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Building Green: Saving the Planet Starts at Home

When you think about it, the very idea of remodeling is earth-friendly. As my partner, green builder Ron Jones, points out, remodeling is naturally “green” because it re-uses an existing structure instead of disrupting a pristine natural site and adding to sprawl. “People who remodel,” he says, “help to improve the economic value of a neighborhood while minimizing their ecological footprint.” And remodeling is good for the soul, too. It’s much more than new carpet, a bigger pantry, or better energy efficiency. It is a process through which we can redefine the way we live, a clean slate upon which we can express our visions, dreams, and principles.

Still, genuinely green remodeling requires us to be alert in a special way to processes, materials, and practices. We not only have to choose wisely, we have to think clearly in order to make a remodeling project a contribution to the health of the planet.

The first step is to be as clear as possible in your own mind about what you want the end result of your remodeling project to be. Begin by asking yourself some personal questions about your home and your relationship with it. Have you outlived the design of your home? Are you adding more space because of a change in lifestyle? Are you simply tired of your interiors and want something new? Do some rooms, especially “formal” areas sit dark and idle for most of the year—and could they be remodeled into lively and truly useful spaces? (After all, interior space is a precious resource, just like clean water, air, and soil.)

The second set of questions to ask pertains to our collective footprint on our precious planet. Will your new design be environmentally appropriate, sensitive, and responsible? Will it be in harmony with the landform upon which it sits—whether that's a rolling hillside or a tiny urban plot-- and with the surrounding neighborhood? Will your changes be durable and long-lasting, so that you're not creating problems for yourself or future owners of the home? Is the design adaptable to new uses once it has outlived your current needs?

By asking yourself questions about the environmental impact that your remodeling project will have--and responding to them with good decisions about design and materials--you will turn your remodeling project into a small but powerful statement about global issues such as water and energy efficiency, waste minimization, recycling and reuse, pollution control, the use of local resources and labor, global warming, and the protection of old growth forests. And that's even more satisfying than new counter tops!

Remodeling Basics

Once you've thought about how you will use your remodeled house and have created a design that fits your personal and ecological needs, then the fun of demolition and construction begins. You'll face problems common to all remodeling projects, green or not. Some will have to do with the age of your home. Many older homes are actually structurally superior to modern ones, since higher quality lumber was used (lumber quality has dropped significantly over the years), more masonry materials (such as

natural stone, bricks, and tile) were employed, and more time was taken for construction and detail work. However, the energy and water efficiency of older homes are typically vastly inferior to that of modern houses because of major advances in insulation materials and techniques, window and door technology, heating and cooling systems, appliances, and wiring and piping systems.

The first step to take when remodeling a home is to look at its structural soundness. Are the foundation, walls, floors, and roof frame solid? If not, make it your top priority to upgrade them.

Next, examine your mechanical and wiring systems. (This is particularly important in homes built prior to the 1970s. New regulations about energy efficiency were put on the books in that decade in response to the energy crisis.) Many older homes do not have an adequate distribution of wiring or enough electrical capacity to meet the heavy demands of modern appliances. Be prepared to make upgrades to assure code compliance (a big factor in your home's resale value), safety, and proper capacity. Replace any aluminum wiring you find; it's a well-documented fire hazard. Older mechanical systems--furnaces, boilers, and water heaters--can create unsafe levels of carbon dioxide if they aren't properly vented or have defects. These devices should be inspected by a professional or a local gas company to assure safety, and problem components should be replaced right away.

When demolishing walls or other elements of the house, watch for dangerous materials such as asbestos and lead paint. These were commonly used in older houses and need to be removed or sealed by a professional who practices accepted techniques for

encasing toxins. If there is lead solder in the water line from the street to your house—a threat to drinking and washing water-- you should consider replacing it.

Other health and safety considerations include:

Checking bedrooms for adequate ways out—many older homes have windows that are too small to meet modern fire rescue requirements, and they often do not have smoke detectors or fire suppression systems like sprinklers.

Inspecting fireplaces to make sure that they are functioning properly and that there are no leaks or cracks in the chimney flue. Many older homes have fireplaces that would not meet the requirements of modern building codes because they have combustible materials (such as newspaper insulation) in contact with the firebox or flue.

Measuring stairs to make sure that they are not too steep—older homes often have stairs with taller risers and narrower treads than modern code allows, as well as railings that are too low or balusters that are too widely spaced.

The Green Remodeling Difference

All of these concerns are important for any remodeling job, whether it's deliberately "green" or not. But if you are a really conscious remodeler, you'll go further. For instance, you'll look at the quality of the indoor environment. Poor indoor air quality can contribute to asthma and ADD in children, as well as heart and lung problems, headaches, and blurred vision. Unhealthy indoor air can often be linked to materials, coverings, and surfaces that "off-gas," that is, emit toxic particles and volatile compounds into the air. Inadequate ventilation also contributes to poor indoor air quality

by trapping pollutants inside the home. High temperature and humidity levels increase concentrations of pollutants, mold, and mildew within a living space.

In order to improve indoor air quality:

Repair leaks, penetrations, or weather infiltration in the walls, roof, floors, windows, doors, drains, or water pipes that may invite mold and mildew. (You can do a meter test to see if you have leaks in your water pipes: shut off your water, note the water meter level, leave the water off for 24 hours, then check your meter—if the meter level has changed, you know you have a leak.)

Choose materials that do not off-gas, such as formaldehyde-free cabinets, paints with low volatile organic compound (VOC) counts, and fabrics and rugs made from natural fibers such as cotton or wool.

Install alternative heating and cooling systems, such as radiant under-floor heat, that do not blow dust particles from ducts into the air.

Install good ventilation and filtration systems that control the indoor climate—and thus diminish mold, mildew, and the buildup of toxins.

Create a blend of natural and energy-efficient artificial lighting (such as fluorescent lighting) for optimum effect. Lighting has a big impact on health, productivity, and quality of life.

Energy efficiency is another important consideration when remodeling in a green mode. In his book, New Ecological Home (Chelsea Green, 2004), Dan Chiras makes a compelling argument that, although energy-efficient homes may initially cost more to create, they offer significant savings on utility bills, increased comfort, and reduced

environmental impact. They may even allow you to take advantage of “energy efficient mortgages,” which reward homeowners for maintaining lower energy costs. According to the Sustainable Buildings Industry Council, buildings that are planned with passive solar design strategies—including appropriate siting, materials, ventilation, glass positioning, and roof overhangs --can reduce energy demand by 30 to 50 percent. Renewable energy systems, high-efficiency appliances, and building components that reduce heating and cooling loads can contribute further to a positive energy picture.

Water is another important issue to consider. Low-flow plumbing devices and lawn irrigation systems can significantly reduce water demand. So can systems that “harvest,” or gather, fallen rainwater. Harvested water can be used for landscaping and other applications where drinkability isn’t an issue. The result? Decreased demand for water from municipal systems, less energy needed for the treatment process, and lower costs. And retaining water at a building site means that less of it is channeled away from the site in costly, environmentally destructive drainage systems. Typically, these drainage systems transport water through a maze of conduits, where the water picks up waste and toxic materials (pet feces, pesticides, fertilizers, etc.) and dumps them into faraway rivers, lakes, and oceans.

No matter how conscious you may be of waste issues, when you remodel you will, invariably, contribute to the waste stream. What will become of that old, worn-out water heater, the chipped, stained cast-iron bath, or the leaky windows? According to the environmental department of the state of New Mexico, approximately 40 percent of the volume of material that goes into landfills is from demolition and construction.

It's the responsibility of the homeowner and the contractor to handle waste, so establishing a partnership with your contractor to minimize waste and finding ways to recycle existing materials (rather than exporting them to the landfill) can help reduce your ecological imprint--and save yourself time, effort, and money, too.

Whenever possible, reuse or recycle products that you already have in your home. Refinishing furniture or fixtures can be a cost-effective, sustainable way to change your interior environment without major reconstruction. As you plan your remodeling, look for local programs that accept used building materials and products for reuse or resale.

If you are purchasing new materials:

Choose organic, low-impact, and healthy products such as bamboo flooring, natural fiber carpeting, natural plasters, and low VOC paints and stains, as well as non-synthetic, natural bedding, linens, cleaning products, and other household goods.

Whenever possible, use products made with high levels of salvaged materials (natural stone, lumber), recycled content (fly ash in concrete), or agricultural byproducts (wheatboard and linoleum). They reduce resource demand and keep waste out of landfills.

Choose products that are durable and low-maintenance; they need to be refinished and replaced less often, saving money and energy in the long term.

Try to use products that are locally or regionally produced. Local products support the local economy, may have used less energy and fewer resources in the production process, and have almost certainly required less transportation.

Remember that there is no one simple solution to your green remodeling needs. Appropriate building solutions differ based on things like climate, geography, and natural systems. For example, while mold-resistant products are desirable in all climates, they are essential in regions of high humidity. And while passive solar strategies, such as shadings with overhangs and vegetation, are important in all areas of the country, they are particularly vital in the Sun Belt. It is important to research appropriate materials, technologies, and systems for where you live—and to avoid a one-idea-fits-all mindset.

For more information on green building materials, look at:

Green Building Products: The GreenSpec® Guide to Residential Building Materials edited by Alex Wilson and Mark Piepkorn (New Society Publishers, 2004).

GreenSpec, the leading national directory of environmentally appropriate products and materials. It's compiled by BuildingGreen, Inc., which also puts out *Environmental Building News*. Manufacturers do not pay to be listed in *GreenSpec*, and BuildingGreen does not allow advertising in any of its publications, which helps the company to be nonbiased in its coverage of green building products.

Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy Technologies and Sustainable Living (12th edition), edited by John Schaeffer (New Society Publishers, 2004), a resource guide for renewable energy, sustainable lifestyles, alternative construction, green building, homesteading, off-the-grid living, and alternative transportation.

A Final Word

As arduous as it is, moving walls and fixing pipes is actually the easy part of remodeling. The real challenge is in blending the charm of older residences with updated designs, the efficiencies, and conveniences of modern construction, and then infusing it all with a sense of who you are and how you want to live. It's all about combining a sense of the past with a feeling for the needs of the present and responsibility for the future, while expressing yourself. It's as challenging—and as exhilarating—as life itself.