Case Studies

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
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Acknowledgments

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Special thanks to the many individuals for contributing to the development of NJGHRG Version 1.0:

Project Team:
Rutgers Center for Green Building
Edward J. Bloustein School of Planning and Public Policy
Rutgers, The State University of New Jersey
33 Livingston Avenue
New Brunswick, New Jersey 08901
www.greenbuilding.rutgers.edu

Jennifer Senick, Executive Director
Maren Haus, Research Project Manager
Dr. Clint Andrews, Director
Dr. Judy Shaw, Research Associate
Jerry Flach, Research Assistant
Eric Tuvel, Research Assistant, Graphic Designer
Mark Bolen, Research Assistant
Pinky Samat, Research Architect
Brian M. Koczan, Research Architect
Thomas Behrens, Research Intern

Expert Advisory Group:
Michael Brown, Director, Program Services, MaGrann Associates
Christine Bruncati, Senior Research Architect, Center for Building Knowledge, New Jersey Institute of Technology
David E. Cohen, Principal, DEC Architect
Edward Conn, Senior Associate, Chu & Gasman Consulting Engineers
Jeff Crum, Vice President of Real Estate Development, Real Estate Advisory and Development Services (READS)
R. James Del Grosso, President, Residential Energy Professionals, LLC
Julie Deseve, Program Manager, Conservation Services Group
Ron Emrich, Executive Director, Preservation New Jersey
David Fredericks, Department Head – Electrical, Chu & Gasman Consulting Engineers
Suzan Globus, Principal, Globus Design Associates
Seiko Goto, Assistant Professor, Landscape Architecture, Rutgers University
Bill Hlubik, County Extension Department Head and Director, Middlesex County Earth Center, Rutgers, New Jersey Agriculture Experiment Station
Walter Kanzler, Principal, Eco Collaborative, LLC
Dr. Richard Lynch, President, Environmental Safety Management Corporation
Mark MaGrann, Chairman and Founder, MaGrann Associates
Mona Mosser, Bureau Chief, New Jersey Board of Public Utilities
Robert Politzer, President, Greenstreet Construction, Inc.
Linda Lee Potter, Principal, Linda Lee Potter Designs, LLC
Lisa Strovinsky, President, Allentown Garden Club
Andrew Topinka, President and Founder, Technical Group Services, Inc.
Thomas G. Wells, President, Thomas G. Wells Construction, LLC
Robert E. Wisniewski, Lincoln Park Coast Cultural District
David Wolk, Residential Programs Manager, New Jersey’s Clean Energy Program™
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Jennifer Senick
Executive Director
Rutgers Center for Green Building
Transforming the conventional lawn into green outdoor living space complements the home and connects it with nature. New Jersey, with long summer days and cool autumn evenings, provides a perfect environment for outdoor living. As the primary connection to our natural surroundings, yards function as a beautiful, livable extension of the home. Whether planning your own outdoor project or hiring a professional, there are dozens of ways to implement renewable products, conserve resources, promote biodiversity and wildlife habitat, and reduce home heating, cooling, and water usage.
Case Study

Location of Project: Bernardsville, New Jersey
Landscape Architect: Michael Fleischacker CLA, ASLA, LEED AP
General Contractor: Back to Nature

Overview and Scope
This project involved a home converted from stables located on a six-acre property. The homeowners approached Back to Nature in 2002 to help transform the outdoor spaces surrounding the home to be in tune with their organic, nature-loving, and family-oriented lifestyle. The project incorporated several environmentally-conscious strategies, and the outdoor spaces continue to develop as a reflection of the clients’ green lifestyle.

Design Approach
The original goal of this project was to create a series of outdoor rooms that would “unfold” in a way similar to the indoor rooms of a home. The project started with a site master plan that evaluated the barriers between indoors and out. Over the next seven years, the landscape architect continued working with the client as the project evolved in the areas of growing organic food, restoring native habitats, integrating alternative energies and stormwater retention practices, promoting a healthy and inviting atmosphere for family and friends, and connecting the homeowners with their land.

Team and Process
An integrated design process has played a value-adding role in realizing the potential of this project. Over the course of this outdoor remodel, stakeholders have included the clients, the landscape architect, architects, contractors from all trades, engineers, arborists, organic consultants, apiary specialists, forest managers, municipal agents, and neighbors.

Finance
Costs are an important consideration for all projects. This venture was no different as costs were woven into the fabric of the project. The project team anticipated and realized both tangible and intangible returns on the investments into this project including a decreased reliance on purchased produce, transportation energy savings and a greatly expanded living space.

Lessons and Trade-offs
The landscape architect points out that there are always surprises in the construction industry; it is a matter of recognizing that fact and anticipating as many of the surprises as you can up front. Having said that, he did not think he would have done anything differently. One thing that this project taught him was that the entire process must be flexible and evolve the same way that the stakeholders and the site do. The world is constantly changing, and so all projects must evolve with it.

“The most rewarding aspect of this project is the relationships I have found myself in with the clients and the other professionals that have had a stake in this regenerative residence.”
- Michael Fleischacker

Compost bins
Organic garden
Streetside garden
List of Green Strategies

Native Restoration

• Converted lawn to birch grove garden, woodland gardens, and native stone terraces
• Removed invasive species and reintroduced native species to woodland ground covers and understory
• Removed stilt grass and lawn from septic field area and reseeded with native prairie mix

Growing organic food and flowers

• Planted peach, pear, and apple trees in orchard
• Created a part-shade herb and vegetable garden with plants selected for their historic medicinal and food value
• Incorporated raised garden beds and a kitchen/cutting garden that expanded significantly the farming capabilities of the property
• Incorporated cold frames to extend the growing seasons and provide a controlled environment for drying fruit, herbs, and vegetables
• Created compost bins from cedar logs, allowing for 100 percent of biodegradable waste to remain on-site and be reintroduced as compost soil in the garden beds
• Built a corn crib-inspired wood shed used to split and store wood harvested from dead or fallen trees, which then are used in wood burning stoves as alternative heating for the residence and ancillary structures
• Created an apiary garden with a beehive that produces fresh honey for a variety of family uses while adding value to the gardens through pollination
• Proposed future projects, including a “green” greenhouse and free range chicken

Other Green Strategies

• Installed low voltage landscape lighting
• Planted edible “living” holiday trees for wildlife habitat and food throughout the winter
• Utilized regional materials and contractors for all aspects of this project.
• Installed an outdoor kitchen
• Proposed photovoltaic array, salt water spa, and solar energy for water heating
The project was a new ‘garden room’ addition to a historical 18th century bank barn that was converted into a home in the 1970’s. The owners wanted to have the addition integrate with both the existing living space and the surrounding landscape, using similar materials and repeating design elements. The room was intended to expand the size of the indoor living area yet convey the feeling of being outdoors and close to nature.

Since the owner is a landscape designer and believes in advancing ecological goals, the possibility of incorporating a vegetative green roof was seriously considered during design discussions.

Design Approach

The architects are committed to green solutions and implement both active and passive sustainable technologies in their projects. They encouraged exploration and had access to knowledgeable local contacts.

The owner was particularly attracted to the aesthetics and ecological advantages of using a green roof. In addition, she was open to using other green technologies, if cost effective.

Team and Process

The homeowners and designers each had a general orientation to green solutions. The architects, in particular, had many successful green project implementations. The building contractor had many years of experience working in the Bucks County area and had previously done work for the owners. He, however, had no experience with green technologies. For the green roof installation, he worked closely with the green roof suppliers to make sure all components were correctly installed. Over time, he became very committed to the project and felt a genuine pride and enthusiasm in his contribution.

Finance

Since the actual size of the green roof was relatively small (approximately 250 square feet), the added cost of a green roof was not as much of an issue as it would have been for a larger area. The owner/landscape designer was committed to doing a green roof; the additional cost was not an issue.

The owner is a recent graduate of the NY Botanical Garden in Landscape Design and had many contacts at the school for suppliers of green roof materials. She acquired estimates for building the green roof from several of these established green roof supplier/builder teams prior to actually selecting the supplier and builder. When a builder the owner had previously used said he would come out of retirement and travel up from Florida to do the project, the owners decided it was an offer too good to refuse. The actual cost incurred by purchasing the supplies directly from a green roof supplier and using the owners’ contractor was approximately 10 percent less than working with an established supplier/builder team. The cost of the green roof was approximately 15 percent more than a high quality copper standing seam roof which would have been the alternate choice.

The owner anticipates a lower cost for heating and air conditioning as a result of installing a green roof and having good cross ventilation compared to a more traditional roof. The savings, however, are difficult to quantify since the room has only existed with a green roof and there would be no other comparable experience.

Lessons and Trade-offs

There were no serious surprises with this project. The roof was designed and built in an arched form to match the surrounding landscape. The construction work involved in implementing the roof curve was more than anticipated and added to the complexity of installing the green roof components.

Serious planning was required to determine the plants for the green roof. The site is only sunny for about a third of the day, so sedum plants, which are traditionally used for green roofs and thrive in the hot, dry sun, were not an option. Instead, the landscape designer decided to use a palette of low-maintenance, drought-tolerant, ground cover plants with various leaf textures and flowering times. The plants were installed in late August 2008 and have thrived in the special green roof growing media. It is anticipated that some supplemental watering will be required for the first year or two until the plants are well established. This plant palette also required a media depth of 4 - 5 inches. The structural engineer needed to take into account this additional roof load when specifying the glulam support beams.

In the opinion of the landscape designer and owner, the combination of the aesthetics of a green roof and its ecological advantages make it an obvious solution for anyone who is interested in the environment and has an appreciation of nature.
“I felt the project was a great example of collaboration and synergy between the architects, builder and owner. Each provided their own particular expertise and worked collaboratively with the others, presenting ideas and brainstorming solutions. The final result is terrific.”
- Barbara Geller, owner/landscape designer

**List of Green Strategies**

**Energy Conservation**
- Installed *green roof* to reduce *heating and cooling load*
- Incorporated cross ventilation into window design to reduce cooling load
- Installed *roof overhang* to reduce summer heat gain and increase winter *passive heat* gain from the sun
- Installed radiant floor heating
- Increased roof insulation *R-Value* by using foam insulation

**Water Conservation**
- Reduced stormwater *runoff* by installing *green roof*

**Resource Conservation**
- Reused Bucks County field stone from an abandoned stone wall found up the road from new structure

**Outdoor Air Quality**
- Increased carbon dioxide absorption and oxygen emission from the *green roof* plant photosynthesis
Resources/References

Photography Credits

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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.

RUTGERS
Center for
GREENBUILDING
Rutgers Center for Green Building
Edward J. Bloustein School of Planning and Public Policy
Rutgers, The State University of New Jersey
33 Livingston Avenue
New Brunswick, New Jersey, 08901
Phone [732] 932 4101, ext 520
Fax [732] 932 0934
www.greenbuilding.rutgers.edu
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The Rutgers Center for Green Building developed 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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