



WASTE MANAGEMENT

Objective

The objective is to develop a waste management plan for the AHIB that would use construction materials more efficiently and recycle the scrap material generated onsite. An effective plan promotes a more efficient use of construction materials during installation, reduces the amount of debris being sent to landfills, and helps the environment. For the AHIB project, a 50% recycling goal is set.

What is Waste Management?

Waste management is the practice of waste reduction that includes prevention, salvage, deconstruction, and recycling (Construction Waste Management Guide). For the purpose of this analysis, the majority of the focus will be on recycling, which entails the separation and recycling of recoverable waste materials generated during construction and remodeling. Packaging, new material scraps, old materials, and debris all constitute potentially recoverable materials (www.greenbuilder.com).

A good waste management plan is implemented very early in the project's life, typically in the design phase. However, to be effective, a good plan is constantly being monitored during the construction phase as well. It is very important to set waste reduction goals for each project, to monitor the goals, and set new goals as they become necessary.

Nonresidential construction accounts for approximately 57% of the debris generated in the United States. The following table summarizes the generation of building-related construction and demolition debris.



<u>Source</u>	<u>Residential</u>		<u>Nonresidential</u>		<u>Totals</u>	
	Thou	Tons %	Thou	Tons %	Thou	Tons %
Construction	6,560	11	4,270	6	10,830	8
Renovation	31,900	55	28,000	36	59,900	44
Demolition	19,700	34	45,100	58	64,800	48
Totals	58,160	100	77,370	100	135,530	100
Percent	43		57		100	

Source: Franklin Associates

Typically, wood is the material that generates the most debris on construction and renovation sites. Commonly, the debris from a construction site is taken to a landfill. An estimated 35 to 40 percent of construction debris was discarded in landfills in 1996.

Why do it?

There are several important reasons why an owner may ask for a waste management plan or a construction management team may implement one. Most good construction management companies would want to implement a waste management plan on their site to promote the efficient use of material. Salvaging construction material that can be used for another project or even the same project will reduce the cost of material by using pieces that in the past may have been thought of as scrap material. As the owner and operator of the AHIB, Howard CC wants to have a building of which they can be proud. Using environmentally friendly construction methods can go a long way to improve the public perception of the building and its owners. Also, tax credits are available to the owner if certain requirements are fulfilled involving green construction such as recycling (www.aicpa.org). Recycling material also provides some benefits in cost savings. It can be cheaper to send certain materials to recycling centers than to send them to a landfill.



What can be recycled?

The most common materials that are recovered and recycled are concrete, asphalt, metals and wood. However, many more construction-generated materials can be recycled. There are many recycling centers located in Maryland, and each one specializes in recycling different materials.

Materials that are commonly recycled include:

- Bricks
- Cardboard
- Carpet
- Concrete
- Drywall
- Paint
- Wood
- Window Glass
- Metals

For this analysis, wood, concrete and gypsum board will be the main focus of materials that are recycled. The LEED (Leadership in Energy and Environmental Design) requirements specify different levels of recycling rates for achieving points. One, two, or three points may be earned for achieving a 50%, 75%, or 90% recycling rate, respectively. Additional points may be earned for salvaged, refurbished, or reused materials.



Where can it be recycled?

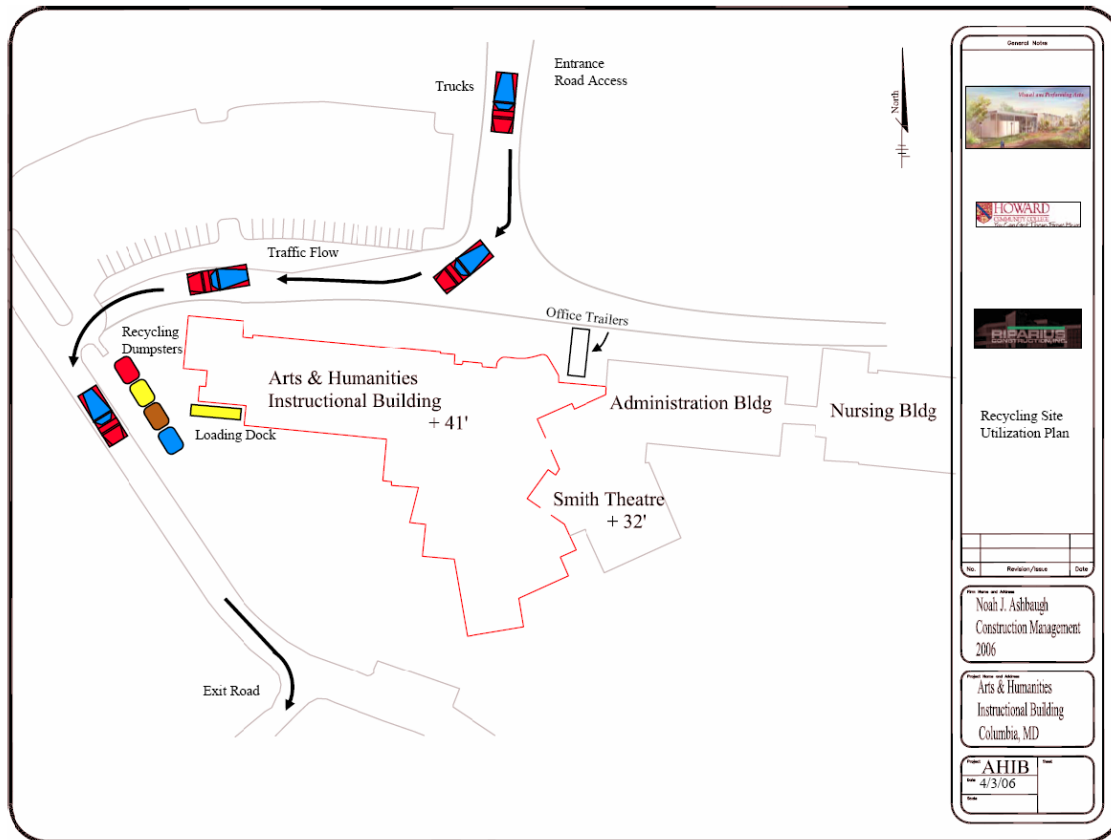
Several recycling centers have been identified near the location of the project.

(www.mdrecycles.org)

Name of Center	Distance from jobsite	Materials Accepted
Baltimore Scrap Corporation	40 miles	Scrap Metals
Better Composting, Inc.	42 miles	Gypsum Board
Benjer, Inc.	37 Miles	Concrete, Wood, Brick

Site Plan

The site of the AHIB is a little congested, making planning for waste removal an important step in the waste management process. A site plan is developed for the flow of waste material and truck logistics through the site. Specific recycling bins are established for different materials that are encountered and are to be recycled. An area on the site is designated for the recycling bins. The bins need to stay easily accessible to both the pick up trucks as well as the construction workers who will be depositing the material into the bins. Therefore, the bins are kept close to the construction road as well as to the loading dock at the rear of the building.



Recycling Costs?

Several factors are associated with the cost of removing construction debris from the job site. They include: a tipping fee, which is the cost of either cubic yards or tons of material for a recycler or landfill to accept the material; a hauling fee, the cost of picking up the debris and hauling it back to the landfill or recycling plant; and the dumpster rental fee. Recycling plants are set up to accept one material or another, and because of this, separate dumpsters need to be designated at the jobsite for easy and efficient separation of materials. Having multiple dumpsters, each designated for a certain material, takes up room on the jobsite, making site planning an important task. Also, some additional time is required for separating the materials as opposed to just putting all the debris in one dumpster. However, this labor cost is not explored in the study. The major focus of the analysis is to determine the material and hauling costs of recycling versus not recycling.



The exact material cost of recycling the specified materials is listed in a cost evaluation table in Appendix C. In summary, recycling 50% of the wood, gypsum, and concrete will save approximately \$2,500 compared to not recycling.

Conclusion

Although the AHIB project currently has no recycling or waste management plan established, implementing a plan could be easily achieved. Not only will a waste management plan reinforce the idea of minimizing construction waste, it promotes recycling materials. It was shown that recycling 50% of the wood, gypsum and concrete could actually save approximately \$2,500 over the length of the project. Because recycling costs less per total tonnage of material, the more material that is recycled, the more money will be saved. From the waste management analysis, a well-planned program will save money and is therefore recommended for the AHIB project.