Getting Started with Green Building:
The first steps for designing a green home.

Make a list.
Consider the things that are most important to you, for example:
#1 Energy Efficiency
#2 Sustainable Products
#3 Good Indoor Air Quality
then make decisions about your design accordingly.

Decide what size home you need, consider having multi-use spaces to optimize your home size. Layout your floorplan to allow appropriate use of space.

Orient your main living space to face South.
This is especially important if you are building in a cooler climate to help with heating loads. Plan for thermal mass to be installed on the south side of the home if you are designing passive solar.

Consider Certification. Joining a green building certification program such as EnergyStar or a state specific program for building guidelines can provide helpful guidance for your project. Make sure early on that your builder is willing to be a partner in your certification plans.

Choose your windows., Minimize west, east and north windows, maximize south facing windows. Also, design for adequate shading on southern windows. Choose quality windows as your budget allows.

"In typical green building projects, 70% of the decisions associated with environmental impacts are made during the first 10% of the design process." USGBC

Design for durability, future reuse and adaptability.

Research the needs of your specific climate zone and specific interests.

Building Science Corporation Builders Guides

Sustainable Buildings Industry Council's Green Building Guidelines

www.buildinggreen.com/ebn/checklist.cfm

Put lots of thought, money and effort into improving the thermal envelope of your home.

Design a well insulated, and well drained foundation. Research the suitability of slab foundations, insulated concrete forms, Superior Walls and sealed crawlspaces in your area.

Design for moisture control. Consider site location, drainage patterns, current and future vegetation, foundation type, and indoor moisture control.

Site mechanical systems and ductwork inside the conditioned area to increase their efficiency. Consider designing an unvented attic to site the mechanical system if it is regionally suitable.

Design plumbing systems with a central core plumbing design. Stack bathrooms, laundry and kitchen to save energy and reduce water use.

What is the next step? Seek outside help to continue your sustainable design. Talk with available Green Building Consultants during the planning stage of your project. Integrate a "whole house approach" to the design, construction and finishing of your home. Visit our website at http://www.deltechomes.com/researchgreenhome.php

deltec GREEN

What Makes a Building Green?

- A green building, also known as a sustainable building, is a structure that is designed, built, operated, or occupied in an ecological and resource-efficient manner. Green buildings are designed to meet certain objectives such as protecting occupant health; using energy, water, and other resources more efficiently; and reducing the overall impact to the environment.

What Are the Economic Benefits of Green Buildings?

- A green building may cost more up front, but saves through lower operating costs over the life of the building. Up front costs will vary by region, depending on availability of resources, experience of installers or contractors and general labor and material costs in. (Most states offer some tax incentives for purchasing specific green building technologies or participating in green building programs such as EnergyStar.)

What Are the Elements of Green Buildings?

Below is a basic primer of green building practices.

Site

- Start by selecting a site on your property well suited to take advantage of already in place systems such as municipal water, sewer, electricity etc.
- Protect, utilize and retain existing landscaping and natural features. Evaluate entire site characteristics such as possible solar gain, tree/vegetative cover, wind loads and directions, as well as existing features such as ponds or views.
- Consider the effect your site choice will have on the entire landscape. Does your site negatively impact any natural systems or adversely impact its surroundings? Consider the visual impact of your building and design it to blend with the surroundings.
- Protect tree and vegetative cover whenever possible. Coverage on the west and east sides of your home generally will protect from wind and sun. When planning landscaping, select plants (preferably native plants) that have low water and pesticide needs. Use compost and mulches to save water.
- Choose recycled content and porous paving materials where local conditions permit, sustainable outdoor furnishings, and mulches to help close the recycling loop.

Energy Efficiency

- Conserving energy is the main goal of most people who choose to build green. There are many different paths to obtaining the goal of maximum energy efficiency.
- Passive design strategies can dramatically affect building energy performance. These measures include building shape and orientation, passive solar design, and the use of natural lighting.
- Use a properly sized and energy-efficient heating/cooling system in conjunction with a thermally efficient building shell.
- Minimize the electric loads from lighting, equipment, and appliances. Choose

EnergyStar appliances and design an open floorplan to encourage optimal flow of heating, cooling and lighting. Use fluorescent lighting fixtures whenever possible and investigate tankless hot water heaters.

- Develop strategies to provide natural lighting. Studies have shown that it has a positive impact on well being, as well as reduces the amount of energy needed
- Properly seal and insulate your building envelope. Air sealing is critical for maximum energy performance in your home. Investigate the feasibility of spray foam insulation, and hire a contractor who understands the importance of air sealing.
- Maximize light colors for roofing and wall finish materials; install high R-value wall and ceiling insulation; and use minimal glass on east, north and west exposures. (This too will vary by region depending on your climate.)
- Consider alternative energy sources such as solar hot water, photovoltaics and ground source heat pump systems. Renewable energy sources provide a great symbol of emerging technologies for the future, and some have a relatively short payback time after installation.
- One very important thing to remember if you are going to be using primarily alternative energy to power your home, is the overall energy benefit it will supply. If you simply put alternative energy sources on your home, without first making your home energy efficient, then they will only supply marginal utility. In some cases, money is better spent improving the energy efficiency of the home than installing costly alternative energy sources.

Materials Efficiency

- Select sustainable construction materials and products by evaluating several characteristics such as reused and recycled content, zero or low off gassing of harmful air emissions, zero or low toxicity, sustainably harvested materials, high recyclability, durability, longevity, and local production. Such products promote resource conservation and efficiency. Using recycled-content products also helps develop markets for recycled materials that are being diverted from landfills.
- Take into account a materials Life Cycle Analysis when choosing products. Life Cycle Analysis considers the entire environmental footprint of the product, from the growth or development of the product, to the transportation and processing of the product, and finally to the end of life options for the product. For example; consider the environmental impact of bamboo flooring made in China versus hardwood flooring produced in a local mill.
- Use dimensional planning and other material efficiency strategies. These strategies reduce the amount of building materials needed and cut construction costs. For example, design rooms on 4-foot multiples to conform to standard-sized wallboard and plywood sheets.
- Require from your builder plans for managing materials throughout the entire construction process, from onsite waste separation and recycling, to protecting materials from the elements that could be used later or possibly donated.

Water Efficiency and Moisture Control

- Design home for plumbing efficiency by stacking bathrooms back to back and locating the washer and dryer near the kitchen or bathrooms to minimize materials used in plumbing and reduce the energy required to heat the water.
- Minimize wastewater by using ultra low-flush toilets, low-flow shower heads, and other water conserving fixtures.
- Install point-of-use (also called ‘on demand’ or ‘tankless’) hot water heating systems for distant plumbing locations.
- Design for proper drainage of air-conditioning coils, and design foundation to control humidity.
- Use state-of-the-art irrigation controllers and self-closing nozzles on hoses.
- Investigate and design in detail water management systems for your site. Talk with your builder about site and foundation drainage.

Indoor Air Quality

- Recent studies reveal that buildings with good overall environmental quality can reduce the rate of respiratory disease, allergies, and asthma.
- Choose construction materials and interior finish products with zero or low emissions to improve indoor air quality. Many building materials and cleaning/ maintenance products emit toxic gases, such as volatile organic compounds (VOC) and formaldehyde. These gases can have a detrimental impact on occupants' health and productivity.
- Provide adequate ventilation especially in rooms with high moisture content such as kitchens, bathrooms and laundry. Also consider a whole house air filtration system and a Heat Recovery or Energy Recovery Ventilator. Heating and cooling systems that ensure adequate ventilation and proper filtration can have a dramatic and positive impact on indoor air quality.
- Consider using low-tech air movement strategies such as ceiling fans and windows that can open to allow air to move.

Durability

- Choose products that will last a long time. Products that have a long service life are ultimately greener than those that have to often be replaced.
- Choose interior finishes to suit many styles and needs. As tastes change, it is better to have spaces designed to change with those needs without a large material investment. For example, paint color is easy to change as tastes evolve, while tile or carpet style is more difficult to change and requires use of more natural resources.
- Consider developing a durability plan with your builder prior to construction.