

# RC 1: RECYCLE CONSTRUCTION WASTE

*New York City Building Code*

Proposal developed by the Construction Practices Committee

## Summary

### Issue:

While most waste from construction sites can be collected in dumpsters and then separated and recycled off-site, certain materials become damaged when commingled. They cannot be reused or recycled unless they are separated at the construction site.

### Recommendation:

Require ceiling tiles, carpeting, new gypsum wallboard scrap, and large-dimension lumber to be sorted on-site and reused or recycled. Also, require construction-waste management plans for large projects.

## Proposed Legislation, Rule, or Study

*Amendments to the New York City Building Code:*

1. Add the following definitions to Section 3302.1:

**CONSTRUCTION WASTE MANAGEMENT PLAN.** A plan outlining procedures for the reuse, including resale, or recycling of recoverable waste materials generated during construction and demolition.

**LARGE-DIMENSION LUMBER.** Any lumber with a minimum dimension of two inches by eight inches by eight feet.

**NEW GYPSUM WALLBOARD SCRAP.** Pieces of gypsum wallboard left over from the cutting and installation of new gypsum wallboard.

2. Add a new Section 3303.15 as follows:

### **3303.15 Waste recycling / reuse.**

**3303.15.1 Recycling carpet, ceiling tiles and gypsum wallboard scrap.** Any construction, alternation, partial demolition, or demolition of a building or space greater than 20,000 square feet (1,858 m<sup>2</sup>) before July 1, 2013 or greater than 10,000 square feet (929 m<sup>2</sup>) on or after July 1, 2013 shall comply with this Section 3303.15.1. All waste ceiling tiles, carpet, carpet padding, carpet tiles, and new gypsum wallboard scrap shall be separated from other waste at the construction site, stored in a dry location, and sent to a facility for recycling or reuse. Such materials shall not be commingled with dissimilar material during onsite storage or transportation.

Exception: If the construction or demolition does not involve more than 10,000 square feet (929 m<sup>2</sup>) of ceiling tiles, 10,000 square feet (929 m<sup>2</sup>) of, collectively, carpet, carpet padding, and carpet tiles, or less than 1,000 square feet of new gypsum wallboard scrap. Beginning July 1, 2013, this exception shall only apply when there is less than 5,000 square feet (465 m<sup>2</sup>) of any such materials, except for new gypsum wallboard scrap.

Exception: When prior to commencement of demolition, materials are damaged, contaminated, or do not comply with industry recycling requirements, including foil-backed carpet tiles, wool carpet, and other carpet that cannot be recycled.

**3303.15.2 Salvaging large-dimension lumber.** Any construction, alternation, partial demolition, or demolition of a building or space greater than 1,000 square feet (93 m<sup>2</sup>) shall comply with this Section 3303.15.2. All large-dimension lumber shall be separated from other waste at the construction site, stored in a dry location, and sent to a facility for reuse. Such materials shall not be commingled with dissimilar material during onsite storage or transportation. Such material shall not be cut except as necessary for removal and shall be maintained in as large a piece as feasible.

Exception: Large-dimension lumber that has no reclaimed value due to damage by rot, dry rot, termites, splitting, fire, or other damage.

**3303.15.3 Construction waste management plan.** Any application for a permit for the following work shall include a construction waste management plan:

1. any alternation or partial demolition of a building or space greater than 50,000 square feet (4,645 m<sup>2</sup>) before July 1, 2013 and greater than 20,000 square feet (1,858 m<sup>2</sup>) after July 1, 2016; and
2. any new building or full demolition.

**3303.15.3.1 Contents of construction waste management plan.** The construction waste management plan shall:

1. comply with the requirements of this Section 3303.15;
2. describe how asphalt, cardboard, concrete, gypsum wallboard, masonry, office furniture and furniture systems, steel, and wood will be collected, sorted, transported, and delivered to a facility for reuse, recycling, or landfill disposal;
3. describe procedures for compliance with state or federal laws regarding disposal of any material containing mercury, lead, asbestos, or any polychlorinated biphenyl;
4. list the corporate names and addresses of any organization responsible for transportation, reuse, recycling, or landfill disposal;
5. outline the documentation each party will maintain to verify that material has been diverted from landfill in accordance with this chapter; and
6. be available at the construction site.

## Supporting Information

### Issue - Expanded

In 2002, waste from construction and demolition in New York City totaled 7.91 million tons.<sup>1</sup> Of this, nearly 70% was recycled, indicating that NYC already has rather high rates of diversion of construction and demolition wastes from landfills. However, there is still significant potential for improvement since many re-useable and/or recyclable materials are still landfilled due to improper handling and/or the comingling of materials.

Sending construction and demolition waste to landfills, rather than recycling the material, clogs our limited landfills and increases the production of new materials, generating greenhouse gas emissions. The number of construction and demolition landfills near New York is declining, which means fuel consumption and related emissions from transporting waste will increase as New York uses more distant landfills in the future.

Large dimension lumber is most commonly found in older townhouses, warehouses, and single-family homes. It is typically old growth lumber, which is a non-renewable resource. Reclaimed lumber can later be re-used as structural members in similar new construction and renovation, made into high-end designer furniture, used as lagging in excavations, cut into blocking, or used for other purposes depending on the quality.

### Environmental & Health Benefits

Increasing the quantity of materials recycled will result in better resource utilization, less natural resources depleted, and the encouragement and creation of local NYC (green) jobs.

This proposal was found to have a high, positive environmental impact per building and to impact a large number of buildings. It was thus given an environmental score of 3.

This proposal was found to have no significant health impact.

### Cost & Savings

As described in the Executive Summary, Bovis Lend Lease prepared cost estimates for each Task Force proposal in the context of well-defined construction projects in specific buildings. Where possible, members of the Technical Committees prepared savings estimates for some of these projects and buildings. These cost and savings estimates are presented in the February 1<sup>st</sup> draft version of Appendix A. The innate uncertainty in how construction and operation will vary from one building to another, the complexity of the Task Force proposals, and the wide range of applications in which the proposals may be realized mean these figures are truly estimates.

This proposal is not expected to have any significant impact on capital costs.

### Precedents

The City of Portland Bureau of Planning and Sustainability requires all building projects with a permit value of \$50,000 or more (including construction and demolition phases) to separate and recycle certain materials from the job site. The general contractor is responsible for ensuring recycling at the job site, including recycling by sub-contractors, and for completing a Pre-Construction Recycling Plan Form. Contractors must keep these materials out of the landfill: Rubble (concrete/asphalt); Land Clearing Debris; Corrugated Cardboard; Metals; and Wood.<sup>2</sup>

In 2006, the City of San Francisco adopted Ordinance No. 27-06 mandating the recycling of construction and demolition (C&D) debris in order to divert a minimum of 65% of the material from landfill.<sup>3</sup> This ordinance affects all construction projects such as new construction, remodels, and partial demolitions, and requires the building permit holder or the property owner to make sure that all C&D materials removed from the project are properly recycled. This ordinance prohibits any C&D materials from being placed in trash or sent to a landfill.<sup>2</sup>

Over the last several years the following companies have had active recycling programs for these materials at de minimus cost: Tiffany, Pfizer, Merrill Lynch.

### **LEED**

All LEED rating systems encourage the reuse or recycling of construction waste including LEED NC-MR cr. 2.1 & 2.2 (Construction Waste Management, Divert from Landfill); LEED CI-MR cr. 2.1 & 2.2 (Construction Waste Management, Divert from Landfill); LEED EB-MR cr. 1.1 & 1.2 (Construction, Demolition, and Renovation); LEED for Homes MR cr. 3.1 & 3.2 (Waste Management); and pilot programs such as LEED for Retail and LEED for Neighborhood Development.

Reporting requirements of new Section 3303.15.3 of this proposal allows for the easy collection of data for submission to the USGBC for LEED Certification or for analysis by the City.

It should be noted that LEED does not differentiate the size of the building or space under consideration, nor does LEED differentiate between types of materials to be segregated.

### **Implementation & Market Availability**

1. The National Carpet Manufacturers (through the Carpet America Recovery Effort - CARE) are committed to increasing the recycling of carpet and carpet tile through a national network of consolidators, one of which is in the NYC New York City area. It would be beneficial to have additional consolidators in the New York City area. For single stream waste recyclers, a permit from NYSDEC is not required; although their support and cooperation would be helpful. For carpet and carpet tile, the economical breakpoint (as of 12/08) is approximately 10,000 to 20,000 sf. National carpet manufacturers participating in these recycling programs include Shaw, Interface, Mohawk, and Milliken.
2. For ceiling tile, Armstrong and US Gypsum, the two largest manufacturers, both have national programs to recycle ceiling tile, although only Armstrong's program is operational in the New York City region. For ceiling tile the economical breakpoint is approximately 20,000 to 30,000 sf.
3. Clean gypsum scrap can easily be incorporated into the manufacture of new gypsum wallboard however no collection facilities currently exist in the New York City region. Typically 100% of pre-consumer gypsum scrap is recycled, however close to 0% of post-consumer scrap is.
4. Preliminary estimates of materials to be recycled annually during the initial three years of the program are 11 million sf of ceiling tile and 57 million sf of carpet/tile. The existing consolidator projects that his company can handle 1 to 3 million sf of ceiling tile and 7 to 15 million sf of carpet tile with his present capacity (the lower end of the range). The carpet manufacturers are recycling at a rate in excess of 200 million pounds (equivalent to 300 million sf @ 6 pounds/square yard or 0.67 pounds/sf) of carpet per year. Armstrong indicates that they are only accepting a small portion of the amount that they could recycle. They produce 1 million sf of ceiling tile per day (or 300 million sf/year) at their Pennsylvania plant.
5. There are many small and medium scale lumber salvage companies in New York City. Most such companies will come to a project site during demolition and remove the lumber, paying for any quality lumber. Securing this service generally does not require more than a phone call with a few days notice before demolition.

Local salvage companies include the following:

[M. Fine Lumber](#), Brooklyn NY  
Sawkill Lumber Co., Bronx  
Build It Green, Queens  
Big Wood, Upstate NY

### **Notes**

Two different approaches were considered to increase diversion rates. Initially a system similar to LEED was considered. That approach mandated required a Construction Waste Management Plan to be developed for each project and mandated high diversion requirements. It was felt this approach would place an undue burden on certain types of projects and not on others. (Due to the different conditions and materials that may be present on a site, some projects would be unduly burdened with trying to reclaim and recycle wastes of no value that would eventually be landfilled anyway.)

An alternate approach the committee investigated was to require recycling of all recyclable demolition and construction waste. This was also deemed too burdensome due to NYSDEC constraints on transfer facilities that limit some of the materials to be diverted.

The final proposal represents a compromise between these two options by targeting specific materials that are often not diverted due to damage caused by handling and/or co-mingling. Requiring site sorting of these materials will likely

push diversion rates to their highest practical point. Market forces will continue to encourage off-site sorting of the other construction and demolition waste.

This proposal sets a lower project size threshold for separation of large-dimension lumber than for separation of other materials. Consultations with local salvagers indicate that there is no lower limit on project scale when it comes to large-dimension lumber: a salvager will come to a site for just a few good quality boards. In addition, arranging for the salvage of such lumber only requires a telephone call, as compared with the training that maybe required for the separation of other materials addressed in this proposal.

## ENDNOTES:

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<sup>1</sup> HENNINGSON, DURHAM, AND RICHARDSON ARCHITECTURE AND ENGINEERING, P.C., COMMERCIAL WASTE MANAGEMENT STUDY, VOL. 4., EVALUATION OF WASTE DISPOSAL CAPACITY POTENTIALLY AVAILABLE TO NEW YORK CITY, (2004) <http://www.nyc.gov/html/dsny/downloads/pdf/swmp/swmp/cwms/cwms-ces/v4-ewdc.pdf>; See also U.S. EPA, WHAT'S IN A BUILDING? COMPOSITION ANALYSIS OF C&D DEBRIS, <http://www.epa.gov/region09/waste/solid/pdf/cd1.pdf> (last visited Jan. 12, 2010); and, Tom Napier, Construction Waste Management, U.S. Army Corps of Engineers, Engineer Research and Development Center / Construction Engineering Research Laboratory (2008) <http://www.wbdg.org/resources/cwmgmt.php>.

<sup>2</sup> City of Portland Bureau of Planning and Sustainability, Construction, Remodeling and Demolition Waste, <http://www.portlandonline.com/osd/index.cfm?c=41683> (last visited Jan. 12, 2010).

<sup>3</sup> SFENVIRONMENT, SAN FRANCISCO, CALIFORNIA ORDINANCE NO. 27-06, <http://www.sfenvironment.org/downloads/library/ondemolitionordinancefinal.pdf> (last visited Jan. 12, 2010).

<sup>4</sup> SFENVIRONMENT, CONSTRUCTION AND DEMOLITION DEBRIS RECYCLING, [http://www.sfenvironment.org/our\\_programs/interests.html?ssi=3&ti=5&ii=125](http://www.sfenvironment.org/our_programs/interests.html?ssi=3&ti=5&ii=125) (last visited Jan. 12, 2010).