolition projects is recycled and reused as much as possible. The City of Buffalo urges [name of demolition contractor] to salvage as many building materials as possible during this project and arrange for the reuse or recycling of those materials. Building materials should not simply be thrown away out of convenience.

³ Personal visit to Buffalo ReUse store and conversations with staff there.

⁴ Personal visit to Habitat for Humanity ReStore and conversations with staff there.

⁵ U.S. Environmental Protection Agency. Construction & Demolition Materials: Recycle. Available online at: <http://www.epa.gov/epaoswer/non-hw/debris-new/recycle.htm>.

⁶ Sandler, Ken. Analyzing What's Recyclable in C&D Debris. Available online at: [http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/BMOE5XLKDG/\\$File/Analyzing_C_D_Debris.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/BMOE5XLKDG/$File/Analyzing_C_D_Debris.pdf).

This type of encouragement will begin to communicate the message that the City cares about what demolition contractors are doing with their waste.

Another way that Buffalo can encourage increased recycling by demolition contractors is to make it more economically advantageous for demolition waste to be recycled rather than taken to landfills. Currently, tipping fees at Buffalo area landfills are very low, ranging from \$30 to \$50 per ton.⁷ The average tipping fee for landfills in New York State is \$67.74, making Western New York's tipping fees exceedingly low in comparison to the rest of the state.⁸ Low tipping fees at landfills encourage demolition contractors to throw away demolition waste rather than take the time to reuse or recycle it. If tipping fees were higher, demolition contractors would be more likely to figure out less expensive ways to discard demolition waste, such as recycling. The city can change this situation by encouraging the state to tax tipping fees at area landfills, effectively raising the price demolition contractors have to pay to throw away demolition waste. Until recycling and deconstruction are legally required of demolition contractors, this is really the only way to ensure that unnecessary landfill dumping decreases significantly.

Mandatory Recycling Provisions

Mandatory recycling provisions within demolition contracts are an effective tool for getting demolition contractors to recycle building materials that might normally be thrown away. Many cities require that construction and demolition contractors divert a specified percentage of the waste created at job sites away from landfills. For example,

⁷ Erie County Construction & Demolition Debris Recycling Directory (2003).

⁸ Solid Waste Digest. Available online at: <http://www.oznet.ksu.edu/swr/Module4/Introduction.htm>.

the City of Chicago now requires that 50% of waste created by construction and demolition projects be recycled rather than thrown away.⁹

Chicago requires this recycling through its Construction or Demolition Site Waste Recycling Ordinance. A copy of Chicago's ordinance can be found in [Appendix A](#).¹⁰ Buffalo should adopt a similar city ordinance requiring demolition contractors to recycle a specific percentage of the waste that is created at job sites. Because Buffalo's effort to require recycling by demolition contractors is new, the City may want to begin with a lesser requirement than Chicago currently uses. For example, Chicago started with a 25% recycling requirement and increased that amount over time. Buffalo's Demolition Site Waste Recycling Ordinance may require waste recycling using language such as:

Any project subject to this section shall be required to recycle or reuse demolition debris produced on site as part of demolition activities by meeting the following requirements:

The contractor on a project that is issued a permit with an application date on or after January 1, 2008 shall cause to be recycled or reused at least 25% of demolition debris, as measured by weight, produced on site.

Additionally, similar language should be included in all demolition contracts using language such as:

[Name of demolition contractor] is required to cause to be recycled or reused at least 25% of demolition debris, as measured by weight, produced on site during the demolition covered by this contract.

⁹ City of Chicago. Construction and Demolition Recycling. Available online at: http://egov.cityofchicago.org/city/webportal/portalContentItemAction.do?BV_SessionID=@@@@1010687856.1194626229@@@@&BV_EngineID=ccccaddmhjfdkggcefecelldffhdfhg.0&contentOID=536909079&contentTypeName=COC_EDITORIAL&topChannelName=HomePage.

¹⁰ City of Chicago. 11-4-1905 Construction or Demolition Site Waste Recycling. Available online at: http://egov.cityofchicago.org/city/webportal/portalContentItemAction.do?contentOID=536932617&contentTypeName=COC_EDITORIAL&topChannelName=HomePage.

Passing an ordinance requiring a certain percentage of reuse and recycling during demolition projects is a very effective first step that Buffalo can take to decrease the negative health and environmental impacts of demolition.

Enforcement of the recycling requirements is also a concern. As seen in its ordinance, Chicago imposes fees on demolition contractors that do not follow recycling requirements. It will be important for Buffalo to address the issue of enforcement as well, with an ordinance provision such as this:

Within 30 days of the completion of a demolition project falling under the scope of this ordinance, the demolition contractor must submit paperwork certifying its compliance with the ordinance. Any contractor not in compliance with the ordinance must pay a fine of \$1,000 per percentage point of difference between the amount required by this section to be recycled or reused and the amount actually recycled or reused.

The city may consider varying fine amounts depending on the size of individual deconstruction projects. Chicago's compliance form, which must be submitted within 30 days of the completion of a demolition project, is included in [Appendix B](#).

Building Evaluation

Some buildings that are being considered for demolition may have even greater potential for recycling. In these cases, the minimum mandatory recycling provision suggested above may not take full advantage of this potential. Therefore, Buffalo needs to adopt a process for evaluating any building that is being considered for demolition in order to determine the potential for reusing and recycling the materials.

When city building inspectors inspect a building to determine whether it needs to be taken down, they should incorporate an evaluation of the reusability and potential for recycling of the materials within the building. Incorporating this evaluation into the

inspection that already takes place will not require many additional resources. Other cities have evaluated their abandoned and condemned buildings for this same purpose.

Many factors should be considered when deciding if a building has potential for more than the mandatory recycling requirements. Building inspectors should analyze the presence of several types of reusable and recyclable materials. First, they should note the quantity and condition of windows, doors, door frames, major appliances, furniture, sinks, cabinetry, drywall, flooring, carpet, woodwork, and hardware that could be sold for reuse in construction and rehabilitation projects. If these items are not of reuse quality, it should be noted whether they can be recycled. Second, inspectors should note the quantity of more traditional recyclable materials such as concrete, asphalt, metals, and wood. Buffalo should provide building inspectors with a checklist that would assist them in this analysis. For a sample checklist, see [Appendix C](#).

Using the building survey form in [Appendix C](#), building inspectors can evaluate the presence of specific recyclable and reusable materials. Inspectors should rate each material on a five point scale, based on the amount of the material that is present in the building and the potential that material has for reuse or recycling. For example, if an item is barely present in a building and its condition is such that it could not be reused or recycled, it should be given a rating of one. If an item is present in the building in large quantities and is in a reusable or recyclable condition, it should be given a rating of 5. These ratings can be used to guide contractors when they are tearing down the building. Even more importantly, the ratings should be used by building inspectors to determine the appropriate recycling requirements to impose upon individual demolition and deconstruction projects.

Based on the inspector's analysis of the potential for reuse and recycling in a given building, he should rate his overall opinion of the building on the form. If materials within the building were given many low ratings, he may choose to assign a poor overall rating. A poor rating would result in demolition of the building with only minimum recycling requirements. Next on the scale, a below average rating would result in demolition of the building with a 5% increase in recycling requirements because the building shows a small increased potential for recycling. An average rating would result in demolition of the building with a 10% increase in recycling requirements. A good rating would result in partial deconstruction of the building with a 25% increase in recycling requirements. Finally, an excellent rating would result in deconstruction of the building with the goal of maximizing reuse and recycling of building materials.

Partial Deconstruction

When a building is identified as having potential for an increased level of recycling, the city should heighten the recycling requirements in the demolition contract for that building. The city must consider that requiring large amounts of recycling may require demolition contractors to use unfamiliar techniques when they are tearing down a building, in order to salvage materials. These techniques are essentially deconstruction techniques that keep reusable and recyclable materials intact. Demolition contractors in the Buffalo area already know how to use some of these techniques. DEMCO Decommissioning and Environmental Management Co. advertises production facility dismantlement for reuse and relocation, which would use similar techniques as

deconstruction.¹¹ Titan Wrecking & Environmental, LLC advertises surgical demolition, which is essentially the same as deconstruction.¹²

While demolition contractors may know how to use some deconstruction techniques, the city should supply demolition contractors with training materials on deconstruction when it is requiring a large percentage of building waste to be recycled. In Florida, the Deconstruction Institute developed a deconstruction training guide to provide demolition contractors and others with training on deconstruction issues and techniques.¹³ Because deconstruction is more labor intensive and requires more hands-on work by people, some of this training should be centered on safety and work crew management. A small portion of the Deconstruction Institute's Guide to Deconstruction is attached in [Appendix D](#), and the full guide can be accessed online. Buffalo could easily provide a similar guide to demolition contractors that are new to deconstruction techniques and issues.

Deconstruction Instead of Demolition

When the inspection of a building reveals that it has great potential for the reuse and recycling of materials, it is appropriate to hire a deconstruction contractor to take down the building rather than a demolition contractor. Deconstruction contractors are specifically in the business of trying to reuse and recycle the greatest quantity of building materials possible. Locally, Buffalo ReUse is a nonprofit organization that focuses on

¹¹DEMCO Decommissioning and Environmental Management Co. Services. Available online at: <http://www.demcodemolition.com/services.asp>.

¹² Titan Wrecking & Environmental, LLC. Services. Available online at: <http://www.titanwrecking.com/services.php>.

¹³ Deconstruction Institute. A Guide to Deconstruction. Available online at: http://www.deconstructioninstitute.com/files/learn_center/45762865_guidebook.pdf.

developing deconstruction practices in Buffalo. Buffalo ReUse is currently welcoming contracts for deconstruction projects, and has responded to the City of Buffalo's request for proposals to deconstruct 10 buildings in the near future.¹⁴

When the City of Buffalo decides that a building should be deconstructed, it should create a Request for Proposals for a deconstruction contract. Traditional demolition contractors should be allowed to bid on deconstruction contracts as well. As deconstruction practices become more common in the field of demolition due to increased recycling requirements, the differences between demolition contractors and deconstruction contractors will become less visible.

Benefits

Traditional demolition practices have many negative effects on the environment and the health of people living in communities where demolition projects take place. The dust and debris that are released into the air when buildings are demolished are harmful to people's health, and the noise and vibrations caused by demolition hurt the quality of life for neighborhood residents.¹⁵ In addition, the local environment suffers when huge amounts of demolition waste are dumped in area landfills rather than recycled.

Increased recycling and the use of deconstruction techniques can significantly decrease these negative effects. Simply requiring that demolition contractors recycle a significant percentage of their waste will decrease the impact on our local environment. The use of deconstruction techniques in place of traditional demolition techniques will

¹⁴ Buffalo ReUse. History of Buffalo ReUse. Available online at: <http://www.buffaloreuse.org/Main/HistoryOfBuffaloReUse>.

¹⁵ Environmental Health Perspectives. Beyond the Bench: Clean Sweep: Adopting Safer Urban Demolition Practices. Available online at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1817685>.

decrease other effects on local residents. Deconstruction contractors take a building apart carefully and slowly rather than by abruptly knocking it down. This results in less dust and debris in the air, lessening the impact on neighborhood residents that may suffer from problems such as asthma. In addition, deconstruction is likely to create less noise due to more hands-on work by people rather than machines.

On top of these environmental and health benefits, the use of deconstruction has economic benefits for Buffalo as well. Because deconstruction techniques require more hands-on work by people, it creates more jobs (even as the sale of salvaged materials keeps the overall costs of deconstruction competitive with demolition). The City of Buffalo can view the deconstruction industry as an untapped asset in the Buffalo community.

Conclusion

The City of Buffalo plans to demolish 10,000 buildings over the course of the next 10 years. While many abandoned and blighted buildings in Buffalo need to be taken down, traditional demolition practices have many negative effects on the local environment and the health of local residents. Therefore, Buffalo needs to require demolition contractors to increase the rate at which they reuse and recycle the waste created when buildings are destroyed. While simple encouragement is a start, the City needs to take more action. Increased recycling can be made more cost effective for demolition contractors if tipping fees are increased through a state tax, but this reform is somewhat outside the scope of the City's powers.

There are many things Buffalo can do to increase recycling and encourage the use of deconstruction practices. At a minimum, Buffalo should pass a city ordinance that would attach minimum recycling requirements to all demolition contracts entered into by the City. Additionally, Buffalo should incorporate an analysis of the potential for material reuse and recycling into the current building inspection process. The City should then use that analysis to create greater recycling requirements for buildings that have an increased potential for such activities. Based on the building inspector's analysis, the City should categorize buildings as subject to the minimum recycling requirements, a 5% increase in minimum recycling requirements, a 10% increase in minimum recycling requirements, partial deconstruction with a 25% increase in minimum recycling requirements, or deconstruction with the goal of maximizing the reuse and recycling of waste materials. These efforts will create significant advantages for Buffalo, including environmental, health, and economic benefits.