

Chapter One:

Overview of Green Building

“I build green for my clients to give them healthy, energy-efficient homes. I build green for myself to leave a light footprint legacy in this heavy footprint industry.”

—Mark Nelson, Renaissance Remodelers, San Anselmo, CA

Overarching Principles of Green Building

- 1** Build for the long-term
Build durable, efficient homes and livable communities.
- 2** Build for our children
Make their homes, communities and environment safe.
- 3** Build for the planet
Use natural resources wisely.

Introduction

In response to growing concerns about the quality of our lives and the quality of our environment, an increasing number of Californians are embracing green building. This holistic approach to home building and remodeling emphasizes quality construction, energy efficiency, good indoor air quality, environmentally sound landscaping, and livable neighborhoods. As you'll discover in these Guidelines, green building provides countless benefits to California's building professionals, residents and communities.

Does green building really matter?

Green building means improving our design, construction and landscaping practices so that the homes we build or remodel today will last longer, cost less to live in, and won't harm our health. It also means protecting natural resources and improving the built environment so that people, communities and ecosystems can thrive and prosper.

With the budget and time pressures we're all under today, is it really worth the extra effort? Increasingly, homeowners and building professionals agree that it is worth the effort. Better homes, it turns out, are also

better for business. Remodeling contractors and other building professionals who follow "building as usual" practices may find themselves at a competitive disadvantage as regulatory and market forces shift the industry toward built environments that are healthier, more resource efficient and less polluting.

By remodeling homes so that they are more durable, healthier, and less wasteful of energy, water and other resources, today's green remodelers are helping to safeguard the well-being and prosperity of Californians now and for decades to come.

Fundamental Objectives of Green Remodeling

There's nothing mysterious about green remodeling—it's really just applied common sense. To move forward with greening your remodeling project, it is helpful to think of green remodeling as quality design and construction achieved through the convergence of four fundamental objectives:

- 1 Conserve natural resources
- 2 Use energy wisely
- 3 Improve indoor air quality
- 4 Make communities more livable

Conserve natural resources

Residential remodeling activities consume large quantities of wood, water, metals, fossil fuels and other resources. Even though the majority of the materials used to remodel a home are put to good use, vast quantities of resources are wasted. In fact, each year close to nine million tons of construction and demolition debris is disposed of in California landfills, accounting for 22% of the entire state's waste stream.

Much of this waste is avoidable. Careful management of the construction process makes a big difference. There are also many well-established remodeling practices that help protect natural resources. If you are building an addition to an existing home, for example, advanced framing techniques can substantially reduce lumber requirements without compromising structural integrity. Using engineered lumber and wood products certified by the Forest Stewardship Council can help ensure the long-term health of forests.

Many effective remodeling strategies not only conserve natural resources, but also provide additional benefits such as saving money. These include using durable

products such as roofing materials with 40- or 50-year warranties, and specifying recycled-content products that divert waste from landfills. Recycled-content decking, reclaimed lumber and other products put waste to good use, while providing quality and durability that often exceed conventional materials. For example, decking materials made of recycled plastic mixed with wood waste fibers can last up to five times longer than wood decking, and never needs to be treated or painted.

Water is another critical resource. California residences use 5.6 million acre-feet of applied water annually. Our prosperity and ability to meet the needs of our growing population hinge on having adequate supplies of clean, fresh water. Homes remodeled and landscaped to use water wisely make a tremendous contribution to protecting our shared resources and reducing the pressure on municipal water systems and supplies. An added benefit is lower water and sewer bills for the homeowner. Today's building professionals and homeowners can take advantage of a new generation of cost-effective, high efficiency appliances and landscape water management systems, as well as a variety of proven landscaping strategies that reduce water use.

Use energy wisely

Using fossil fuel–based energy is a major contributor to air pollution and global climate change. With homes accounting for roughly 31% of the electricity consumed in the state, it is clear that homeowners and remodeling professionals have a significant role to play in helping our society address energy-related concerns now and in the coming decades.

Energy efficiency is the cornerstone of every green home. Whether you are remodeling a 30-year-old suburban ranch house or a 120-year-old inner-city Victorian, you can improve its energy performance. Improving energy efficiency and using renewable energy sources are effective ways to reduce the potential of energy supply interruptions, improve air quality, moderate the impacts of global warming, and slow the rate at which we need to build new power plants.

Energy efficiency also makes good sense for homeowners: an energy-efficient house saves money by reducing utility bills year after year, and provides other valuable benefits. Better insulation, for example, reduces uncomfortable drafts, and double-pane windows

make for a quieter home. Homeowners who have already made their homes as energy efficient as possible may choose to go a step further and install renewable energy systems such as solar water heating and photovoltaic panels.

Improve indoor air quality

On average, Americans spend 90% of their time indoors, yet the air inside our homes can be ten times more polluted than outdoor air, according to the U.S. Environmental Protection Agency. Children are particularly vulnerable when it comes to air pollution. A report in the *New England Journal of Medicine* states that 40% of children will develop respiratory disease, in part due to the chemicals in their homes.

A common source of indoor air pollution is volatile organic compounds (VOCs), a large class of chemicals that offgas from many building materials. Exposure to VOCs may cause a range of symptoms, from eye irritation and headaches to more severe effects. Many paints, floor finishes, adhesives and sealants emit unhealthy VOCs. Kitchen cabinets, countertops, shelving and furniture may be made from particleboard or medium density fiberboard. These pressed-wood products are typically made with adhesives that release urea formaldehyde—a known human carcinogen—into the home for years after installation.



Photovoltaic panels



Salvaged building materials

Fortunately, the building products industry is responding to these indoor pollution problems by developing safer products, including low-VOC paints, cleaners and adhesives. These products are now commonly available from most major suppliers at costs comparable to conventional products.

Poor indoor air quality is also often caused by biological contaminants, such as mold that grows as a result of moisture infiltration due to inadequate ventilation, poor design and maintenance, and other factors. Dust, another major source of air pollution inside homes, can be reduced by making sure the entryways have easy-to-clean flooring materials such as natural linoleum, bamboo or wood, and by offering a bench and shoe storage to encourage people to remove shoes before entering the home.

Make communities more livable

Whether you are updating the kitchen or adding a bedroom, it's natural to think of a remodeling project as a private affair. But it is important to remember that the remodeling decisions we make don't just affect our own lives. Our choices can also have an impact on other people's lives for decades to come. A home that is remodeled without taking energy efficiency into account will waste energy year after year, resulting in air pollution and global warming that

affects all of us. A home remodeled using poor quality materials may put an unnecessary burden on landfills a few years down the line, if those materials have to be torn out and replaced. Landscaping that sends rainwater directly to the sewer rather than allowing it to sink in the soil strains our aging wastewater treatment systems.

Green remodeling offers remodeling professionals, community leaders and California residents sensible solutions that both improve an individual home's performance and provide broad-based community benefits. These benefits range from cleaner air to reduced global warming impacts, from healthier landscapes to longer-lasting buildings.

Clearly, green building cannot solve all the social, economic or environmental challenges facing California's communities. Still, green remodeling offers a valuable set of strategies for meeting our expectations for livable, healthy, sustainable communities.



Recycled plastic composite decking



Sustainably renovated home

Costs and Benefits of Green Remodeling

There are many reasons to embrace green remodeling. These include health considerations for residents and construction workers, utility and maintenance costs, concern about environmental issues such as global warming and destruction of old-growth forests, and a desire to create higher quality homes.

By applying a sustainable perspective to the remodeling process, green building brings the benefits of resource conservation, durability, energy savings and healthy living. Although all of these benefits are compelling, on any given project you or your client may decide that one type of benefit—such as energy savings or better indoor air quality—is most important.

If you are a building professional, green remodeling skills may help you expand your market and develop an environmentally friendly image for your business. And if you are a homeowner, green remodeling strategies that focus on energy and water conservation can reduce your utility bills year after year. While it's true that some individual green remodeling strategies may cost more, the benefits and value of adopting a green approach to remodeling are vastly higher than any small increase in cost.

Balancing costs and benefits

These Guidelines describe methods and materials that range in cost—some of them cost no more or even less than conventional options. In fact, when a remodeling project is designed from the outset to be green, it need not cost more than a conventional remodeling project. While not all measures described in these Guidelines will be applicable to your project, the measures included are relevant and reasonable for most existing homes in California.

Some of the measures do cost more initially, but this additional cost needs to be evaluated in the context of the longer-term benefits provided: utility and maintenance cost savings, better indoor air quality for residents, healthier jobsites for workers, and longer building life. When considering green building measures, it is very important to balance upfront design, product and construction costs with these other significant benefits.

While most green remodeling practices are just common sense, sometimes the greenest approach requires that

the remodeling professional or homeowner become familiar with a new product or practice, such as incorporating a rain screen wall system when building new exterior walls. Learning new practices sometimes involves an initial outlay of time and money. But green buildings are more than just buildings. They are the manifestation of the homeowner's and building professional's desire to do their part in contributing to a healthier, more sustainable world.

Getting started with green remodeling

These Guidelines are for building professionals and homeowners planning to remodel single-family homes in California.

The methods and materials in these Guidelines range from basic, common-sense practices such as venting bathroom fans to the outside, to more sophisticated strategies such as installing renewable energy systems.

No matter where you are on the green remodeling spectrum—from novice to expert—you can count on these Guidelines for resources, design ideas and real-world advice that you can put to use today.

If you are new to green remodeling, you can start taking steps right away toward creating healthier and more energy- and resource-efficient homes. Inside these Guidelines, you'll find many strategies that are easy to implement and add virtually no cost.

As your experience with green remodeling grows, you'll likely find yourself scaling up to even healthier and more effective design and construction practices. The Green Remodeling Checklist in Chapter Two provides a very convenient way for you to track green features in a particular project. And for remodeling professionals, the Green Remodeling Checklist is also a handy way to benchmark your progress over time as you and your company gain experience with green building.

If you are experienced with green remodeling, some of the approaches and practices described here may already be part of your daily practice. In that case, these Guidelines will help you employ more advanced green-building strategies that will reinforce your organization's leadership position.