

Roanoke-Lee Street Project



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Community Housing Partners (CHP), a non-profit community development corporation, completed construction of the Roanoke-Lee Street Project in 2006, comprising 14 units of green, affordable, duplex housing in Blacksburg, VA. This development has four building designs, with 9 two-bedroom units and 5 three-bedroom units. Homes are situated in an established neighborhood with mature trees and sidewalks, and are within walking distance to public transportation, restaurants, a library, shopping, recreational amenities and other businesses. All homes were constructed in an area targeted by the town for revitalization and were restricted for sale to homebuyers with incomes at or below 80% of the area median.

Greening Goals:

Community Housing Partners' (CHP) top priority has been to build, develop, preserve, manage, maintain, and support housing that is high quality, sustainable and affordable. This goal highlights CHP's commitment to an intentional expansion of housing for low and moderate income households that features high quality construction using sustainable materials. Special focus is given to the utilization of environmentally friendly building techniques, materials, and appliances that make each home healthier to build and live in, while lowering operating costs in the long-term. Greening goals included meeting mandatory and optional criteria from Enterprise's Green Communities Initiative, which relate to an integrated design process, location and neighborhood fabric, site improvements, water conservation, energy efficiency, environmentally beneficial materials, healthy living environment, and operations and maintenance.

Project at a Glance

Location: Blacksburg, Virginia

Project Type: New Construction

Ownership/Rental: Home Ownership

Size:

14 units

16,100 total sq. ft.

1.82 acres on two sites, 7 units/acre

Project Completion Date:

December 2006

Affordability:

All units sold to households earning 43-80% of the area median income (AMI)

Project Team:

Developer: Community Housing Partners (CHP)

Architect: Community Design Studio

Contractor: CHP

Development Cost:

Land cost:	\$443,341
Hard costs:	\$1,824,668
Soft costs:	\$259,509
Total:	\$2,527,518

Cost/Savings of Greening:

Total Cost of Greening:	\$246,600
Rebates and Grants:	\$57,000
Net Cost of Greening:	\$189,600

Standards Used:

Enterprise Green Communities Criteria
Energy Star for New Homes

Key Green Features:

- Increased energy efficiency by exceeding code requirements for insulation, using advanced framing techniques, increasing roof overhangs for climate control
- Well documented, efficient energy performance
- Energy Star rated appliances
- Pre-occupancy duct sealing and blower door testing
- Comprehensive water conservation and stormwater management system includes dual-flush toilets, low-flow fixtures, rain gardens and pervious pavement

Green Features

Integrated Design Process:

CHP implemented an integrated design process, whereby the architects, developer, construction manager, energy consultant, project manager and project engineer worked together from the initial stages of the project to produce a thorough, efficient and innovative design.

Site Design/Landscape Planning:

The project was constructed on two separate sites in close proximity. One of the sites was relatively flat, undeveloped land, the second site had an elevation that required CHP's staff and civil engineer to educate the building inspector about the capacity of a rain garden and pervious paving to prevent stormwater run-off. A Phase I Environmental Assessment was undertaken by a licensed engineer to determine the existing site's condition. The site plan was intentionally developed to reduce building footprints, preserve trees and vegetation, and to set aside an open space. A 10% common open space area was delineated, and now serves as a Town park and recreation space for project residents.



Location and Linkages:

The homes are located in the center of the town within easy walking distance to public transportation, government offices, places of worship, the local farmer's market, restaurants, libraries, shopping, recreation, and other businesses. All community amenities are within 1/4 mile of the project site, offering the residents convenient access to town services and activities, thereby limiting the need for automobile use and reducing greenhouse gas emissions.

Building Design Greening:

Energy: Energy efficiency is achieved through effective insulation, advanced framing techniques, increased roof overhangs for climate control, low-e windows, use of 100% Energy Star rated appliances, and compact fluorescent lighting. These improvements resulted in 33% electricity savings for the average unit in the first year of occupancy (11,286 kWh versus 16,856 kWh for a modeled base house). Residential Energy Services Network (RESNET) certified staff performed pre-occupancy tests on the duct sealing and post construction blower door tests to confirm the building envelope's air leakage characteristics. All buildings were found to have exceeded HERS Energy Star rating with an average score of 75. Additionally, all external lights have daylight sensors in order to provide automatic shut-off during the daytime. To maximize energy efficiency, a recognized building energy software tool was utilized to determine the smallest heating, ventilation and air conditioning equipment necessary to meet each unit's needs.

Indoor Air Quality: To minimize the presence of pollutants in the units, low volatile organic compound (VOC) paints, primers, adhesives, caulks, and sealants were used. Hardwood flooring and ceramic tile was installed as an alternative to carpet or PVC flooring to reduce off-gassing and enhance durability.

Green Highlights

- Utilized existing roads and utility infrastructure
- Achieved maximum allowable density and preservation of green space
- Protected existing vegetation
- Used pervious paving, installed rain barrels and planted rain gardens with native tree species
- Installed Energy Star rated appliances
- Exceeded code requirements for insulation
- Applied advanced framing techniques
- Increased roof overhangs for climate control
- Installed low-e windows
- Installed compact fluorescent lighting
- Performed pre-occupancy tests on duct sealing
- Performed blower door tests to confirm building tightness
- Post construction energy audits showed HERS scores ranging from 72-77 on all units
- Implemented erosion and sediment plan to create erosion barriers, minimize stormwater run-off, and protect trees

Resource Conservation: Advanced framing techniques were utilized to reduce the amount of lumber used and waste generated during the construction of the Roanoke and Lee Street project. Wall studs, floor joists, and roof rafters were spaced 24 inches on-center, and two-stud corner framing and inexpensive

Green Features

Measurable Benefits

Energy Efficiency:

Post construction energy audits of the units by RESNET certified technicians showed an average HERS score of 75. Average unit used 33% less electricity in first year of occupancy.

Green Open Space:

10% of area was reserved as common open space and serves as a Town park and recreation space for project residents and their children.

Waste Minimization:

50% of waste wood was given to local homeowners for craft projects and home heating. Recycled construction waste included 360 lbs. of cardboard and 600 lbs. of construction pallets.

drywall clips for drywall backing were used instead of studs to increase affordability and reduce material consumption. Floor, wall and roof framing members were aligned directly above or below one another to transfer loads downward in order to eliminate the need for double top plates. Single lumber headers and top plates were used to save wood and provide better insulation. Over 50% of the project was designed on 2-foot modules.

In addition, the following materials were selected in order to reduce raw material consumption: oriented strand board (OSB) wall and roof sheathing, cellulose wall and attic insulation, fiber cement board siding, open-cell porous paving, concrete with 15% fly ash recycled content, and Trex wood/plastic composite lumber for decking.

Water Conservation: All water fixtures in the units are low-flow, water-conserving fixtures. For example, dual flush toilets, low flow faucets and shower heads, Energy Star clothes

washers and dishwashers, rain barrels, pervious paving areas, and rain gardens were incorporated in the project.

Commissioning: Commissioning for the homes was performed as part of the Energy Star certification process, including energy modeling, ductwork and building envelop testing, and HVAC system testing.

Resident Education: Each homebuyer was given an Owner's Operation and Maintenance Manual that contains information on how to maintain a green environment both inside and outside the home. The manual includes information and warranties on all appliances and mechanical systems. Sections include: HVAC, water heater, roofing, windows, cabinets, dishwasher, stove, refrigerator, and plumbing. The manual also contains a section that summarizes the green features in the home and the proper care and maintenance necessary to maximize function, environmental benefits and sustainability.

An interactive electronic homeowner's manual that is being developed



through a partnership between CHP staff and the Building Construction Department at Virginia Tech will also be provided to the residents.

Occupant Satisfaction:

"Since living in our new house our quality of life has risen dramatically. Our free time is spent together working on the house and yard, and we take pride in our new community."

-Roanoke Street Resident

Project Financing

The Roanoke and Lee Street Project was financed by a variety of funding sources, including First National Bank, Neighborworks® America, Self-help Homeownership Opportunity Program funding from the Housing Assistance Council, a Town of Blacksburg Community Development Block Grant, the Virginia Housing and Development Authority, Virginia Department of Housing and Community Development HOME funds, and below market rate financing from the Federation of Appalachian Housing Enterprises.

Funding specifically related to the project's sustainability measures and green features included grants from the Enterprise Green Communities Initiative and the Housing Assistance Council.

Cost of Greening Project: The incremental cost of including green elements in the project was an estimated \$246,600. This was partially offset by \$57,000 in rebates and grants, so the net cost was \$189,600 or 7% of the total development cost.

Life-Cycle Cost Analysis (LCA): No overall LCA was performed, but the project's LEED certified professionals considered life-cycle costs and benefits in selecting specific green, sustainable materials and systems. This resulted, for example in the specification of wood and ceramic tile flooring, rather than carpet and vinyl.



2007 Awards of Excellence

Affordable Housing Built Responsibly Case Study

Looking Ahead

Challenges:

While the project's pre-development phase began in 2003, over the next two years, construction and real estate costs inflated dramatically, significantly increasing development costs. This challenge was overcome through successful partnerships with local, state and national organizations committed to develop affordable housing and provide families with opportunities to build assets. As a result of the relationships built with these organizations, CHP was able to secure below market rate financing and provide loan packaging that opened the doors of homeownership for many who were otherwise unable to afford their own homes.

Partnerships:

CHP has a strong tradition of collaboration and community partnering. Partnerships are developed on a case by case basis depending on the type of project, the needs of the community, and market conditions. Partnering with government agencies, foundations, other NGOs, faith-based groups, businesses and universities provides CHP with needed expertise as well as additional funding and resources required to build affordable units and deliver services.

Policy/Practice Implications:

The Roanoke and Lee Street Project demonstrates CHP's strong commitment to environmental stewardship and sets an example of high quality, green design that refutes the stereotypes associated with "affordable" housing. This project has had a major impact on the Town of Blacksburg, the New River Valley, the State of Virginia, and the national affordable housing industry. Since the commencement of the project, CHP has been pro-active in increasing environmental consciousness of residents in Blacksburg and throughout the New River Valley. CHP has been a leader in the development of the first local chapter of the U.S. Green Building Council and worked with town officials to identify and adopt achievable environmental development goals. This project has also received state and national recognition, including awards from the U.S. Environmental Protection Agency and the Department of Energy for Excellence in Energy-Efficient Affordable Housing, the 2007 James River Green Building Council "Go Green" Merit Award, as well as the HUD Secretary's Gold Award for Excellence as part of the 24th Annual Best of American Living Award (BALA) competition.

"Reflecting an extremely well qualified development team led by Community Housing Partners' impressive integrated internal capacity, a great strength of the Roanoke and Lee Street Project is its breadth and comprehensiveness. The thoughtfulness of the project is evident in many ways: from small building footprints, site accessibility and building orientation to superior energy performance that is well documented, careful material selection, and a comprehensive approach to water conservation and stormwater management. The Roanoke and Lee Street Project is truly a model for the region and beyond."

- Member, Awards Advisory Committee

Contacts

Community Housing Partners Corporation

Janaka Casper
President and CEO
(540) 382-2002
jcasper@chpc2.org

Colin Arnold, AIA
Director of Community Design Studio
(540) 382-2002
carnold@chpc2.org

Todd Peacock
Vice President of Construction
(540) 382-2002
tpeacock@chpc2.org

