

WELCOME

To Your Greatest Adventure!

You are about to begin the design of a home that is radically superior to any tract house or custom home that you could buy today. Your home will be precisely tailored to your needs. It will be totally comfortable, exceptionally strong and safe, and beautiful. It will be super-efficient, eliminating most of the heating and cooling costs of a conventional house. It will be immune to the health problems that afflict modern housing.

Your super-home will be economical to build. It makes no compromises with appearance or practicality, so it will have an exceptionally high resale value. It will be a superior investment for the conditions that lie ahead.

If you want to expand or renovate an existing house, **SUPER HOUSE** will show you how to reap the benefits of a super-house design in your project.

Designing your own home or designing an addition to your home may be the most satisfying thing that you will ever do. You will create the perfect environment in which your family will live. And, when later generations live in your creation, they will respect your ability and imagination. No achievement is more enduring.

To achieve these benefits, we will spend several months together as we have fun learning about super-house design. You don't need any prior experience with building a house. All the principles and special techniques that you need to learn are here.

You won't need to become a skilled tradesman, and you won't need to deal with the administrative aspects of construction, such as getting permits. That's because you will hire a professional custom homebuilder or a good remodeling contractor to do the construction. Your contractor will provide the knowledge of the conventional aspects of house construction. This book will teach you enough about conventional construction so that you will communicate effectively with your builder.

Is it really possible for a person with no prior experience to design a home that is far ahead of contemporary residential architecture? It certainly is. We will do it with a step-by-step design sequence that gives you the information you need at just the right times.

Even if your dream home still lies years in the future, start planning it now. Designing your home will be an immensely pleasurable activity for you and your family while you wait for the opportunity to build.



HOW WE WILL DESIGN YOUR HOME

We will design your super-home in a series of eight Steps, which are identified by the color bars on the right side of the pages:

- In **STEP 1**, we design the *interior layout*, the *exterior shape*, and the *architectural style* of your home. Your home will provide space for all your activities, along with a dazzling appearance that suits your taste. This is the most creative part of your design.
- In **STEP 2**, we design the *glass and shading* for your home, providing important lifestyle benefits while minimizing your energy costs. This is one of the most interesting parts of your design, providing a major advance over conventional homes.
- In **STEP 3**, we design the *structure* of your home. We make it super-efficient, exceptionally strong, and resistant to weather, fire, and intrusion. And, we eliminate the common problems of foundations that cause settlement cracks and moisture problems.
- In **STEP 4**, we design your *heating, cooling, and ventilation*, providing total comfort under all conditions. We narrow the choices to two highly efficient types of heating and cooling systems, which we will select based on the climate and energy supply of your location. We eliminate all causes of indoor health problems.
- In **STEP 5**, we design your *water and plumbing* systems, which will provide luxurious bathing, conserve water and water heating energy, and protect against waterborne diseases.
- In **STEP 6**, we design your *lighting*, combining ideal visual quality with energy efficiency.
- In **STEP 7**, we select the best *appliances* for energy efficiency, convenience, and reliability. This Step is especially easy, because we will exploit an established system of appliance efficiency ratings.
- In **STEP 8**, we *get your home built*. We explain how to find the right builder, and how to have an effective relationship with your builder. We show how to get your formal construction drawings prepared by a specialist. And, if you need design help, we will tell you where to find it.

YOUR HOME WILL BE SUPER-EFFICIENT

The superior features of your home will be designed around the central principle of energy efficiency. In a typical climate, your super-efficient house will use only 10% to 20% as much heating and cooling energy as a house of similar size that is built to contemporary standards. For much of the year, your home will be comfortable with no heating or cooling at all. Also, your other energy costs, which include water heating,

refrigeration, cooking, and lighting, will be much lower than for a conventional house.

For the first time, **SUPER HOUSE** offers a thorough, fully practical approach to super-efficient home construction. There is no longer any reason to build an ordinary, inefficient house. This breakthrough is based on following five key principles of super energy efficiency, listed in the adjacent sidebar.

Why is energy efficiency so important? The world will soon be a very different place because we are exhausting our supplies of cheap energy sources. The Age of Petroleum will end some time around the middle of the 21st century. Even if we manage to find adequate supplies of new energy sources, their prices will rise to many times present levels. It will not be economical to heat and cool an ordinary wasteful house to the levels of comfort that we take for granted today. However, your super-efficient home will remain comfortable under virtually all conditions.

Your super-efficient home design offers a wonderful bonus. It enhances the other qualities that you want your home to have, including comfort, health, durability, economy, and beauty. For example, when you make the walls thicker to accommodate super-insulation, you will use the greater thickness to make the walls strong, to make them virtually fireproof, and to exploit the sills and wall openings as beautiful stylistic enhancements.

Your super-home will integrate super-efficiency so smoothly that only you and the person who pays the utility bills will know that you have a super-efficient house. Everyone else will think of your home as exceptionally beautiful, interesting, and convenient.

THE INNOVATIONS IN YOUR SUPER-HOME

Your home will have many innovations, ranging from radical improvements to small conveniences. The innovation symbol, shown here, identifies these advances:



This symbol lets you know where your design is being especially innovative.

Many of these innovations appear for the first time in this book. Others are proven advances that have not yet received the attention that they deserve, such as super-insulation. And, some are important improvements to existing technology, such as heat pumps that can operate well in colder climates.

Equally important is what your super-efficient home *won't* have. It won't need a solar system on the roof or a wind generator in the back yard. It won't need outlandish features, like straw bale walls or sod roofs.

THE FIVE PRINCIPLES OF SUPER-EFFICIENCY

Localize Your Energy Use. You live in one room at a time, so heat and cool all the rooms independently. Design your floor plan to isolate unoccupied rooms and spaces while providing convenient travel between occupied rooms.

Insulate Abundantly and Efficiently. Your home will use much more insulation than a conventional house. Distribute it for maximum effectiveness.

Design the Glass and Shading for Maximum Benefit. Optimize the location, size, and orientation of your glass. Design shading for your glass that optimizes the balance between cooling and heating, and that prevents glare.

Minimize Air Leakage and Control Ventilation. Eliminate air leakage through the structure with improved construction techniques. Provide optimum ventilation for health and comfort with localized fans and air inlets.

Select High-Efficiency Appliances. Use efficiency ratings to select each energy-using item in your home.

You won't have to build your home underground. It won't be a humid greenhouse. You won't need to heat your home with corn kernels or other exotic fuels. Because these concepts are popular and some of them offer future promise, we give them a closer look at the end of the book, in a bonus section titled *Last Look: Energy for Pioneers*.

WHAT WILL YOUR SUPER-HOME COST?

One of the main features of your super-house will be economy. Your home will require no expensive or risky features. Construction cost is less than 10% more than the cost of a well built conventional house. The land cost is the same, so the overall cost premium is typically only a few percent. By careful purchasing and negotiation – which you will learn – you may actually lower your cost below the price of a conventional tract house. Your energy savings will pay for the improved features early in the life of the house.

How do we achieve all these benefits without a big cost premium? The answer is that your home will use only proven materials and equipment. All of your home's advanced construction features are based on skills that conventional builders already have. The big difference is that your design will use conventional materials and skills much more effectively.

USING THIS BOOK FOR ADDITIONS, RENOVATIONS, AND REPAIRS

SUPER HOUSE does not make a big distinction between building a new house and upgrading an existing house. The techniques and materials are the same in both cases. Usually, the only difference is the scope of the project. If an upgrade does require some special methods, they will be explained.

If you are building a major addition, go through the book in sequence, from Step 1 through Step 8. While you are doing that, broaden your perspective to improve the original part of the house. For example, if you are adding new rooms, providing their heating and cooling can be an ideal opportunity to replace the house's original inefficient heating system with a highly efficient system that will serve the entire expanded house.

For a more limited project, use the Table of Contents and the Index to go directly to the parts of the book that apply to your project. For example, if your windows need replacement, the coverage of windows in Step 3 will show you how to achieve the perfect installation.

For every kind of repair or renovation, this book will show you how to do it better, including better energy efficiency, comfort, convenience, and appearance.

We're going to have fun. Let's begin!