# The Interior Design Process Part I: Synthesizing Sustainability, Universal Design, And Technology

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## synopsis

*The Optimum Performance Home will be a "high performance building," in which all systems work together to reduce significantly its environmental impact, provide maximum energy and resource efficiency, reduce maintenance and capital costs, and increase the occupants' comfort and health.*

*The interiors of the first Optimum Performance Home will embody and integrate three basic functional concepts: sustainable design, universal design, and innovative technology.*


## Quality Interior Design

Readers of *Ultimate Home Design*® are following the development of the first Optimum Performance Home™ from its beginning as a bold idea combining sustainability and universal design with innovations in technology, to its completion as a dynamic, beautiful, and comfortable family home. We are learning about this process through a series of articles from the owner/designer's perspective describing the challenges and opportunities involved in such an ambitious and innovative project. Upon completion, the first Optimum Performance Home will be a LEED® for Homes (Leadership In Energy & Environmental Design) certified showcase of some of the most advanced, innovative, functional, and beautiful aspects of sustainable, universal design.

This article focuses upon the considerations and processes for the overall design and development of the interiors of the first Optimum Performance Home. Quality interior design plays a significant role in the overall goals for and success of any home, but it is absolutely essential to successfully meeting the extensive and ambitious goals for this home. Far from being limited to the stereotypical practice of "decoration" narrowly defined by the choice of colors, furnishings, fabrics, surfacing materials and finishes, quality interior design involves also a holistic understanding of the context of the entire design—from the site, to the structure, to the systems, to the most intimate experience of the home—the interiors. This approach provides maximum benefits for the homeowners and the environment.





## Functional Design Concepts

The Optimum Performance Home will be a "high performance building," in which all systems work together to reduce significantly its environmental impact, provide maximum energy and resource efficiency, reduce maintenance and capital costs, and increase the occupants' comfort and health. To achieve these goals, the interiors of the first Optimum Performance Home will embody and integrate three basic functional concepts: sustainable design, universal design, and innovative technology. Each of these three functional concepts has distinct advantages, and they also pose some potential challenges in implementation. Great care has been taken to ensure that these three functional concepts are designed to enhance the experience of living in the Optimum Performance Home. However, often we find that sustainability, innovative technologies, and universal design elements are applied with little consideration for how they will be experienced by homeowners. But, our "experience of environments"—how they make us feel and react, and how well they support our physical and psychological needs—is every bit as important a consideration for the interiors as is the number of square feet or the layout of spaces.

In fact, considerations for how we will actually experience our homes should precede and guide all other decisions. For example, when we decide to build an environmentally responsible home, we are committing ourselves to a learning process and lifestyle change that connects us with our homes in ways rarely imagined. Beyond the typical functional requirements and desired amenities we all have of our homes, by choosing to live a more environmentally responsible lifestyle we discover opportunities to experience how deeply our lives affect and are affected by the world both inside and outside the walls we build. If the interior design fails to take advantage of this opportunity, the home will never be truly sustainable.

## The Challenges

Designing for sustainability using the LEED for Homes rating system will certainly increase energy and resource efficiency, improve indoor air quality, reduce waste and the overall environmental impact of the construction, operation, and maintenance of a home over its increased life span. However, some critics have pointed out that LEED fails to consider the ways in which sustainable design can also enhance quality of life issues such as increased productivity, and overall health and well-being.

Similarly, designs that incorporate state-of-the-art technologies can provide enhanced convenience, entertainment, and safety to a sustainable home. But research has shown that if the technology overwhelms the design or fails to be user-friendly, people may reject it or simply won't use it.

The third functional concept, designing for universal accessibility and use, enhances the safety, adaptability, and comfort of people in their environments for their full life span. Universal design is often described as "human-centered design" in which the experience of the user is central to all decisions. But universal design also relies heavily on science, medicine, and technology to create products that accommodate a broad range of personal needs and abilities. As discussed in previous articles in this publication, universal

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design must enhance the users' sense of control, independence, and self-reliance through the use of improved product design and elimination of physical barriers.

The challenge for each of these functional design concepts is to integrate them seamlessly into the home so that the homeowners can effortlessly enjoy their diverse benefits as a natural part of their daily lives.

## Aesthetic Approaches: Biophilic Design And Quality Over Quantity

Sustainable design focuses on environmental sustainability; universal design focuses on social sustainability; and technology helps make them both possible. The interiors must integrate these three components in such a way that the over-

all experience of living in the home is enhanced. The result should not reflect or perpetuate stereotypes but rather be an example of true quality-of-life design.

## Biophilic Design

The interiors of the first Optimum Performance Home are designed using the concept of Biophilia: the human need for nature. I have defined and discussed biophilic design in previous articles in Ultimate Home Design as an important approach to creating environments that enhance our physical and psychological health and well being by providing for direct and indirect experiences with nature. The argument for biophilic design is compelling. Research indicates that we need to experience and interact with nature as a central part of our lives to enjoy a variety of benefits including improved physical skills, concentration and memory; increased productivity; relief from stress and mental fatigue; as well as enhanced aesthetic and spiritual experiences.

Biophilic design is an excellent (and natural) way to meet the challenges of combining sustainable, universal design qualities with the technologies of a "digital home" in a life-enhancing, aesthetically pleasing environment. This approach represents the new design paradigm that seeks to create environments that are healthy for the planet and for people of all ages by understanding our deeply rooted human-nature connection. Because biophilic design is based upon the universal, inherent needs we have as human beings to experience nature as a vital part of our lives, it is essential to integrate biophilic design attributes into all aspects of the design from site to structure to interiors.

Biophilic design attributes are elements and qualities of the physical environment that connect us to the physical, psychological, and cognitive benefits resulting from direct experiences with nature. Dynamic natural light and ventilation, access to open and/or moving water, frequent opportunities for spontaneous interaction with nature, sensory connections with nature, and the use of fundamental natural forms and local natural materials are biophilic design attributes that provide physical links with nature in the home. Symbolic links that appeal to our genetically based affiliation and association with nature and the essential sense of meaning we attribute to the natural world are also important biophilic design attributes. They include concepts of environmental complexity and order, a sense of mystery, and prospect and refuge (strategic viewing conditions from a position of safety and security). These physical and symbolic attributes were discussed in-depth as they applied to the first Optimum Performance Home in the July/August 2006 issue of Ultimate Home Design (Issue 4) and they will be illustrated and discussed further in future articles as the home is completed.

## Quality Over Quantity

A complimentary aesthetic approach to biophilic design is the design principle described by architect and author of *The Not So Big House* series of books and contributor to *Ultimate Home Design* Sarah Susanka as "quality over quantity." This design principle embraces the sustainable idea of reducing resource and energy use by designing a smaller overall "footprint" for the home (i.e. fewer square feet). It also emphasizes the need to fully inhabit our homes by designing flexible, adaptable spaces rich in detail and meaning so that no space is wasted, no space is unused, and all spaces are special.

Susanka provides guidelines to achieve a smaller-is-better design that include biophilic design attributes such as dynamic, natural light and visually/physically connecting interior spaces to exterior spaces. The intimate experience of our homes is greatly enhanced by combining biophilic design attributes with this quality-over-quantity approach. The interiors of the first Optimum Performance Home are designed with intricate details inspired by and similar to those found in nature that fascinate us and connect us with the larger world.

## Privacy Needs

Unless we design smaller homes with careful consideration, they often fail to provide for the diverse privacy requirements a family has over time. Privacy, the ability to control how much and what types of interactions we have with others, is central to achieving a high quality of life. People of all ages, all backgrounds, and all cultures require privacy to maintain physical and emotional well-being. But achieving privacy it is not a factor of square feet; it is a factor of good design.

The book I co-authored, *Designing For Privacy And Related Needs*, discusses the diverse needs for privacy we experience in all environments, including our homes and throughout the stages of life. Our privacy needs indeed do change as we age. Therefore, any universal home design must be responsive to these changes. But because we tend to equate the ability to achieve privacy with more space, we also tend to equate larger homes with more rooms as being more private. The reality usually is: more space is simply more space, and often these voluminous spaces actually provide less privacy than well-designed smaller spaces.

Designing for privacy requires interior features that 1) provide spatial hierarchy (a sequences of spaces that progress from less to more private); 2) create circulation paths that connect but do not pass directly through private spaces; 3) delineate "thresholds" (places of transition) between public and more private spaces; 4) provide stimulus shelters (places to retreat such as alcoves and window seats within larger rooms; and 5) design opportunities for prospect and refuge (a vantage point from which to view your surroundings relatively unobserved). These interior features subtly but effectively provide adaptable, flexible conditions for privacy that are integrated seamlessly into the overall design of the first Optimum Performance Home.

## The Process

Once the functional design concepts and aesthetic approaches have been fully defined, the process of designing the interiors becomes a focused effort involving many individuals. Designing the interiors of any home is a collaborative process between the interior designer, other design professionals involved with the project, and the homeowners. But, as qualified, experienced interior designers know, the interiors are not a separate element of the home, but rather an integrated component of the entire exterior/interior environment of which the home is a part. Creating a successful interior environment for a sustainable, universally accessible, technologically innovative home requires research and education about products and processes as well as an integrated design approach. It also requires a commitment to a changed and enhanced lifestyle.

## Determining Owner Needs And Requirements

The challenge is to develop interiors that incorporate the homeowners' functional and aesthetic requirements while also allowing them to fully experience the enhanced lifestyle of their high performance home. For the first Optimum Performance Home, this challenge involves meeting the multifunctional requirements of an environment that serves as a family gathering place, home office, state-of-the-art home theatre, and intimate retreat—all within a series of sustainable, healthy, adaptable, supportive, and beautiful spaces in a stunning Pacific Coast natural setting.

## Research And Education (Products, Processes, Technology)

The process begins with research and education. Sustainable products, processes, and technologies are changing and advancing rapidly—as are universal design and home technology products and processes. To be better informed about these changes and innovations, homeowners and their design professionals should attend some of the related design industry conferences, seminars, and workshops held each year throughout the United States and Canada. For example, a wealth of sustainable design information is now available to everyone from the United States Green Building Council's gigantic annual GreenBuild international conference, to local and state sustainable design conferences, to workshops and seminars offered by colleges and universities.

Some sustainable design events are directed specifically to design professionals, while others cater more to the general public. The annual West Coast Green conference in San Francisco is the largest residential green building event in the country, combining three days of professional level training courses, seminars, and networking for design and building professionals with a full day for the general public including entry level training and keynote speakers. As a designer, I have found the USGBC's annual GreenBuild conference and the annual EnvironDesign conference to be excellent sources for design professionals. Optimum Performance homeowner, Gary Reber suggests also the National Green Building Conference, The Green Building Conference, GreenBuild Expo, Pacific Coast Builder's Show (PCBC), Solar Power 2007, the Sustainable Living Fair, AltBuild, SolFest, and the National Association of Home Builders Building for Boomers & Beyond: 50+ Housing Symposium.

Numerous magazines, newsletters, and books for design professionals provide in-depth, state-of-the-art information about sustainable and universal design, and home technologies. The United States Green Building Council's Web site: www.usgbc.org provides excellent information on all aspects of green design and building—from new commercial construction to homes, including access to the LEED suite of rating systems. The Center for Universal Design (CUD) is a research center that provides information, technical assistance on most aspects of universal design. CUD evaluates, develops, and promotes accessible and universal design in housing, commercial and public facilities, outdoor environments, and products. Their Web site is www.design.ncsu.edu/cud/index.htm. A must attend conference and trade show is the Custom Electronics Design and Installation Association (CEDIA) Expo and CEDIA Lifestyles Expo, where one can learn about leading-edge home electronics and electronic system integration.

## Integration With Other Design Professionals

Successful sustainable design rarely is achieved by using the conventional, sequential relay-race model for design and construction in which each design professional does his or her part of the work and then passes it off to the next design professional. This traditional process of design and construction isolates professionals from each other, from the interdependent details, and from the larger goals of the project. Because every aspect of a building affects, and is affected

by, every other aspect, the approach to the design must be highly collaborative and multi-disciplinary.

The term “integrated design” refers to a design process that brings together all key members of the project team to work together across disciplines throughout the process from beginning to end. The goal of this process is to achieve high-performance buildings that provide multiple synergetic benefits at a lower cost. Participation from all design and construction specialties including architecture, engineering, lighting design, electronic lifestyle, interior design, landscape design, and construction is essential to the success of an integrated design approach. When all key players work together at key points in the design process, each part of the design is evaluated from multiple perspectives producing more efficient and effective design solutions.

Integrated design ensures that all decisions about the interiors that affect the interiors of a sustainable home are never an afterthought but rather are central to the overall design. The result is a beautiful, comfortable, energy and resource efficient, healthy, life enhancing home for the entire span of the homeowners’ lives.

## Next

Future articles about the interiors of the first Optimum Performance Home will examine how biophilic design is achieved through interior elements and other components chosen and designed via the integrated design process. UHD

**The Author**

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