

Recycling C&D Debris to Higher End Value



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Construction & Demolition Debris (C&D Debris)

- 124 million tons per year in US based on 2005 US Census Population Estimate.
- Building Related Only.
- Not including highways and bridges.
- Based on 2.3 pounds per person per day estimated by the USEPA in 1998.

Construction & Demolition Debris (C&D Debris) (cont.)

- NYSDEC:
 - 2,700,000 Tons per year (as of 2005) into 42 Landfills
 - Top 5 are 73%
 - Over 50% are NYC Metro
 - 3,400,000 Tons per year (as of 2005) into 222 Registered Processing Facilities
 - Top 4 Registered Facilities (NY City Metro) are 73%
 - 3,000,000 Tons per year (as of 2005) into 75 Regulated Processing Facilities
 - Top 8 Regulated Facilities (NY City Metro) are 72%

Construction & Demolition Debris (C&D Debris) (cont.)

- C&D Debris generation is between:
 - 6.4 Million Tons per year, and
 - 9.1 Million Tons per year

Processed	3,400,000
	3,000,000

Landfilled	2,700,000
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Construction & Demolition Debris (C&D Debris) (cont.)

- 124 million tons per year in US Building Related C&D debris
- 6.4 million tons per year, and
- 9.1 million tons per year
 - Both estimated from NYSDEC Data
- 5.1- 7.3% of estimated US generation rate
- 5.3% of US population was estimated to live in NY in 2005
- NYSDEC data produce a range of generation rates for NY that appears reasonable.

Building Deconstruction

- Some materials can be economically removed:
 - Copper pipe, cast iron pipe, drawn steel pipe
 - Drop ceiling metal grids, aluminum siding
 - Ceiling tile
 - Acoustic tile
 - Carpets
 - Architectural elements – mantels, accents, stair rails, cabinets, bath fixtures, windows

- Sort on site and direct to appropriate hauler or recycler

- Other materials, if you look for ways to recycle.

LEED Points

- Leadership in Energy & Environmental Design (LEED) Green Building Rating System
- 1 Point = 50% Diversion of Construction Waste from Disposal
- 1 Point = Additional 25% (or 75% Total) Diversion from Disposal
- Excavated soils & land clearing debris not eligible
- Donations to Charitable Organizations Allowed (e.g. greendemolitions.org, habitat.org/donation/)

C&D Processors

- “Predetermined” Beneficial Use Determination (BUD) for “recognizable, uncontaminated
 - concrete and concrete products,
 - asphalt pavement,
 - brick,
 - glass,
 - soil, and
 - rock

placed in commerce for service as a substitute for conventional aggregate.”

C&D Processors (cont.)

- “Predetermined” BUD for Aggregate
- Can use:
 - As generated
 - Crushed by dozer
 - Crushed and size sorted to Item #4 aggregate
- Item #4 Aggregate meets a specification and receives highest price in construction

C&D Processors (cont.)

- Sort

- Wood
(unadulterated)
- Gypsum
- Metal – large & small
(even nails and staples)
- Cardboard
- Asphalt Shingles

- Suggested Uses:

- Decorative landscape mulch
- Multiple uses (see next slide)
- Send for scrap metal recycling
- Send for recycling
- Soil separation & reinforcing layer (see later slide)

C&D Processors (cont.)

- Asphalt Shingles
 - NYSDEC BUD list shows 4 BUDs for Asphalt Shingles and these are:
 - 3 road sub-base layer (inexpensive geotextile?)
 - 1 minus 1/2" size into hot mix asphalt concrete.
- Why not more of above?
- Why not a fuel supplement/replacement?
Perhaps in cement where mineral would not be too detrimental?
- Is asbestos content limiting either of above?

Gypsum

calcium sulfate dihydrate or $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

- NYSDEC BUD list shows 5 BUDs for Gypsum Wallboard and these are:
 - 3 soil, 1 new wallboard, 1 oil spill absorbent
 - Mushroom growers:
 - Reduces greasiness of compost (reduced washing?)
 - Increased air penetration in compost
 - A major ingredient in the production of fertilizer products
 - Cement - but paper fiber content is inhibiting
 - Paper as animal bedding
- Is market ready to separate fiber? Specific gravities of gypsum and fiber must be different Other means of separating paper?.

The Future C&D Debris?

- More Building Deconstruction?
- More Upfront Controls? Remove mercury switches, thermostats, CCA lumber?
- Send more C&D Debris to processors?
- Processors become more efficient at separating recyclables and BUD material?
- New uses for BUD materials?
- Processors deal with a greater percentage of the incoming waste mix?

The Future C&D Debris? (cont.)

- What's left?
 - Contaminated wood
 - Plastics- e.g. Hard items, flexible items, and rigid insulation
 - Non-rigid insulations – e.g. glass, cellulose
 - Intimately co-mingled – e.g. paper on insulation, paper-foil-plastic composite wallpaper, chip board (wood and synthetic glues)
 - Un-recognizable
 - Non-magnetic metals
 - Too small to economically sort

The Future C&D Debris? (cont.)

- Wood, plastics, chipboard, etc. can be gasified to produce gas for energy
- Wood, chipboard, etc. can be converted to ethanol for energy or chemical synthesis
- Reduce dependence on petroleum
- Carbon credits?

The Future C&D Debris? (cont.)

- Other ideas or suggestions?

To Discuss After Today Call or Email:

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