

# Rural Voices

THE MAGAZINE OF THE HOUSING ASSISTANCE COUNCIL  
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Rural Housing Goes **GREEN**

Dear Friends,

This issue of *Rural Voices* is part of a Green Building/Healthy Homes Initiative launched by the Housing Assistance Council to promote the effective use of green building and healthy homes technologies in affordable rural housing. The first three articles in this issue provide basic information for those who are new to the subject. Then five segments on “Green Building Techniques” offer a variety of examples for beginners as well as those who already know what bioswales or blower door tests are and want to learn how other rural housing groups have used them.

The challenge of balancing higher initial costs against long-term savings is one of the common themes running throughout these articles. Several of the local organizations featured here have found funders that appreciate the value of using costlier materials such as triple-paned windows in order to reduce later energy costs for low-income residents. Articles from The Home Depot Foundation and The Enterprise Foundation describe their green building funding programs. (These foundations are funding HAC’s initiative, and a Home Depot Foundation grant made this issue of *Rural Voices* possible.) We hope that, as the news about successes spreads, additional funders will join the trend.

Another common theme is the difficulty of bucking the system and obtaining community support for new ways of constructing or rehabilitating homes. The organizations profiled here have seen local support grow as their successes have become tangible over time. Successes include easily measurable changes such as drastic reductions in use of heating fuel on a remote Alaskan island, and more subtle psychological shifts such as Texas colonias residents’ acceptance of adobe as an energy efficient material rather than a sign of poverty.

Few, if any, of these organizations use just one or two green building/healthy homes techniques. The magazine presents them in categories to illustrate specifics such as land planning or energy efficiency, but it should be noted that many of the profiled groups carry out other green activities in addition to those described here.

We look forward to working with the rural housing movement to enhance the connection between affordable rural housing and responsible use of resources.

Sincerely,



Arturo Lopez, Chair



Moises Loza, Executive Director



David Lollis, President

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Maria Luisa Mercado, Gideon Anders

*Cover photo courtesy of Umpqua CDC/Heartwood ReSources.*

*This issue of Rural Voices has been printed on 100% post-consumer waste, processed chlorine-free paper and printed with soy-based inks.*

# GREEN BUILDING TECHNIQUES: RESOURCE CONSERVATION

**R**esource conservation is an important component of rural green building activities, especially in areas where transporting building materials to remote sites proves challenging and expensive. Reducing building waste and recycling construction and demolition debris offer financial benefits to contractors and nonprofit developers. Employing good waste management strategies during construction and renovation projects can offer financial dividends while diverting significant amounts of used building materials from landfills. Builders also have available an increasing number of building materials made from recycled content (cellulose insulation, plastic lumber, tiles).

Using large volumes of water increases maintenance and lifecycle costs for building operations and increases consumer costs, including those for municipal supply and treatment facilities. Reduction in water use can lead to more stable water rates. And by handling reduced volumes, water treatment facilities can delay expansion and maintain stable water prices. Water efficiency measures include using low-flow devices and expanding use of non-potable water for landscape irrigation. For instance, captured rainwater from roof run-off and gray water from sinks and showers can easily be used for landscape watering.

The following organizations have engaged in successful programs incorporating green building techniques to conserve resources in the development of rural affordable housing.

## OPAL COMMUNITY LAND TRUST

by Elisabeth C. Byers

The mission of Of People And Land (OPAL) Community Land Trust is to acquire and own land so that islanders in need

may have access to permanently affordable homes and workplaces. Based in Eastsound, Wash., OPAL collaborates with others, develops infrastructure and housing, and stewards the land in a manner that is cooperative, stable, environmentally sensitive, and socially responsible.

OPAL builds houses for homeownership and rental housing and delivers rental assistance, energy assistance, and weatherization funds to qualified households.

OPAL has been committed to the values of green building and low impact development since its inception in the late 1980s. All of OPAL's projects have incorporated low impact development techniques that have minimized the effect on the land of our newly constructed neighborhoods. We have employed techniques such as preserving land in and around houses with native vegetation, minimizing the overall footprint of buildings, roads, and parking on the land, and installing water catchment systems to use rainwater roof run-off for irrigation and flushing toilets.

Only in the past few years, however, have green and healthy building materials become more affordable, enabling us to incorporate a greater percentage of healthier construction materials into the homes we build. In 2005, OPAL adopted its first "Green Building Guidelines" that articulate what we have been able to do in our projects and guide our future development. These guidelines will evolve as we learn from our experience, and as new products are time-tested and become more affordable.

OPAL Community Land Trust is located on Orcas Island, one of the San Juan Islands along the northwest coast of Washington state – an area with mild winters. Orcas Island is about 60 square miles and has a year-round population of about 4,500 people. San Juan County consistently ranks as the county with the highest median income and the highest land cost in the state, as well as one of the lowest wages. It has a three-month drought season in the summer that makes water conservation a priority. Since the county is accessible only by boat or plane, building costs are high because of additional delivery charges and labor prices are high because most builders construct custom homes for higher-priced markets. The lack of competition in the lower cost housing market and the scarcity of options for materials suppliers makes utilizing green materials and techniques that much more difficult.

OPAL's Lahari Ridge project incorporates a number of green elements. The project is six single-family homes that are affordable for households earning less than 80 percent of the county median income. The six families purchasing Lahari Ridge homes, all of whom have single heads of household, have an

average income of \$27,000 or about 55 percent of the county median.

### Green Techniques

The 5,000-square-foot lots are clustered around a common driveway and located to minimize disturbance to the existing topography and native vegetation. During construction, access to each building was limited to an area no greater than ten feet around the building footprint in order to preserve native vegetation and minimize the need for landscape restoration. The houses are small – 840 square feet – and designed with single-wall construction, roof trusses, and no interior support walls so that each may be easily and affordably adapted from a studio to a one-bedroom or a two-bedroom configuration. Each home has a 1,000-gallon water tank located under a porch that captures rainwater runoff from the roof and makes that water available for flushing toilets. Materials used in construction include metal roofs (more durable and better suited to water catchment), “marmoleum” flooring, formaldehyde-free insulation, and certified green cabinets (which were assembled and installed by the homeowners in a workshop with our project manager and general contractor).

### Benefits

The benefits of these techniques are numerous. The houses fit into the landscape and landscape planting is less expensive, because so little of the surrounding landscape and native vegetation is disturbed. The buildings are healthier to live in because the products used have much less off-gassing than comparable products. The buildings will also last longer and be less expensive to maintain because of the more durable materials.

### Challenges

The biggest challenge has been cost. The water catchment system, including the metal roof, added about \$6,000 to the cost of each house. We will cover that additional cost by additional fundraising. When surveyed, our supporters and donors say they value green materials and low-impact development and some have contributed additional funds for green products, when used in a prudent manner.


### Affordability

We are covering the additional costs of green building materials by raising additional funds from our members and from foundation grants. It is only through this support in addition to the support we are already getting that we have been able to make this commitment. Until marketplace competition brings



Photo courtesy of OPAL Community Land Trust

Water catchment systems are installed with each home. As shown here, the system allows the water to run off the roof, through a drainpipe, into a 1,000 gallon water tank.

the total price down on these materials, this will be the only way to continue with this commitment. 

*Elisabeth C. Byers is OPAL Community Land Trust's Executive Director. More information about the organization is online at [www.opalclt.org](http://www.opalclt.org).*

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## NORTH CAROLINA RURAL COMMUNITIES ASSISTANCE PROJECT, INC.

by Nina Ann Baccanari

The mission of the North Carolina Rural Communities Assistance Project, Inc. is to provide outreach, advocacy, onsite training, and technical assistance for rural North Carolinians, focusing on water, wastewater, solid waste, and affordable housing issues affecting low- and moderate-income communities. More specifically, we monitor and contribute to state and local policies regarding public health and environmental issues, support activities and initiatives that improve and sustain equitable

economic and social systems in an environmentally sound manner in rural North Carolina, and educate North Carolina residents and organizations about water, wastewater, solid waste, and related public health and environmental issues.

For more than a decade, NCRCAP has co-created solutions with thousands of rural North Carolinians who have experienced some of the most severe water, waste disposal, and housing conditions in the state. NCRCAP has worked to bridge the chasm among rural community residents, political leaders, and funding agencies in order to facilitate solutions and build the capacity of low-income rural communities. NCRCAP acts as a liaison between local and state governments, community organizations, and individuals experiencing water and wastewater needs and the housing problems that can be associated with these conditions.

NCRCAP's Safe Housing Initiative assists individual households throughout Chatham and Randolph counties in North Carolina. All households have incomes that are very low, no more than 50 percent of the county's median household income. According to 2000 census data, these counties are predominantly rural, with 80 percent and 61 percent of their population located in rural areas, respectively. Census data also indicate high levels of poverty in each county. In the total project area, 9.2 percent of households are below poverty. Approximately 6.9 percent of all non-minority households are below the poverty level, while 18.9 percent of the minority population lives in poverty.

The Safe Housing Initiative program addresses the health and safety hazards related to inadequate housing found in rural areas, focusing primarily on families who live without indoor plumbing or have inadequate water or wastewater facilities. NCRCAP performs rehabilitation work on individual houses scattered throughout the counties. Students taking a beginning home building course from Central Carolina Community College construct bathroom additions for very low-income households that lack complete indoor plumbing and do not have spare rooms that can be easily converted into bathrooms.

After a bathroom is completed, it is transported to the participating home, set on a permanent foundation, and attached to the home according to county standards. NCRCAP also installs wells and septic systems and completes housing repairs to ensure the families' health and safety. NCRCAP has begun to incorporate green building activities to conserve rural resources. Since participating families live in existing homes, we do not experience challenges such as high land costs that impact our ability to utilize green techniques. Our primary challenge is the home itself, as many of our families are living in severely deteriorated housing conditions.



Photos courtesy of North Carolina Rural Communities Assistance Project, Inc.

Shown above on left, an 8' x 12' bathroom addition is lifted off of the truck to prep it for installation next to the home. To the right, a homeowner proudly stands in the doorway of his new bathroom addition.

In its most recently ended program year, NCRCAP completed renovation work on eight single-family homes. In the 2005-2006 program year, NCRCAP proposes to perform rehabilitation work on six single-family homes.

### Green Techniques

*Land planning and design techniques:* Safe Housing Initiative rehabilitation projects are by nature smaller and less disruptive than new home construction projects. Each 8' x 12' bathroom addition generally attaches to a home in an already cleared area of the yard, preserving the natural environment and minimizing

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### TIPS FOR RESOURCE CONSERVATION

- Minimize job-site waste. Centralize cutting operations to reduce waste and simplify sorting. Set up clearly marked bins for different types of usable waste. Find out where materials can be taken for recycling and educate the building crew about recycling procedures. Reducing the net weight of construction waste can reduce the landfill tipping fee cost to the project.
- For exterior water conservation, limit lawns to play and recreational areas and use native and drought tolerant plants and trees for landscaping. Install a rainwater catchment system for non-potable water reuse for landscape irrigation.
- For interior water conservation, install water-efficient equipment such as water-conserving toilets, showerheads, and faucet aerators to reduce water use and reduce demand on septic systems or sewage treatment plants.

## TIPS FOR HEALTHY HOMES



Educate residents on ways to maintain good indoor air quality including minimizing and treating mold, reducing track-in of dirt, and using mechanical ventilation properly. Install a ventilation system that includes operable windows and mechanical ventilation to reduce or eliminate instances of mold, control odor, and reduce excess moisture.



Reduce emissions of volatile organic compounds, or VOCs. Carpeted areas collect dust and can be breeding grounds for molds and dust mites, and carpets, carpet pads, and carpet glues off-gas volatile organic compounds. In living rooms and sleeping areas, install hard flooring surfaces or carpets with a CRI IAQ (Carpet and Rug Institute Indoor Air Quality) label that identifies low-emitting carpets and cushion materials. Use non-toxic adhesives and sealants as well as "Green Seal" rated paints to improve safety for both the construction crew and later residents. Use medium density fiberboard or wheatboard instead of particleboard for underlayment, cabinets, and storage units.

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**Water conservation:** Currently, low-flush (1.6 gallon) toilets are installed in the bathroom units. We also educate families on water conservation methods to prevent water waste and reduce monthly bills. In the future, NCRCAP will also install low-flow shower heads and faucets in bathrooms and kitchens.

**Energy efficiency:** NCRCAP partners with local community action agencies to ensure that homes are energy efficient and meet USDA thermal guidelines. Various insulating materials are used to create a tight home, thereby reducing energy consumption and improving the quality of indoor air. Additionally, all doors are weather-stripped and insulated steel or solid core wood exterior doors are installed when needed. Since 50 percent of heat/cooling loss in a home is through the windows, double-glazed (paned) vinyl window units are installed if we are replacing windows.

Many of the families NCRCAP assists are the poorest of the poor, and therefore many rely on wood stoves and electric ovens to heat their homes. Our partnering organizations, Regional Consolidated Services and Joint Orange Chatham Community Action, replace wood stoves with propane-heating units to eliminate safety and health hazards. Propane units do not emit dangerous toxins into the indoor air, they reduce the chances of house fires, and they minimize environmental degradation of our forests.

**Waste reduction, reuse, and recycling:** Unused materials, such as lumber and partial sheets of plywood, are transferred from site to site to minimize waste. NCRCAP also routinely purchases salvaged bathroom fixtures and materials from local building surplus stores in an effort to reuse materials.

### Benefits

Green building techniques reduce the overall impact to the environment. Green building, in the form of waste reduction and reuse, helps NCRCAP to conserve resources, thereby lowering project material costs. Most importantly, green techniques help to improve the overall health and safety of our households while reducing energy bills for low-income families.

### Challenges

Cost has been a primary challenge in using these green building techniques. Although we do achieve cost savings in some areas, other activities, such as systematic window replacements, increase overall project expenses. NCRCAP addresses this issue by leveraging materials and labor through partnerships with other agencies, contractor discounts, and donations.

### Affordability

NCRCAP receives funding for the Safe Housing Initiative from the USDA Rural Development Housing Preservation Grant program and the Section 504 loan/grant program in addition to the Southeast Rural Community Assistance Project. Funding from HAC allows us to incorporate additional green building techniques. All improvements to participating households are provided as grants.

*Nina Ann Baccanari is Associate Director of the North Carolina Rural Communities Assistance Project. More information is available at [www.ncrcap.org](http://www.ncrcap.org). NCRCAP is funded in part by the Southeast Rural Community Assistance Project.*