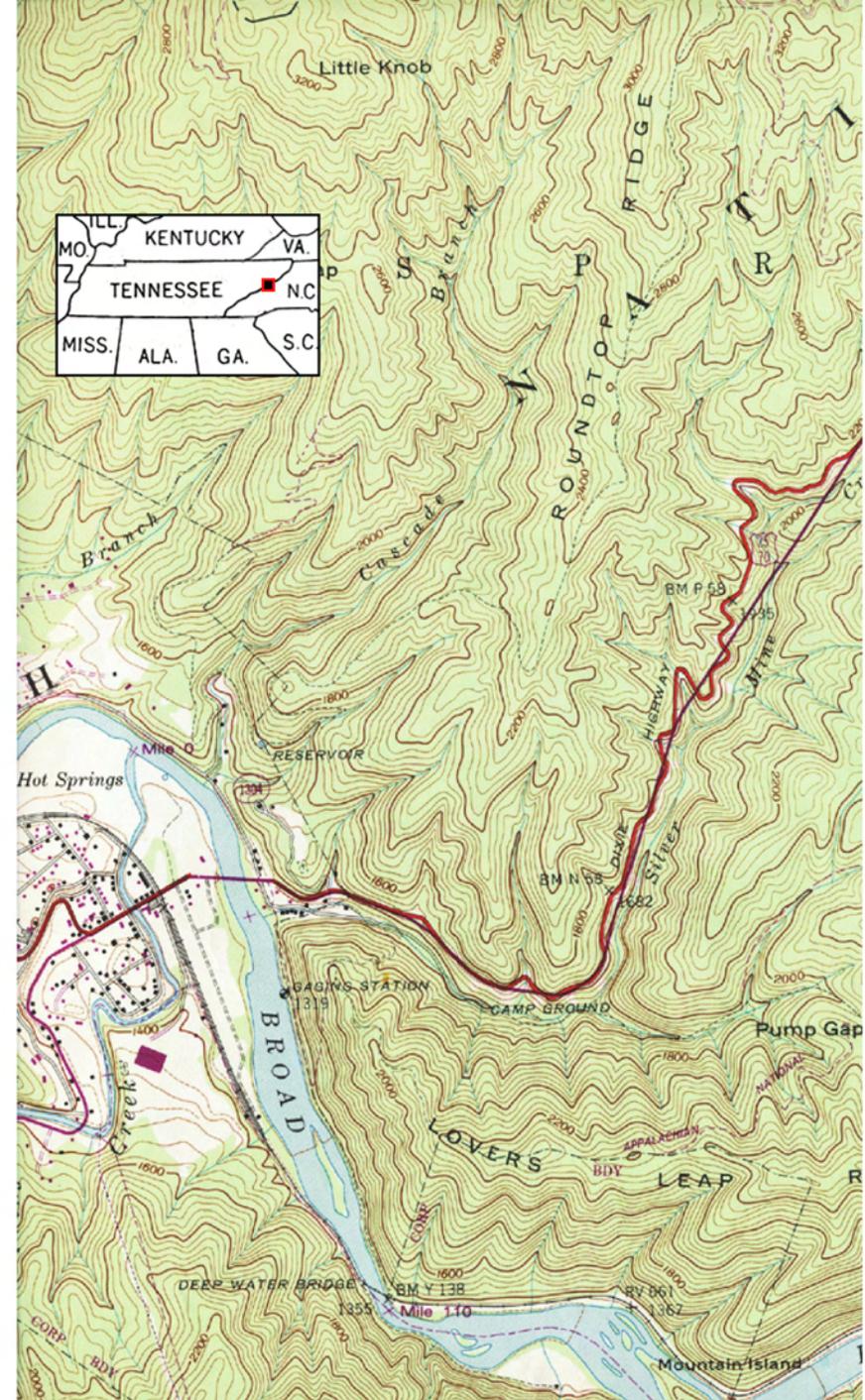


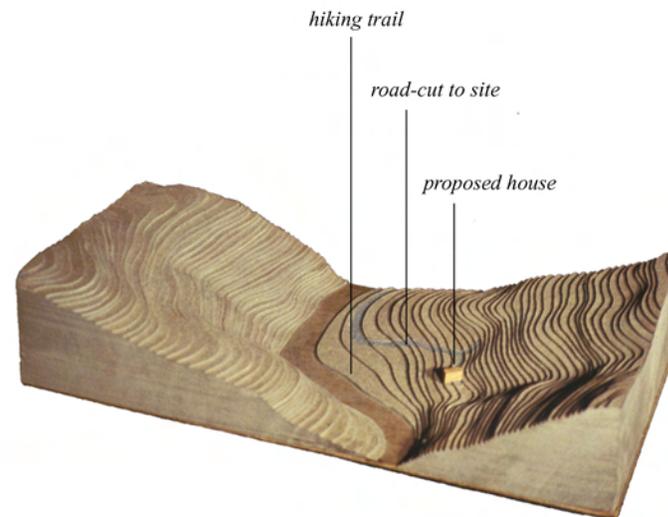
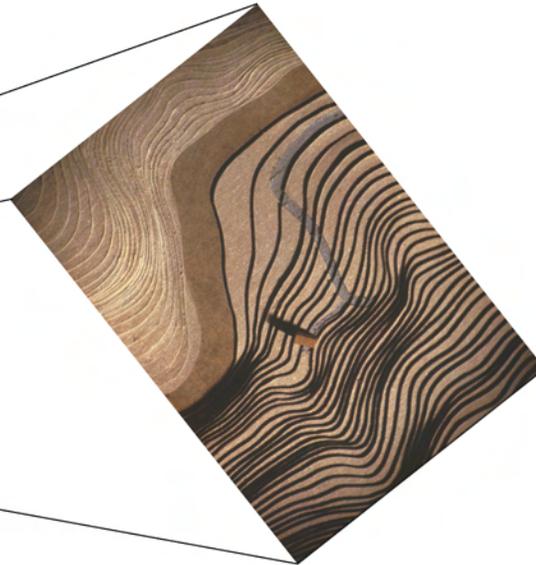
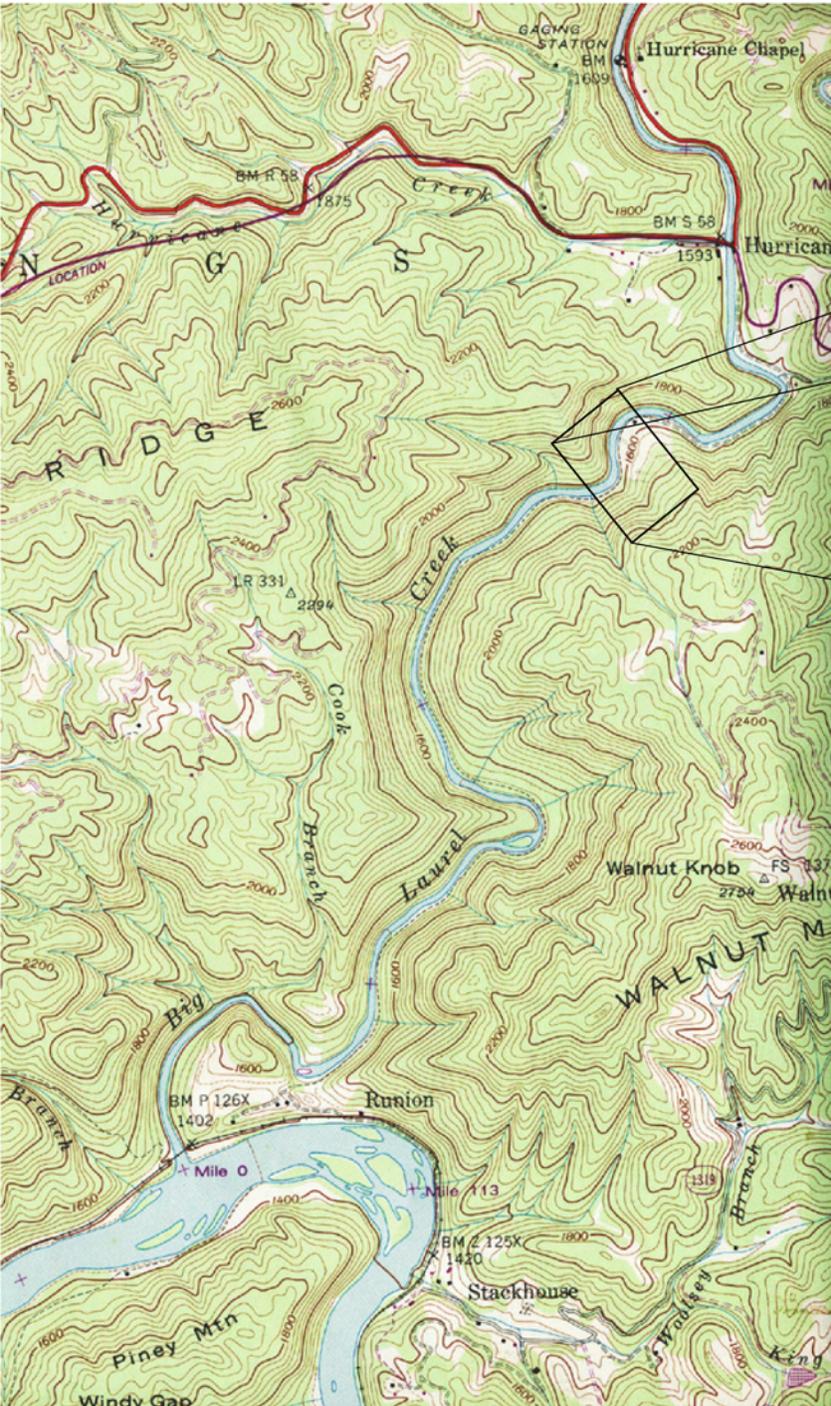


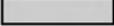
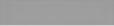
drawing the analogy:
a house on laurel creek

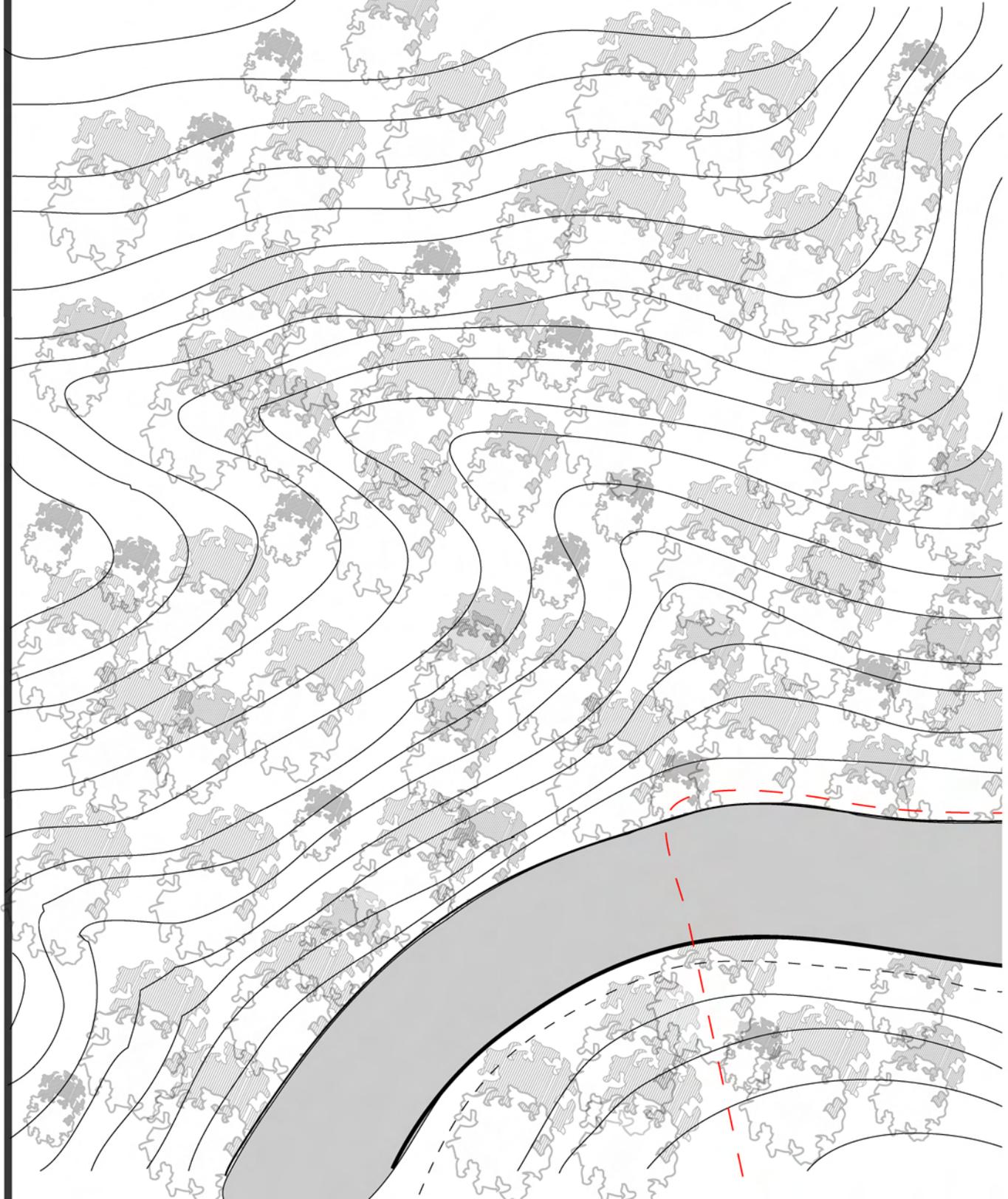
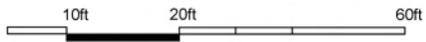
Drawing the Analogy: a house on Laurel Creek

With the foundation of a working definition of nature in hand, the next step was to move from universals to particulars by bringing in the variables of site and user. Asked by my clients to keep them informed of my creative process, we agreed to discuss aesthetic matters as “themes.” Having already established an *aesthetic* as a unified body of rules directing all aspects of the design and addressing appearance and function as equal aspects (hence, a functionalist aesthetic), the primary themes here were the actions or qualities present in both natural growth and human construction, namely, *process* and *integration*.



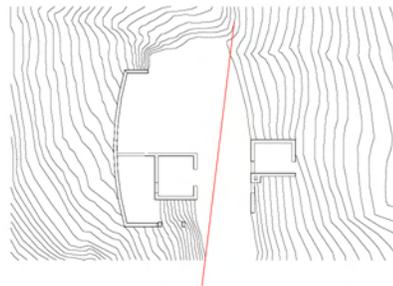


-  laurel creek
-  entrance road
-  hiking trail
-  Pisgah National Forest boundary
-  rock outcrop





Integration: Earth/Site

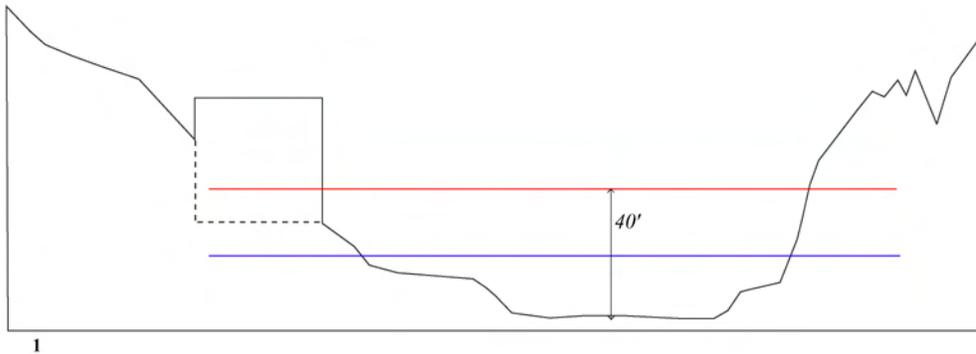


View to south across the slope. This point marks the end of the access road as well as the north boundary of the parcel. The visible road was cut into the hillside prior to an earlier plan to build.

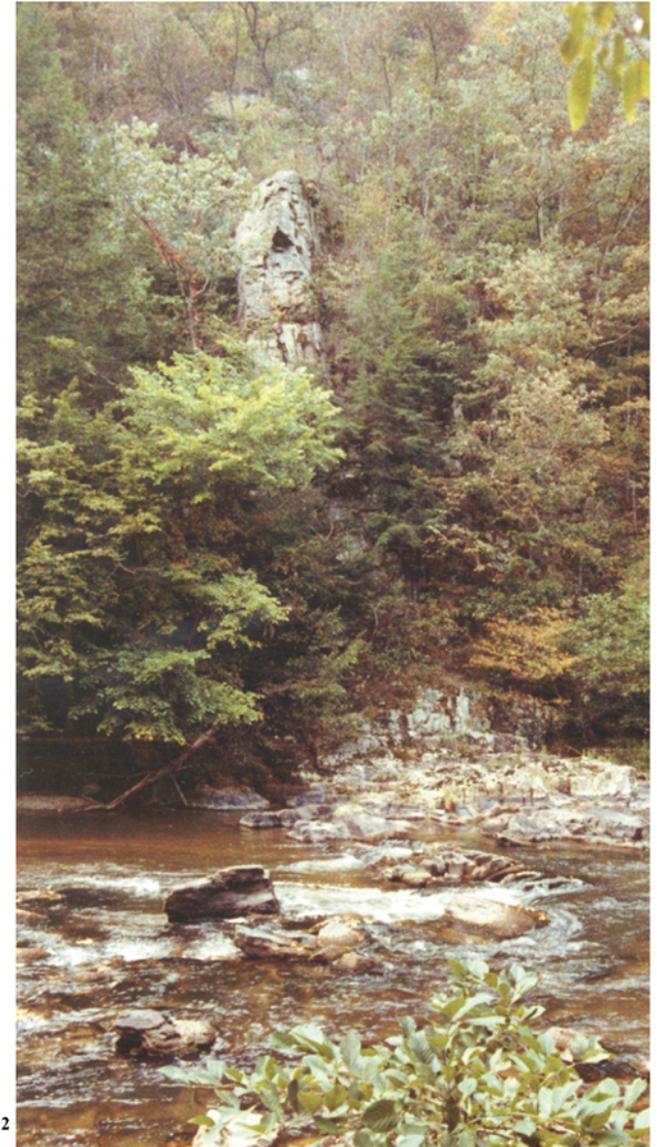
Where for millennia organic theory focused on nature's objects for their internal consistency, we now see them as integrated members of larger systems. In several respects, a quality of "naturalness" can be described as simply a state of being dependent and contingent upon other outside actions. As knowledge about the environment has opened us up to a different way of understanding the site, I wanted this building to be integrated into both the cultural and physical contexts, while also being *about* integration.

I approached the schematic phase of design assuming that a statement of nativity presupposes connection between structure and earth. Although more difficult to defend from an environmental standpoint, I wanted to assert through a pronounced excavation that the inhabitants were not visitors perched temporarily on the surface but established as invested stewards. Therefore, the first level would be some form of masonry construction placed partially below the grade of the slope. The most compelling reason to start the building with a masonry level was provided by the forest itself. With an annual rainfall of 48 inches, a moist environment at grade is the given condition for much of the year, therefore any materials in that zone would need to be of a highly durable and impervious nature.

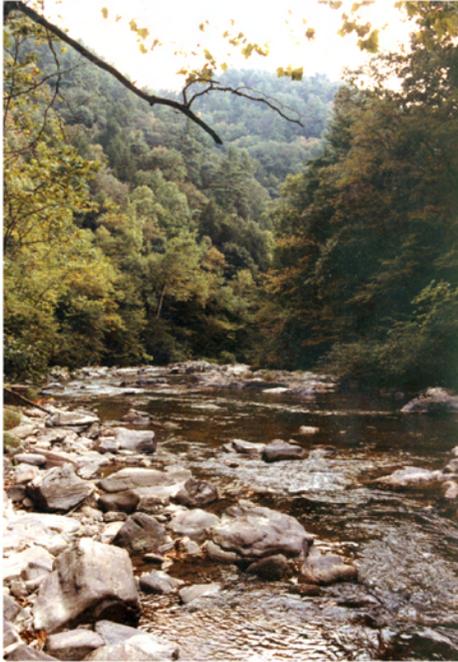
Of additional interest were the extant outcroppings on the opposite bank of the creek. With its proximity to the Pisgah boundary, I wanted the house to register as a visual balance to these elements and create a sense of "gateway" into the forest. Siting for the house would take place at roughly the same elevation as these rocks, a fact that was already partly determined by the pre-existing drive and observing a reasonable safety factor from flash-flooding.



- 1 section of site indicating balance between house (left) and rock outcrop on the creek's opposing side. The blue line approximates the highest level of flooding in the last 100 years.
- 2 view across Laurel Creek indicating large rock feature.



Forest and Creek



Since this building would exist in a densely wooded context, it needed to respond to the sensual aspects of its surroundings without being over-powered by them. Constructed primarily of wood, it would reflect processes of transformation that would be traceable to both forest and builder.

Forests, no matter their age or type, are in many respects archetypal to us for their demonstration of nature's elemental actions. We experience forests as the natural inverse of the open space—not only because they contain a different kind of spatial interval or quality, but because they express a different scale of time. Trees are not only much larger organisms than we are, they are also capable of living far longer. Through time, the space affected by a single tree is remarkably static by our measure, yet as they cycle through their state of perpetual perishing and coming into being, the gradual layering of their struggle creates a familiar and yet profound continuity all its own.⁵⁰

In addition to the trees, the creek was another

important element that, like the slope, the house would create a response to. Unlike a forest, a creek constantly changes and is a perpetual source of motion and sound. At certain intervals it floods the small valley and for that reason possesses an almost menacing quality. With such a dynamic presence only one-hundred feet away, I decided the house should not compete so much as retreat into a contrasting pose of stability. Therefore the house would allow for the experience of the water from a safe distance, visually and aurally.

Of equal importance to experiences of reflection and study would be the active use of the area's recreational opportunities. Avid outdoor enthusiasts, the owners wanted the house to provide them with ample storage for their equipment, clearly exhibiting such functionality yet keeping everything out of sight and secure. In this sense, they saw the house as partly an outpost where they could arrive and quickly load their equipment without entering the living spaces.

view to south from east bank of Laurel Creek



A Critical Regionalism

What the Appalachian region has lacked in progressive stewardship it has attempted to make up with its attachment to the land and local traditions. This attitude served until more recent surges in development arrived with the expansion of Asheville and its neighboring communities. Poor planning may have been the norm of the region in the past, but a strong sense of the importance of place and its ongoing historical frameworks offer to provide some balance. Drawing from the broader theory of "critical regionalism," I came to base much of the aesthetic and programming of this house on its central concept of a "self-aware" vernacular. Infusing a local tradition and its sense of place with a global perspective was precisely the duality I wished to represent by bringing both spheres together in mutual awareness. By asking what the "liberative" as opposed to "restrictive" boundaries or limits of a region are, critical regionalism proposes that we look beyond the static or historically fixed components of climate and existing structures in favor of a global view which is in turn locally inflected.⁵¹

The traditional Appalachian idiom sprang from mainly European types, techniques and farming practices which were adapted to the specific requirements of the area over time. While they might at first appear to be products of restraint, more often these buildings are illustrations of a severe and distressed relationship with the limitations imposed by relatively unproductive land. Though two centuries of settlers from the British Isles and later central and Eastern Europe have imported their respective building vocabularies,

the uniqueness of the region has brought about something of a unified, agricultural vernacular. For example, throughout the region, tobacco and livestock barns reveal a typical asymmetrical grammar of exposed stone foundation, opportunistic wooden superstructure and steel roof. Infinite in variety but parallel in their typically loose application, these elements unite what is at times a disjunctive and disorienting topography.

The success of introducing a new or revised idea of nature into a local fabric would seem to depend not only on an understanding of the region's building traditions, but also on their notion of tradition itself. In his brief treatise on the failures of Postmodernism to produce works of place and substance, Michael Benedikt points to the importance of the "correspondence between something's own history and its historicity."⁵² I take this to mean that referencing local type is meaningful only if one participates in it according to the functional essence of those traditions, and



roadside structures outside Hot Springs, NC



that that essence is based on a "liberative" interpretation of its boundaries. In the case of Appalachia, local building practices of the past were essentially the recordings of utility and subsistence farming, not creative aspirations. This would seem to explain much of the dissonance that takes place in such landscapes when contemporary efforts attempt to build for nostalgic nature-concepts. Although modern, disengaged versions of Appalachian life are now often forced into resembling traditional forms, one's expectations for their traceability and connection with the land are rarely rewarded.

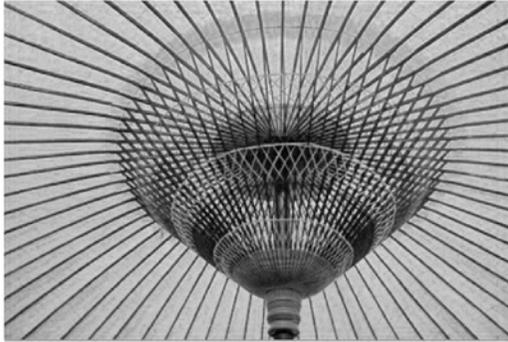


Going back to its first inhabitants, the Cherokee and Catawba tribes, the region had been impacted for centuries by humans. Therefore this house would not only mediate between the pre-dominant "natures" of the local and global, but of those past and present as well, as these often seem strangely coexistent in the region. In more recent history, from roughly the early 1800's through the 1950's, much of the floodplain and even the banks of the

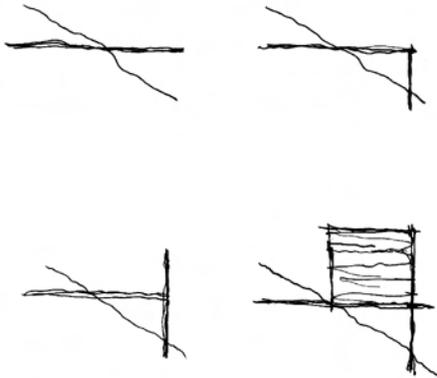


upland creeks were heavily cultivated with tobacco, corn, fruit trees and grasses for livestock. In these cases the primary view of nature was utilitarian and shaped by small-scale agricultural practices and their requirements. But with the designation of Pisgah in 1964 and the subsequent demise of the small farming operations within its borders, the land along Laurel creek reverted mainly to timber. With the rise of recreational tourism and its importance to the local economy, area residents began to alter their approach to the land, shifting from extractive to conservational practices. Reading this ethos as a lower-impact version of the earlier utilitarian approach, I looked to revive the region's earlier de facto aesthetic by adapting a similar palette of materials and attitudes toward newer functions. However, since most of the historical structures are no longer viable, despite carrying a certain attractiveness and cultural significance, I realized I would have to be on guard against mimicking local buildings as much as I would the natural forms that surrounded them.

Function and the elements of shelter



1



2

After several discussions, my clients and I agreed that architectural function is equally split between the accommodation of basic comfort and the actions of our bodies, and the complex needs and desires of our mental life. Shelter as a concept is just as important to our mental state as its protections are to our physical existence. Inseparable, these activities are collectively evaluated by the quality we called “functionality.” Satisfied with how the cairn illustrated the earlier point regarding a cultural artifact displaying both human and non-human qualities, I sought another concrete example—this time, in a more obvious cultural object. A marvel of elegant engineering and efficacy, the “purposive unity” of the modern umbrella reveals an understanding of minimal material used to satisfy a basic need. While performing its functions of portability, contraction and the deflection of rain or sun, it can also carry cultural information such as social status or one’s membership in a particular group. Most interesting was whether it might also communicate more profound issues, such as what it means to be a species with sensitivities to rain and sunlight who also happens to also understand the critical role these elements play in its existence. In other words, if an umbrella can reveal not only the essence of the elements but that of the one holding it, could a house do likewise?

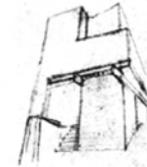
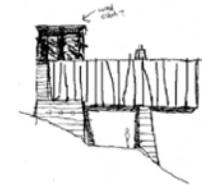
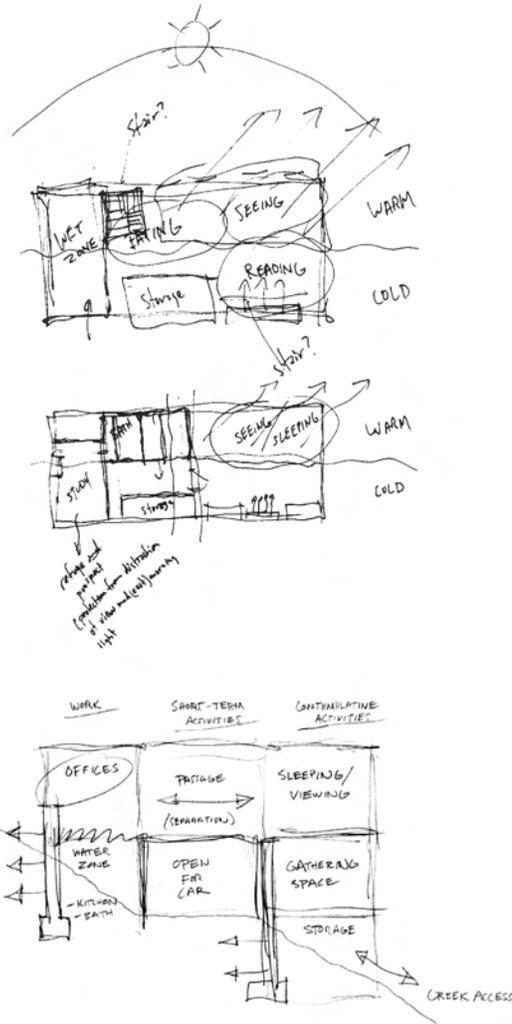
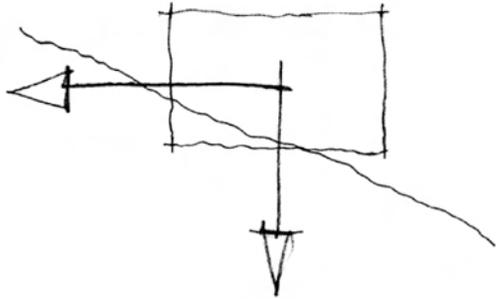
The articulation of function as an enhance-

ment to an implied action or activity is one of architecture’s most expressive capabilities. A neutral force *per se*, it is not its technological sophistication that renders a building incompatible with its site, but its means of construction and environmental cost, current and future. Nature’s own qualities of seamlessness appear to support this. Therefore, weighing the full expenditure of construction against the life-cycle costs of the building’s use and maintenance yielded in favor of simplicity and minimal technicality. All aspects of utility would be framed according to a sense of appropriate complexity, the virtues of “low-tech” intended as a way to express the client’s simple approach to a life in balance with its surroundings.

With a basic materials palette of wood and masonry already decided upon, the next step was to determine the relationship between a few designated functions and the forms the materials would allow based on techniques I as a designer could control. This began by diagramming the programme as a balance between basic interior and exterior actions. With a long axis aligned north-south, the east end of the building would be close to the ground and receive the entry traffic, thereby opening up the west end free to views and light. Orienting the house in this manner would also give the building a minimal footprint since a lighter envelope could then be easily bridged or cantilevered above.

- 1 *mechanism of a Japanese umbrella*
- 2 *studies of counter-acting slope condition*

Progression depicting how the basic relationship between object and site led to bubble diagrams and, in later stages, perspective explorations.





Building as Sign

It is impossible for functional objects to avoid referencing entities or ideas beyond themselves, for bound up in their forms are indicators of both origins and ends. Makers and their skills present the first set of connections we can make. Likewise, one look at a building can tell us a great deal about the intended use and user. For example, on one level a basic Windsor side chair makes no attempt to symbolize anything other than the categories of handmade objects, wooden furniture and Windsor chairs. In this sense it is agreeably labeled “self-referential.” Yet to the knowledgeable observer, that same chair conveys a great deal of information about the maker and to what degree they understood the activity of making. The manner in which the various woods are selected, shaped and assembled reveals the maker’s level of skill, care and knowledge. In this respect, a craft object is always representative of its maker. As for referencing its end, the chair provides a clear image of the general shape, weight and size of the intended user, as well as something about their taste in furniture. If such is the case with a simple chair, a simple building is no different. If every manner of functionality draws a connection between makers and user, there is no cause to mimic natural forms in order to achieve “naturalness.” To do so would be to break what is already an entirely natural connection.

Performing referential action simply by existing, architecture cannot escape its own gestalt.

To this point, we chose to elevate the themes of refuge and nativity to the level of other functional concerns. From the beginning, one of the thematic functions of this house was to influence observers in some positive way regarding their use of the contiguous recreational areas. Drawing from my own nature-concept, the notion of this house as a “gateway” between cultural and wilderness realms suggested a visual cue to match the overall theme of *boundary* discussed earlier in the nature-concept diagrams, and further reinforced by the relationship of the building site with the impressive rocks across the creek. As with the cairn—which is an object *and* a sign—the gateway refers to its idea but also to the things it makes separate.

Repetition of discrete parts, orthogonal relationships, systemic separation, efficiency—as part of nature’s matrix, we find advantage and even beauty in shortening the distance between problem and solution, desire and expression. Repetitive orthogonal ordering is indeed a human peculiarity and the most definitive evidence of human presence and the natural economism of our perception. A suitably rich frame of purpose and destination so established, simplicity may achieve elegance and take on the quality of authenticity we admire in vernacular buildings and other natural entities.

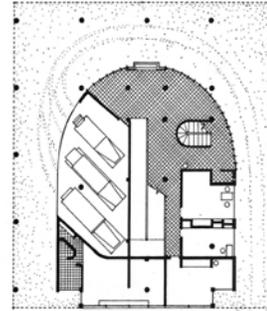
1 Renzo Piano's NeMo center (1997) Oosterdok, The Netherlands

2 comb-back Windsor side chair

The Automobile

Since this structure would be a contemporary dwelling and not based directly on a regional type in any functional sense, participating in the dialogue of the local vernacular would require the accommodation of new elements. Primary among these was the automobile. As an isolated structure with no immediate built context, the house would acknowledge the car as a means of connection to the human realm beyond. Recalling Le Corbusier's Villa Savoye and its integration of car and dwelling, the entry sequence was viewed as an opportunity to continue the theme of transparent process. Although whereas Le Corbusier cleverly concealed his scheme within the classical modulation of the house, I wished to call attention to the presence and function of the car as an integral part of contemporary life.

Reinforcing the earlier notion of raising the main living space off the ground, the car reinforced the other organizing principles of topography and the desire for a minimal footprint. The most direct way to place vehicles at the rear of the house was to send them through and beneath the structure. Breaking the first level apart allowed passage and created a protected area when making the transition from car to house, and vice versa. Supporting this was the way the north elevation referenced the modified crib barns of the region (known as "bank" barns in hilly terrain), with the center drive and cantilevered superstructure.



- 1 plan indicating auto storage at Villa Savoye
- 2 Villa Savoye, Poissy, (1928-31)
- 3 19th c. Appalachian "crib barn."



Materials

Although we have learned to alter and improve naturally-occurring compounds and materials, we remain viscerally connected to them in their raw state. This is certainly due to their sensual qualities, but why not also their connections to their natural origins? Consumed with the conceptual aspects of design, we forget how dependent nature's forms are on material properties. When we are drawn to the tactile or visual complexity of a natural thing, are we not also intrigued by its quality of revealing the make-up and action of the forces that produced it? Within this unbroken series of relationships lies an essence of truthfulness and integrity that has drawn the fascination of many an aesthetic theorist, even prompting a view of nature as a source of morality. Yet while nature moves dumbly forward, unconcerned with the record of what it has wrought and how, we often deny the evidence of our own processes by erasing our imprint in favor of a seamless ideal.

When we describe the way non-human organisms use raw material to construct shelters or defenses, we say that they do so "naturally." Basically, their process is to extract a material or compound from the immediate environment and combine its inherent properties with those of their own. Because nature has no long-term goal or preconception about form and its aesthetic impact on humans, its processes are conspicuous and

wholly contingent. Nothing is intentionally concealed and all form is eventually dependent on the success the organism has in optimizing the properties of the materials at hand.

Looking at the physical inventory of the Laurel Creek area—its weathered rock strata, stream banks continuously altered by the waters of the creek, settling debris flows, a forest floor in various stages of decomposition, opportunistic plants taking root wherever possible—the site was composed of literally nothing but ongoing material processes, mineral as well as vegetable. It is through this catalogue that the elemental quality of naturalness is revealed.⁵³

If there is a common signature for human construction with wood, it is likely described by the quality of orthogonality. Connecting the geometrical elegance of the perpendicular with other reason-based practices such as logic and rhetoric, the expression of orthogonality has long been the basis for a "rational" architecture. Much of this is simply a reflection of the way we have learned to maximize our use of space, particularly in urban contexts. But it is also a function of the way we approach and control building materials. As Wright would explain in his essential essay, "The Art and Craft of the Machine," our production of the basic elements of building reveals our nature as creatures interested in maximization. Given that, the reduction of space to Cartesian

simplicity is sure to follow.

However, the expression of "humaness" via a rational severity is transformed as we re-envision ourselves as subordinates to the greater earthly whole. By reversing the traditional relationship between form and material, with material succeeding the idea, we resume a much more "natural" approach. Asking the brick what it wants to be, as Louis Kahn advised, is something only we can do, and when followed, this leads to the critical quality of authenticity so valued in good architecture.

But as nature's other entities are inexorably bound by the innate corrective forces at work around them (and we are not), it becomes our ethical responsibility to act as our own corrective. Our extraordinary success as a species may be something of a natural destiny, but so then would be our exhaustion of our environment and imminent correction. Only through the wise selection of materials according to their embodied energy, relative scarcity and the impacts involved with their harvest or extraction (on other species and environments) do we counteract this. Convinced of the strong human signature of the orthogonal joint, I committed early to a grammar in which wood would describe a linear realm reflecting its growth and manner of processing, while concrete would in turn protect and support the wood.

*vernacular wood
construction reflects the
multiple variables of
material, maker and tools*



*the signature grammar of
the **Apis cerana***



The Earthwork

A basic tenet of sustainability is that stewardship is best cultivated through the long-term habitation of an area. Connection to land, either through agriculture, recreation or an appreciation for its history, can be fostered and deepened by recognizing and then articulating a sense of nativeness. Building for longevity challenges us to build better, and in the process build less often. Adopting this stance from the owner's own statements, I chose to anchor the house with a substantial amount of masonry material, most likely site-poured concrete. Although initially having greater environmental impact than, say, a raised, stick platform, the long-term stability of such a structure and its ability to withstand fire or flood was favored for its overall life-cycle costs as well as its more likely contribution to the future historical record.

As an expression of these ideas, the masonry substructure would be partially embedded while

also extend up into the frame of the superstructure, intervening in places so that the frame would not appear fully differentiated from its telluric base. Interlinking frame and site in this manner would also convey that wood was declared the superior material for privileged spaces involving pro-longed contact with the body.

Whereas the frame would express the mostly orthogonal nature of its stick construction, the masonry walls, because of their initial plastic state, would express their own properties, functions and means of fabrication. For example, the retaining wall would take the form of an arc to better resist the force of the slope and overturn. Since the walls would be formed up by a minimal crew, the joints between pours were stepped to provide a ledge on which to set the next formwork in place should the walls become a long-term project. Also, by staging the concrete in

incremental pours, the method would be fully apparent in the completed walls. The vertical proportional changes in the levels were derived from a very early stage of the process—the site model. Using the typical method of layering material of uniform thickness to create a representative topography, I was struck by how one must understand something of slope and its formal tendencies in order to create a convincing surface. Articulating the joints between pours would illustrate this understanding in the form of the house itself. Just as the site model's horizontal distances between elevation lines abstractly indicate the angle of the slope, the pours would be spaced according to the human form in various stages of movement and extension. The ledge depth would then remain constant as the wall's thickness was decreased with each pour.



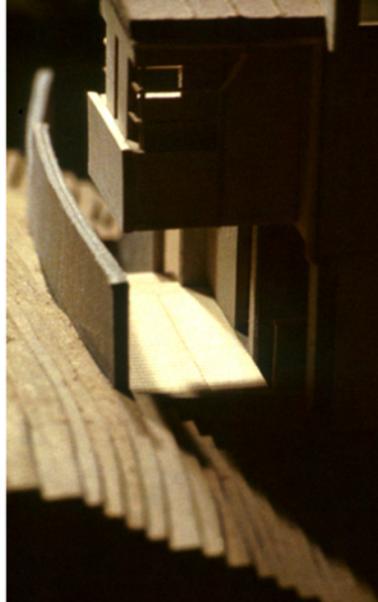
1 *traditional Appalachian building grammar of stone foundation/timber superstructure*

2 *site model*

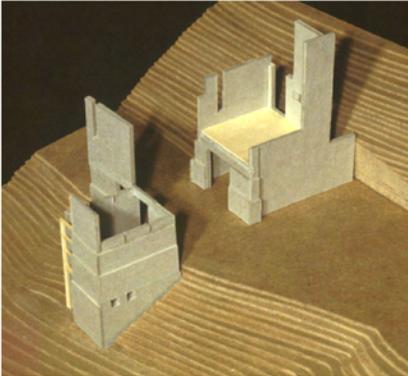
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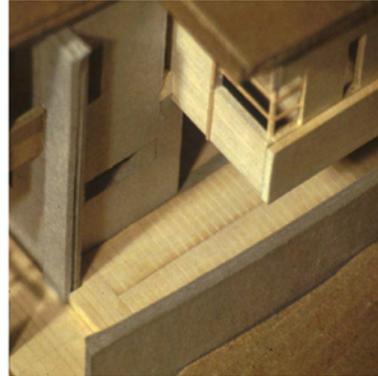
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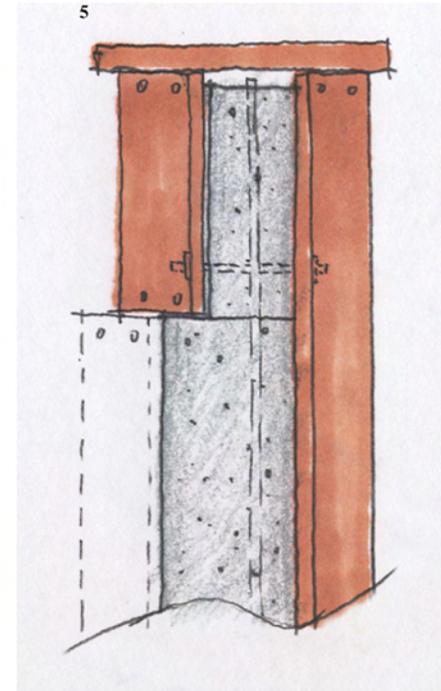


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- 1 site model showing excavation and retaining wall
- 2 first and second level masonry structure
- 3 northeast corner
- 4 southeast corner
- 5 sketch of masonry wall section and final stage of formwork. (The previous outer form is indicated by the dotted line, which would remain to support subsequent staging)

5



Frame and Skin

“Building the site,” to use an expression of Mario Botta’s, is a twentieth-century reiteration of Victorian organicism, the period when Alexander Pope urged 19th century landscape designers to “first consult the genius of the place.” Expressing physical and cultural context will continue to act as the seat of architectural meaning as we begin to develop our ecological themes and strategies. Here, the decision to make the superstructure of the house primarily of wood was based as much on the ability of the material to reflect local building traditions as it was on establishing a sensory continuity with the forest.

Wood construction possesses an extremely broad range of structural and cladding possibilities. Yet as our technical abilities have multiplied, we seem to maintain a cross-cultural appreciation for wood that is kept close to its natural state. The qualities we are most drawn to—texture, figure, color, temperature and the natural structural restrictions that control its stress capacities and workability—are heightened when arranged in a clearly ordered frame.

As with other animal species that use wood to construct shelter, there is no best way, no central logic or spine other than that of obeying the mutually reinforcing relationship between builder, material and the incremental discovery of an advantageous technique. For example, the concept of the *tectonic* as an evaluative strategy practiced in opposition to a more two-dimen-

sional, visually-based approach, seems to lend itself to similar impulses within nature by advocating that construction develop according to internally-derived grammars and techniques which seek integrity through a consistent and purposeful means of joinery.

- 1 *Thorncrown Chapel, Fay Jones (1980)*
- 2 *Wood Residence, James Cutler (2003)*
- 3 *Moduli 225 system, Juhani Pallasmaa*



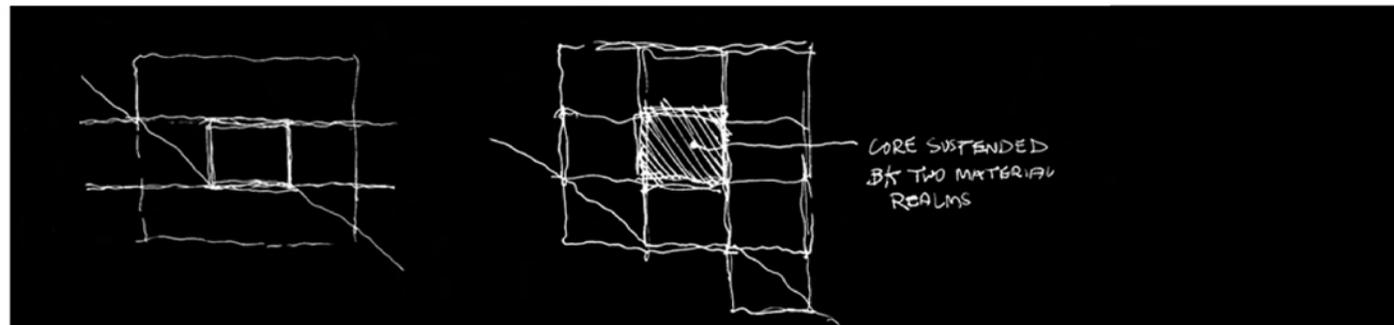
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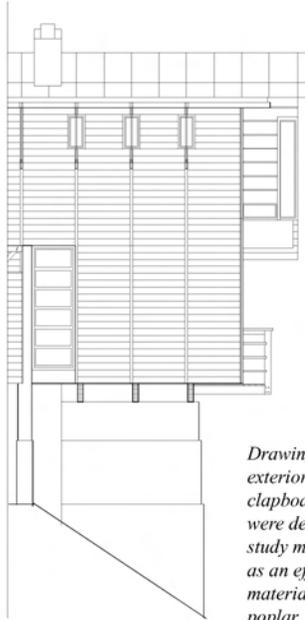


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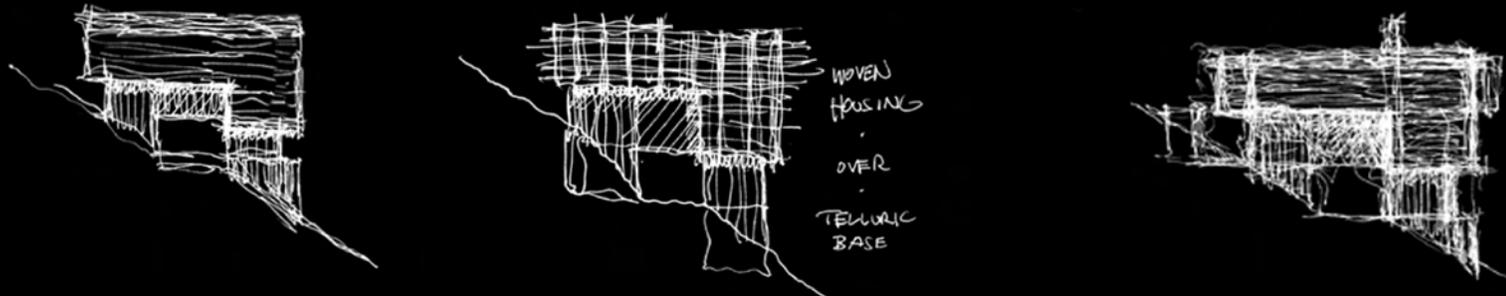
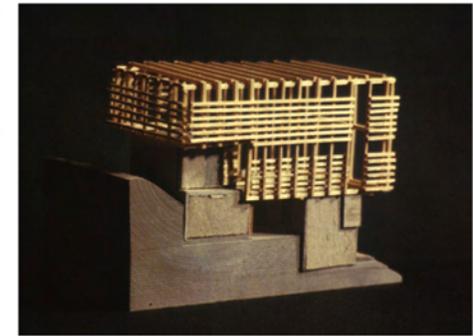




Drawing indicating final exterior cladding. Short clapboards with battens were derived from early study models (right), as well as an efficient use of local materials—such as young poplar, which tends to have numerous defects.

The primary living spaces of this house were eventually contained within four distinct volumes that together form a unified envelope composed primarily of wood. Establishing a hierarchy for the various layers of the frame began by relating each of the discrete units to the masonry base first, and to each other second. The intent was to make the connection between wood and masonry elements a matter of interest. Using the language of Kenneth Frampton, the relation between the “stereotomic” base and the “tectonic” envelope would comprise a site where the layers of the framing and sheathing process could be revealed and articulated so as to consistently place the masonry planes in a subordinate role inside those of the structure and sheathing. Aside from the pursuit of syntactic clarity, the rationale of the visible layers was also intended as a way of illustrating how the elements—water in particular—are the main forces to which the envelope’s exterior must respond. Whereas a building’s (or

animal’s) structure speaks mainly of the conditions of gravity and, in the case of large buildings, wind load, it is surface that, like an animal’s coat or a tree’s protective bark, indicates the environmental conditions that surround it. It was to these conditions that we wished the exterior to not only respond to functionally, but to refer and correspond to *materially*, as if the accretion of layers had evolved over time.

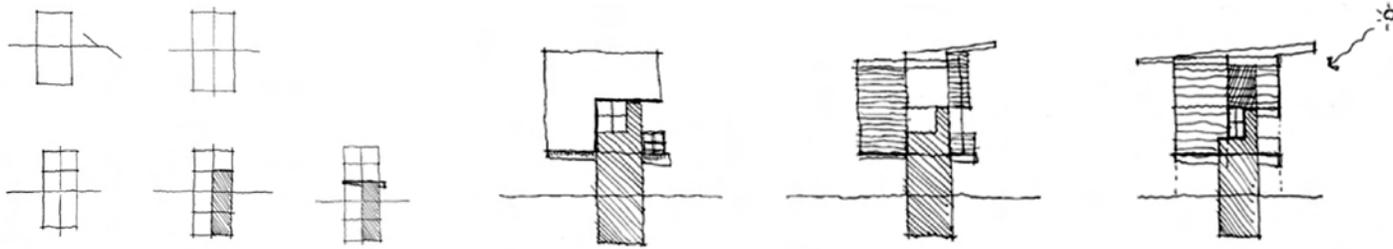


- 1 *finding a grammar for the frame and its cladding began with sketches and stick modeling based around the developing program.*
- 2 *west elevation diagrams and sketches*
- 3 *first complete model*



1

2

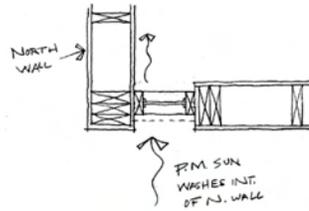


3





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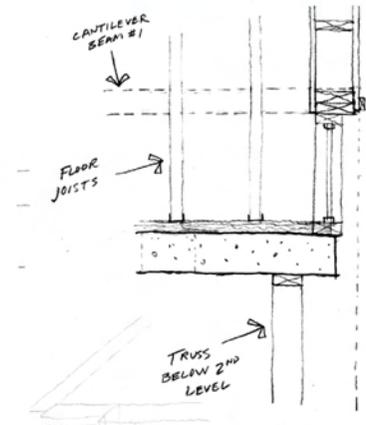
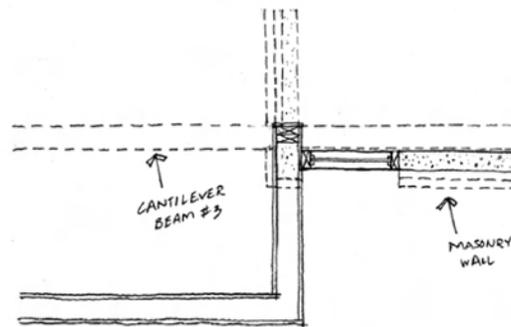


2



3

- 1 window in west elevation intended to provide separation for the north wall of the frame envelope
- 2 details of glazing, west elevation
- 3 details of glazing, north elevation



Refuge

Foremost among the frequently cited ideas of Jay Appleton's *The Experience of Landscape* is his "prospect-refuge" theory, which makes the claim that humans have evolved a strong need to "see without being seen." One of the unfortunate realities of building in a secluded area is vulnerability to theft and vandalism. For this reason there was the need to accentuate the aspect of refuge in order to create a seemingly impregnable elevation as experienced from the beginning of the approach sequence. On approach, the house would need to appear to have no entry and no way of easily accessing its fenestration. Also, as this was the north elevation, minimizing its glazing made added sense from the standpoint of thermal conservation.

In addition to providing protection from flash flooding, siting the house at the higher end of the property would also provide privacy from the

public's sightlines on the hiking trail. Of greatest importance to the owners were the vantages this placement would allow of the entry drive to the north and the creek to the southwest. Raising the living space off the ground and placing it behind an imposing wall became an actual demand of the clients, who knew nothing of Appleton's theory but demonstrated its claims explicitly.

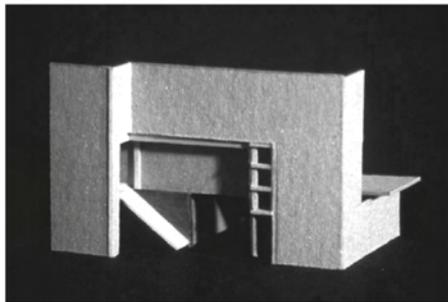
Since the house would be used primarily as a base from which to enjoy the natural surroundings, I wanted to extend the protective aspects of the exterior in order to create intermediate areas--spaces neither inside nor completely outside. These areas would further support the use of cantilevers, which were already necessary as a means of decreasing the building's footprint while maintaining the desired area of 1500-2000 square feet of interior living space.



1



2



3

- 1 sketch indicating an early placement of entry on the northeast corner
- 2 rock overhang in the Blue Ridge
- 3 study model attempting to create a pronounced elevation for approach

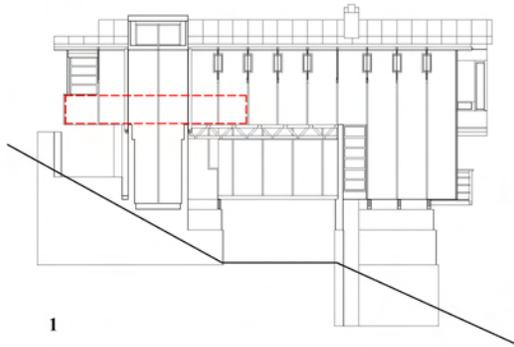
Energy: sun, wind, wood and earth

While other organisms must participate in local energy and material streams to survive, we have worked diligently to insulate ourselves from our immediate surroundings. Yet a building is not an organism and has no essential reason to perform like one since it is not capable of adding to or reproducing any part of its own form. As objects posed in a perpetual state of intermediacy, our buildings should be thought of as tools, not extensions of ourselves or beings unto themselves. It is when this distinction is lost that we are most likely to commit the “biological fallacy” my clients were partial to. Moreover, in any ecological modality, the gathering of light and air should be a primary form-generator for every building. Taking stock of the renewable sources

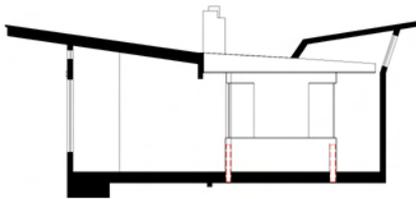
on the site, we assembled a list that included sun, wind, wood and earth (geothermal).

Solar

Today, fine-tuning issues of solar energy stands as one of the central matters of most “green” projects. For this project, issues of capturing available solar rays involved striking a balance between the clients’ experience within the forest, their anticipated power needs and the times of the year (and duration) of their occupation. For example, future power in the area will likely come from locally supplied wind sources. Should the house, which is primarily a tool for dwelling, then be made a tool for solar collection too?



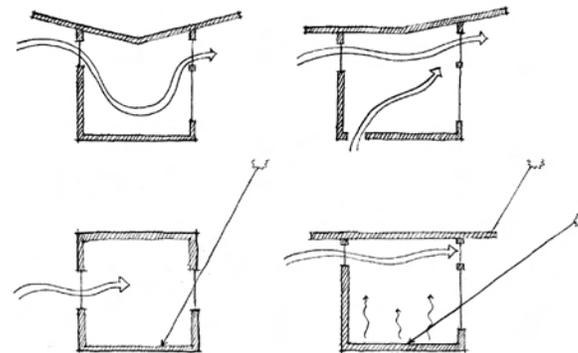
1



2

The drawings above show an internal box-beam supporting a cantilever on the east end of the third level. Rather than extend the envelope out to the retaining wall for its support, the opportunity to create a dramatic load condition was taken not only to visually unify the L-form plane as part of a balanced mass, but also to signify the form as a unified type of space. On a more visceral level, the cantilever gave another chance to equate the integrity such a feature demands with similar conditions of dependency in natural forms.

3

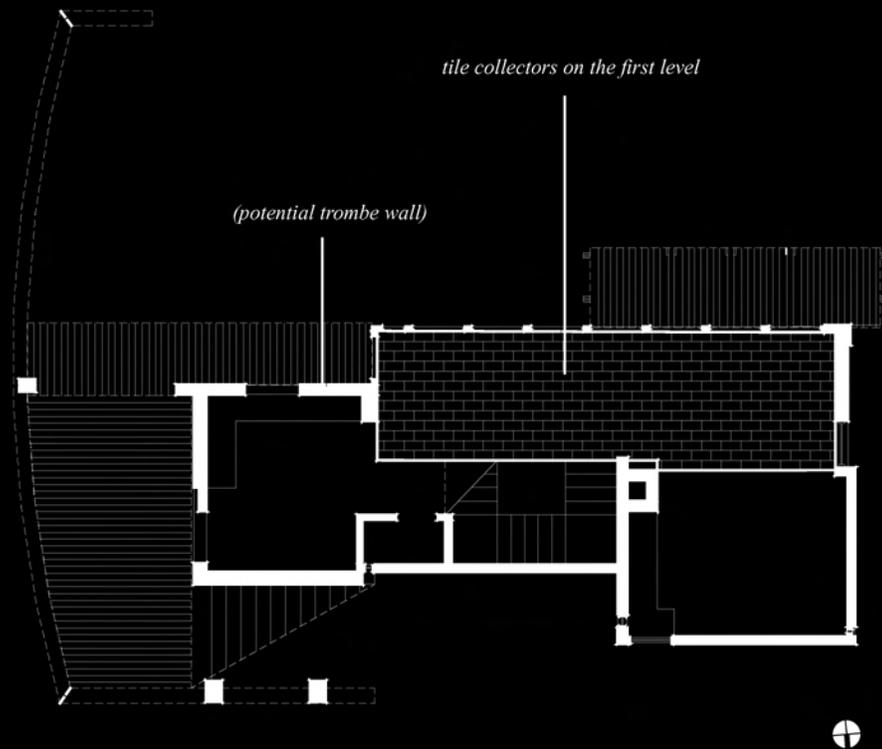


- 1 north elevation
- 2 second level section from east
- 3 basic strategies for passive heat gain and natural ventilation based on a north/south orientation.

Given that the house was to be used mostly as a summer residence when cooling is the main concern, and that the surrounding mountains and forest canopy block much of the daytime sun, solar access for active systems was never a consideration; therefore all solar strategies for this design would be passive.

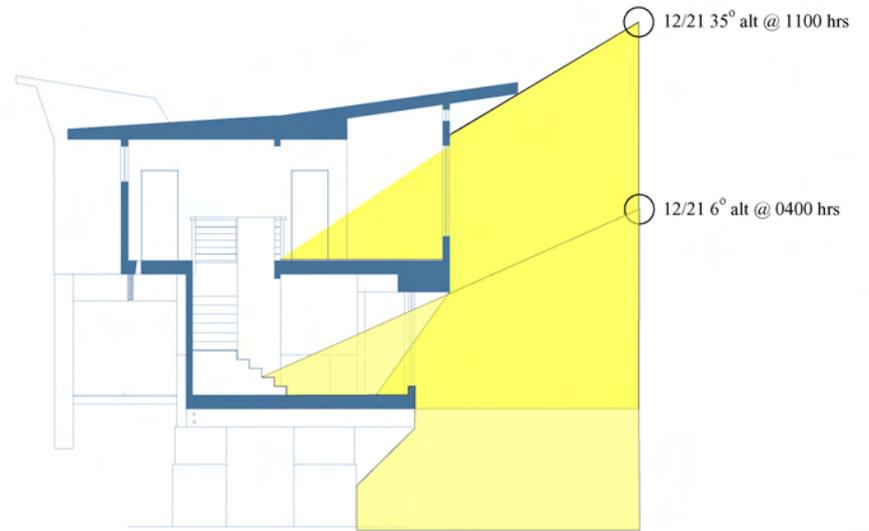
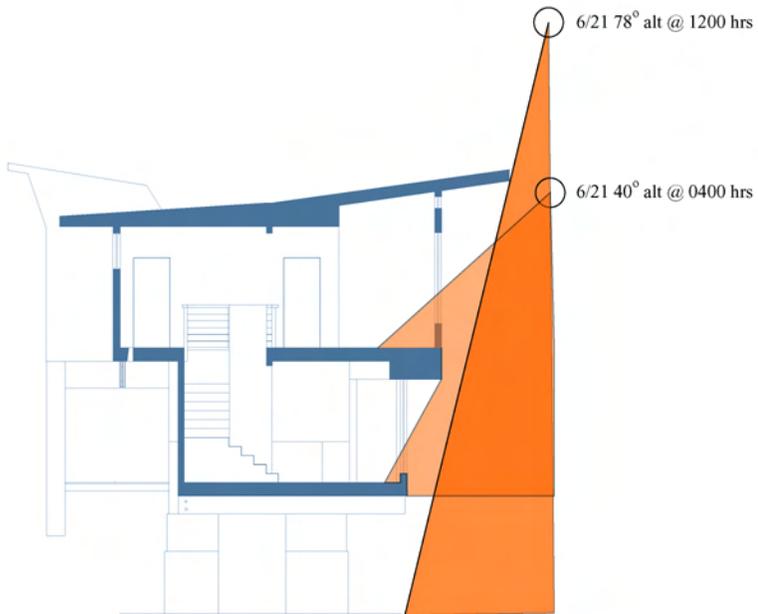
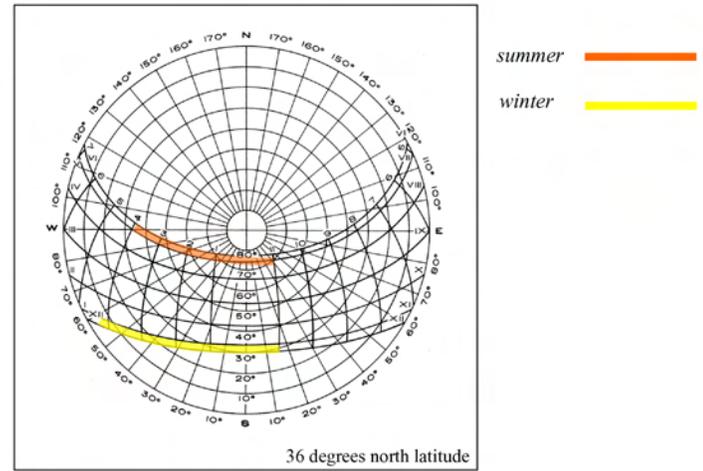
Despite its position at 36 degrees latitude, the summer climate of the area is moderate with summer high temperatures typically ranging between 75 and 85 degrees F. Tempered by a fairly high altitude (1700 ft) and consistent daytime and evening breezes, the main issue of cooling would be to prevent direct solar gain in the summer while allowing for it during winter. Most of this would be dealt with simply by extending the roof out as a shading device, a common feature in southeastern architecture for centuries. Addressing solar angles during the summer months, the roof and second level overhangs were sized so as to shade the southern elevation during the three hours of most intense sunlight (noon to 3 p.m.). After that, several large spruce trees would provide shade for the western elevation glazing.

The second part of this direct gain strategy would be absorption, and for this 1/2" thick ceramic floor tiles would be used. During the winter months, the roof would allow for complete solar coverage of both first and second level interior floor surfaces on the southern half of the building at all times of the day. An additional possibility would be to make a trombe wall out of the kitchen's south-facing masonry, a relatively simple matter requiring only a glazed collector installed on the outside of the wall, leaving an air space of three to four inches between glass and masonry.

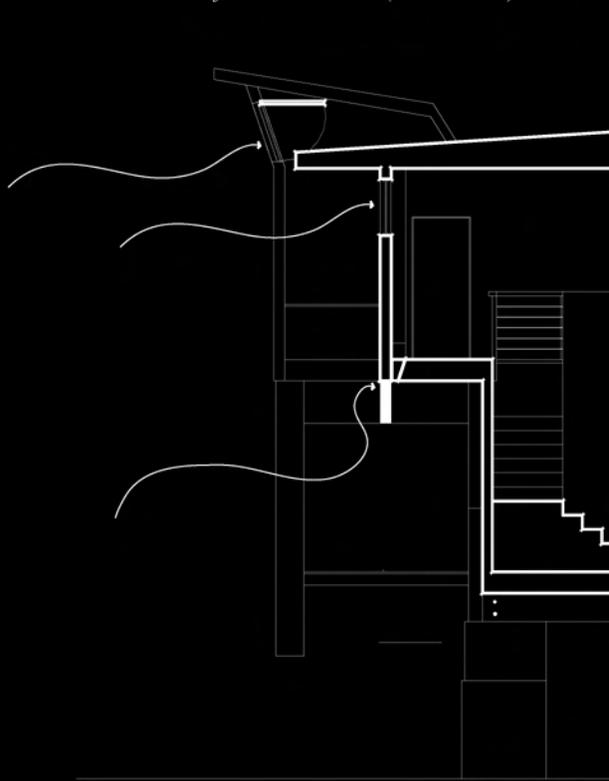


solar diagrams

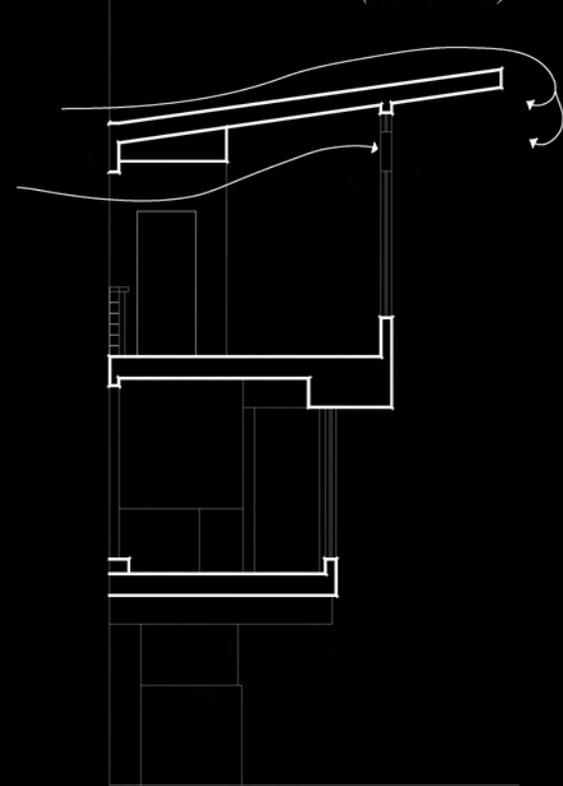
(primary hours of solar gain 1100 to 0400 hrs)



ventilation for warm months (north intake)



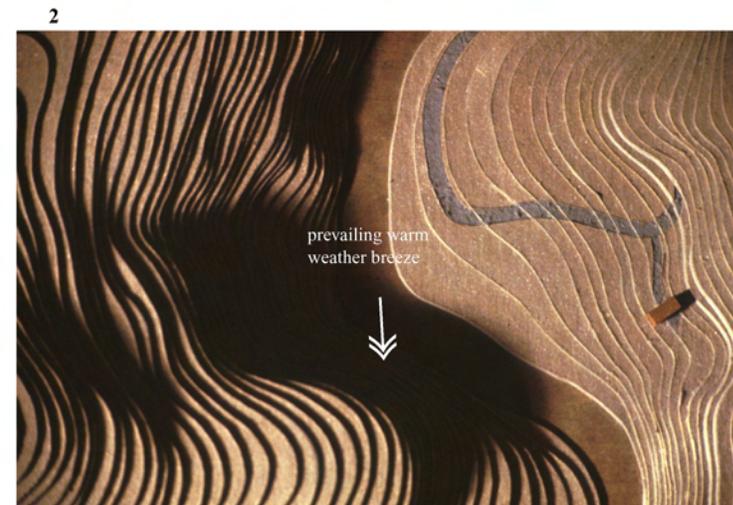
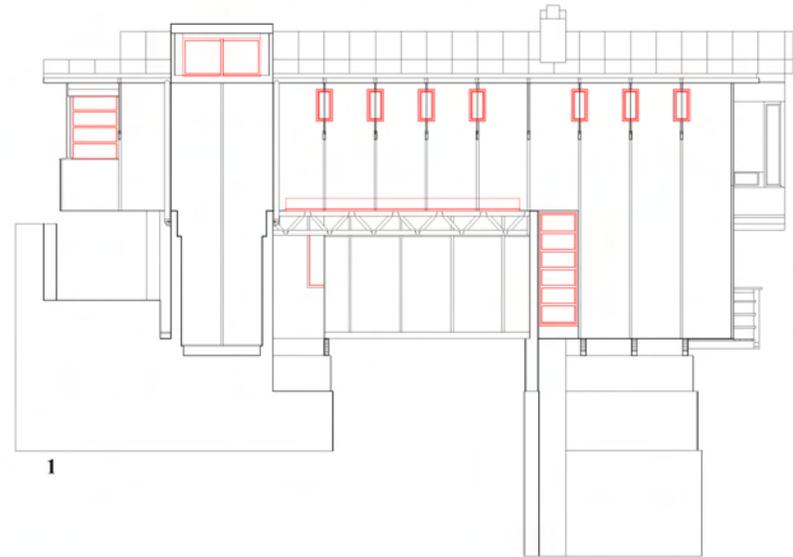
(south exhaust)



Wind

Taking advantage of the prevailing summer breezes from the north and northwest, the north elevation would be used to regulate and direct natural airflow through three sets of openings: a "windcatcher" element, seven third-level clerestory windows and a series of vents in the third-level floor. Placing the primary axis parallel to the slope would maximize the windward elevation and allow the intake of outside air to passively push warmed interior air out through higher openings on the southern elevation. In order to aid this exhaust, the leeward section of the roof was pitched more steeply (from five to ten degrees off the horizontal) in order to produce a down-wind eddy, which by aerodynamic principles increases in depth as the roof pitch increases. This would in turn create an area of slight negative pressure to help draw heated air out of the leeward clerestory. Shaped accordingly, the roof would allow for larger apertures for solar gain as well as improved views of the creek to the southwest. Once again, it was important for the roof to not only perform such functions, but to clearly display them, the overall aim being a device that both controlled and indicated the action of the elements.

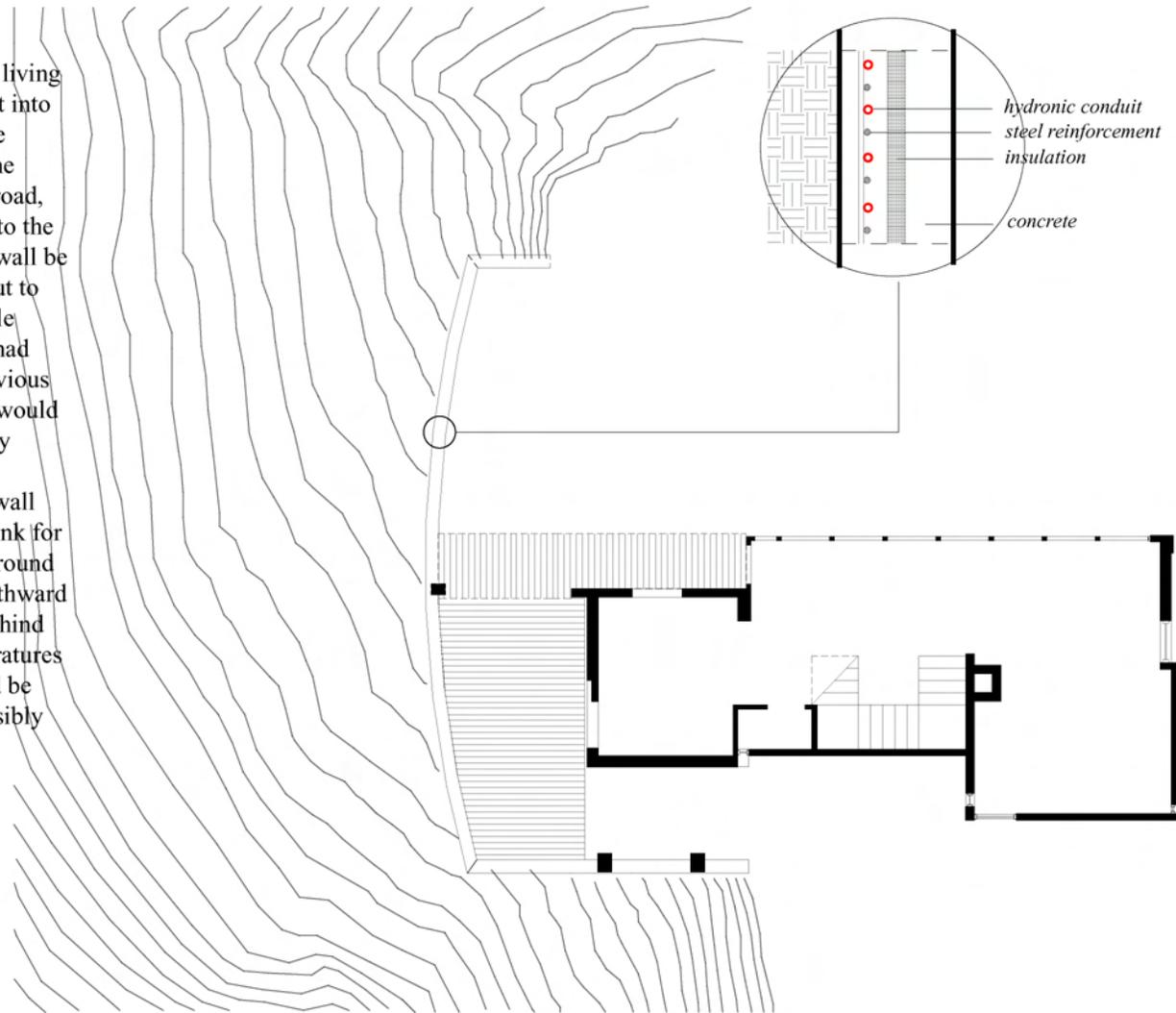
- 1 north elevation's red lines depicting operable openings for ventilation
- 2 site model illustrating the westward orientation of the east side of the creek. The indicated light source mimics the sun at approx. sunset during summer months. Implied structure is 1" in length. (scale: 1" = 40')



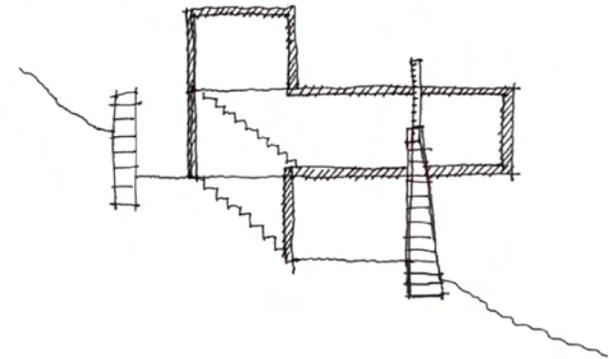
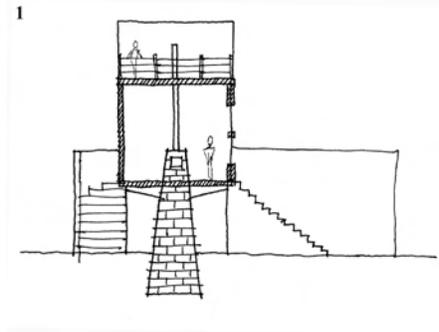
Earth Cooling/Heating

In order to create more usable outdoor living and parking space, the clients wanted to cut into the hillside on the east and south side of the proposed house site. Since an upper volume would already be inserted above the entry road, that excavation could simply be continued to the south. This would require that a retaining wall be constructed to maximize the angle of the cut to ninety degrees and thereby gain more usable space. Though quite invasive, the hillside had already been steadily eroding since the previous owner's placement of the entry road. This would make a retaining feature of some kind likely inevitable.

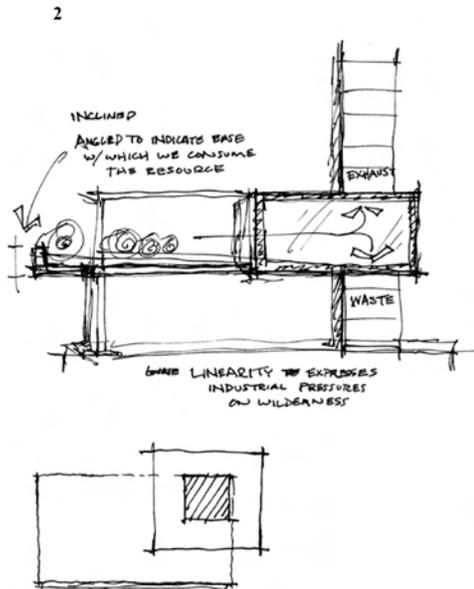
As an attempt to offset its impact, the wall was eventually viewed as a possible heat-sink for the building. By installing a closed-loop ground source geothermal system either on the earthward side of the retaining wall, or inside of it behind an internal layer of insulation, earth temperatures up to sixteen feet beneath the surface could be made readily available for cooling and possibly even heating purposes.



- 1 *early studies of hearth as a form generator for the overall structure*
- 2 *final hearth scheme*



Wood



The hearth has traditionally occupied a central location in nature-interested architecture for expressive as well as functional reasons. A place in which to burn wood was conceived here as both a functional heat source and an opportunity to observe and contemplate natural phenomena. Familiar with many of Frank Lloyd Wright's examples, my clients requested a hearth that would speak of wood as both living organism and indicator of local culture. Serving as both furnace and hearth, this was first envisioned as the termination of a monolithic support for the cantilevered living space. As the building's form developed away from this toward a more differentiated collection of spaces, I chose to retain a central hearth as a focal point.

To demonstrate this I turned once again to the theme of process. I wanted to show the progres-

sion of extracting heat (and carbon) from trees so as to shape the activity into a designed practice infused with the reverence my clients spoke of. Wanting this to depict an act of human ingenuity, the hearth assumed a mechanical, almost industrial reference with the stages of transformation enframed and separated. A carefully placed window would begin a linear triptych by framing the standing trees outside. Inside and next to the window would be a storage area for logs, followed by a rack for drying leading into a combustion chamber. Wright's hearths have established a standard for iconographic play between building structure and the symbolic importance of fire in the domestic realm. But rather than using the element as a canvas, I attempted to shape its expressive qualities via a more sculptural, three-dimensional route.

