



FOUNDATION

# CASE STUDY

2008 AWARDS OF EXCELLENCE

AFFORDABLE HOUSING BUILT RESPONSIBLY

## PROJECT AT A GLANCE

*Location:* Chicago, Illinois  
*Project Type:* New Construction  
*Ownership/Rental:* Rental  
*Project Completion Date:* Feb. 2007

### Size:

96 single-room occupancy units  
Average unit is 300 sq. ft.  
46,000 total sq. ft. (total building)  
3/4 acre; 128 units/acre

### Affordability:

All 96 units are occupied by tenants earning 30% or less of area median income (AMI)

### Project Team:

*Developer:* Mercy Housing Lakefront  
*Architect:* Murphy/Jahn  
*Landscape Architect:* Smith & Smith  
*Contractor:* Linn-Mathes  
*Green Consultant:* The Renschler Company  
*HVAC Design:* Environmental Systems Design

### Development Cost:

*Land cost:* \$3,690,000  
*Hard costs:* \$11,859,544  
*Soft costs:* \$2,360,023  
*Total:* \$17,909,567

### Cost/(Savings) of Greening:

*Total Cost of Greening:* \$684,000  
*Rebates and Grants:* \$282,215  
*Net Cost of Greening:* \$401,785

### Standards Used:

LEED

### Key Green Features:

- LEED Silver building
- Brownfield site redevelopment
- Reduced construction material use
- Tapered design with smaller first floor reduces building footprint
- Rooftop wind turbines produce portion of electricity needs
- Solar hot water
- Rainwater collection & storage system for on-site irrigation
- Greywater system for toilet flushing
- Reduced use of upholstery and carpet; low-VOC paints & sealants

## Schiff Residences

### Mercy Housing Lakefront



The Margot and Harold Schiff Residences involved new construction of 96 units of permanent, supportive housing for chronically homeless and very-low income adults. The building combines affordable housing with support services integrated into the accommodation. Mercy Housing Lakefront (MHL), the regional affiliate of Mercy Housing, Inc., is the project owner, property manager and service provider. The Schiff Residences is part of the City of Chicago's Ten Year Plan to End Homelessness, in which Mercy Housing Lakefront (MHL) is a leading partner. The project is also part of the City's plan to create mixed-income communities with new affordable rental units, single family homes, and commercial space. Located in the Near North community, home to the former Cabrini-Green public housing development, the Schiff Residences is a start in the replacement of nearly 2000 units of affordable housing lost in the closure of Cabrini-Green. MHL has become a strong advocate and nationally recognized leader in demonstrating how the pairing of affordable rental housing with on-site services is a cost-effective and permanent solution to homelessness. It was one of the first non-profits in Illinois to use Low Income Housing Tax Credits to finance the acquisition, preservation and rehabilitation of decaying SRO hotels as supportive housing.

### Greening Goals

MHL articulated both general and green goals for the Schiff Residences. General goals include: provide high quality permanent housing for the formerly homeless, achieve a high standard of design excellence, utilize durable materials and finishes that are easily maintained, and maximize and efficiently use space to accommodate residents. Specific green goals were: implement a sustainable site design, apply innovative wastewater management, maximize renewable energy, achieve a 25% reduction in operating cost, set a new standard for green affordable housing, and achieve LEED Silver Certification.



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## Green Features

### Integrated Design Process

The MHL team held monthly charrettes during the design development period. All the major team members participated in the charrettes, with their level of involvement shifting over time as appropriate to the evolution of the design process. The integrated design process allowed MHL to evaluate and incorporate green and sustainable technologies into the project in a systematic manner. Early participation of the general contractor and input from major subcontractors during the design process facilitated ongoing feedback on the cost implications of design decisions so that at completion of design, the construction cost was fixed. In the end there were only three change orders, one of which was for a credit. This is highly unusual for a project of this size and complexity.

### Site Design/Landscape Planning

Located on a former brownfield, the site required extensive remediation prior to construction. The Schiff Residences building shape tapers from the ground floor to the larger upper floors, minimizing the building footprint and impervious surfaces on the site. Landscaped areas consist of trees and native prairie species planted between gravel bands. Rainwater is collected on the roof and stored in (10,000 gallon) below grade cisterns for irrigation and site maintenance water needs. Pervious paving materials foster natural drainage.

A (computational fluid dynamics) computer model was used to assess wind direction, speed, and duration to predict electric generation performance of the roof-top wind turbines. As a result of this analysis, the building is oriented perpendicular to the prevailing wind direction in order to maximize wind access. Zoning height limitations ensure that adjacent buildings do not block the wind or cast shadows on the south-facing roof-mounted solar thermal collectors.

### Location and Linkages

The Schiff Residences is situated in an existing urban neighborhood near existing utility infrastructure and public transportation. A new shopping center with a grocery store is across the street, CTA bus routes stop near the building and a subway/elevated train line is within short walking distance. The two acre Seward Park is located across the street from Schiff Residences, and the Winfield-Moody Health Center, which provides services to tenants, is one block away.

### Building Design Greening

**Energy:** The building's envelope is optimized for energy performance. The façade is made of metal panels with rigid foam insulation and low-e coated glass window systems with a 0.4 U-factor. The roof provides 4" of insulation, and the majority of the roof surface is used for solar collector arrays and wind turbines to maximize the energy production capability of the Schiff Residences. The on-site energy is used to heat water and supplement the building's electrical needs. Also, the Northwest-Southeast orientation and operable windows ensure natural daylight and fresh air in every room. Interior lighting uses fluorescents. The building uses six sealed combustion natural gas-fired furnaces that operate at over 90% efficiency, with individually controlled vertical fan coil units in each SRO apartment to improve heating and cooling efficiency. Energy Star refrigerators and stoves are used in each unit, the common area laundry rooms has Energy Star washers and dryers, and all bathrooms have Energy Star exhaust fans.



## GREEN HIGHLIGHTS

- Remediated and reused contaminated site
- Integrated design process with monthly charrettes resulted in fixed construction cost and minimal change orders
- Completed independent commissioning process
- Urban infill, brownfield site with access to existing infrastructure and other amenities
- Northwest-Southeast orientation ensures daylighting in every room
- Building oriented to maximize wind access; 16 roof-top wind turbines
- Solar panels PV and thermal panels on roof, plus maximum daylighting
- High albedo roof minimizes urban heat island effect
- Well insulated envelope
- Energy Star appliances in each unit and washers and dryers in common laundry room
- Used high-fly ash content poured concrete
- Natural gas-fired, high efficiency, sealed combustion furnaces/air conditioning units
- Pervious landscape and paving materials
- Rainwater collected and recycled for landscape irrigation
- Planted native prairie plant materials

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## Green Features *cont.*

**Indoor Air Quality:** All units include ventilation systems that provide fresh air per the ASHRAE standard. The ventilation system provides residents with almost three times the fresh air required under City building codes. In addition, operable windows promote natural ventilation. In order to maintain healthy indoor air quality, the MHL team reduced the use of carpet and upholstery and selected low-VOC paints, flooring, sealants and adhesives.

**Resource Conservation:** All concrete structural frame elements, slabs, columns, and walls are exposed and treated as the finish surface so that there is no need for them to be covered by finishing materials such as suspended ceilings or gypsum board walls. Use of poured-in-place concrete with reusable forms and pre-engineered steel reduced construction waste as estimated 50% relative to conventional building methods. Also, the project used high-fly ash content poured concrete, which has significant resource, energy, and CO2 reduction benefits, and recycled crushed concrete was utilized as backfill. Reinforced steel for the framing was constructed out of scrap metal. The insulation is formaldehyde free and contains 20-30% recycled content.

**Water Conservation:** The Schiff Residences integrates two innovative water conservation systems, one that uses stormwater runoff to irrigate the building's landscaping, and another that recycles greywater. Stormwater runoff is channeled in a 10,000 gallon basement storage tank. The greywater system captures water from sinks and showers, treats it in an on-site facility, and uses it to flush the toilets.

**Resident Services and Education:** As with previous MHL developments, the first floor of the 5-story Schiff residences includes a 24-hour staffed reception desk, a laundry room, offices for property management and maintenance staff, and a storage room. There is also a small conference room for resident meetings with case managers, case management offices, and a community room. Programs include vocational counseling, substance abuse recovery support groups, and financial literacy and life skills workshops.

Resident education includes an orientation for new tenants, which includes instructions on how to care for and operate appliances and heating and cooling systems in their unit. To inform residents of the purpose and function of the building's various green systems, a web-based kiosk that provides basic descriptions of the greywater, wind turbine, and rain water cistern systems was installed in the first floor lobby adjacent to the front desk.

### Occupant Satisfaction

"A year and five months ago, I dreamed that I was living in a building that oversaw Seward Park Field House. Now that I'm here, I sleep better and feel better more and more with each day. I was three days from being homeless. The place I left was full of drug users. There was no security... Living at the 'Schiff' is a dream; the building has the best incorporation of green technology that you only read about."

— Schiff Residences Resident

## Project Financing

Project financing of almost \$18 million came from a variety of sources, including the National Equity Fund, the Illinois Housing Development Authority HOME funds, Trust funds, plus land and cash donations; Federal Home Loan Bank of Chicago, HUD's Supportive Housing Program; and the Chicago Department of Planning and Development tax increment financing.

### Cost of Greening Project

Total costs for the building's green systems was \$684,000 or 4% of total development costs, including: greywater recycling (\$240,000), solar hot water panels (\$131,000), wind turbines (\$160,000), rainwater collection (80,000), and high-efficiency, sealed combustion boilers (\$73,000). Greening costs for the project were paid for by private fundraising and in-kind donations. The City of Chicago Department of Environment donated the solar hot water panels. Grants were received from LISC Chicago, Illinois Clean Energy Community Foundation, Enterprise Foundation, and CAN Insurance. Greening costs did not impact the rent structure, as rents are kept at 30% of a tenant's income. Rents are subsidized by the HUD Shelter Plus Care program and Section 8 vouchers.

### Life-Cycle Cost Analysis (LCA)

Life-cycle cost analysis was used to evaluate the relative long-term cost implications of alternative green materials and systems. For example the life-cycle costs of solar thermal panels were compared with solar photovoltaic panels as the basis for selecting the thermal panels.

## MEASURABLE BENEFITS

- **Energy Savings and On-Site Generation:** Projected to use 22% less energy than traditional building. Wind turbines generate over 10% of building electricity requirements; solar panels produce 30% of hot water needs.
- **Waste Minimization:** Poured-in-place concrete, reusable forms and pre-engineered steel reduced construction waste by 50% compared with traditional building methods.



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**“Mercy Housing Lakefront is breaking new ground in providing a formerly homeless population with permanent, affordable, and attractive green housing integrated with the full range of on-site support services. Building the Schiff Residences on a brownfield site in the Near North community is an important step in reviving the neighborhood. The roof-top energy generating technologies and other innovative elements speak to MHL’s strong commitment to sustainability. ”**

- Member, Awards Advisory Committee

## Contacts

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Mercy Housing

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**Murphy/Jahn**

## Looking Ahead

### Challenges

The building site for the Schiff Residences had to be completely remediated, as it was a brownfield site that contained ash left over from the Chicago fire. Cleaning up and redeveloping the site returned a valuable property to public use. Another obstacle MHL faced was to find funders that would support the cost of the sustainable design features of Schiff Residences. This motivated MHL to research and apply to organizations that do not normally fund their projects. The lack of clear regulations governing some of the green elements of the project also presented a challenge. For example, City and State regulations were not in agreement concerning the use of gray water systems or rain water cisterns, as both contain non-potable water. The MHL worked closely with the State Health Department to resolve concerns, contributing to the mainstreaming of such innovative systems.

### Partnerships

Prior to opening the Schiff Residences, MHL staff spent considerable time on outreach to the community. These efforts included meetings with the Near North Homeowners Association to keep neighborhood residents updated on project details. Senior MHL leadership also met regularly with the Ward 27 Alderman and other local political leaders. Building staff developed relationships with many organizations in the neighborhood that have offered additional services to the tenants. For example, the Winfield-Moody Health Center, located next door, has provided health screenings and follow-up medical services, filling a critical need given the health conditions of many Schiff Residences tenants. Partnerships were also established with two external employment organizations that provide job readiness training, counseling, and mentoring.

### Policy/Practice Implications

In the Schiff Residences MHL has incorporated several important innovations. Their overall approach of combining affordable rental housing with on-site services is a model for a cost-effective and permanent solution to homelessness. MHL was one of the first non-profits in Illinois to use Low Income Housing Tax Credits to finance the acquisition, preservation and rehabilitation of decaying SRO hotels as supportive housing. Also, two highly innovative technologies have been installed at Schiff Residences: the roof-top wind turbine system, which is battery-free, and the greywater system is the first such system ever approved by the Chicago Building Department.

