



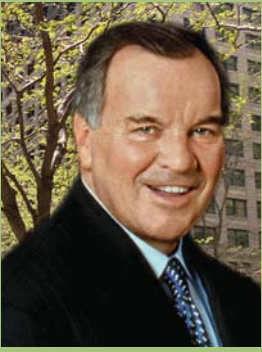
Green
Homes



for Chicago

Five Winning Designs and Architects





Chicago is a beautiful city, known for its parks, lakefront and architecture. It is also a city where we have a balanced commitment to both keep our economy growing, and enhance and protect our environment.

That's why since I've been Mayor, we've worked hard to beautify neighborhoods and reduce noise and air pollution and summer heat by planting more than 300,000 trees and building over 63 miles of landscape medians.

It's why Chicago has become a national leader in installing rooftop gardens. A few years ago we installed a rooftop garden on top of City Hall and since then more than 40 of them have been constructed or are being planned for public and private buildings around the City.

In addition, our landscape ordinance requires developers of everything from office buildings to parking lots to install and maintain landscaping around their property and on the public way.

The City of Chicago also wants to assure that government does its part by designing and constructing environmentally sound buildings. We are demonstrating how buildings like the Chicago Center for Green Technology and the renovated Green Bungalows can cost less to operate and are healthier, more productive places in which to live and work.

This brochure highlights the five winning designs and architects from the Green Homes for Chicago Program sponsored by the Departments of Environment and Housing. These homes are both environmentally sound and affordable for first time home buyers. These innovative designs include features such as solar power, a rooftop garden and recycled and sustainable building materials.

I encourage you to take time to tour the five green homes and consider the design features in any new construction or remodeling you may have planned for the future.

Green roofs and green homes are just part of Chicago's overall commitment to enhance and protect our environment. We are working hard to make Chicago the greenest city in America, with the best quality of life.

Sincerely,

Richard M. Daley
Mayor





Green Homes for Chicago

*Bringing energy efficient, environmentally friendly,
and affordable homes to Chicago.*

Green Homes for Chicago demonstrates how energy efficient and environmentally friendly practices can be incorporated into affordable housing design and construction.

In 2000, the City of Chicago's Departments of Environment and Housing held a competition to solicit green, single-family home designs. The purpose of the competition was to generate the most creative and resourceful applications of existing green technology and simultaneously make it affordable. Three layers were incorporated into the design competition: a base green home, an upgraded green home, and a cutting edge green home.

Seventy-three design proposals from across the nation and five foreign countries were submitted. A panel of twelve local architects, designers and builders selected the five winning entries based on the following criteria:

- **Energy Efficiency** - the home had to conserve energy and use alternative or renewable energy sources as appropriate
- **Sustainability** - the design had to minimize the home's impact on the environment by using resource efficient building materials, recycled and recyclable building materials and resource conserving features.
- **Context** - the design had to reflect the social and economic character of the communities in which they were being built.

The City of Chicago is proud to present these five winning designs and architects. The Green Homes for Chicago will be open to the public in Summer 2003. The homes will then be sold as affordable housing. The energy performance of the homes will be monitored for a period of 18 months. The lessons learned from this project will influence the design of future affordable housing programs.

- **Affordability** - the home had to be affordable to build and for the homeowner to maintain

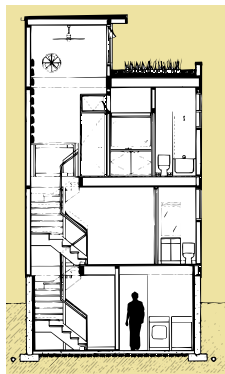
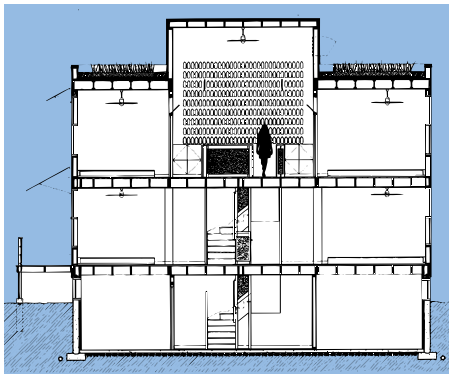
The Home Energy Rating System (HERS)

All of the Green Homes for Chicago winning designs were assessed for energy efficiency according to the industry standard Home Energy Rating System (HERS). The HERS system measures the home's energy characteristics, including insulation levels, window efficiency, heating and cooling system efficiency, the solar orientation of the home and the water heating system. Each home receives a point score between 0 to 100 (with 0 representing the least energy efficient home possible and 100 representing the most energy efficient home possible) and a star rating between one and five stars. To be considered an "Energy Star," (a five-star home), the home must receive a HERS score of at least 86.

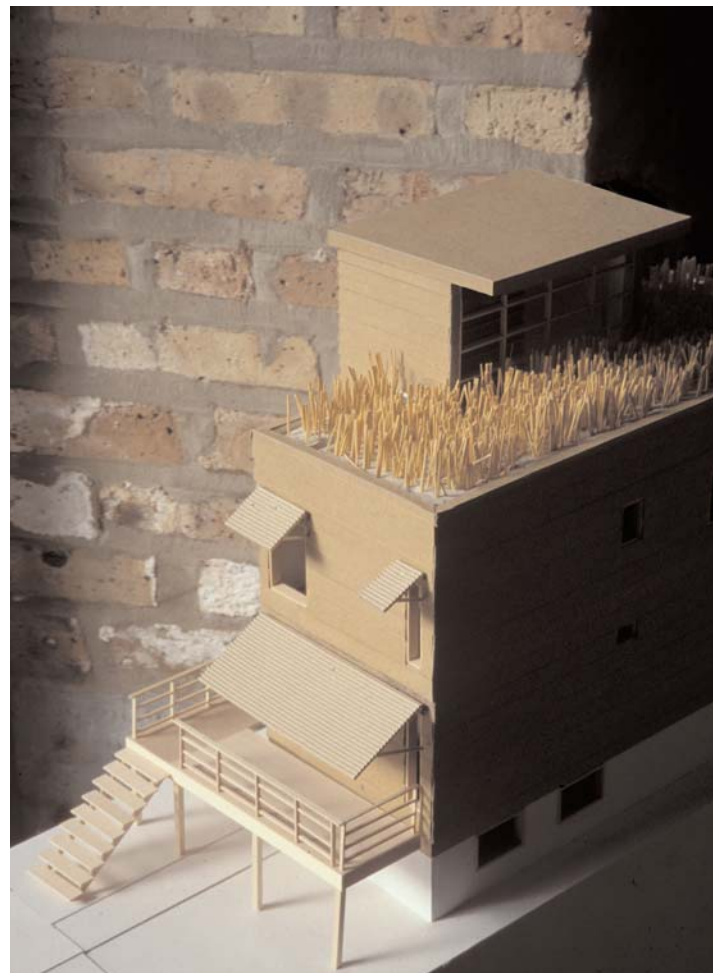
Least Efficient	0-19	20-39	40-49	50-59	60-69	70-79	80-82	83-85	86-89	90-100	Most Efficient
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Cutting Edge Design

1919 N. Keeler



Cross section of home



Model of 1919 N. Keeler highlighting the sod roof and the south-facing clerestory window

Architect's Green Philosophy

The Factor 10 House is based on a concept developed in the mid-1990's to address a global environmental crisis brought on by human activity that could cause mass extinction of one-fifth of all living species in the next 30 years. As a major contributor to this crisis, buildings consume 42% of all energy,

30% of all raw materials, and are responsible for 40% of all air pollution. Using four strategies—size reduction, improved efficiency, extended life span, and impact reduction—the Factor 10 House strives to reduce life-cycle environmental impacts by a factor of 10 compared to the average home being built in America today.

Green/Energy Efficient Features

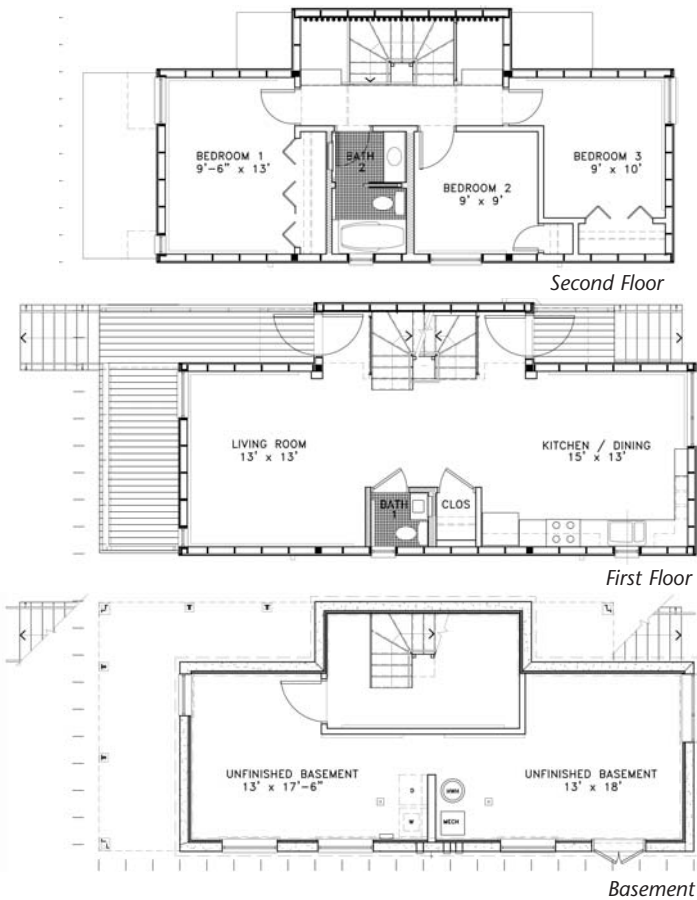
- ☞ The modular design minimizes waste of materials and allows off-site assembly.
- ☞ Energy consumption is minimized by maximizing insulation, careful placement of the windows and the use of a heat sink.
- ☞ The careful placement of windows maximizes reflected light into the interior of the home and reduces glare. Also, a south-facing clerestory

window brings light to the core of the house reducing the need for artificial lighting.

- ☞ Augmented by a whole-house fan, the shaft will pull warm air up and out of the house in the summer, and push warmed air down in the cold months.
- ☞ Materials were selected for their extended life spans and initial production impact.
- ☞ The porches include perforated metal awnings that channel air inside.

☞ Recycled materials are incorporated throughout the house. The most notable, a wall of water bottles acts as a heat sink in the solar chimney.

- ☞ The unique sod roof has many environmental benefits:
 - It counters the effect of heat gain through evaporative cooling, adding to the insulation value of the roofing system and thereby reducing energy consumption.
 - It eliminates the destructive effects of ultra-violet rays on the



Pictured from left to right: Marc L'Italien, Mayor Richard M. Daley, Marj Brownstein, Erin Meana, Susan Hagerty, Tom Pejic, Chris Hoyt

EHDD | **ARCHITECTURE**

Founded in 1946, Esherick, Homsey, Dodge and Davis has worked to translate client visions into innovative spaces shaped by light, materials, and physical setting. The firm, with a staff of 85 and offices in San Francisco and Chicago, has received numerous design awards and honors, including the Firm of the Year and the Gold Medal Award from the national American Institute of Architects.

EHDD has a wide range of project experience. With several aquarium, museum, and zoo designs to its credit throughout the United States, Asia, the Middle East, and Europe, EHDD is a leading designer of exhibit-related facilities. The firm opened the Chicago office in 1997 to design and implement, in association with Perkins & Will, the master plan for the world-renowned John G. Shedd Aquarium. Since then, EHDD has completed the restoration and renovation of many of the exhibits in the Shedd Aquarium, including the Wild Reef: Sharks at Shedd, a 28,000 square-foot addition that opened this year. Since its founding, EHDD has been committed to environmental issues in design. Their staff is knowledgeable and focused on sustainable design issues, with fourteen architects currently certified as Leadership in Energy and Environmental Design (LEED) accredited professionals.

roofing membrane, extending the life span of the structure.

- It converts carbon dioxide to oxygen while looking beautiful - sod on the roof is like icing on the cake!
- It absorbs and retains storm water runoff, reducing the impact on the City sewer system.

☞ The foundation is constructed of high fly ash concrete, which involves a less energy intensive manufacturing process and creates

less global warming gases than regular concrete. Fly ash is a by-product of coal-fired power plants that generally goes into the landfill. When used in concrete in high volumes, it creates a stronger, more durable product that reduces concrete's environmental impact.

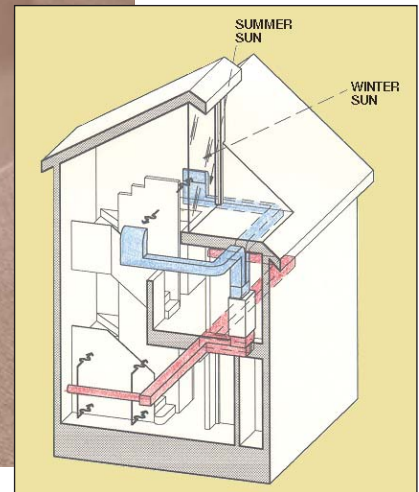
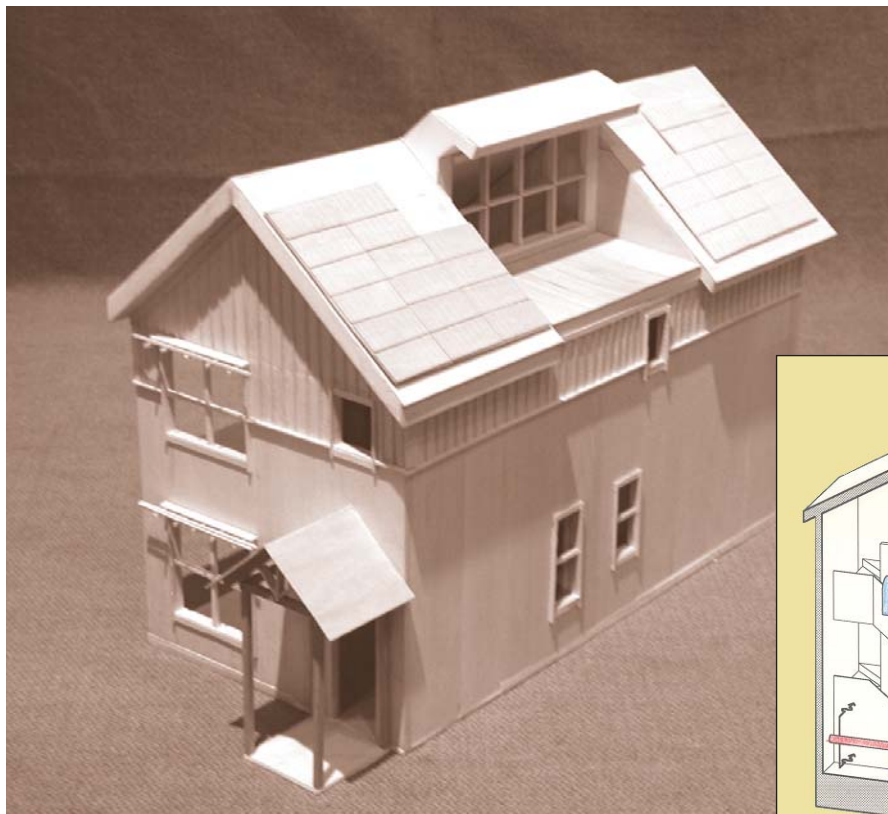
☞ The wrap-around deck is constructed from IPÉ, a certified Brazilian hardwood that naturally resists rot, decay, insects, and mold without the use of toxic chemicals used in other decking products. It is naturally fire resistant and has

been awarded an 'A1' rating. Additionally, IPÉ is a strong, dense wood, harvested from naturally sustainable forests. It has very high wear durability in daily use, and has an expected lifetime of more than 25 years.

☞ Energy Star appliances

★★★★★

Five Star rating on 'HERS' System



Green Upgrade Design

1917 N. Keeler

Architect's Green Philosophy

The driving vision behind this green home was to create a graceful place to live - a home that was comfortable and earth friendly, as well as attractive. This handicap accessible design focused around three priorities: sunlight, ventilation and insulation.

The interior spaces are composed around a central "solar" atrium. The atrium projects above the roof line to capture direct

southern light, illuminating the heart of the home and providing for solar heat gain. In winter, the sun-warmed air will naturally circulate as it cools, or it will be drawn into the high return air plenum as pre-heated air adding to the efficiency of the forced air heat system. In summer, the higher air temperature at the top of the atrium will create a stack effect and facilitate natural cross ventilation, actually creating an internal breeze.

Green/Energy Efficient Features

- ☞ A light-filled central atrium illuminates the heart of the home, facilitating natural ventilation in the summer and providing direct solar heat gain in the winter. A thermostatically controlled whole house ventilation system is located at the top of the solar atrium.
- ☞ A generous amount of fiberglass batt insulation is thoughtfully designed into the floors, walls and roof to keep the home air-tight.

- ☞ Triple honeycomb insulating window shades are installed at the solar atrium. The shades are mounted to a photocell and open and close automatically to minimize heat loss.
- ☞ Trellised window eaves provide sun protection for the home in the summer.
- ☞ Photovoltaic solar panels convert sunlight into clean solar electricity, potentially reducing electricity costs by up to fifty percent.
- ☞ Airlock front and rear entry vestibules help keep warm air from

escaping out the front and back doors in the winter.

- ☞ Materials used in the construction of the home are resource efficient, have recycled content, and are environmentally friendly. These materials include small dimension and composite lumber, recycled wood stairs and decking, fast-growing, renewable bamboo flooring, recycled ceramic tile.
- ☞ The home is designed with a wheelchair accessible first floor. This includes a front living space

ROSS ARCHITECTURE

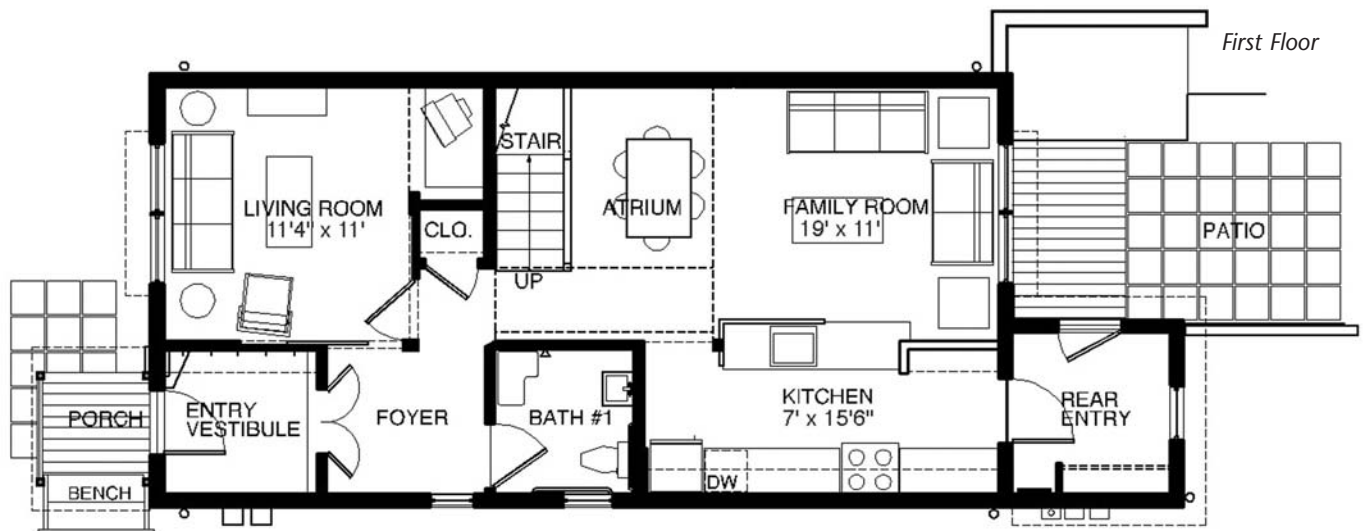


Pictured from left to right: Eric Haubner, Douglas Ross, John Kline, Brian Gruetzmacher, Chris Michaleck

Douglas Ross established Ross Architecture in Chicago in 1991, with a commitment to building his firm and reputation by providing personalized attention to each client and attracting associates who share that vision. Using his breadth of international experiences as the firm's cornerstone, he continues to express the distinct inner personality of each and every Ross Architecture design.

A 1999 recipient of the American Institute of Architecture Chicago Young Architects, Ross is also president of Ropar Construction Inc. and director of the Greater North Michigan Avenue Association. In addition, Ross has been a professor at the International Academy of Merchandising and Design and

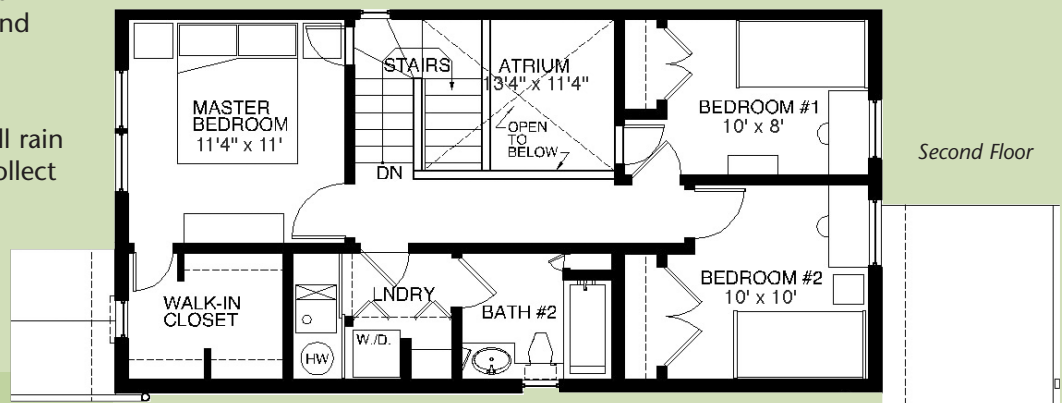
a guest lecturer and critic at the Mushashi Institute of Technology in Tokyo. His work has been published in many publications including *Japan Architecture*, *Chicago Magazine*, *Chicago Tribune Magazine* and *Better Homes & Gardens*.



with pocket doors that can be closed to create a bedroom and a wheel chair accessible bathroom and kitchen.

☞ French drainage and a drywell rain water management system collect and maintain all rain water run-off onsite.

☞ Energy Star appliances



★★★★★+

Five Star Plus rating on 'HERS' System



Cutting Edge Design

664 W. Englewood

Architect's Green Philosophy

This Green Home aspires to the status of architecture by manifesting architecture's ability to communicate the implicit intentions of a building program through the language of construction. In the broadest terms, "green" refers to the inter-connectedness of all things. The relationship of interior to exterior spaces, the juxtaposition of materials and the manner in which they are assembled, and the introduction of color where not typically found are examples of breaking the

pattern of expectation. The Green Home confronts the visitor with the contrasting orders of the man-made and the natural. These tactics establish a figure/ground relationship between building and landscape that illustrates the breadth of the gap between humankind and the sources that sustain us. To that end, this Green Home does not represent a simple solution as much as it signals a wicked problem: our strategies for growth and development - the exploitation of natural resources for personal profit - are not sustainable.

Green/Energy Efficient Features

Energy Efficiency is the primary focus of this Green Home design:

- ☞ Air-tight, expanding foam Icynene insulation system is used in the home. The soft foam insulation is sprayed in walls, ceilings and floors as a liquid and expands in seconds to create an air barrier that seals the building envelope.
- ☞ RenewAire EV130 Energy Recovery Ventilator (ERV) tempers incoming fresh air and ensures that indoor air

quality remains high despite the tight building envelope.

- ☞ The two-story entry atrium passively ventilates summer heat through operable skylights.
- ☞ HURD aluminum-clad, wood windows with Cardinal LoE²-170 glass increase daylight in the home while minimizing summer heat gain and winter heat loss. The glass is expected to reduce solar heat gain as compared to ordinary clear glass.
- ☞ Interior finishes consist of sustainable and recycled materials.

- ☞ Welded-wire fabric *Green-Screen* panels affixed to the building exterior provide a climbing surface for seasonal plantings that shade glazing during the growing season and mitigate solar gain during warm months.
- ☞ Engineered wood framing materials are from fast-growth, renewable sources.
- ☞ Low-Volatile Organic Compound paints
- ☞ Energy Star appliances

★★★★★

Five Star rating on 'HERS' System

SGA

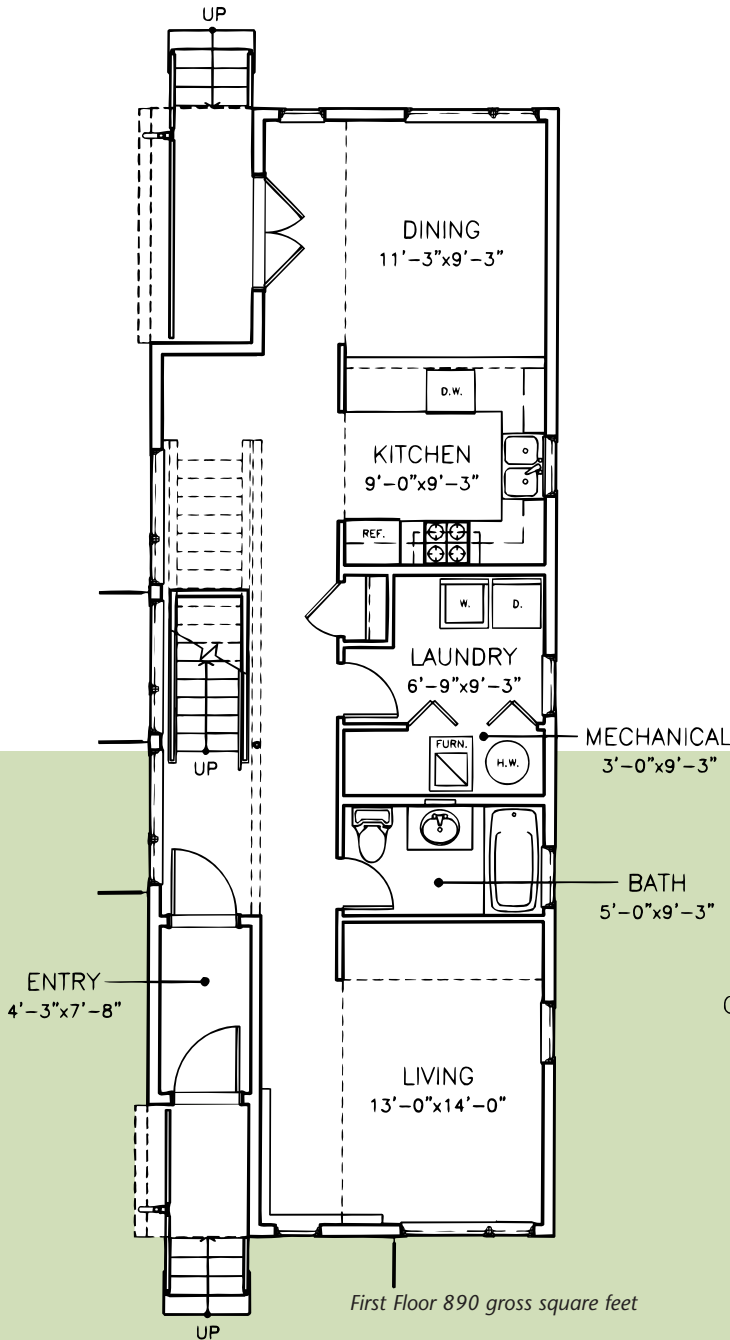
Sean Garrett Architecture



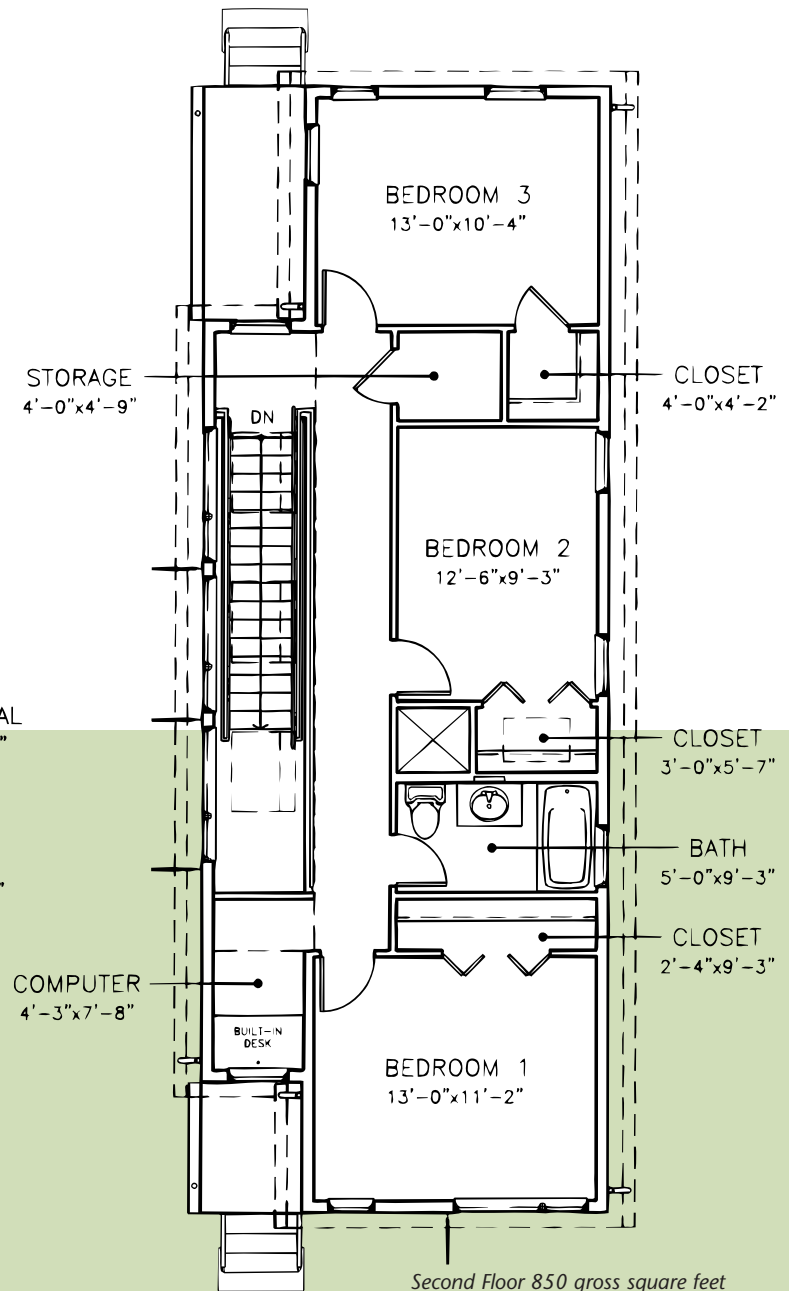
Sean Garrett

Sean Garrett, AIA, established Sean Garrett Architecture's Denver office in 1999 following ten progressive years of architectural design and construction experience with leading Chicago and Colorado architecture firms. Founded on the conviction that the quality of one's environment directly affects the experience of living, Sean Garrett Architecture provides design and planning services of the highest order. This

exceptional firm rewards corporate, private, and institutional clients with responsible, performance-driven designs that incorporate modern building technologies while remaining uniquely suited to the individual, community, culture, and place.



First Floor 890 gross square feet



Second Floor 850 gross square feet



Green Upgrade Design

658 W. Englewood

Architect's Green Philosophy

This Green Homes for Chicago winning design addresses accessibility and sustainability, focusing on minimizing construction waste, utilizing recycled and renewable materials, and improving indoor air quality. The design also allows for changing family circumstances with a bedroom and full bath located on the first floor.

This Sustainable Design is more complex than the environmental impact of the building or its lifetime operating costs, though these are important factors. Sustainable Design is that which is comfortable and healthy for its inhabitants, promotes community interaction, and most importantly, is accessible and visitable.

Green/Energy Efficient Features

☞ The house employs passive solar design features to minimize energy consumption, including energy efficient glazing on all the windows, overhangs that shade the windows, and a deciduous tree on the south elevation. This will aid in summer shading yet allow winter sun to enter the home.

☞ All interior framing consists of light

gauge steel with greater than 50% recycled content. All wood framing lumber is fir spruce and/or hemlock. All framing is spaced 24 inches on center, and is six inches deep, rather than the typical construction practice of four inch deep studs 16 inches on center. This results in less construction waste and allows for larger and deeper continuous spans of insulation in the building.

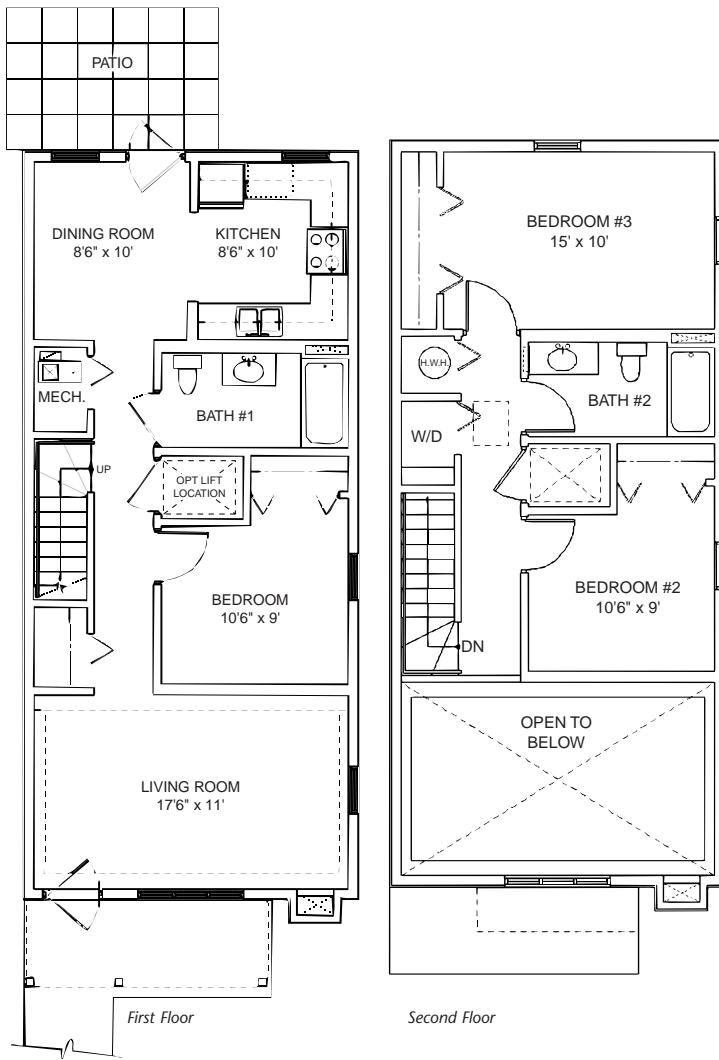
☞ Cellulose insulation is used in the floors, exterior walls and ceiling to

achieve above-average R-values (resistance to heat flow).

☞ Adhesives and paints with low Volatile Organic Compounds (VOCs) were used throughout the home, improving indoor air quality.

☞ The landscaping includes native, drought-resistant species of groundcover and prairie flowers.

☞ The design seeks to minimize "thermal bridges," or the transfer of heat and cold into the house. This is



Pictured from left to right: Former Commissioner of Department of Environment: Bill Abolt, Mike Jerabek, 31st Ward Alderman: Ray Suarez, Mayor: Richard M. Daley, Bill Worn, Kinson Mills, Commissioner of Department of Housing: Jack Markowski, Craig Eigenberg

P.C. operates with the philosophy of establishing long-term relationships with clients.

The design work of William Worn Architects P.C. has received many awards, most recently selected as winner of the Green Homes for Chicago competition. For their work with the U.S. Department of Housing and Urban Development in Idaho the firm was honored with a HUD Best Practices 2000 Award. HUD also selected our group home for adults with disabilities in Pullman for Ada S. McKinley Community Services as an example of how accessible new construction can be successfully integrated into an historic district. In 2003, the Masonry Marketing Council presented William Worn Architects, P.C. with their Quality Masonry Design and Execution Award for Riverwalk Seniors Apartments. In 2002, the Associated Builders & Contractors Excellence in Construction Award was presented to William Worn Architects, P.C. for The Delta on Lincoln. Mr. Worn has been awarded multiple American Institute of Architects design awards and was selected as one of the top one hundred architects in the world by *Architectural Digest* magazine.

WILLIAM WORN ARCHITECTS

William Worn Architects, P.C. specializes in the integration of sustainable techniques into the architectural process. The firm's focus is the design of affordable multi-family; market rate multi-family; senior's housing and commercial work with an expertise in environmental architecture and architecture for children and adults with disabilities. William Worn Architects,

accomplished through an innovative framing technique that reduces wood and increases insulation at headers and stud intersections.

Composite wood siding is used on the exterior of the house. The siding is made from wood by-products that are compressed together utilizing an environmentally friendly production method, offering a durable, sustainable alternative to traditional vinyl siding.

Energy Star appliances

Cabinetry is made from rubberwood, a durable, renewable material.

Gypsum drywall is composed of recycled material with chlorine-free recycled paper.

Double-hung windows are energy efficient and low maintenance, installed with double flashing to omit drafts and eliminate heat loss.

Exterior doors are solid-core wood with veneer face and glass insert. Interior doors are hollow-core wood

with veneer face composed of recycled material.

The double height living room aids in cross-ventilation and natural lighting of interior. Unique to this home is a "chimalator" - a wind turbine heat and air exchange system. Creatively incorporated into the design of the house, the system keeps warm air flowing in the winter and helps cool the house in the summer.

★★★★★

Five Star rating on 'HERS' System



Base Green Home Design

646 W. Englewood

Architect's Green Philosophy

Starting with a simple, consistent design strategy, off-the-shelf mechanical systems, and available green materials, and combining them using intelligent building techniques, a low cost, highly

energy efficient 'green' home can easily be constructed. This building requires no additional work by its users nor does it inhibit the design possibilities of the exterior or the layout of the interior. It demonstrates that building 'green' has come of age.

Green/Energy Efficient Features

- ☞ The landscape includes smaller areas of grass which reduces the amount of mowing required, preferably with a manual mower.
- ☞ A recycling center is integrated into the kitchen cabinets.
- ☞ A one-inch rigid insulation board is used around the entire house. This is used in conjunction with a high

density, blown-in rockwool insulation set within the 2x6 perimeter framing. This allows for a 'breathable' interior while still providing a very high insulation value.

- ☞ Two 60-gallon rain barrels, made from recycled plastic, connect directly into the downspout system, keeping some of the storm water on site to be used for landscaping purposes.
- ☞ The entire structure is set up on a two-foot module for its rough framing to reduce lumber waste.

- ☞ An efficient forced air gas fired furnace uses a sealed combustion/ direct vent unit, which takes outside air for combustion instead of conditioned interior air.
- ☞ An 'air cycler' system provides fresh air into the house at preset periodic times.
- ☞ The structure is comprised of panelized engineered lumber.
- ☞ Energy Star appliances
- ☞ Other materials within the building



Pictured from left to right: Mark A. Miller, Nathan Kipnis

NATHAN KIPNIS ARCHITECTS INC.

Nathan Kipnis Architects, Inc. (N.K.A.) is a full-service, design-oriented architecture organization based in Evanston, Illinois. Founded in 1993, the scope of work includes a variety of residential, commercial, and renovation/historic preservation projects in the Chicago area.

Mr. Kipnis is also an energy and environmental consultant for the City of Chicago's "Green Bungalow" program. N.K.A.'s

designs have been featured in trade and consumer publications, such as the *Chicago Tribune's* "Dream Homes," *Chicago Magazine*, and *Better Homes & Garden*.

The organization specializes in energy conscious and environmentally responsive design for both residential and commercial applications. N.K.A. is committed to combining a client's challenging requirements with excellence in design and environmental awareness, and is equally adept at meeting the distinctly different demands of owner and developer clients.

Mark A. Miller Architects/Builders assisted N.K.A. for this Green Homes project. This firm offers clients architectural design, interior design, including custom furnishings, and construction management services. The firm's philosophy is to create spaces that enrich and awaken one's spirit. Mark A. Miller has spent over 15 years studying various Zen disciplines and this spiritual component is now an integral part of his work.

are typically locally available and have recycled content, low energy content and/or low volatile organic compound emissions.

Selected materials include:

- The use of natural linoleum
- Carpet made from recycled materials
- Unpainted galvanized metal detailing at the gutters, downspouts, front overhang and front

light fixture create a virtually maintenance free exterior.

- Recycled Chicago common brick and a stained rather than painted cement fiber board siding were used for the exterior materials
- Working with the smallest budget of competition, an open floor plan and generous color were used in the design. By setting the mechanicals to one side, the first floor is completely open, making

the space appear larger and providing views from front to back. Because color is "free," it helped provide visual interest and avoid a white box look. The black appliances play off stainless steel accents. Flooring uses four different tile colors in a random pattern. Walls, doors and trim are one of three colors, which is a welcome surprise.

★★★★★

Five Star rating on 'HERS' System



CITY OF CHICAGO

Richard M. Daley, Mayor

Alderman Ariel Reboyras
30th Ward

Alderman Shirley Coleman
16th Ward

DEPARTMENT OF ENVIRONMENT

N. Marcia Jiménez, Commissioner

The Department of Environment protects human health and the environment, improves the urban quality of life, and promotes economic development. Through a number of environmentally sound and innovative programs and practices, Chicago has become a leader in urban environmental issues while creating a better city in which to live, work and raise a family.

DEPARTMENT OF HOUSING

John G. Markowski, Commissioner

The mission of the Department of Housing is to increase housing opportunities by creating affordable and accessible homeownership opportunities and rental options for all residents. Since 1994, the Department of Housing has leveraged more than \$1 billion to develop affordable housing throughout Chicago, and over the next two years, will spend an additional \$900 million to create and preserve more than 25,000 units of housing affordable to individuals and families of diverse incomes and backgrounds.

DEVELOPER

Neighborhood Housing Services of Chicago
Neighborhood Housing Services of Chicago, Inc. (NHS) is a nonprofit organization working in partnership with business, government and neighborhood residents to revitalize Chicago's low- to moderate-income neighborhoods. Formed in 1975, NHS is Chicago's largest neighborhood revitalization organization. Throughout its history, NHS has leveraged investment of more than \$1 billion in Chicago's neighborhoods.

CONTRACTORS

Brickyard Development and Construction
Telion Contracting Corporation

MARKETING PARTNER

Coldwell Banker Residential Brokerage

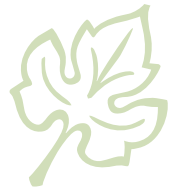
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Spire Solar Chicago
Illinois Clean Energy Foundation
Illinois Department of Commerce and Community Affairs
Green Corps Chicago
Marvin Windows
Terra Green Ceramics, Inc.
Timber Grass
Trestlewood
Caroma



SEARS







For more information contact:

Neighborhood Housing Services of Chicago
773.568.1020

Department of Environment
312.744.7606

www.cityofchicago.org/environment/