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 IS NOT AS IMPORTANT AS
HOW YOUR HOME IS BUILT

Recent 2x6 stud frame ‘green-built’ homes in Asheville, NC showing massive energy loss through stud framing

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Thermal imaging photos featuring both methods of construction taken over same two nights.

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On the Cover
  Regina Hunter and Nikita Norris play with their children, Kyree Norris and Kaleia Norris, outside their home in Asheville Area Habitat for Humanity’s 21-home neighborhood in Arden. Their home and all of Asheville Habitat’s other projects are certified through Green Built Alliance’s Green Built Homes program.

Dedication

This year’s directory is dedicated to the memory of all the lives cut short this year by the viruses plaguing our communities.

As we mourn the heartbreaking losses of life sustained due to COVID-19, we also face a long overdue reckoning with our nation’s most enduring disease of systemic racism.

We grieve with families who have lost loved ones during the pandemic, while we stand with the Black Lives Matter movement as it strives to eradicate white supremacy and build racial justice.

May we deepen our commitments to lovingly care for our neighbors, fiercely protect the wellbeing of each member of our communities, compassionately heal what plagues us, and tirelessly work together to create a more just, healthy and equitable world for us all.

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he value of sustainable, equitable and affordable building is relevant now more than ever.

The importance of green building has never been more obvious than in this year where most of us are spending more of our time at home than ever before while vigilantly monitoring our own health, and while being called to step up, speak out and stand alongside our neighbors of color.

As we approach the 20th anniversary of our nonprofit’s inception here at Green Built Alliance, we expected that 2020 would be an exciting start to the new decade, with plans for renewal and refocusing in several of our prominent community programs.

Of course, if recent months have reminded us of anything, it is that expectations do not always match reality. However, the recent curve balls thrown our way didn’t stop us from marching forward in our work with adaptability and agility.

Our work today

In the first half of 2020, our Green Built Homes program completed and began the roll out of version 3.0 of its certification checklist, which has been updated and revised to stay current with changing building codes and increase simplicity for program participants. The new checklist places more emphasis on regenerative elements, including the addition of an innovative Net Zero Water Ready Certification and a pilot Regenerative Certification. Learn more about the leaner, greener version of our certification program in the story on page 44.

Meanwhile, following a Request for Proposals from the City of Asheville and Buncombe County, Green Built Alliance was selected to continue implementing the work of the Blue Horizons Project. With more than two years under its belt since launching its community-focused campaign, Blue Horizons Project is excited for the next phase in its evolution. As Green Built Alliance carries forward the clean-energy torch through this work, the program’s founding entity, the Energy Innovation Task Force, is being dissolved and reborn as the Blue Horizons Project Community Council. Learn more about this collaborative approach and the next phases of Blue Horizons Project’s work in the story on page 60.

In early 2020, Green Built Alliance also assumed management and operation of Energy Savers Network’s efforts to offer energy-efficiency upgrades to low-income homes in Western North Carolina, with the intention of continuing to expand the grassroots program’s impact and reach. Green Built Alliance had served for two years prior as the fiscal sponsor of Energy Savers Network, which has been operating under the umbrella of the broader Blue Horizons Project.

Last but not least, our nonprofit’s Appalachian Offsets program is celebrating the long-awaited completion of fundraising for the Isaac Dickson Elementary School solar system. With more than 100 donors contributing to the $428,000 system, Appalachian Offsets finished fundraising for the Isaac Dickson solar project in late 2019 and the 300 kW array is expected to be installed on the school’s roof in September 2020. Learn more about the Isaac Dickson project and what’s next for Appalachian Offsets in the story on page 54.

Our work continues

 Needless to say, the world of green building has come a long way in the two decades since our nonprofit’s formation, and we’re proud and humbled to have been able to evolve and grow along with our industry.

While there has been a great deal of positive transformation worth celebrating in these past 20 years, we know that we still have a long way to go, especially as it pertains to racial equity. For all of our progress, the world of green building still seems primarily white, and Green Built Alliance is actively engaged in the work of changing that. We recognize that in order for green building to be truly sustainable for any of us, it must also be accessible to all of us.

Though our programs have made commitments toward equity and our staff has participated in numerous training sessions around diversity and inclusion in recent years, we have not done nearly enough. Good intentions are simply not adequate, and we are committed to increasing our efforts toward inclusion and equity by working tirelessly to build healthier homes for all of our neighbors.

Black lives matter. The healthiness, affordability and sustainability of black homes matters. No one says this better than the NAACP, which has launched an initiative on Centering Equity in the Sustainable Building Sector. Learn more about the NAACP’s perspective and initiative on page 40, or read a local take on the ties between racial justice and the Asheville building industry on page 66.

There are no right words in this watershed moment of such immense suffering and turmoil engulfing communities across our nation, but there are right actions we can begin to take together, one step at a time.

As an anti-racist organization, Green Built Alliance is committed to listening and learning. We are committed to remembering that there is much we do not know. We are committed to advancing sustainability for all people. We are committed to building a community of healthier homes for each of our neighbors.

As Green Built Alliance prepares to mark the milestone of 20 years since our inception in 2001, we invite you to join us in recommitting to this work of preserving our Earth, reevaluating the ways that we are protecting our neighbors, and renewing our resolve to cultivate true sustainability in the built environment.

Thank you for being part of the solution.

In the past year, Green Built Alliance has reached countless individuals through its work advancing sustainability in the built environment through its numerous programs that focus on community education, measurable standards and regional action. Here are a few highlights of the past year of work.

- 60 Builders Certifying Homes
- 124 Green Built Homes Certified
- 12 Net-Zero Energy Projects Certified
- 16 Clean-energy Presentations
- 1,277 Volunteer Hours
- 164 Homes Improved
- 1,807 LED Bulbs Installed
- 80 Contributions to Offset Carbon Footprint
- $8,000 in Donations to Offset Carbon Footprint

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Green-built homes afford their residents countless benefits. Healthier indoor air quality, lower energy bills, and increased comfort top the list.

These benefits should be available to all people, especially our lower-income neighbors who are more likely to suffer from health problems like asthma and be energy burdened, meaning they pay a disproportionate share of their income on energy bills.

Smart design and the healthier materials utilized by green building yield results including better indoor air quality, reduced allergens, lower utility bills, and higher quality of residence — all of which are social determinants of health.

Concerns with code
Esteemed architect William McDonough is famously credited with saying, “The building code defines the worst house allowable by law.” When one thinks of affordable housing, an uninspired housing stock is more likely to come to mind than green building. More often than not, affordable housing is built to minimum building code standards; is constructed from cheap materials; has cookie-cutter designs; and falls into disrepair more quickly due to poor construction, design and deferred maintenance. These strategies keep costs low, ensuring maximum profitability for developers and homebuyers alike.

On the other hand, green-built construction utilizes materials that are durable and long lasting, sustainably sourced, and made of healthier, non-toxic components. Energy- and water-saving appliances and fixtures are used. Designs are more innovative and exciting. These green-building features form the building blocks of homes and structures that will be comfortable, long lasting, less expensive over their lifetime, and likely to emit fewer greenhouse-gas emissions due to increased energy efficiency.

These benefits translate to healthier homes, as well as lower operating costs for residents. More than eight million American households pay more than 50 percent of their income on housing. It is a short-sighted disservice to our communities and planet to build code-built affordable housing. The traditional mindset of building to code overlooks the myriad long-term benefits of green building, and it has been demonstrated that green building saves money while increasing occupant health and comfort.

Saving green by going green
In 2016, Virginia Tech’s Virginia Center for Housing Research and Southface Institute collaborated on a study on the impact of green-certified affordable housing. The study found that when affordable housing is green-certified (whether through Green Built Homes, LEED, Energy Star, or another program), developers construct higher-quality housing at a lower cost while low-income residents save more energy and money.

Families residing in green developments saved an average of $96 per year, and seniors saved more than $122 per year more on energy costs when compared to non-green developments. Green developments saved nearly $5,000 per year on owner-paid utility costs when compared to non-green developments, and total construction costs are nearly five percent less than their non-green counterparts. Soft construction cost savings (architectural, engineering, financing, and legal fees, and other pre- and post-construction expenses) were even greater, costing 13 percent less than non-green developments due to increased coordination on the front end of design and planning.

The majority of developers surveyed in the study indicated that green buildings provide benefits in terms of quality of end product and achieving their firm’s objectives and mission. The study admits that green buildings can be more expensive on the front end than traditional construction projects, but cost-benefits are achieved on the operations side once people are living in and using these homes. Green spaces are frequently included as criteria for green-building certifications and
have been shown to reduce tenant turnover and reduce crime in multifamily developments.

In the Northeast, where the winters can be long and cold, the New York State Energy Research and Development Authority helped finance energy improvements at nearly 100,000 apartments across the state, bringing both new construction and existing buildings up to the federal ENERGY STAR® standards and cutting their energy costs by a quarter on average. All of these apartments were tested on their actual utility expenses as part of the program, and savings were nearly $400 per unit annually.

**Commitments for the future**

What does this mean for our beloved Western North Carolina mountain communities?

My work on the Blue Horizons Project focuses on energy efficiency for all residents and businesses of Buncombe County. Increasing the energy efficiency of new construction of all types helps meet our region’s shared goal of creating a cleaner energy future. The less energy used to operate a building, the less natural gas is burned at Duke Energy’s Lake Julian power plant — a win for us and a win for the climate.

Incorporating green and energy-efficient building standards into affordable housing can help further many local municipalities’ focus areas such as climate resilience, equity, and health. Green-built affordable housing checks many boxes. There are multiple financial incentives for green building and energy efficiency, including City of Asheville development application fee rebates, North Carolina Housing Finance Agency System Vision, and Duke Energy new construction rebates. Many other states offer points for affordable housing developments built to green standards, but unfortunately, North Carolina is not one of them.

Locally, Mountain Housing Opportunities and Asheville Area Habitat for Humanity stand out in their commitment to building green-built affordable housing developments.

Mountain Housing Opportunities’ green vision statement is, “By educating our community and ourselves about green-building practices, we can build more efficient, well-located homes. In this way we conserve natural resources, protect the environment, and serve our primary mission, to build and improve homes, neighborhoods, communities and lives.”

To date, Asheville Area Habitat for Humanity has certified 163 projects through the Green Built Homes system, more than any other home builder in the whole state of North Carolina.

“Habitat has made a commitment to green building and sustainable standards for all homes we construct around the country.” — Paul Reeves

Sophie Mullinax manages the Blue Horizons Project, a community-wide campaign to help residents and businesses of Buncombe County adopt energy efficiency and renewable energy. Before moving home to Asheville in 2018, she spent nine years working in the nonprofit sector while living in Washington DC. Connect with Sophie at bluehorizonsproject.com.
Affordable for the Long Haul

Habitat Tests New Style of Housing in Curry Court

BY ARIANE KJELLQUIST

On 2.7 acres in Candler, not far from shopping and services, is a thriving community of 12 certified Green Built Homes created by Asheville Area Habitat for Humanity.

Previously the site of five abandoned mobile homes, the parcel presented Asheville Habitat with an opportunity to build something other than its time-tested detached single-family arts-and-crafts-style homes. Dubbed Curry Court, the Candler community would be a small-scale test of a new housing product for Asheville Habitat: two-story townhomes.

Townhomes enabled the non-profit builder to serve 33 percent more families on the same parcel — an important consideration due to the rising cost and limited availability of buildable land, coupled with a growing need for affordable housing. Additionally, not every-

Project Team

Builder — Asheville Area Habitat For Humanity
HVAC Contractor — Gentry Heating
Ventilation Equipment — Green R
HERS Rater — Vandemusser Design

At Curry Court and throughout Buncombe County, Asheville Habitat defies the misconception that green building is expensive and only accessible to the wealthy.

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one wants a single-family detached home and maximizing land use is an environmentally smart strategy.

At Curry Court and throughout Buncombe County, Asheville Habitat defies the misconception that green building is expensive and only accessible to the wealthy. In fact, Asheville Habitat has certified more Green Built Homes than any other builder in the state — 173 since 2008.

**Affordable to buy and maintain**

Through Habitat’s affordable homeownership program, qualified families who earn 70 percent or less of area median income partner with Habitat to build and buy a certified Green Built Home. Future homebuyers participate in the building of their own home and the homes of their neighbors, take homeownership preparation classes, then purchase their home from Habitat and pay back an affordable mortgage over 30 years. The typical monthly mortgage payment for a three-bedroom, one-and-a-half-bath Habitat house is $650.

In addition to being affordable to purchase, it’s essential that Habitat homes are affordable to maintain. Advanced Energy predetermines the heating and cooling cost of the home using energy modeling and proper HVAC sizing. If the homebuyer properly maintains their HVAC system and thermostats, the costs exceed the predetermined amount (typically $35 to 45 per month) during the first two years of ownership. Advanced Energy will pay for the additional fees and evaluate the cause of the energy surplus. For the new homeowner, that provides peace of mind as well as incentive to take good care of the systems.

To that end, Habitat works hard to ensure homebuyers understand the importance of changing out their return-air and heat-recovery ventilator filters every three to six months, for example. An in-depth class about home-system maintenance is part of Habitat’s Homeownership Education curriculum, and a short refresher is provided during the final walk-through on closing day.

A participant in the SystemVision program, Asheville Habitat homes include passive radon mitigation, an HRV unit, sealed crawl space, and much more.

“We keep close tabs on the crawlspace from the onset, continuously monitoring the moisture levels throughout construction of the home and fully encapsulating the space as soon as it is feasible to do so,” Construction Administrator Sumaya El-Attar said.

The houses also boast high-efficiency vinyl windows, high-efficiency heat pumps and water heaters, ENERGY STAR® appliances, R-18 spray foam insulation, R-15 wall insulation, and R-19 floor insulation. Habitat is proud of how tight their homes are, and homeowners are appreciative.

“The money I will be saving from having affordable heating, I can put into my savings account,” said new Curry Court townhome owner Belinda Finley, who was paying nearly $400 per month in heating costs during the winter as a renter. “That’s going to mean a lot to me.”

**Trying something new**

Asheville Habitat works with Vandemusser Design, a third-party Home Energy Rating System (HERS) rater that gathers efficiency information through a frame-and-insulation inspection and blower-door test and ensures SystemVision compliance. The Green Built Homes certification is presented by Green Built Alliance, the program administrator.

While townhomes were a welcome addition, the new model required new equipment and extensive training. Habitat staff had to learn new processes and teach hundreds of volunteers the new ropes — or in this case, the new scaffolding. The townhomes are two stories, a departure from Habitat’s single-story detached homes. A new scaffolding system that encompasses the entire structure was purchased to ensure staff and volunteers could work safely at heights.

“Our volunteers are excited by new things, they love to be challenged,” El-Attar said. Eager to learn and be involved, they showed up in droves to a safety training that was required for staff, but optional for volunteers.

Also new to Habitat’s construction crews were firewalls. Wide and heavy, it took a minute for the staff to determine the best way to install the thick wall between two townhome units. Interior stairwells with half-walls upstairs and finishing caps were new too. The townhome layout and design also necessitated new types of lighting, such as wall sconces in the stairwell and pendant lights above the kitchen island. And the upstairs bedrooms include hypoallergenic and antimicrobial berber carpet.

It proved highly successful to use the small Curry Court community as an opportunity to learn the best way to build the new housing model. In Habitat’s largest community to date, the 98-home New Heights neighborhood under construction off Old Haywood Road in West Asheville will include more two-story townhomes, the time-tested single-family homes, and a brand new housing type with single-level Aging in Place townhomes for adults age 55 and older.

**A well-oiled machine**

Green building has immediate and long-lasting positive impacts above and beyond the commonly cited environmental ones. In Habitat’s case, there are financial benefits for both the nonprofit and the homebuyer. A low HERS score means Habitat receives a rebate from Duke Energy of about $2,500 per house, while a Green Built Homes certification generates a $6,000-per-house grant from the North Carolina Housing Finance Agency, both of which make homes even more affordable to the homebuyer.

A low monthly mortgage is only part of what makes a Habitat home affordable. Low maintenance costs contribute significantly to the long-term affordability of a home, so Habitat works hard on the front end to build energy-efficient homes and educate homebuyers on how to properly maintain them.

“The goal is to build a home that runs like a well-oiled machine,” said El-Attar.

Ariane Kjelquist is the communications director for Asheville Area Habitat for Humanity. She has worked since 2006 for the local nonprofit, which builds and repairs homes, operates two ReStores, and offers deconstruction services. Connect with Ariane at ashevillehabitat.org.
At one point in time, only wealthy folks could afford cell phones. The same has happened with electric cars, computers, television sets and many other feats of technology. Over time, more and more people have access to these commodities because prices fall as supply grows and the cost of production gets reduced by economies of scale.

Though one could argue that most people can lead a safe and healthy life without many of the products mentioned, the same cannot be said of housing. Everyone needs a home in order to lead a life with dignity, health and safety regardless of income.

While populations in cities are growing, housing permits and unit production are not keeping up with the demand. This makes access to housing very expensive, if not unaffordable, for families perceived to be middle class, let alone for folks in the lower socioeconomic levels of society.

Dollars and sense
Besides the monthly cost of mortgage or rent payments, there are many other costs calculated into the housing cost such as electricity, water, natural gas, taxes, insurance, associations, maintenance, transportation, cable, internet, sewer, garbage pickup, and the list goes on and on.

While it’s true that some energy-efficient features in a home result in added expense to construction, the truth is that the vast majority of green features are standard fixtures which simply have improved their efficiency with time and technology. Just like cell phones and smart TVs, the prices of many green technologies have dropped to the point of being as affordable as non-efficient competition and in some cases even less expensive.

Moreover, some of these efficient fixtures are now required by the building code. Some examples include low-flow plumbing faucets and shower heads; LED and CFL high-efficiency light fixtures; wall, roof and flooring insulation; energy-efficient appliances; and many others.

Additionally, these energy-efficient features result in a home that improves health for its occupants, contributes to the environment by using less energy, and lowers building operational costs.

All this is to say that by integrating relatively basic practices and materials by today’s standards in the dwellings we build, we can provide healthier homes to the users, reduce energy and water consumption, and save money while we’re at it. Who doesn’t like that idea?

Key Commons
That is exactly what we at Homeward Bound intend to do. As we enter into the development of one-bedroom, one-bath dwelling units throughout Asheville and Buncombe County, it is our intention to apply most of these green features on rehabilitations and go for certification with new ones.

To that end, Homeward Bound acquired Key Commons, an 11-unit apartment complex at 296 Short Michigan Avenue in Asheville, in October 2019. After Homeward Bound’s extensive renovations, there will be 11 of the one-bedroom, one-bathroom, 400-square-foot units, and two of the two-bedroom, two-bathroom,
Here is a list of potential savings that green features can bring into a building’s operational costs in one year, according to the U.S. Department of Energy:

<table>
<thead>
<tr>
<th>Recommended Action</th>
<th>Potential Savings (as percentage of utility bills)</th>
<th>Average Annual Savings in Dollars (actual savings vary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install exterior Low-E windows</td>
<td>12 to 33 percent annually on heating and cooling bills</td>
<td>$100 to $274</td>
</tr>
<tr>
<td>Seal uncontrolled leaks</td>
<td>10 to 20 percent on annual heating and cooling bills</td>
<td>$83 to $166</td>
</tr>
<tr>
<td>Plant shade trees</td>
<td>15 to 50 percent of annual air-conditioning costs</td>
<td>$35 to $119</td>
</tr>
<tr>
<td>Use a power strip for electronic equipment and turn it off when not in use</td>
<td>Up to 12 percent of electric bill per year</td>
<td>$100</td>
</tr>
<tr>
<td>Replace an older toilet with a WaterSense-labeled model</td>
<td></td>
<td>$100</td>
</tr>
<tr>
<td>Turn back your thermostat 7 to 10 degrees for eight hours a day</td>
<td>Up to 10 percent annually on heating and cooling bills</td>
<td>$42 to $83</td>
</tr>
<tr>
<td>Weatherstrip double hung windows</td>
<td>5 to 10 percent annually on heating and cooling bills</td>
<td>$83</td>
</tr>
<tr>
<td>Fix leaky faucets; one drip per second wastes 1,661 gallons of water per year</td>
<td>7 to 16 percent annually on water-heating bill</td>
<td>$20 to $45</td>
</tr>
<tr>
<td>Insulate water heating tank</td>
<td>9 percent on electricity bill annually</td>
<td>$75</td>
</tr>
<tr>
<td>Fix leaky faucets; one drip per second wastes 1,661 gallons of water per year</td>
<td>9 percent on electricity bill annually</td>
<td>$75</td>
</tr>
<tr>
<td>Insulate hot water pipes</td>
<td>4 to 22 percent annually on water-heating bill</td>
<td>$12 to $60</td>
</tr>
<tr>
<td>Use sleep mode feature on your computer</td>
<td>Up to 4 percent of annual electric bill</td>
<td>$30</td>
</tr>
<tr>
<td>Total Potential Savings*</td>
<td></td>
<td>$723 to $1,182</td>
</tr>
</tbody>
</table>

* All actual savings will vary depending on home, climate, products and use.

source: energy.gov/energysaver/articles/how-much-can-you-really-save-energy-efficient-improvements

700-square-foot units.

Among the energy-efficient features being installed, the units will be getting cool roofs, R-30 attic insulation, R-19 floor insulation, beefed up wall insulation, new Low-E windows, low-flow plumbing fixtures, LED light fixtures, building-envelope sealant, as well as energy-efficient appliances and mechanical systems. All units are expected to be completed by the beginning of 2021.

Homeward Bound uses the Housing First approach to get people experiencing homelessness into housing. Referrals for housing services happen when people who are experiencing homelessness visit our AHOPE Day Center or through referrals from our community partners. Since 2006, Homeward Bound has moved more than 2,050 people off the streets and out of cars, camps and shelters into permanent homes.

Going green

For us, it is not really a question of whether we should go for these green practices; it is a must.

Most, if not all, of our clients rely on very low incomes to afford housing along with all their other expenses of life. By going green, we are ensuring that their utility and building-operation expenses are kept at a minimum. It also gives us peace of mind that our buildings will last longer and their systems will run more efficiently. More often than not, the savings realized through the use of green features mean the difference between our clients being able to access a safe, high-performing and healthier home versus a dwelling that is not.

Affordable housing should be synonymous with sustainable housing, and there’s no better way of making a building sustainable than by implementing energy-efficient features.

As if all of this wasn’t enough incentive, builders, developers, home buyers, owner builders, and pretty much anyone building or renovating a home can access discounted financing solutions as a result of including these green-building practices into their projects from federal institutions such as Fannie Mae, Freddie Mac and the Federal Housing Administration. These discounts can come in the form of interest-rate reductions, increased loan proceeds, rebates and more.

Both building users and building managers have a large responsibility to the greater community. By ensuring that the buildings and their systems are used in the way they are intended, we are further advancing the idea of affordable and sustainable living.

Don’t forget to turn off the light when you leave the room!

Santiago Cely is the facilities and housing development director at Homeward Bound of Western North Carolina. Santiago is a strong advocate of affordable housing and has been developing it in South Florida for the past decade. He recently moved to North Carolina and joined Homeward Bound to help in the fight to end homelessness in the community.

Connect with Santiago at homewardboundwnc.org.

Unit interior renovation at Key Commons.
HIGH LAKE MEDIA PHOTO
Designing for Density
Green Affordable Homes at East Haven Apartments

BY GEOFFREY BARTON

When designing any building, and particularly a green building, we traditionally start by considering the natural elements: sun, water, wind and earth.

What is the solar exposure? How can we harvest rainwater? What is the direction of the prevailing breezes? Can the earth itself be used as a building material, or its warmth for geothermal?

The answers to these questions often define green buildings. But as we expand our thinking about how to create green communities, we must think more holistically. Progressive municipalities across the country are endorsing the proposition that the greenest building material that we have at our disposal is not a natural resource, but an artificial one: density.

The defining green feature at East Haven Apartments — and there are several we are proud of — is its density. In Swannanoa, with an official population of fewer than 5,000, we created one of the densest new apartment developments in Buncombe County. So how did this happen?

Settling in Swannanoa

It starts with place. Swannanoa has a rich tradition of innovation. In 1936, Charles D. Owen II moved Beacon Manufacturing to the Swannanoa Valley, creating what would become the largest mill in the world. Just a few years prior and up the road from the Beacon Mill, a group of experimental artists led by John Andrew Rice formed Black Mountain College, which became an enclave for exiled Bauhaus artists chased out of Germany by the Nazis. And a few years prior to that, EW Grove, who made millions off of his wildly popular Tasteless Chill Tonic, moved to Asheville, attracted by the healthy mountain air. Grove used his fortune to build the Grove Park Inn, the Grove Arcade, and the planned community of Grove-mont in Swannanoa.

All of these things — global industry, experimental arts education, a town planning experiment that happened in the context of the rural community of Swannanoa. When it comes to innovation, Swannanoa proves that “rural” is far from synonymous with “small.”

In 2013, we started evaluating the potential for building affordable apartments east of Asheville. For many reasons, we felt that Swannanoa made a lot of sense. Despite the area’s growing employment centers — particularly the Veterans Administration Medical Center, Ingles Markets’ warehouse, and Buncombe County Schools — no new affordable rental development had been built east of Asheville in quite some time. The French Broad River Metropolitan Planning Organization’s 2007 US-70 Corridor Study also painted a future vision for this stretch of US-70 transitioning from strip commercial to mixed-use.

Policy and planning

In the early stages of planning East Haven Apartments, we held a community-planning charrette,
consulted with the Friends and Neighbors of Swannanoa group, and developed a plan to build what seemed like reasonable density for a small commercial parcel of 3.18 acres in a rural part of the county. With Buncombe County's support, we were able to secure approval to exceed the underlying zoning (12 units per acre) and create a plan for 60 units (18.9 units per acre) of affordable housing.

Housing Tax Credits are the financial tool that enables us to build attractive apartments with rents well below market rate, and the process for obtaining them is highly competitive and can often turn into a multi-year exercise in patience. Our application for East Haven proved no different. Every year, the number of projects that apply for Housing Tax Credit funding in North Carolina exceeds the amount of available tax credits by about a three-to-one margin. We applied for tax-credit funding unsuccessfully in three consecutive years before winning an allocation on our fourth attempt in 2017.

The delays, however, ended up working in our favor. In 2016, the Buncombe County Planning Department developed an innovative density bonus called Community-Oriented Development. When Buncombe County adopted Community-Oriented Development, we were first in line and secured approval to build 95 apartments, a 250 percent density bonus (29.9 units per acre).

Buncombe County’s Community-Oriented Development policy is an innovative approach to incentivizing denser development in certain well-located areas, particularly those served by transit. The policy awards points for including sustainable features such as rainwater capture, renewable energy, and open space and wetland conservation. The policy’s largest bonus is awarded to developments that include affordable housing, in alignment with Buncombe County’s high need and the County Commission’s recognition of affordable housing as one of its six strategic priorities. By definition, the policy incentivizes moderately dense green affordable housing.

Green features

In addition to its density, East Haven has several green features including a 46-panel, 17.94-kW photovoltaic solar array, ENERGY STAR® appliances, WaterSense low-flow plumbing fixtures, and ceiling fans and large operable windows to help reduce energy consumption by extending the season for natural ventilation. The buildings were constructed using prefabricated wood frame wall panels to eliminate construction waste and reduce on-site erection time.

East Haven Apartments contains a mix of one, two and three-bedroom apartments in two four-story L-shaped buildings that enclose a large courtyard. The 95 apartments at East Haven have monthly rents ranging from $250 to $700. We have committed to maintaining the affordability of the apartments for at least 50 years, and we have reserved 10 of the apartments for veterans. Onsite amenities include a playground, laundry facility, fitness center, and picnic area with grills. The primary cladding materials are fiber cement siding and brick.

Accommodating multi-modal transportation options can be a bit of a challenge outside of denser urban areas, but we aimed to make East Haven part of a transition to multi-modal transportation. We provided a right-sized parking ratio (0.7 parking spaces per bedroom) to try to limit the size of our parking areas. Buncombe County installed a new bus shelter on ART’s 170 bus line in front of East Haven, which will provide our residents with access to jobs and services without relying on a car.

Through the assistance of a recent grant, we will also be helping Buncombe County and the North Carolina Department of Transportation develop pedestrian-safety improvements in collaboration with Friends and Neighbors of Swannanoa. East Haven is also located near the planned route for the Swannanoa River Greenway that aspires to connect Asheville’s greenway network with Black Mountain.

Sensible rural density

A four-story building built along a five-lane regional thoroughfare will rarely feel out of scale, and demonstrates that even rural communities have commercial areas that can handle sensitively developed density. Despite the imperative to accommodate a growing population while protecting ridgelines from development, proposals to exceed the underlying zoning in a rural community by 250 percent would rarely get off the ground without innovative green development tools like Buncombe County’s Community-Oriented Development policy.

A sensible model for rural density, East Haven Apartments provides an optimistic vision for the future: affordable homes in green buildings situated in green communities.
After a close friend of the community froze to death in 2016 while sleeping along the banks of the French Broad River, the BeLoved Asheville team mobilized to make a dent in the housing and security crisis.

With the realization that transitional housing and existing affordable housing were failing, the BeLoved team zeroed in on a long-term solution. The nonprofit’s vision is coming to fruition this year in the construction of BeLoved Village, a community of affordable, sustainable and long-term micro homes.

The local housing problem

BeLoved Asheville is a nonprofit dedicated to helping those who live on the fringes of society. Its core mission is to empower individuals and end homelessness, poverty and racism. The board works closely with donors, people on the streets and volunteers to help those in need. The nonprofit has learned that a lack of housing can impact every other facet of a person’s life.

“A lot of people we work with have stories about their inability to find housing,” said the Rev. Amy Cantrell, co-director of BeLoved Asheville. “We dug into why that was and found the kind of housing currently offered here is unhealthy in a lot of ways. What people really want is a ‘home,’ something with dignity.”

Cantrell says much of the affordable housing offered in this region is unhealthy or transitional in nature. The options are limited, and often not very sustainable. Much of the affordable housing stock in this area can be found in overcrowded apartments, trailers located many miles from a bus stop, or older buildings that contain mold and unhealthy toxins.

Additionally, research shows Asheville rent ranks highest in North Carolina, that Asheville is the second most gentrified city in the nation, and that 62 percent of area renters are cost-burdened. Older adults on a fixed income, individuals living on the streets, veterans, and workers employed in minimum-wage jobs are among the groups most often in need of affordable housing. From representatives of these groups, the BeLoved board garnered information about the types of housing that people feel a sense of pride, put down roots and get to know their neighbors.”

— Rev. Amy Cantrell, co-director of BeLoved Asheville
The board learned that these individuals not only need housing that is affordable, but they also crave trees and land, a sense of community, and sustainability.

The BeLoved board took a full year to consider these needs and study the housing crisis in Western North Carolina and across the country. At that time, they created the initial concept for BeLoved Village.

In 2017, the team posted a video on Facebook, introducing their idea and asking for help. The response was immediate. A local church offered an acre of land in East Asheville. This plot is now the construction site for the envisioned micro-home village.

The sustainable housing solution

BeLoved Village’s model involves four components: deeply affordable, community oriented, sustainable and equity producing.

There will be 12 micro homes in BeLoved Village, and each is built to be accessible to people making 30 percent of the median income, or $750 to $1,000 per month.

Residents will pay one monthly rate. A percentage of this payment will be directed into an equity fund for each resident. Another percentage will be put toward a “pay-it-forward” fund supporting the next village project. The remaining amount will support ongoing maintenance and upkeep of the village.

“The people who need this type of housing are working really hard and not getting anywhere,” Cantrell said. “It was important that we put an equity component into the project. Equity helps people move forward and mitigate crises. It helps them go back to school or start a business. We truly believe this model is a transformative agent on many levels.”

Each cottage will be roughly 440 square feet with a loft above as well as a porch. The goal is to build an infrastructure that fosters a sense of community. The first home was expected to be completed in the summer of 2020.

The plan is for this village to serve as a model for future villages in the region and beyond. Cantrell says if they can show it works to aid in the housing crisis, they plan to coach other groups to replicate the model.

A Sustainability Action Plan was developed to guide decision-making as it pertains to the use of green and sustainable building materials, practices and methods.

Building supplies used in the project will be sourced through donations and recycled materials. There will be green space for residents to plant gardens and use for recreation. Further, local artists are creating pieces and Warren Wilson College pottery students are making dishes for each cottage. Volunteers and youth are painting recycled wood to be used throughout the property.

“Our goal is to create an environment where people feel a sense of pride, put down roots and get to know their neighbors,” Cantrell said. “The feeling of home goes into this very deep place inside all of us and it’s traumatic to not have one. We hope BeLoved Village offers this basic human need to its residents.”

The Sustainability Action Plan

The Sustainability Action Plan is being developed in cooperation with the University of North Carolina Asheville’s McCullough Fellowship. At the core of this plan are the LEED standards for Neighborhood Development and Residential Construction, as well as the local Green Built Homes certification standards.

Though the decision to pursue green certifications is still under consideration, the organization is using the associated checklists and guidelines as roadmaps to inform decisions. The Sustainability Action Plan also includes guidelines such as the EPA’s Energy Star and Water Safe standards, as well as individual recommendations for materials, construction methods and other factors.

Aside from the formal action plan, BeLoved Asheville plans to use donated construction materials whenever possible. Instead of clear cutting the existing bamboo and hardwood forest and flattening the parcel prior to construction, the team will use volunteer labor to hand-clear only as much vegetation as necessary. Similarly, a low-impact grade will be implemented to remove only the required amount of soil to move forward with construction. The combination of these practices significantly reduces potential for land erosion and leaves much of the original topology and soil structure intact.
In 2001, I took on a rehab project that featured energy retrofits, historic restoration, and affordable housing. At the time, the building at 100 Biltmore Ave. was falling apart and needed a lot of TLC.

Built 90 years prior as a traveler’s inn, it had declined over time to be a low-end rooming house. I did a complete restoration, preserving the character of the building while upgrading the tenancy. Two decades later, it remains affordable today with half occupancy as full time and the other half as a return to the original use as an inn.

The history of the property

The Gray Rock Inn was built by Morris Meyers in 1911 as a boarding house. It has been a short-term rental ever since, with weekly rents and shared facilities.

It started out sparkly and swank, but the Great Depression took the wind out of the sails for all of Asheville in 1929. After that, well, the years took their toll. By 2001 when I got involved, it needed a serious overhaul. It was an opportunity to restore, recycle, and reuse an older building, and at the same time, practice green: non-toxic, solar, and affordable building.

It was a pretty piece of real estate on the southern edge of downtown Asheville. The rent was very low. The neighborhood was about to change. From the outside, the brick and rockwork looked solid. The metal shingle roof was original. There was some rust. Six spruce trees graced the front sitting porches. Inside, the place showed significant damage with termites and falling plaster. It needed a lot of work.

As a historic building, it had several features that you will not find in newer construction. The exterior walls were 18-inch thick masonry. The heating was a natural gas boiler with original radiators. The windows were large for lighting and ventilation.

There were 18 rooms for residents on a weekly budget. The bathrooms and kitchen were shared, making it private shared housing. Private means everyone has a separate room with a door that locks. Also, the ownership is private, not a big company or government. Shared means there are common facilities that everyone uses. Tenants are from all kinds of backgrounds with all sorts of interests. In the downtown area, a car is not required. Facilities and landscaping are taken care of professionally. Public spaces are cleared and cleaned daily.

The vision for the rehab

In the 1990s, I started to craft an idea. What if an apartment building were acquired and rehabbed with solar and green-building technologies? What would that be like? Could advanced energy alternatives like solar and wind be incorporated into a housing development?

It was early in the development of green-building initiatives. The
WNC Green Building Council (which later became Green Built Alliance) was formed in 2001, the same year I took on the Gray Rock Inn rehab project. Across the world, green initiatives have moved the direction of the entire building industry toward sustainability. Affordability was a high priority. How could I make this building shine and still be affordable?

Nationally, buildings account for 40 percent of energy consumed. A lot of older buildings are energy hogs, using a greater portion of that energy for heating and cooling. New codes since the 1970s require insulation and conservation methods. Older buildings are still allowed to continue under the grandfather loophole. Owners and developers take advantage of that loophole to leave wasteful facilities in place. Insulation and conservation pay back their costs after only a few years, so persistence beyond the payback window pays off.

There were more questions: Can sustainable housing supply solar for people who would never be able to afford those benefits on their own? Could I find community-minded people who are willing to share resources? Could I make it attractive and fun? Could I make money and keep the affordability?

The background on shared housing

People have always shared homes. Privately held housing for friends and family has always been the most affordable option. The market-rate rent for shared housing is lower than for apartments, multiplex or single-family housing. Yet, shared housing is seldom talked about in the context of affordable housing. Shared housing seems to be invisible. The Department of Housing and Urban Development tracks affordability data for this area, but the smallest unit covered is an efficiency studio apartment. Shared housing is not on the list. It may be too hard to measure, so it is simply ignored.

Government and nonprofits help as much as they can but depend on subsidies to lower market-rate pricing. Qualifiers for rent assistance are often rated by Area Median Income (AMI) and placed according to their percentage of AMI.

The Gray Rock Inn is unsubsidized shared housing; even at market rates, rooms are affordable in the range 60 to 80 percent AMI. All the rooms are private and small, with shared bathrooms.

In Asheville and around the world, shared housing is the most affordable housing option for friends, family and travelers. It has always been that way.

The long-term lessons

As affordable housing, the Gray Rock Inn is positioned to serve the community with style and flair. It has been cleaned up. The facilities have been brought up to code for the new century. The sustainability improvements are substantial and ongoing, with more work scheduled. The tenant mix has changed; the neighborhood has changed. With the new coronavirus at hand, so has the whole world.

Heating, plumbing, wiring and fire protection have all been upgraded. Insulation was added, windows were replaced, solar hot water was installed. Environmentally responsible finishes were used for better air quality. Recycled materials were scrounged, collected and installed. The kitchen and bathrooms were upgraded. It is still affordable housing, and it is also green.

What lessons were learned?

- Shared housing is not for everybody.
- Fair-market rental rates are at the lower end of market-rate rentals, lower even than for apartments.
- Green building can be a real benefit to older buildings. It does not have to be done all at once. Changes can be made in stages.
- Parking is an issue and always will be, as long as there are cars. Car-free living is possible when things like food and jobs are available nearby.
- Sophisticated systems require upkeep. Professional maintenance is necessary.
- Affordability is always in demand, even in an economic downturn.
- Screening new tenants is vital to maintaining sanity as a landlord.
- Travel through life lighter. Waste less. Help each other. Keep spirit alive. We have the tech, the finance, the will. Reinvest in the community. We know what to do, and how to do it.

John Senechal is a green builder and founding member of the WNC Green Building Council, now known as Green Built Alliance. His special interests are solar, community and real estate. General interests are gardening, dancing and peace. Connect with John at baldmtnhomes.com.
Becky Wood and Carol Kemp came to us several years ago with the goal of relocating from Seattle to build a new net-zero house in the Asheville area that would support electric vehicles, have privacy and space for gardening, and allow them to age in place.

We took time to find an affordable piece of property within 30 minutes of Asheville so they could save as much of their budget as possible for the house and systems. When a 4.5-acre site with southern exposure near Marshall came on the market at a great price, they jumped on it.

The site was overgrown with brambles on top of rubbish at the time, but would clearly be a great spot for a passive and active solar home. About half of the site is a southeast-facing hill with unobstructed solar access and distant views of Mount Pisgah, while the northern half of the lot is wooded.

We brought the driveway in along an upper contour at the west side of the property. We designed a detached carport with several enclosed storage areas and connected it to the mud room of the main house by a pergola. The house itself sits with the long axis...
Becky and Carol decided to spring concrete floors for thermal mass, systems. The overall footprint is 26 feet wide by 60 feet long, not including the 10-foot-deep porches on the east end.

The 60-foot-long south side of the house is full of windows with high solar heat gain coefficient glass. We placed the stairwell to the lower level along the south window wall to act as a heat collection area. A board-formed concrete interior (trombe) wall at the stairwell acts as thermal mass to store the heat from the sun on winter days and release it into the home at night.

To bring life into the home, we formed a trough in the top of the concrete wall, waterproofed the inside, and added a drain to the basement so Becky and Carol could plant directly in the wall and plants can hang down into the light-filled stairwell.

Additional thermal mass for the solar gain is provided by the concrete floors on both the basement level and the main floor. To counter potential overheating when heat gain is not needed, we were careful to properly size the overhangs on the main level. We also built a pergola along the entire south side between the floors to shade the lower-level windows when needed and provide a place for plants to grow on the exterior face of the building. In addition to the windows on the south wall, we added smaller windows throughout to catch cross breezes for cooling. Becky and Carol have commented that if there is any breeze at all, the house catches it.

The main open living, dining and cooking space at the east end of the home feels perched up in the trees that are visible through the windows on the north side. The kitchen and dining nook windows look south towards distant mountain views. Large doors open to a screened porch at the east end of the house. The owners’ bedroom suite is tucked away in the northwest corner of the house and the walkout lower level contains a sunny south-facing guest suite with covered porch. The lower level also contains a conditioned storage area and a large mechanical room for the HVAC systems.

Since we were already installing concrete floors for thermal mass, Becky and Carol decided to spring for radiant floors too. A project goal was to be truly net zero so we could not use a gas boiler for the radiant floors. We began looking for a radiant floor system that could operate solely on electricity that was more affordable than a geothermal system. Our solar contractor had never installed such a system but they were willing to research and install one.

We ended up using an ANK heat pump system that could also supply the domestic hot water for the house and chilled water for wall-mounted mini-split AC units. Since Becky and Carol didn’t want ducted air conditioning anyway, this turned out to be a great system for them.

There was a learning curve for all involved in the install of the system, but our solar contractor did a great job troubleshooting it and making sure it was operating correctly in all seasons. We are really excited to now be able to install radiant floors without burning gas and supporting the fracking industry or paying for a geothermal system, and we are thankful that our solar contractor was willing to try it out.

A 9.86-kW photovoltaic system on the south-facing roof provides enough energy for the HVAC system, the rest of the 1,900-square-foot home’s electrical needs and extra for electric-vehicle charging.

The final Home Energy Rating System (HERS) Score was calculated to be -22, setting a new record for the Green Built Homes program through which the project was certified. Becky and Carol made eco-conscious choices for finishes throughout (such as recycled paper and resin counters), and the home ended up certified as Green Built Homes Platinum with a score of 307 points.

It was a pleasure to work with clients who prioritized building an environmentally friendly home at every step of the building process and we look forward to seeing them settle into the house and land in the coming years.

Emily Boyd is co-founder of Mountain Sun Building & Design, a design-build firm building net-zero and green-certified homes. A Certified Professional Building Designer and Certified Permaculture Designer, she is passionate about creating light-filled homes that connect occupants to nature. Connect with Emily at mountainsunbuilding.com.
When I first met Kate Zubko and Jeff Konz at their property on Elk Mountain Scenic Highway two summers ago for an initial site visit, I left the meeting with two distinct impressions: that Kate and Jeff seemed like really nice people and that I had no idea at all how to approach building a house on their tricky lot.

Building on challenging lots is common practice in the mountains of Western North Carolina, and most builders who’ve been around for a while have cut their teeth on plenty of difficult sites. My previous experiences with difficult lots were limited to really steep sites and a few lots with poor soil conditions. What we encountered at Kate and Jeff’s lot was a different variety of difficult: a property with compound slopes and angles.

The primary topographic feature of Kate and Jeff’s property was a prominent spine sloping down from left to right and folding off to both the front and rear of the property. Rainwater was shedding off in multiple directions. Nestled into this were several prominent boulder outcroppings and two magnificent oaks.

“Paying attention to the land from the start led to the uniqueness of the design,” Jeff said. For the design work, Kate and Jeff engaged Steve Farrell of SSF Architecture and a concept was born. “We saw the slope of the lot and we asked Steve to hug the land in his design,” Kate said. “We knew it would have to be multi-level. We were really interested in keeping the rocks exposed and hugging the house around them and up the slope.”

In order to accomplish his design, Steve used specific elevation data to design a home that steps up the lot from right to left, allowing for preservation of the rock outcroppings and mature oaks. What I found to be unique about his approach was that it didn’t include a traditional basement, which would have been my natural inclination as a starting point. Instead, Kate and Jeff will enter the home through a garage on the right and step up into a mudroom on the lower level, which also includes two bedrooms and a bathroom. From there, a flight of stairs takes them to the main level of the home. There are two separate sealed and conditioned crawl spaces — one behind the garage and below the lower level, and another adjacent to the garage and below approximately half of the main level. At the far left end of the property, six large cedar posts were mounted on top of two large boulders to carry the welcoming entry gable, creating the effect of the house coming right out of the rocks. RS MOTLEY CONSTRUCTION PHOTOS
the main level, the elevation changes once more to a raised sitting area, screened porch and open deck.

By a stroke of good luck, the house was built on a direct east-west axis with full southern exposure at the front of the property, giving the public areas of the house a sun-tempered effect. This also informed the design.

“We paid attention to the light in terms of time of day and the seasons and then created pockets to dwell in throughout the day,” Kate said.

For Kate and Jeff, this means a sunny start to the day on the east end of the house where the meditation room and kitchen are located, and afternoon light at the end of the day in the raised sitting area and on the porch and deck. The open design of the public part of the house allows for light to enter from all four directions and minimizes the need for artificial lighting.

Another unique feature of this home is the flagstone entry porch through which guests enter the house. To complement the existing rock outcroppings, additional boulders were carefully selected and brought in early in the project to create a natural-looking form to surround the patio. Six large cedar posts were mounted on top of two large boulders to carry the welcoming entry gable, creating the effect of the house coming right out of the rocks. Guests ascend a gentle slope of large stone slabs on their way to the front door, making for a pleasing journey.

For all framing members, we used southern yellow pine that was grown and milled in North Carolina. Local sourcing of wood is really important and not discussed frequently enough in the green-building industry. When building my first home 14 years ago, I recall being shocked to see that the spruce I had ordered for wall studs had come from Austria and Slovakia. I think that’s way too far for wood to travel.

Framer Series lumber from Weyerhaeuser that’s used in this area is normally farm-raised and milled in eastern North Carolina, or at the very least in a neighboring southern state. By contrast, spruce frequently comes from Canada and usually requires a fair amount of culling. Better-quality spruce is often sourced from Central and Northern Europe, indicating they are drawing from older-growth forests, which is also problematic. Regionally sourced lumber is better in my opinion and certainly makes for a greener finished product.

We also used 1.5-inch insulated ZIP sheathing for the wall covering, which started us off at an R value of 6.6. In addition, R-19 batts in the 24-inch o.c. stud cavities give us a total R value of 25.6 in the walls. Foam insulation was used in the roof and the band joists. The HVAC system features an 18-SEER (Seasonal Energy Efficiency Ratio) heat pump from Bosch, as the home is all electric and has no natural gas or propane. A heat pump water heater, highly efficient windows from Sierra Pacific, fresh-air exchange via a heat-recovery ventilation system (HRV), LED lighting, ENERGY STAR® appliances, and no-mow fescue grasses are among the home’s additional green features.

The home’s HERS rating score is currently estimated to be 54, or 46 percent better than code, and we are certifying through both Green Built Homes and ENERGY STAR®.

This has been a really enjoyable project for me. Good customers and a unique design always help with the satisfaction level. Most good architecture is site specific to some degree, but I feel like the design of this house was a really precise response on a micro level to a variety of unique features and challenges. I’m proud of this home and hope that it gives Kate and Jeff many happy, comfortable years.
The Value of Biophilic Office Design

ENO’s HQ Gets a Facelift

Eagles Nest Outfitters, an Asheville-based outdoor company, had outgrown their downtown Asheville location and approached Samsel Architects to design a modern office renovation. TODD CRAWFORD PHOTOS

BY MARGARET CHANDLER

The opportunities for biophilic architecture in an industrial office park are not as limited as they might seem. Eagles Nest Outfitters, an Asheville-based outdoor company also known as ENO, had outgrown their downtown Asheville location and approached our studio to design a modern office renovation. While the building provided them with the warehouse space they needed, the attached office was a dark, water-damaged maze of outdated cubicles. Their new space needed to enhance creativity, collaboration and productivity while conveying a strong connection to the outdoors.

Our design solution focused on a connection to nature through daylight, views to the outdoors, and natural materials. Two twenty-foot-long north-facing modular skylights were added in the open offices, bringing daylight deep into the building. New floor-to-ceiling storefront walls allow views of the improved landscape. Large indoor planters take advantage of the interior daylight, help improve indoor air quality, and bring nature into the building.

The renovation also needed to meet the logistical and pragmatic demands of a modern office. The program itself includes a mix of private offices, open workspaces, and varying styles and scales of meeting areas. Providing a range of open and closed spaces helps encourage collaboration while also allowing for acoustic privacy and areas for work that require focused concentration. The space design also allows for hiring additional staff, as the company continues to grow.

A large-format tree bark accent wall greets visitors upon entry. This bark panel wall from Bark House of Spruce Pine consists of three 3-foot-by-10-foot Cradle-to-Cradle Platinum-Level Certified reclaimed poplar bark panels. The bark panels, considered a waste product of the logging industry, bring the materials and textures of nature into the office.

ENO requested a new outdoor “Zen Patio” to allow employees to work and socialize outside, but the heavily paved industrial park necessitated some creativity to provide a calm and welcoming space. The Zen Patio is screened from the parking lot by a curved wooden-slat wall, which allows a breeze to pass through while providing a visual barrier. Our design team removed eight parking spaces in front of the building for additional green space, which serves as a natural buffer from the adjacent parking lots and helps alleviate the heat-island effect in that area. The densely planted, predominately native-species garden features plenty of hanging opportunities for ENO’s flagship hammocks, as well as additional outdoor space for employees to meet and retreat. The value of outdoor meeting spaces like this has been further reinforced by recent pandemic concerns. An established maple tree provides shade and serves as an anchor for the improved outdoor areas.

A future phase two of the outdoor-space renovation is designed to include the conversion of up to 72 more parking spaces around the building into additional green space, with a proposed walking trail winding through existing established evergreen trees. This expanded, ambitious replacement of pavement with green space will further the biophilic goals of the design, and provide building occupants and neighbors with an oasis of natural space in the middle of the office park.

Renovation projects such as this are an inherently environmentally preferable means of development. Even buildings or sites that don’t necessarily have high historical or cultural significance can be renovated to the benefit of the project, the building owner and the environment. Renovations take advantage of existing building sites; reuse infrastructure such as parking, roads and utilities; and are
often more environmentally responsible than developing virgin land and perpetuating sprawl.

In addition to curtailing sprawl through redevelopment, renovating existing buildings serves to mitigate the high carbon footprint of new construction. Steel, concrete and brick all require large amounts of carbon in their production. Maintaining or reusing these materials instead of demolishing and replacing them keeps this embodied carbon from going to waste. In this project, our design team stripped the existing office building back to its structural bones, and used the principles of biophilic design to enhance the environment of a high-functioning modern office.

“This design approach has improved the work experience for all staff as well as the efficiency and quality of the work for our business,” ENO General Manager Lane Nakaji said.

Margaret Chandler is an architect with Samsel Architects. She has worked in sustainable design since earning her degrees at Clemson University, and briefly lived in a treehouse off the grid in Austin, TX. Margaret has spent years serving on the AIA Asheville Executive Committee in a variety of roles. Connect with Margaret at samselarchitects.com.

A large-format tree bark accent wall greets visitors upon entry.

ENO requested a new outdoor Zen Patio, which is screened from the parking lot by a curved wooden-slat wall.
Sweet Spot
Custom Home Balances Comfort and Environmental Responsibility

BY DOUGLAS AGER

Mike Herrick loves Western North Carolina for the area’s temperate year-round climate, and his wife Ellen wanted to live closer to their grandchildren on the east coast. But their shared goal when building their new custom house was to find the sweet spot between creating a comfortable home while being mindful and respectful of the resources they consume to provide that lifestyle.

So when the couple began designing their dream home in Hendersonville, they saw an opportunity to invest in renewable energy as a way to infuse their environmental values into their everyday lives. Sugar Hollow Solar installed a 8.4-kW rooftop solar photovoltaic system on their home. Sugar Hollow Solar installed a 8.4-kW rooftop solar photovoltaic system with two Tesla Powerwalls integrated for battery backup. The Herricks’ solar-panel system works through net metering, a billing system that allows owners to receive credits on their monthly utility bills that are equal to the power they produce.

“We had the unfortunate experience of being without power for two weeks after Hurricane Sandy, which was especially painful since we had well water, so we knew that we wanted some sort of backup electricity for when the grid goes down.”

Two Tesla Powerwalls provide backup electricity for when the grid goes down.

Project Team
Builder — Kilpatrick and Company
Solar Installer — Sugar Hollow Solar

GABE SWINNEY PHOTOS
backup electric source and thought that a Tesla Powerwall would be much nicer than a conventional gas generator,” Mike said. 

Sunshine powers their solar system, which earns the Herricks credits to use at night or on cloudy days. Additionally, their two Tesla Powerwalls provide backup electricity for when the grid goes down, as well as decrease the Herricks’ dependence on the utility grid by storing a power supply to pull from when sunshine isn’t directly available.

“My solar gives us the peace of mind that we’re doing our part,” Mike said. “We wanted to take advantage of solar electricity as much as possible, so everything except our hot water heater is electric. At the suggestion of Sugar Hollow, we installed a geothermal heat pump to further reduce our environmental impact.”

Installing a solar-panel system in their new home helped the Herricks build a life in line with their values, and has also translated into lower energy bills. Since the home is new, there were no pre-solar bills to compare against, but they report paying about $200 total for electricity usage in the last 12 months. On six of their recent bills, they have only owed the $15 connection fee to their utility.

“We were able to take advantage of federal tax credits for the solar installation as well as an incentive from Duke Energy, which Sugar Hollow was instrumental in procuring,” Mike said. “Later, when we installed a battery, we were also able to get a federal tax credit to offset some of the cost. In our particular case, we felt confident that this was the right way to go for the long term so the incentives were secondary but it does certainly speed up the payback period.”

Interestingly, the single largest consumer of the solar power their home produces is their electric car — a Tesla Model 3 that they charge through a Tesla wall charger in their garage — so this also represents money that they’d otherwise be paying at the pump.

The Herricks are also now able to set their thermostat to a comfortable temperature, where previously they’d tried to save energy by keeping it set on the brink of discomfort.

Ultimately, the couple said they enjoy being “solar pioneers” in their area and they often welcome curious neighbors who want to see how solar works.

“Solar just makes sense,” Mike said. “Why mine fossil fuels thousands of miles away, transport them to factories where carbon is released, then transport the electricity to your house, when sunshine is delivered most days directly to your house for free?"
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Blue Sky, Green Roof
Reimagining Asheville’s Rooftops

BY EMILIO ANCAYA

Nestled on Lexington Avenue in the heart of downtown Asheville is an apartment building that offers a unique and distinguishable feature. Situated on top of the building is a beautiful 8,200-square-foot green roof that can be seen and enjoyed by surrounding buildings, guests at a neighboring hotel pool deck, and people walking the city’s hilly streets.

The roof is a meadow and supports a diverse plant community focused on pollinator habitat and food sources. It seems only appropriate since Asheville was the first city in the United States to be certified as a Bee City USA.

Native plant species with high pollinator value, such as Asclepias tuberosa, Eryngium yuccifolium, Pycnanthemum muticum, and Rudbeckia fulgida, were selected to promote biodiversity and a thriving urban habitat for pollinators such as bees, moths, butterflies, and birds.

Beginning in the spring and continuing through fall, the roof teems with different species of pollinators doing their important work. During the winter, seed heads and old flower stalks provide food and habitat for our permanent bird residents.

Installed in tandem with the building’s construction in 2017, the green roof system begins above the roof membrane. It includes a roof protection layer (a fleece fabric made from recycled materials), a drainage layer, filter fabric, and...
green-roof growing media. The growing media is composed of a blend of expanded slate, compost, and fines (such as sand). The growing media depth is 6 inches to support a diversity of plant species. The building was new construction and designed to support the green roof. Toward the end of the building’s construction process, a crane lifted the materials to the roof for the crew to install. Once the growing media was prepared, an irrigation system was installed. Then the plants were arranged according to the planting plan, planted, and watered in. The roof continues to be maintained with monthly visits during the growing season.

In addition to providing breathtaking views and access to nature in an atypical locale, this green roof also provides an array of other benefits. Asheville faces climate challenges related to increasing temperatures associated with the urban heat-island effect and a documented reduction in the city’s urban tree canopy over the last several years. This green roof helps to serve as an important counterweight to rising temperatures in downtown Asheville by keeping the apartment’s rooftop temperature cooler during the hottest months.

The green roof also serves as an extraordinary stormwater management tool. A stormwater analysis for this green roof modeled the total stormwater retained and detained at peak flow levels using rainfall data. The study found that this green roof retains all rainfall up to one inch of rain and annually prevents over 100,000 gallons of stormwater from entering public storm drains. Rainwater is absorbed by the plants, then released into the atmosphere through evapotranspiration.

Even for a 10-year storm and a 25-year storm, this green roof reduces total runoff volume by 69 percent and 59 percent, respectively. This can have a major effect in reducing the amount of water rushing into our stormwater system during historical weather events, thereby reducing the potential for damaging flooding and overburdening our stormwater infrastructure.

Green roofs like this one on Lexington Avenue can have a dramatic effect on preventing pollutants and sediments from rushing into storm drains and making their way to our area’s creeks, streams and rivers. Because of their ability to retain and detain stormwater, green roofs can serve as a useful tool for meeting municipal stormwater requirements. They also can afford more flexibility to designers who may no longer need an underground cistern or retention pond to meet city stormwater management requirements.

In addition to the environmental benefits of promoting biodiversity, combating rising downtown temperatures, improving air quality, and helping reduce stormwater runoff, the roof also provides some compelling economic benefits. Green roofs extend the lifespan of a traditional roof by at least three times. This can significantly reduce the lifecycle costs of maintaining a roof over time. By helping to control rooftop temperatures during the city’s hotter months, the green roof also serves to reduce costs for cooling the apartment building.

So next time you are walking the streets of Asheville, keep an eye to the sky. As Asheville property owners continue to adopt green-roof technology and create a thriving network of green roofs like the one on Lexington Avenue, we can envision a future where the city’s rooftops provide crucial habitat with newly created biological corridors. And, we can imagine a day when green roofs can help Asheville become a more resilient city in facing emerging climate challenges.

Emilio Ancaya, GRP (Green Roof Professional), is the co-founder of Living Roofs Inc., a green-roof company based in Asheville. He has extensive experience with all types of green roofs, having designed, supervised and installed projects throughout the southeast, northeast and western states. Connect with Emilio at livingroofsinc.com.
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Centering Equity in Sustainable Buildings

Why Green Buildings are a Civil-Rights Issue

Sustainable buildings promote the health and wellbeing of building occupants while minimizing climate change and pollution, but not everyone has equal access. [ISTOCKPHOTO/NNPA]

By Jacqui Patterson and Mandy Lee


For more than a century, the civil-rights movement has taken on the inequities that divide and disfigure American society. Now the green-building sector has joined the fronts of struggle for access and equity.

Why?

The green-building sector is transforming the places in which we live, work, and gather. Sustainable buildings, defined by certification programs like LEED, promote the health and wellbeing of building occupants while minimizing climate change and pollution.

For some people.

This wave of better building practices has yet to fully reach the people suffering the most from buildings that are unsafe, unhealthy, unaffordable and unsustainable. African Americans and other people of color disproportionately feel the burden of unsustainable buildings: energy insecurity in their homes, health problems like asthma from poor indoor air quality, and damage from worsening disasters fueled by climate change. These are enduring legacies of discriminatory practices, disinvestment and barriers to building wealth over the generations.

What’s worse, the sustainable-building sector is an insider’s club with a serious diversity problem. Whether it’s as policy makers, advocates, architects, contractors, or even in the construction workforce, the most impacted communities are underrepresented in the design and construction of sustainable buildings. For example, according to the National Organization of Minority Architects, less than two percent of registered architects are African Americans, and less than 0.4 percent are African American women. Green building is a huge growth industry, but communities of color are not yet positioned to fully benefit from it.

When we decided to establish our new headquarters as a living building and began to explore what it takes to do so, we saw the problem firsthand at meetings of green-building organizations. We were struck by just how homogeneous some of those spaces were in terms of race, with a significant dearth of people of color engaged in these discussions. We juxtaposed this against what we knew to be true: Communities of color and low-income communities are more likely to be in sick buildings, whether it’s mold, lead, asbestos, or radon. We are more likely to be in the least energy-efficient buildings, and that is reflected in the fact that we pay the highest proportion of our income for electricity. And we are more likely to be in the least disaster-resilient buildings, with homes in floodplains or without reinforcement.

That’s why the NAACP recently launched the Centering Equity in the Sustainable Building Sector (CESBS) initiative, pushing forward civil rights in this critical (if unexpected) new sphere. The NAACP will define and articulate an agenda for an equitable green-building sector, using its Baltimore headquarters as a living laboratory for this concept. Through this effort, the NAACP will develop a replicable model for centering equity in all aspects of sustainable, healthy, safe and regenerative buildings.

Another model is the Green Communities Criteria (GCC) program, a framework and certification developed by Enterprise Community Partners to bring the benefits of sustainable construction practices to low-income families and affordable housing. While this program is still in development, it has already produced 127,000 certified affordable homes through $3.9 billion in investment. Thanks to the leadership of standards like GCC, a total of 32 states have incentivized green-building certification programs for affordable housing developments receiving support from the federal Low-Income Housing Tax Credit program.

Fundamentally, sustainability without equity will merely sustain inequity. The civil rights movement has a critical role to play in creating a sustainable building sector that is both green and just — for the benefit of our families, our communities, the economy and the planet.

This article is adapted from two reports released in February 2020 from the NAACP’s Centering Equity in the Sustainable Building Sector (CESBS) Initiative. Jacqui Patterson is the senior director of the NAACP Environmental and Climate Justice Program, and Mandy Lee is the program manager for the CESBS Initiative at the NAACP. Connect with them at NAACPPorg.
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So you received your economic impact payment from the federal government and you’re not sure how to spend it. Maybe you’re fortunate enough that you don’t need to use it right now for food or rent, but you’d really like to spend it in a way that will pay you back over time.

Well how about investing it in your home? There are a ton of energy-efficiency improvements you can make that not only don’t cost a lot, but are also potentially easy to do yourself and will pay you back in a very short amount of time.

As energy-efficiency professionals, we analyze these types of improvements with energy modeling every day. Here is our summary of the ones that usually make the most sense for homeowners to do on their own existing homes, specifically focusing on DIY (do-it-yourself) items, fast-payback items, and behavior-based items.

1. **Replace all incandescent and halogen bulbs** with LED replacement bulbs: Don’t wait until they burn out — replace these right now. Some people have trouble telling halogen and LED bulbs apart. If you turn the light on for five minutes and the bulb gets too hot to touch, it’s inefficient. Replace it with an LED. LED bulbs are usually $1 to $2 each, very easy to replace yourself, and pay back in less than a year.

2. **Low-flow plumbing fixtures**: Reducing your water usage saves you money in two ways: with the actual water saved and with the reduction in hot water usage. Changing fixtures and/or aerators is a really easy thing to do yourself and can pay back very quickly. People sometimes worry that low-flow fixtures won’t rinse things as well, but they often do a better job because the water comes out with more pressure. A low-flow showerhead is the fastest payback.

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**Bang For Your Buck**

*7 Ways to Use Your Stimulus Check for Energy-Efficiency Improvements*

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**BY AMY MUSSER AND MATTHEW VANDE**

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and biggest bang-for-your-buck efficiency upgrade we’ve ever analyzed. The flow rates to look for are:

• Showerheads: 1.5 to 1.8 gpm
• Aerators for bathroom faucets: 1.0 to 1.5 gpm
• Toilet replacement: 1.28 gpf (single flush) or 0.8 to 1.1/1.6 gpf (dual flush)

3. Install an efficient water heater. If you have an electric water heater, you want to replace it with a heat pump water heater. Not cheap ($1,000 to $1,700 depending on size), but they typically have a very quick three-to-five-year payback period. These use about a third as much energy as a regular electric water heater and they dehumidify the area where they’re located.

If you have a gas tank water heater, switching to a tankless model can give good savings while also being less likely to backdraft and cause carbon monoxide problems in your home.

Since water heaters are often located in a basement or garage, this is something you can have someone work on while still maintaining social distancing.

4. Air seal or add insulation to your house. Air sealing can encompass the entire envelope of your home, from weatherstripping drafty doors and windows to sealing electrical and plumbing holes in walls, between floors and even with lighting fixtures and wiring in your attic. Air sealing of floors and ceilings or roofs makes the most impact on energy efficiency.

You can definitely educate yourself and DIY this for a couple hundred dollars or less. Or for the amount of your economic impact payment, you can hire an experienced weatherization or insulation contractor to do the work. These jobs are labor intensive, so you’d also be using your stimulus money to keep someone in our community employed. And since a lot of this work takes place in crawl spaces, basements, and attics, it’s social distancing friendly.

5. Energy-efficient appliances. If you have an older appliance that’s about to go, this might be a good time to replace it. Clothes washers tend to offer the fastest payback in this group. Get an ENERGY STAR®-rated clothes washer, ideally a front loader with good efficiency ratings. This will go a long way to improving your efficiency, but you can make an even bigger impact if you install a clothesline and commit to using it. Even if you commit to drying half your clothes outside, it really helps.

Refrigerators and freezers are another big opportunity. These have gotten much more efficient over the years, so any unit more than 20 years old would benefit from replacement. To the extent that you can consolidate these and not have too many of them, that also helps. One refrigerator can use 5 percent of a new home’s total energy, so it’s easy to see how having that extra refrigerator for special occasions can really add to your carbon footprint.

6. Duct sealing. Sealing your HVAC ductwork is a big energy saver because, on average, 15 to 30 percent of the air that moves through duct systems is lost due to leaks, kinks or loose connections. In practice, what we find is that some homes do better than this, but a few homes are much worse. If you have ducts outside the conditioned space of your home (for example, those in a garage, vented crawl space, or vented attic), air sealing your ducts can be very worthwhile.

This is also something you can learn to DIY using UL-rated tape and mastic, but it’s also a great task to outsource to a professional. It’s another labor-intensive job that can be done in an unoccupied part of your home.

7. Solar. Your economic impact payment probably isn’t going to pay for your entire photovoltaic system, but it can definitely take a meaningful bite out of the cost. And, you guessed it — solar is installed outside and doesn’t require workers to come inside your house!

Now is a great time to make your home better. We’re spending more time there, and many of these fixes can also contribute to improved comfort and indoor air quality. It’s an opportunity to invest that stimulus check on something that will pay you back over time while employing someone in our community. And best of all, it helps put the planet on a better track for our kids and grandkids.

Amy Musser and Matthew Vande are the owners of VandeMusser Design, PLLC. They provide Home Energy Rating System (HERS) services, green-design consultation, and home-energy audits to homeowners in Western North Carolina. Amy is a licensed mechanical engineer and Matt is a licensed architect.
Leaner and Greener

Green Built Homes Rolls Out Updated Checklist, New Certifications

Green Built Alliance is thrilled to announce the release of Green Built Homes Version 3.0, which has been updated to stay current with changing building codes and increase simplicity for program participants. All homes registered after January 1, 2021 will be required to use the new checklist.

Many items that are now standard construction practices have been removed from our checklist, while we have added opportunities to gain points for new technologies. The sections have been overhauled to be more streamlined and organized. The point system and levels have been adjusted to reflect the changes.

New elements
Two new prerequisites are now required for all homes.
- First, all baths with showers must be tested to exhaust 50 CFM intermittent or 20 CFM continuous. Previously, fans were required to be rated at these levels and we provided points for passing the diagnostic testing, but now the exhaust fans must prove to function as designed in order to achieve certification.

This Platinum Net Zero Energy Certified home was built by Familia Enterprises on an infill location in a walkable neighborhood. The home includes native and edible landscaping, and a variety of green finishes. FAMILY ENTERPRISES PHOTO

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Second, consistent with code, CFL or LED light bulbs must be installed in 75 percent of lamps in permanent lighting fixtures.

For Platinum Level Certification, a balance ventilation system is also now required.

The Net Zero Energy Ready Certification has been updated to allow installation of combi meters in lieu of installing a chasse and conduit for future solar. In addition, a home that does not meet all prescriptive requirements — including having a maximum Home Energy Rating System (HERS) Score of 55, adequate south-facing roof area within 45 degrees east or west of solar south, and a minimum of 110 square feet of roof area per 2,000 square feet of conditioned area — may provide an estimate and system design by a licensed installer that will achieve a HERS Score of 15 with 6 kW or less. Designs may include future ground-mounted systems. The idea is to encourage homeowners to go solar by making it as easy as possible.

Green Built Homes Version 3.0 introduces the newly available HERSH2O. The Residential Energy Services Network (RESNET) that developed and oversees the HERS Index has created a tool for estimating and rating the water use of the home as designed.

“HERSH2O is a system for rating whole-house water efficiency that includes both indoor and outdoor uses,” according to RESNET. “With the average family spending more than $1,000 annually on water costs, HERSH2O provides a simple, easy to compare rating on a scale from 0 to 100; where lower numbers mean less water use. The HERSH2O Index was developed as part of a partnership between RESNET and the International Code Council.”

There are also more credits available for non-toxic, healthy and environmentally preferable products. There is also more information on wildlife protection, bear prevention and biophilic design strategies that attempt to create connections between humans and nature within the built environment.

“The Green Built Homes checklist is a robust tool and guide that provides the best metric to differentiate between greenwashing and the real deal.”

— Sure Foot Builders owner Raymond Thompson

Get Involved

There is an opportunity for builders to be among the first to complete a project under the new Regenerative or Net-Zero Water Ready certifications. Email Program Director Maggie Leslie at maggie@greenbuilt.org if you are interested in the distinction of being a leader in these new certification levels available for the first time in Western North Carolina by participating in our pilot.

New certifications

Thanks to funding from the Kendeda Foundation, the Green Built Homes program now places more emphasis on regenerative elements, including the addition of a Net Zero Water Ready Certification and a pilot Regenerative Certification.

Regenerative buildings are designed and built so that they are integrated to have a net-positive impact on the natural environment around them. The regenerative items encourage the certification system to evolve beyond the previous approach of rewarding features that make homes “less bad” for homeowners and the environment, to begin encouraging elements that actually improve the world around them.

All items considered regenera-
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Protecting Our Places
Economic and Environmental Benefits of Conservation Subdivisions

BY RJ TAYLOR

Western North Carolina is feeling a growth spurt. Many people around the country have become aware of our secret, that Asheville and the surrounding communities are a wonderful place to live and play.

The downside result of that to our local environment and water resources is that many people are moving here and the population is rapidly growing. People need a place to live, so the development boom is leading to many new subdivisions being constructed in areas that are either environmentally sensitive, on lands bordering our waterways, or on the steeper areas of our mountainous environment.

Most of these new subdivisions are being built in the way developers have always done it. Conventionally designed residential subdivisions are characterized by the division of the entire tract of land into houselots and streets with limited common space. The common space is usually limited to the minimum areas required for the avoidance of wetlands, streams, steep slopes, floodplains and stormwater-management areas. These subdivisions have limited areas to walk or recreate because most of the land has been cut up and parcelled out to the individual landowners for their private lots. The result is that most of the land becomes paved over, built upon or converted into lawns. Much of the landscape is also planted with lawn grasses and nonnative trees and shrubs.

Both Buncombe and Henderson counties have recognized the value of a more environmentally friendly development design in their reviews of subdivision proposals. In Buncombe County, a Conservation Development is a subdivision option which allows for the preservation of conserved open spaces and farmland within the footprint of the subdivision. These Conservation Developments limit the disturbed areas within the developed landscape and tend to prioritize the protection of ridgetops, woodlands, floodplain and wetland areas, landslide hazard areas, active agriculture lands, open space and other environmentally sensitive areas. For proposed subdivisions of a size at least 15 acres, various permitting benefits are provided to the developer if 50 percent of the overall tract can be preserved in an open space form. Agricultural lands that remain active to agricultural production count double in this calculation.

Subdivisions being developed in the more suburban areas of Western North Carolina can take advantage of these county benefits and provide their residents with that natural setting adjacent to their residential homesites. Agrihoods such as the Olivette Riverside Community and Farm in Woodfin have already included active farmlands into their subdivision design. Residents of that community will get the pastoral setting of rural agriculture production and also take advantage of the community supported agriculture (CSA) shares that allow them to purchase subscriptions to the farm’s locally grown seasonal produce. That is in addition to the enjoyment that a serene farm setting provides to their neighborhood as opposed to looking into someone else’s backyard.

Subdivisions such as High Hickory in Swannanoa and Couch Mountain in Arden are designed to avoid development on the more visible mountaintop areas, and have set aside those portions of the land for nature preserves.
and natural surface trail systems.

There are distinct economic advantages to utilizing a conservation design for the development of residential subdivisions. These include:

- Review periods often proceed more smoothly since the designers have usually taken into account many of the concerns that the city or county planning departments would be working to resolve, therefore avoiding many of the disputes and conflicts over design.
- An opportunity to reduce the infrastructure engineering and construction costs for single-family lots and multifamily units. The layout is clustered and more compact, often more like a village layout. There are often fewer waterway and wetland crossings, there are fewer linear feet of roadways and less pavement, the costs of stormwater-management facilities are lessened, and shorter electrical and water-utility lines are needed due to the more compact layouts.
- An opportunity to market this sort of development for an environmentally oriented community. The presence of woodlands, stream and wetland-preserve areas, wildlife meadows and active farmland are all amenities that can be promoted in the marketing of the subdivision. Also, greenways and walkable corridors in the subdivision are desirable amenities on open spaces in these subdivisions; especially if there are connections into greenway corridors in the larger community and neighboring cities.
- Conservation subdivisions have been documented to appreciate in value faster than their counterparts in conventional residential developments.
- The presence of natural and recreational areas within these conservation subdivisions help to reduce the demand for public open spaces, parklands, recreational areas and other areas for the local governments’ requirements. This will also be an attractive factor to local plan reviewing bodies at the city and county levels.

In addition to these advantages, there are numerous environmental and ecological benefits being provided through the protection of undeveloped and open space lands within a residential development. Sensitive ecological areas such as streams, wetlands, mature forests, native meadows, and wildlife corridors are being avoided in a good conservation development design. These subdivisions tend to shed less stormwater than the conventional subdivision design and the natural landscape provides a buffer to filter runoff before it reaches rivers and streams. The naturally vegetated buffer zones absorb stormwater, and the overhanging forest cover provides shade and maintains cooler temperatures for aquatic areas in the summer.

Protection of the waterway corridors, sensitive habitats and vistas in a Conservation Development fits nicely with the green-certified homes in our communities. The clustering of the homesites in the buildable environment is often paired with stormwater management, low-impact development and use of native plantings. Subdivision areas with a natural feel and environmentally smart designs are very desirable and therefore very marketable to residents of Western North Carolina. The Planning and Zoning departments with Buncombe County and Henderson County can provide more details about these development options for developers.

Land trusts like RiverLink are working with a number of private development companies on some of these Conservation Subdivisions around the Asheville area. By accepting conservation easements on open space and natural areas within these Conservation Developments, land trusts are helping to make the built environment of our new residential communities more enjoyable. The conservation easements also protect the integrity of our adjacent waterways which receive the runoff from these developed areas where we live.

RJ Taylor is the land resources manager for the nonprofit RiverLink. He has collaborated with numerous conservation developments to protect the natural features within these innovative subdivisions, and is actually a founding resident of one such community in Swannanoa. Connect with RJ at riverlink.org.
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Tiny Home Havens
Tiny Home Communities Develop in Western North Carolina

BY SUSANNA SHETLEY

Tiny-home living has been growing in popularity over the past decade, and the advent of the coronavirus crisis may intensify that surge.

With modern society craving more time outdoors and more money for travel and leisure, tiny homes offer a lot of advantages. “Designing my tiny home was really fun,” said Jacki Yates, a resident of Acony Bell Tiny Home Community, which is nestled in a wooded 60 acres in Mills River. “The design depends on the type of storage you need and how you’ll use your space the most.”

Yates, a longtime road biker and Ironman triathlete, works from home and needed space to store bikes. During her design phase, she factored in these two important components. In the summer of 2020, Yates married her husband, Sam, an avid mountain biker, and her tiny home’s bike storage became even more useful.

Yates says living in her tiny-home community is like being at camp all the time. She and her husband are good friends with the other residents and often enjoy potluck dinners, campfires, board games and community gardening.

Acony Bell

Acony Bell co-founders Mark Brooks and John Monroe developed the village specifically for tiny houses on wheels and outdoor enthusiasts. On site, residents enjoy mountain biking trails, fishing, hiking and edible gardens. There are even hop vines strategically planted around electrical units to beautify each site.

Acony Bell is a blend of permanent residents and vacation rentals. Since each demographic has different needs and desires, the two sections are separated on the property.

“When we acquired this plot of land, we were originally thinking of an RV park,” said Brooks, a civil engineer and president of Brooks Engineering. “That was around the time tiny homes were getting popular. We went to a few tiny-home shows and thought they were really cool, so we decided to go the tiny-home route.”

All of the structures at Acony Bell are tiny homes on wheels, also known as a THOW. The goal for Brooks and Monroe was to have an eclectic blend of homes designed by a realm of builders throughout the region.

“We don’t want to sell you a house,” said Monroe, property manager at Acony Bell. “We can help you design the home, but we want our residents to have control of the details. Also, we want to support local and regional tiny home builders and put money back in the economy. With that being said, each tiny-home owner chooses their builder so they get what they want.”

The Village

Down the road from Acony Bell is The Village at Flat Rock, another tiny-home community which operates under a different paradigm but with a similar comprehensive goal.

“More and more people are reevaluating what’s important to them,” said Coles Carangian, marketing director for The Village at Flat Rock. “They’re realizing all that living space they’re trying to maintain may not be worth it.”

The Village at Flat Rock is one of several small cottage home villages managed by the umbrella company Simple Life. Company founders, The Resource Group, have been in land development and homebuilding for two decades. They realized there was a need for affordable, low-maintenance housing for a particular demographic – homeowners who wanted nice home features and amenity-rich living. This realization combined with the tiny-home movement was the impetus for Simple Life.

Currently, Simple Life operates two sites, one in Flat Rock and one in Central Florida. They recently broke ground on a second community in Henderson County. At The Village, residents select from a handful of designs. They own...
their home and lease the land. Additionally, the community offers amenities such as a swimming pool, clubhouse, social events and an all-inclusive service cost with landscaping, cable, water and trash pick-up.

**Sustainability and ordinances**

Acony Bell and The Village at Flat Rock both strive to embrace sustainability. All homes in The Village at Flat Rock are manufactured indoors then brought on-site. This decreases construction waste and improves the air quality of the dwelling. Many of the Acony Bell residents select builders known for their green-building prowess. Tiny homes are known for producing a relatively small carbon footprint and using less energy due to reduced space to heat and cool.

Ordinances can be tricky when it comes to tiny-home living. Depending on location, zoning restrictions may inhibit tiny-home goals. A tiny home with a foundation is more likely to be approved for residential use, unless a piece of land is leased like those offered at Acony Bell, which fully welcomes homes on wheels. A THOW may not qualify as a house because there’s no structural foundation. Further, some places require a minimal square footage, which challenges the basic concept of a tiny home.

Another choice to consider is an accessory dwelling unit (ADU), which is a tiny home on the same property as a standard-sized residence. Homeowners routinely use these for guest houses or rentals. An ADU is often preferred over a tiny home serving as a primary residence. When the tiny home is the only dwelling on a piece of property, it can lower the tax value of the land. Further, neighbors often frown upon a single tiny house among larger homes due to aesthetics or an anticipated decrease in value in their own home.

Some states are more amenable to tiny-home living than others. Architect Magazine ranked the top five states for tiny homes as California, Oregon, Texas, North Carolina and Florida. This assessment was based on a multitude of factors, including zoning laws, ordinances, access to information, number of tiny-home communities and the prevalence of builders focusing on tiny homes and ADUs.

The tiny-home industry is growing and evolving, but ordinances, zoning laws and human resistance to change can make that movement slow going. Nonetheless, for folks like Yates and her husband, a tiny home is exactly what they need.

“I like how living in a small space forces a person outdoors,” Yates said. “We absolutely love the area and Acony Bell. We plan on sticking around for quite a while.”

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"More and more people are reevaluating what’s important to them. They’re realizing all that living space they’re trying to maintain may not be worth it.”

— Coles Carangian, marketing director for The Village at Flat Rock
Green Built Alliance’s Appalachian Offsets program is celebrating the successful completion of its fundraising campaign to install a solar system at Isaac Dickson Elementary School in Asheville.

Appalachian Offsets funds renewable-energy projects and energy-efficiency upgrades in Western North Carolina schools, nonprofits and low-income housing by pooling money contributed by local businesses and individuals through its voluntary carbon-offset program.

Appalachian Offsets finished fundraising for the Isaac Dickson solar project — its largest undertaking to date — in late 2019 and the system is expected to be installed on the school’s roof in September 2020.

“Over two years, more than 100 donors contributed directly to make this project happen,” Green Built Alliance Executive Director Sam Ruark-Eastes said. “This was a collective effort and we couldn’t have done it without the support of our many donors and the large contribution of an anonymous donor who reached deep into their pockets to fund this effort. We are so grateful to live in a place that values clean energy for schools.”

Isaac Dickson was designed as one of the state’s first Net Zero Energy schools and has been awaiting the solar system to help it move toward that vision since it was built in 2016.

The school will receive a 300 kW photovoltaic array on several roofs with a total price tag of $428,000. Appalachian Offsets coordinated the fundraising efforts, collecting $55,000 through community contributions, while an anonymous donor generously committed $250,000. The project is also being made possible through a $75,000 rebate from

The solar array will be a net-metered system, resulting in the school’s electric bill being lowered by more than $30,000 per year with a 30-year savings of more than $1.3 million.
Duke Energy as well as Asheville City Schools’ allocation of $48,000 in energy-efficiency rebates it received for Isaac Dickson. The solar array will be a net-metered system, resulting in the school’s electric bill being lowered by more than $30,000 per year with a 30-year savings of more than $1.3 million, according to Sundance Power Systems, with which Asheville City Schools has contracted to install the system.

Through an agreement with Buncombe County, the money saved on Isaac Dickson’s electric bills will go back into school operations.

“Installing a rooftop solar system will fulfill the architects’ vision of using the school building itself as learning tool that can be used to facilitate discussions about our environment and conservation, as well as the impacts of fossil fuel consumption not just on our climate but also on our air and water quality,” said Isaac Dickson parent Matt Menne, who played an integral role in fundraising efforts during his time as co-president of the school’s PTO. “What better way to help than by reducing the carbon footprint of our schools, which provides the added benefit of saving money on energy costs for the district in the long run.”

With the Isaac Dickson system coming to fruition, Green Built Alliance is inviting fellow nonprofits and local schools to apply for financial support on future clean-energy projects through Appalachian Offsets.

There is a rolling application submission window to be considered for funding support as one of Appalachian Offsets’ future projects. Appalachian Offsets has historically completed a variety of energy-efficiency and renewable-energy projects over its 15-year history in Western North Carolina, but the program is also open to considering applicants with carbon-sequestration plans. To receive funding, the project must be under the umbrella of a nonprofit, school or coop.

Individuals or businesses interested in supporting the work of Appalachian Offsets can visit cutmycarbon.org to calculate their carbon footprint and offset emissions by paying into the community fund that supports these projects in local nonprofits, schools and low-income housing.

Organizations interested in applying for this funding and those with additional questions can email Green Built Alliance Executive Director Sam Ruark-Eastes at sam@greenbuilt.org.

Cari Barcas is community engagement director at Green Built Alliance. She has more than a decade of experience in communications and nonprofit management, including time reporting on the green building scene in Chicago as a journalist covering residential and commercial real estate. Connect with Cari at Cari@greenbuilt.org.

Members of the Isaac Dickson community have been outspoken advocates for sustainability practices at the school, including at this 2015 protest against a Duke Energy proposal to put a new energy substation 300 feet away from their new building. Duke ultimately decided not to pursue construction on that site based on community concerns. PAT BARCAS PHOTO

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Sustainable Building is Resilient Building
Designing Spaces that Last

BY LEIGHA DICKENS

In a world with a changing climate, how we design our homes matters.

Reduced environmental impact has long been a huge focus of green building. Yet our homes are also critical in protecting us from the environment when that environment turns harsh.

As it turns out, some of the most basic principles in sustainable building also greatly improve resilience to changing and strengthening natural disasters, both on the level of our individual shelters and of entire communities. Resilience, in turn, tends to decrease a building's environmental footprint. After all, a home that is constantly rebuilt is far from environmentally responsible.

Here are four basic principles from the world of sustainable building that also improve resiliency.

1. Insulate and seal the building envelope

This is the single most important strategy advocated by building scientists and green-building experts to reduce a home’s energy use. A home with high levels of insulation and good windows, and one that is extraordinarily air tight, can have half the heating and cooling costs of the same home with average features.

Since heating and cooling is the largest energy expenditure of most homes, since insulation and air-sealing are very cost-effective, and since the energy consumed by residences contributes 20 percent of equivalent national carbon emissions according to the U.S. Energy Information Agency, it makes sense that this strategy would rise to the top of the list of priorities for a sustainable home.

Yet a super-insulated and air-tight home is also a more resilient home. Such a home doesn’t need as large of a heating-and-cooling system, and that system doesn’t need to use as much energy to keep the home at a comfortable temperature.

These homes warm up or cool off more slowly on their own, with less need for energy input. This means that during periods of extended power outages, these homes can keep their humans better sheltered from extreme outdoor temperatures.

2. Use sun tempering and natural comfort principles

The shape and orientation of a home also plays a role in how well it can maintain safe and comfortable indoor temperatures.

Passive solar design principles combine with super-insulation to do this to great effect: orienting the largest portion of a home’s window glass toward the sun (and limiting glass on all other sides), using thermal storage materials in the sunny space to hold on to heat gained through the windows while shading or screening devices work to keep that heat out in summer.

The more that passive solar principles are followed, the lower the heating load of the home, yet even modest attention to these design principles can improve a home’s comfort.

In the northern hemisphere, overhangs or awnings should shade most south-facing windows, large north-facing windows should be limited, and designers should avoid placing small rooms with large windows on the south or west to avoid acute overheating.

3. Design for drying

Water destroys homes, and it can strike in ways both dramatic and subtle.

Though storm surge, wind-driven rain, and widespread flooding are certainly familiar concerns for those building in hurricane zones, simple and robust practices against water and moisture intrusion should be a high priority in every home design.

According to climatologists, most regions of the U.S. are seeing dramatic increases in "big rain" events: intense, heavy downpours that dump an increasing proportion of the region’s annual rainfall all at one time, often overwhelming natural and man-made stormwater infrastructure.

In the face of these deluges, design principles for moisture con-
Percent increases in the amount of precipitation falling in very heavy events (defined as the heaviest 1 percent of all daily events) from 1958 to 2012 for each region of the United States. Our region has seen a 27 percent increase in the amount of rain that falls during heavy rain events. Image courtesy of the National Climate Assessment and U.S. Global Change Research Program.

Some of the most basic principles in sustainable building also greatly improve resilience to changing and strengthening natural disasters

4. Incorporate regenerative strategies, or plan for their future integration

Regenerative buildings are defined as those that "produce all of their own energy, capture and treat all water, and are also designed and operated to have a net-positive impact on the environment, including repairing surrounding ecosystems."

While this might be more aspirational than currently feasible for some systems in our homes, some bridge regenerative practices can be nonetheless incorporated into homes today. Meanwhile, other future possibilities can still be affected by how new homes are planned today.

One example would be an all-electric home, with planned-in space for future solar generation and future battery storage. Going all-electric capitalizes on the fact that the largest energy-using systems in a home— heating and cooling, water heating, cooking, clothes drying, and increasingly transportation— have all-electric options that are considerably more energy efficient than alternatives that burn a fossil fuel. (For example, heat pumps and heat pump water heaters are more than 100 percent efficient, while electric induction ranges offer a cooking experience like gas but consume much less energy than gas while also offering better indoor air quality.)

A home’s electricity use, in turn, is increasingly able to be offset by affordable on-site or neighborhood-level solar generation. Meanwhile, the electric grid overall is getting greener: supplying more and more of our electricity from cleaner-burning or renewable energy sources.

The gradual decrease in the cost of batteries will soon make storing energy on site more affordable, providing easier backup in the case of a natural disaster. Yet gains in energy monitoring and load-management technology could even make highly resilient community-level scenarios possible in the future, such as solar microgrids that store excess energy in heat pump water heaters and electric cars batteries, allowing the community to draw on that stored energy in times of need.

This year’s launch of the new and improved Green Built Homes certification will even include a new regenerative designation, recognizing homes that incorporate the best available regenerative elements and technologies— both those that are simple, and those that are more aspirational but nonetheless beneficial. I’m excited to see what new building innovation this spurs in our community, and I hope you are too.

One of my favorite definitions of the term “sustainability” is a simple one: “the ability to exist constantly.” While in the context of green building and environmentalism this often refers to the ability of our ecosystems, our economies, and our very planet to do so, it’s clear that many of these same practices help us sustain ourselves into the future too.

Leigha Dickens is in her tenth year as the green building and sustainability manager with Deltec Homes, a company which specializes in hurricane-resistant homes. She is a member of Green Built Alliance’s Board of Directors, RESNET HERS Rater, and University of North Carolina Asheville alumna of the physics and environmental studies programs. Connect with Leigha at deltechomes.com.
For nearly two decades, Green Built Alliance has been working to advance sustainability in the built environment, and we would not have been able to make such an impact without the support of the many individuals who energize our mission by engaging with our programs. Thanks to all those who have supported our work by building green homes, offsetting their carbon footprints, and donating to improve the homes of our neighbors in need in the past year.

 Builders who have certified projects through Green Built Homes

Altitude Builders, Inc.  GreenSource Construction Company  Nathan Elliott Construction
Amarx Construction, LLC  Gulf Equities, LLC  Nicholson and SUN, LLC
Asheville Area  Habitat Re-Imagined  Nobodys Business, LLC
Habitat for Humanity  HomeSource Real Estate & Construction  Old North State Building Company
Balsam Homes, LLC  Housing Assistance Corporation  Osada Construction
Beach Hensley Homes  Ironwood Studios  Rare Earth Builders
Benchmark Custom Homes, Inc.  J&A CM, LLC  Red Tree Builders
BH Wicker, LLC  JAG and Associates Construction, Inc.  River Birch Builders
Brown Wulff Homes  Judd Builders  RS Motley Construction
Corner Rock Building Company  Kaizen Homes  SACE Builders of WNC
Craig Payne  Kogi Group, LLC  Schumacher Homes of North Carolina
Crazy Hair Construction  Living Stone Design + Build  Self-Help CDC
D.A. Fiore Construction Services  LMT Homes  Solid Rock Builders
DeBord Enterprises, LLC  Mchugh Designs  Steel Root Builders, LLC
Duinkerken Homes, Inc.  McMaster Construction Company  Sure Foot Builders
Earthtone Builders  McInch Construction, Inc.  Union-Anson County Habitat for Humanity
Evergreen Construct, Inc.  Milo General Contractor, LLC  V&S Land Management
Green Leaf Builders, LLC  Mountain Sun Building & Design  Virant Design
Green Light Home Builders  Multi Construction  William & Beth Ellis
Greencraft, Inc.  

Individuals and businesses who offset their carbon footprint and support clean-energy projects in local schools and nonprofits through Appalachian Offsets

Chrissy Burton  Jon Phillip Pertee  Joe Stelpflug
Sarah Alice Wyndham  Elaine Robbins  Victoria Smll
Todd Hoke  Robin Cape  Nicholas Ladd
William Lowrey & Alice Petersen  Robert Lackey  Dane Barrager
Shannon Capezzali  Sunita Patterson  Amanda & Jeffrey Clayton
Jane Laping  Sam Ruark-Eastes  LaZoom
Daniel Walton  Dana Barrager  Southwings
Ada Lea Birnie  Robert Reynolds  
Joyce Young  Jamie and Rachel Shelton

Individuals and businesses who donated to support home-efficiency improvements for neighbors in need through Energy Savers Network

Amy Musser  Brian Smith  Jeff Dektor
Bruce Michael  Dale Stratford  Cec Hue
Lew Gelfond  Wendy Livornese  Vernon Dixon
Kim Cobb  Joe Wombell  Lanwermeyer
Catherine Rosfjord  Joanne Lazar  Family Fund
Steve Anderson  Frances Stewart  Blue Moon Rentals
Boone Guyton  Jane Laping  Ed Prestemon
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Future Looking Bright for Blue Horizons Project

BY CARI BARCAS

With more than two years of success in meeting the goals outlined for its community-focused campaign, Blue Horizons Project is excited for the next phase in its evolution and an expanded involvement in the region’s efforts to transition to 100 percent renewable energy in the next two decades.

Following a joint Request for Proposals from the city and county, Green Built Alliance was selected in the summer of 2020 to continue implementing the work of the Blue Horizons Project. “We are thrilled at the opportunity to continue and build upon the first two years of the Blue Horizons Project, and are looking forward to a broader scope of work and new opportunities to deepen our relationships within the community to work together for clean energy,” Blue Horizons Project Coordinator Sophie Mullinax said. “We’re grateful for the trust the City of Asheville and Buncombe County have placed in us.”

After years of planning under the leadership of the Energy Innovation Task Force, Blue Horizons Project was launched in March of 2018 to make a clean-energy future a reality in Buncombe County by improving access to and engagement in the wide variety of programs and resources available to local residents and businesses.

Through a suite of strategic energy-efficiency and demand-response solutions, Blue Horizons Project has positioned itself over the past two years as a comprehensive hub of programs to empower community members to save money and reduce the area’s peak energy demand.

In one pivotal early success, Blue Horizons Project was credited with playing a key role in influencing Duke Energy’s decision to take off the table plans to build a natural gas peaker plant—one of the core concerns that prompted the formation of the Energy Innovation Task Force in early 2016.

As Green Built Alliance carries forward the clean-energy torch through this work, many of the Blue Horizons Project’s efforts will stay consistent. As it did in its first two years, Blue Horizons Project will continue providing resources for residents and businesses to reduce energy demand and consumption, as well as adopt renewable energy.

Also remaining steady is the involvement of Energy Savers Network (ESN) in completing weatherization and energy-efficiency upgrades in low-income homes. One new layer within that is a partnership between ESN and Green Opportunities and United Community Development, which will both serve as subcontractors on the work in low-income homes.

“We are excited to partner with these minority-led organizations embedded in communities we seek to serve,” Mullinax said.

In an exciting new development, Blue Horizons Project plans to launch a solarize campaign in Buncombe County in partnership with Solar CrowdSource, a platform that facilitates residential and commercial solar installations, often at below market-rate pricing. Blue Horizons Project will host public events and connect with neighborhood associations to inspire and inform residents to go solar, and select local solar installers to participate by offering free site evaluations and quotes for homes and businesses.

Homeowners will benefit from lower pricing for solar installations, access to vetted contractors, and a streamlined process. Local solar installers will benefit from reduced customer recruitment costs, as well as improved and increased community relationships.

It is difficult to determine exactly how much photovoltaic capacity could be installed via these efforts, but the program’s goal is 1 MW in 2020, 2 MW in 2021, and 4 MW in 2022.

Blue Horizons Project

The Blue Horizons Project’s new guiding body is intended to convene by fall 2020 with a diverse nine-member panel representing the fields listed below. Those interested in being considered for a seat on the community council can email sophie@bluehorizonsproject.com.

- Residential Developer
- Affordable Housing Provider/Developer
- Commercial Developer
- Utility (local, technical, policy, program)
- Government (staff, political leadership, citizen advisory board)
- Public Sector; leaders beyond City and County (schools, AB Tech, Airport, MSD, other municipalities)
- Large Employers
- Business (large users, mid-size users, business associates, entrepreneurs)
- Large utility Users (plus rooftop owners)
- Non-Profit/ Advocacy Organizations (LMI, Seniors, environmental, policy)
- BIPOC Voices
- Renewable energy installer, industry representative
- Energy Efficiency Professional (energy rater, HVAC expert)
- Alternative fuel transportation professionals
- BIPOC
- Women
- Youth
- Workers and Organizers
- Other leaders, organizers, community champions

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It is difficult to determine exactly how much photovoltaic capacity could be installed via these efforts, but the program’s goal is 1 MW in 2020, 2 MW in 2021, and 4 MW in 2022.
The solarize campaign is one of several strategies being adopted to ensure Buncombe County’s progress toward its goal of reaching 100 percent renewable energy for the community by 2042. With increasing focus in year two of the three-year contract, Blue Horizons Project will be engaged in creating a strategic plan for achieving 100 percent renewable energy.

“It will start with a foundation of energy efficiency to ensure we’re using the energy we need wisely and to reduce our consumption before installing renewable energy on our homes and businesses,” Mullinax said.

The program’s founding entity, the Energy Innovation Task Force, held its final meeting in March 2020, with plans for it to be reborn as the Blue Horizons Project Community Council later in 2020.

The council will come together to address the current climate crisis by leading the region in achieving its community-wide renewable energy goal of transitioning to 100 percent renewable energy by 2042 through community engagement and collaboration with Buncombe County, the City of Asheville and Duke Energy.

Cari Barcas is community engagement director at Green Built Alliance. She has more than a decade of experience in communications and nonprofit management, including time reporting on the green building scene in Chicago as a journalist covering residential and commercial real estate.

Connect with Cari at Cari@greenbuilt.org.
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Asheville is treasured by residents and visitors alike for the natural beauty surrounding the city. Our region is covered with forests, teeming with wildlife, and saturated with mountain views. Like all growing cities, Asheville faces the issue of preserving nature while promoting smart growth that propels our economy and serves our citizens.

Saving existing tree canopy and planting new trees within the city provides numerous benefits for both the natural environment and the humans who live and visit here. Unfortunately, Asheville has seen a decline in tree canopy cover of more than 6 percent since 2008, with some neighborhoods experiencing more than 30 percent canopy cover decline.

Despite the losses, it is not too late to preserve our urban forest. Builders and developers are in a unique position to lead the way on tree preservation and augmentation. Implementing smart-growth principles in the development and building process has benefits for both the economic bottom line as well as the health and well-being of the environment and residents.

Benefits of Urban Trees

Urban forests provide a multitude of social, economic and environmental benefits, including offering urban cooling, reducing air pollution, lowering stress, improving biodiversity, managing stormwater, combating obesity, increasing property values, and mitigating climate change through carbon sequestration.

Studies have shown that even a view of nature can reduce stress and increase productivity for workers. The presence of trees increases the utility of public outdoor spaces by providing shade and reducing flooding.

These benefits can be calculated in terms of monetary value to the city. In 2008, Asheville’s urban tree canopy coverage provided $82,348,000 worth of carbon sequestration. The 6 percent canopy loss in the next 10 years resulted in a loss of $7 million worth of carbon-capture benefits. Stormwater mitigation is another example of how the loss of tree canopy cover cost Asheville millions of dollars.

From 2008 to 2018, the increase in stormwater runoff as a result of reduction of tree canopy cover cost the city $1.6 million and totaled approximately 18 million gallons of water. This is equivalent to 27 Olympic-sized swimming pools. Conserving mature tree canopy cover in addition to planting new trees provides incredible economic benefits to the city.

Shade provided by trees, particularly in the summer, can reduce the urban heat-island effect, or the increase in temperatures experienced in cities due to vegetation loss combined with heat capture from the built environment. Hot summer temperatures in the city can lead to health issues, particularly for the elderly and those people in poverty who are less likely able to escape the heat through air conditioning.

A 2019 study in the city of Asheville conducted by the NASA DEVELOP team found that census tracts with high vulnerability (high poverty and/or high rate of elderly residents) were often also those with low tree canopy. Restoring the tree canopy in historically un-
Canopy Study

Asheville Tree Construction values.

addition to increasing post-construction landscaping and tree removal, in reduce job costs associated with design for building projects can reduce costs. Proper pre-planning and site design can help ensure that trees are distributed more equitably in Asheville. Addressing this inequality of tree cover can improve living conditions for all city residents.

The presence of trees is also known to increase property values. Preserving mature trees at the time of building is the easiest way to promote canopy cover with new construction and site redesign projects. Trees reduce the energy used by buildings and provide natural beauty, and consumers value mature landscaping in both residential and commercial properties. Proper pre-planning and site design for building projects can reduce job costs associated with landscaping and tree removal, in addition to increasing post-construction values.

Asheville Tree Canopy Study

A recent Tree Canopy Study of Asheville performed by the Davey Resource Group examined data from 2008 to 2018, and noted an overall decline in tree canopy. The modest decline of 6.4 percent loss does not account for canopy that was removed prior to 2008 when the city experienced rapid development.

The study concluded that around 44 percent of Asheville’s land is covered by tree canopy. While this amount is encouraging, it is less than other southern cities and less than the 50 percent benchmark proposed by local tree groups such as the city’s Urban Forestry Commission and the Tree Protection Task Force. While city ordinances are designed to preserve and protect tree canopy cover on public property, more needs to be done to stop tree loss and encourage tree planting in the city, including on private property.

Not surprisingly, the loss of tree canopy in Asheville was greatest in areas with the most development and building, including West Asheville and the area around the Asheville Outlet Mall toward Bent Creek.

While building and development are necessary for the growth of the city, some of the tree loss can be avoided. Reducing the amount of mature canopy removed from building sites can also lessen the impacts of flooding and stormwater runoff, prevent destructive landslides due to erosion, minimize pollution caused by increases in vehicular traffic, and increase shade to prevent deaths and worsened health conditions from the urban heat-island effect.

How to Promote A Healthy Tree Canopy

Builders, developers, and private-property owners can be a part of the solution to canopy loss in Asheville.

Sustainable development practices including pre-planning and site design can avoid unnecessary tree loss. Creating a tree-protection plan as part of the construction-planning process and ensuring that all parties follow that plan will save trees. Understanding how trees live and how construction impacts trees, even without direct contact to the tree itself, is essential to proper tree protection. Conserving existing trees increases the benefits of trees on the site, reduces planting costs, avoids possible fines, and boosts property values.

Through its Green Built Homes program, Green Built Alliance provides guidelines for tree protection on residential development projects, including the creation of a tree-protection plan, installing tree fencing at the drip line, conserving greater than 25 percent of existing trees and natural vegetation on the site, and planting new trees.

Potential buyers and customers in Asheville are becoming more aware of environmental issues within the city and demanding that businesses and developers follow these best practices. A green portfolio and well-planned building site can help a future business or property for sale stand out to an increasingly environmentally minded consumer base.

Mindful planning and tree-canopy conservation should be used to promote environmental equality and justice in the city, and to reduce issues such as the urban heat-island effect on vulnerable populations.

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Anti-Racism and the Building Industry
Our Role in Building Racial Equity

BY STUART ZITIN

We watched for almost nine horrifying minutes as a Minneapolis police officer suffocated George Floyd with a knee on his neck in May of 2020. Across the U.S. and the world, in cities and towns large and small, people took to the streets. We have again risen up in numbers to protest racial discrimination.

It’s not just about police brutality, even though this is only the latest of numerous brutal incidents. America’s original sin of slavery and lynching has evolved into systemic racism that has marginalized the African American community.

Racism in our industry and town

There is a long history of racism in our construction and real-estate industries. Redlining, white flight, discriminatory lending, and many other injustices were prevalent throughout post-World War II America. The G.I. Bill helped many whites to purchase homes, while few black families benefited. Later, we built multi-story, urban public housing, which failed memorably and miserably to provide a safe, healthy environment.

When desegregation happened in Asheville, black citizens here were adversely affected. Their segregated Stephens-Lee High School was closed, and they were sent to the all-white Asheville High. Little attempt was made to welcome them to the new school. None of their trophies and other memorabilia was taken for display in their new school. The discrimination they bravely faced was formidable.

Most black businesses in the Block eventually went under, and white-owned discount stores were opened to people of color. Gentrification has dramatically changed many neighborhoods, including Montford, the South Slope, and West Asheville. Many black residents have had to relocate due to increasing property taxes.

When I moved here in 1981, those urban areas were very affordable. Asheville was literally a sleepy mountain town, with little happening downtown after 5. Now that tourists have discovered us, some have understandably moved here, pressuring the housing market, and substantially boosting the construction industry. Of course, all that reasonably-priced housing stock is gone. In its place are over-priced fixer-uppers, tract homes, and green-built residences for more than $400,000.

With 11 million tourists visiting each year, Asheville has decided to foster a hotel explosion. Nevertheless, our city government has long promoted the idea of affordable housing. Locally, Asheville Area Habitat for Humanity and Mountain Housing Opportunities have greatly increased availability. In 2016 an overwhelming majority of Asheville voted for a $24 million housing trust fund. The City of Asheville has been disbursing that while the problem gets worse.

The context is a highly profit-driven, reactionary construction industry loath to change. While building science has improved our potential to be safe and comfort-

able in our homes, poor folks of color are still in inadequate housing, often in environmentally compromised neighborhoods, with higher numbers of life-threatening diseases like diabetes, hypertension, and asthma.

Particularly here in Asheville, racial inequality is rampant and public housing is woefully inadequate. The socioeconomic, health, and educational disparities between whites and blacks are deeply disturbing. As a long-time resident, I’ve observed with distress numerous unsuccessful attempts to rectify them. I participated in Building Bridges of Asheville since it began in 1993 — first as an attendee, then as a facilitator, board member and board chair.

The context is a highly profit-

www.GREENBUILT.org

Resources

RECOMMENDED READING:
- “How to be an Antiracist” by Ibram X. Kendi
- “White Fragility: Why It’s So Hard for White People to Talk About Racism” by Robin DiAngelo

RACIAL JUSTICE:
- Building Bridges of Asheville, bbavl.org
- Racial Justice Coalition, facebook.com/RJC.Asheville
- Racial Equity Institute, racialequityinstitute.com

BLACK-OWNED BUSINESSES IN ASHEVILLE:
- hoodhuggers.com/social-enterprise/the-green-book
- colorofasheville.net
- theavlview.com
- avltoday.6amcity.com/black-owned-businesses-asheville-nc

OTHER TRUSTED SOURCES:
- Green Opportunities, greenopportunities.org
- State of Black Asheville, stateofblackasheville.com
- Darin Waters, darinwaters.com
- Deborah Miles, diversityed.unca.edu

The community gathers in Asheville’s Pack Square at a candlelight vigil in memory of black lives lost to police violence on Saturday, June 6, 2020. PAT BARCAS PHOTO
Our nation’s racial divide is also its most intractable and pressing problem to resolve, and it is a white problem.

The path forward

What do we want Asheville to look like?
Sustainability has become quite the buzzword, but what’s sustainable about a sprawling green home on a ridgetop for one retired couple?

Healthy, affordable and available housing is at the heart of a society whose moral arc bends toward justice. Thoughtful builders can find house plans that are small and efficient, while still achieving certification through Green Built Homes and ENERGY STAR®. Infill building is creating more density, which is appropriate in the city.

Yes, people often move here with money, which seems to go further in this right-to-work state. Maybe we builders want to make a bundle, retire early, and meet this demographic where it’s at. I get it. We work really hard, often long hours, frequently in unfavorable weather. We deserve the rewards.

The thing is — no justice, no peace. That’s true the entire world over, throughout history. If we want healthy children, safe neighborhoods, and good jobs in a sustainable economy, we have to greatly reduce inequality and eliminate racism.

Words matter. Stand up and speak out when you hear bigoted talk or racist language. Now there’s anti-Latinx talk here as more Latin Americans enter construction, maybe with a stronger work ethic than many American workers. Many whites are threatened by people of color entering our industry and putting them out of jobs.

We’re in trouble, folks. What can we do?

If you’re the boss, seek to hire more people of color. There are numerous black-owned businesses and skilled black workers in Asheville. Green Opportunities trains disadvantaged youth for jobs in both the construction and culinary industries. Consider enrolling in the next nine-week Building Bridges session to learn more about the history of the local black community, and joining the Racial Justice Coalition or the Racial Equity Institute.

Consult local experts. Read the results of retired professor Dwight Mullen’s State of Black Asheville project from University of North Carolina Asheville. Professor Darrin Waters has researched the history of black folks in our mountains, including the enslavement of several hundred. For years, Deborah Miles has diligently run The Center for Diversity Education at UNC Asheville as well. (Find links to these resources in the box accompanying this article.)

If you want to change things, you’ve got to understand how and why they are. There’s plenty of information out there. Get informed; talk with friends, family, coworkers, suppliers and subcontractors; and make plans to get involved if that is your desire. If not, take responsibility for your little world. Interrupt racist talk and behavior. Understand and utilize your white privilege to override racist systems.

Time for change

Racism and other forms of prejudice are characterized by tunnel vision — narrow thinking and fear. Our nation has a history of both welcoming and reviling immigrants, as we struggle with that issue too. Unrest has lingered and erupted, and we’re pitted against one another.

That old ruling-class ploy counts on the fight to stay off the bottom rung of the socioeconomic ladder, but the “pulling yourself up by the bootstraps” ideal and the Horatio Alger “rags to riches” myth have lost favor. Many hard-working citizens still can’t get ahead, as opportunities are lacking. Black people in particular have suffered under this oppressive narrative far too long.

Change is long overdue, and it begins with you and me.

Stuart Zitin owns Building for Life, LLC, as a North Carolina Licensed General Contractor since 1995. He has built new homes and completed additions, remodels, and renovations, as well as commercial trim projects for more than 45 years. He is currently developing four acres in Asheville with 18 homes — some affordable, some workforce housing — planned to be certified through Green Built Homes and ENERGY STAR®.

Connect with Stuart at buildingforlifeasheville.com.
Hot Water Recirculating Loops
A Tricky Green Feature To Get Right

BY AMY MUSSER AND MATTHEW VANDE

Hot water recirculating loops are having a moment. They’re popular with plumbers because they reduce callbacks from homeowners who don’t want to run their taps and wait for hot water.

Recirculating loops are a water-saving feature, especially if coupled with low-flow plumbing fixtures on showerheads, toilets and faucets. But if not properly done, they can waste a lot of energy.

What are the ways a house can be plumbed for hot-water distribution?

- A typical “trunk and branch” hot water system has piping that comes from the water heater in a “tree” configuration, with a main trunk and smaller branches that go to each fixture. When you turn on the hot water tap, you have to wait for the cool water to flush out of the piping before you get hot water. These can be made more efficient by locating the water heater close to the fixtures so that the piping isn’t very long — this arrangement is often referred to as a “compact” plumbing system.

- “Manifold” systems have a “home run” of pipe to each hot water fixture. These home runs can be smaller and more direct, so it doesn’t take as long to flush the cool water out of the pipe.

- A recirculating system is piped differently, using a loop that travels throughout the house and gets close to all of the fixtures that use hot water. There are very short branch pipes that connect each fixture to the loop. A pump is used to circulate hot water through the loop, so it arrives at each fixture very quickly.

Do I need a recirculating loop in my house?

If the house is smaller and the water heater can be centrally located, you don’t. Sometimes in a bigger house, you can have two water heaters, both of which are relatively close to their fixtures. We also encourage clients to think about whether they need fast hot water at every fixture. They may be happy with a water heater that’s located close to the master bathroom, but be willing to wait at an infrequently used guest bathroom or a laundry room. Using a manifold system is another option for stretching out the distance from the water heater without a long wait.

When you understand how recirculating systems work, it’s pretty obvious what can go wrong from an energy standpoint. First, an inefficient pump that runs all the time can use a lot of energy. Second, the pipe loop filled with hot water can transfer a lot of heat to the house, especially if it’s not insulated. You’re essentially heating your house with your hot water — which is inefficient in the winter and fights with your air conditioning in the summer. Insulating the pipes helps, but some heating still occurs because pipe insulation isn’t very thick. These effects can add up to a potentially big energy penalty.

If we look at all of the above strategies and feel that the plumbing fixtures in a home are just too far apart and can’t reasonably be served by compact or manifold plumbing systems, it’s worth considering recirculation. But you have to commit to doing it right, which isn’t going to be free.

How do you do a recirculating loop correctly?

1. Insulate all of the loop piping. This is actually a code requirement in North Carolina. Unfortunately, a lot of plumbers aren’t aware of it because it’s in the energy code, not the plumbing code. It’s especially important to insulate the last few feet of pipe right at the water heater, which are often installed later and missed. Making sure to fully insulate bends and tees matters. Insulating the branches also helps.

2. Don’t install a crazy amount of loop piping. If you can do less loop, you get less heating that you don’t want. Lay out your loop to get close to those important rooms (master bath, kitchen, etc.) and maybe you don’t need to get so close to infrequently used rooms.

3. Use a control so that the pump doesn’t have to run all the time. This saves energy from the pump itself and also lets the loop cool down some to reduce the house heating effect. The best controls are either occupancy sensors or buttons that the homeowner can press when they walk into a bathroom to activate the pump when someone is likely to use hot water. A less efficient (but easier and less expensive) option is to use temperature-based control. These controllers activate the pump only when the loop cools down.
4. Don't only rely on timers.
Timers seem like a good idea, but they're not a stand-alone solution and you get no credit in the Home Energy Rating System (HERS) for a timer. I think timers can be helpful when installed with temperature-based control. They can be used, for instance to turn the system off entirely overnight when hot water is unlikely to be needed. However, they’re not very effective during the day. People use hot water at fairly random times, and they tend to turn timers off when they aren’t getting hot water. If you have a loop that's not on it will take much longer to get hot water at the fixture than it would with a non-loop system, so occupants likely won’t be satisfied if they want hot water when the timer is off.

5. Don’t allow your plumber to install a “future loop.” The idea behind the “future loop” is that they’re going to install the piping in a loop and only add a pump if you complain about how long it takes to get hot water. There are several problems with this:
   - You’re going to complain. It takes longer to get hot water if the plumbing is installed in a loop.
   - It’s almost always impossible to get access to insulate all the loop piping later. We don’t install anything else in homes for the future that we know wouldn’t meet today’s building code. If you have a loop, it needs to be insulated.
   - If you don’t connect the return portion of the loop, you’ve created a “dead leg” in your hot-water system. A dead leg is a length of piping that is connected to your active hot-water piping but doesn’t go anywhere. Water collects there at room temperature or slightly above. Bacteria (including the kind that causes Legionnaires’ disease) loves this range of temperatures and is not very easy to trace as the cause of someone getting sick.

So absolutely, we want you to practice water conservation. We’re also totally cool with the idea that you might also get fast hot water. Just don’t do it at the expense of energy conservation. You can have both!

Amy Musser and Matthew Vande are the owners of VandeMusser Design, PLLC. They provide HERS services, green-design consultation, and home-energy audits to homeowners in Western North Carolina. Amy is a licensed mechanical engineer and Matt is a licensed architect.
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buchanancustomconstruction.com
A green home is healthier to live in and healthier for our planet. It is our mission to build green homes that bring together the features of an environmentally-friendly structure, while maintaining the function and design of a custom-built, upscale home - our unique hybrid of green and luxury.

**Deltec Building Company**
Cindy Criss
Ashville - 828.257.4907
CCriss@DeltecHomes.com
DeltecHomes.com

**Consultants**
**Builder’s Pro**
Laurie Chavarria
Fletcher - 828.490.1583
laurie@yourbuilderspro.com
yourbuilderspro.com
CoConstruct Customization & Local On-Site Services including 360° Photos

**Crawlspace Sealing**
**Conservation Pros**
Sara Sabol
Ashville - 828.712.3346
sara@conservationpros.com
conservationpros.com

**The Insulators**
Kent Walker
Boone - 828.773.1103
kentw@theinsulatorsco.com
theinsulatorsco.com
Specializing in thermal and acoustic spray foam and batt insulation and crawlspace encapsulation.

**Developers & Communities**
**Asheville Housing Authority**
David Nash
Ashville - 828.258.1222
dnash@haca.org
haca.org

**Building for Life, L.L.C.**
Stuart Zlin
Ashville - 828.230.1424
stuartzlin@gmail.com
buildingforlifeasheville.com
We have completed many renovations, additions, and a few new homes in Asheville since 1996. Now we have begun developing a south-facing acre in Oakley, a mile from Biltmore Village. All homes are Energy Star/Green Built Certified with breathtaking mountain views and some affordable, including a Cottage Development.

**East West Capital**
Brian Nelson
Ashville - 828.490.1156
bnelson@eastwestcapitalgroup.com
eastwestcapitalgroup.com
East West Capital is a private-equity investment firm with a focus on acquiring, repositioning and managing value-add projects. We focus on driving successful residential and commercial projects in urban areas and in the path of development. Sources of capital include the principals and funding from Asia and the U.S.

**Green Earth Developments**
James Boren
Ashville - 386.690.0886
James@loveyournewgreenhome.com
loveyournewgreenhome.com
Our business involves developing responsible homes on a site where the trees are considered very important to this planet. Love your new green home!

**Habitat Re-imagined**
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Ashville - 828.407.9989
ron@czechoinski@gmail.com
habitatreimagined.com

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**LAND OF SKY WASTE REDUCTION PARTNERS** helps organizations improve environmental and energy management through efficiency techniques that save money. The WRP team conducts free on-site assessments and provides consulting services to businesses and public facilities throughout North Carolina. Learn more at bluehorizonsproject.com.
Fusco Land Planning & Design, PLLC
Matthew Fusco
Ashville • 828.243.6604
matt@fuscola.com
Fuscola.com

Otter & Arrow Land Planning
Kevin Tate
Roswell • 828.551.1414
kevin@otterandarrow.com
otterandarrow.com

V & V Land Management and Resource Recovery LLC
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Weaverville • 828.777.6637
carrie@vogllerlc.com
vogllerlc.com
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Ambrose Landscapes
Steve Ambrose
Ashville • 828.768.1861
dave@reliableacorn.com
scapingasheville.com

Appalachian Creek Garden Nursery and Landscape
Jeff Seitz
Swannanoa • 828.296.7396
appcrk@yahoo.com
appalachiancreek.com

Asheville Drainage + Rain Harvesting
Benjamin Portwood
Ashville • 828.222.3720
info@ashevilledrainage.com
ashevilledrainage.com
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Adam Garr
Weaverville • 828.337.4060
adgarr@hotmail.com
gardenology-ashville.com

Equinox
David Tuch
Ashville • 828.253.6856
david@equinoxenvironmental.com
equinoxenvironmental.com
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Nicholas Anthony Tropeano, PLLC
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Denver • 704.910.9220
nick@tropeanolanddesigns.com
tropeanolanddesigns.com

Osgood Landscape Architects
Joel Osgood
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jo@osgoodla.com
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YummyYards
Laura Ruby
Weaverville • 828.785.8624
laura@yummyyards.com
yummyyards.com

Southwestern Native Plant Nursery
Brad Martin
Candler • 828.670.8330
brad@southeasternnatives.com
southeasternnatives.com
We are a wholesale nursery providing native trees and shrubs to landscapers, garden centers, state and federal agencies in WNC.

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jones.wilson@gmail.com
ecoconomy-services.com
ESI uses reduced risk pest control products in our exterminating services to protect your home, family, pets, and the environment.

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Ashville • 828.423.6289
katti@blueplanetplumbing.com
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Jackie Rocks Green at Dawn Wilson Realty
Jackie Tatelman
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jackie@dawnwilsonrealty.com
dawnwilsonrealty.com

A eco-certified realtor who is customer-focused and knows how to navigate the complexities of real estate transactions. Jackie lives in a gold-certified green home that has solar PV and thermal. She has built two green homes. Jackie works with buyers and sellers in the Asheville area including Black Mountain and Marshall.

Keller Williams
Professionals Realty
John Senechal
Asheville • 828.230.4021
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Love The Green Team
Mary Love
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Love The Green Team is a women/veteran-owned full-service real estate company. Our mission is to create a sustainable world, one home at a time. We provide services to buyers and sellers, and property management services. We're your matchmaker for the home that you love which fits your budget.

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APPALACHIAN OFFSETS is a voluntary carbon-offset program from Green Built Alliance that offers businesses, organizations, and individuals the option to easily reduce or offset their carbon footprint. Supporters offset their emissions by paying into a community fund that helps make energy-efficiency improvements within local nonprofits, schools and low-income housing. Learn more and donate at cutmycarbon.org.

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Caledonia Homes
Russell McMillan
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rfmcmillan@gmail.com

HomeSource Real Estate & Construction, Inc.
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Jade Mountain Builders is a team of 19 craftsmen who pride themselves on taking an ecologically sensitive approach to building homes.

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“We WHY SHOULD WE TOLERATE a diet of weak poisons, a home in insipid surroundings, a circle of acquaintances who are not quite our enemies, the noise of motors with just enough relief to prevent insanity? Who would want to live in a world which is just not quite fatal?”

— Rachel Carson, “Silent Spring”

DUKE ENERGY’S HOME ENERGY HOUSE CALL program offers eligible homeowners a free home-energy assessment to help you learn how your home uses energy, including where you can improve comfort and maybe even save money. You’ll also get a free Energy Efficiency Starter Kit. Learn more at bluehorizonsproject.com.
Imagine a building designed and constructed to function as elegantly and efficiently as a flower: a building informed by its bioregion’s characteristics, that generates all of its own energy with renewable resources, captures and treats all of its water, and that operates efficiently and for maximum beauty.

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— International Living Future Institute’s Living Building Challenge
Green Opportunities
Eric Howell
Asheville • 828.398.4158
eric@greenopportunities.org
greenopportunities.org
Green Opportunities (GO)’s mission is to train, support, and connect people from marginalized communities to sustainable employment pathways. In addition to technical training in construction and culinary arts, GO’s holistic programs include wrap-around support services, high school equivalency classes, life skills training, counseling, and job placement assistance.

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