

# Building With Vision

Written by Daniel Imhoff

Designed by Roberto Carra

Foreword by Sim Van der Ryn

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*“Building with Vision is timely and extremely useful, a must-have resource for every architectural studio across the country.”*

— Sim Van der Ryn, architect

*“A lens into the future of building.”*

— Zahid Sardar, *San Francisco Chronicle*

## Introduction

Building as if the Forests Mattered

Sim Van der Ryn

First, a confession. I designed and built my share of wood homes, some of them out of old-growth materials. Wood, in the form of dimensional lumber, is simply a wonderful material: easy to work with, warm to the eyes and hand, natural, reasonably durable, the material that defines the trade of carpentry and the standard material for houses and light buildings in North America.

But there are reasons I’ve looked for other ways to build. I was born in Holland, a country with almost no forests and lots of clay. There, as in most of Europe, masonry is the material of choice for light construction, and it is the building industry standard. Visiting the United States for the first time, my Italian son-in-law was incredulous at our profligate use of wood—a material he considered inferior to masonry in terms of durability, fire resistance and maintenance.

About thirty-five years ago, I started experimenting with alternatives to standard wood construction. My partner and I designed low-cost housing with an early panel system using 4x8 plywood sheets bonded to styrofoam cores. I built a weekend home for my family using this system for floors, walls, and roofs. Then I discovered recycled materials, which in the 1960s and 70s could often be had for nothing if you showed up at the right time with a flatbed truck at a demolition site. The house I live in now has windows from old East Bay trains, beams from a dismantled Mendocino mill, stairs made from recycled wine tanks—all free for the asking.

Ancient old-growth forests are the keystone species of unique and awe-inspiring ecosystems—the lungs of our planet, and the host to the greatest diversity of life—whose value to society far exceeds any monetary value to a forest owner. Cutting and using any newly cut old-growth woods—our forest relatives—is the moral equivalent of murdering our living grandparents. I built the exterior of my cottage walls out of salvaged old-growth straight grain Douglas fir that had already spent a useful life as the floors of chicken coops. Thirty years later, they show no wear. Why? Study the growth rings on trees that grew slowly. The densely packed cells in the rings of winter growth may be as many as twenty

slowly. The densely packed cells in the rings of winter growth may be as many as twenty to the inch. Then examine most newly harvested second- and third-growth timber that has grown up rapidly. The summer sapwood growth between the dense winter rings now fills most of the space. In the weather, it oxidizes and rots quickly unless it is constantly painted, and even then it won't last more than several generations.

The non-old-growth wood available today is inferior to the old growth we used in the past. The answer is to use no new wood in the building shell exposed to the weather and in the building frame. Go to other materials and the manufactured wood products featured in this book. Use wood—reclaimed or new—very sparingly for indoor accents, for cabinetry, and special details that feature its warmth and beauty. Reduce the amount of newly harvested wood in homes by 50 to 80 percent and our children and grandchildren may get to experience forests that are more than the sylvan equivalent of cornfields.

Today, as this timely and useful book outlines, we seem to have a multitude of choices available to us in designing and building without destroying forests or polluting the planet. The building products industry—which spends less on research and development than any other industry—is beginning to change because of economic and environmental pressures. In fact, it's difficult for an innovative, environmentally conscious office such as ours to keep up with all the new products and evaluate the various claims made for many of them. For the homeowner or casual builder, the environmental building marketplace presents a dizzying array of choices and claims. It's an exciting time to be an environmental architect!

There are many economic and durable home shell construction systems that are preferable to wood. Our office has used many of these, including straw-bale, stabilized soils, recycled industrial and agricultural fiber and cement boards, steel, even photovoltaic cells that generate electricity while they protect you from the weather. Today, steel is our most recycled building material. A host of other industrial and agricultural waste products and plastics are all good candidates for recycling into new building components.

The total market share of all these products is still very small compared to the total light construction market, and the number of buildings that integrate multiple systems is smaller still. We are in the early stages of a green building revolution. Wider acceptance by consumers and builders will come about as issues and answers become clearer to builders and the general public.

Many people still associate green architecture with the crude experiments of the back-to-the-land 1970s. I plead guilty to designing and building my share of leaky greenhouses, slanting solar walls, clumsy solar hot water heaters, and a mine shaft aesthetic. People don't understand the potential for common sense integration of climate responsive design and materials such as wall and roof panels that produce electricity directly from the sun. Soon builders will be offering green showcase homes to their buyers that create a new, graceful and up-to-date natural aesthetic.

The toughest question is how to make decisions regarding design, materials, and systems when there seem to be so many choices. Interest in green materials and sustainable building techniques is growing rapidly among all types of clients—private, corporate, institutional. It is difficult even for professionals to sort out claims from reality. Lacking independent third party-verification—'The Green Seal'—it is difficult, often impossible, for lay people or even professionals to properly evaluate materials and systems from a sustainable perspective.

Many clients become overly involved in the details before concentrating on more basic design strategies that determine a building's true value, true cost, and its ultimate contribution to a more sustainable society. Some of these principles are listed at the end of Chapter One, "Basics of Resource Efficient Building" (see page 14). I would like to add the questions we ask of clients—the Five Points of Green Building underlying Van der Ryn Architects' and the Ecological Design Institute's approach to sustainable building.

Is it a Tough Building? A tough building is designed to last a long time by specifically addressing the different life cycles of its major component systems. British Architect Frank Duffy identifies five categories from typically longest to shortest life span as follows: site, structure, systems (mechanical, electrical etc.), skin, and ‘stuff,’ i.e. furniture and equipment. But with new materials, these life spans change, and thus the entire design may change. We have found, for example, that the systems for thick wall earth houses, where the skin has a very long life and is difficult to change, must be designed with redundant conduit and ducting for rapid technological change in communications and other systems. Another example is in the commercial building sector. The typical in-the-ceiling high-pressure ductwork is inefficient from an energy and user comfort point of view. Changing office layouts and wiring is cumbersome and time-consuming. This has led to the growing use of low-pressure, shallow, underfloor plenums to provide plug-in electrical and communications raceways — just like home appliances — and highly efficient, warm and cool air directly to work stations.

Is it a Smart Building? Stewart Brand’s *How Buildings Learn* is a useful primer of common sense case studies showing that buildings that have a long useful life are designed to easily accommodate and adapt to changes in use, culture, and technology, while many buildings designed for show or single purpose are not capable of learning and soon abandoned. With our clients, we often use the scenario planning approach to ask the unasked ‘what if’ questions regarding a building’s adaptability to future programs and uses.

Is it User Friendly? A ‘user friendly’ building is designed for people first and recognizes that our bodies and sensing mechanisms are superbly designed to be tuned to natural cycles. Thirty years ago, progressive architects designed schools with no windows (to eliminate distractions — like clouds moving by the windows) and with high-intensity, evenly distributed fluorescent light (on the theory that students could read faster). In designing the Bateson State Office Building in Sacramento, the first major climate-responsive, energy-efficient office building, we rediscovered the obvious: what works in nature tends to work well for people. We are animals not machines, aren’t we?

Does it Provide Better Environmental Performance? The measure here is the ‘ecological footprint’ of your building: all the impacts, direct and indirect, flowing from its sourcing, construction, and operation. The U.S. Green Building Council’s LEED rating system is rapidly becoming a standard for assessing a building’s impact on its site, the waste stream, pollution, indoor air quality, materials use, and energy efficiency. (See [www.usgbc.org](http://www.usgbc.org) for more details.)

Does it Provide Better Economic Performance? We are often asked three basic questions: How much more does it cost to build green? How much longer does it take? How risky are the technologies? Following the information presented in this book and using the process outlined in these five points, we can confidently answer that doing it right costs no more, takes no longer, and adds no risk, although it provides an adventure! Carpenters are fond of saying, “measure twice, cut once!” That is what building with vision is all about.

Sim Van der Ryn is the author of numerous books and the founder of Van der Ryn Architects and the Ecological Design Institute in Sausalito, California. He can be contacted at [www.vanderryn.com](http://www.vanderryn.com).

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