Introduction

The Institution Recycling Network

7 South State Street

Concord, NH 03301

866-229-1962

www.WasteMiser.com

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Construction Waste Management

- Recoverable materials & markets
- Costs of recycling versus disposal
- Barriers and solutions
- Recycling in CT & New England
- IRN Wastemiser Program

Recoverable Materials: Pre-Demolition / Renovation

- Furniture & Furnishings
- Architectural Salvage
- Casework
- Carpet
- Ceiling Tiles
- Partition Systems
- Lighting (bulbs, ballasts, fixtures)
- Doors and Windows
- Wiring and Cable
- HVAC Equip't
- Bathroom Fixtures

Deconstruction, Soft Strip....

Deconstruction and Salvage Advantages

- Cost Savings- Specialized labor
- Higher recovery rates= lower waste costs
- Site prep for Abatement and Demolition
- Low noise, vibration, dust work methodology
- Source separated recycling achieves the highest recycling rates at the lowest cost

Markets...

- Local
- Regional
- National
- International

One donation load can equal up to three (3) dumpsters.

CT- Deconstruction and Building Material Reuse Centers

- The ReCONNstruction Center
  230 South Street
  New Britain, CT 06051
  (860) 597-3390
  info@reconnstructioncenter.org
- The Building Materials Reuse Association
  www.buildingreuse.org
  Online directory by State/ Type

Worcester State College Dorm Furniture – Ready For Trailer Loading

Dorm Furniture Being Stored In Nicaragua


MA State College Building Authority and
Framingham State – Dorm Furniture
Donation

Donated Beds In Place At Orphanage In El Salvador

“Live Loading” Medical Supplies and Equipment At New England Baptist Hospital

Donated Wardrobe Finds New Home In Village

Removing Range Hoods For Donation – Harvard University

Full IRN Donation Trailers Ready For Unloading In Central America

Unloading Donated Dorm Furniture In Nicaragua

Donated Student And Teacher Desks Put Right To Use – El Salvador

Donated Dorm Furniture Ready For Village Distribution

Dressers Used For Medical Supply Storage – Central America

Donated Office Furniture Arriving In The Ukraine

Recoverable Materials: Demolition & Renovation

- Landclearing debris
- Asphalt paving
- Concrete, brick, block
- Wood (incl. treated & painted, plywood, OSB)
- Metals (ferrous & nonferrous)
- Glass
- Asphalt shingles
- Commercial roofing
- Slate, other roofs
- Mixed debris

Recoverable Materials: New Construction

- Concrete, brick, block
- Wood (dimensional, ply-wood, OSB, etc.)
- Metals (structural, studs, HVAC, plumbing, elec.)
- Gypsum wallboard
- Cardboard, other packaging
- Mixed debris

Recycling Works ... Again

- Concrete & Masonry

  St. Paul's School

  Before

- Aggregate for Roads and Sidewalks

  After

And Again...

- Gypsum Wallboard
  Cambridge City Hall Annex
  Before

- Gypsum Wallboard
  After

And Again...

- Old Ceiling Tiles (Dartmouth College) Become New Ceiling Tiles

- Old Window Glass (Northeastern University) Becomes New Window Glass or Aggregate for Paving

Project Recycling

What's Important ?

- Early Planning
- Performance Goals
- Waste Management Plan
- Excellent Documentation
  - ✓ Weights, markets, process
- Be Thorough – Don't Miss a Waste
  - ✓ Example: Furnishings, Landclearing

Regional Legislation
New Hampshire

- Moratorium on Burning C&D Derived Fuel
- Multiple Mixed Debris Processors
- Close proximity to other states/ markets
- Deconstruction and C&D Recycling Bills in various stages of House and Senate
- Vowed not to become dumping ground for out of state waste.
- Gypsum markets
- UNH Recycled Products Laboratory

Regional Legislation
VERMONT

- ACT 250
  - Under Sate Department of Environmental Protection Groundwater Protection Act.
  - All major development in VT must conduct Cost/ Benefit Analysis and explore deconstruction and C&D Recycling opportunities
    - UVM- Green Campus Initiative

Regional Legislation
MAINE

- Public / State funded projects must meet LEED Standard
- STEP-UP Program
- SPiRT
- Agronomic Permits- BUDS

Regional Legislation
RHODE ISLAND

- All Public / State funded projects must meet LEED Standard
- Reviewing and implementing higher standards for C&D waste recycling and deconstruction mandates
- Close proximity to other states/ markets

Regional Legislation
New York

- Agronomic Permits- BUDS
- International Wood Markets
- Mixed Processing Facilities
- Gypsum Recycling Markets
- Close to PA Markets
- NYC Pushing for more mandatory C&D recycling

Regional Legislation
MASSACHUSETTS

- Public / State funded projects must meet LEED Standards
- Boston-Publicly funded projects must meet LEED Standards
- Collaborative for High Performance Schools
- Massachusetts- DEP Waste Ban: MA CMR 310, 19.017
  - Bans All: Brick, Block, Concrete, Masonry, Asphalt, Cardboard, Metal, and Wood
  - Banned from landfills and Transfer Stations

Regional Legislation
CONNECTICUT

- All Publicly funded projects must meet LEED Silver Standard-
  - *CT DPW not DEP?*
  - *UConn Med School and UConn are Exempt or do not follow mandate*

Barriers to Connecticut C & D Recycling – Markets:

Limited Markets-

1 Mixed Debris Processor with over 60%

1 Asphalt Shingle Recycler

1 Carpet Recycler

Gypsum

-1 Aggregator of Materials- High cost to transport

Robust Markets- Wood, Metal, Agg., Brick, Block

First Steps for Connecticut

- Enforce Mandates and Specifications for Publicly / State Funded Projects
  - Get UConn on board
- Promote Permitted Markets Better
  - List on Web site
- Require Cost Benefit Analysis
  - All projects over 30,000 sf or 1 Mill.

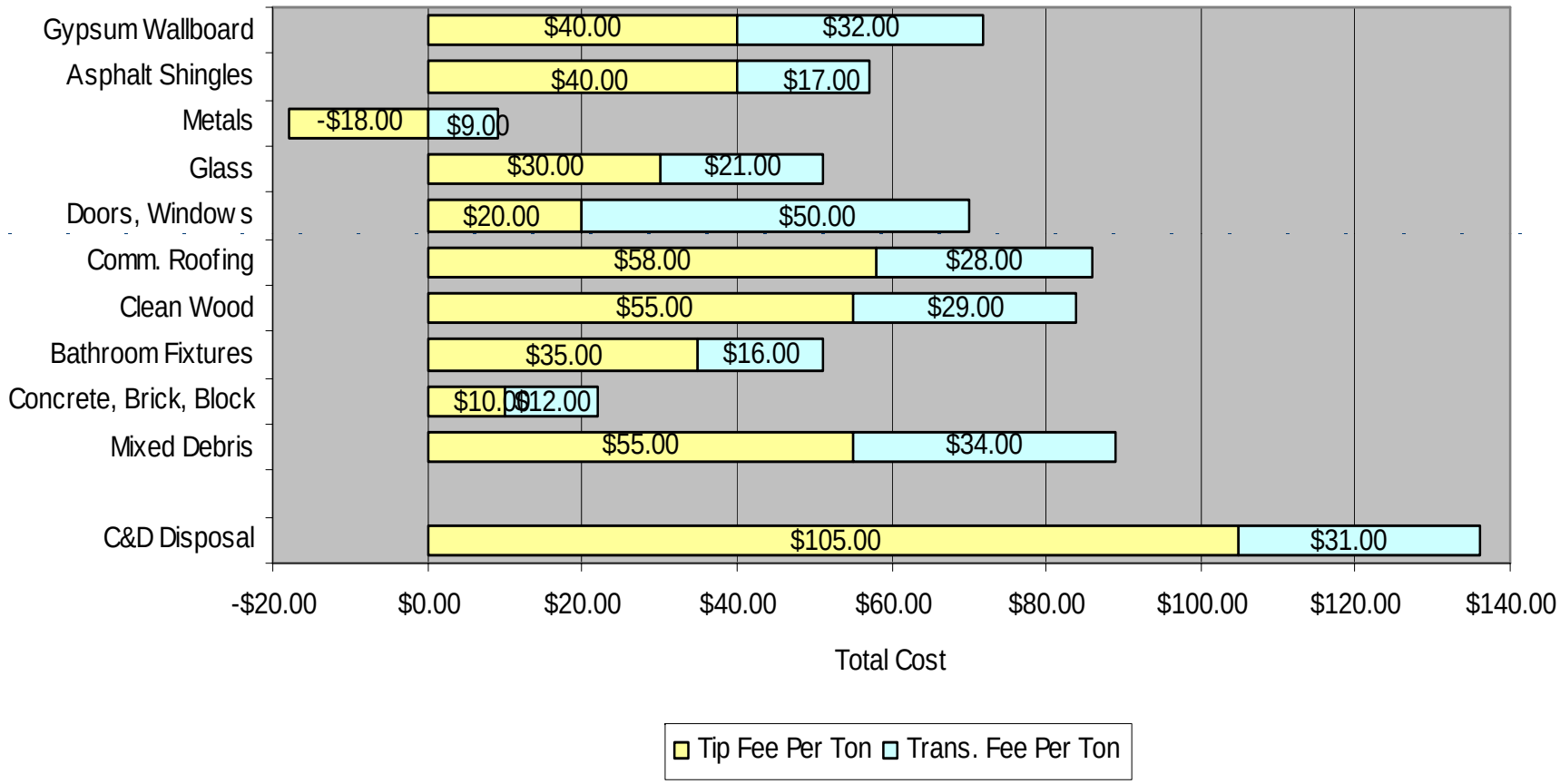
Next Steps for Connecticut

- Market Development
- Better Permitting Process
  - Change from Volume Reduction Facility to Recycling Facility
  - BUDS – Agronomic Use
  - Recycling Markets are not incinerators/landfills
- Promote Market Development- Incentives
- Cooperation with other state agencies/ departments

Promoting C&D Recycling and Deconstruction in CT.

- Deconstruction and C&D Legislation
- Promotion of C&D Markets
- Beneficial Use Determination Permits / Agronomic Use Permits
- Pilot Projects…. The more you know….
- Grant Funding to promote markets and services

Costs: Recycling vs. Disposal



Fulton & Carney Halls

- Classroom & Office Buildings
- 39 Room AV Equipment Upgrades
- Classroom Carpet Renovations
- Carpet, Cardboard, Mixed Debris

Challenges

- Limited Space
- Weather / Moisture
- Contamination
  - Student / Public
  - Other Projects

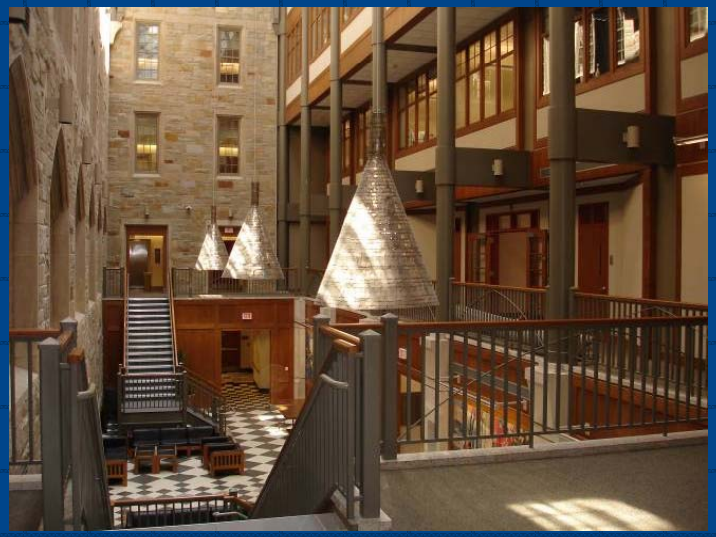
- Long Duration
- High Profile – Image
- Sub-contractor participation

Tools applied to meet goals:

- Covered Dumpster
- Signage
- Communication with PM and Subs
- Mixed Debris
- OCC on Site

Results

- Total Waste: 28.81 Tons
- Tons Recycled:
  - Mixed Debris- 10.12
  - Carpet- 15.73
  - OCC (cardboard)- 1.17
- Recycling Rate- 94%



Boston Scientific Campus

Description: Complete interior demolition and reconstruction. 483,000 sq ft, three stories, three buildings (1980's). Steel frame on slab.

Size/Duration: $38M, 24 months

Location: Marlborough (exurban)

Contractor: Payton (GC SOS (demo)

Architect: BKA

Challenges

- Single loading dock (inbound + outbound)
- Long carries
- Large number of materia
- Oddball materials (demountable partitions, rooftop HVAC units, etc.)
- Phased construction (wit employee move-in as phases completed)

Materials Recycled

Furnishings (reuse)	49	Carpet	157
Building Mat'ls (reuse)	39	Plate Glass	34
Metals, Mixed	430	Gypsum (Partitions)	2,762
Wire & Cable	135	Wood	12
Metals, HVAC	3,134	Aggregate	34
Ceiling Tiles	581	Mixed C&D (Net at 85%)	964
Total Project Reuse and Recycling			8,331
Total Waste Disposed			371
Project Recycling Rate (Through 9/20/05)			95.7 %

Keys to Success

- Hampers and carts (indoor staging to live-load)
- Union support
- On-site presence
- Training, communications
- Flexibility from all involved

Harvard Blackstone

Description: Complete interior gut, interior reconstruction (office), exterior renovation. 40,000 sq ft in three buildings (1890s). Structural brick, concrete, wood beams.

Size/Duration: $10M, 9 months

Location: Cambridge (urban, tight)

Contractor: Consigli

Architect: Bruner-Cott

Challenges

- Tight site; Site work during construction
- Two projects on same site
- Hazardous materials (working around abatement)
- Identifying reuse options

Materials Recycled

Furnishings (Reuse)	9	Brick	15
Fixed Assets (Reuse)	10	Concrete	395
HVAC Equipt	7	Asphalt	461
Metal	73	Gypsum Wallboard	25
Wood	61	Mixed C&D (Net at 70%)	6
Total Reuse and Recycling			1,061
Total Disposed			4
Project Recycling Rate			99.6%

Keys To Success

- Early involvement
- Recycling requirements inserted into each section of specifications
- Good waste management spec
- Use selection process to identify committed contractor
- Committed owner
- Lots of concrete and asphalt

IRN Connecticut Projects

- Institutional Projects
- Move Outs and Surplus
- New IRN Warehouse in New London
- Huge Potential in the State- Climate and Clients.
- Move Outs / Surplus
- Yale
  - +/- 6 projects in various stages of progress and scope
- Fairfield Properties
  - LEED Housing

Site Solutions

Obstacles and Challenges

- Unfamiliar Crew
- Accelerated Schedule
- Stacked Trades
- Multiple Materials
- Limited Site
- High Recycling Goals

Reasons for Success

- Specifications For Recycling
- Unilateral Support
- Smart, Trainable Workforce
- Construction Waste Management Plan
- Flexibility, Adaptability
- Capitalizing On Materials That We Can Control To Build Our Rates
- Dedicated Commitment From Crew

IRN as “Waste Manager”

Partnership

- RFP and Specification development
- Pre-bid and pre-job planning, on-site coordination and troubleshooting
- Job site training and signage
- Dedicated logistics (markets, containers, transportation)
- Complete accountability and reporting for all materials
- Waste Management Plan and LEED documentation

Results

- 75-99% recycling rate
- Two LEED points at a cost savings
- Potential Innovation Credit
- Trained Work Force
- Recycling Goals Achieved
- Noteworthy Marketing Tools

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