A Regional Opportunity to Promote Deconstruction and Reuse of Building Materials at JFK Corporate Square

Grant Agreement No. X1982800-02-0
Fourth Quarter/Second Year Report to
EPA Region 2, Solid Waste Management Division

by
NY Wa$teMatch
A program of the Industrial and Technology Assistance Corporation

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A. Project Summary

Under U.S. Environmental Protection Agency Agreement No. X1982800-02-0, the New York City Industrial and Technology Assistance Corporation (ITAC) is promoting deconstruction and building materials reuse in New York City. Through its NY Wa$teMatch program, ITAC has developed a deconstruction and building materials reuse plan for a building project as well as resources to help building professionals implement these waste-reducing practices.

The project originally sought to use Site 2 of the JFK Corporate Square development in Jamaica, Queens, as the site of a pilot project demonstrating deconstruction and building materials reuse. However, the developers of JFK Corporate Square withdrew from their commitment to the pilot project. NY Wa$teMatch has instead conducted the pilot project at the St. Francis of Assisi Venture, a joint development of the Durst Organization and Sidney Fetner Associates.

In this quarter, NY Wa$teMatch completed the final phase of the project by facilitating the deconstruction and salvaging of materials at the St. Francis of Assisi Venture site. NY Wa$teMatch's other activities included:

1. Assisting organizations in New York City that seek to establish a deconstruction crew, start deconstruction businesses, or otherwise foster the acceptance of deconstruction and building materials reuse and recycling. (See section B-2.)
2. Developing the Case Study on Deconstruction at the St. Francis of Assisi Complex. (See section B-3.)
3. Developing and distributing materials promoting deconstruction, building materials reuse and green building. (See section B-3.)

B. Activities

1. Project development

On September 14, 2004, the Community Environmental Center (CEC) began deconstruction at the St. Francis of Assisi Venture site, which covers the following buildings: 125-127 and 129-131 W. 31st St., and 126-128, 130, and 132-134 W. 32nd St. Ten crew members worked on the site full-time for six weeks. Results of this project are documented in a case study (see Exhibit 3).

2. Partnership development

NY Wa$teMatch and the Community Environmental Center worked together to facilitate deconstruction at the St. Francis of Assisi Venture site. NY Wa$teMatch has been providing resources to help CEC in finding space and financial support for a reuse warehouse through outreach to other reuse groups, government agencies, LDCs, and contractors and developers. NY Wa$teMatch has also been promoting CEC's deconstruction services by referring companies interested in undertaking deconstruction projects to CEC. NY Wa$teMatch has also been assisting CEC in marketing the materials through its online Materials Exchange, outreach to other materials exchanges and outlets for salvaged building materials.

3. Resource development

In this quarter, NY Wa$teMatch distributed a request for proposals for printing the brochures that will be included in the marketing and education kit promoting deconstruction,

building materials reuse and green building. (The RFP is included as Exhibit 2 to this report.) After reviewing the proposals, NY Wa$teMatch awarded the contract to Royalty Press, which submitted the lowest bid and was the only printer that was able to meet all printing requirements

The promotional kit has five components (see Exhibits 3-7).

(1) Case Study on Deconstruction at the St. Francis of Assisi Venture Site
(2) Guide to Deconstruction
(3) Primer on Deconstruction and Building Materials Reuse
(4) Building Materials Reuse Calculator
(5) Trends in Green Building

Eileen Banaticla and Stefanie Feldman of NY Wa$teMatch coordinated the development of the brochures. These materials were printed using 100% recycled and 100% post-consumer paper using soy ink. These kits will be distributed to organizations interested in establishing a deconstruction crew, starting deconstruction businesses, or learning about the environmental benefits of deconstruction and building materials reuse and recycling. Copies of the electronic and print versions of these materials are available from NY Wa$teMatch's Web site

C. Outreach & Education. *These activities are performed as a service and are not included in the list of project deliverables.*

NY Wa$teMatch continued to serve as a resource to organizations and companies interested in learning more about deconstruction.

NY Wa$teMatch shared information about its deconstruction workshops with Resource Venture, a program of the Seattle Chamber of Commerce. Resource Venture is scheduled to hold a deconstruction workshop in late October 2004 and requested tips and guides from NY Wa$teMatch on running the workshops, marketing and promotions, and documenting the event.

NY Wa$teMatch provided materials on deconstruction and C&D waste recycling to EPA Region 2 for posting on the EPA website. These materials include the directory of C&D recycling companies in NYC, outlets for used building materials in NYC, guide to deconstruction, et al.

NY Wa$teMatch also responded to a request for more information about deconstruction from the NYC Department of Parks & Recreation, which is looking at the feasibility of performing deconstruction in one of its buildings in Brooklyn.

D. Activities

This is the last quarter of the grant and NY Wa$teMatch has satisfied all the deliverables required to complete the pilot project (see Exhibit 1).

1. Project development

The pilot project has been completed and documented in a case study. (see Exhibit 3)

2. Partnership development

NY Wa$teMatch will continue to assist the Community Environmental Center in placing the materials salvaged from the St. Francis of Assisi Venture site through the online Materials Exchange, other online exchanges, and other outlets of used building materials. It will also help to promote CEC's deconstruction service as well as other reuse businesses in NYC.

3. Resource development

NY Wa$teMatch prepared a marketing and education kit promoting deconstruction and green building in NYC. One of these materials is case study on deconstruction at the Francis of Assisi Venture site, which is the final deliverable to complete this project.

Exhibit 1: List of project deliverables

Deliverable	*Status*
a) A workshop on the U.S. Green Building Council's LEED standards for the coordinator and developer of JFK Corporate Square†	**Complete**
b) Two training workshops: one on incorporating deconstruction into requests for bids, and one on general deconstruction training	**Complete**
c) A forum on deconstruction open to the public	**Complete**
d) A final document, for EPA and other interested parties, consisting of:	
i) A set of recommendations for implementing deconstruction into the development of JFK Corporate Square†, including funding options available	**Complete**
ii) A list of nonprofits and demolition contractors interested in further deconstruction training	**Complete**
iii) A list of end users by type (reuser, remanufacturer, recycler) for the deconstructed and the construction waste material	**Complete**
iv) An inventory of what materials should be sold/given away for reuse, remanufacture and recycling	**Complete**
v) A table of material categories and types of materials rating their deconstructability and providing reuse options for each material type	**Complete**
vi) A list of resources for used and green materials for free and for a fee	**Complete**
vii) A set of procedures for deconstruction firms to use for reporting and compiling data on their environmental benefits, including a simple software tool	**Complete**
e) Case study on pilot project	**Complete**

† References to JFK Corporate Square have been held over from the proposal. The pilot deconstruction project will take place at the St. Francis of Assisi Venture.

REQUEST FOR PRINTING ESTIMATE
NY Wa$teMatch
Marketing Materials (Brochures and Envelope)

Description of NY Wa$teMatch

NY Wa$teMatch (NYWM) is the materials exchange and waste reduction program of the Industrial & Technology Assistance Corporation (ITAC). The New York City Department of Sanitation and Empire State Development's Environmental Services Unit sponsor NYWM. Our services help businesses, nonprofits, public agencies, and other organizations to realize lower disposal costs, increased revenues, and lower purchasing costs.

Background

NYWM has been conducting a research and education project to promote the salvage and reuse of building materials. As part of this project, we will develop a marketing and education kit promoting deconstruction, green building and building materials reuse.

Project Description

NYWM seeks proposals to develop the marketing materials described above. Below are specifications of these materials:

JOB NAME	Square Flap A-10 Envelope	Brochure (5 versions**)**
QUANTITY	1,000	(5 versions print as 300 each version)
NO. PAGES	Two sides	Two sides
SIZE	Envelope: A-10 (6 x 9.5) Square Flap with side seams no bleeds	Brochure: 11 x 8.5 No bleeds
RECYCLED STOCK	24# Genesis Milkweed vellum text	80# Genesis Milkweed vellum Cover
PREPRESS	Electronic files supplied with all art and copy in position	
PROOF	PDF proof supplied for each component .	
PRESSWORK	Both pieces print PMS 3425 2 sides.	
BINDERY	Trim and score.	
SPECIAL INSTRUCTIONS	Use Soy Ink.	

NYWM will provide:

- Copy
- Mechanicals/artwork
- Layout

Proposal Requirements

Each proposal must include the following information:

1. Estimated per unit price and bulk price for printing envelope and
2. Estimated cost to buy recycled stock (if specified stock is not available, please recommend a similar stock)
3. Estimated shipping cost
4. Date estimated completed

5. In-house printing compatibility (can NY Wa$teMatch use an internal laser printer for additional copies?)

NY Wa$teMatch will need to inspect proof before printing begins.

Selection Criteria

NYWM will choose a consultant based on:

- Quality of proposal
- Sample Work
- Estimated costs (printing and delivery)
- Experience, especially on projects similar to this one
- References
- Willingness to be flexible during development
- Acceptance of ITAC payment schedule

Bidders should submit proposals to the contact at the location below.

Proposal due: By 5:00 p.m. EST, August 11, 2004

Contact:
Eileen Banaticla
NY Wa$teMatch/ITAC
253 Broadway, Room 302
New York, NY 10007
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E-mail: ebanaticla@itac.org

ITAC provides disadvantaged-, minority-, and women-owned businesses with equal access to contracting opportunities. We encourage these firms to pursue this contract. Discrimination on the basis of race, religion, color, sex, or national origin is prohibited.

Terms

The contract will be between ITAC and the consultant. The terms will include ITAC's standard terms and conditions and are not negotiable. A copy of ITAC's terms and conditions is attached.

The bid price includes all direct and indirect expenses incurred in completing the scope of work. Any additional expenses must be pre-authorized by ITAC representatives.

Unauthorized charges beyond the initial project budget will not be paid. Unauthorized delay in submission of deliverables may be penalized by $200 per day. ITAC may terminate the contract at its discretion.

The consultant may bill ITAC for 50% of the total contract value upon signing of the contract. The remaining 50% shall be billed upon completion of the job. ITAC will retain 10% of the total contract value until all work is certified as satisfactory by ITAC's Vice President of Finance. Invoices will be processed within 2-4 weeks.

Industrial & Technology Assistance Corporation
Standard Terms and Conditions of Consultant Agreement

Consultant shall provide the technical services specified in accordance with the following terms and conditions:

1. **Coverage**. Consultant agrees that he/she and all his/her employees and subcontractors will be bound by the provisions of the contract, including, without limitation, with regard to elements of confidentiality and intellectual property.
2. **Confidentiality.** It is understood by Consultant that during the course of the agreement certain confidential and proprietary information may be made known for the purposes of fulfilling the agreement deliverables. The term 'Confidential Information' shall include, without limitation, any and all trade secrets, business methods, business records and files, computer programs, customer and supplier lists, product specifications, drawings and prototypes, price lists, reports, or other confidential or proprietary information of any type or description, with respect to a party hereto, without regard to the form in which it is retained. All confidential written or electronic information will be clearly marked and identified as confidential by Consultant or ITAC. Consultant agrees, on their behalf and on behalf of their respective officers, directors, employees, agents, distributors and their representatives, not to communicate, divulge, or use for the benefit of any individual or entity whatsoever, any Confidential Information obtained by one regarding the other without the express written consent of the other party hereto, except as required pursuant to applicable federal and state sunshine laws and open records acts, or as otherwise compelled by legal process. All written confidential information will be returned to the company at the close of the project.
3. **Intellectual Property Rights**. Subject to all applicable laws, statutes, rules, and regulations of any governmental or quasigovernmental authority having jurisdiction, including, but not limited to, 37 C.F.R. Part 401, Company shall retain all right, title, and interest throughout the world in each invention, discovery, or copyrightable material that is derived through or in connection with this Agreement and that is or may be patentable or otherwise protectable under Title 35 of the United States Code. Consultant shall disclose all inventions and improvements in its project reports to ITAC and they become the sole property of ITAC.
4. **Record Keeping.** Consultant agrees to keep complete financial and technical records of progress made on the project and to present a summary of the records to ITAC upon request.
5. **Indemnification.** Consultant shall be solely responsible for and shall save, defend, indemnify, and hold the ITAC and its directors, officers, employees, agents and affiliated companies free and harmless from and against any and all claims, expenses, damages, lawsuits, or other liabilities (including without limitation, reasonable attorney's fees and court costs) arising from the breach by the indemnifying party or any of the terms or provisions of this Agreement, or from the actions of the Consultant, his agents and employees.
6. **Changes to Agreement.** Any changes in the Agreement will be made only upon mutual agreement of the parties and will be evidenced by a written agreement executed by both parties.
7. **Implementation**. The implementation of any advice or products provided by Consultant will be in the sole discretion of ITAC.
8. **Waiver**. No waiver of any provision of this Agreement shall be implied from any course of dealing between the parties hereto or from any failure by either party hereto to assert one or more of its rights hereunder on any occasion or series of occasions. No exercise or partial exercise of any right hereunder shall preclude any other or further exercise thereof or the exercise of any other right.
9. **Compliance with Laws.** Consultant agrees to comply with and this Agreement shall be subject to and governed by all applicable laws, statutes, rules, regulations, directives, circulars, and the like, of the United States, including, without limitation, those prohibiting discrimination, ensuring a drug free workplace, protecting persons affected by disabilities, and preserving civil rights of all affected persons. ITAC and the Consultant further agree not to take any action in the name of or otherwise on behalf of the other party which would violate applicable laws or government regulations
10. **Binding Effect/Third Parties.** This Agreement shall be binding upon and inure to the benefit of the parties, their successors and assigns, but shall not be assignable by Consultant.
11. **Entire Agreement**. This Agreement constitutes the entire agreement between the parties for the Services and there are no other agreements between the parties for the Services.
12. **Force Majeure**. Whenever a period of time is prescribed herein for the taking of any action by Consultant. Consultant shall not be liable or responsible for, and there shall be excluded from the computation of such period of time, any delays due to flood, drought, earthquake, storm, fire, pestilence, lightening and other natural catastrophes, epidemic, war, riot, civil disturbance or disobedience, strike, labor dispute, or sabotage, or any order or injunction made by a court or public agency or, governmental laws, regulations, or restrictions, or any other cause whatsoever beyond the control of Consultant.
13. **Choice of Law.** THE AGREEMENT IS MADE AND ENTERED INTO AND SHALL BE GOVERNED BY AND CONSTRUED UNDER THE LAWS OF THE STATE OF NEW YORK WITHOUT REGARD TO CONFLICTS OF LAW, AS THE SAME MAY BE IN EFFECT.

Deconstruction – Building Disassembly and Materials Salvage: the St. Francis of Assisi Complex Case Study

Prepared for:
U.S. EPA Region 2
Solid Waste Management Division

Grant Agreement No. X1982800-02-0

By:
NY Wa$teMatch
A Program of the Industrial and Technology Assistance Corporation

253 Broadway, Room 302
New York, NY 10007

October 2004

About ITAC and NY Wa$teMatch

ITAC is a not-for-profit organization that provides consulting, technical and business assistance services to the manufacturing and technology sectors of New York City. Started in 1987, ITAC's mission is to strengthen the economy of New York City by improving the performance of small to mid-sized firms that create or produce technical and manufactured goods. ITAC has an accomplished track record of successfully serving more than 1,400 companies with over 1,600 projects. ITAC is the New York State designated Regional Technology Development Center for New York City, and is part of the National Institute of Science and Technology funded Manufacturing Extension Partnership.

ITAC has operated the NY Wa$teMatch program, a materials exchange for New York City, since its inception over five years ago. Funding for the program is provided by The City of New York Department of Sanitation's Bureau of Waste Prevention Reuse and Recycling and the New Empire State Development's Environmental Services Unit. The mission of NY Wa$teMatch is to foster environmentally sound economic development through innovative solid waste reduction and resource recovery strategies. Our materials management services, in addition to our education and research and development projects, merge environmental responsibility with sensible business practices, guiding New York's businesses towards a sustainable future. We run a citywide materials exchange as an alternative means of managing a large portion of NYC's recoverable commercial solid waste.

Acknowledgments

We gratefully acknowledge those who shared their time, expertise, ideas, materials, and insights on deconstruction, green buildings and building materials reuse: Jim Primdahl of the Institute for Local Self-Reliance, Amy Baumann of greenGoat, Robert Ricketson and Sherman Plumley of ReCycle North, Nicole Tai of ReUse Alliance, Wayne Tusa, Pamela Lippe, Justin Green, and the Community Environmental Center and its deconstruction crew.

We also recognize the support provided by U.S. EPA Region 2 especially Lorraine Graves and Kimiko Link, and Department of Sanitation of NY for its general support of the program.

Summary

With support from the U.S. Environmental Protection Agency's Region 2 office, NY Wa$teMatch is promoting the recovery and reuse of building materials in New York City through deconstruction. The program's goals are to reduce the amount of landfill waste from construction and demolition and to encourage the development of new businesses that salvage, refurbish, and sell reusable building materials.

The program focuses on deconstruction as an environmentally and financially preferable alternative to conventional demolition. Deconstruction is the process of dismantling old buildings in order to recover the materials for reuse. Unlike demolition, which generates waste that is only fit to be landfilled or recycled, deconstruction produces materials that can be used again or remanufactured into higher-value goods. Real estate developers can realize lower costs by specifying deconstruction on their projects, and contractors can gain a competitive edge by salvaging and selling materials rather than throwing them away.

The St. Francis of Assisi pilot project proved that deconstruction can be a viable complement to demolition. Deconstruction reduces the amount of construction that must be disposed of in landfill. The project diverted over 36 tons* (based on partial results) of construction materials from landfill. Deconstruction is labor intensive, relying primarily on the use of hand tools and manual power to take buildings apart. While it takes longer than traditional demolition, deconstruction brings significant social, economic, and environmental benefits. It opens job training opportunities and creates jobs for unskilled workers. It yields reusable building materials instead of waste thus opening an opportunity to create a new business for a local nonprofit organization.

It is not possible for a single case study to document all the issues associated with deconstruction and building materials reuse. Each project presents a unique set of challenges. This study was designed to address the issues facing commercial structures in constricted spaces in NYC.

Background of the St. Francis of Assisi Pilot

In 2002, NY Wa$teMatch implemented a pilot project at the St. Francis of Assisi Complex to demonstrate the viability of deconstruction as a means to promote the recovery and reuse of building materials in NYC. According to the NYC Department of Sanitation, C&D waste accounts for more than 60% of the solid waste stream (NYC DDC Construction and Demolition Waste Manual, 2003). With lack of landfill space and limited resources for recycling construction and demolition waste materials, NYC needs an alternative to traditional methods of handling these kinds of debris.

NY Wa$teMatch worked with the Durst Organization, Gotham Construction, E4, and the Community Environmental Center to deconstruct buildings at the St. Francis of Assisi

Complex at W 31st and W 32nd Streets. The project was funded through a grant from U.S. EPA Region 2.

The overall purpose of the pilot deconstruction was to demonstrate the feasibility of deconstruction and to gain practical experience in financing, contracting and implementing a deconstruction project in NYC. In addition, NY Wa$teMatch proposed to identify local non-profit organizations interested in developing a deconstruction business in order to demonstrate the benefits of deconstruction as a revenue source and a job training opportunity.

During preliminary building review at the St. Francis of Assisi Complex, NY Wa$teMatch hired a consultant to perform a to catalog the building materials available, estimate the fair market value of salvageable materials, estimate the costs and savings associated with deconstruction and salvage, estimate overall landfill diversion rate and to outline the steps involved in planning and implementing sustainable management of demolition waste, along with the responsibilities of different parties working on the project.

The initial assessment indicated that the salvageable building materials at the project site have a fair market value* of about $270,000. (Fair market value is based on a retail price). The consultant estimated about 20% more man-hours during deconstruction compared to conventional demolition because it involves more manual labor as compared to traditional demolition jobs. Overall landfill diversion rate was estimated at as much as 85% of total demolition waste by weight. The revenues and tax deductions that the developers will earn from the project, plus the reductions in waste disposal costs and diversion from landfill created a strong argument to recommend deconstruction at the St. Francis of Assisi Complex.

Case Study Site Description

The St. Francis of Assisi Complex runs from 31st Street to 32nd Street, located mid-block between 6th Avenue and 7th Avenue in Midtown Manhattan. West of the site is a lot containing the existing Church of Saint Francis of Assisi. The Durst Organization purchased the complex from the Archdiocese to build a multi-unit residential apartment/dormitory tower. The project is seeking a Leadership in Energy and Environmental Design (LEED) Certification from the U.S. Green Building Council and is expected to be completed in 2006.

Table 1. St. Francis of Assisi Complex Building Descriptions

Location	Size	Description / Structural Components
125-127 W. 31st St.	2-story;9,621 gross square feet	Built in 1930. The structure is primarily masonry and wood and the exterior facing is stucco. The first floor houses a meeting room; the second floor, office space.
129-131 W. 31st St.	6-story; 25,628 gross square feet	Built in 1920. The structure is primarily masonry and wood. The front elevation is light brick with sandstone slabs above and below the windows. The side and rear elevations are standard brick. The ground floor houses a former bookstore. The bottom two floors contain office space. The upper floors contain dormitory rooms and a chapel on the third floor.
126-128 W. 32nd St.	3-story; 14,314 gross square feet	Built in 1920. The structure is primarily masonry and wood. The first floor contains a pizza parlor and two stores. Newly renovated office space takes up the top two floors.
130 W. 32nd St.	4-story; 6,637 gross square feet	Built in 1920. The structure is primarily masonry and wood. The first two floors house a seating area for the Harp Bar & Restaurant and a kitchen at the back of the building.
132-134 W. 32nd St.	6-story; 27,612 gross square feet	Built in 1921. The structure is primarily masonry and wood. The bar and lounge of the Harp Bar & Restaurant and a store called Willoughby’s occupy the first floor. Office space takes up the upper five floors. Most of the building's exterior is finished with brick of good quality.

Photo 1. Front Elevation of the 6-Story Building at 134 W 32nd St.

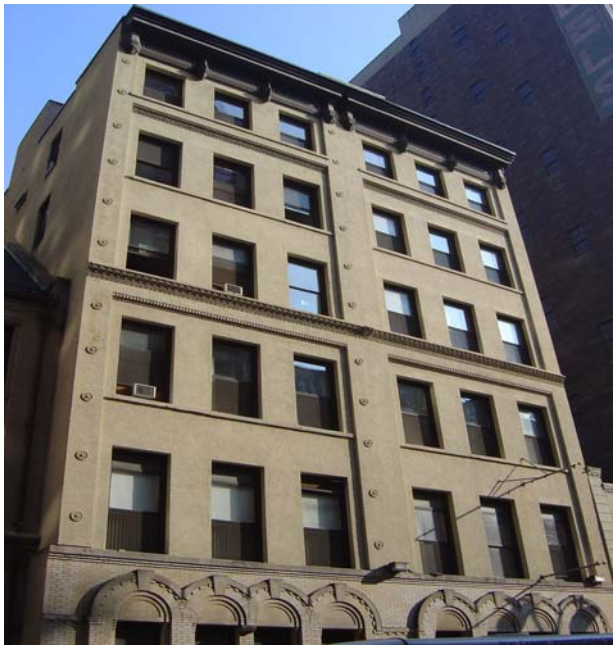


Photo 2. Corridor in the 6-Story Dormitory

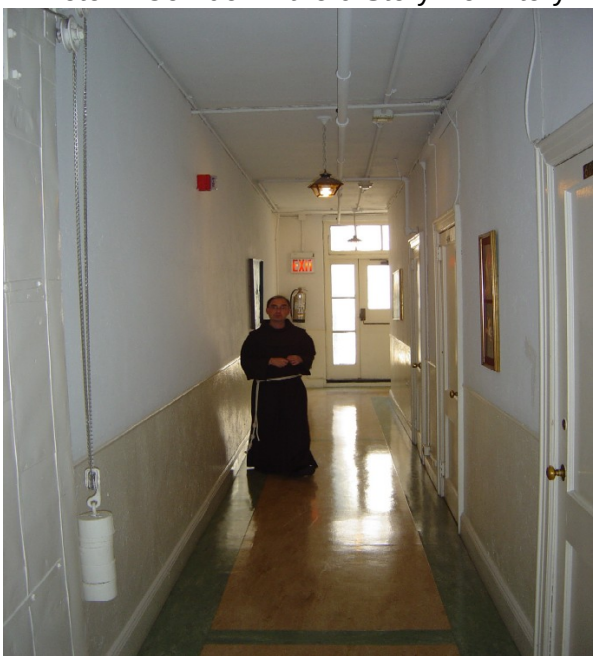


Photo 3. Harp Bar & Restaurant at 132 W 32nd St..

Photo 4. Pizza restaurant in 3-story at 126 W 32nd St.

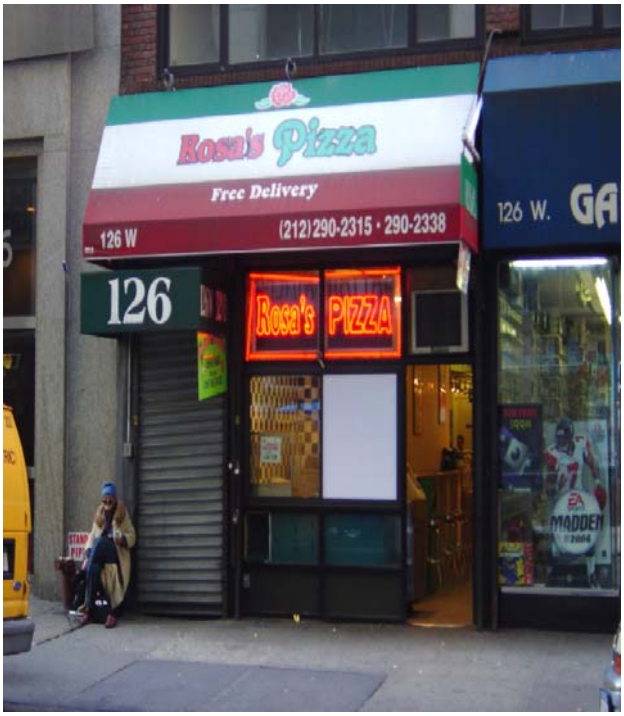
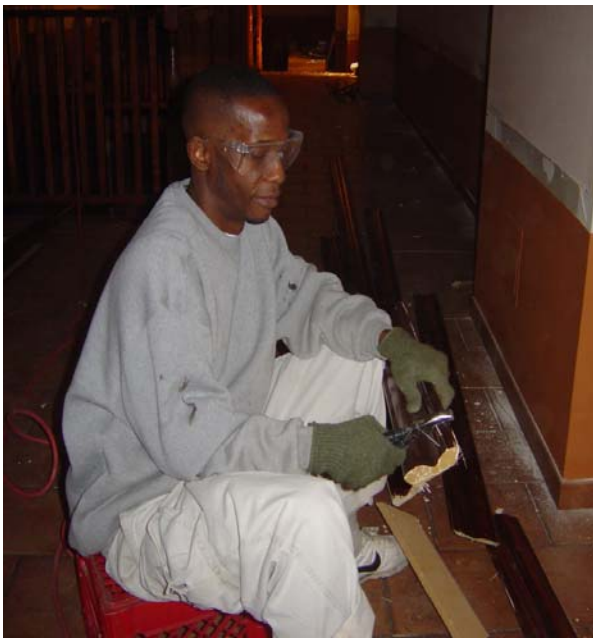


Photo 5. Deconstruction workers denailing wooden floorboards (5a) and removing lighting fixtures (5b) from Harp Bar & Restaurant at 132 W 32nd Street.

5a



5b

Through the numerous tasks involved in this deconstruction project, CEC developed the following skills:

- Structural takedown (extraction of building elements)
- Separation of materials into categories: recyclable, needs reworking, reusable as is, and trash
- Preparation of reusable materials (wood denailing; removal of fasteners, bolts, locks; cleaning, bundling, and covering)
- Transportation and Warehouse of salvaged materials
- Use of tools, familiarity with various building materials, fasteners and joinery, construction sequence, and jobsite safety

Quantities of Salvaged Building Materials

Tables 2 and 3 give quantities of salvaged and recycled materials from the St. Francis of Assisi Complex.

Table 3. Quantities of Materials Salvaged for Reuse from the St. Francis of Assisi Complex (partial results)

Materials	Units	Weight	Total weight	Volume	Total Volume
Ceiling Tiles (126 W. 32nd St) in sq. ft.	2600	1.1	2860	0.14	364.00

removed and packed into boxes					
Sinks - Bathroom: capped and removed	23	45.0	1035	2.00	46.00
Sinks - Kitchen: capped and removed	3	25.0	75	2.50	7.50
Tiles - Bathroom: chiseled from bathroom walls	3600	0.4	1400	0.01	36.00
Bathroom vanities: removed and packed	3	25.0	75	2.00	6.00
Furniture - Bookshelves	25	55.0	1375	12.00	300.00
Radiator covers - wood	7	25.0	175	6.00	42.00
Wood floor (in sq ft): removed, denailed, and wrapped in units of 9	1509	2.5	3773	0.10	150.90
Furniture - Cabinets	3	75.0	225	18.00	54.00
Wood - Rough cut(1"*10"*8'): removed from wall and denailed	32	10.0	320	0.56	17.78
Wood - MDF (1"*12"*8)	9	22.0	198	0.67	6.00
Shutters - sets of 4	21	25.0	525	2.00	42.00
Wood - shelves for bookshelves	142	3.0	426	0.25	35.50
Wood - closet shelves and doors (misc. plywood avg. 2'*3'): removed from closets and denailed	93	7.0	651	0.50	46.50
Doors - steel: hardware and hinges removed	2	75.0	150	3.00	6.00
Doors – hollow core: hardware and hinges removed, where possible frame also removed	34	25.0	850	3.00	102.00
Doors - solid core: hardware and hinges removed, where possible frame also removed	48	65.0	3120	3.00	144.00
Doors - sliding and louvered (most in sets of 2)	34	40.0	1360	6.00	204.00
Door closers	11	8.0	88	0.30	3.30
Door hinges	522	0.5	261	0.05	26.10
Door knobs	174	0.5	87	0.05	8.70
Door - steel bucks	18	35.0	630	2.67	48.00
Door Panic Bar	11	10.0	110	0.18	1.95
Vent Covers	13	8.0	104	1.33	17.33
Vents - small	13	4.0	52	0.26	3.37
Fans: disconnected, capped and packed	16	17.0	272	1.28	20.56
Lights (misc incandescent): disconnected, capped	39	4.0	156	0.50	19.50

and packed					
Lights - Canned track lighting	17	3.0	51	0.75	12.75
Cans of sidewalk salt	6	100.0	600	6.00	36.00
Doors - bifold	4	25.0	100	3.00	12.00
Doors - solid, painted	39	65.0	2535	3.00	117.00
Door - closet tracks	16	4.0	64	0.50	8.00
Door - steel	1	75.0	75	3.00	3.00
Furniture - headboards	5	35.0	175	3.50	17.50
Furniture - chairs	9	25.0	225	4.00	36.00
Furniture - desks	4	225.0	900	30.00	120.00
Wooden handrails	4	8.0	32	1.00	4.00
Furniture - Computer desk	2	30.0	60	8.00	16.00
Furniture - wood cabinets	2	200.0	400	10.00	20.00
Kitchen cabinets	2	75.0	150	6.00	12.00
Exit lights	9	7.0	63	0.25	2.25
Furniture - bookshelves	4	55.0	220	16.00	64.00
File cabinets	11	95.0	1045	20.00	220.00
Furniture - metal cabinet	1	35.0	35	20.00	20.00
Office supplies - boxes of packing envelopes	8	2.0	16	1.50	12.00
Bathroom vanities	11	25.0	275	0.75	8.25
Office supplies - boxes of hanging folders	7	35.0	245	1.50	10.50
Office supplies - boxes of notebooks	4	5.0	20	1.50	6.00
Steel shelves	14	65.0	910	18.00	252.00
Kitchen cabinets	8	75.0	600	10.00	80.00
Doors - doors and frames	14	70.0	980	3.00	42.00
Vents	15	8.0	120	1.00	15.00
Lights	31	1.0	31	0.25	7.75
Wood flooring sq ft (from bar)	1600	2.5	4000	0.10	160.00
Furniture - chairs	12	25.0	300	4.00	48.00
Stove	1	200.0	200	12.00	12.00
Wood paneling and trim (approx sq ft 4' high by 280' of wall)	1120	1.5	1680	0.10	112.00
Wood flooring	1818	2.5	4545	0.10	181.82
Furniture - Desks	3	225.0	675	30.00	90.00
Furniture - Chairs	3	25.0	75	4.00	12.00
Door - wood	1	75.0	75	3.00	3.00
AC	1	55.0	55	2.00	2.00
Vacuums	2	5.0	10	1.50	3.00
Water Bottles returned to Poland Springs	21	1.0	21	1.50	31.50
Refrigerator	1	25.0	25	12.0	12.00
Fire extinguishers	2	10.0	20	1.0	2.00

Frames, Camera bags, paper, envelopes, foamboard, cd players, microphones (4 carts - 36 cubic feet each)	4	250.0	1000	36.00	144.00
Total	Salvage weight in lbs	42,961		Salvage volume in cubic feet	3,726
	Salvage weight in tons	21.5		Salvage volume in cubic yards	138

Table 4. Quantities of Materials Recycled from the St. Francis of Assisi Complex (partial results)

Paper recycling (boxes of paper)	362	35.0	12670	1.50	543.00
Ceiling Tiles - in sq ft nearly all recyclable tiles from all buildings (Removed Oct. 19)	15000	1.1	16500	0.14	2100.00
Total	Recycling weight in lbs	29,170		Recycling volume in cubic feet	2,643
	Recycling weight in tons	14.6		Recycling volume in cubic yards	97.9

Photo 6. Salvaged ceiling tiles from 132 W 32nd Street. The broken tiles were picked up by Armstrong for recycling.

Table 5. Total Quantities of Materials Diverted from Landfill from the St. Francis of Assisi Complex (partial results)

Diverted Weight in Lbs.	72,131	Diverted Volume in Cubic Feet	6,369
Diverted Weight in Tons	36.1	Diverted Volume in Cubic Yards	236

Note: Cubic footage was based on salvaged cubic footage. If the materials were broken down for landfill, in some cases they would take up less cubic space.

Lessons Learned

The St. Francis of Assisi Venture deconstruction project resulted in several important lessons about future deconstruction and building materials reuse in NYC.

- Get everyone behind the project.

It is important to get the support of management, demolition contractors, local city agencies and organizations, and funding sources.

- Prepare a good business development plan. To make deconstruction viable in NYC in the long-term, there must be a building materials reuse center with adequate space. The economic and social benefits of deconstruction cannot be fully realized without a reuse center

The project had hoped to secure additional funding to open a building materials reuse center during its early phase. One of the difficulties faced by CEC was the lack of its own reuse center for storing and selling the salvaged materials. This limited CEC from accepting other deconstruction jobs, or receiving big donations of building materials from other construction projects.

Based on the experience of other salvage and reuse operations, a reuse center should have a 25,000-sq-ft area with a mix of indoor and outdoor space, have street access for retail customers, and a loading dock where donors and recipients can conveniently deliver or pick up materials.

- Provide sufficient time for worker education and on-site training.

Based on the initial building survey at the St. Francis of Assisi Complex, the consultant recommended a two-week intensive training program for deconstruction crew members to equip them the necessary skills required to run an efficient salvaging operation in a

large-scale building removal. CEC's deconstruction workers only received 2 days of training. While the workshop covered the basic skills and techniques necessary for crew members to operate a salvage operation, there was not enough time to demonstrate salvage techniques for a wide variety of building materials. There was also not enough time for crew members to get hands-on training.

- Remain flexible and expect hidden conditions.

There were difficulties associated with the long timelines involved in getting the deconstruction crew to the job site. Issues in the negotiations between the developer and the property owners resulted in extensive, unplanned delays. This affected the schedule and availability of deconstruction workers and the amount of time the deconstruction workers were able to salvage materials from the site.

- Ensure contracts clearly delineate contractor requirements for deconstruction and recycling efforts. Should add something about who owns materials: Harp Bar may have owned the materials that the liquidator took so there was no obligation for it to be part of the deconstruction project.

It is important to have a clear agreement from the outset of the division of ownership of salvageable materials. At Harp Bar and Restaurant, a liquidation company had already taken out some items from the location weeks before CEC was allowed into the site.

- Allow plenty of time for general market research and development.

- Educate the public about the benefits of your project.

Appendix

Related Studies

In September 2002, NY Wa$teMatch prepared a report on the development of deconstruction and green building at JFK Corporate Square in Jamaica, Queens, to illustrate how deconstruction and green building can be viable alternatives to traditional practices of disposing C&D waste. The report provides recommendations to project stakeholders, the developers of JFK Corporate Square and Polytechnic University, on handling construction debris. The report includes material recovery options specific to the JFK Corporate Square and general deconstruction guidelines to aid the developers in making informed decisions about the demolition of the existing buildings and the design of new buildings. The project indicates that deconstruction methods are especially appropriate for JFK Corporate Square buildings, and other NYC buildings, where demolition is often done by hand because of the space restrictions which prevent large pieces of equipment from doing the bulk of the work. Thus, the potential for materials recovery through deconstruction is high and the incorporation of the low-tech methods used during deconstruction can be easily adopted by existing demolition contractors.

This report includes a list of building materials that can be reused, recycled or remanufactured, and in the local New York area and in the region. It also includes a list of those companies which currently take or buy such materials, with details on the specifications, quantity, and transportation requirements. This report is available from NY Wa$teMatch.

Working with Local Nonprofit Organizations

Throughout the course of the project, NY Wa$teMatch identified three organizations interested in starting a deconstruction business: Community Environmental Center, Green Workers Cooperatives, and the Greater New York Laborers' - Employers' Cooperation & Education Trust.

Table 2. Local Organizations Interested in Starting a Deconstruction and Building Materials Reuse Business in NYC.

Organization	Address	Contacts
Community Environmental Center	43-10 11th St. Long Island City, NY 11101 Phone: 718-784-1444 www.cecenter.org	Richard M. Cherry, President Sean Neill, Director Justin Green, Consultant

		jgreen@cecenter.org
Community Environmental Center (CEC) is a 501(c)(3) non-profit organization that provides energy, building performance and environmental services for residents in the New York metropolitan area. It's mission is to assist people throughout the New York metropolitan area in achieving a healthier, more affordable life by improving their home and community environments with educational and technical assistance services. CEC is in the forefront of advanced building energy performance technologies and services which provides cost-effective, energy saving retrofit implementation and management. It works to address those environmental problems which undermine the health and well being of people, the affordability and sustainability of housing, and the development of local economies in New York City. It runs two state-of-the-art Learning Centers to keep communities informed on these topics and more.		
Green Worker Cooperatives	889 Hunts Point Avenue Bronx, NY 10474 Phone: 718-617-4668	Omar Freilla, Director E-mail: omarfreilla@ssbx.org
Green Worker Cooperatives (GWC) is dedicated to economic and environmental justice through the creation of worker-owned and environmentally friendly manufacturing businesses in the South Bronx. Its first cooperative, the Building Materials Reuse Center, will offer services to salvage building materials from construction and demolition projects – keeping them out of the landfill and keeping resources in the local neighborhoods.		
Greater New York Laborers' - Employers' Cooperation & Education Trust	266 W. 37th St. New York, NY 10018 Phone: 212-452-9300	Joe Cestaro, Field Coordinator
Greater New York Laborers - Employers Cooperation & Education Trust (GNYLECET) is a partnership between the 15,000 members of the Mason Tenders District Council of Greater New York & Long Island and its 1,800 signatory contractors. Through this partnership between labor and management, GNY LECET works to facilitate an increase union market share, which creates opportunities for employers and jobs for the highly trained, skilled membership.		

NY Wa$teMatch worked with CEC in facilitating deconstruction at the St. Francis of Assisi Complex. Prior to this project, CEC submitted a bid for the salvaging of materials at One Bryant Park which is another project of the Durst Organization. CEC did not win the bid to perform deconstruction and salvaging, but it received the non-architectural building materials harvested from the site.

Funding Possibilities

Green guidelines such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) building standards recognize the value of deconstruction and building materials reuse. NYC green construction projects can earn LEED points for integrating material recovery and using salvaged or refurbished materials. The New York City Department of Design and Construction (DDC) also developed High Performance Building Guidelines as a means of introducing sustainable practices to DDC projects.

There are 76 registered projects seeking LEED ratings in NYC. At least six of these are public or government-funded projects. The rest are commercial and residential multi-story structures owned by real estate developers committed to environmentally responsible architecture. These developers are constantly investing to achieve and promote green construction. Ideally, these companies have the financial resources to fund or support deconstruction and green building initiatives in NYC.

Job Creation and Skills Development Opportunities

Community Environmental Center is a nonprofit group that provides cost-effective, energy saving retrofit implementation and managements services to low-income housing in NYC. Its workers are highly-competent and trained to provide energy conservation and building retrofit services. Deconstruction at the St. Francis of Assisi Complex opened opportunities for CEC workers to develop deconstruction skills. These skills would be valuable as CEC works to increase the scope of its services, and to develop its own deconstruction and building materials reuse business. The workers' deconstruction skills should naturally increase in response to the growth of a market for salvaged materials.

The pilot project provided full-time work for 10 Community Environmental Center workers for six weeks. Despite the large interval from the time the workers received training to actual deconstruction, the workers showed a good aptitude for applying the techniques they learned during the workshops. Workers with a background in construction trades were more intuitive in performing tasks and progressed to taking on more responsibility in the job site during the course of the project.