Building in The Lowcountry

AN EXPERT GUIDE TO NEW HOME CONSTRUCTION
AND RENOVATION IN THE LOWCOUNTRY

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Welcome to the Lowcountry

Chances are you're here because the Lowcountry is one of the most beautiful places in the world. All four of our distinctive seasons can be enjoyed outside. Beaufort County has 64 inhabited islands and at high tide there is more water area than land.

The historic district of Beaufort is known for Antebellum architecture, featuring Federal, Neoclassical, and Greek Revival styles. In 1969, historic Beaufort was listed on the National Register of Historic Places and declared a National Historic Landmark in 1973.

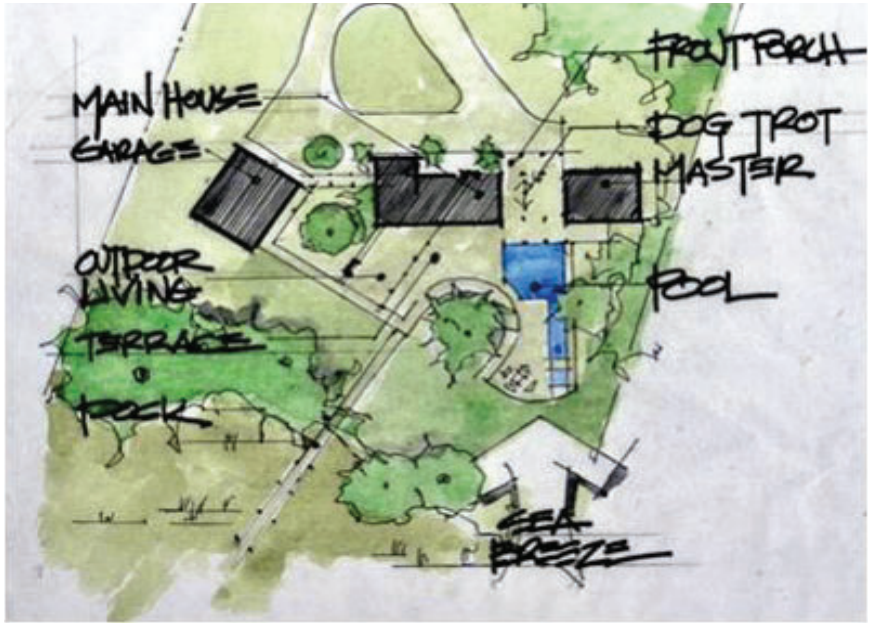
Hilton Head Island and Bluffton boast world class golf courses and resorts tucked into a natural and serene landscape.

Southern Vernacular Traditions

In vernacular architecture there is a strong relationship between, site, climate, and the elements of building in the generation of the building form. -Richard Hyde

As more and more people move to the coastal South there's a growing need to understand how to design your house for our hot, humid climate. The intense solar radiation and high moisture create unique challenges to building a comfortable house that is easy to maintain and minimizes the impact to the environment.

Prior to the advent of air conditioning, an understanding of local environments enabled southerners to build in ways that buffered the harsh climatic realities. Five components of vernacular architecture are equally important today.



5 Lessons from Southern vernacular architecture:

1. Houses one room thick maximized cross ventilation. The thin plans also provided ample light that prohibited mold growth in dark areas.
2. The best orientation of this thin plan was east to west to reduce solar gain. The windows were located to catch the prevailing summer breezes.
3. Large porches or verandas were always located on the southern side and often on the east and west, too. The verandas protected the house from both the sun and the rain, provided circulation, and created a cool place to sit and sleep in the summertime.
4. High ceilings allowed the heat to rise and provided a more comfortable environment.
5. By raising the houses off the ground several things were accomplished; it allowed the first floor to be out of the flood plain in coastal areas; breezes are better on the raised first floor; and air circulating under the house helped reduce the heat gain.

An early prototype embracing these principles is the dog trot, also known as “two pens and a passage”. One room was used for sleeping and the other for cooking. The covered open center passage was the main sitting room in warm weather and was cooled naturally by the Bernoulli effect. The center passage was often used as the dog kennel and thus the name - dog trot. Dog trots are found in Tennessee, Alabama. Mississippi, Louisiana, Florida, the Carolinas, and Texas.

Another typical southern house is the I-House, named because of the tall narrow profile. This house is two stories with a simple gable roof and a shed-roofed one story porch in front. It often has a shed-roofed addition on the rear. Typically, there were masonry chimneys on each end of the house.

This simple house is one room deep maximizing the amount of light and cross ventilation. High ceilings which heat to rise providing a more comfortable environment. Its full porch faces south.

Kitchens were usually in a separate building behind the house. Keeping the heat out of the main house and protecting the house in the event of a kitchen fire. There are a number of I-Houses found in Beaufort and the surrounding counties. The Charleston single house is an “I” house with the narrow end of the house facing the street and a door onto the porch.

The T-House is another traditional house in the Lowcountry. It is one room thick with a verandawrapping three sides. The intersection of the T is where the stairs are located. All the rooms except for the stairhall have windows on three sides, allowing for nice cross ventilation. T-Houses are raised off the ground and have high ceilings.

Sustainable Design

Designing a sustainable home means reducing the building's impact on the environment. Reducing the environment's impact on a building offers resiliency.

We design high performance houses that use less energy and conserve water. We carefully place our buildings to minimize the impact to the site by saving trees and controlling the stormwater runoff.

We are always working to reduce the embodied carbon of building materials. Our houses are designed to mitigate the effects of hurricane force winds, floods, and lightning. We are participants in the AIA's 2030 Commitment which is a strategy that gives goals for reaching net zero carbon emission in buildings.

Our clients choose the Lowcountry to experience and embrace the natural beauty found here and we design our houses for the specific site to connect with nature.

As the landscape architect Robert Marvin said, "*We need to knock the walls down and let nature in again. Man needs to get out of his box that technology has created. He needs to wrap his arms around nature.*"

Southern vernacular building techniques that were outlined in the previous section are based on sustainable principles which we continue to use today. Additional components for a sustainable house include the following:

- Use sunscreens and large overhangs to block the summer sun
- Detail and build a airtight house
- Keep all HVAC ducts and equipment in conditioned or semi-conditioned space
- Use high efficiency heating and cooling equipment
- Use durable, local materials with post consumer recycled content
- Use excellent insulation
- Use LED lighting

Many homeowners want to go to the next level by creating their own energy with solar panels or wind generators and heating their own hot water with solar hot water heaters.

The following residential clean energy expenditures are eligible for a Federal Residential Clean Energy Property Credit of 30% of the cost:
- solar electric property expenditures (solar panels);
- solar water heating property expenditures (solar water heaters);
- fuel cell property expenditures;
- small wind energy property expenditures (wind turbines);
- geothermal heat pump property expenditures; and
- battery storage technology expenditures.

When calculating the Residential Clean Energy Property Credit, a taxpayer may include the labor costs properly allocable to the onsite preparation, assembly, or original installation of the qualified property and for piping or wiring to interconnect the qualifying property to the home

South Carolina provides a 25% tax credit for solar panels. It credits $3,500 per year for up to 10 years or 50% of the tax liability, whichever is less.

Certificate Programs
There are several certification programs active in the Lowcountry. They all have third party verification requirements and different programs for different building types. Some require performance -based measurements while others have a prescriptive path to the desired performance level. The non-residential programs are led by the design team of architects and engineers and the residential programs are under the purview of the contractor.

There are five general areas that all the programs measure; sustainable sites, water efficiency, energy use, materials and resources, and indoor environmental quality. There are mandatory requirements and a minimum number of earned points in each category. Each program awards different levels of certification based on the number of points earned. For example the LEED programs are LEED Certified, LEED Silver, LEED Gold, and the highest-rated LEED Platinum. The areas overlap and green strategies can often result in points in several categories. The decision to have daylight in all interior spaces can gain points in energy use (less need for electric lights) and indoor environmental quality (occupants' well-being is better with daylight and a view).

Sustainable Sites
Sustainable site requirements are focused on minimizing the building impact which includes: locating the project in a developed area, preferably on a pre-developed site within walking distance of essential services; using regionally appropriate landscaping; controlling storm-water runoff both during and after construction; and reducing erosion, light pollution, and construction related pollution. Beaufort County averages almost 50 inches of rainfall a year. This creates an opportunity to retain the water in a cistern for use in landscape irrigation or for non-potable domestic water use.

Water Efficiency
Water efficiency rewards water conservation both inside and outside. The interior strategies include high efficiency appliances, fixtures and fittings. Water-wise landscaping and water harvesting in rain barrels or cisterns for reuse are exterior conservation options.

Energy Efficiency
The single most important category is Energy & Atmosphere, where the overall goal is to reduce energy consumption and encourage the generation of renewalable energy. Strategies include; energy use monitoring, efficient design and construction, efficient appliances, HVAC systems and lighting, use of renewable and clean sources of energy generated on-site or off-site, and natural daylight in spaces by windows or skylights. Many homeowners want to go to the next level by creating their own energy with solar panels or wind generators and heating their own water with solar water heaters. A solar electric system qualifies for both federal and state tax credits and net metering from the power company.

Material
Materials & Resources promotes the selection of sustainably grown, harvested, produced and transported products and materials. This category also is concerned with the reduction of waste both from the construction site and the manufacturer's site as well as reuse and recycling. Attention is given to the travel distance of materials and resources to the construction site and to the manufacturer's plant. Reuse of an existing building, recycled materials, and locally produced materials are the high point favorites.

Indoor Air Quality
Indoor Environmental Quality strives to improve air quality; access to natural daylight and views; and improving acoustics. The category focuses on reducing indoor pollutants such as VOC's (Volatile Organic Compounds) in paint and off gassing of irritants found in adhesives, carpets, composite wood products and furniture. Strategies include managing moisture to prevent mold, increasing ventilation rates and mechanical controls to maintain the proper levels of temperature and humidity.

Designing for Hurricanes

The ASHRAE Guide for Building in Hot & Humid Climates recommends designing and constructing buildings in hurricane prone areas using the following steps in order of priority.

1. Keep the building from blowing away
    a. The building must be tied together from the roof rafters to the foundations
    b.The building must be designed to withstand wind shear
    c. Windows should be impact rated
    d. The exterior finishes should be securely fastened to the structure
2. Keep the rain out
    a. The roof should have a large overhang
    b. All windows and doors should have sill pans
    c. Flash all windows, doors and other penetrations
    d. Provide a secondary roofing membrane
    e. Design closed crawl spaces that are dry and watertight
    f. Drain water away from the house by using gutters and sloping the ground away from the building
3. Prevent flood damage
    a. Elevate the structure above the floodplain
    b. Install hydro-static vents to prevent flood water from collapsing foundation walls

FEMA Flood Zones

In the Lowcountry, flooding is also a major concern. New structures are required to be elevated above the base flood elevation. Base flood elevations are reevaluated periodically, so an older home may be below the flood elevation. A surveyor can determine the zone the house is located in and provide an elevation certificate to verify that the building is properly elevated.

Flood Zones are as follows:

V-Zone – (Velocity zone) coastal high hazard subject to 100 year flooding and storm surge
A-Zones – High risk of flooding
B-Zone & X- Zone shaded – Moderate risk of flooding
C-Zone & X unshaded – Minimal risk of flooding

Special consideration should be given before buying an existing home where the first floor of livable space is below the base flood elevation.

Make sure you receive a flood elevation certificate as part of your closing package when you buy in the lowcountry. A surveyor can provide an elevation certificate.

Beaufort County and the municipalities within the county all participate in the National Flood Insurance Program (NFIP) that is administered by the Federal Emergency Management Agency (FEMA). FEMA establishes a base flood elevation above mean sea level which is revised periodically. New buildings must meet the NFIP requirements which include having the first floor above the base flood
elevation or higher depending on the flood zone, along with other requirements.

If the cost of improvements or the cost to repair a damaged building exceeds 50% of the market value of the building, the entire building must be brought into compliance with the NFIP requirements. The market value is for the

building only not the property, any landscape improvements, or detached accessory buildings. The value can be determined by a licensed appraiser or the county's property assessment.

Many existing houses in the county do not meet the NFIP requirements and must adhere to the 50 % rule or raise the building out of the flood plain. Most houses built in accordance with the 2009 or 2012 edition of the International Residential Code (IRC) meet the NFIP requirements and are not subject to the 50% rule.

Municipalities often adopt a cumulative substantial improvement policy which combines any combination of repairs, reconstruction, rehabilitation, additions, or other improvements to a structure during a finite period of time that is limited to the 50% rule. The cumulative substantial improvement policy for Beaufort County and Bluffton is 10 years; the City of Beaufort is 5 years; and Hilton Head currently does not have a cumulative substantial improvement policy.

Lightning Protection

The Lowcountry experiences frequent thunderstorms, especially in the summer months. According to the National Weather Service, central and southern South Carolina average 50 to 70 days with thunderstorms each year with approximately 395,962 lightning hits to the ground. South Carolina is ranked 12th in the nation in the number of lightning strikes to the ground.

"Home and business owners needn't take their chances with lightning," explains Bud Van Siclkle, executive director of the Lightning Protection Institute (LPI). *"A professionally installed lightning protection system which meets U.S safety standards...will prevent lightning damage by providing a safe electrical path into the earth."*

While lightning protection system can be installed at any time, it is best to install it during new construction because it is easy to hide the cable conductors in the walls. The costs vary depending on the size and complexity of the building. Van Sickle estimates that the system will cost about one percent of the building's total construction cost. The costs can be offset with potential home insurance savings and the peace of mind that your home is safe from lightning.

Navigating Review Boards

Architectural review board policies and procedures are a common concern among people who wish to build or renovate. The process seems lengthy,the forms can be confusing, and people worry that the board will prevent their project from moving forward. The first step is to discuss the process with the administrator. Homeowners who have hired an architect will find themselves at an advantage in the review board process. Local architects have established relationships with many of the review boards in the area. The architect will help you through the process by completing forms, compiling submissions, and presenting your project to the board.

Review boards can be either public, (established by local municipalities) or private (administered by a residential development). In Beaufort and Port Royal, the public review boards are tasked with preserving the integrity of the historic districts and entry corridors. The meetings are open to the public, so they will vote and discuss projects in front of the architects and owners.

Many private communities in Beaufort County have their own review boards. Generally, these boards are populated with other homeowners and have an architect advisor. The boards often meet in private but will allow your architect to present the project and answer questions.

Beaufort County Environmental Regulations

Preserving the natural beauty of our region as it grows is critical. All the communities in Beaufort County have River Corridor Setbacks to protect the rivers from undesired toxic runoff. The setback is a strip of land between the edge of the water and the developed area which requires existing native plants be preserved to filter the runoff. It also serves as habitat for wildlife, enabling them to move along the river's edges. The river buffer preserves the views from the water by putting the buildings back from the water's edge. A surveyor will delineate the critical line at the edge of the water.

Some vista pruning is allowed to open views to the water. An arborist is a valuable team member and can prune trees to open the views and remove deadwood to keep trees healthy. They will prepare a report that assesses the health of all the trees. Significant trees close to the construction should be monitored and protected during construction with tree protection fencing.

Stormwater Management

In addition to river buffers, Beaufort County requires the management of stormwaters to preserve the integrity of our river systems. The requirements are based on the characteristics of your individual site, such as the soil quality and lot coverage. When applying for a building permit, you'll need to put a plan for stormwater management in place.

There are several ways to manage stormwater runoff, any or a combination of these methods are acceptable:

- Rain Garden - a depression landscaped with plants that enjoy a wet habitat.
- Cistern - a tank for storing water that can then be utilized for irrigation or even non-potable water for the house. It is connected to the gutters and downspouts.
- Rain Barrels - a smaller water storage tank connected to the gutters and downspouts.
- Dry Well - a rock filled hole under the downspouts. Excess water can slowly fill around the rocks before seeping into the groundwater.

A rain garden in Palmetto Bluff designed by Verdant Enterprises

Landscaping

Just as important as the major trees are the vertical layers of understory scrub and herbaceous plants. Native plants require less maintenance, fertilizer, and irrigation than non-natives. They are also more deer-resistant. These layers retain moisture and keep the tree roots cool and wet. The best mulch is leaves!

Our local sandy soil needs organic supplements such as compost. It's great to preserve the native plants in the river buffer, - they also work well for the majority of the landscape design.

Great garden spaces require a strong conceptual backbone using both buildings and plants to create outdoor rooms that can vary from symmetrical and formal to wild and mysterious. Long water views can be supplemented with delightful water features that engage the senses and provide a cooling, peaceful atmosphere.

Selecting the Right Property

After a local realtor has shown you numerous beautiful lots and you have narrowed your choices to the top three, **now is the time to call an architect.** The architect will analyze the buildability of the lots, potential placement of the structures, and identify any issues with the site. Likewise, if you're considering buying an existing house, the architect's expertise can give you a non-biased opinion and ideas of how to make the house fit your lifestyle and needs.

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