



The First Optimum Performance Home™

site planning part IV



The Sea Ranch, Sonoma County, California

Gary Reber

Introduction

This is the fourth article in the series documenting the design and construction of the first Optimum Performance Home™. The project has been selected by the U.S. Green Building Council (USGBC) for inclusion in the national Leadership In Energy & Environmental Design (LEED®) for Homes pilot program, their new green build certification initiative.

The home will be built at The Sea Ranch, located in Sonoma County, along the Northern California coastline of the Pacific Ocean.

The showcase project is exemplary of the "Ultimate Home Design™" concept, which integrates age-friendly universal design with the best sustainable building practices while exerting minimal impact on the environment. Universal design is the inclusive, non-discriminatory design of products, buildings, environments, and urban infrastructure, as well as information technologies that are accessible to and useable by (almost) all. With respect to home design, the idea is to design and build homes that have no physical barriers, thus sustaining people of all ages and all capabilities in a functional, comfortable, and aesthetic lifestyle.

A building science systems approach to home building is the cornerstone of the project with emphasis on the relationships between the home's components and the envelope they create. Also

"The Optimum Performance Home's site plan is designed to strongly support the efficient use of the community's water supplies, equitable allocation of water resources provided by the community and harvested on-site, elimination of water pollution and contamination from poorly-designed or failing septic systems, and general land use patterns that conserve and protect water resources within the overall ecosystem at The Sea Ranch."

paramount is good stewardship—proper regard and respect for the rights of neighboring homeowners, resource efficiency, and the surrounding natural setting. The goal is to optimize occupant health, comfort, and safety; maximize energy efficiency and structural durability; and minimize environmental impact. Many of these goals are intrinsic to the LEED criteria and procedures. In addition, the aim is toward providing a nurturing home environment to support independent living and sustainable lifestyles.

Part I of this case study series appeared in Issue 1, January/February 2006. The introductory article extended to 16 pages and covered extensively the project scope. Part II appeared in the March/April issue and focused on site planning and preparation. Part III expanded on the approach to Low-Impact Development (LID) for the site.

This is Part IV, which presents a further refinement to the site plan and drainage design, which still has not received final approval from The Sea Ranch Design Committee, which appears to be the final hurdle to be met before the project is submitted to the Sonoma County Building Department for final structural and code approval, which is necessary to obtain a building permit.

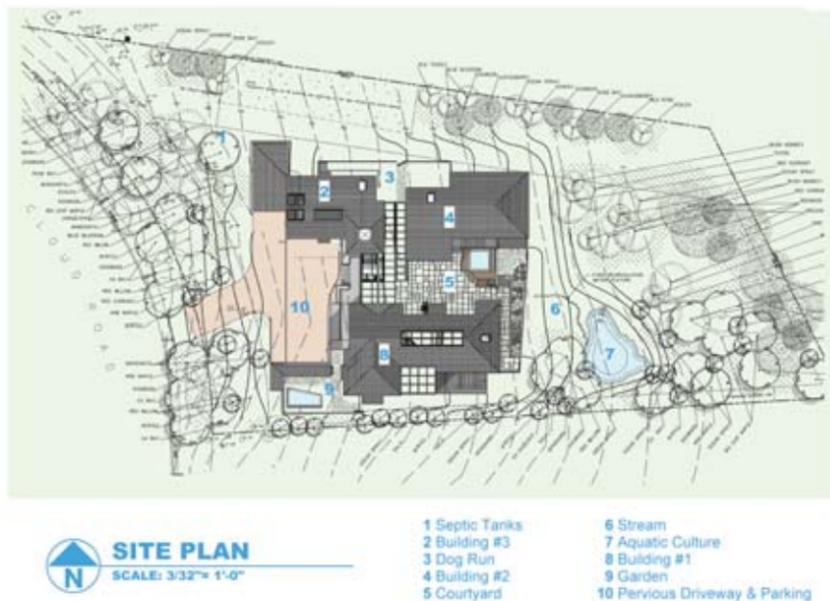
As noted in the previous articles in this series, the home design integrates all of the concepts advocated in Ultimate Home Design™. I conceived the "Optimum Performance Home"

synopsis

As with any "planned" development, especially one sensitive to environmental impact, one should expect refinements to the subjectively interpretive design guidelines and rules over time, while adhering to the founding principles expressed in the CC&Rs.

The Optimum Performance Home project could be argued to be a microcosm of the design and building challenges facing participants as The Sea Ranch development approaches build-out.

Paramount is good stewardship—proper regard and respect for the rights of neighboring homeowners, resource efficiency, and the surrounding natural setting.



and “Ultimate Home Design” concepts, and have a vested interest, as this will not only be my home but my office as well. My goal is to demonstrate how today’s products and building methods can make life safer, more comfortable, and more enjoyable. The science of optimum performance homes is about building structures that use less energy, are quieter and more comfortable, have fewer problems with material degradation, provide clean air and water, and do less damage to the environment. As an integrated holistic design, the house will serve as a home for many people and serve in many phases in one’s life.

An “Unbelievable” Case Study

The approach I am taking with this series of articles on designing and building the Optimum Performance Home at The Sea Ranch is to present a case study, which details every phase in the design and building of this

Platinum-slated certified LEED home project (see “So You Want A LEED® Home—What’s It Going To Take To Get One Built?” on page 56).

For our readers who have not personally experienced such a process, we believe that this serialized documentation will be enlightening and beneficial to approaching your own home design and building project (see “The Architect’s Role As Designer And Implementer” in Issue 2, March/April, 2006 and “So You Want A LEED® Home” in Issue 3, May/June 2006).

Of course, this is our experience, and not all aspects of our approach will apply to your project. Nonetheless, there will be aspects of our approach that will be educational and useful. I hope that, as a result, you will be rewarded with a better appreciation to the extent of commitment necessary to successfully design and build a new home with as much respect for the natural environment as this project demonstrates.

Home Visions

We all have different visions of our ultimate home design, which express our individualism—a deep-rooted trait ingrained in the collective American psyche.

Common to the visions expressed are the desire for our homes to be beautiful, comfortable, and respectful of Mother Earth. Our responsibility as the caretakers of our planet should be to wisely use her sustainable resources. To realize such a dream and turn our dream homes into reality often presents challenges and obstacles that appear, at times, to be insurmountable. I have often pondered, while engaged in this leading-edge green building project, whether the notion of responsible sustainable green building can ever become the norm.

About Architects And Landscape Architects

As I noted in this article series in Part III, Issue 3, over the course of a four-year period that I have spearheaded the design of the first Optimum Performance Home at The Sea Ranch, I have become aware that what is needed is a more direct link between the design community and the responsibility they exercise in the building process as it impacts a sustainable and interconnected community. Too often, design teams, including design committees and planning commissions, are “not interested” in trying to incorporate something they are “not familiar with.” Too often “architectural design” overpowers “function” to the detriment of alternative sustainable solutions, and, as a result, saddles communities with undesirable environmental consequences. This is a lose-lose proposition that forces progressive property owners to adopt less-than-optimum design compromises in order to receive the necessary approval from such oversight authorities in order to build.

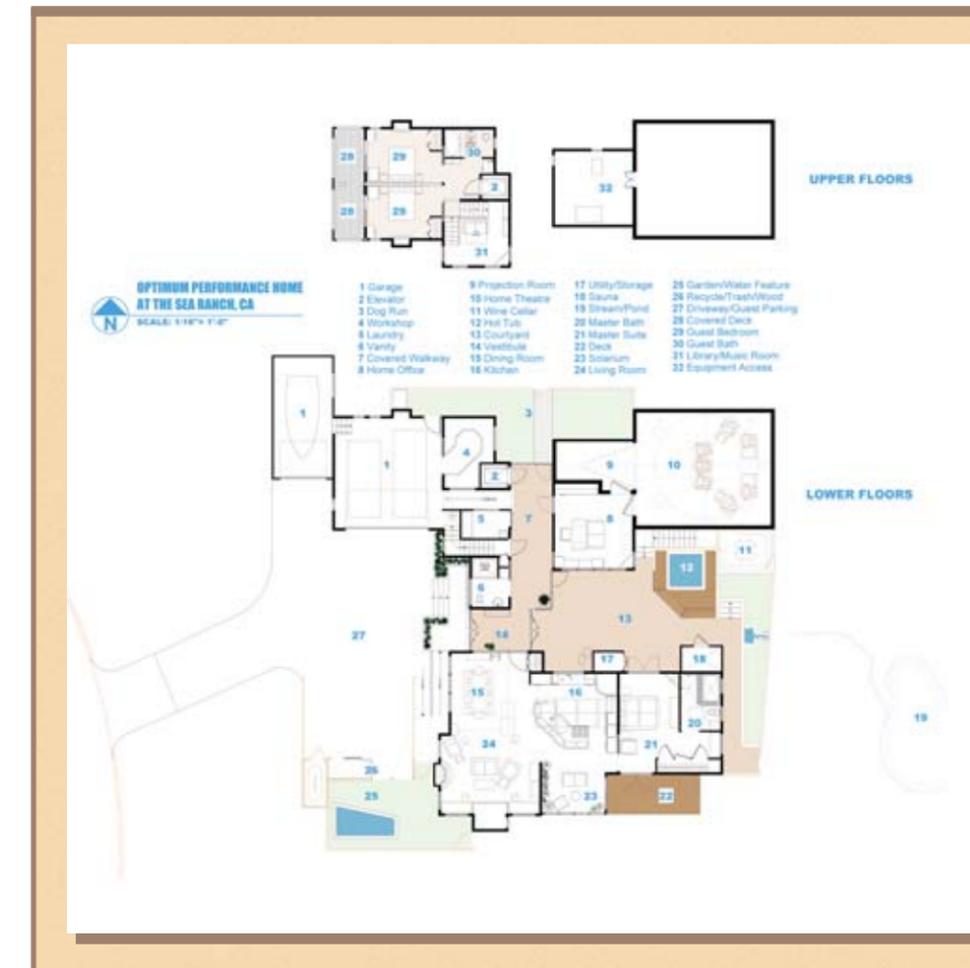
This is the quandary that the Design Team and I face in turning our dream home project into reality at The Sea Ranch.

As such, the often-agonizing process of design review that we have been documenting will probably be read as an “unbelievable” case study in trying to gain support from the members of the architectural profession that comprise The Sea Ranch Design Committee. These professionals serve on a paid basis and are appointed to the Design Committee by the Board of Directors of The Sea Ranch Association, a Common Interest Development.

In this series, we have fully documented our efforts to promote sustainable design and resource conservation and embrace new building science practices that truly result in a home that touches the earth lightly during both construction and day-to-day operations once built, and respects the beauty and diversity of the natural setting surrounding it. (We have not fully documented the unbelievably agonizing process we have endured for obvious reasons. After all, we seek agreement and support, not dissension and denial.) Yet we continue to be challenged with new (and old but thought-to-be resolved) conditions as we seek final construction plan approval so that we can then proceed to obtain a building permit from Sonoma County.

The essential issue continues to be the site planning as related to drainage and landscaping. Rather than take a leading proactive role in treating us as one of their architectural clients and really guide us in the design specifics that will meet their approval and realize our dream, the experience continues to be an expensive, time-consuming trial and error, acceptance or denial process, which is now six months into the third year of the project’s design review.

One landscape architect member of the Design Committee, in particular, will not accept our credited and nationally respected licensed environmental engineer’s proposed solution, even though he has warranted that his site plan and drainage design will function as documented. Our environmental designer’s proposed LID solution



addresses the wet condition on our site due to the lack of control of drainage originating on the adjacent two lots abutting the east and south of the project property.

Landscape architects are self-described as practitioners of urban design and revitalization, site planning, responsible land use, and community master planning that protects and enhances natural, cultural, and scenic resources and avoids environmental degradation by respecting ecological systems and landscape character. They are supposed to be competent in the design of innovative approaches to provide for the efficient use of water and the protection of water quality. This includes the design, planning, and management of coastal zones and waterways, enhancement and revitalization of wetlands, wastewater

treatment, storm water management, and irrigation in all climate zones.

As professionals, architects and environmental designers are supposed to be trained, educated, experienced, and ethical, as well as have integrity. Their clients look to them as professionals for all of the above, including leadership, listening, and solving problems in a practical manner.

Codes And Established Methods

The Optimum Performance Home’s site plan is designed to strongly support the efficient use of the community’s water supplies, equitable allocation of water resources provided by the community and harvested on-site, elimination of water pollution and contamination from

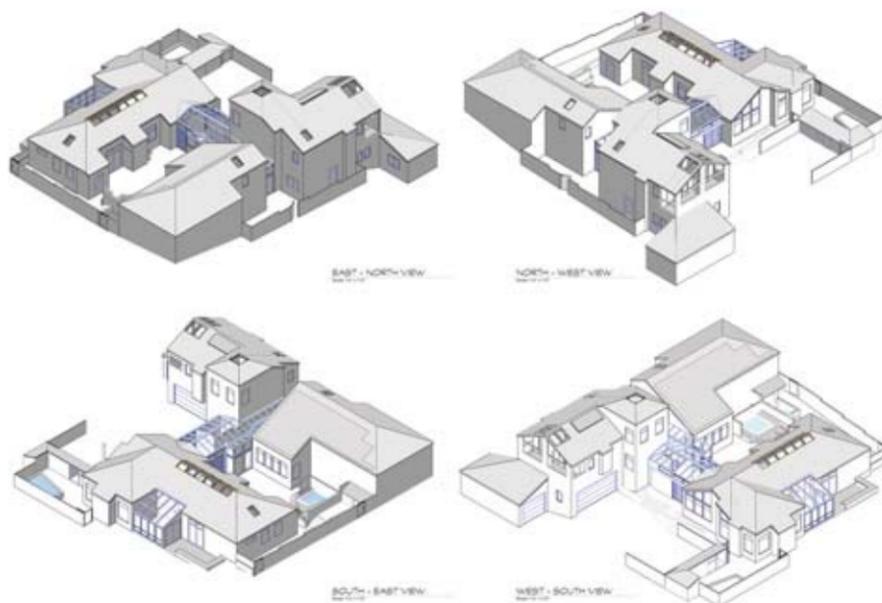


Above: A perspective of the southwest view created by architectural designer Ed Rose.
Below: Four perspective views of the Optimum Performance Home at The Sea Ranch

poorly-designed or failing septic systems, and general land use patterns that conserve and protect water resources within the overall ecosystem at The Sea Ranch. The water-efficient site plan and drainage design promotes "smart water use."

As noted in Part II in Issue 2, a frequent observation in the environmental design community is that codes and established methods often present barriers and restrictions on projects that are attempting

to be more resource-efficient or accommodate a better environmental "fit." And while this particular project must comply with a distinct set of guidelines and rules and pass before a design review committee, most green building projects will have a similar experience in adjusting to codes and going before planning commissions. In addition, members of planning commissions and design committees are frequently architects or



design professionals themselves, and may have strong opinions about how a project should look or what the standard of practice should be.

In our particular case, I believe that putting forth the Design Committee's specific solutions that they would support and approve would have effectively condensed the process down to a year and six months, rather than three years and six months, while still counting days, weeks, and dreadfully months to final approval. Such a proactive role on the part of the Design Committee and staff would have further resulted in far less expense overall, both in terms of the cost burden on the client for professional design services and the escalating cost of construction, and costs borne by the property owners who comprise The Sea Ranch Association and employ members of the Design Committee.

Preface

As a Californian, I am very conscious of the examples that California and the Pacific Northwest have set forth as this territory has become recognized as a mecca for green designers, architects, and builders practicing sustainable design.

In 1965, The Sea Ranch development became the first development of its kind that embraced environmental conservation on a large, community-wide basis. Architecture at The Sea Ranch embraces the natural lay of the land as implemented in environmentally-sensitive site-specific home design. The Sea Ranch builds on the ideals of preservation and appreciation of the rural coastal history and respect for the land.

In the early years and into the 1980s, amenities and services to support full-time living were limited and, as a consequence, homes were small, poorly insulated, resource and energy inefficient, and regulated to second home usage. Since the 1990s, the level of amenities

and services provided in the surrounding area has become more substantial and, as a result, is attracting a progressive class of younger professionals who want to remain productive and have the resources to sustain an independent lifestyle, while living in this beautiful development. This new generation of Sea Ranchers, while at present with little political clout, are demanding much more finely crafted home designs that respect the past architectural pallet but provide more room for living a full-time productive lifestyle facilitated by advanced electronic communication. This trend propelled by "baby boomers" is the future of The Sea Ranch. Home design will be based on serving the personal needs and requirements of this new generation of independent, entrepreneurial homeowners, which is destined to result in a wave of new larger homes on vacant lots, and remodels. As of May 2006, there are 1,716 homes built and 573 undeveloped lots—all spread over 5,000 acres of which approximately 2,500 acres are permanent nature preserve in the form of community commons.

This is the context in which the Optimum Performance Home project must perform, while respecting the environmental sensitivities The Sea Ranch has embraced.

Site-Specific Design And Low-Impact Development

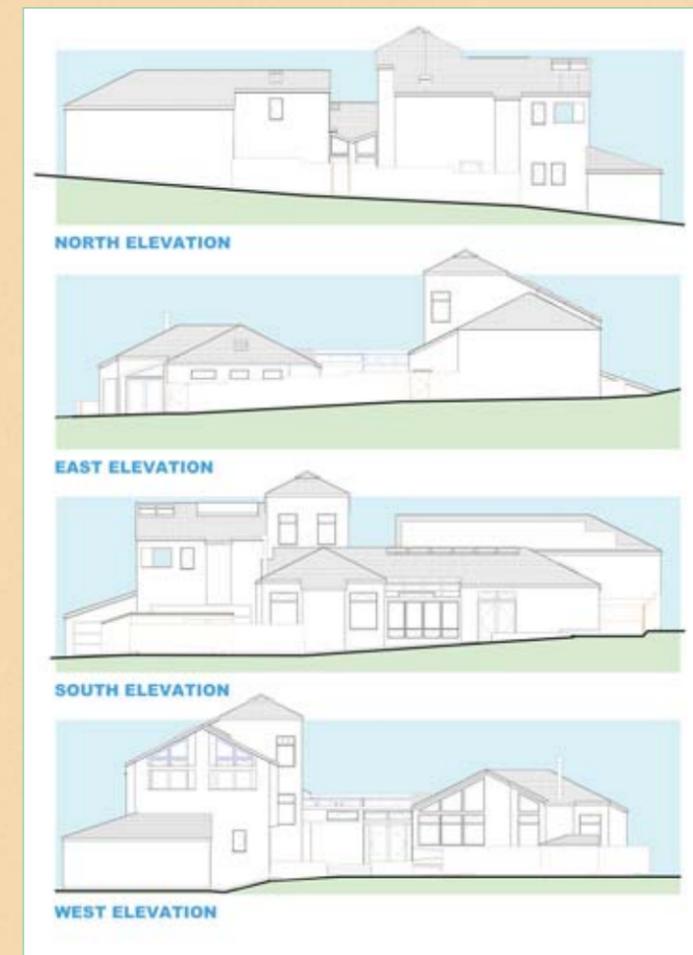
Gary Reber & Bill Wilson

At the core of The Sea Ranch concept is a set of guidelines for development with a strong sensitivity to environmental stewardship. These guidelines, which were thought out and incorporated into The Sea Ranch Declaration of Covenants, Conditions, and Restrictions (CC&Rs), embody the principles that development of home sites are to embrace. These principles

are expressed as design criteria and rules interpreted by three (six, including alternates) Design Committee members appointed by the property owner-elected Board of Directors of The Sea Ranch Association.

It bears repeating what was written in Part III. Over the years, the implementation of the guidelines, which are, for the most part, subjectively interpreted, has resulted in greater demands on recent projects and their owners, who have endeavored to design and build their dream homes under the same rules that applied to other property owners who engaged in the design process before them. As with any "planned" development, especially one

sensitive to environmental impact, one should expect refinements to the subjectively interpretive design guidelines and rules over time, while adhering to the founding principles expressed in the CC&Rs. The impact is that property owners in the design process are subject to new interpretations, rules, and limitations that were not imposed on homeowners who bought property and made plans under earlier interpretations of the guidelines, particularly now that the development is in the build-out and "infill" stage. As well, precedents may be applied differently than in the past. The Optimum Performance Home project could be argued to be a microcosm of the design and building challenges



The elevations of the Optimum Performance Home at The Sea Ranch

facing participants as The Sea Ranch development approaches build-out.

During the last few years, new thinking about the use of sustainable and renewable materials and building science approaches and techniques, and on-site energy generation, have been taking hold on a national level. This new thinking is the future of environmentally-responsible housing development, aimed at better stewardship of Mother Earth. The Sea Ranch planners and designers are faced with this new reality, which is challenging them to expand their thinking and application of the long-standing guidelines. The guidelines, in turn, were envisioned to protect The Sea Ranch concept from degradation of the natural environment and the perceived blight of typical subdivision development, done without regard to good site-specific design.

When one purchases a lot at The Sea Ranch, one must assume, as does the community, that responsible property

owners will respect and adhere to the philosophy and requirements of the Design Manual and Rules, as well as The Sea Ranch CC&Rs, which read:

“It must be assumed that all owners of property within The Sea Ranch, by virtue of their purchase of such property, are motivated by the character of the natural environment in which their property is located, and accept, for and among themselves, the principle that the development and use of The Sea Ranch must preserve that character for its present and future enjoyment by other owners.

“It is also assumed that those who are entrusted with the administration of The Sea Ranch will discharge their trust in full-recognition of that principle and, to the extent consistent therewith, will foster maximum individual flexibility and freedom of individual expression.”

It has always been the intent in designing the Optimum Performance Home at The Sea Ranch to respect

and adhere to the philosophy and requirements of these documents in terms of natural settings, simplicity and modesty of development, and sustaining the predominance of nature.

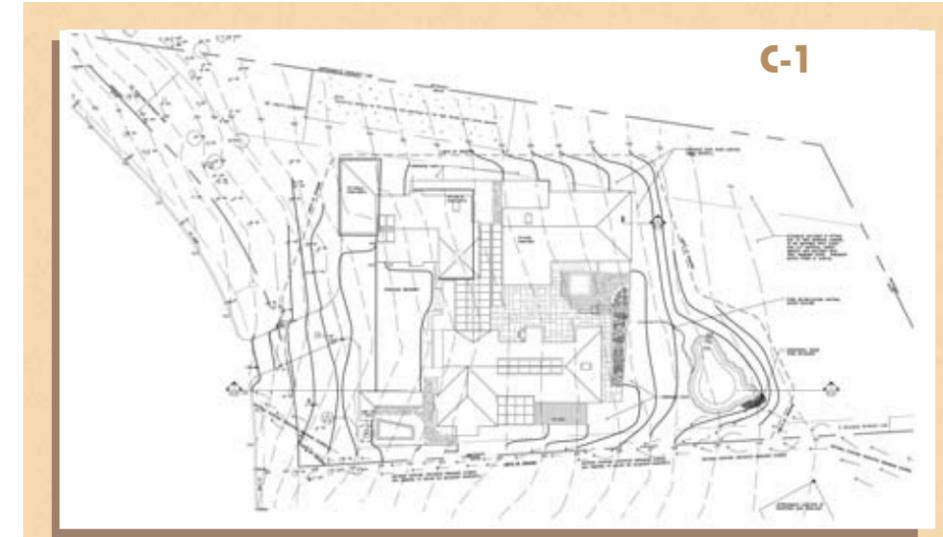
With respect to the preservation of the character of the natural environment, the guiding principles in the environmental design and site preparation and development has been to employ resource-efficient sustainable design and development practices. The intent has been to reduce the environmental impacts and harm to natural systems, enhance environments and human health, and avoid, minimize, and mitigate the adverse effects of modern construction practices.

Just as the Low-Impact Development design features seek to foster a healthier watershed and, hydrologically speaking, approach “zero impact,” so is the intent to improve the energy performance of the proposed home in such a manner

that it effectively will be nearly a net “zero-energy home.” To accomplish these twin goals, site design includes saving indigenous trees and unique natural vegetation, constructing on-site storm water retention/infiltration features to integrate with the natural hydrology, preserve and enhance habitat, orient buildings to optimize solar resources, use of active renewable energy systems, optimizing passive solar design, and making water and energy conservation choices in fixtures and appliances.

The Optimum Performance Home is designed to be a building that touches the earth lightly during both construction and day-to-day operations once built, respecting the beauty and diversity of the natural setting.

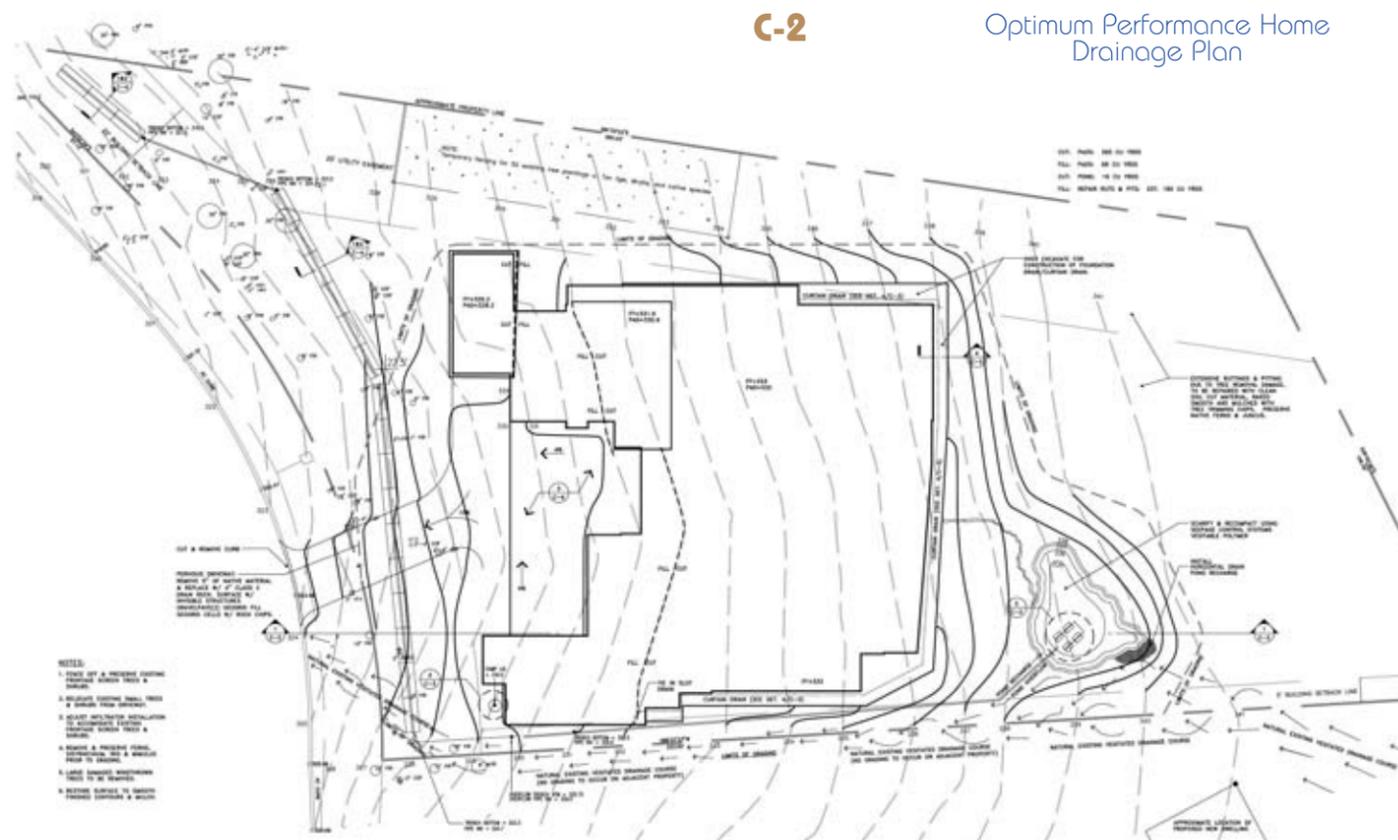
These measures are at the center of designing and constructing green homes that satisfy the human physical and psychological need for contact with nature. At the core of the architectural design



Optimum Performance Home Grading & Drainage Finish Grades

of the Optimum Performance Home is a built habitat that is full of daylight, sunlight, natural fresh air ventilation, outdoor views, and indoor and outdoor green spaces—a habitat that achieves a harmonious relationship between its occupants and the natural environment.

(Please see Julie Stewart-Pollack’s article in this issue on the biophilic design characteristics of the Optimum Performance Home. Biophilia is the idea that people possess an inherent affinity for nature, and when applied to the built environment, it enhances people’s



C-2

Optimum Performance Home Drainage Plan



Optimum Performance Home Landscape Plan

L-1

- 1 Septic Tanks
- 2 Building #3
- 3 Dog Run
- 4 Building #2
- 5 Courtyard
- 6 Stream
- 7 Aquatic Culture
- 8 Building #1
- 9 Garden
- 10 Pervious Driveway & Parking

physical and mental well being through positive connections to the natural environment.)

Environmental Plan Options

As described in Part III, our approach, in essence, strives to adapt the planned development to the background hydrology at the site, the regional hydrology that affects the site, and the site's position in the overall watershed. The ultimate goal in utilizing this approach is to balance necessarily impervious surfaces, such as building roof area with enhanced infiltration and storage of rainfall and runoff, eliminate unnecessarily impervious areas like driveways and walkways and replace them with pervious paving, maintain high water quality, enhance infiltration and groundwater recharge, enhance interflow, and maintain the incremental contribution over time to the base flow of regional streams.

Sheet flow and runoff crossing onto the site from the neighboring property to the south are indicated on drawing C1 by the arrows designating the existing, pre-development flow pattern along the southern property line. The existing natural vegetated swale meanders somewhat back and forth across the property line, with the majority of flow taking place on the neighboring property until the front of the two adjacent lots. At this point, as indicated, it spreads out and tends to swing onto the project site. This natural overland drainage pattern will be preserved, and no grading is to occur on the neighboring property to the south. A DVD of the natural drainage pattern was sent to the Design Committee showing a walk-through along the southern property line.

The LID plan for the site seeks to distribute runoff at every opportunity, as close to the source of the runoff as possible.

In contrast, conventional drainage planning generally collects runoff from different sources and discharges it off-site through a pipe, or more recently

with some sort of accommodation being made to water quality and detention requirements, such as a detention basin or infiltration trench.

Since LID is a distinct departure from the conventional drainage plans that have previously been implemented on The Sea Ranch, in which runoff is directed to the drainage in more direct ways, and because of the unique hydrology of the subject parcel, the proposed LID environmental plan requires consideration and study to form an impression of how the integrated systems will work and to better understand the project in context. It is admittedly difficult to derive this kind of information piecemeal from a set of finely-scaled drawings. In appreciation of this, the following will attempt to clarify the elements of the environmental plan that were presented to the Design Committee on June 2, during the current Final Construction Plan submittal stage. This is the latest revised and updated submittal, which addresses the last set of conditions conveyed to the Design Team in telephone and in-person communication with the Design Committee and their staff.

The current status of the project remains as Preliminary Plan approval with conditions for Final Construction Plan approval to be reviewed on June 2. Unfortunately, our printer's deadline does not allow us to cover in this article the outcome of the Design Committee's action on our submittal of an updated set of drawings, which hopefully, comply with and satisfy the Design Committee's *last* conditions for approval.

What follows is our response to their remaining issues as we have interpreted them, drawing on the recommendations and preferences expressed by the Design Committee over the course of previous submittals, communications, telephone conversations, and meetings. Some of the modifications could be regarded as fairly drastic at this stage in the proceedings, such as the indirect inference that a slice be taken out of the middle of the house to enable a two-foot

additional setback from the south property line, which was done. This was done, along with provision of an upgrade to what had been a rough grading plan.

Screening And Reduction Of Apparent Building Mass

Two mitigating elements were requirements of the Design Committee in the Preliminary Plan approval stage: a) "the visual screening of the development provided by both existing and proposed on-site vegetation," and b) "the reduction of building mass provided by 'digging' the structure into the grade at the east side of the lot."

The other major constraint has been the generally wet condition of the site, which is subject to sheet flow from adjacent properties as well as having groundwater moving across the bedrock, only five or six feet below the surface.

Drainage

To avoid having to place a curtain drain across the entire lot uphill of the property, a combination foundation drain and curtain drain has been designed within the pad excavation footprint, which wraps around the rear and sides of the building compound (see drawing C-2), and building materials and a building and foundation system have been selected, which will provide moisture protection to the portions of buildings that are below grade.

Once the water reaches the front of the building, Infiltration chambers are designated for shallow burial across the front of the property, in an open area between the house and the frontage trees and shrubs. This band of Infiltration chambers will provide an optimized way for excess water to be re-integrated with the groundwater and the natural gradient, and actually correct a pre-existing problem that contributed to the downing of several large pines and the nearly continuous saturation of parts of

the surrounding area and frontage.

Unfortunately, the use of the Infiltration chambers and their location relative to the remaining understory tree screen across the frontage was not clearly understood at our initial Final Construction Plan submittal, but we are sticking with this approach as it is a sound engineering approach and supports the LID objective.

The band of Infiltration chambers that is planned across the property frontage is part of the integrated system designed to balance the perched shallow groundwater, seepage, and sheet flow that move across the property from the neighboring south and east properties. The purpose of the Infiltration chambers is to work in concert with the proposed foundation and curtain drains that will intercept groundwater behind and around the sides of the house and return it to the groundwater in front of the house. The combination foundation and curtain drains are from grade to at least one foot in depth into the bedding formation, which is generally about six feet below grade across the site.

An earlier rendition of the home design (depicted on the approved Preliminary Plan) showed the house as earth-banked to set it deeper into the ground and reduce the apparent bulk in the now-deforested landscape. But following that Preliminary Plan, we submitted a plan that set the buildings the same depth into the terrain, but banked away from the buildings so that soil moisture would not be up against the walls. The visual effect (reducing apparent mass) was the same, since anyone viewing the site from "across the way" would not see the receding banks, but would rather just get a view across the plan of the land and see the recessed house. Despite arguments that this was a sounder approach to meeting the visual goals and dealing with a major site constraint (the hydrology), it was rejected.

Our updated drawings submitted for the June 2 review show the previously approved earth-banked implementation. Thus, on the recommendation of the Design Committee, and in keeping with the Preliminary Plan approval for the project, the submitted grading and drainage plan shows the compound buildings earth-banked, rather than showing the surrounding earth sloped back. The building pads will be over-excavated beyond the final building footprints by a few feet to accommodate construction of the foundations and drainage systems, and then built up to the finished grade.

This was not our preferred solution, as our desire was to minimize slope disturbance, as well as to minimize soil disturbance and erosion, and to better protect the building materials from the hydrostatic pressure and potential long-term damage due to the constant moisture. Part of the decision included a determination that construction of the deep curtain drain across the back of the property would, in balance, be just as disruptive as the extension of the house pad cut by a few additional feet, and would result in a less reliable method of protecting the home and building materials from the continuous presence of groundwater and seepage. This was arrived at based on the geology and soils report provided by Keith Colorado, a project engineer with BACE Geotechnical, based in Santa Rosa, California.

With this design, as with the previously proposed sloped grade adaptation behind the house pad cut, the pad cut still has to be cut back as shown, in order to construct the foundation regardless, regardless of whether or not the ultimate construction would be earth-banked in order to construct the foundation, then backfilled with engineered fill.

The Infiltration chambers are to be carefully installed and set back toward the house from major tree roots and the existing screen of trees and plants that currently exist at the site. The trench

bottom is to be shot dead level (with a transit), so that any excess water that is introduced to the Infiltration strip will tend to redistribute evenly across the site, and infiltrate back to groundwater, which is perched across the site at approximately 5- to 6-feet below grade at the boundary of the overburden and bedding formations. The trench bottom for this Infiltration strip will be approximately 2.5- to 3.5-feet below grade.

As previously stated, the Infiltrators are to be installed between the frontage screen and the residence, outside the drip line of any trees, and without damage to any supporting root laterals. As with all aspects of this project, a great deal of care and attention will be placed in the construction of the home. The intent and design of the Infiltration chambers is to preserve the native hydrology and enhance groundwater recharge, and this will prove beneficial to the landscape, existing or planted, rather than detrimental. The Infiltration chambers, working in tandem with the pervious driveway, will also alleviate the saturated conditions that persist for long periods along the frontage of the property that result when the asphalt street and curb act as a dam to sheet flow moving across the site.

Also, as previously discussed, the area was planted with large pines back in the '60's, which grew (30-inch plus trunks), matured, declined (due to drought, beetles, and other factors, and finally blew down in the high winds of November, 2003.

Landscaping

The Vegetation Management Plan (the Roberts vegetation plan), for management of windthrow properties, has been closely studied and adhered to in the careful environmental design of this site. The Vegetation Management Plan clearly supports the use of understory trees, such as laurels and wax myrtles, in the manner in which the site's environmental plan intends to establish them, as

well as the selection of redwoods for the rear of the property to the east.

In addition, the Vegetation Management Plan recommends against such screening trees on wetter properties, and the interception of cross-site sheet flow and seepage will actually help to preserve the remaining frontage vegetation, which has been subject to extended periods of soil saturation. The integrated system for handling this cross-site water, including the Infiltrator chambers, will eliminate the present condition, in which sheet flow overflows onto the street along the entire Fly Cloud Road frontage, along which the site is located. This sheet flow begins on the property to the south of the site, and is present for much of the year, creating saturated soils around the entire existing screen of trees and shrubs.

We have fully embraced the Vegetation Management Plan, which provides for a wide variety of vegetation species, which we have incorporated into the landscape plan. The selection and variety has also been done with an eye towards providing habitat and a succession of flowers, nuts, and seeds year-around, to support birds, butterflies, and foraging animals. The landscape selection makes use of the managed extra moisture that this site features and which is not generally available at other sites, and which could enable the site to support a higher order of landscape without irrigation. This includes several native bulbs of considerable beauty, such as purple iris and Tiger lilies. While other, drier sites may be somewhat limited in native plant selection, this one could be naturally lush, and indeed, left clear of the tall trees that had previously crowded out other species, it is becoming just that without any encouragement or intervention. (See drawing C-1)

The Design Committee has expressed concern that too many varieties are implemented in the landscape plan and have indicated that a further

possible condition will be to reduce the number of plant species. Yet the Vegetation Management Plan does not specify that plant species shown appropriate for a particular site need to be limited in their diversity and implementation, leaving the homeowner to somewhat guess what will be acceptable.

The existing frontage plantings consist of a mix of Douglas firs, madrones, myrtles, laurels, tanoaks, coffee berries, and ferns, with some pines (targeted for removal) remaining in the overstory. As expressed in the landscape plan, the frontage screening is to be enhanced by infilling this remnant screen with dogwoods, maples, rhododendrons, and azaleas, and a lush understory of ferns and native irises. Except for the driveway entry, the goal is to completely screen the home to well above eye level. Additional screenings are designed for the areas between the Infiltration chambers and the house, creating multiple layers and a very effective visual masking of the home itself.

Native plants are to be collected from the site and preserved in a field nursery prior to grading, including irises, sisyrinchium, mimulus, ferns, small coffee berries, and other species of interest. Initial plant collections made during the tree clearing have been successful, and the plants are to be replanted as ground cover and understory following construction. The Sea Ranch stockpiles greenwaste to be chipped and made available to property owners, and a deep mulch cover will be used to restore bare areas and help infiltrate rainfall, as well as supplying soil humus.

The neighbor to the north has already planted a fenced area containing 50 tanoaks and myrtles, with trunk sizes ranging from 1 to 3 inches in diameter, as indicated on the landscape sheets, and these screen trees have been indicated by trunk diameter rather than ultimate canopy, as are other existing trees that make up the frontage screen. This planting straddles the northern

property line and into the PG&E right-of-way on the parcel, and when grown out will effectively screen off the planned buildings from the neighboring property.

The landscaping is expected to require only spot irrigation during the late summer and during the hot period, usually occurring in the fall for the first two years, and then be self-sufficient.

Plan Elements

A level "pad" is to be created below the building footprint as part of the universal design requirements for the residence. The design of the building pad was undertaken specifically to "build to the site," to not involve excessive grading or excavation, and to not involve engineered slopes or excessive fill. This includes the following elements of the plan, which are presented again in our latest submittal:

- The design plan is to preserve native topsoil and hold any graded topsoil aside for replenishment of areas that have been damaged by the tree removal activities and any areas exposed during construction. The plan anticipates mixing cut soil with mulch, spreading it in a thin layer, and re-establishing regenerative topsoil.
- The entire water handling system is designed to alleviate existing problems at the site, which were to some degree responsible for the downing of major trees and are even currently impacting the asphalt paving of Fly Cloud Road.
- The drainage plan is designed to positively affect existing vegetation and foster beneficial growth in new plantings by removing excess saturation, while preserving ambient soil moisture and healthy topsoil conditions.
- The drainage system is designed to deal with the existing problem at the site and prevent future drainage problems.
- In a very elaborate and detailed way, the house is "tailored to the site, not the site to the house."
- A hydrologic plan has been developed to intercept the water that moves

across the house site, transfer it around the house, and return it, through Infiltration chambers, to the natural hydrology in front of the house, using a pond as a stabilization feature on the whole system. This should effectively address the movement of water from the neighboring properties across the site, providing a dry pad, while at the same time maintaining the existing natural hydrology.

• One of the factors that has influenced the design is the easement for power lines along the entire northern property line. This necessarily has pushed the home over to the southern side of the property. This creates a false impression that the lot is smaller in size than it actually is and that the home is larger than it actually is. In reality, there is a significant belt of open space along the entire northern side of the property. But to satisfy a new Design Committee condition, we have moved the main residence north two feet to provide more space along the southern side of the property for drainage and vegetation planting. This, unfortunately, has resulted in a reduction in the depth of the courtyard and vestibule entrance.

• Additional refinement of the slope of the driveway has resulted in further minimizing the grading in keeping with disturbing the natural environment as little as possible. As mentioned earlier, this involved taking a 2-foot slice out of the middle of the house plan. This also necessitated some additional design of steps, a deck, and a ramp leading to the main entry vestibule doors, which now creates a more dramatic entrance.

• The driveway and the path leading around the home's perimeter are to be constructed using drain rock in the base and Invisible Structures Gravelpave. As such, they will infiltrate runoff and transmit it to the infiltration system or to a foundation drain, obviating the need for surface inlets.

• The site has been extensively rutted during tree removal, and some additional

tree removal remains to take place. Excavated soil from the building pads and tree chips will be used to restore the rutted areas, consuming all or most of the excavated soil from the recessed pad excavation not otherwise used as fill. The repaired areas will be replanted.

• Extensive site controls will be integrated into the management of the site during construction, so that no silt leaves the site, and runoff is managed and controlled and retained on the site.

To summarize all of this, interaction between the LID grading and drainage design, the Permaculture and native plants landscape design, and the placement and design of the home, are all intended to work together to result in a well-integrated, successful project on a difficult site.

The Pond

The Design Committee in a previous meeting and letter expressed concern that the proposed pond "may pose a safety risk...the pond and stream now become major features of the site." Further, the Committee stated: "their proposed locations at the high side of the lot are contrary to the patterns of nature and appear artificial and 'forced.' In addition, the grading plan implies over a six-foot total depth posing a risk to both humans and animals, and potential liability issues."

Rather than press this issue, we decided to implement the smaller pond that was shown on the site plan and was approved with the Preliminary Plan submittal.

The pond has been reduced in both dimension and in depth, and now follows the footprint originally approved by the Design Committee. It has actually been placed in a depression on the site that has contained standing water for the past two years. The pond continues to contain the water quality and storage features that were presented to the Design Committee in discussions on

the larger pond that was shown on the previous drawing submittal. It will recirculate for water quality, with water drawn down through the bottom gravel substrate and underdrain filter. Makeup water is to be pumped up to the pond from water harvested from the foundation drains, and surface recharge is from horizontal drains placed in crossflow coming across the property line, as indicated on Drawing C-2. This pond will act as a "flywheel" on excess runoff and provide some water quality and detention elements, as well as providing, preserving, and enhancing the habitat values of the site.

For water quality, there is a small recirculating stream flowing down to the courtyard area in the back of the home, at which point it is pumped back up to the pond. This is to create a drawdown to the under-gravel filter and water quality in the pond. The stream is small and natural in appearance, and will be invisible from neighboring properties.

The pond's gravel filter consists of a manifold of Infiltration chambers buried in gravel and rock chips. Water to feed the recirculating stream is to be drawn from this underdrain, similar to an under-sand filter in a home aquarium, this will insure that water is drawn down through the pond bottom, removing particles and providing aerated water for resident bacteria, which will consume wastes and nutrients and out-compete algae that might otherwise become established in a stagnant pond.

The pond is to be constructed as a dip in the topography, without any constructed berm or engineered containment that might be subject to failure, and sealed with a vegetable oil polymer (provided by Seepage Control) that is completely non-toxic and used for this purpose, and the pond will not leak. The pond is to be natural in appearance and landscaped with native wetland plants and bulbs, many of which are now found at the site, and shielded or screened from neighboring properties. The pond is intended to be both entirely

functional and to be a real amenity to the area, in effect making the best use and actually augmenting a difficult situation in regard to excess moisture at the site.

During the dry months, it is anticipated that seepage will continue to recharge the pond through the horizontal drains (provided by Smart Drain). In addition, water collected from the combination foundation and curtain drains can be pumped to the pond, if there is capacity, and this is expected to be available year-round.

Summary

The above updated recommendations of the Design Team were presented in a letter to the Design Committee on May 1, 2006, along with revised drawings, necessarily done in a hurry. At their meeting on May 19, the Design Committee decided that rather than write another denial letter, they would allow us further opportunity to resolve their conditions, which now included removing the two-foot section out of the house layout. As previously noted, the next submittal review is slated for June 2, as this issue of *Ultimate Home Design* goes to press.

It appears that the Design Committee is satisfied with the updates to the architectural plans that they recommended as part of their latest conditions for approval.

While it appears that some progress has been made and that final approval is imminent, assuming no further conditions, you will have to wait until the next installment in this case study article series to find out what happens. Hopefully, we will satisfy the Design Committee and obtain final approval so that we can then proceed to file with the Sonoma County Building Department for their review of structural and Code issues, and finally obtain a building permit. Department for their review of structural and Code issues, and finally obtain a building permit. Needless to say, we are anxious to get started!

The design review process for the Optimum Performance Home at The Sea Ranch is now in its fourth year (three-years, six-months as of June 2006). The design process has been an unbelievable endurance experience. As a case study, our project is instructive with respect to dispelling the often unrealistic expectations about the design process and the multitude of challenges facing leading-edge projects, and serves to educate prospective homeowners about the realities of building.

Moreover, the "indeterminate sentencing" that sometimes takes place before planning commissions is not unique to The Sea Ranch. Vague guidelines with subjective interpretations, changing personnel, and strong notions as to what constitutes good design lead to many projects getting "hung up." To add to the problem, most Boards of Supervisors do not give proper direction to their Planning Departments or work to clarify ambiguous design guidelines, resulting in a "tail wagging the dog" situation. To further complicate matters, there may be a subtle bias against "growth" and further development, even on vested lots. The inconsistency and constantly moving target can result in a frustrating experience for the prospective homebuilder.

No doubt, the process itself has weighed us down over this unexpectedly long period of time. But, as stated before, while our resolve to overcome the many objections and challenges has been sorely tested, we are committed to achieving success in the building of the first Optimum Performance Home. **UHD**

The Authors

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Acknowledgements

Ed Rose is a residential architectural designer. His company, Rosebud Studios is based in Monte Rio, California. Ed has been designing homes and remodels on The Sea Ranch and surrounding areas since the late 1980s. His skill in listening to and understanding his client's architectural program and then translating that into a workable and pleasing design acceptable to the rigorous philosophy of The Sea Ranch Design Committee is responsible for the final successful approval of the "First Optimum Performance Home" at The Sea Ranch. This included the fairly new design concepts of universal access and aging-in-place, use of "green" materials, and meeting the exacting guidelines for a residential LEED® designation. It wasn't until Ed joined our team that we began to make progress with the Design Committee in this challenging process. Ed provided all of the images of the site plan, floor plans, elevations, and isometric perspectives for the magazine. His extensive education and experience span numerous disciplines from architecture to industrial and graphic design to technical illustration, photography, and painting. Ed can be reached at 707 865 1146 or 707 785 9180 or rosebud@thegrid.net.

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