

Practical Green for Coastal Homes

Guidelines to help you build “green” right

by Mike Guertin with Clayton DeKorne

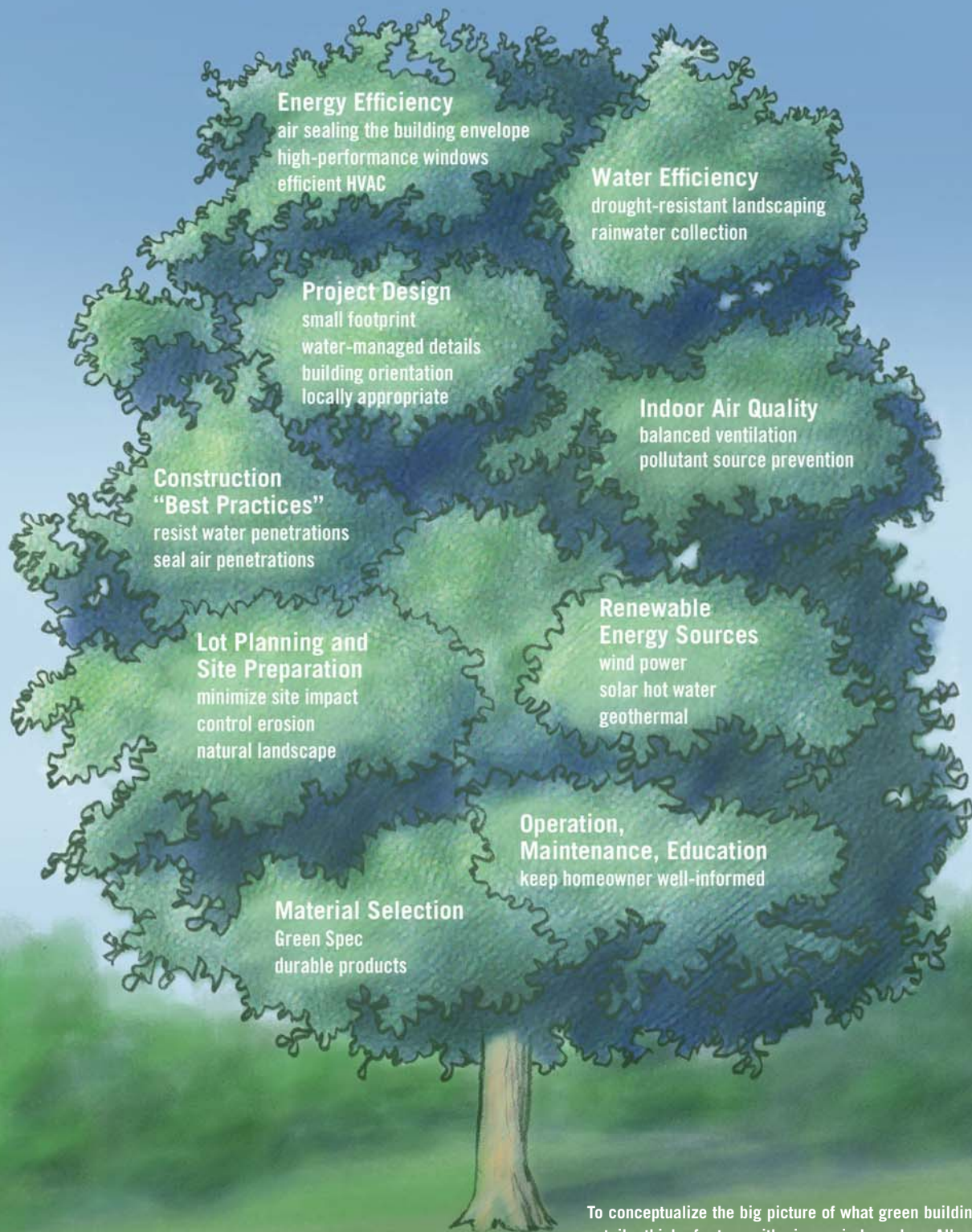
In today's slow housing market, the one bright spot is decidedly green. Everywhere you look, green building is grabbing the attention of otherwise cautious home buyers.

But all this attention raises the potential for “green-washing” — the efforts of overzealous marketers to label anything and everything “green.” Building a green home is certainly much more than slapping down bamboo flooring. And the media hasn't helped the matter by parsing “green” into a bunch of unrelated “plug and play” solutions. Selectively focusing on one feature while ignoring others or intentionally misleading buyers about the green credentials of a product or process only threatens to diminish the concept of green building as a whole.

One of the reasons many builders and the general

public don't understand green building is because it encompasses so much. Green building touches just about everything we do when we build a structure. It wasn't until I had to teach a green building course for high school and junior college construction career programs that I began to wrap my head around what it means to be green and how to explain it in concrete terms.

Soak your brain with the LEED for Homes (www.usgbc.org/leed/homes), NAHB Model Green Home Building Guidelines (www.nahb.org/publication_details.aspx?publicationID=1994), the SBIC Green Building Guidelines (www.sbicouncil.org/store/gbg.php) and the ICC – NAHB National Green Building Standard (www.nahbrc.org/technical/standards/greenbuilding.aspx), and you'll begin to find common threads between the different programs. You



To conceptualize the big picture of what green building entails, think of a tree with nine main branches. All are important and interrelated, but some — namely energy and water efficiency — should be considered higher priorities and take a more prominent position in the overall green plan for a project.

CHUCK LOCKHART

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ENERGY FIRST. Energy improvements sit at the top of all green building priority lists for good reason: Energy consumption represents an ongoing expenditure of resources. In all coastal climates, focus attention on air sealing measures at critical framing connections. One example is the band-joint area on this Florida home (above), which has been sealed with spray foam to stop air and provide optimal insulation. Attic bypasses, such as the holes created by routing wiring through an attic (right), are critical but often overlooked energy drains.



STEVE EASLEY

may realize, as I did, that the houses you build are already pretty “green” just by the nature of building along the coast. Coastal regulations and climate conditions typically force us to build to a much higher green threshold than might be required in other regions.

The important thing is to understand green building on two levels: the big picture and the more fine-grained details of implementation. You’ll communicate with clients wearing your “big picture” hat. To provide a better understanding of this big picture, I break down green building into nine different branches of a tree (previous page). Not every branch is weighted the same, but none can be ignored. A perusal of the outline provided here will provide a quick check on how close you’re already coming to building green and detail what practices you might need to reach the goal.

Eventually, you’ll have to steep yourself in the practical side of pulling the

pieces together on site, as well, but that will take more than one magazine article.

PROJECT DESIGN

Most coastal homes I build or remodel have a design professional on board. If they are involved in green building, then my job is simplified. If not, I “green engineer” the project, focusing first on the following:

Water-managed details. Coastal contractors understand the importance of managing water and how to keep buildings dry. If you haven’t already, develop a standard set of details for flashings, window and door installation, siding, and roofing that ensure your buildings will keep water out. (For more information on good coastal water management practice, see “Best Practice Wall Shingles,” March/April 2007, and “Weather Barriers for Coastal Conditions,” January/February 2008; www.coastalcontractor.net.)

Locally appropriate. Design features

and structural details that suit coastal construction in your area, wind zone, and exposure. This isn’t necessarily about aesthetics but rather about roof pitches, overhangs, exposures, glazing area, and structural load paths. If you get these right, you’re well on your way to a durable home that uses less energy.

Building orientation. Clients want to maximize their view, of course, but we can tweak the design to take advantage of prevailing coastal wind patterns for natural cooling, to increase or decrease solar gain, and to improve natural daylighting (see “Designing with the Sun in Mind,” Fall 2005).

Footprint. While builders are usually beholden to the wishes of our customer’s desires, we can steer them to build smaller. Smaller houses require fewer materials to build and tend to use less energy. The net effect is a clear prescription for conserving resources.

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ENERGY EFFICIENCY

As a result of the ongoing use of resources inherent in the energy use of any building, energy efficiency also comes at the top of any green building priority list. The EPA/DOE Energy Star Home program serves as a basis for the energy efficiency component of many green building programs. Even though coastal environments are tempered by ocean water (cooler in summer and warmer in winter) compared with inland climates, they're still punishing when you factor in the wind.

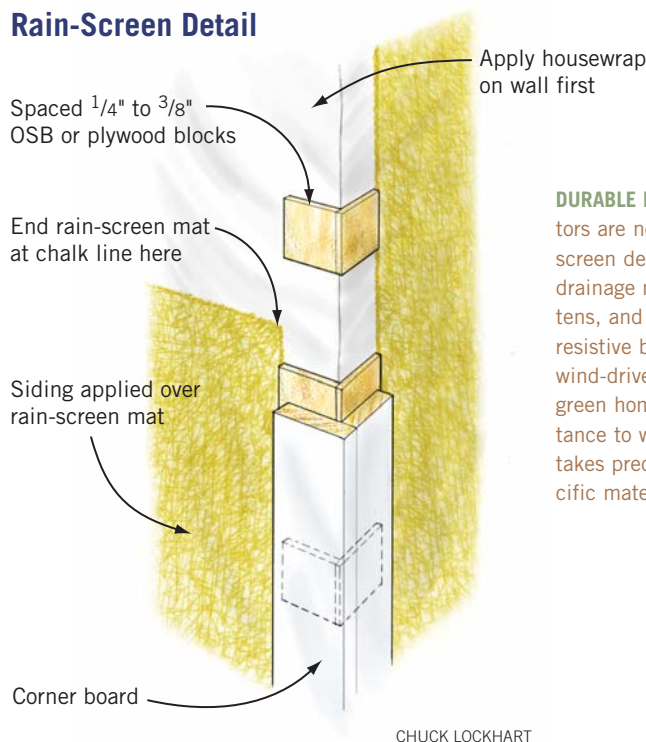
Building envelope — namely, insulation and air sealing measures. I think air sealing is by far the biggest issue for coastal contractors. Even a small constant breeze on a building can drive conditioned interior air through leaks. Special attention needs to be made to both window and door installation to reduce losses. Other critical areas are at building element connections (floor to foundation, wall to floor, roof to wall) and penetrations in walls and ceilings (see "Details: Airtight Framing," January/February 2006 and "Air Leaks: Hidden Moisture Movers," July/August 2007).

Window and door selection. Coastal homes usually have greater glazing area than inland homes. Choosing higher-efficiency (both lower U-factor and lower SHGC) windows and doors will have a greater impact on the energy performance of a coastal home (see "Selecting Windows for Coastal Homes," March/April 2006). Interior shades are often overlooked from an energy-efficiency standpoint. They help building performance by reducing the heat gain of the summer sun and heat loss on a winter night. These are usually left to the clients after a builder closes out a project; I recommend coastal builders include this step as part of their scope of work.

HVAC design and equipment.

Heating and cooling loads can be different when you're building an ocean-side

Rain-Screen Detail



DURABLE DETAILS. Coastal contractors are no strangers to rain-screen details that rely on drainage mats (as shown) or battens, and a well-detailed water-resistant barrier, to manage wind-driven rain. For exteriors on green homes, durability and resistance to water damage and mold takes precedence over any specific material choice.

CHUCK LOCKHART



CLAYTON DEKORNE

HIGH-PERFORMANCE WINDOWS.

Reduce cooling loads by choosing windows that resist both radiant and conductive heat flow. Look for the NFRC label found on all windows. The two critical numbers are the U-factor, which measures heat flow, and the solar heat gain coefficient (SHGC), which measures the percentage of radiant heat energy that will pass through the window. The lower these ratings are the better. For optimal performance in all climates, both numbers should be below 0.35.

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house compared with one just five miles inland. The HVAC equipment can often be downsized because peak summer and winter loads are less — this reduces the cost and complexity to install and reduces the operational cost both in money and environmental impact.

WATER EFFICIENCY

Most coastal building environments have limited fresh water, and potable water is a limited resource. Plumbing codes and government regulations have driven us to green practices already with low-flow/low-consumption fixtures inside the home. More than half the water delivered to the average home is used for irrigation, so looking at ways to reduce water use outside so the homes you build or remodel will have less impact on local water supply is the first course of action.

Landscaping. Avoid the need for irrigation, but when necessary, use drip systems rather than sprinkler systems.

Rainwater collection. Underground tanks or simple rain barrels can store roof runoff for outside irrigation needs as well as indoor nonpotable purposes such as toilets. Collection and filtration systems are available for potable water use.

Think twice about graywater reuse. While some green proponents tout graywater reuse, coastal areas tend to be environmentally sensitive. Graywater reuse systems may not be permitted or wise for coastal zones.

CONSTRUCTION BEST PRACTICES

You're probably already incorporating "best practices" in every aspect of your coastal projects. Best practices make for durable low-maintenance (green) buildings.

Roofing, siding, windows, and doors. Coastal buildings experience more wind-driven rain on a regular basis than interior buildings. Detailing the exterior to resist water penetration is critical for long-term durability.



TODD CAVERLY

Insulation and air sealing. To achieve the best performance from insulation, it must be installed perfectly and the building must be air sealed. Coastal buildings are exposed to higher wind exposures than inland buildings, so air sealing has a bigger overall impact to energy performance. Seal all penetrations between inside and outside. Pay particular attention to air leaks from the conditioned space to the attic space.

RENEWABLE ENERGY SOURCES

Solar and wind resources can be tapped along shorelines, but with some, maintenance may be an issue.

Photovoltaics. Knowing the true day of sunlight for the microclimate you build in is important. Many coastal areas (particularly in the Northeast) often experience more fog, haze, and clouds that would reduce the performance of photovoltaic panels. Airborne salt can deposit a film on collectors and reduce their effectiveness. While photovoltaics may be the first thing on clients' minds, they may not

always be the best choice for all coastal climates. Systems should be located for easy access to clean, and owners need understand the seasonal energy production limits due to clouds.

Solar hot water. Vacuum-tube systems are ideal for cloudy coastal areas. These systems can produce hot water even on cloudy days and will provide more bang for the buck than photovoltaic systems. They will suffer from salt film on the tubes, so someone will have to have easy access for cleaning (and be willing to do it).

Wind. Residential-scale wind generators are a slam-dunk for coastal buildings. Consistent breezes — no matter from what direction — will spin the blades on modern generators. Many states are incorporating laws that supersede local zoning and private development restrictions that would otherwise prohibit wind generators, though in many locales, this remains an issue that must be investigated.

Geothermal. Coastal building sites often have high water tables, and this is good thing when you're thinking of geot-

REDUCE WATER CONSUMPTION.

Increasingly, water efficiency is climbing to the top of the green priorities list for coastal homes. Low-flow fixtures are a must indoors, but don't forget the landscaping. A landscape that relies on native plant species will not only use much less water but will also better withstand salt spray and poor coastal soil conditions.

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hermal. Deep well or field/trench-type exchange systems perform better when they are in the water rather than dry soil.

MATERIAL SELECTION

Materials are often the first thing people think of when they think “green,” and it’s where you’ll find the most controversy. The material arena is where you and your clients will find the most greenwashing and become the most confused.

Green Spec. To cut through the bias and confusion, consult *Green Building Products* (BuildingGreen, LLC and New Society Publishers, www.buildinggreen.com) — a compendium of some 1,600 green products derived from the online Green Spec Directory (www.buildinggreen.com/menus/).

Durability/reduced maintenance. Materials that last a long time in service are preferable to ones that deteriorate.

Most coastal builders I know already opt for durable materials — especially on building exteriors — because they understand how punishing the coastal climate can be.

LOT PLANNING AND SITE PREPARATION

Many coastal building requirements mandate best practices for lot usage and site impact already, so you may not need to change your current practices to go green here.

Minimize site impact. Only clear and dig where you have to. Coastal building sites are often environmentally sensitive. Keep the natural geography and retain native plants to minimize the effect of natural disasters and speed recovery (see “Wetlands Done Right,” January/February 2007). Minimal site impact practices are often economical as well.

Erosion control during construction.

Common requirement on most coastal sites, you can improve erosion control just by minimizing site impact to begin with. Wrap up sitework activities as soon as possible and implement the replanting plan to reduce the need for mechanical control systems (see the discussion on low-impact development, *Soundings*, May/June 2008).

Landscape. Maintain the natural state of the site. Use native and drought-resistant plants, and minimize lawn areas. Use trees to shade parts of the building or let sun reach the building during specific times of the day/seasons to reduce or increase heat gain into the building. (For more information, see “Native Landscaping,” November/December 2006.) Be sure to include a water runoff plan to retain water on-site with the landscape design. Avoid hard, impermeable surfaces.

INDOOR AIR QUALITY AND MAINTENANCE

Two other chief concerns arise in the green building arena: indoor air quality and operation/maintenance issues. However, there is nothing particularly coastal about these topics, though maintaining low indoor humidity levels might be more challenging in many coastal climates. Controlling indoor air quality starts with building a tight building envelope and installing a balanced ventilation system, but it also involves strategies for keeping pollutants out of the home. One place to begin gathering the requisite knowledge on the issues is the Healthy House Institute (www.healthyhouseinstitute.com).

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SURGICAL SITEWORK. Many coastal builders are already required to minimize site impacts and limit water runoff, but there is always room for improvements to preserve precious coastal wetlands. On this Sarasota County site, an engineered wetland is underway to offset the impact of nearby building sites.