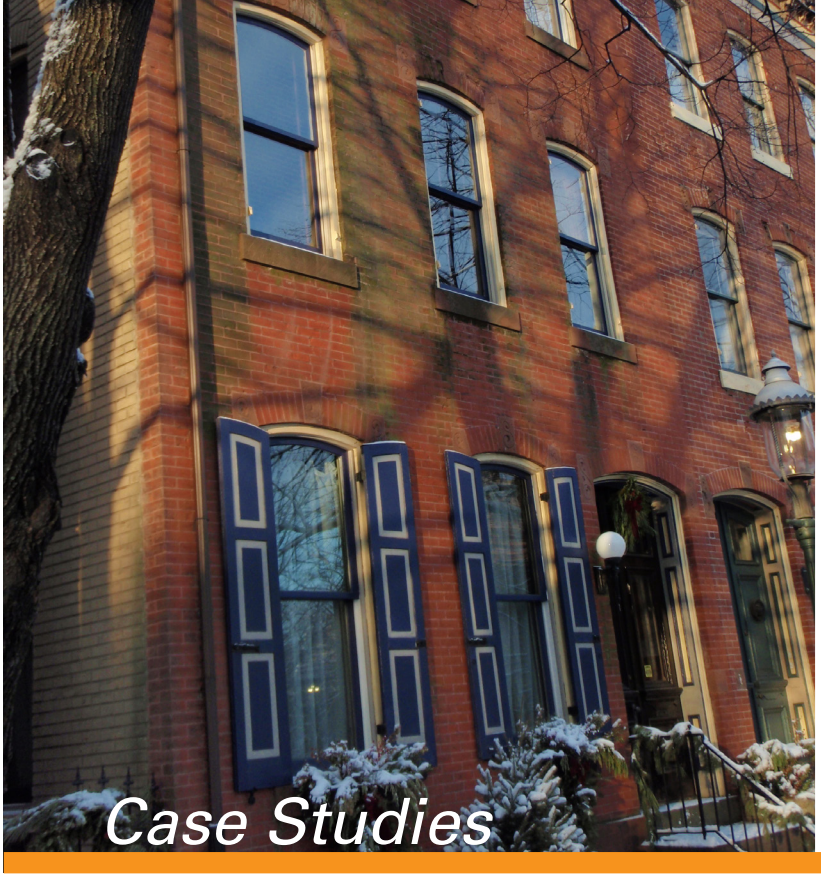

NJ GREEN HOME
REMODELING GUIDELINES

Use of the Guidelines

What are the guidelines and what are they not?

The information provided in these guidelines is intended to assist homeowners, contractors, architects, interior designers, landscape architects, and other professionals who design and remodel residential structures. They draw upon best practices and provide a general overview of green remodeling strategies customized for New Jersey, with links to additional information and resources. These guidelines introduce ways a homeowner or remodeling professional can incorporate green building practices into common home remodeling projects. These are not step-by-step technical guides but rather a menu of 'best practices' organized by major building systems. One should become familiar with local building code and zoning requirements before undertaking a green home remodeling project.

The guidelines do not list or endorse specific green products or services but rather identify 'greener' options to consider when selecting materials and services for the home.

These Guidelines do not constitute an endorsement, approval, or recommendation of any kind by any persons or organizations affiliated with developing these Guidelines. The NJDEP further disclaims any and all liability for any personal injury, property damage or any other damages that are caused by or that may result from the reliance on these NJ Green Home Remodeling Guidelines.

New Jersey Green Home Remodeling Guidelines Version 1.0

Cover Images: Michael Fleischacker, Ford 3 Architects, Barbara Geller, Patricia Gaylor, John D. S. Hatch, Ed Schwartz

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REGREEN
ASID & USGBC

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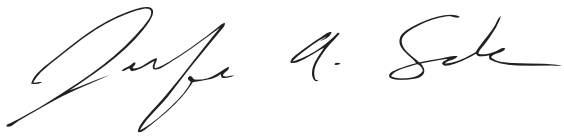
RUTGERS
Center for
GREENBUILDING



Jennifer Senick
Executive Director
Rutgers Center for Green Building

Increasing the livable space in the home through finishing the basement or adding a new addition provides an excellent opportunity to incorporate green home remodeling. In basement remodeling and additions, ensuring indoor environmental quality through radon reduction and moisture control is paramount. Before embarking on a do-it-yourself remodel, consider consulting with a professional who can help ensure implementation of proper green design techniques. Selecting green options for basements and major additions requires a bit of research, but the overall benefits of better insulation, ventilation, and finishes cannot be understated.

Finished Basement and Major Addition

Photo: Lise Thompson

Case Study

Location of Project: Ridgewood , New Jersey
Homeowners: Ed Schwartz, Julie Tung
Interior Designer: Lori Jacobsen, The Repurposed Home
Sustainability Consultant: Green Living Solutions
General Contractor: Norton Thompson, Tremor Contracting
Area Affected: ~5,000 square feet

Overview and Scope

This project involves the complete restoration of a historical home, originally built circa 1767. The new remodel has three major components. First, the existing part of the home was restored, all systems were updated and a thermal envelope was established. Next, an attached stucco garage built in the 1970's was removed, along with a damaged portion of the home, with plans for a new detached garage to be built later. Finally, a wing which was originally built in 1860 but removed at some point thereafter, is being partially rebuilt. This addition will include an expanded kitchen, family room, master suite, and finished basement.

Design Approach

The homeowners originally started this project with the challenge to show that a historical home could be remodeled sustainably while also adhering to the aesthetics and integrity of the building's past. To this end, the design team used **reclaimed**, salvaged, and recycled components wherever possible. The owners also desired to reduce their carbon footprint by increasing the energy and water efficiency of his home.

Team and Process

The homeowners planned this project before building green had started to become more common. Since at the time there were very limited resources to assist them, they were inspired to launch a green consulting firm, Green Living Solutions. Therefore they acted as the advisors, choosing all of the green products, features, and materials. The architect was chosen for his experience with older homes and not necessarily for his interest in sustainability, but working with the homeowners, the architect and contractor learned a great deal about green remodeling. The interior designer selected additional detail and materials to further a green result.

Finance

Restoring a historic house properly is inherently more expensive than a standard renovation. Materials used, as well as specialists with experience working on older homes, tend to be more expensive than average. Since the owners have a financial background, they considered the overall costs of operating a home and chose green features that had reasonable payback periods, including efficient lighting and **HVAC** equipment, better insulation, and a **photovoltaic** array. The payback periods for all of these features are estimated to be no longer than six years.

Other aspects of green construction were no more expensive than their conventional counterparts, since the homeowners had a good sense of what green products were available.

So far, the owners have reported reduced energy use from the previous owners by roughly 70 percent. When all aspects of the project are complete, they expect to be at 80 percent - 90 percent lower than the energy used by the previous owners despite the fact that the house will be nearly 40 percent larger!

Lessons and Trade-offs

The design team found that most contractors are not fluent in the latest green trends and sustainable practices. A green consultant can make one aware of those options and provide guidance on their viability in the real world; available locally, installed properly, performing up to expectations, etc. Green options tend not to be more expensive if one knows where to look. By becoming aware of green options, homeowners can make sustainable choices without sacrificing comfort, safety, or savings.

"People think of building green as being difficult, more expensive, etc.. It's at the point where all construction should be done with an eye for sustainability. Green building leads to more durable structures, better indoor air quality, greater comfort, and lower energy costs, not to mention doing our part to reduce green house gases and our reliance on foreign energy sources."

- Ed Schwartz

Ductwork sealed and insulated

All climate heat pumps

List of Green Strategies

Energy Conservation

- Improved the thermal envelope, allowing the system to perform much more efficiently
- Utilized a heat-pump-assisted water heating system that dehumidifies the basement, and captures energy to offset water heating needs
- Installed an ultra-insulated hot water tank
- Reduced air infiltration through caulking and air sealing
- Installed expandable spray foam insulation in parts of the attic, the basement ceiling, and the restored addition*
- Installed **cellulose insulation** in the attic
- Sealed and insulated ductwork
- Excavated dirt crawl spaces which will be replaced with poured concrete over 2" of rigid **extruded polystyrene** foam board
- Incorporated **fly ash** in the concrete of the new foundation to reduce the amount of cement needed
- Used **Energy Star®** rated appliances
- Used **CFLs** in most light fixtures
- Installed **solar tubes** for natural daylighting
- Proposed a solar array to offset a significant portion of electricity usage
- Retrofitted fireplaces with inserts that prevent conditioned air from being pulled from the home during use

Water Conservation

- Installed low-flow fixtures and toilets
- Utilized an outdoor rainwater harvesting system to reuse rainwater for gardens and landscaping
- Created **rain gardens** to keep storm water on site and facilitate **infiltration**
- Replaced part of the driveway with permeable surface

Salvaged front doors

Expandable spray foam insulation*

Deconstruction not Demolition

Indoor Air Quality

- Removed old **asbestos** and lead pipes
- Removed lead paint where necessary
- Replaced **carbon monoxide** producing appliances
- Used low- and no-**VOC** paints
- Used hardwood and cork flooring instead of carpeting
- Installed an all-climate **heat pump** with an air filtration system to constantly filter air, provide proper humidity levels, and produce indoor air quality that is better than outdoors

Resource Conservation

- Used **reclaimed** materials wherever possible
- Reused old floorboards for repairs in other parts of the home
- Salvaged front doors from a pre-demolition 1880's brownstone
- Reupholstered furniture with surplus scrap materials
- Collected stones to be used to build a retaining wall
- Sorted and recycled construction debris

Sustainable Materials

- Installed cork flooring in the foyer and kitchen
- Used countertops made from scrap pieces of granite and recycled glass
- Chose closets and cabinets from manufacturers with sustainable practices

*To avoid fire hazard when using spray foam materials installed in walls or ceilings, choose an approved, fire resistant thermal barrier with a finish rating of not less than 15 minutes as required by building codes. Rim joists/header areas in accordance with the IRC and IBC, may not require additional protection. Foam plastic must also be protected against ignition by code-approved materials in attics and crawl spaces. See relevant Building Codes and www.iccsafe.org for more information.

Case Study

Location of Project: Stormville, NY
Homeowners: Deborah Monroe
Architect: Jordan Valdina
Landscape Architect: Deborah Monroe
General Contractor: Deborah Monroe
Area Affected: 725 sq. ft.

Overview and Scope

The project transformed a 1960's studio apartment and garage into a 1-bedroom in-law apartment with a kitchen and bathroom, living room and laundry room. A new 3.5 bedroom/2.5 bath home, built to the **U.S. Green Building Council's LEED** Silver rating, was built and connected by a covered breezeway to the existing in-law apartment.

Design Approach

Surrounded by an organic beef farm and overlooking pastures and a pond, the homeowner wanted to respect the quiet and beautiful section of Stormville where she lived and aimed to have a lesser impact on the environment throughout the remodeling process. In turn, her desire was to make small changes to the house that would make a huge impact on energy savings and indoor health.

Team and Process

The homeowner was responsible for all changes and upgrades to the home. The renovation to the in-law apartment took place gradually over a period of six years.

Finance

The homeowner developed a marketing program to secure sustainable materials and sponsorships for the project. The program offered three levels of sponsorship (bronze, silver, gold) based on the percentage of discounted or donated materials and/or labor. In return, sponsors received varying levels of marketing and publicity, including recognition on the project's website. The highest level of sponsorship included participation in a series of open houses over the course of six months. For more information on the project and a full list of sponsors, see (www.monroegreenproject.com).

Lessons and Trade-offs

The homeowner was interested in installing **photovoltaic** panels but the existing site conditions that included a 200 year old maple tree on the south side of the home and the costly up-front investment did not create a good return on investment, even with New York State's solar rebates. Instead, the homeowner plumbed the home for future installation of geothermal and solar-thermal, to take advantage of these technologies as they become more cost-effective down the road through better incentives and/or and technological advancements.

"You can do things the easy way or do them the right way….only a valiant soul will endure the pressure to do anything the right way....be that valiant soul and change your world."

- Deborah Monroe

Before remodel

List of Green Strategies

Energy Conservation

- Removed vinyl siding, used **house-wrap** and added 2-3 inch insulation board to the exterior, and installed fiber-cement siding
- Installed **Energy Star®** lighting and appliances
- Removed saturated and non-functioning insulation with blown **cellulose** made from 100 percent recycled newspaper in the attic, bathroom, and under stairs to reduce drafts
- Added European flat panel radiant baseboard on the ground floor
- Installed double pane **low-E** windows; caulked and used foam insulation around windows to reduce air leakage
- Extended eaves for **passive solar heating** and cooling and took out roof **soffit** to eliminate drafts
- Installed chimney for pellet stove that currently uses 1/2 - 3/4 of the amount of pellets and propane used before the changes

Water Conservation

- Replaced a 3.5 gallon toilet from 1952 with a low flow toilet
- Installed low flow faucet in bathroom and water filter on kitchen sink (now uses tap water instead of bottled water)
- Replaced dirt driveway with semi-pervious stone that becomes more solid when wet but still allows for water **infiltration**
- Extended eaves to protect the home against rain and moisture

Indoor Air Quality

- Repainted entire house with no- or low-**VOC** paints
- Removed carpet and installed wood flooring upstairs to reduce allergens and eliminate **VOC off-gassing** from carpet
- Uses green cleaning products

Sustainable Materials

- Replaced trim with **FSC-certified wood**
- Replaced all sheetrock in bathroom with **recycled content** sheetrock

Blown cellulose insulation in attic

European flat panel radiant baseboard

Case Study

Location of Project: Tri-state area

Architect: Tom Vierschilling (Project Manager), **LEED** AP, WESKetch Architecture

Sustainability Consultants: Homeowners and project team members

Landscape Design: Gaia Gardens

General Contractor: Robert Nagy Building Company

Green Interior Design: Patricia Gaylor Interior Design

Energy Monitoring Services: Christine Bruncati, R.A. New Jersey Institute of Technology

Area Affected: 3200 sq. ft.

Overview and Scope

A couple with young children purchased the house in which the wife grew up. The home is a 1930s colonial, 3-bedroom, 1.5 bath. Since they had to remodel, they decided to do a "green" remodel with improved energy efficiency, better indoor air quality, and sustainable materials and practices. Their goal was to create a safer, healthier, and more environmentally responsible home in which to raise their family. In addition, the move provided them with a "right-sized" home and a more sustainable location, with a greater number of amenities within walking distance to reduce the need to use a car for transportation. With some additional effort, they decided to pursue a **LEED** for Homes Platinum rating and use the project to help educate and inspire others about sustainable building and remodeling.

Design Approach

The design team initially struggled with trying to preserve as much as possible of the original home for conservation and sentimental reasons. But in the end it was agreed that the house's performance was best served by making it a true "gut-rehab." As a gut-rehab the house is eligible for seeking both the **Energy Star**® for Home rating and a **LEED** for Homes Platinum rating from the U.S. Green Building Council. (Only one home in New Jersey is currently rated Platinum, and that is new construction.) The residence is being remodeled using many of the latest environmentally responsible methods and materials. The benefits will include lower operating costs, a smaller carbon footprint, a healthier home, and better environmental stewardship. It will serve as a model of how to "green" an older traditional-style house at different ranges of budgetary investment and how traditional builders can adapt to green building techniques.

Team and Process

The homeowners met with the architect to scope the project and present the variety of initiatives they were interested in pursuing. The architect in turn made suggestions and initiated the design. The homeowners found an interior designer focused on green residential design. They interviewed several builders before deciding on a team that included a green building specialist and a builder who was interested in learning to adapt additional green building practices to his work. The homeowners brought an **HVAC** contractor on board to explore high-efficiency systems. As the team was assembled, they met and communicated frequently.

Finance

Many of the green methods and materials used can be implemented in any home, with a modest budget, and with a short payback to make it healthier and environmentally friendly. Others are appropriate in a remodel with a bit more investment and longer payback period. Some of the materials chosen, such as flooring, are less expensive than the traditional products. More expensive choices were evaluated using long-term cost savings as a basis, and some choices were pared back to reduce the budget. The homeowners anticipate tremendous savings in energy costs and maintenance. They are grateful to have had the assistance of the project team and partners in keeping costs reasonable, including BASF, Superior Walls, Huston Lumber, Serious Windows, Caroma, Smart Little House, and others.

Lessons and Trade-offs

The biggest challenges for the homeowners, though not really surprises, were the initial difficulties in finding a builder and subcontractors who were knowledgeable and interested in green building. It required research before deciding upon the products that met their needs, since many new options are just now becoming available. The final challenge was managing the budget. The best advice they have is to do a lot of research up front, assemble a capable and enthusiastic team in the design phase (including all of the major sub-contractors) and integrate them in the complete planning process. The team approach helps avoids delays and allows everyone to contribute ideas early in the process, where the costs are lower and benefits potentially higher.

Before remodel

"We're blending a variety of best practices in green home building while trying to preserve the character of a home that's been in the family for 50 years. It's a challenge, but we'll end up first of all with a very comfortable and healthy home for our family that will have low energy and maintenance costs, and is within easy walking distance of a variety of amenities. In the process of building a home, we're hoping to pass on the values and responsibility that will make the world a better place for our children and generations to come."

- Homeowners

List of Green Strategies

Energy Conservation

- Sealed all leaks in **building envelope** with **spray foam insulation** (seams, outlets, switches)
- Insulated exterior walls and attic roof with closed cell spray foam, which features twice the **R-Value** of typical batt insulation with no hydrochlorofluorocarbons (**HCFCs**) or **formaldehydes**
- Installed **low-E** glass windows with insulated frames and low **U-factors**
- Designed to maximize daylighting
- Replaced all lighting with efficient **CFL** and **LED** lighting
- Installed occupancy sensors and centrally/remotely controllable lighting
- Installed geothermal ground source **heat pump** for heating and cooling, expected to eliminate most fossil fuel usage
- Installed super-insulated, high-efficiency gas hot water heater, partially heated by geothermal system
- Installed efficient radiant floor heating
- Installed a whole-house energy recovery ventilation system to reduce need for air conditioning
- Designed for solar hot water heater
- Used advanced framing techniques: insulated headers, open insulated corners, 24" O.C. framing, hangers instead of jack studs, and no vents or piping in exterior walls
- Designed integrated shading system to block high angle summer sun and allow low angle winter sun for passive heating

Water Conservation (Indoors)

- Installed low-flow aerated faucets/showerheads
- Purchased touch-control kitchen sink faucet
- Installed dual-flush toilets (0.8 gpf and 1.26 gpf)

Water Conservation (Outdoors)

- Limited lawn area, reducing water, fertilizer, and pesticide usage and energy necessary to mow lawn
- Purchased **native, drought-resistant plants**
- Installed rain barrels and **rain gardens** to use rainwater for irrigation and reduce **runoff**
- Paved driveway and hardscapes with pervious paving materials

Indoor Air Quality

- Used low/no-**VOC** paints and sealants
- Purchased countertops and cabinets made with low-**VOC** finishes and other **formaldehyde-free** products
- Built detached garage to prevent auto fumes from infiltrating house
- Installed high-MERV air filter with ventilation systems
- Used no carpeting throughout the home

Resource Conservation

- Prefabricated foundation walls greatly reduce construction and demolition waste

Inegrated Pest Management

- Used organic fertilizers and pest control
- Used termite shields and simple screening

Superior building envelope

Advanced framing technology

Case Study

Location of Project: Rosemont, New Jersey

Design Team: Conservation Development, LLC and Entasis Architecture, LLC

Landscape Design: Paul W. Steinbeiser, Inc.

General Contractor: Robert J. Brander, Inc. and Conservation Development, LLC

Homeowners: Lise Thompson and Robert Brander of Conservation Development, LLC

Area Affected: 5,646 sq. ft. home (including 2006 addition, finished basement and attic), 1,200 sq. ft. bank barn, 960 sq. ft. 3-bay garage barn, 384 sq. ft. barn, 195 sq. ft. barn , 70 sq. ft. well house, and metal corn crib, on 2.4 acre site

Overview and Scope

This project involved the preservation of and addition to a circa 1869 Victorian home and exterior buildings. Systems and landscape were modified where necessary. A barn of 1,200 sq. ft. was approved for conversion to apartment space.

Sustainable building practices were used where possible that included reused, recyclable, and renewable materials that promote healthy indoor living. Systems were designed to be energy-efficient and water saving

Design Approach

The goal of this project was to update and restore the historic home and its exterior buildings using methods that integrated sustainable building practices with historic detailing to highlight the existing original qualities of the home.

Team and Process

The owners acted as the general contractor and project mangers for this project. Their relationships of over 15 years with most of the contractors helped tremendously with communication throughout the project. They used a true integrated design process and made a commitment to spending scheduled time with all members of the project's team, allowing for the most efficient communication in order to integrate green design issues, materials and methods.

Finance

In order for a project to be truly sustainable and repeatable, it needs to be financially feasible. In this project, the research involved in determining which products to use, evaluating their impact and locating those products in a timely fashion was the greatest contributor to the increased budget of the project, which exceeded the installation cost of those products. Like many historic houses, the original house had a south-westerly orientation and the owners oriented the addition to take advantage of passive solar. However, while the quality of the workmanship was consistent with previous projects, the attention to details (e.g. increased insulation, choosing a lighter color for the roof as apposed to a black slate, added overhangs and increased attention to the window efficiency and mechanicals) will likely result in a significant reduction in the cost of heating and cooling the house.

Lessons and Trade-offs

The restoration process itself was a reminder of how many of the old world building practices are considered green today; siting a house in relationship to the land and weather, using local, reclaimed, or natural materials, natural day lighting and ventilation. Many of these simple time tested practices were applied to the new "green" addition. As part of the commitment to making this project a true restoration, one of the trade-offs was that the home did not qualify for Energy Star because they decided to restore all of the original windows, re-glaze them, add high performance storm windows and insulate around the windows thoroughly instead of replacing them.

"I believe that restoring an old building is inherently green; it sustains culture as well as resources. It was often a challenge deciding which products and techniques to utilize while trying to balance our commitment to an authentic restoration with our commitment to energy efficiency, a healthy environment and using natural, recycled or long life cycle materials. The green industry changes so rapidly, you have to keep the big picture in mind and make the best choices you can."

- Lise Thompson

Exterior after remodel

List of Green Strategies

Energy Conservation

- Installed **low-E** windows in the addition to prevent radiant heat from escaping and block ultraviolet rays that can fade many fabrics and materials
- Re-**glazed** existing windows to help control heat flow
- Replaced broken windows and added **storm windows** to reduce air leakage
- Installed rigid polyurethane foam insulation to cut air flow throughout the **building envelope** and reduce **heating and cooling loads**
- Installed a high-efficiency and high-velocity **HVAC** system and radiant hydronic heat
- Installed a high-efficiency oil-fired burner which doubles as the indirect hot water heater and can be converted to bio-diesel
- Insulated hot water lines with ½" walled rubber insulation
- Designed home to provide for excellent natural day lighting that reduces the demand for artificial lighting during the day
- Oriented renovations toward the southwest providing it **passive solar** advantages **reducing heating loads**
- Specified **Energy Star®** appliances where possible

Water Conservation (Indoors)

- Installed copper piping with minimal amounts of **PVC**
- Added new plumbing fixtures to comply with new energy codes
- Added ½ inch walled rubber insulation to domestic hot water lines allowing for constant hot water and reducing water wastage
- Installed a thermostatically activated recirculating line that heats water as needed saving energy
- Installed an indirect water heater

Water Conservation (Outdoors)

- Replaced existing built-in gutters and soffits with 16- ounce copper interior gutters and molding that match the original detailing
- Re-pointed and water proofed the original foundation
- Installed an underground drainage system that collects water from most of the downspouts and the foundation drain and redirects it to a **rain garden** located below the southern lawn
- Planted **rain garden** with **native plants** and with an emphasis on color, appeal to birds and butterflies, and water-absorbent properties
- Protected trees with rock-lined wells
- Used permeable Delaware red stone for driveway

Indoor Air Quality

- Gutted the original house allowing it to breathe and removing all the accumulated dust that usually remains inside the walls of old houses
- Used non-toxic, natural materials and no-**VOC** paint and water based finishes on the flooring and wood trim
- Utilized existing cross ventilation designed for the original house and added a fresh air exchange unit that brings **HEPA** filtered air into the house every 20 minutes
- Installed a high-efficiency, high-velocity **HVAC** system with multiple zones that aids in moisture control and the prevention of mold and mildew

Resource Conservation

- Preserved all components of the home and site where possible
- Restored moldings, doors, floors, siding, and masonry where possible with local materials
- Used reclaimed antique hemlock flooring to match the original flooring
- Re-**glazed** existing windows and replaced broken glass with reclaimed antique glass
- Restored barn foundations
- Preserved original roof rafters on the large bank barn while adding a new metal roof and purlins
- Repaired or replaced siding where needed with Pocono Eastern White Pine
- Relocated or replanted trees, shrubs, and other vegetation
- Installed copper gutters and piping that have a long service life and are recyclable
- Used steel beams instead of wood as girders where the original house attached to the new addition
- Installed a new metal roof on the bank barn that will be long lasting and is recyclable
- Utilized reused and local materials where possible

Restored porch

Remodeled interior

Photography Credits

Cover

Top left: John D.S. Hatch, Trenton Row House Case Study

Top right: Michael Fleischacker, Hanson Case Study

Below top right: Ed Schwartz, Schwartz Case Study

Bottom left (top): Patricia Gaylor, Abbott Case Study

Bottom left (bottom): Ford3 Architects and Barbara Geller, Geller Case Study

Bottom right: John D.S. Hatch, Trenton Row House Case Study

Kitchen, Bath and Living Spaces

Cover: Patricia Gaylor, Abbott Case Study

Case Study 1: Jacqueline Germany, Montclair Casew Study

Case Study 2: Lori Jacobsen, Quinn Case Study

Case Study 3: Randall Solomon, Solomon Case Study

Case Study 4: Patricia Gaylor, Abbott Case Study

Case Study 5: Patricia Gaylor, Collins Case Study

Case Study 6: Stephen Fiedler, Fiedler Case Study

Case Study 7: Photography by www.marisapellegrini, Twin Maples Case Study

Finished Basement and Major Addition

Cover: Lise Thompson, James Dean House Case Study

Case Study 1: Ed Schwartz, Ridgewood Case Study

Case Study 2: Deborah Monroe, Monroe Case Study

Case Study 3: Tom Verschilling, Greendale Case Study

Case Study 4: Lise Thompson, James Dean House Case Study

Weatherization and Energy

Cover: John D.S. Hatch, Trenton Row House Case Study

Case Study 1: Thomas G. Wells, Parkland Properties Case Study

Case Study 2: John D.S. Hatch, Trenton Row House Case Study

Case Study 3: GreenStreet Energies, Black Case Study

Case Study 4: Darren Port, Bellvue Court Case Study

Outdoor Living and Landscaping

Cover: Michael Fleischacker, Hanson Case Study

Case Study 1: Michael Fleischacker, Hanson Case Study

Case Study 2: Ford3 Architects and Barbara Geller, Geller Case Study

Back Cover

Left: Photography by www.marisapellegrini, Twin Maples Case Study

Middle: Lise Thompson, James Dean House Case Study

Right: Patricia Gaylor, Collins Case Study

Rutgers Center for Green Building [RCGB]

The Rutgers Center for Green Building is located at the Edward J. Bloustein School of Planning and Public Policy, Rutgers, The State University of New Jersey. The Center forms a common umbrella for existing and proposed initiatives being carried out through separate Centers at the Bloustein School, the School of Environmental and Biological Sciences (formerly Cook College), the School of Engineering and other Rutgers units that are integral to developing and implementing innovative green building strategies.

The Rutgers Center for Green Building has developed capabilities in applied green building research that entail modeling the life cycle cost and environmental impact of buildings, post occupancy study tools including survey research and building operating data analysis, and financial methodologies to better estimate green building value. The Center has produced a series of reports documenting best practices in green building and regularly provides green building training and education modules for a variety of audiences.

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The Rutgers Center for Green Building develope the guidelines with extensive input and review by an expert advisory group comprised of residential building and remodeling professionals, interior designers, landscape architects, and experts in the field of green building and energy-efficient design.

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