



10 Steps to Building a Greener Home

We are starting to realize that many of the homes that have been built are resource hogs; using more energy, building materials and water than they should, while providing poor indoor air quality.

1. Choose The Best Site

If you travel into town frequently save gas by living nearer. For passive solar your house needs to be facing south. Trees to your north will shelter you from cold north winds, too many trees to the south may block your solar gain in winter.

Live on site for a year before building to experience all your site's micro-climates. Building away from the shore may shelter you from winter storms, and building below the ridge of a hill can protect you from chilling winds, while preserving the view for others.

2. Minimize House Size, Maximize Orientation

Square houses use less wall for a given volume than rectangular homes. Building on two stories halves the footprint of a building, reducing its impact on the flow of stormwater and reducing construction costs.

Having living spaces face south increases passive solar gain in winter and can be shaded with window treatments. Window sizes should be designed to capture the right amount of sun at different times of the year, overhangs can be calculated so that they shade windows in summer yet let winter sunlight in.

3. Reduce Energy Demands

Use sprayed in cellulose or soy foam, insulate rim joists and seal all penetrations with expanding foam. Build the tightest envelope, and ventilate the space with a HRV (Heat Recovery Ventilator) to control fresh air exchange.

Use CFL (Compact Florescent Lights) or LED lighting where possible, and the highest rated Energy Star appliances. Front-loading washers not only use less water they waste less energy heating it. Pay attention to the appliances you use the most, such as fridges, washing machines, and domestic hot water heating.

In-floor radiant water heating can heat very effectively. A solar hot water heating system can partially supply the hot water for heating and bathing, with top-up when needed from an on-demand instantaneous water heater.

4. Protect the Site During Construction

Site design should allow access for construction and staging of materials with minimal disturbance to vegetation and soil. Fence out-of-bounds areas and trees to be protected and have the contractor sign a contract to honor these.

Plywood, OSB, and MDF can be stacked on a level spot with spacers between them to allow off-gassing and protected from adverse weather.

Construction waste should be managed. Containers can be placed on site and all reusable materials placed in one, waste in another and more hazardous materials (pressure treated wood) in another.

5. Build Using Appropriate & Local Materials

Lumber is reasonably priced compared to materials that travel long distances. Innovative materials such as AAC blocks (Autoclaved Aerated Concrete), Rastra, even strawbale are difficult to come by locally and local contractors may not have the tools and experience to use them.

Stick building is still effective and green if "advanced framing" is used. Concrete, papercrete, tile, plywood and bamboo slabs all make excellent countertops.

6. Use Innovative Building Practices

Use 'advanced framing' to reduce lumber used and create better insulation. This reduces the number of studs that act as thermal bridges, and uses insulated headers over doors and windows.

Pex plumbing uses flexible plastic piping that is connected with compression fittings. Pipe and connector costs are slightly higher, but labor costs are lower and cold water pipes will not split if they freeze.

Shakes, shingles and slates made from recycled tires and cement are available and have higher fire ratings.

Galvanized metal and factory painted metal roofs last longer than most products and are easy to install.

7. Use Less Toxic Materials

Plywood, OSB and MDF contain very high levels of formaldehyde. With a typical half-life of 3 to 5 years they take many years to off-gas. It is possible to order these materials in no- or low-formaldehyde versions. Many paints and finishes have VOC's (volatile organic compounds) that off-gas and can effect health. Always specify low VOC products.

8. Use Natural Light & Ventilation

Larger opening windows placed on the south will maximize light, with smaller opening windows on the colder north side. An efficient window has only about 5% of the R value of an insulated wall.

Windows placed up high can create a chimney effect that draws warm, stale air up and out of the house. Windows on opposing walls can create cooling cross breezes.

In winter you can use an HRV/ERV to ventilate the house or specific rooms. In winter these use the heat of the exhaust air to heat the incoming air, and filter it. In summer they cool the incoming air. They are efficient.

9. Post Construction Cleanup

After construction is finished clean up all construction waste. Then clean using 'green' cleaning products. Then the house should be heated to higher than normal temperatures, windows and doors opened, and forced ventilation used to vent VOC's from the home.

The driveway and landscape should be cleaned of any construction debris such as pressure treated wood scraps, nails and any other material that poses a hazard to the landscape, people or animals.

10. Use Low Impact Development (LID)

LID uses native vegetation and soils to capture, filter, and infiltrate rain to mitigate the effects of having impervious surfaces. Impervious areas concentrate stormwater which leads to erosion and soil loss. In the case of roads and driveways the stormwater can collect pollutants and transfer them into your groundwater, creeks and wetlands.

Create bioswales along driveways to capture run off, phytoremediate it with native plants and let it infiltrate back into the ground. Rain gardens can be used to infiltrate stormwater from your roof into the ground, where it can help recharge the aquifer.