

Holistic Dwelling: *integrating biophilic design, environmental psychology,
and feng shui*

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Submitted towards the fulfillment of the requirements for the doctorate of architecture degree

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May 2013

We certify that we have read this Doctorate Project and that, in our opinion, it is satisfactory in scope and quality in fulfillment as a Doctorate Project for the degree of Doctor of Architecture in the School of Architecture, University of Hawai'i at Mānoa.

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"It doesn't matter how you get
knocked down in life; all that
matters is how you get back up."

- Ben Affleck

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Abstract

Holistic Dwelling endeavors to explore different design methods to create a more conscientious approach to designing homes. The three approaches that are being utilized are environmental psychology, *feng shui*, and biophilic design. The study of these diverse methods gives a more extensive look at the concept of home, what has not previously been investigated.

In this document each of these methods is examined, starting by looking at how the methods were developed over time. Theories, schools of thought, and popular studies, schools explored to fully understand each method. Beyond this background information, there are specific attributes from each method that are significant towards the design of a residence. At this point the methods interact with each other and how they overlap to agree on certain elements. The final portion of the Doctor of Architecture project is a design of a house that takes what has been discovered and tests it in a practical setting.

The research does not support a total overlap that was initially hypothesized. However, for most attributes, there are at least two methods with recommendations, and at least one element within the attributes that two methods both agree upon as being beneficial. This comes from the different approaches and foci of environmental psychology, *feng shui*, and biophilic design.

In architecture, the future inhabitants are important in the design process. To consider this aspect, a design project takes a practical look at the research. A small family volunteered to act as a client looking for a new single family residence on Peacham Pond in Vermont. Through a series of meetings, the client explained what they needed in the home and narrowed down specifically what layout they were interested in.

The final design takes the attributes from the research and marries it with the input of the client. Beyond the building, the site and landscaping is taken into consideration since a common theme throughout biophilic design, environmental psychology and *feng shui*. The design is extensively analyzed against the attributes of the home identified in the research portion.

The overarching objective of this document is to find a technique of designing homes that are more attuned to the well-being of the client. Since this is the environment where people consistently spend the most of their time, it needs take specific needs of individual clients into consideration. This document introduces a framework that aids in this process.

1 Introduction

Holistic dwelling is an approach to residential design that incorporates biophilic design, environmental psychology and *feng shui*. I first became interested in this topic during a conversation with a former professor. He was sharing his travels in Europe, and he told about an apartment complex in Berlin, Germany. This building supposedly has the highest suicide rate in the world. This piqued my curiosity. Was it the building that caused this or did the building get a reputation that drew people to it? If it was the building, what parts of the building was affecting the inhabitants? What can designers learn from it? Can it improve how residences are designed? Unfortunately, with further research, I haven't been able to find evidence of this building and the professor doesn't remember sharing the story. However, the idea still got my mind working, not to create homicidal architecture, but how to create designs that are more attuned to clients' needs and desires.

The document is broken into three parts: research, design, and analysis to fully explore the previous thoughts. The first part of the document is the research segment investigating the biophilic design, environmental psychology, and *feng shui*.

Environmental Psychology has been its own field of study, prior it was known as industrial psychology, for a relatively short amount of time limiting the time span of the publications. Most of the older sources come from the 1970's, written from a psychologist's point of view, not an architect or designer's. Early works focus on work efficiency in spaces. The field has since evolved to include all elements in buildings as well as different building types.

Biophilic design is even more recent than environmental psychology, starting in 1984 with Edward O. Wilson's study of Biophilia. The fixation of this method is nature's relationship with the building and the impact

that it has on the inhabitants. This extends to sustainable systems, giving the home a minimal impact on the surrounding environment; however, this is not the focus of this document.

These two branches predominantly are a North American, South American or European study, hence the inclusion of *feng shui* in this study. *Feng shui* evolved through instincts of building historically in China. Through the study of these intuitive building techniques, complemented by the more analytical environmental psychology, a more comprehensive approach to design can be found. While the main principles have remained the same, *feng shui* has recently begun to be accepted internationally.

The initial research into these three methods provided background, with further research recommendations for attributes of the home developed. These attributes are suggestions to be incorporated in the design of a home. These attributes range from specific elements, colors, materials, to spatial layout. At least two of the methods are cross-referenced with each attribute to give the diverse perspective the different methods bring to this document.

Having the knowledge to be able to create designs this way is helpful, but without being able to communicate to clients, it would be difficult to get them built. A theme throughout the biophilic design, environmental psychology and *feng shui*, was the client-architect relationship. Beyond having a home that is designed for the client's well-being the process also should be a positive experience.

The second section tackles the element of communication within a design project. While the project is hypothetical, the client is real, Elan Bacon (pseudonyms chosen by volunteer) volunteered to give input in the design process for a new residence. The

design process through a series of meetings and proposed schemes are documented along with the final design. The final design is more fully developed compared to the earlier schemes. It is presented through floor plans, sections, elevations, and renderings.

The natural environment is a focal point in all three methods, which is reflected in elements incorporated in the interior. Exterior spaces are also addressed to incorporate the home into the site. The main focus of the site design revolves around the entry sequence, accommodating both vehicular and pedestrian entry.

Bringing the first two pieces of the document together is the analysis in the final section. As part of the research, a set of recommendations from biophilic design, environmental psychology and *feng shui* for home design are identified. Rooms or areas from the final design are focused on individually. Each is then analyzed through diagrams and vignettes based on the research. This is to achieve a more complete understanding of the design. It also demonstrates how the recommendations can be integrated within a design, which improves the communication between the architect and client.

Through these three sections, the parallels between biophilic design, environmental psychology and *feng shui* are utilized to approach the concept of holistic dwelling in an all-inclusive manner. This goes back to that initial desire to find an alternative way to design homes that is more attuned to the clients' well-being.

2 Research Document

2.1 Literature Review

The goal of this literature review is to explore the existing body of knowledge on the subject of environmental psychology, *feng shui*, and biophilic design in residential architecture. These three topics have a similar central goal; to create designs that are more attuned to the inhabitants' needs and desires; however they all go about achieving this in different ways.

The field of environmental psychology is more analytical than the other two, focusing mostly on observation of human behavior within certain environments. Design recommendations were then determined based on conclusions from the observations. These break down into two main categories, the relationship between humans and their environment and how people perceive their environment.¹ Most of studies report on the observations, but doesn't necessarily make specific recommendations how to improve, leaving designers to take the next step. A few authors outline direct elements that can be improved including DAK Kopec and Christopher Alexander. One thing that is distinctly different about the recommendations that the field of environmental psychology provides is novelty. While the other two fields tend to stick towards more traditional techniques, some authors haven't been afraid to propose more radical thoughts. The concepts presented might not be used, but they can get the designer's minds thinking outside the box.²

Feng shui is the oldest of the three fields of study that has been deliberately studied. All three fields are based on behavior and techniques that have been used by humans as early as the paleolithic era. *Feng shui* was

developed by the Ancient Chinese overtime as they found the ideal location to build structures, based on elements within the natural environment. This has been interpreted as the 'art of placement' by western cultures. There are many books that discuss the topic of *feng shui*. One author, Sarah Rossbach, who has worked with a *feng shui* master, Lin Yun, brings the techniques to a Western audience in a way they understand. The school of *feng shui* that Rossbach focuses on is the Black Sect School; this document utilizes that as well as the form school. These both look at the orientation of the building within its natural setting and how elements within the building work together. *Feng shui* gives clear recommendations. One thing to be aware of when analyzing and potentially utilizing this advice, is how it relates to the culture where the project is being completed.

Biophilic Design is the most recent of the three subjects. Edward O. Wilson first used the term *biophilia* in his book of the same title published in the mid 1980's. It looks back at how people connected to the natural world and the difference between their lives then. Technology changed the need of humans to rely on nature for survival. Wilson and others, who study in this field, feel that has left a gap in life that nothing can fill artificially. The suggestions that biophilic design gives are very clear cut regarding how to best achieve the connection with nature that Wilson feels humans need. While most of the recommendations focus on healthcare and early childhood development, elements can be extrapolated to pertain to residential architecture.

There is a significant amount of overlap between environmental psychology and biophilic design. Some of the research from environmental psychology has recently spread over to biophilic design, specifically with Stephen and Rachel Kaplan. They developed their own hypothesis of

¹ DAK Kopec, *Environmental Psychology for Design* (New York: Fairchild Publications, Inc, 2006).

² Paul Bell, Thomas Greene, Jeffery Fisher, and Andrew Baum, *Environmental Psychology 4th Edition* (New York: Harcourt Brace College Publishers, 1996).

preference framework within environmental psychology; the Kaplans found how elements within biophilic design supported it. From there they expanded more into that side of things. Similar to this example, many of the elements within environmental psychology are based on how humans developed over the years, though not all have been fully identified.

Feng shui initially seems to be an outsider in this study, but even though this was developed in another culture and time period than environmental psychology and biophilic design, however many of the basic needs of humans that have developed over time are quite similar. Some of the differences between the two cultures give a different perspective on design, which provides a more encompassing design method.

What I hope to achieve with the study of these three different fields of study is a system that can create a cohesive design that takes both the architectural and interior design into consideration. The crossover of the three offers an approach of creating a pleasing environment. Still the areas where they differ should not be ignored; they still may have insight that is important to the design process.

2.1 Biophilic Design

2.1.1 Introduction

Biophilic design methods complement many of the concepts in *feng shui*. The methods are also more closely aligned and sometimes overlap with Environmental Psychology than *feng shui*. Specialists in this field, predominantly designers, psychologists, and biologists, look at the idea of sustainability, they found that with the need to create better buildings for the natural environment, the human aspect was left out. Biophilic design looks at techniques that are beneficial to the environment, the building, and the inhabitants.

2.1.2 Development

Edward O. Wilson, a biologist from Harvard, first introduced his concept of biophilia in a publication in 1984. Wilson defines biophilia as "the innate tendency to focus on life and lifelike processes."³ In the book he describes being on a research trip in South America to study the social behavior of insects. At a village he noticed the surrounding buildings, the natural building materials, the techniques used to create the structures, but mostly how the village connected to the surrounding environment.⁴

Wilson continued his research into biophilia collaborating with Stephen Kellert in their book *The Biophilia Hypothesis*. They break down the concept of biophilia into nine distinct values: utilitarian, naturalistic, ecologicistic-scientific, aesthetic, symbolic, humanistic, moralistic, dominionistic, and negativistic. From this introduction the authors invited other professionals to react to their hypothesis. A significant contribution is by Roger S. Ulrich regarding biophobia, falling under negativistic. The general concept of embracing natural forms with in design would be counterproductive if the

client is fearful of the element. Others contribute towards human behavior, animals' role in human lives, and the spiritual side of relating to nature.⁵

Kellert recently, with Judith Heerwagen and Martin Mador, compiled a book specific to the built environment, *Biophilic Design*. This came out of a three-day meeting of various professionals in Rhode Island. A significant amount of the research into biophilic design is focused on making urban environments more habitable for people, though these techniques can also be transferred to residential environments to ensure the health and well-being of the inhabitants.⁶

Stephen Kellert defines biophilic design as a "deliberate attempt to translate an understanding of the inherent human affinity to affiliate with natural systems and processes"⁷ He feels that through the development of the human mind and body, peoples' world is governed by natural environmental features. Historically this was light, sound, odor, wind, weather, water, vegetation, animals and landscapes. With the advent of technology humans lost the intimate connection with these elements, which they had before. Part of biophilic design is to get people to reconnect with the natural environmental features.⁸

Kellert identifies this as a new design paradigm, not just a new building style. He calls it "restorative environmental design" which hopes to be environmentally friendly, having low impact on the natural environment, as well as creates a beneficial

⁵ Stephen Kellert and Edward O. Wilson, *Biophilia Hypothesis*, (Island Press, 1995)

⁶ Stephen Kellert, Judith Heerwagen, and Martin Mador, *Biophilic Design* (New Jersey: Wiley & Sons, Inc. 2008)

⁷ Stephen Kellert, *Biophilic Design*, 3.

⁸ Stephen Kellert, *Biophilic Design*.

³ Edward O. Wilson, *Biophilia*, (Boston: Harvard University Press, 1984), pg 1

⁴ Wilson, *Biophilia*.

connection between people and nature through their buildings and landscapes.⁹

The first element of biophilic design, from Kellert's standpoint, is an organic or naturalist dimension. This is incorporated physically in the form the building takes as well as symbolically reflecting an affinity for nature. It is important for people to be a part of two different types of experiences with nature, direct and indirect. Direct experiences with nature are when there is contact with a self-sustaining element of the natural world, daylight, plants, animals, etc. An indirect experience requires human involvement, potted plants, water fountain, or aquariums. This requires that the human is a participant in the well-being and success of the element.¹⁰

Placed-based or vernacular aspects are what Kellert identifies as the second basic element. Buildings and landscapes should be connected to the culture and ecology of the area in which they are being created or manipulated. This ties into "sense of place", if someone has a tie to earth where they are building, then they will be more respectful towards it and take better care of it.¹¹

From the two basic elements Kellert introduces six design components, which are then broken down into over seventy attributes. The components include Environmental feature, Natural shapes and forms, Natural patterns and processes, light and space, place-based relationships, and evolved human-nature relationships. While all of these are valuable within building design, this study shall focus on portions that directly relate to enhancing a residential design. The attributes are later elaborated upon by the other authors in the rest of the book.¹²

Julie Stewart-Pollack took Kellert's attributes and looked at a specific building in California, The Sea Ranch. Stewart-Pollack found that the specific attributes included dynamic natural light, natural ventilation, access to water, interaction and connection with nature, complexity and order, mystery, prospect and refuge, fundamental natural forms, and local materials. This goal of using biophilic design within The Sea Ranch was to take it beyond the United States Green Building Council's Leadership in Energy and Environmental Design (LEED) standards. LEED looks at the building's performance and how it relates to the environment, but not the physical psychological and social needs of the people living within the building.¹³

Judith Heerwagen looks at biophilia as something that is necessary for a well-rounded lifestyle, like exercise and nutritious food. She goes back to the paleolithic era with hunter and gatherers. Nature provided what they needed to survive, water sunlight, food and shelter. Heerwagen, like many, says this connection is still within us.¹⁴

Heerwagen also identifies that a connection with nature can create more of a respect with the environment leading towards more sustainable actions. She does specify that people should be aware of the type of nature they interact with. Not going as far as the concept of biophobia, she suggests avoiding dead or dying plants might be beneficial. Living and vibrant plant life creates more relaxation and enjoyment. The scale of this can range from a flower pot or single tree, to forests or parks. The nature should, however, be appropriate to the region it's located, using the natural environment and culture to ensure success.

⁹ Stephen Kellert, *Biophilic Design*.

¹⁰ Stephen Kellert, *Biophilic Design*.

¹¹ Stephen Kellert, *Biophilic Design*.

¹² Stephen Kellert, *Biophilic Design*.

¹³ Julie Stewart-Pollack, "Biophilic Design: For the First Optimum Performance Home," *Ultimate Home Design*, Issue 04, July/August 2006.

¹⁴ Judith Heerwagen, "Biophilia, Health and Well-being." *Restorative Commons: Creating Health and Well-Being through Urban Landscapes*, authored by Lindsay Campbell and Anne Wiesen, 38-57. (United States Dept. of Agriculture, 2011)

¹⁵ This sentiment is echoed in another study that proposes biophilic design must have local connection with the environmental and culture of the area.¹⁶ Use native while avoiding invasive species, the native plants and animals thrive for a reason in certain climates.

In another publication Judith Heerwagen teamed up with Betty Hase to discuss Biophilia specific to buildings and how people connect with nature within their surroundings. They predominantly focus on visual aspects that influence users. Elements they found beneficial include views of natural landscapes, green elements within a space as well as animals and water. However they identify elements that could also be counterproductive depending on some individuals' preferences. Heights, darkness, enclosed spaces, and certain types of animals can be detrimental.¹⁷

One of Heerwagen's associates, Gordon Orians explored the concept that even though humans have evolved, they are still tied to aspects of the African savannah. People seek out elements within their surroundings to mimic the hunting and gathering elements of the savannah. These elements are open grass areas with clusters of trees, diversity of plant life, topography that allows observation, water and a view of the sky. Orians agrees with Wilson that what people consider and seek as beautiful, comes from the survival techniques of early humans.¹⁸

¹⁵ Heerwagen, "Biophilia, Health and Well-being."

¹⁶ Amjad Almusaed, Asaad Almssad, Zaki Abdushaik Khalil, and Salih Shalil, "Biophilic architecture, the concept of healthy sustainable architecture" (paper presented at the 23rd Conference on Passive and Low Energy Architecture, Geneva, Switzerland, September 6-8, 2006).

¹⁷ Judith Heerwagen and Betty Hase, "Building Biophilia: Connecting People to nature in Building Design," *United State Green Building Council* (March 08, 2011) (PDF).

¹⁸ Heerwagen, "Building Biophilia".

Martin Jordan takes a look at more of a therapeutic side of nature, particularly as using nature as part of the healing process and how the environmental factors into individuals' mental well-being. Studies have found that patients' conditions are improved significantly when connecting to the outdoors versus being inside a facility. The term that Jordan uses, *ecotherapy* was first used by Clinebell. Clinebell proposes that a "holistic relationship with nature encompasses both nature's ability to nurture us, through our contact with natural places and spaces, and our ability to reciprocate this healing connection through our ability to nurture nature"¹⁹

Jordan ties this back to the Wilson's Biophilia hypothesis. He looks at Wilson's research of how humans need to connect more than just the human world. People are connected to nature through water, food, seasons, climates and cosmological aspects. These are present in rural as well as urban settings; they effect human perception, emotions and behavior.²⁰

The importance of ritual is also an element that Jordan addresses in humans connection to nature. He says that people need to reconnect to the earth; the re-establishing of this connection, humans will find the interconnectedness that their ancestors had. The culture that he focuses on is the Australian Aboriginals, though he acknowledges that similar beliefs were held by western cultures as well. Predominantly Jordan looks at how the Aboriginals used the landscape as part of their spiritual rituals, with these spiritual connections they allow a part of themselves to become intertwined.²¹

Nikos Salingaros and Kenneth Masden II take a closer look at the connection between the natural environment, building design and neuroscience. Starting with what historical

¹⁹ Martin, Jordan, "Back to Nature", *Therapy Today*, 17487846, Apr 2009, Vol. 20, Issue 3

²⁰ Jordan, "Back to Nature"

²¹ Jordan, "Back to Nature"

building practices, they talk about materiality. Prior to technological advances people used materials that was logical to their climate and surroundings to give basic shelter. As technology advanced people were able to separate themselves further from the natural world.²²

In research to re-connect humans with the built environment, researchers have tried to find the cause of why humans react strongly to natural forms, details, hierarchical subdivision, colors, and more. Saligaros and Masden express how humans interact with the built environment is no different than how they interact with the natural environments. So by learning from what humans find pleasing outdoors, designers can either simulate it or bring it directly indoors. Since people were more connected to their surroundings historically, they were able to tell what those elements were.²³ Therefore, humans should listen to what their instincts tell them to do. Our biological origin is still rooted in that natural environment; even with evolution humans should be able to sense what is beneficial for our well-being.²⁴

2.1.3 Conclusion

Even though biophilic design is a relatively new field of study compared to the other two, what it can teach is quite valuable. Similar to *feng shui* and environmental psychology, biophilic design was something that humans utilized while evolving from cave dwellers, without categorizing it. However with technological advances they lost touch with nature, hence the need to distinguish it as a distinct design philosophy. While a large element of biophilic design has been focused on urban living environments, it can be used within a rural setting as well to embrace the natural surroundings. This is particularly true with the setting of northern New England.

²²Stephen Kellert, *Biophilic Design*.

²³Stephen Kellert, *Biophilic Design*.

²⁴Stephen Kellert, *Biophilic Design*.

2.2 Environmental Psychology

2.2.1 Introduction

The practice of environmental psychology has been a part of the field of psychology for a long time, though it was only recently acknowledged as a separate topic of study. The term environmental psychology was used within the field of psychology by Egon Brunswik. Brunswik's main focus was representative design, creating an environment that could be manipulated for experiments.

Around the same time as Brunswik, Kurt Lewin started studying a link between social change and scientific research. He specifically thought that aspects outside of the awareness didn't influence our psychology. The studies of these men would not be considered a part of environmental psychology today, though they both started influencing others towards this line of research.²⁵

In the 1950s the field starting expanding. Abraham Maslow studied how people rated photographs while in different settings. Later a study in Saskatchewan had Robert Sommer and Humphrey Osmond changing physical aspects of buildings to monitor reactions of residents. The first conference on the subject was held in 1961 with the main topic being architectural psychology.²⁶

It wasn't until 1968 that a degree was offered at the City University of New York, the first graduate completed the program in 1975. It was in the sixties that the *Journal of Environmental Psychology* and the *Environment and Behavior* were established, along with the Environmental Design Research Association. Today environmental psychology has caught on within the design field, not just the psychological one. More architectural schools are beginning to offer

courses on the subject, even though a degree in environmental psychology is typically found in the psychology department.²⁷

In Robert Gifford's *Environmental Psychology: Principles and Practice* he discusses the meaning of home. What he calls the "six dimensions of home" parallels my interest in the subject. Haven, order, identity, connectedness, warmth, and physical suitability. Home is where we go for refuge from the outside world. It is our base, a constant in the daily travels in our life. Our abode tells as much about us as our clothing or music preference, it also shows how we connect with the world. Ideally we want our dwelling to evoke these feelings; the design can encourage them or impede them.²⁸

In Bell et al.'s textbook they look at environmental psychology as more than just the relationship of behavior and buildings. They expand their definition to cover both the built environment and its natural surroundings. It is also identified that not only is behavior dictated by the environment, but environment is influenced by behavior. In the book they characterize environmental psychology as the study of both the environment and behavior shaping each other and how they relate or interact to each other. Bell et al also acknowledge that the field of environmental psychology affects more than just architects or psychiatrists; it also influences the users of the space or fields that study human behavior such as anthropologist or city planning offices. Specifically on the topic of residential spaces, they focus on sense of place and usage of spaces within a home.²⁹

Roderick Lawrence discusses healthy residential environment in *Handbook of*

²⁵ Kopek, *Environmental Psychology for Design*.

²⁶ Kopek, *Environmental Psychology for Design*.

²⁷ Kopek, *Environmental Psychology for Design*.

²⁸ Robert, Gifford, *Environmental Psychology: Principles and Practice* (Allyn & Bacon, 1996).

²⁹ Bell, *Environmental Psychology*.

Environmental Psychology. Lawrence discusses the difficulty of creating a singular solution for environmental psychology because of cultural, occupational and geographical differences. He uses the definition provided by the World Health Organization for the term Health, "not merely the absence of disease and infirmity but a state of optimal physical, mental and social well-being", highlighting that enjoyment is included within the definition and should be a standard of the built environment. Lawrence takes a more practical approach when pinpointing his components of quality of life. He lists safety from natural disasters, shelter against the elements, dust, insects, animals and noise. The home should have a good water supply, waste disposal system and indoor air quality. It should also be located within proximity to facilities such as doctors, schools, or supermarkets.³⁰

Gifford has a similar general outlook on the field of environmental psychology as the previous authors. However he delves deeper into the differences in personal influences and how they affect the satisfaction of a resident. The age or stage of life of the inhabitants changes how they perceive or use the spaces, as we age our priorities change and what we need or desire in an abode also changes. The gender of the user also influences the choices an individual makes in their home, also the role they have within the household manipulates the environment. For example, as women entered the workforce their desire for a kitchen that is more open to the living or dining room increased. Socioeconomic status affects how people perceive and what they value in their home. What an individual plans for the future also impacts the choices they make in their residences.³¹

³⁰ Roderick J. Lawrence, *Housing, Dwellings and Homes: Design Theory, Research and Practice* (Chichester, England: Wiley, 1987).

³¹ Robert, Gifford, *Environmental Psychology: Principles and Practice* (Allyn & Bacon, 1996).

As shown through these texts, it is impossible to create a one size fits all home. It has to be tailored to the individuals who are going to occupy it for the best outcome, though that would make it difficult for another user to adjust to the space if house was to change occupants. It is quite important to keep a building flexible for the current users as well as future users. Gifford also discussed that the built environment influences the preference of the user, through housing form, architectural style, interior layout, and outdoor area. By studying previous work on spatial arrangements and uses, a set of guidelines could be derived.

2.2.2 Human-Environment Relationships

Basic theory of Human-Environment Relationships is that humans are affected by multiple factors. There are several main studies that explore this relationship, integration, control, behavior-setting, stimulation.³²

Integration (Integral). Isidor Chein identified five elements needed in a design to enable specific behavior within an environment, global environment, instigators, goal objects and noexients, supports and constraints, and directors. Global environments are universal features of the environment. Instigators are stimuli within the environment that elicit behavior of individuals. Goal objects and noexients are situations that trigger reactions, positive or negative. Supports and constraints are the elements that affect behavior within an environment. Directors are features that guide people within a space.³³

Control Theories. Humans feel most comfortable within spaces where they can control aspects of their environment. James Averill identified three types of controls; behavior control – the ability to change

³² Kopek, *Environmental Psychology for Design*.

³³ Kopek, *Environmental Psychology for Design*.

events, cognitive control – the ability to change how they regard the environment, decision control – capacity to choose a reaction to events.³⁴

Behavior-Setting Theories. In this theory Roger Barker explains that a human's behaviors are a reflection of the surroundings they inhabit. He states that certain environments elicit difference responses.³⁵

A study into negativity biases was conducted by David Kanouse looked into how the bias plays into evaluation and choice behavior. This gives insight into how people are influenced by information within different settings. When people interact with objects they form conclusions based of various characteristics of the objects. These conclusions can come from a positive standpoint or a negative one; these are different for various people.³⁶

Kanouse states that when making a judgment people tend to weigh the negative greater than positive. He also finds that first impressions that are negative are harder to alter than positive ones. There are several reasons for these occurrences, what Kanouse identifies these looking at the micro-level to the macro level.³⁷

Starting with the response scale artifacts, this looks at the process of creating a judgment and then formulating a response. There can be a shift between the judgment and response. A person might not have a behavioral response that fits their judgment and therefore subconsciously choose the best fit.³⁸

Humans are also subjected to selective attention. They don't always focus equally on all information, which then in turn influences the judgment. How and what an individual focuses on can show a negative bias, which would then in turn produce a negative judgment. The elements that are the most attention grabbing are extremes. Out of positive and negative extremes, it has been seen that negative is the most immediately observed.³⁹

The judgment process that people develop elaborates on the above statement. Within this process people tend to weigh negative information greater, because that is how they were taught to view it. One thought is that out of all the information gathered, people gravitate towards the most extreme and then base their judgment off of that.⁴⁰

When individuals form a judgment, it is based on prior experiences, which requires a retrieval process. This process, just like the ones stated earlier, can also be influenced by negativity. When humans form a memory they are based on an overall impression. Over time the overall impression changes because of what it relied upon as an example for further behavioral responses. These responses don't typically allow for time to exhaustedly search one's memory which can also color a response.⁴¹

Getting back to the contrast between positive and negative biases is the figure-ground hypothesis. This concept identifies human's negative bias comes from the dominance of positivity in the environment. People more inclined to use positive words than negative ones, and they are more optimistic. This makes the negative information stand out against what they typically view. This idea is similar to the

³⁴ Kopek, *Environmental Psychology for Design*.

³⁵ Kopek, *Environmental Psychology for Design*.

³⁶ David Kanouse, "Explaining Negativity Biases in evaluation and choice Behavior: Theory and Research,"

<http://www.acrwebsite.org/volumes/display.asp?id=6335>.

³⁷ Kanouse, "Negativity Biases in evaluation and choice Behavior".

³⁸ Kanouse, "Negativity Biases in evaluation and choice Behavior".

³⁹ Kanouse, "Negativity Biases in evaluation and choice Behavior".

⁴⁰ Kanouse, "Negativity Biases in evaluation and choice Behavior".

⁴¹ Kanouse, "Negativity Biases in evaluation and choice Behavior".

theory of novelty and distinctiveness. Since people don't interact with negative information as often it becomes novel and therefore distinctive. Because of this, the information becomes more weighted in formulating a response.⁴²

Definitiveness is related to the previous two ideas, by looking at the prevalence of positive aspects versus negative. However, in definitiveness, it is identified that people are less concerned about their positive traits compared to their negative ones. Positive traits are more normative and are taken for granted, while non-normative are weighted heavier when evaluating the traits of an individual. There is also the belief that people find negative information to be more credible when taking other's advice into consideration.⁴³

In a 1972 study, Kanouse and Hanson found that just one negative element can influence further interactions. The example of this that they give is the composition of a soup. No matter how good the soup is, if there is one ingredient that is bad, the whole soup is affected. Likewise if there is one element in a room that has negative connotations for a user, the user won't enjoy the room as much as others might.⁴⁴

Stimulation Theories. This explores the concept that environments appeals to all five senses and from that information humans can comprehend said environments. Rachel and Stephen Kaplan explore this concept in their studies on Attention Restoration Theory. They base their conclusions on the attention humans devote to situations. They found that even though each human has a different level of attention they can achieve, everyone could experience attention deficit and overload. In those situations they

restorative experiences typically through connecting with nature.⁴⁵

Social Learning. Julian Rotter developed the social learning theory method of analyzing behavior. He combined learning and personality theories to observe human behavior. Rotter used the empirical law of effect, stating that people are encouraged by positive stimulus, while they stay away from negative, which he felt that previous psychological theories lacked.⁴⁶

Rotter looks at several interdependent aspects, personality, behavior, and environment. These relationships he classified in four components of his theory. *Behavior potential* described the probability of how someone would react in a particular situation. The likelihood that behavior will lead to an outcome is termed *expectancy*. Individuals who have a high "expectancy" are certain of the resulting positive behavior, conversely a low "expectancy" has an unlikely outcome. Individuals' reactions in these situations are based on previous experience in similar circumstances. *Reinforcement value* is simply defined as the outcomes of behavior. A high reinforcement value indicates attraction, while avoidance has a low reinforcement value. The final component is a combination of the three previous known as *predictive formula*. This looks at the behavior potential as a function of expectancy and the reinforcement value.⁴⁷

Rotter also found several other elements in his study of social learning theory that he felt were important. He felt it was quite important to keep *psychological situation* in consideration while predicting behavior, that interpretations of a certain environment are subjective. Various stimuli that are

⁴² Kanouse, "Negativity Biases in evaluation and choice Behavior".

⁴³ Kanouse, "Negativity Biases in evaluation and choice Behavior".

⁴⁴ Kanouse, "Negativity Biases in evaluation and choice Behavior".

⁴⁵ Kopek, *Environmental Psychology for Design*.

⁴⁶ Kopek, *Environmental Psychology for Design*, "The Social Learning Theory of Julian B. Rotter," last modified 2011, <http://psych.fullerton.edu/jmearns/rotter.htm>

⁴⁷ Kopek, *Environmental Psychology for Design*, "The Social Learning Theory of Julian b. Rotter".

specifically significant for the individual make up their reactions and no two people have the same background to lead to the same reaction. This leads *generality vs. specificity*; Rotter believed that both had merits. General constructs allows the analyzer to have broader observations from a smaller amount of data, though it tends to have a lower accuracy than specificity. Specificity constructs are easier to measure, but they can be limited to particular situations.⁴⁸

Julian Rotter has also become known for his concept "locus of control". He looked at how people reinforced their life and how they developed conclusions based on observations. Rotter found that people tended to fall into two categories, internal or external loci. With internal locus, individuals find the support they need from within themselves, that they are responsible for their own positive or negative results. People with external loci tend to explain their reinforcement for their behavior as coming from luck, chance or other more dominant individuals to dictate their behaviors and actions.⁴⁹

Albert Bandura also developed a version of social learning theory. This was first published in the 1970s⁵⁰, twenty years after Rotter started working in the field of psychology⁵¹. Bandura's focus was how this related to aggression and violence, though the study method can be applied to other research. He felt that information can be gathered based of observing behavior⁵², this lead to three concepts. In observational learning, individuals learn their behavior from seeing others demonstrating the same behaviors, from verbal instruction, or through books or

film. Bandura's next concept is similar to the locus of control theory Rotter developed, looking at intrinsic and extrinsic reinforcements. The final concept is acknowledges that learning does not always impact an individual's behavior.⁵³

Within his studies, Bandura identified a modeling process that people need to successfully learn behaviors. First an individual must pay attention to the example. If they do not pay attention it makes the next step more difficult, retention. Without retention of that behavior what has been learned won't be stored in an individual's memory to reproduce the behavior. With reproduction of a behavior an individual will experience reinforcement, if that reinforcement is positive they will be encouraged to continue that behavior.⁵⁴ Two contemporaries have expanded upon Bandura's theory, Ronald Akers and Gary Jensen. They have added several concepts to their analysis. *Differential association* of the direct and indirect interaction of an individual with behavior of others that support the individual's behavior or groups that do not display behaviors that are similar to the individuals. How a person's orientations, rationalizations, justifications and attitudes that delineate the individual's actions and how they determine right and wrong is called *definition*. The anticipated rewards, positive or negative, that people as a result of their behavior are identified as *differential reinforcement*. Through their supplementing concepts, they identified patterns of behavior developing over time. Similar to Bandura, they focused on how social learning theory relates to aggression and violence.⁵⁵

⁴⁸ "The Social Learning Theory of Julian b. Rotter".

⁴⁹ "The Social Learning Theory of Julian b. Rotter", Julian Rotter, "Internal Versus External Control Reinforcement: a case history of variable," *American Psychologist* 45.4 (1990): 489-493.

⁵⁰ Kendra Cherry, "Social Learning Theory," <http://psychology.about.com/od/developmentalpsychology/a/sociallearning.htm>.

⁵¹ "The Social Learning Theory of Julian b. Rotter".

⁵² Kopek, *Environmental Psychology for Design*.

⁵³ Cherry, "Social Learning Theory".

⁵⁴ Cherry, "Social Learning Theory", Margret Isom, "The Social Learning Theory," <https://www.criminology.fsu.edu/crimtheory/bandura.htm>.

⁵⁵ Ronald Akers and Gary Jensen, "Empirical Status of Learning Theory of Crime and Deviance," <http://sitemason.vanderbilt.edu/files/l/13Bguk/Empirical%20Status%20of%20Social%20Learning%2>

The main critics of Bandura's version of the social learning theory are biological theorist. They feel that social learning ignores the genetics, and learning differences in different individuals. People react differently to various situations. He also doesn't acknowledge the conditioning process people go through as they interact with situations over time.⁵⁶

2.2.3 Theories of Environmental Perception

Probabilistic Lens Model. Egon Brunswik developed this model to look at relationship of humans and the environment as all-inclusive rather than individual parts. Brunswik is categorized as a functionalist, believing that the environments can explain how humans behave within them.⁵⁷

Affordances. James J. Gibson proposed that instead of looking at individual parts of an environment, they are organized in a pattern that can explain spaces. He also explained that humans placed difference values on various objects that can also tell more about the spaces.⁵⁸

Collative Properties. In his model, Daniel Berlyne, theorized that humans respond to stimuli including novelty, complexity, incongruity, and surprise. These properties affect judgment through two dimensions: Hedonic tone and Uncertainty-arousal.⁵⁹

Pleasure-Arousal-Dominance Hypothesis. Albert Mehrabian and James A. Russell developed a method of determining humans' emotional reactions to environments. Responses to spaces are graphed based on four determinants, arousing vs. not arousing and pleasurable vs. not pleasurable. Through the results a

conclusion can be made. Russell disagreed with the inclusion of dominance in the analysis, though it is believed that with dominance (and vulnerability) creates a more complete analysis specific to environmental design.⁶⁰

Preference Framework. The Kaplans developed a framework for exploring environmental preferences. The framework is made up of four elements; coherence – the ability to make sense, legibility – the ability to discern elements, complexity – involvement, and mystery – potential involvement. While these elements can create an exciting environment, Berlyne warns that too much stimulation can create fatigue.⁶¹

Elements of Legibility. Kevin Lynch developed a way of analyzing settings, typically used in cities, it can also be used buildings. He identified elements of paths, edges, districts, nodes, and landmarks.⁶²

2.2.4 Conclusion

This introduction to environmental psychology scratches the surface by looking at the two predominant theories, environmental perception and human environment relationships and their related studies. Each study brings different a different approach to analyzing the home, though some contradict each other. With that in mind, it means that the field has challenged itself to evolve over time. Just looking at how the focus of the field has changed over time, starting with primarily the analysis concentrating on the efficiency in work environments and expanding to encompassing all building types. The result of many of these studies provide analysis, observations of human behaviors, and how elements affect people within spaces, but they rarely give specific design recommendations.

0Theory%20of%20Crime%20and%20Deviance.pdf.

⁵⁶ Isom, "The Social Learning Theory".

⁵⁷ Kopek, *Environmental Psychology for Design*.

⁵⁸ Kopek, *Environmental Psychology for Design*.

⁵⁹ Kopek, *Environmental Psychology for Design*.

⁶⁰ Kopek, *Environmental Psychology for Design*.

⁶¹ Kopek, *Environmental Psychology for Design*.

⁶² Kopek, *Environmental Psychology for Design*.

2.3 *Feng shui*

2.3.1 Introduction

Feng shui is typically described as the 'art of placement' or the 'sacred art of positioning'. In the Chinese culture, that developed *feng shui*, one's position was very important, whether it was the position in the landscape, world or cosmos. They strived to find their own correct location through various methods that are sometimes considered mystical by western standards, including numerology and astrology. These phrases have been developed as ways that Westerners have developed to better understand the concepts of geomancy and elements that make up *feng shui*. Stephen Feuchtwang, a professor of anthropology, disagreed with the term 'geomancy' favoring instead the term 'topomancy'. He felt that the Chinese geomancy had more to do with divining elements of the earth rather than random elements cast upon a surface. As the ultimate goal of *feng shui*, the Chinese tried to balance and enhance the environment to create a harmonious and comfortable space.⁶³

The literal translation of *feng shui* is 'wind and water'. This originated in the ancient divination practices of the ancient Chinese, which tied humans to nature. This was logical in their agrarian society where nature was influential in their well-being. It was developed as a survival technique.⁶⁴

The ancient Chinese observed that their lives were affected by their surroundings. They found that some places were better than

others, believing that certain areas were either blessed or lucky. The surrounding hills and buildings, elements in the house, how everything was oriented effected the building. Lin Yun, a *feng shui* expert from Taiwan, explained that he creates homes designed to harmonize with the flow of *qi* or energy. All of this needed to be balanced. The ancient Chinese believed that everything is tied together; humans were dependent on the well-being of the earth. If they damaged the earth, they themselves would feel the consequences. *Feng shui* felt that humans should enhance their surroundings rather than harm them. The goal should be to create harmony with nature.⁶⁵

Feng shui evolved from the initial survival techniques to include elements of Taoism, Buddhism, and yin-yang theory of balance. Feuchtwang, describes *feng shui* as being made up as three major elements; astronomical phenomena, natural phenomena, and human behavior. These elements are combined with Chinese astronomy, geography and philosophy. The goal of this is to create harmony between heaven, earth and humans, which can be interpreted as nature, the built environment, and people. This has formed what is classified today as *feng shui*.⁶⁶

The practices of *Feng shui* were typically passed from father onto son, who could be semi-literate peasants to scholars or priests. Historically women did not practice the art of *feng shui*, Confucian customs did not allow the sacred knowledge to be passed down to females. The Buddhist and Taoist priests were particularly believed to have sacred knowledge to interpret the elements of the landscape. The reading of a landscape was

⁶³ Vincent Smith, *Feng Shui: A Practical Guide for Architects and Designers* (Kaplan Business, 2006), Sarah Rossbach, *Feng Shui, The Chinese Art of Placement*, (New York: Penguin Compass, 2000), Marja Sarvimaki, "Structures, Symbols and Meanings: Chinese and Korean Influence on Japanese Architecture", (PhD diss., Helsinki University of Technology, 1999).

⁶⁴ Marja Sarvimaki, "Structures, Symbols and Meanings", Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

⁶⁵ Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁶⁶ Mak "The art and science of Feng Shui", Rossbach, *Feng Shui, The Chinese Art of Placement*.

used to track the *qi* that flowed through it to determine the most auspicious locations. They would analyze the physical environment; mountains, trees, water, wind and alignment of the stars. Smaller details were also important like breezes, leaf colors, moon rings, smells, insect and animal activity as well as moisture in the site. Today while many Chinese know a little about *feng shui*, they rely on specific *feng shui* masters to analyze and make recommendations for them.⁶⁷

Even though this document uses *feng shui* to guide the designing of a house, it was and is used for so much more within the Chinese culture. *Feng shui* can be used in every part of a person's life utilizing their name, birthdate, astrological symbol and even the hour of their birth to create personalized recommendations. It is also employed on the larger scale of urban planning; most of the major cities in China follow to the teachings of *feng shui*.⁶⁸

Western cultures still do not fully understand the ideas of *feng shui*, but the overarching goal improve people's lives. This document will look at the importance *feng shui* emphasizes of the well-being of the inhabitants of buildings. People can look to nature to inform elements to create a harmonious home that will create a healthier living environment. The *feng shui* professional should create spaces that enhance the spaces that people inhabit and improve elements that may negatively impact their life. Many of these techniques are practiced by architects without consciously knowing that they are *feng shui* customs, which will be discussed later in the document. Many of the major cities around the world follow the principals that *feng shui* recommends. Some earlier Western cultures also practiced similar

concepts including the Greeks, Egyptians, Scandinavians, and Navajo Native Americans.⁶⁹

Within *feng shui*, there are many different approaches towards designing and analyzing, but there are three main schools: form school, compass school, and the black hat *feng shui* school (sometimes known as the black sect *feng shui* school).⁷⁰

2.3.2 Elements in Chinese Cosmology

Yi jing. The *Book of Changes*, more commonly known by the Wade-Giles transliteration of *I Ching*. The text was developed from the use of "oracle bones" in a divining process. Tortoise shells or ox shoulder bones were heated with fire until they cracked, from reading the fissures either an affirmative or negative response was found.

Divination. The ancient Chinese developed trigrams based on objects and interpreting their relationships as instructions and wisdom. ☷ - earth, ☲ - fire, ☰ - heaven, ☱ - lake, ☶ - mountains, ☳ - thunder, ☵ - water, and ☴ - wind. The symbols for heaven and earth also correspond with father and mother respectively, as well as other elements in *feng shui* like the cardinal directions, time and stages of life. These were printed on the compass to provide bearing points when aligning furniture, rooms, building, or even cities.⁷¹

⁶⁷ Rossbach, *Feng Shui, The Chinese Art of Placement.*, Marja Sarvimaki, "Structures, Symbols and Meanings

⁶⁸ Rossbach, *Feng Shui, The Chinese Art of Placement.*, Smith, *Feng Shui: A Practical Guide for Architects and Designers.*

⁶⁹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Michael Mak and Thomas Ng, "The art and science of Feng Shui – a study on architects' perception," (*Building and Environment* 40, 2005).

⁷⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers.*

⁷¹ Rossbach, *Feng Shui, The Chinese Art of Placement.*

The ancient Chinese also used astrology in their divinations.⁷²

Bagua. The eight trigrams from *Yi jing* collectively create the *bagua*. It is a symbol of cosmic wholeness. In *feng shui* it is a tool that is used to analyze the spaces that are being designed and will give recommendations for the spaces and their uses.⁷³

There are different types of *bagua* used in different schools of *feng shui*. The traditional *bagua* is stationary; the trigrams are fixed in a set position when analyzing a space with relation to the cardinal directions, north, south, east and west. The *bagua* that the Black Sect School uses is not static; it is oriented based on the entrance to the space.⁷⁴



Figure 1. The Bagua – In the bagua the eight trigrams from the yi jing form an octagon. Each of these segments has corresponding colors as well as elements and meanings.

⁷² Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁷³ Sarah Rossbach and Lin Yun, *Feng Shui Design: The art of creating harmony for interiors, landscape and architecture* (England, Penguin Book, 1998)

⁷⁴ Rossbach, *Feng Shui Design: The art of creating harmony for interiors, landscape, and architecture.*, <http://www.bluemountainfengshui.com/formschool.html>

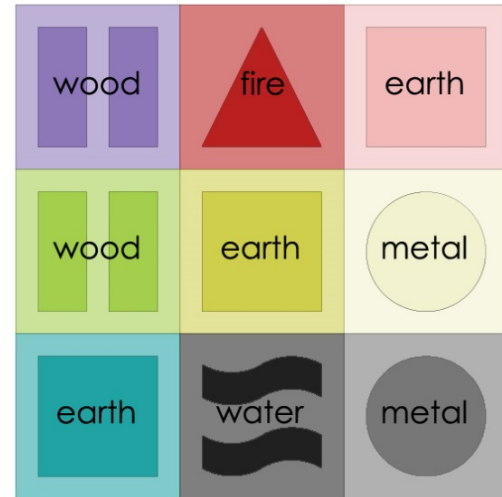


Figure 2. The Bagua – This is another version of the bagua that is commonly used in the Black Sect School. Each box corresponds to the version in figure 1. This is overlaid on a house floor plan, or room layout or even a city. The entry to the space is always oriented towards the bottom of the bagua and how it is shown here.

The goal of the *bagua* is the same despite the school it is being used in. The *bagua* is used to raise the amount of *qi* in the given location which can result in the improvement of the users' life.⁷⁵

Five Elements. In *Feng Shui*, there are natural elements that are represented within spaces, colors, and paraphernalia coming from *Yi jing*. The elements are similar to western natural elements; water, wood, fire, earth, and metal. These can either build on each other in a productive manner or interact in a destructive way.⁷⁶

The productive cycle focuses on the creation or building of an element upon another element. Water is essential for the growth of trees that produce wood. Wood is a crucial element in fire, fire creates ash that is

⁷⁵ Rossbach, *Feng Shui Design: The art of creating harmony for interiors, landscape, and architecture.*, <http://www.bluemountainfengshui.com/formschool.html>

⁷⁶ Marja Sarvimaki, "Structures, Symbols and Meanings"

interpreted as earth, earth produces minerals making up metals, and metals can become liquefied mimicking water.⁷⁷

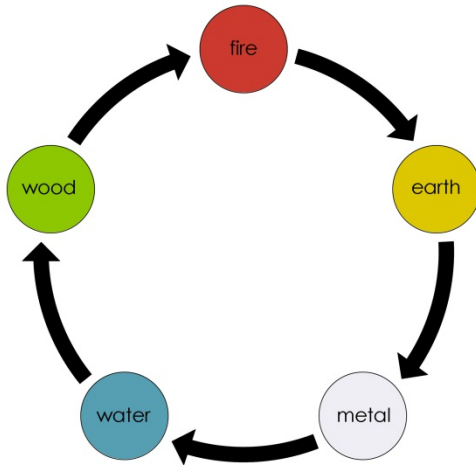


Figure 3. The Productive Cycle of the Five Elements – this interaction of the elements builds or grows upon other elements in a productive manner that is perceived to be positive.

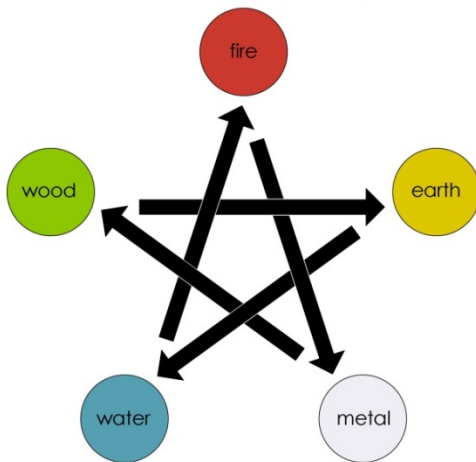


Figure 4. The Destructive Cycle of the Five Elements – the relationships between the elements in a destructive cycle breaks down one another, changing the make up on the affected element.

The destructive order can be seen in the pairing of the elements that change the physical makeup of the elements. Water to fire, fire to metal, metal to wood, wood to

⁷⁷ Marja Sarvimaki, "Structures, Symbols and Meanings"

earth, earth to water. They are not compatible and therefore should be avoided to create harmonious spaces.⁷⁸

Yin/Yang. *Yin* and *yang* are two forces that are believed to control the universe, ideally it is best if they are balanced and harmonize. While most westerners are familiar with the image and basic concept of *yin* and *yang*, they don't necessarily fully understand the meaning of the terms. *Yin* and *yang* are opposites, but they are also complimentary and dependent upon one another. *Yin* cannot exist without *yang*; likewise *yang* doesn't exist without *yin*. United together they create *tao*. It is important to note that contrary to western beliefs *yin* and *yang* aren't negative and positive in a Western sense.⁷⁹

Yin represents a more passive energy that is open and flexible. It is typically found in the following aspects; the female, intuition, dark, earth, cold, even number, interiors and introspection. In contrast, *yang* is male, conscious, light, sky, warm, odd numbers, exteriors, and extroversion. The *yang* energy is active, assertive, and has more initiative than the *yin*.⁸⁰

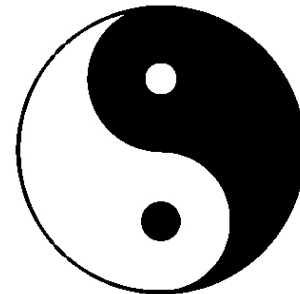


Figure 5. Yin and Yang – Yin and yang are two complementary forces that in turn, balance each other.

⁷⁸ Marja Sarvimaki, "Structures, Symbols and Meanings"

⁷⁹ Rossbach, *Feng Shui, The Chinese Art of Placement.*, Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Marja Sarvimaki, "Structures, Symbols and Meanings"

⁸⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers.*

With *yin* and *yang* in a building, the former relates to rounder shapes, curves, areas that are inactive like garages, closets, and bathrooms. *Yang* represents the more active areas of the home as well as sharp straight forms. *Yin* and *yang* should be balanced with each other to create harmony within a space. This can be achieved in a home through materials, colors, and textures.⁸¹

Qi⁸² *Feng shui* says that our life and destiny are connected with the universe and nature, the force that bonds these two is known as *qi*. It is an energy that is part of the atmosphere, the earth, and all elements contained within those. The term *qi* is first found in *Yi jing*. There are two main types of *qi*, one relating to the heavens and one relating to the earth. Without *qi* life cannot be sustained. *Qi* is the life force or breath of life that creates everything from mountains to plants, or trees. It is the most essential part of human life; it is the human spirit or energy. *Feng shui* tries to harness and enhance environmental *qi* to improve our personal *qi*. It is what ties humans to nature, everything breaths *qi* in and out, so what has been exhaled is then inhaled by a human, animal, plant, rock or any element in the atmosphere.⁸³

The ancient Chinese felt that *qi* was influenced by physical elements that direct and how that in turns affects the building that is being analyzed. These elements include natural, like rivers and mountains, and man-made, roads and other structures. Those components can affect the *qi* of others, either changing the quality or the movement of the *qi*. They cannot increase

or decrease the amount of *qi* that one person has.

Typical interruptions are usually man made elements that change the existing natural landscape, like a new road, building or swimming pool. This disturbs the natural balance, disrupting the tranquility and was viewed as violating the earth.⁸⁴

Since *qi* is considered the breath of life, there is also complementary side of it. There are two types of *qi*, living and dead. Living *qi* logically gives energy, while dead *qi* ends life and is cold. Naturally it is beneficial to have living *qi*, which can be enhanced by being surrounded by water and protected from being blown away from the wind. A negative aspect that relates to *qi* is *sha*. *Qi* flows in sinuous paths, while *sha* is more violent with straight lines. This can be caused by man-made elements interrupting or guiding the *qi*, they are sometimes known as 'secret arrows'. It is tied into the destructive order of the five elements.⁸⁵

The belief is that *qi* is linked to the geographical features in the landscape. As *qi* meanders within the world, its relationship with the earth's surfaces fluctuates. If *qi* is too far removed, it will result in a dry desert like environment, if *qi* is too active; bubbling up close to the surface there is the chance for a volcano. The ideal situation has *qi* just stroking the earth's surface creating mountains, promoting vegetation growth, fresh air, and clean air. All things that humans need to survive. These are also the places with the best balance of *yin* and *yang*, if not harmony cannot be achieved

⁸¹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

⁸² Known as chi or ch'i in the Wade-Giles transliteration system, see the transliteration chart in the appendix

⁸³ Rossbach, *Feng Shui, The Chinese Art of Placement.*, Marja Sarvimaki, "Structures, Symbols and Meanings", Mak "The art and science of Feng Shui".

⁸⁴ Candace Czarny, "Understanding the Different Schools of Feng Shui", last modified 2012, <http://www.artofplacement.com/FengShuiSchools.htm>, Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁸⁵ Mak "The art and science of Feng Shui", Marja Sarvimaki, "Structures, Symbols and Meanings", Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

and the overall goal of *feng shui* is thwarted.⁸⁶

A study by Jane Lu and Albert So looked at the fluid dynamics of natural ventilation within the typical bathroom. Their findings related to how the principles *feng shui* describes *qi*. Similarly, Alfred Hwangbo found that many of the western architectural geometric techniques are comparable to traditional *feng shui* principles. Designers are intuitively incorporating these methods within their buildings.⁸⁷

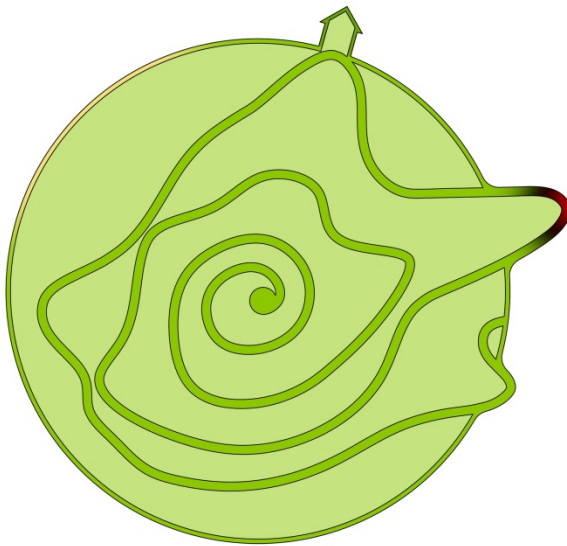


Figure 6 Qi's relationship with the world – Qi flows throughout the world, in this diagrammatic cross section, it is seen where the qi is far away from the earth's surface it is dry and desert like. Whereas where it is active and pushes up through the earth's surface mountains are formed. If the qi is too vigorous, volcanoes are formed. The ideal location to build is where the qi just touches the surface creating a lush environment.

Commanding Position. In every location there is one space that is the most favorable, known as the commanding position. This comes from the user in that space having the best control over the location. What makes up the commanding position is an unobstructed

view of the entry and as much of the space as possible including at least a ninety degrees cone of vision for the person in that location.

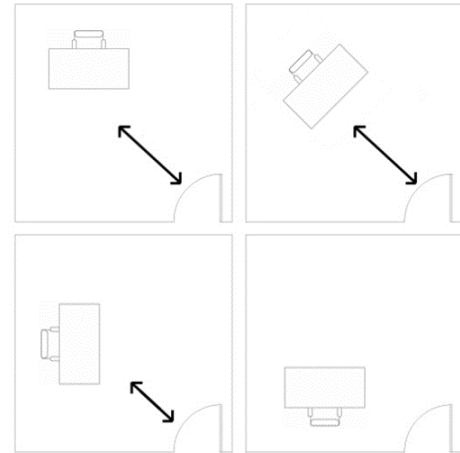


Figure 7. Examples of the Commanding Position – This shows how a desk can be oriented within a space following the commanding position. The user of the space should have a clear view of the entry to the area. This gives them the control to appropriately respond to whatever comes through that door.

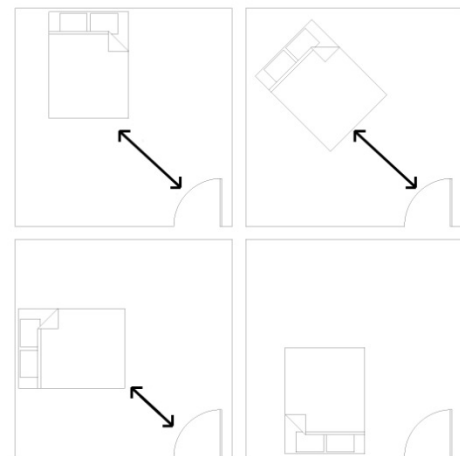


Figure 8. Examples of the Commanding Position – The commanding position will most frequently be used in the bedroom in a home. Similar to the previous figure, the users of the room should have a clear view of the door from the bed. Other places in the home where the commanding position should be considered is in the kitchen and living room.

⁸⁶ Mak "The art and science of Feng Shui", Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁸⁷ Mak "The art and science of Feng Shui".

Compass. Unlike the Western cultures, the ancient Chinese used compasses in feng shui for orientation instead of navigation. They are used for the positioning in divination and geomancy. Initially they were thought to have magical properties, which made the masters using them more mystical.⁸⁸

There are several different parts of the Chinese compass. Divination board, *shipan* – lower square – ‘earth plate’, *dipan* – round moveable ‘heaven plate’, *tianpan* – relationship of cosmological elements.⁸⁹

The *loupán*, or geomancer’s compass, takes astrology as well as the earth’s magnetic field into consideration to help find the orientation that is most favorable for an individual. It includes various elements including the eight trigrams, five phases, hours of the day, solar fortnights, and the animals of the Chinese zodiac.⁹⁰



Figure 9. Chinese Compass – The Chinese compass is a magnetic compass that was used for orientation. The first ring around the magnetic compass has the eight trigrams from the *yi jing*. The surrounding rings have other information that

would relate to the client. This includes birthdates, astrological symbols, and more.

Four Emblems. Another element within *feng shui* is the four emblems theory. These grew from Chinese astronomy. The culture at the time had twenty eight minor astrological constellations; these were organized into four emblems. The emblems create the ideal location to have a city, home or room is with the space protected by mountains to the rear, hills flanking, and a river in front. Each of these emblems has an associated animal to describe it.⁹¹



Figure 10. Four Emblems – The four emblem theory is based on Chinese astronomy. The four emblems are a turtle, tiger, dragon, and red bird, or phoenix. They represent various elements within a site, typically hills.

The phoenix (red bird) is the front part of a space. Looking at each of these terms in a residential setting, this would be the front of the house/property. In the ideal example, a river would be located here, but that could be a wandering path or flowerbed, a low

⁸⁸ Marja Sarvimaki, "Structures, Symbols and Meanings"

⁸⁹ Marja Sarvimaki, "Structures, Symbols and Meanings"

⁹⁰ Marja Sarvimaki, "Structures, Symbols and Meanings"

⁹¹ Form School Feng Shui," last modified 2012, <http://fengshuiweb.co.uk/advice/formschool.htm>, Marja Sarvimaki, "Structures, Symbols and Meanings", Mak "The art and science of Feng Shui", Rossbach, *Feng Shui, The Chinese Art of Placement*.

hedge, anything that will provide "protection" while still allowing visibility.⁹²

The dragon (azure dragon) focuses on the left side (from the perspective of the front door) of the property. This is supposed to be one of the buffering hills; in most western neighborhoods properties don't allow for that much space. The buffering can occur with trees, other buildings or a fence. Typically people already have a similar technique in place for privacy. Mirroring the dragon is the white tiger. It should have similar elements as the dragon.⁹³

The dark turtle (black tortoise), the mountains, protects the rear of the house. Likewise this is supposed to be protective, it should be more formidable than the elements of the white tiger and dragon, but ensure that light to the house is not blocked.⁹⁴

Yang Jungson, a *feng shui* practitioner in the Tang dynasty (618-907 CE), created methods of designing within five geographical factors. Form and direction is another technique used in the form school. Similar to the four emblems, this looks at hills, mountains, water, and the relationship between the landforms and the water. The five factors are dragon, sand, water, cave, and direction. Combined with the previous methods, Yang formed a systematic analysis.⁹⁵

Yang's dragon is different than the dragon (azure dragon) described earlier. Yang describes the factor as a string of mountain

ridges. There are several "dragons" within the ridges. Starting with the peak of Ancestor with at least three major peaks following, the forefather, great grandfather and grandfather, the combination is called a *true dragon vein*. These peaks end with the *hill of parents* which shelters the location of the cave. The emblems that were previously looked at are classified as *sand*, hills that protect the cave. The phoenix (red bird) is also considered *sand*, but has two further classifications. It's either a smaller hill called a *Table Hill* and is closer to the cave or is a far away mountain called *Facing Mountain*.⁹⁶

The *water* that Yang presents logically represents water that flows through the site. With contemporary *feng shui* practices this factor can also be used to describe roads or street, elements that carry moving elements like water. Further addressing the cave, it is the best location for the building to occur, whether that is a home or a city. The final factor is *direction*. The orientation of the building is quite important, with the best being southern.⁹⁷

2.3.3 Schools of Feng Shui

Form School. The oldest school of *feng shui* is the form school; it was developed in rural China. Each village had their own methods of designing, but it primarily came out of the physical environment so there were similarities between each method. The general guidelines came out of the surrounding landscape and elements, like wind and water. These came out of a need to survive, which led to success and eventually became a tool of the emperors to ensure achievement in their lives.⁹⁸

⁹² Form School Feng Shui", Marja Sarvimaki, "Structures, Symbols and Meanings", Mak "The art and science of Feng Shui", Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁹³ Form School Feng Shui", Marja Sarvimaki, "Structures, Symbols and Meanings", Mak "The art and science of Feng Shui", Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁹⁴ Form School Feng Shui", Marja Sarvimaki, "Structures, Symbols and Meanings", Mak "The art and science of Feng Shui", Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁹⁵ Mak "The art and science of Feng Shui", Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁹⁶ Mak "The art and science of Feng Shui", Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁹⁷ Mak "The art and science of Feng Shui", Rossbach, *Feng Shui, The Chinese Art of Placement*.

⁹⁸ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Czarny, "Understanding the

Even though in the previous explanation landscape features were used; the form school can be applied to the layout of a city to individual rooms or even spaces within a room. The goal is to improve the health, prosperity and relationships of those using the spaces and to create harmony within the existing environment.⁹⁹

Many of cities in China follow the parameters that the form school presents. Though this isn't limited to China, a study by Michael Mak found that of the twenty major metropolitan areas in the world fourteen follow these principles. This comes from the practical survival techniques that the form school was based on.¹⁰⁰

Compass School. This school is the most popular approach to *feng shui* in modern China. It uses a compass with multiple concentric circles to orient and determine the spaces. The most auspicious orientation is determined by the head of the household's birthdate (defeating the "not one size fits all approach of this thesis). This compass is called a *Loupan*.¹⁰¹ The *Loupan* incorporates time and space that relate to astrological elements.¹⁰²

The Compass School uses orientations similar to the more familiar Western compass: north, south, east, west, northeast, northwest, etc. The form school influences it as it was developed from that initial method. One thing to take into consideration is the susceptibility of the magnetic element within the compass. Outside elements such as

large iron deposits can alter the orientation of the compass.¹⁰³



Figure 11. Jungson's Geographical Features – Jungson describes a series of mountains within a mountain range and how they relate to a site. The significant mountains are highlighted in a darker color within the diagram.

Black Sect School. The Black Sect School – the most recent school of *feng shui* was formed by the Black Hat Sect Tantric Buddhist *Feng shui*. This also uses an overlay device to determine spaces, though not the *Loupan* of the compass school, their version is called a *bagua*. The *Bagua* is more "generically" oriented in line with the entrance. They use both the tangible and intangible methods to work with *qi*, or energy within a space. The Black Sect School has tried to blend with Western customs, though this has created some tension between the Black Sect School and the Compass School.¹⁰⁴

Some of the elements of western culture that has been added within the Black Hat Sect

Different Schools of Feng Shui", Mak "The art and science of Feng Shui".

⁹⁹ "Blue Mountain Feng Shui Institute" last modified 2012.

<http://www.bluemountainfengshui.com/formschool.html>.

¹⁰⁰ Mak "The art and science of Feng Shui".

¹⁰¹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁰² Mak "The art and science of Feng Shui".

¹⁰³ "Blue Mountain Feng Shui Institute" last modified 2012,

<http://www.bluemountainfengshui.com/formschool.html>.

¹⁰⁴ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

include electricity, computers, microwaves and other technological elements. Even parts of the rituals have been westernized, using rum instead of rice wine.

Despite these adaptations, the goal of *feng shui* in the Black Hat Sect remains that same, creating environments that are comfortable and harmonious for living and working.¹⁰⁵

The Black Hat sect *feng shui* has predominantly followed an oral tradition being passed from Master to pupil. One of the first comprehensive publications was by Sarah Rossbach working with *feng shui* master Lin Yun.¹⁰⁶

Like the Compass School, the Black Sect School was built out of the Form School and still retains many of the similar features. This school was developed by a group of monks. Supposedly as the *feng shui* masters were used more and more for the emperors to develop their empires, they became paranoid that the masters could be used against them. Thus the masters were banished or executed, some of these masters fled, hiding within the Buddhist temples. These were the originators of the Black Sect School.¹⁰⁷

Vincent Smith approaches *Feng shui* from a designer's standpoint in his *Feng shui: A Practical Guide for Architects and Designers*. He tries to approach *feng shui* in a way that makes what can be thought of as an esoteric concept more understandable. He introduces three main schools of *Feng shui*:

After the introduction, Smith predominantly focuses on design techniques that use the *Bagua* and Five Elements. He also relates everything to what he calls the "Primary Purpose". This brings in a practical element

to what some people might find spiritual or intangible.

The goals of *feng shui* are simple and positive. For new spaces, they should complement and enhance the users' life. Existing spaces should be analyzed to find ways to best optimize their potential, which could potentially solve issues the users has. To achieve these two, the client needs to be educated and given tools that will allow them to achieve what they want or need and reinforce pattern of behavior that will promote the desired effect.¹⁰⁸

The Black Hat sect *feng shui* considers factors that range from the Universe to furniture placement and how it affects personal *qi*. The more immediate the factor, the more influential it is.¹⁰⁹

According to *feng shui* master Lin Yun, Black Hat Sect operates within two levels, *syng* and *yi*. *Syng* is the tangible factors of *feng shui*. It includes elements; structure, door position, furniture placement. Traditionally "shapes" and directions. *Yi* is less tangible and harder to understand, the loose translation is "a wish, a will, or an intention"¹¹⁰. This element is very intuitive and can only fully be learned orally from a *feng shui* master.¹¹¹

2.3.4 Conclusion

While there has been some debate on the validity of the practice of *feng shui* by Western cultures, there are many elements that are practical and prudent to be used within building design. All of the different schools of *feng shui* can be helpful in the design process, but the form school and

¹⁰⁵ Rossbach, *Feng Shui, Interior Design with Feng Shui: New and Expanded*.

¹⁰⁶ Rossbach, *Feng Shui, Interior Design with Feng Shui: New and Expanded*.

¹⁰⁷ Czarny, "Understanding the Different Schools of Feng Shui".

¹⁰⁸ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, pg 8

¹⁰⁹ Sarah Rossbach, *Feng Shui, Interior Design with Feng Shui: New and Expanded*, (New York: Penguin Compass, 2000).

¹¹⁰ Rossbach, *Feng Shui, Interior Design with Feng Shui: New and Expanded*, xv.

¹¹¹ Rossbach, *Feng Shui, Interior Design with Feng Shui: New and Expanded*.

particularly Lin Yun's teachings on the Black Hat Sect are more attuned towards the western senses and therefore shall be the schools that are focused on in the design attribute section of this document. The compass school is more tailored to particular individuals who inhabit a space; therefore elements of the compass school shall be a part of the communication and client portions of the document.

2.4 Reflection on Existing Knowledge

While the three studies, environmental psychology, *feng shui*, and biophilic design, developed over thousands of years in different cultures, they have similarities. These similarities will be explored within the parameters of residential design in the second half of this document.

Logically, environmental psychology and *feng shui* have the most resources since they have been around the longest. As seen in the venn diagram they do cross over with regards of content they cover. Biophilic design is a relatively new area of study first being conceived by Wilson in the 1980's. The supporters have been quite prolific and enthusiastic in their research, only a small percentage focuses specifically on residential design. While biophilic design is made up of multiple fields, the majorities of the topics are discussed in environmental psychology as well. This isn't a case of the chicken and the egg, but of a new field of exploration forming and an existing field evolving. Some prominent authors have been active in both fields of study. Biophilic design also crosses over with some of *feng shui*'s more intuitive and natural based elements found in the form school.

Something to specifically point out with regards to this venn diagram is that it does not in any way represent the importance of these three approaches within this document. That would look more like a traditional diagram with three equally sized circles. This focuses on the existing bodies of knowledge and how they relate to one another.

Additionally there are numerous distinctive approaches to design from every culture around the world, including Rudolph Steiner's anthroposophic approach toward the designs of the Waldorf schools. This document endeavors to have a comprehensive understanding of the topics

discussed and therefore will focus on the initial three studies.

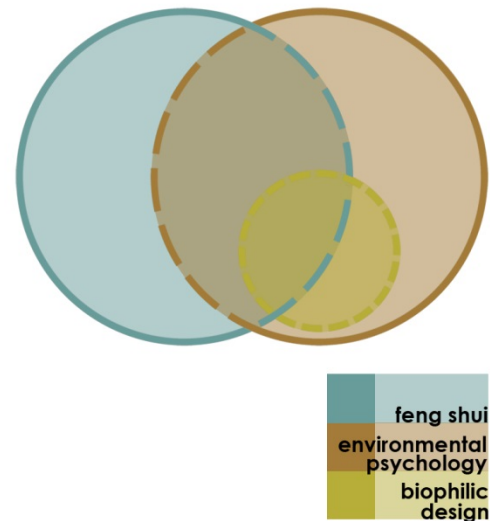


Figure 12. Venn Diagram of existing body of knowledge

2.5 Residential Architecture

There are many different types of shelter that people inhabit. This can range from a studio apartment to palaces to migratory tents. For the purposes of this document, the focus will be the single family detached residence. To help further explain specifically what is being looked at in terms of residential architecture, Irwin Altman can be consulted.

Altman developed five categories that characterize residences:¹¹²

Permanent vs. Temporary – As societies develop the start in temporary dwellings, basic shelter like cabins or cottages. Some of these groups grow into migrant communities, creating homes that can be easily moved. In most industrialized nation's temporary dwellings progresses into permanent houses over time.¹¹³

Differentiated vs. Homogeneous – These terms refer to how the home is divided within the exterior walls. Differentiated homes have multiple segmented rooms or spaces, while homogeneous have few. In a more open plan, the rooms can have multiple uses. This difference in housing classification can be for cultural or financial reasons. Also the number of people living within a house can dictate how a house is broken up.¹¹⁴

Communal vs. Noncommunal – Primarily a cultural difference, communal homes can house multiple non related families as in some African or Native American societies. Communal homes can also be used to describe households that contain multiple generations of one family. Noncommunal residences are typically found in European cultures, these contain a smaller group of people, normally a nuclear family.¹¹⁵

Identity vs. Communality – Within a group of dwellings, if they are all similar in appearance, style, building techniques, materials, etc. they have communality. If a building does not fit within the previous category the building has its own identity.¹¹⁶

Openness vs. closedness – This set of parameters refers to the site rather than the building itself. Depending on how the property owner wants to present themselves (consciously or unconsciously) to the rest of the world can be shown in their site. Openness expresses welcome or trusting of their neighbors, they usually won't have a barrier at the edge of their property. With closedness, the site is more isolated, is not inviting and could be outwardly hostile with walls, hedges or fences to show where their area starts and the public's ends.¹¹⁷

Besides these categories that point towards a specific type of building, there are elements that every type of house should take into consideration.

People setup their own personal boundaries. Some of these follow them as they move and interact with the world, called personal space; on the other hand territories are stationary. Predominantly people's territories are focused around their home; it is what they consider "theirs". Personal space is commonly known as a personal "bubble"; in a home this is important when creating spaces for interactions. Something to be aware of is if people's personal spaces are encroached upon, they can feel the effects of behavior constraints. For everyone the size of their "bubble" is different, but there are some general rules for comfort levels associated with spaces.¹¹⁸

Edward Hall observed people's comfort level to develop his spatial zones. Intimate

¹¹² Kopek, *Environmental Psychology for Design*.

¹¹³ Kopek, *Environmental Psychology for Design*.

¹¹⁴ Kopek, *Environmental Psychology for Design*.

¹¹⁵ Kopek, *Environmental Psychology for Design*.

¹¹⁶ Kopek, *Environmental Psychology for Design*.

¹¹⁷ Kopek, *Environmental Psychology for Design*.

¹¹⁸ Bell, *Environmental Psychology*.

distance is from physically touching another to around eighteen inches. This space is primarily reserved for family, friends, or pets. Further out, from eighteen inches to four feet is personal distance, the proximity people use when chatting with small groups. When interacting with strangers or new acquaintances, people typically stay four to eight feet away. The most remote spatial distance is used when doing activities that require a larger audience, i.e. speeches, lectures, or performing. The corresponding distance is over eight feet away.¹¹⁹

Within this paper I will be focusing my observations towards a single family residence, falling into the categories; permanent and noncommunal dwellings, perhaps up to three generations living within one home. Openness or closedness and differential or homogeneous are aspects that are preferences of a client or characteristics that will be apparent with further research. Identity or communality pertains more towards the neighborhood, sense of place or community, which won't be addressed within this document and could lead to future research.

¹¹⁹ Bell, *Environmental Psychology*.

2.6 Attributes of the Home

2.6.1 Introduction

The main focus of this thesis is how biophilic design, environmental psychology and feng shui relate to residential architecture. In the next section recommendations that each approach gives towards certain elements are discussed. Not all of the approaches agree or even consider some of the elements, but there is enough overlap between the three to give a clear idea of where to take home designs.

The specific areas that will be covered here are:

- Connections to Site – how the home sit in and relates to its surroundings

- Spatial Arrangement – specific details about each room

- Materials/Colors – color theory as well as patterns and materials can be used within a space

- “Climate” – lighting, sounds, temperature and other environmental concerns

- Inhabitants – the human portion of the home

These are elements are explored within a design project later in the document and a detail analysis is conducted with regards to the designs.

2.6.2 Connections to Site

Siting. When starting a design, one must first have a site for that design to be situated in. There are elements within the site that can benefit a home and enhance the living experience, or it can hurt it.

How the house is situated within the topography of the site can have great influence upon the building in *feng shui*. This is largely because of a feeling of defense and protection this can bring to the inhabitants. Having the building nestled into a hill will keep one side naturally protected while allowing for observation to the lower side. If the site is flat there is no protection and feels out in the open.¹²⁰

Additionally *feng shui* shows that there is also the perhaps unintentional image that the home is presenting. It is preferred to have the site to be situated in a hill above the road. With most antiquated villages, the higher up a hill the more important the structure. Typically, vassals' homes were visibly lower than their lords to convey the significance of the lord. Even today people are more likely to purchase a house on a higher side of the road. If a building is too high on a hill, it gets back to the issue of exposure and protection.¹²¹

Biophilic design suggests that unique aspects within the site can be used within the site to create a building that is more connected to its surroundings. Interacting with elements like water, objects within the site, and geological elements can create a more dynamic shape for the building, instead of being a hindrance. This will also tie into several other important elements of design, including the natural element of water,

natural patterns and materials. It also ties the home into the ecological fabric of the site.¹²²



Figure 13. Site Location – *Feng shui* advises locating a building on a hill. Additionally how it is situated on the hill can greatly influence the building. A building on the top of a hill is can feel too exposed with no natural support. Placing midway on the hill is ideal, giving a strong sense of support to the building. This orients the front of the house towards the slope down. If the house is then downhill from a road, the rear of the house, what should be supported, is exposed to the public road.



Figure 14. Site Location – a simplified version of Fig. 8 shows a building situated partially up on a hill, but buffered on either side for protection by other hills. Ideally water should be located in front of the site with another hill protecting the site on the other side of the water. This has been compared to an arm chair.

From a sustainability standpoint, biophilic design recommends when looking at the site, it is important to be aware of the orientation of the building. This can improve the passive components the site has to offer, if not it can create a very uncomfortable interior environment. The main natural aspects that facilitate this are sunlight and wind direction. It is best to design in a way to best utilize these two so that artificial remedies don't

¹²⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹²¹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹²² Stephen Kellert, *Biophilic Design*.

have to be employed. With the natural solutions, inhabitants are also more in tune with their natural surroundings.¹²³

Biophilic design has found that when homes are tied to the natural environment, they are more acclimated to the cycles of the site, which gives the inhabitants a closer relationship with the environment. With this relationship, people feel more responsible for their own ecosystem. This is achieved through ecological attachment, the siting of the building and what comes out of the siting, highlighting other buildings and landscapes.¹²⁴

Entry. An important aspect of a site is how it is entered. This can set the tone for the experiences to come within the space, so it is best to create a good impression from the offset.

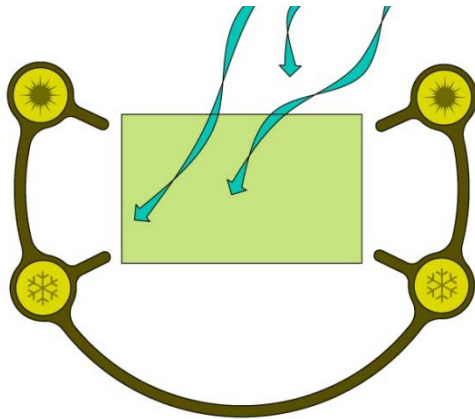


Figure 15. Simple Sustainable Site Orientation – Looking at the site from a sustainable point of view, designers should take wind paths, and sun angles into consideration, among other things.

In environmental psychology the transition between the outside world and personal property should be significant. Outside of one's site the world can be busy, hectic and chaotic, in contrast within the personal property there should be a more comfortable relaxed feeling. This change can be facilitated by elements in the site.

¹²³ Stephen Kellert, *Biophilic Design*.

¹²⁴ Stephen Kellert, *Biophilic Design*.

Beyond the obvious literal gateway to demarcate the entrance, material changes, sounds, and lighting can be employed. Moreover the focal point of the experience should change. While traveling along the road or sidewalk the view is typically forward, a path or driveway should reorient the user towards the goal, the home.¹²⁵

Since the availability of public transportation is limited within northern New England¹²⁶, the car is most likely part of the entry experience. This changes the conditions needed for entry into the property, predominantly where the car is going to be stored. Within environmental psychology it is suggested that the vehicle should be in close proximity to the main entrance to the home to allow for easy transitions with bags and packages. The parking should not just be a tacked on element, it should be beneficial to the landscaping if a garage or carport is not being used.¹²⁷

Gardens. A valuable outdoor space in a property is gardens. A garden can be used purely as a visible element with flowers. It can go beyond and provide sustenance with vegetables and herbs.

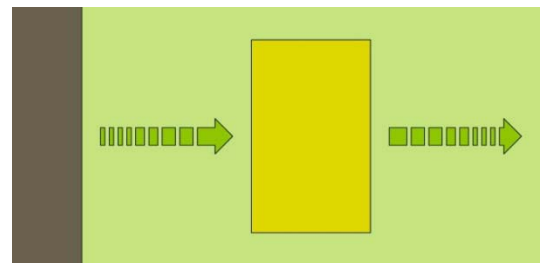


Figure 16. Transitions in a Site – There should be a transitional space in between the road and the house, to protect the house. The house itself becomes a buffer for a more private backyard.

¹²⁵ Christopher Alexander, Sara Ishikawa, Murray Silverstein, Max Jacobson, Ingrid Fiksdahl-King, and Shlomo Angel, *A Pattern Language* (New York: Oxford University, 1997).

¹²⁶ Approximately .8 percent of commuters use public transportation for ME, NH, & VT http://www.bts.gov/publications/state_transportation_statistics/

¹²⁷ Christopher Alexander, *A Pattern Language*.

Part of the allure of outdoor gardens is the ability to transform the space, which is supported by biophilic design. Plants are not stagnate objects, but move, grow and change. This allows peoples mind to wander and envision what the space could become. With children, this creates a creative play space, enabling their imagination to wander and explore.¹²⁸ Playing outdoors also fosters learning skills in children. It develops exploration and building abilities, improves decision making, how to respond to situations as well as problems solving.¹²⁹ It has also been found that children who are exposed to green spaces have reduced symptoms of Attention Deficit Hyperactive Disorder (ADHD).¹³⁰

Environmental psychology highlights the importance of the location of the garden within the property. If the size of the site allows it, the garden shouldn't be too close to the street. If the owner wants others to enjoy the garden, it shouldn't be too far away from the public face of the site either. Locating it near the side of a house is best, keeping it partially hidden, while still having part of it exposed. It is also imperative that the type of plants desired is taken into consideration when locating the garden. If the garden is to the north of the house then shade plants should be considered; likewise to the south the plants will get full sun.¹³¹

Feng shui and environmental psychology agree upon the value of bringing plants indoors. The growing season is limited in northern New England; a way to extend the value of a garden is with a greenhouse. Not only can the greenhouse provide year round foliage, but it will naturally produce heat in

the winter, which should be vented in the summer.¹³² Having plants within the home will also be beneficial to the well-being on the inhabitants. Plants filter out toxins that are present within built environments.¹³³

Outdoor Spaces. Besides gardens, the rest of the property outside of the building can be utilized and quite valuable.

When organizing the layout of the site, biophilic design recommends that if there is room, it is best to have a front and back yard. Even when enjoying the outdoors, people like to have their backs protected, typically the building. From that vantage point, there should be a "distant" view; this could be of a garden, hill or mountain, river, or the natural surroundings.¹³⁴ This is also something to consider when designing views from within. It is best utilizing natural views. These vistas are found to be more satisfying for inhabitants.¹³⁵

Environmental psychology and biophilic design propose designers can create "rooms" outdoors as well as indoors. These spaces can be created out of plantings like hedges, trees, bushes, and shrubbery or they can be man-made interventions like trellises, screens, or parts of the building.¹³⁶ During the summer months these spaces can attract and draw the inhabitants out of their homes to enjoy what their yards have to offer.¹³⁷

Environmental psychology also stresses the importance of the traditional wide open lawn. This can be used for relaxation, sporting activities, or playing with pets.¹³⁸

Not all spaces within the site need to be directly connected to the earth while being

¹²⁸ Judith Heerwagen, "Biophilia, Health and Well-being." *Restorative Commons: Creating Health and Well-Being through Urban Landscapes*, authored by Lindsay Campbell and Anne Wiesen, 38-57. (United States Dept. of Agriculture, 2011)

¹²⁹ Heerwagen, "Biophilia, Health and Well-being."

¹³⁰ Heerwagen, "Biophilia, Health and Well-being." – Faber et al 2001, Kuo and Faber 2004)

¹³¹ Christopher Alexander, *A Pattern Language*.

¹³² Christopher Alexander, *A Pattern Language*.

¹³³ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹³⁴ Christopher Alexander, *A Pattern Language*.

¹³⁵ Stephen Kellert, *Biophilic Design*.

¹³⁶ Christopher Alexander, *A Pattern Language*, Stewart-Pollack, "Biophilic Design."

¹³⁷ Heerwagen, "Biophilia, Health and Well-being."

¹³⁸ Christopher Alexander, *A Pattern Language*.

outdoors, such as terraces, decks, or patios. Environmental psychology highlights the value of the value of these spaces to extend the indoor living spaces outdoors. These spaces are directly adjacent to a house, and are usually used as another room during warmer months even a second kitchen with a grill. To create privacy inside the home, these elements can shield the inhabitants from a public face.¹³⁹

It is important even while being indoors the inhabitants are connected to their outdoor spaces. One way to do this is how people transition from indoors to the outdoors. Biophilic design urges that outdoor pathways should directly connect to the travel paths outdoors creating smooth flow.¹⁴⁰

Another obvious way that environmental psychology identifies ways for the inhabitants to be connected is through the use of windows. This goes back to the vistas and view concept. Make sure that the windows take advantage of natural features like gardens.¹⁴¹ An expert at this technique is the Japanese. Within the traditional Japanese house they took advantage of beautiful views that westerners have called zen views. As people move through the home they see various views celebrated of specific elements. The building is designed to highlight these.¹⁴²

¹³⁹ Christopher Alexander, *A Pattern Language*.

¹⁴⁰ Stewart-Pollack, "Biophilic Design."

¹⁴¹ Tom Bender, "Living Architecture" *Biophilic Design: The Theory, Science and Practice of Bringing Buildings to life*, authored by Kellert, Heerwagen, and Mador, Chapter 20. (Wiley, 2008)

¹⁴² Christopher Alexander, *A Pattern Language*.

2.6.3 Spatial Arrangement

One of the most significant elements of a home is the physical building. How spaces are arranged within the shell is integral to the well-being and happiness of the clients. There are several different main categories of spaces within a home.

In environmental psychology they have identified different levels of privacy for the inhabitants and to control visitors' interactions within the space. To avoid an uncomfortable flow of circulation in a home, the spaces should be arranged in a sequence that follows a gradation of public to private. Typically this starts with the most public space, the entry and ends with the most personal and private spaces of the bedrooms and bathrooms.¹⁴³

In a home, environmental psychology recognizes that there are several different levels of interaction for a person. Individual space is the most private; it is someone's personal space for secluded study or work. Shared space is an area where a sub-set of the family interacts; this could be a master bedroom, shared children's room or a playroom. Public space allows the whole family to interact with each other as well as with outsiders. These are typically separated by placing the spaces on different floors or having 'wings' of the house.¹⁴⁴ For this document Individual and shared spaces will be under the 'private' heading.

An additional issue that environmental psychology considers when designing is how the spaces are divided. Is the public and private space balanced? If it is unequal, find out why. Perhaps there is a good reason, possibly the client loves to entertain so they need a larger public space. It is also important to contemplate how the spaces are going to be shared between users. This can show who has control over the space. If

the children have the most space what is going to happen when they leave? ¹⁴⁵

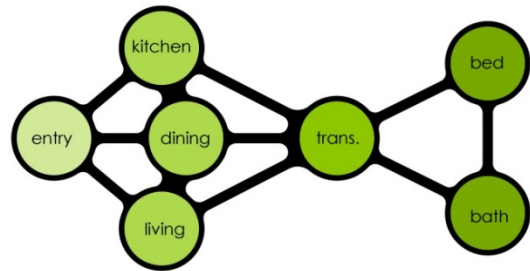


Figure 17. Public to Private Spaces – in a home spaces transition from the most public to more private spaces. From the outdoors an entry shifts users from the outdoors to the indoors. From there more public spaces are accessed, the kitchen, dining and living spaces and then more private areas that house the bedrooms and bathrooms. These can be separate rooms connected with transitional spaces or be areas within a larger space with minimal transitions.

Feng shui feels that overall goal of a home should be to create a building that goes beyond shelter. A home should provide a safe haven for the occupants where they can relax, sustain, and exist. It is imperative to listen to the clients, hear what they need from the space and incorporate those desires into the home.¹⁴⁶

Something that *feng shui* emphasizes and the environmental psychology has picked up on is the primary purpose of a space. Every room, building, and area should have a designated function. If the design of the space matches its purpose the space will be more successful and not fighting with how the user wants it.¹⁴⁷

Public. The spaces where inhabitants are going to share or invite others into are predominantly considered the public areas of a home.

¹⁴³ Christopher Alexander, *A Pattern Language*.

¹⁴⁴ Israel, *Some Place Like Home*.

¹⁴⁵ Israel, *Some Place Like Home*.

¹⁴⁶ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁴⁷ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Bell, *Environmental Psychology*.

These spaces can include the traditional, living room, family room, dining room, kitchen, or great room, but can also expand to comprise the home office, den, home theater, recreational rooms, religious areas, sunrooms, and the more contemporary man cave. The first space that is addressed here is the first that visitors or inhabitants will interact with, the entry.

Entry. The entry of the home is the first introduction that users have to the home. The feeling from this can influence how people perceive the rest of the home. This can be enhanced or degraded by the how the area is laid out, sequenced and decorated.

Environmental psychology relates the importance of the main entrance to the house, where it is located, and how it relates to users. Contrary to some designs where the entry is hidden to add a bit of mystery, it is usually best practice to place the main entrance in an easy to find location. An entrance is most effective if it can be used successfully.¹⁴⁸

Feng shui discusses the transition from the exterior to the interior of the home. A porch starts to introduce elements of the home, like a floor and a ceiling, while still being open. It is important to have the entry well lit to make the space at night less claustrophobic. If there are steps in the entrance sequence, which typically for construction reasons there are, they should be in sets of three. Less than three may trip up the users. A landing should also be wide enough for at least one step so users aren't directly deposited on the stairs when exiting and have a place to pause to open the door when entering. The stairs should also be wider than the door way.

When entering the building *feng shui* has identified that the inhabitants' subconscious will pick up on the first elements they see influences how they are going to interact

¹⁴⁸ Christopher Alexander, *A Pattern Language*.

with the rest of the home. It is important to make sure that the first impression is consistent with the feeling that the inhabitants wish to convey to visitors.¹⁴⁹

The flow from the outside to inside should be smooth according to *feng shui* beliefs. While blocking any unintended views with a wall, the designer has to be aware of creating a space that can meet the needs of an entry. In Northern New England, because of the weather, an entry needs to be able to accommodate the apparel that comes with the seasons. To create a space that is not too small, the human scale should be taken into consideration. A room that is six to seven feet deep, a little bit higher than a person is tall, can feel too narrow and confining. It will only take several steps to cross, in that time when confronted with a wall will not give enough time for people to compute the obstruction and confuse people.¹⁵⁰

To go back and further discuss the need for space of seasonal apparel, *feng shui* recommends the entry hall needs to be able to store these items. The materials within this space should also be durable, to be able to resist water, mud, or snow that will be tracked into the space. The storage of the seasonal items should be located to avoid the obstruction of the path of travel. If there is a closet or armoire within the space, shouldn't be located behind the main door. That will make the storing of items difficult while entering the space.¹⁵¹

To tie to the outdoors with this space environmental psychology and *feng shui* both agree on utilize natural lighting with windows. This will help the space feel larger as well as inform the inhabitants what the weather is outdoors and how to best prepare

¹⁴⁹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁵⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁵¹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

for it.¹⁵² The lighting will also convey a positive feeling within the space, which is always a good sentiment to express.¹⁵³

Living. The living room is central to the public aspect of a house, it gives people a place to interact as well as inhabitants to relax and congregate with each other.

Environmental psychology approaches the living room as a place for the social group to interact. People need to interact with one another, especially in a home setting, the living room offers this. Having a living room grounds a home; place it in a way that paths throughout the house are tied together by traveling through it.¹⁵⁴

To promote socialization, environmental psychology suggests seating areas be provided for users within this space. To create a more active seating environment the furniture should not inhibit circulation within the living room. Placing the furniture in a circular arrangement allows for this flow to happen. It will also enable the users of the space to better communicate with each other. There is a different level of formality with seating as well. It is best to enclose formal spaces, what has classically been used as a formal living room. While informal spaces can be more open, like a family room or even part of another room as in a great room.¹⁵⁵

To promote the flow of the living room, some *feng shui* masters recommend looking at the circulation within the furniture's arrangement. Leave enough space, usually about thirty inches, to allow for comfortable movement between items.¹⁵⁶

If possible a designer should accommodate different sized groups that might be

gathering in the living room. Environmental psychology advises that alcoves can create areas where smaller groups can congregate. These niches should allow one or two people to meet, being no wider than six feet and no deeper than three to six feet and a lower ceiling to allow for a more intimate interaction. These spaces should be able to contain seating as well as a table or desk. Along with conversation the alcove can be used for personal work when there isn't space for a home office, or a small game area.¹⁵⁷

If space is limited environmental psychology proposes built in seating can open up a room. It can give a more settled feel to a room and make it give more of a luxurious impression. One issue is that once constructed the built in seat is there and requires a lot of effort to relocate. Make sure that this will be used by the inhabitants. If the space is already existing it is recommended to try placing a temporary seat in the desired location and see how much it is used.¹⁵⁸

An element of a living space that was highlighted by environmental psychology and the famous architect Frank Lloyd Wright highlighted the importance of the fireplace, or as he called it 'the hearth'. Especially in a northern climate, the fireplace becomes a place to gather in the winter, bringing warmth and depending on the design, light into a living room.¹⁵⁹

Dining. The dining room is also a vital gathering place in a house. Environmental psychology has found that families are more connected when they eat together; there are some simple elements that can create a space to aid in this. Having a heavy table creates a solid center. Have a central light that emphasizes the table will make the table and people around it feel like they are in their own space with the contrast of light and darkness. Beyond that sphere of light,

¹⁵² Christopher Alexander, *A Pattern Language*.

¹⁵³ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁵⁴ Christopher Alexander, *A Pattern Language*.

¹⁵⁵ Christopher Alexander, *A Pattern Language*.

¹⁵⁶ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁵⁷ Christopher Alexander, *A Pattern Language*.

¹⁵⁸ Christopher Alexander, *A Pattern Language*.

¹⁵⁹ Christopher Alexander, *A Pattern Language*.

the chairs need space to be pulled out comfortably. The dining room should have more than just a room with a table, chairs and light, there should also be shelves or counters to store or place dining elements on.¹⁶⁰

Kitchen. In today's society the kitchen has become a focal point of the home. It's where the daily activity of preparing and consuming meals occur. During social events everyone inevitable congregate there.

Environmental psychology has tracked the role of the kitchen as it has changed as both spouses moved out into the work place. The kitchen was considered the woman's work place; therefore it was separated from the rest of the rooms. As people spent more time out of the home they wanted to spend more time connected to the rest of their family, so the kitchen became more open. With this shift the kitchen should be large enough for multiple users or even a table and chairs. It is also important to have plenty of cabinet space for storage.¹⁶¹

Feng shui brings the idea the placement of the appliances within the kitchen. The ideal location for the stove relates to the command position. While working at the stove the user should be able to see who is entering. This way no one can sneak up on them, if placing the stove in the ideal location isn't possible make sure that there is a reflective surface that allows the users view what's behind them. Otherwise they will be distracted while trying to monitor the rest of the space. It is also important for there to be plenty of space around stove. Keep it out of a corner to make sure the users have sufficient room to complete the tasks.¹⁶²

Within a kitchen how the other elements interact should also be taken into consideration, which *feng shui* and environmental design both agree on. There should be a triangulation between the stove, refrigerator, and sink that is no closer than five to six feet if space allows, but also not go any larger than ten feet apart. It is best to have the sink placed in front of a window to give the user a view while doing an easy task. There should be at least twelve linear feet of cabinet space for adequate storage. To make sure that the storage is usable keep segments of the cabinets at least four feet long. Cabinets don't have to hug the walls of the kitchens, create peninsulas or islands to delineate the kitchen from adjacent spaces without a finite boundary like a wall.¹⁶³

Feng shui recommends when using floor tiles in a kitchen they can make the space feel smaller. If the tiles are laid on a diagonal this will avoid too many parallel lines giving the impression of a narrower space. This could also apply to wood flooring, it would be difficult and costly to install at a 45 degree angle, making sure that the wood floor is oriented perpendicular to the prevailing lines of the overall kitchen.¹⁶⁴

Transitional. Between rooms in houses there are transitional spaces. These can vary from a doorway, hallways, or stairs; they shift people from room to room, public to private, or allow people to move between floors.

These spaces can simple act as a gap or interruption, but it could become a more meaningful space. Biophilic design recognizes that they can aid in the transition between the spaces, to encourage a sense

¹⁶⁰ Christopher Alexander, *A Pattern Language*.

¹⁶¹ Christopher Alexander, *A Pattern Language*, Bell, *Environmental Psychology*.

¹⁶² Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

¹⁶³ Rossbach, *Feng Shui, The Chinese Art of Placement.*, Christopher Alexander, *A Pattern Language*.

¹⁶⁴ Stephen C. Benton, "The Hidden Language of Mantras," last modified 2008, www.fengshuihomes.net/home.cfm?dir_cat=90950.

of mystery as well as entice users into the other spaces.¹⁶⁵

Transitional spaces within a home include alcoves, balconies, decks, patios, terraces, hallways, entries, stairways, doorways, and ramps. This section will focus on hallways, stairs and doors. Entries and alcoves were addressed in the public section and deck and patios will be covered later in the private segment of the spatial arrangement.

Hallways. Environmental psychology has found that there has been a shift away from hallways in residential architecture. When halls are used it is recommended in environmental psychology that they are kept short. Longer halls remind users of their use in offices or hospitals and can transform a house into a sterile environment. It is also critical to keep the hallways wide and well lit making the space feel larger therefore making the hall feel shorter.¹⁶⁶

Stairs. In many houses, to make the footprint smaller or to further separate functions the house is split into two parts and stacked above one another. This causes the need for a means to transverse the two, typically stairs or rarer in residential settings an elevator.

Both *feng shui* and environmental psychology discuss the importance of stairs. They can be used to create a grand gesture within a house. This space should not be an afterthought; it should be alive to tie the two or more stories of the building together. It is recommended that the stair shouldn't be tucked away and hidden, treat it like it is its own room. Have the stairway flow into the rooms that it connects to promote circulation and avoid having the stairs oriented straight towards the entry. Keep at least one side of the stairs open to allow whomever is moving in between can be seen from either floor. Turning, curving, or flaring the stairs will break

up the stagnant straight line and further encourage movement.¹⁶⁷

When planning for the stairs environmental psychology distinguishes that the size and slope is critical to the function of the stairs. Like a hallway the stairs should be at least three feet wide to five feet maximum. As the stairs are widened the slope can be lessened. Most Westerners are used to steps that range from six to seven and a half inches. With this ingrained, any deviation will cause the user to have difficulty with the steps.¹⁶⁸

One area where *feng shui* differs from popular Western thought is in the case of spiral stairs. While they seem like good solutions for a small space, the *feng shui* masters feel that they cause an imbalance of *yang* energy that will accelerate with the spiral. It is also not recommended because of the open risers not supporting the energy. If this is the only way to circulate between the floors, how to get furniture moved can also be an issue.¹⁶⁹

Doors. Doors are addressed predominantly in *feng shui*. They influence the flow of energy throughout the spaces depending on the alignment, size and shape.

The alignment of the doors is influential on movement of the energy or *qi* within a home as well as the passage of the people in the home. How the doors should align is also influenced by what is behind the door. Ideally doors should be directly opposite one another, except in the case bathrooms and make sure that the rooms relate to one another. Though this is not always possible. The opposite of mirrored doors, are unrelated doors. It is essential in this situation for the users to have a clear idea where they are headed once leaving the room. As

¹⁶⁵ Stephen Kellert, *Biophilic Design*.

¹⁶⁶ Stephen Kellert, *Biophilic Design*.

¹⁶⁷ Christopher Alexander, *A Pattern Language*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

¹⁶⁸ Christopher Alexander, *A Pattern Language*.

¹⁶⁹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

discussed in the entry section, being presented with a wall can be confusing and will be put at ease if they don't have to think about which way they are going.¹⁷⁰

Doors that are in between mirrored and unrelated doors are off-centered doors. It conflicting alignment will block energy from freely flowing. It is worse if the difference isn't perceptible to the eye, the mind will still pick up on the difference and irritate the user. Another situation that is not advised in *feng shui* is what is called piercing heart door. This is where three or more doors are centered on each other through a sequence of rooms. Similar to the spiral stair, the energy is accelerated, becoming harmful. Logically doors should be placed where they won't interfere with the swing of other doors.¹⁷¹

Additionally the size of the door should be proportional to the space that it leads to. A large door in a small space can overwhelm the space, while a small door in a large space makes the room feel overpowering. This will minimize confusion based on expectations.¹⁷²

It is important to carefully consider the location of a door. An unused door is called a dead door in *feng shui*. This can cause a negative influence on the inhabitants, particularly if the door was intended to be used as the main door.¹⁷³

The door handling and swing should be analyzed when designing. When people are carrying objects, they typically hold stuff in their left hand while using the right to reach out. This stems from shaking hands. As a door is approached, people tend to reach

out with their right hand even if they are left handed. It is best if the door knob is then oriented for a right-handed door. As a person opens the door it will swing to the right allowing them to move into the space unimpeded. Whereas with a left hand door being operated with a right hand, the users own arm will obstruct their passage through.¹⁷⁴

The door swing should follow the main path of movement allowing the user to enter into the room. The door should open towards the most important part of the room, letting the user have a clear view of the room. This will give the user entering a feeling of control while entering a potentially unknown space. It will also provide inhabitants within the space a sense of comfort, because they too will be able to visibly see who is entering.¹⁷⁵

To the last element in a door, the shape. Doors are traditionally rectangular or may have an arched top. The shape of the door becomes an issue when it deviates from those traditional forms. To accommodate a sloped ceiling a door maybe sloped to match. This is goes against *feng shui* and is believed to bring bad luck. Dutch doors are also not looked upon favorably. When greeting someone using a Dutch door, if just the top is used it shows a distrust of the person on the other side and lack the warmth that a greeting should have. Designers should also hesitate to use double doors as an entry into a residence. They can overwhelm a smaller house's façade. Doors also represent an invitation into a space. Double doors may convey more of a welcoming feeling than the owner intend. It is also common to fix one of the doors shut even though both doors have the hardware

¹⁷⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

¹⁷¹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁷² Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

¹⁷³ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

¹⁷⁴ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁷⁵ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

to be operable, which can cause further confusion.¹⁷⁶

Private. In contrast to public spaces in a house, the users also need space to be able to get away. These spaces comprise bathrooms, bedrooms, closets, storage spaces, and in this document porches and decks are also included.

It is important to provide each user their own space to retreat to that is their own, whether it is an individual bedroom or study. While it is essential for a family to gather together, it is equally crucial that they can have alone time as well. This space should be separated from the more public areas via spatial layout or using different floors.

Bedrooms. One of the more personal spaces in a home is the bedroom. The bedroom should be a space that promotes relaxation, repose, and intimacy. While there are several different types that will be explored later, to achieve the desired purpose, previously listed, of a bedroom, the room shouldn't be extensive with high ceilings. *Feng shui* recommends a more modest sized space to confine the energy of the room. However, environmental psychology has noticed a trend towards larger bedrooms, particularly master bedrooms, due to the bedroom serving more functions than just a space for sleeping.¹⁷⁷

The best orientation for a bedroom is in the east. This will relate to the natural cycle of the sun, waking up the users at dawn and sheltering it from the heat of the western sun. Environmental psychology recommends that if the only location for the room is on the western side of the house, that there is adequate shading to protect the room.¹⁷⁸

The children's bedroom is typically their space to retreat and be alone.

Environmental psychology stresses the importance of having this space for the children. The space should be able to accommodate the immense amount of energy that children have and need to expel. Giving them their own space that will allow them to do this will keep everyone else's lives calmer. If space allows it, this can extend to a recreational room or outdoor space for the children, if not the bedroom might be the only available space for them.¹⁷⁹

Not only will children use their bedrooms for sleeping and playing, but also for school work. This expands the furniture needed in the room to include a desk. In *feng shui* both the desk and the bed should be in the command position, which is quite difficult to achieve. The bed should be given preference. However when placing the desk, try to keep the desk from facing a wall, a wall can limit the imagination of the child having the desk near a window can allow the child's mind to think more freely.¹⁸⁰

When space is limited in a home children often share bedrooms, while it is more desirable to have each child in their own room, it is not always possible. Environmental psychology emphasizes the need even in a shared space to create individual spaces within the room. Utilizing the concept of alcoves for a bed nook can create a personal place for a child where they can withdrawal to while still sharing the main part of the room with their sibling. While bunk beds might seem like a logical solution, *feng shui* points out that it creates a compressed sleeping space and creates a hierarchy within the room. It is also not something that

¹⁷⁶ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁷⁷ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Bell, *Environmental Psychology*.

¹⁷⁸ Christopher Alexander, *A Pattern Language*.

¹⁷⁹ Christopher Alexander, *A Pattern Language*.

¹⁸⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

will accommodate children as they grow older.¹⁸¹

The master bedroom is a place for the couple to escape to. Environmental psychology highlights the need for this to be separate from the children's area. While the parents should have quick access to the children and be able to monitor them, the couple should be able to have their own space. Without this it can have an effect on the relationship.¹⁸²

The bed is a vital part of the master bedroom. It is used for more than just sleeping, including socializing, resting, intimacy, and a place to care for one another during sickness among other uses. Environmental psychology encourages that the bed can become then a room itself. This doesn't mean to wall it off, but lower the ceiling or having a canopy above the bed. Creating a more compressed space that encourages horizontality when in that space. *Feng shui* however warns against having a beam or sloping ceiling above the bed, the uniform lower ceiling suggested before would not be an issue. The beam or slope causes an uneven pressure or compression over the bed making it uncomfortable.¹⁸³

The beds position should also be placed in the *feng shui* command position within the room. If this is not possible, ensure that the head of the bed is not on the same wall as the entry door so that the users of the bed have the door in view.¹⁸⁴

The bed has significance in any bedroom. *Feng shui* warns against certain shapes and orientations besides the command position.

A couple's bed should be one large mattress rather than two twin sizes put together. No matter how minimal the gap between the two mattresses it can still have a psychological effect on the relationship. It is best for the head of a bed to rest against a wall; this will provide support for those using it. The orientation of the bed in relation to the cardinal directions and the *bagua* is also believed to influence the users. Eastern alignment will bring a happy and peaceful family life, north produces good business, south can cause fame, and western can produce fame for future generations. Besides beds the furniture is significant in any type of bedroom. In *feng shui* other objects can potentially impact the flow of energy within the room. Large storage objects should be placed away from the foot of the bed to avoid constriction of energy.¹⁸⁵

Bathrooms. Bathrooms are one of the most private areas of a Western home. While people have become accustomed to having this amenity in their home, they tend to have a low priority in when designing a home.

The environmental psychologist, Alexander Kira identified over thirty functions that take place in a home. Some in that field believe that a social aspect can be added to bathrooms contrary to the comfort level of most Westerners. Kira recommended that since the bathroom is not in constant use, that some of the elements can be used in other areas of the house, for example using a bathtub in the living room as a gathering place. However it is important to take cultural values into considerations, therefore stretching the boundaries might not be the best practice.¹⁸⁶

Looking at the bathroom from a more traditional standpoint, a study in environmental psychology found that most families felt that one restroom didn't have

¹⁸¹ Christopher Alexander, *A Pattern Language*, Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁸² Christopher Alexander, *A Pattern Language*.

¹⁸³ Christopher Alexander, *A Pattern Language*, Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

¹⁸⁴ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁸⁵ Rossbach, *Feng Shui, The Chinese Art of Placement*.

¹⁸⁶ Bell, *Environmental Psychology*.

enough space for them. Though having more than three full bathrooms became stressful because of the need for maintenance. Also by the same logic from Kira's study, since bathrooms aren't used constantly, it is a waste of space to have one for every member of the family.¹⁸⁷

Focusing on the layout of the bathroom, environmental psychology and *feng shui* agree on one element, the toilet. When entering into a bathroom the first view should not be of the toilet. While this is fairly common knowledge, it is a frequent mistake when space is limited. Having the toilet hidden out of plain view will give more of a sense of privacy. People are also more comfortable walking towards a sink.¹⁸⁸

The location of the bathroom within the house should also be considered. It has become popular in today's western society to have a separate bathroom for the master bedroom. With both members of a couple working the bathroom should be big enough for both to get prepared at the same time in the mornings. There should be at least one other bathroom within the house for children or guests to use as well as a half bath located near the public areas of the house. Environmental psychology explains that this will keep the more personal, private bathroom separate from visitors.¹⁸⁹

Storage. While storage is essential in all residential projects, because of the seasonal changes in northern New England, and the equipment that goes along with that, more storage space is required to accommodate this additional equipment.

Some common storage areas are attics, basements, closets, mechanical or electrical rooms, garages, laundry rooms, pantries, and

root cellars, though in this document we will only address a few of these.

Environmental psychology recommends that planning the storage spaces should not be left until the end of the design. This can take up to twenty percent of the overall building area. The spaces listed above have been developed as auxiliary spaces that don't take away from the overall building. These spaces can be lower in cost since they don't have to be finished to the same level as other rooms in the house.¹⁹⁰

Starting at the bottom with basements, these are typically partially underground and are sometimes used as living spaces. *Feng shui* advises that energy drops as people go below ground. This can cause low energy and self-esteem for people habituating these spaces, due to lack of access to natural light and ventilation. It is best for the basement then to be used for high energy activities or storage.¹⁹¹

A typical method of storage within the house itself is closets. Environmental psychology advises that when allocating space for closets consider the use of the closet. If it is going to have shelves then the size is more flexible. However if the closet will have hangers, it should be at least twenty four inches deeps accommodate them. Closets can also be used to create a buffer between bedrooms for acoustical purposes. When placing a closet, avoid locating it on an exterior wall. Keep the exterior walls free to allow for windows to bring in natural light.¹⁹²

¹⁸⁷ Bell, *Environmental Psychology*.

¹⁸⁸ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Bell, *Environmental Psychology*, Kopek, *Environmental Psychology for Design*.

¹⁸⁹ Christopher Alexander, *A Pattern Language*.

¹⁹⁰ Christopher Alexander, *A Pattern Language*.

¹⁹¹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁹² Christopher Alexander, *A Pattern Language*.

2.6.4 Materials/Colors

In a home the materials and colors can enhance a space. These can help stimulate the users of the space. This can be achieved with the patterns, shapes, artwork, and plants; as well as materials and colors.

In today's society people have become accustomed to a higher level of stimulation from technology, the materials and colors help accommodate this need. They can also over or under stimulate the users. It can create inquisitiveness, imagination, or explorations, which can reinforce the primary purpose of a space.¹⁹³

Natural Patterns and Materials. Materials, and by association patterns, are an integral element of design; everything in a space is made out of something. The materials will then influence how people interact with the spaces, so it is important to ensure that the materials are conveying the appropriate message¹⁹⁴

Feng shui is quite clear about the use of materials and the meanings they can convey, referring back to the five elements in *feng shui*. Each element refers to a type of material that represents a natural element. Earth is represented by ceramics, tiles, and other similar materials. It can also refer to carpets, expressive of the feeling of the ground. Metal logically represents metallic surfaces as well as concrete and other hard surfaces. Water is found in the form of glass or other reflective materials. Wood, like metal, can be literally found within a home including wood imitations. The last element, fire, does not have a material associated with it, but has objects within rooms that are attributed to fire; woodstoves, candles, and cooking stoves for example.

These need to be balanced by other colors and objects because they are so strong.¹⁹⁵

To create the harmony that *feng shui* strives to achieve all the elements have to balance and not overwhelm each other within a space. More than one element should be represented within a given space. They should also support the primary purpose of a space to reinforce the feeling that should be achieved.¹⁹⁶

When starting to analyze the potential materials for a room it is logical to start with the floor, or the earth, to form a stable base to build up from. If the floor is glossy, shiny, or very dark, subconsciously users wonder if it is safe to walk on. It could be wet and slippery, so the user will hesitate before proceeding into the space. Even though the floor should give stability this doesn't mean that it has to give a hard feeling. Typically people associate hard with stone or concrete, primarily used outdoors and public settings. To transition to the indoors use less 'harsh' materials like wood, linoleum, or carpet to create a more protective warm environment.¹⁹⁷

The texture of the flooring also aids in this transition. The outdoors the ground is naturally uneven, which isn't a feeling that is desired within a home. Concrete and stone, while perhaps not uneven can still give the subconscious feeling of an rough surface, whereas wood is solid and supportive while carpet evokes feelings of a grassy lawn.¹⁹⁸

Flooring facilitated transitions happen not just from the outdoors to the indoors, but inside the home as well. *Feng shui* explains that changes in material can show the different use of a space within a home. The most

¹⁹³ Stephen Kellert, *Biophilic Design*, Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁹⁴ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁹⁵ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁹⁶ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁹⁷ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

¹⁹⁸ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

common example is from the living space to the bedrooms. Having wood floors in the living room and carpet in the bedroom will soften the more private space. This can make the private space feel more protective, a value that should be incorporated in a bedroom. Within a great room this technique is also used to separate the different uses within the space. Usually a linoleum or tile separates the kitchen from the living and dining spaces. Area rugs are also employed to separate smaller zones in the larger room.¹⁹⁹

The patterns and materials on the walls profoundly affect how people perceive a space since they are at eye level. *Feng shui* recognizes that just like with the flooring a concrete or stone wall gives a hard cold impression, depending on how it is applied it can give a foreboding message, though this can be an effective way to visually cool down an area with a woodstove or other fire elements. Wall paper can create activity within a room with a striped pattern, while this is a good choice for a high activity room; it is not advised for a restful place like a bedroom. Calmer vertical elements in a wall can create the feeling of being in a forest, particularly with wood paneling. It brings in the warm feeling of the wood element, but can become overwhelming if the room is too small and it is overused.²⁰⁰

The final large area within a room is the ceiling. *Feng shui* describes that having a light colored ceiling gives the illusion of the overhead sky and feels farther away. To emphasize this, the surface should be kept smooth. If the ceiling is textured it will pick up shadows and feel darker than it actually is. Exposed beams can be treated based on what feeling is desired within a space. If they are darker than the ceiling they are up against, they will feel heavier and make the ceiling feel closer. However, if the beams

are painted the same color as the ceiling, a light color, and then the room will feel more spacious and the beams will blend in with the ceiling more.²⁰¹

Biophilic design elaborates on the recommendations of *feng shui*, staying within the same natural vein of *feng shui*. Utilizing natural materials is the foremost priority in biophilic design. People tend to be drawn to natural materials rather than synthetic ones. Part of this is attributed to the natural cycle and aging of materials. A plastic item, no matter how close to the natural original, won't degrade as it ages like the original. The dynamic trait of aging or weathering can be seen in all natural materials including stone. It shows the progression of time within a space, which isn't always a negative element.²⁰²

Biophilic design focuses on utilizing natural materials, designers and users should be respectful of the source that the material initially came from. Local materials in particular can be an excellent way for the space is tied into natural environment; this can also promote more sustainable building practices as well. However it is important not to use natural resources in a cautious manner, ensuring that endangered, threatened or limited resources aren't used within the building, those are better enjoyed in their natural habitat undisrupted.²⁰³

Biophilic design also encourages designers to look to nature for inspiration in how they use materials and patterns within a space.

Complexity and order go back to the idea of the stimulation that a space provides. These two concepts are shown in biophilic design and should be balanced, the extremes creating an uncomfortable environment. If the space is too ordered it can become boring and monotonous, while a too

¹⁹⁹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²⁰⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²⁰¹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²⁰² Stephen Kellert, *Biophilic Design*.

²⁰³ Stephen Kellert, *Biophilic Design*.

complex space can lead to chaos and an inability to focus. It is best to design in a way that stimulates the user's imagination, but in a controlled way. This can be achieved with contrasting and complementary elements, like *yin* and *yang*. Balance and harmony, scale and proportion, and novelty and familiarity can bring a sense of diversity to a room while maintaining coherence.²⁰⁴

Fractals can be used within a space when creating ornamentation or patterns. Biophilic design pinpoints that in nature, elements are almost never exact copies of one another, take snowflakes for example. They might be similar but not exactly the same. This is a kind of ordered variation, when used in a manner that related to scale this falls under the term of fractals. A space can use a theme that appears within the building or landscape at a different scale to tie in with the rest of the building.²⁰⁵ This can be seen in Frank Lloyd Wright's design of Taliesin West, the form of the drafting studio, kitchen, dining room and living room are similar, though not exact copies of the McDowell Mountain range surrounding them. This is similar to two other concepts within biophilic design, integration of parts to wholes and patterned wholes. The first is how people find places that have elements that relate to the overall whole space more pleasing. This can be achieved in smaller elements like material and patterns, or on a larger scale of rooms to the whole building. Using the smaller elements can give the space a more integrated, thoughtful feeling. The idea of patterned wholes is similar to integration of parts, but it explores the connection between the natural and built environment. Having the patterned element in a way that is comprehensible to the users makes it easier for them to understand, giving them a sense of control.²⁰⁶

²⁰⁴ Stephen Kellert, *Biophilic Design*, Heerwagen, "Biophilia, Health and Well-being.", Stewart-Pollack, "Biophilic Design."

²⁰⁵ Stephen Kellert, *Biophilic Design*.

²⁰⁶ Stephen Kellert, *Biophilic Design*.

The final concept that will be discussed here that is strongly encouraged by biophilic design for a successful pleasing home is botanical motifs. This elaborates on the technique brought up earlier about *feng shui* suggesting the use of wood paneling to bring in the idea of a forest. To tie nature into the interior environment forms, shapes, and patterns of natural elements, like trees, plants, animals or shells. These don't have to be literal imitations, but they can mimic or have characteristics of the element. This technique has applied to more than just patterns and materials for example in the practice of biomimicry.²⁰⁷

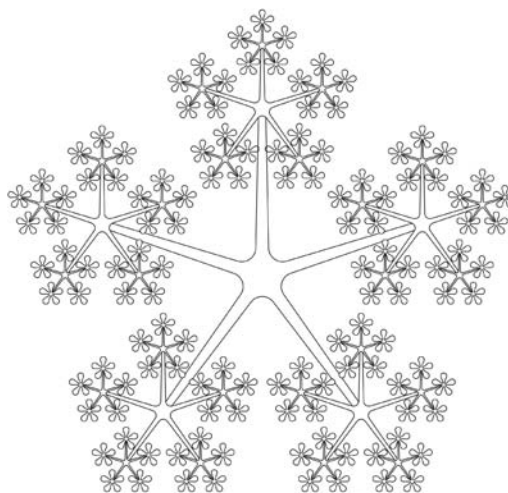


Figure 18. Figure 17. Example of a fractal – a fractal is a design that replicates itself with different scales within one design. This example is based on the wildflower Queen Anne's Lace. From a central stem, branches extend outwards. Each branch then has other branches, and those in turn have another set with blossoms culminating at the end

Natural Shapes. The idea of natural shapes has some of the same concepts as the previous section; shapes can be organized in patterns. This section focuses on natural shapes of spaces within a house.

When starting schematic design layout, *feng shui* experts recommend organizing the

²⁰⁷ Stephen Kellert, *Biophilic Design*, Heerwagen, "Biophilia, Health and Well-being."

spaces start with a rectangle, ideally a golden rectangle that is scaled to the appropriate area. Square shaped rooms can feel stagnate and finite, conversely the slimmer a room gets, the less comfortable it will feel and it will be harder to maneuver around furniture.²⁰⁸

Looking at the building as a whole, *feng shui* has some recommendations regarding the shape. This takes how the client wants to be perceived into consideration. When approaching a building the depth is not necessarily known. If the building is a rectangle and the entrance is on the longer side, then visitor perceives the building as larger, whereas if the entrance is on the narrower side, they will think it is smaller.²⁰⁹

Some recommendations that environmental psychology suggests parallel that of *feng shui* and biophilic design, particularly pertaining to shapes. Environmental psychology cautions against using stagnant squares and rectangles in designing, warning that they can leave the users in a stationary preoccupied state. Instead the same golden rectangle is recommended as well as looking at more organic shapes. Biophilic design carries this thread suggesting that spirals, tubular forms, and shapes that resist straight lines should be employed.²¹⁰

Biophilic design looks towards natural shapes, incremental shapes for inspiration when designing spaces. This includes bee hives, sea shells, termite mounds, spider webs and more. In nature, animals, particularly the invertebrates in these examples don't build for the sake of building. They create their homes for purposeful reasons, so looking at their construction and shapes can inform how people develop their own building. This starts to fall under the category of

²⁰⁸ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

²⁰⁹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²¹⁰ Christopher Alexander, *A Pattern Language*, Stephen Kellert, *Biophilic Design*.

biomimicry, while this document is not focused on the study of biomimicry here is a brief overview. This is the technique of adapting functions of elements found in nature and incorporating it into a design for humans. An example is how people have learned how termites built their mounds in a way to control the temperature within the mound.²¹¹

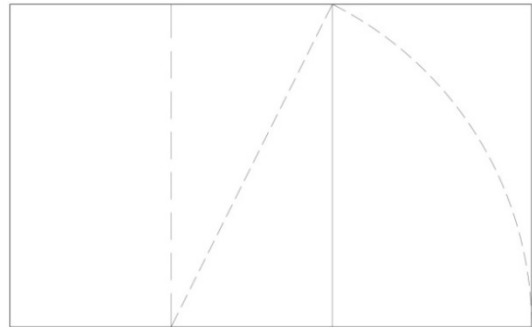


Figure 19. The Golden Rectangle – A golden rectangle is created from a square that is divided in half. A diagonal line drawn from the end of the centerline to a corner then becomes the radius for a circle. The location where that line then crosses the horizontal axis where the center of the new circle is located is the boundary of the new rectangle. The ratio for a golden rectangle is approx. 1:1.618...

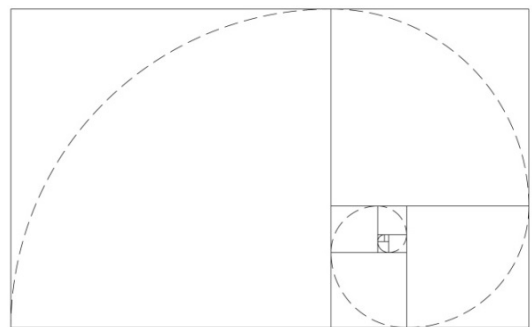


Figure 20. The Golden Rectangle – continuing the concept of the golden rectangle, an arc within that initial square will replicate itself to create a spiral. This spiral is found in nature, most notable in the chambered nautilus. It is also a form of a fractal, discussed earlier.

Biophilic design also encourages the use of tubular forms, which have been integrated within buildings as rooms, overall building

²¹¹ Stephen Kellert, *Biophilic Design*.

masses, and landscaping. They can create a free flowing feeling within a space that creates movement. It can also be used in ornamentation as well as structurally in arches or domes, which can evoke the impression of beehives, nests, shells, or cliffs to shelter.²¹²

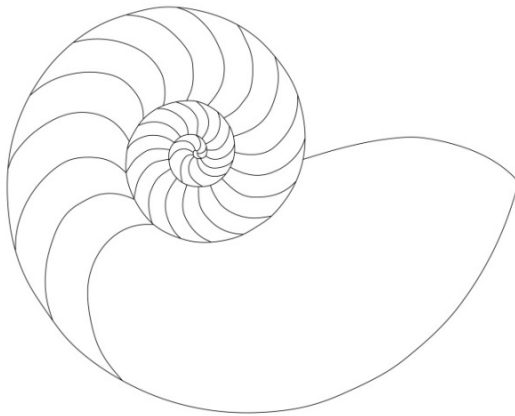


Figure 21. Chambered Nautilus – an example of a section of the chambered nautilus. The proportion of the segmentation within the nautilus demonstrates the golden ratio as well as fractals.

Having structures that don't follow straight lines or right angles was first introduced in the section on kitchen design with regards to the kitchen island. In nature, biophilic design has discovered that there is rarely a perfectly straight line and are most often sinuous and flowing. They react and adapt to forces and pressures that they encounter. It wasn't until humans came along and started engineering and manufacturing structures that lines became perfectly straight. Despite this innovation people still prefer designs that have more organic forms within them that resist hard edges. This is particularly true in areas of circulation, when looking at paths worn on a surface from people walking over it they don't turn at a right angle, but rather round it off. They also don't tend to walk in a perfect line; even in a long straight hallway people unless guided by something won't follow the trajectory of the walls perfectly.²¹³

Biophilic design also elaborates on the idea that *feng shui* supported regarding elements that relate to trees. They take this a step beyond a wall treatment however to propose the use of columns to evoke this same feeling. Since trees are part of human life whether it is in the original tree form or used as food, building material, paper, or for heating, it is logical that the design of trees would be desired within a space. When grouped together it can also begin to suggest the impression of a forest.²¹⁴

When starting to look at the space as a three dimensional form other considerations come into play, most importantly light. While the element of light will be discussed later, the implication of light with regards to space shall be addressed here.

Environmental psychology and biophilic design both look at how people use their spaces within a volumetric context. Within rooms people prefer spaciousness, as long as it is partnered with refuge. This means having smaller areas within easy access of a larger area. Having a variety of spaces can also foster intellectual stimulation; however it must be balanced and organized. The introduction of light can create a more dynamic and harmonious space, the goal is to make the users feel safe and encourages movement within the space. This does not just mean variety within the floor plan, but environmental psychology picks this back up with the ceiling height. Depending on the use of the room, the ceiling height can be lowered or raised. For larger gathering spaces have a large space to accommodate the energy, also for spaces that will predominantly have people seated the ceiling can be lower.²¹⁵

Looking at the building within the site presents another spatial issue. This was partially discussed in the section on siting, but

²¹² Stephen Kellert, *Biophilic Design*.

²¹³ Stephen Kellert, *Biophilic Design*.

²¹⁴ Stephen Kellert, *Biophilic Design*.

²¹⁵ Stephen Kellert, *Biophilic Design*, Christopher Alexander, *A Pattern Language*.

biophilic design looks at the natural shape of the land interacting with the building's form.

To enhance the ability to negotiate the site there should be a central focal point that helps centralize the site. This can help tie the building to the site and reduce the visual conflict between the two with a central reference point. Biophilic design also introduces the concept of geomorphology to this document. This has the building mimicking the surrounding environment rather than a foreign natural element. This can blend the structure into the site rather than juxtaposing it.²¹⁶

Color Theory. Color has a profound impact on how a space feels to the users on a conscious and subconscious level.

Biophilic design identifies color as part of human survival. Through evolution it was used to locate food, resources, and water. Color was critical in identifying danger, and showing potential for circulation. Over time people have developed an affinity for rainbows, brightly color flowers, sunsets, sparkling water, and blue skies. Analyzing these led to various color theories.²¹⁷

In *feng shui* color theory there are warm hues and cool hues. Hue refers to the specific color, i.e. red, yellow, or green. The warm hues fall under *yang* and include red, orange, and yellow shades. The cool hues are therefore *yin*, encompassing greens, blues and purples.²¹⁸

Each color is associated with certain elements and feelings. Red is vibrant bringing energy to a space. It relates to speech as well as stimulating appetite. Red is the color of power and strength. In the Five Element Color Theory from *feng shui* has red

connecting to the fire element, with in the *bagua* red represents the users reputation.²¹⁹

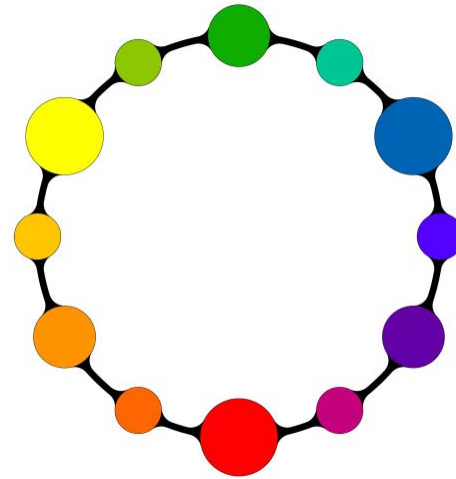


Figure 22. Color Wheel – shows all the colors, starting with the primary colors; red, yellow, and blue. Through different combinations of those three, secondary colors can be created; purple, orange, and green. The combination between the six create another set of colors that are in between the primary and secondary.

Moving around the color wheel, orange can cause aggression or agitation. It can be over whelming used in a large manner, so keeping it limited to accents can maintain stability in the room. It has also been shown that children can be more upset by orange. While orange doesn't directly relate to the Five Elements or the *bagua*, depending on the shade of the orange it can fall under red or yellow.²²⁰

Yellow is a very cheerful happy color that exudes the warmth of the sun. It can also inspire feelings of tolerance, acceptance, and honesty in people within a space. Yellow represents the earth as well as health. Related to yellow is gold. However gold has its own characteristics, it can ground a space as well as improve communications

²¹⁶ Stephen Kellert, *Biophilic Design*

²¹⁷ Stephen Kellert, *Biophilic Design*

²¹⁸ Smith, *Feng Shui: A Practical Guide for Architects and Designers.*

²¹⁹ Smith, *Feng Shui: A Practical Guide for Architects and Designers.*

²²⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers.*

for users of a space. Naturally it is connected with prosperity.²²¹

Green embraces the natural world; it shows new beginnings, growing, and abundance. The color is calming and promotes rest within users of a space, but evokes hope and vitality while stimulating productivity and success. Green also represents wood as well as family.²²²

A soothing and tranquil space can be created with blue hues. Being in a space that is blue make time feel longer and symbolizes understanding. Historically blue was associated with royalty. In the Five Elements, blue is associated with water and within the *bagua* it represents self-knowledge. Related to blue is purple, which is associated with prosperity in the *bagua*.²²³

Browns bring in the feeling of the ground creating a stable environment and is less intimidating than blue. Black is much more serious, representing knowledge and justice as well as relating to water in the five elements and the path of life in the *bagua*. Cold gray hues can bring down the energy in a room and signifies helpful people within the *bagua* and it teams up with white in the five elements metals. However within the *bagua*, white embodies children and completion. White also characterizes purity and death within *feng shui*.²²⁴

Beyond just the straight colors there are different tints and shade of each color, this either lightens or darkens the color respectively. In nature colors are not flat; they have different values ranging from dark to light. Typically in the daytime, lighter colors are higher, medium values are at eye

²²¹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²²² Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²²³ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²²⁴ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

level with the darkest shades are related to the earth.²²⁵

When looking at large expanses of some colors, they can exhaust people, particularly red. To alleviate this multiple colors can be combined within a space. This means that how colors interact need to come into play.

Feng shui and biophilic design both consider how colors relate with each other. The intensity can be increased when a color is paired with its complement.

Complementary colors paired together can create harmony within a space; green and red, yellow and purple, orange and blue. When the colors are a pure hue, like a purple-red, a red that has a hint of blue, then the green should also have a hint of blue to balance. When the intensity between the two colors is strongly contrasting, that is when fatigue can set in. Colors that contrast more mildly can be more peaceful physically for eyes and mentally.

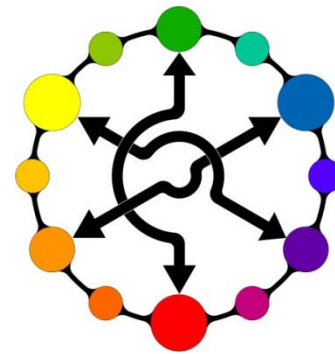


Figure 23. Complementary Colors – complimentary colors are found in the color wheel directly across from the source color.

When designing a space with complementary colors, make sure that there isn't just one item of the complementary color within the space. The item will stick out more than any other object. Two objects will still distract the user; they will be constantly looking between the two which will become uncomfortable after a while. At least three

²²⁵ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

items within a space will lead the user's eyes in a circular motion and while doing so they will observe the whole space.²²⁶

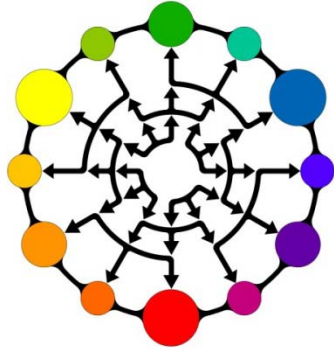


Figure 24. Analogous Colors – Analogous colors are colors that are directly adjacent to the desired source color on the color wheel.

Another relationship between colors is analogous, where three adjoining hues within a 12 color wheel are used together. This could be yellow, yellow-green, and green. To enhance this trio add a complementary accent, it will increase the hues within the dominant scheme.²²⁷

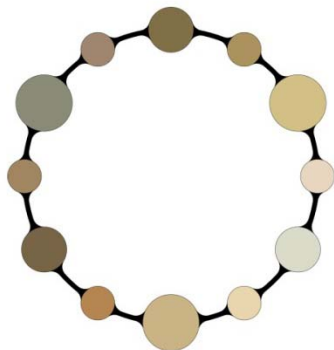


Figure 25. Neutral Colors. Some examples of neutral colors

Neutral colors can be used in dominant areas of room like gray, white, or beige. Use warmer hues of these colors to create a more welcoming space. If cool hues are used then warm it up with warmer accents.

²²⁶ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Stephen Kellert, *Biophilic Design*.

²²⁷ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

It is typically not advisable to use gray since it is a low energy color.²²⁸

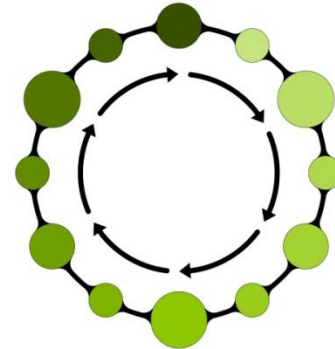


Figure 26. Monochromatic Colors – Monochromatic colors are colors that range in tonal values; they can be subtle gradations or range all the way from black to white.

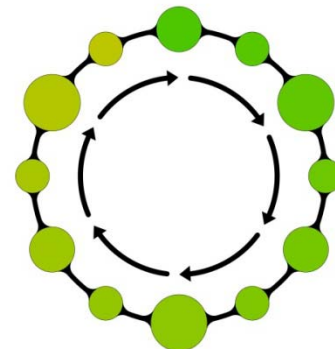


Figure 27. Monochromatic Colors – monochromatic colors can also have subtle changes like making a color warmer or colder.

A monochromatic scheme uses the same hue, but with different tonal values. This can create a very dramatic space, but it won't be harmonious or comfortable. Using the Five Element Color Theory will create a more balanced space.²²⁹

Similar to monochromatic, monotone using a single neutral color for the basic color, however with elements that should be

²²⁸ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²²⁹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

highlighted, by using hues in the same tonal or chromatic value.²³⁰

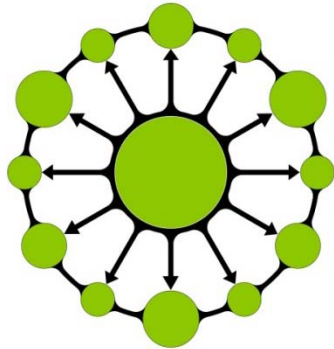


Figure 28. Monotone Colors – Monotone colors are all exactly the same in hue, tone and chromatic value.

Contrasting to the above interaction of colors is full spectrum colors. It pulls all six primary and secondary colors into a space, if done right this can create a space that is more natural feeling giving a complete and fulfilling sense to the space. This comes from the full spectrum of refracted light ranging from red to purple.

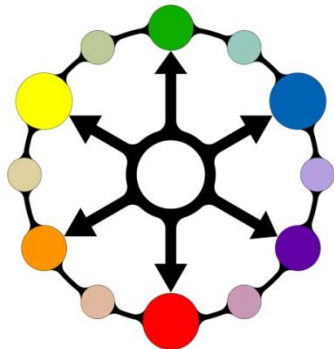


Figure 29. Full Color Spectrum – the full color spectrum uses all of the colors in the color wheel, mainly the primary and secondary colors, red, orange, yellow, green, blue and purple.

How a space is artificially lit can affect the color on surfaces. Incandescent lighting can tint red an orangish color, make blue walls appear greenish, make yellow more intense, white and green walls will be warmed to appear more yellowish. Fluorescent lighting

²³⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

will have more of a cooling effect on colors, red becomes purplish, blue takes on a grey quality, yellow is tinted green, while green white walls will develop a bluish cast. This can significantly impact the feeling on a room and should be taken into consideration when designing a space.²³¹

How colors are used within an area can also impact the feeling within the space. There are three dominant areas in a room; walls, floors, and ceilings. Medium areas include larger pieces of furniture and draperies, and smaller areas cover small furniture, pillows, accents, and accessories. The color scheme of a room is formed mainly in the dominant and medium areas utilizing the small areas to create a harmonious balance to the room.

²³²

The larger more dominant areas of the room are best kept neutral. With such large area, designers need to be cautious. A large intense color can make a space feel smaller. The location of the color will also affect the users within the space. To have the most impact on the user the color should be located between four and six feet above the finished floor, this is where most people's eyes are located.²³³

There are several key concepts to keep in mind when designing with colors. Lighter colors will recede compared to darker colors which pop out. The former are also more associated with youthful and happy element, while the latter are more mysterious, dignified, and mature. Similarly, warm colors are higher energy and come forward while; cool colors recede and are lower energy.²³⁴

²³¹ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²³² Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²³³ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²³⁴ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

2.6.5 Environment

The building is significantly affected by less tangible aspects that make up the climate of a building. These include the temperature, ventilation, sound and light, water has also been included in this section since it affects the others. The outdoor environment in Northern New England is quite diverse. The temperature ranges from over one hundred degrees down to below zero, to create a comfortable living environment within a home the house has to take this into consideration.

Humans have used these elements in evolving with survival. To effectively survive humans had to adapt to various environmental factors. From this need, humans developed shelter, which then became what people have today as homes.²³⁵

Temperature. Due to the temperature fluctuating between summer and winter, northern New England can affect the people there.

The Federal Bureau of Investigation has used environmental psychology to study how people's attitudes change dependent on the weather, to be better prepared for potential criminal activity. High temperature can cause people to be more irritable and uncomfortable. Logically a cold environment brings out an opposite reaction from people, cold being classified as below sixty-eight degrees Fahrenheit; people are calmer and less anxious. This should be considered when thinking of the ambient temperature of the room and how to maintain it.²³⁶

Even though a cooler temperature creates less of an aggressive environment, it also doesn't encourage inhabitants to get out of their homes and interact with the natural world. Historically people have thought that

this could result in 'cabin fever', where inhabitants feel too cooped up and become agitated and hostile. However studies in environmental psychology haven't found this theory to be correct.²³⁷

Ventilation. Natural ventilation has returned as a feasible alternative to air conditioning. Since summers in northern New England are milder than the rest of the United States, natural ventilation is an excellent way to passively cool a home.

Biophilic design has found that people prefer natural ventilation since it promotes airflow within a building, preventing stagnant air. Ensure that the source where the air is coming from is a clean source, not near any vents from the house. Natural ventilation can stimulate a user's senses beyond just smell to include sight.²³⁸

The movement of air in a room will also change people's perception of the temperature. The feeling of air moving over bare skin will make the users feel cooler, creating a slightly more pleasant space in warmer temperatures. It can also tie users of the space to the outside natural world by bringing in smells of the outdoors indoors, which is the goal of biophilic design.²³⁹

Noise. People enjoy sound, where as they describe noise with a more negative connotation. Its sound that isn't pleasing the user is considered noise and therefore unwanted. It becomes a personal preference which makes designing around it difficult.²⁴⁰

In environmental psychology several characteristics within noise that affect people have been identified. The annoyance level is evaluated based on

²³⁵ Stephen Kellert, *Biophilic Design*.

²³⁶ Bell, *Environmental Psychology*.

²³⁷ Bell, *Environmental Psychology*.

²³⁸ Stephen Kellert, *Biophilic Design*.

²³⁹ Heerwagen, "Biophilia, Health and Well-being."

²⁴⁰ Bell, *Environmental Psychology*.

volume, predictability and perceived control.²⁴¹

Noise can come from an exterior source, which is the most typical complaint regarding noise in a residence. Environmental psychology has identified the main sources coming from passing vehicles, neighbors, or other transportation devices like airports and trains. Environmental psychology identifies that this becomes an issue since the users inside the home have not perceived control over the noise. With the lack of control, the noise is felt to be annoying that it actually is.²⁴²

Environmental psychology notes that there can also be problems with noises from the interior of a home. Unnecessary noises can increase a user's aggravation level. Also if the user feels that whoever is generating the noise doesn't care about how it impacts others within the space, they will feel more irritated by the noise. The noises can evoke a feeling of fear from people. Additionally if an element from in the space already is annoying the user, than an extra noise can only increase that uncomfortable feeling.²⁴³

Some techniques that are used in *feng shui* that can help alleviate unwanted noise are wind chimes and water. Wind chimes create a gently peacefully sound; they can also give subtle clues of people's movement within the spaces. Moving water within a space creates its own noise, which then cancels other exterior noises.²⁴⁴

Light. Light is a valuable resource within a house. Before electricity, candles and natural daylight were the primary source of illumination. Whether it is artificial or natural light is important to efficiently utilize a space. Environmental psychology, biophilic design

and *feng shui* each provide insight into designing with light in mind.

Light influences people more than they think. Something that environmental psychology has found that can be an issue in winter is Seasonal Affective Disorder (SAD). This disorder has symptoms that include depression, excessive sleep, fatigues, and weight gain. This is reminiscent of hibernation or dormancy cycles that some animals follow in nature. What is thought to contribute to SAD is the shortening of daylight hours; a solution for this has been artificial light.²⁴⁵

Feng shui approaches light as a source of energy, beyond the idea of photovoltaic panels. It is viewed as an element that humans need to be able to perform successfully. Natural light physically and emotionally warms a space creating a more joyful environment. If there isn't enough light within a room, people will have problems seeing which can create a nervous or tense feeling, oppressing *qi*. Whereas stimulated *qi* is in a well lit room is more comfortable, particularly if it is lit from above, reminiscent of the sun in the sky. It is also important to make sure that the light is not too intense.²⁴⁶

Sunlight is addressed in biophilic design as well. Physical and mental health and well-being are positively affected by the use of sunlight, not just artificial light, within a home. It ties the inhabitants inside with the diurnal patterns of the sun, as well as enhancing the mood of inhabitants. While the best interaction with sunlight is the direct exposure outside, but through design methods the same benefits can be brought inside²⁴⁷. Bringing the natural sunlight into a space also brings in the full color spectrum that was

²⁴¹ Bell, *Environmental Psychology*.

²⁴² Bell, *Environmental Psychology*.

²⁴³ Bell, *Environmental Psychology*.

²⁴⁴ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²⁴⁵ Bell, *Environmental Psychology*.

²⁴⁶ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

²⁴⁷ It is important to consider the potential of skin cancer due to prolonged exposure to direct sunlight.

discussed in the color section of this document.²⁴⁸

Environmental psychology has a more technical analytical approach to lighting, looking at the productivity of the activities within a space. This field has been studying this idea since the 1920's looking at workers' productivity with daylight. There are limited guidelines in for this side of sunlight design most of it focuses on thermal and visual effects. While this seems like an issue that might only be relevant in a workplace setting, it can also be applied in a residential setting. While homes are used for shelter and relaxation, tasks do have to be completed there. This can be anything from doing the dishes to paying bills, or even having a home office as well as recreational activities like reading.²⁴⁹

However, environmental psychology acknowledges that not everyone enjoys the same level of light exposure; thoughtful design will accommodate different levels of contact to sunlight. This can relate different functions within a room depending on the level of light needed in a space. Though within a space that has differing levels of sunlight, people tend to gravitate towards the lighter spaces. Ideally each room should have natural light coming in from two sides if possible. This can be used to draw people through spaces by using alternating light and dark spaces.²⁵⁰

Biophilic design concurs on bringing sunlight in from multiple directions. Each cardinal direction has a unique quality of light. The southern sun provides the most warmth,

northern creates a flatter diffused light, and the most dramatic light comes from the eastern and western sides. Through the day this light will move through a space connecting users of the space to the outdoor cycles. The changing pattern stimulates peoples' minds and relieves mental fatigue.²⁵¹

There are several conditions that light can be presented in other than direct exposure. It can be diffused or filtered to lessen the effects of glare in space. It can also promote introspection for users of a space. When there is light, there are also shadows, without shadows people are uncomfortable in a space. The shadows create depth, stimulation, and mystery which have been used in humans' evolution. Light can also be reflected off of other objects, which allows light to further penetrate a space. It is also important to keep in mind the property of warmth in southern sunlight. This can be used to the advantage of the home for heating in winter months; however it should be blocked during summer months. This is brought up in all three areas of study; environmental psychology, *feng shui* as well as biophilic design. This southern space should be embraced for this quality, use it for spaces that need the best light indoors or even a sunroom and develop the exterior with gardens. One interior space that can benefit from a sunny location is the kitchen. The south east area is an excellent location, bringing sun in during morning preparations which with help invigorate users. Also when working in the kitchen in the evening it will prevent glare from the setting sun outside.²⁵²

While talking about natural light and its benefits, how that light comes into the space should also be addressed. The primary tool in bringing it into the space in a home is

²⁴⁸ Heerwagen, "Biophilia, Health and Well-being.", Stephen Kellert, *Biophilic Design*.

²⁴⁹ Na Wang and Mohamed Boubekri, "Investigation of declared seating preference and measured cognitive performance in sunlit rooms," *Journal of Environmental Psychology* 30 (2010): 226-238.

²⁵⁰ Wang, "Investigation of declared seating preference and measured cognitive performance in sunlit rooms," 226-238, Christopher Alexander, *A Pattern Language*.

²⁵¹ Stewart-Pollack, "Biophilic Design."

²⁵² Stephen Kellert, *Biophilic Design*, Christopher Alexander, *A Pattern Language*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

windows, if the windows are operable, they can also promote natural ventilation.²⁵³

In biophilic design it is recommended to use various sized windows as well as differing window positions. This can create an even more dynamic pattern of light within a space. Having high or transom windows will also bring light farther into a space as well as lighting up the ceiling brightening the whole space.²⁵⁴

Environmental psychology takes advantage of windows for more than light. They can also create little niches where opportunities can create within a space. This is the ideal location for a small garden or window seat.²⁵⁵

One thing that *feng shui* addresses that the other two don't discuss is artificial lighting. In today's culture people are active past the time that the sun goes down, particularly in northern New England, in the winter where there is a little less than nine hours of daylight, artificial lighting needed.

Feng shui highlights the different types of light sources and how they can create diverse conditions within a space. Incandescent lights are warmer, but are becoming increasingly hard to find. Fluorescent lights will create a cooler atmosphere within a room and can drain energy. Light-emitting diode or LED lights can come in a variety of shades, including warm or cooler whites. Candle light also brings a warm, though uneven, light within a space.²⁵⁶

In *feng shui* they also address how lighting fixtures are placed within a space should also be considered. They should accommodate what the space is intended to be used for and ensure that there are no dead, unlit, areas of the room. Using artificial lighting on

the ceiling can bring a feeling of inferiority to users within a space. Having lighting lower at a more human level that is oriented towards the users will create a more comfortable space that is easier to complete tasks in.²⁵⁷

Water. An element that can enhance both noise and light is water. Biophilic design and *feng shui* both agree on the importance of this component in building design. Kellert says that people are drawn to water for a number of reasons. Humans desire to conquer the terrifying force or be calmed by the soothing motion and sound of a gentle river. Water can create a visual attraction through the refraction of light, creating rainbows. The surface of the water can also creating an abstraction of the reflection. There are some negative aspects to water, flooding or drowning, but those are mostly over shadowed by the positive, humans can't survive without water.²⁵⁸

Moving water creates a musical sound. Depending on the speed and volume it can create a multitude of tones, rhythms, or pitches whatever is desired. It also has the capability of buffering against unwanted noised cancelling them out. People also take cues from water. A smooth surface that has been disturbed can warn of oncoming weather or approaching elements that causes the water to vibrate.²⁵⁹ *Feng shui* also looks the symbolism of water within a space. Air can be cooled by water, so having a water feature can create a cooling sensation within a space. This symbolism is further incorporated in five element theory, using not the physical element of water, but

²⁵³ Rossbach, *Feng Shui, The Chinese Art of Placement*.

²⁵⁴ Stewart-Pollack, "Biophilic Design."

²⁵⁵ Christopher Alexander, *A Pattern Language*.

²⁵⁶ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²⁵⁷ Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

²⁵⁸ Stephen Kellert, *Biophilic Design*, Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Rossbach, *Feng Shui, The Chinese Art of Placement*.

²⁵⁹ Stephen Kellert, *Biophilic Design*, Stewart-Pollack, "Biophilic Design."

employing attributes of water to evoke the same feeling.²⁶⁰

Water is ever present in the house even if unintentionally. Biophilic design looks at the presence of plumbing. While plumbing is generally utilitarian and ignored, as soon as there is a problem plumbing becomes quite important. Today manufacturers are starting to design fixtures that celebrate the water delivery system and how it is presented to the user.²⁶¹

Biophilic design acknowledges that many people value the playful or sociable aspect of water in pools. The value of a home is typically enhanced with the addition of a pool or hot tub. These larger bodies of waters gives the inhabitants a place to cool off, relax, exercise or just play. If outdoors it can become a space that is almost equal to living room in terms of a gathering place during the summer months.²⁶²

Natural water features are also valued within a site in biophilic design and *feng shui*. Wetlands, rivers, ponds, or lakes provide an interaction with nature for the inhabitants. This also goes back to the historical significance of water for protective reasons. The feature would additionally be essential for survival, having clean water close at hand for consumption.²⁶³

²⁶⁰ Smith, *Feng Shui: A Practical Guide for Architects and Designers*, Rossbach, *Feng Shui, The Chinese Art of Placement*. Rossbach, *Feng Shui, The Chinese Art of Placement*.

²⁶¹ Stephen Kellert, *Biophilic Design*.

²⁶² Stephen Kellert, *Biophilic Design*.

²⁶³ Stephen Kellert, *Biophilic Design*, Smith, *Feng Shui: A Practical Guide for Architects and Designers*.

2.6.6 Inhabitants

One aspect of design that hasn't been discussed is the client. No two clients are the same; even if it is a returning client what they need from the home will most likely be different from the first design.

Environmental psychology expresses how important it is to consider the cultural background of the clients when designing for them. Different cultures have different ways of laying out the sequences of rooms. Creating a home that has highly segmented spaces for a family who are used more open flowing spaces would make the client uncomfortable. This can be a part of their social values as well, relating to levels of privacy.²⁶⁴

Much of what people desire within their home comes from their past and what the spaces they grew up in were like. This is the focus of a branch of environmental psychology called design psychology. It is important to identify what home symbolizes for the clients. This could range love and family to the need to belong or a physical attribute, the hearth that represents gathering.²⁶⁵

A tool that can be helpful when interacting with clients is the Jungian psychological types. The psychiatrist Carl Jung developed this theory that identifies personality types that are unique for each person. While there is no evidence to date that these personality types relate to design elements, however they can tell designers about the decision making process that a client will go through and how the designer can best interact with that client to have a successful design experience.

Jung's personality types are based on a combination of several factors, sensing or intuition thinking or feeling. This can be linked in four different combinations. There is

another factor that Jung included, extroverted versus introverted, and this can help facilitate some design decisions for the clients. An extroverted person tends to be more sociable and outward focused, while an introvert prefers to be private and inward focused. The introverts are more territorial and will most likely favor a home that allows for the user to retreat to be alone, read, meditate, or just work by themselves. Extroverts choose spaces that are more open where they can socialize with other people.²⁶⁶

²⁶⁴ Bell, *Environmental Psychology*.

²⁶⁵ Israel, *Some Place Like Home*.

²⁶⁶ Israel, *Some Place Like Home*.

2.7 Conclusion

The beginning of this document introduces the concept of conscientious architecture as a way to create homes that are more attuned to clients' needs and desires. To investigate this idea, I explored environmental psychology, *feng shui*, and biophilic design. The goal of the three diverse design methods, that span various cultures and thousands of years, is similar, creating buildings that are physically and psychologically healthy for the inhabitants.

These three methods have not been analyzed together, though there is some cross referencing between biophilic design and environmental psychology. They all are developed from intuitive ways of building. Technology in Western cultures has allowed us to go beyond the initial purposes for the techniques to create buildings that aren't necessarily the best for human nature. Each method has its own ways of achieving this reconnection, with some elements overlapping, from these similarities, designers can better respond to their clients.

With the research to date, there is not the complete overlap between environmental psychology, *feng shui*, and biophilic design. This is not to say that there is a huge disconnect between each. For the most part at least two methods had recommendations on attributes of the home. Within each attribute at least one element was shared between different methods. With more detailed research, I believe more connections can be found.

Part of this initial discrepancy is the priorities of each method. While environmental psychology, *feng shui*, and biophilic design all have a similar overarching goal, stated earlier, how they work towards achieving that goal is very different. Environmental psychology has a more technical and psychological approach based on observations and experiments. *Feng shui* has been developed from historical Chinese

practices. Biophilic design focuses on how humans are tied to nature, and how that can be brought into the building design. Biophilic design and environmental psychology also historically focused on non-residential buildings, components of which can be extrapolated and related to homes.

While the age of the diva architect has mostly passed, there is still sometimes disconnect between the architect and client. This can partially be remedied with better communication between the two parties. Primarily through the simple act of listening. Listening to what the clients are saying they want and sometimes equally important what they aren't saying. The architect also needs to educate the client to help them make better informed decisions with regards to their home in the design process.

3 Design Project

3.1 Site

896 Onion Point Road, Peacham, Vermont.
Peacham, VT, 05862

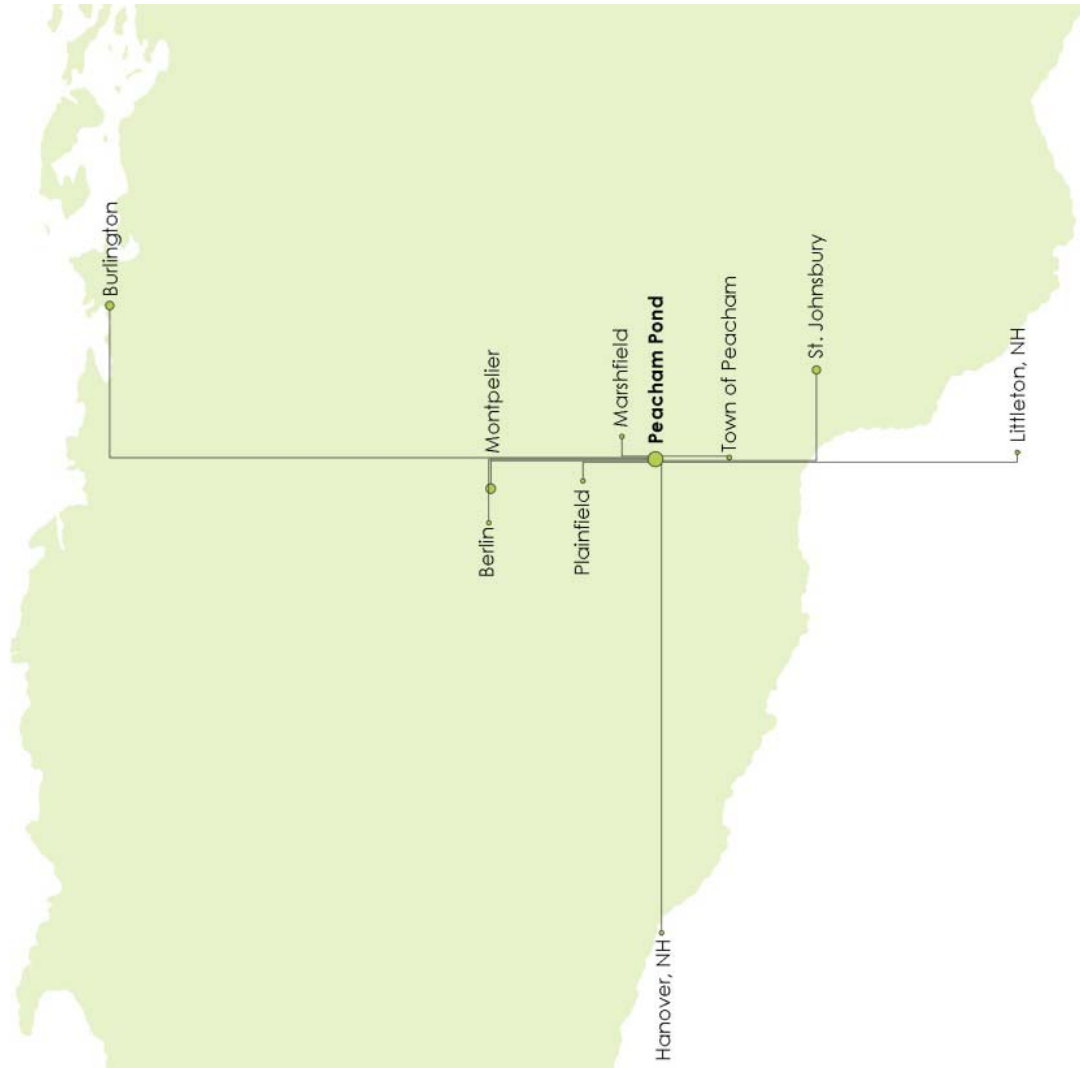


Figure 30. Vermont State Map – significant towns within proximity of Peacham Pond

Peacham Pond is located to the east of the town of Peacham, but is closer to the town of Marshfield. The closest city to Peacham pond is the capital city of Montpelier, another larger town is St. Johnsbury. The largest city in the state is on the western edge, Burlington, this is also the home of the state university. Due to the proximity of Peacham Pond to the New Hampshire border to the East, it is also pertinent to mention several towns there. Littleton has what many people today have become

used to for shopping, with name brand and box stores. Hanover is the home of Dartmouth Hitchcock Medical Center, which is one of the premier medical centers in the area.

With the previous figure the towns closest Peacham Pond may seem nearby, particularly the town of Peacham, however because of the Green Mountains and State Forests traveling straight from one town to another is almost impossible. The Groton

State Forest separates Peacham Pond from the town, so to get from one to the other; you have to travel back through Marshfield and up to Danville before going back down to the town of Peacham.

The weather in Peacham is fairly standard for the state of Vermont. The average temperature is lower than the national average, dipping almost down to 0 degrees Fahrenheit in the winters, while rising up to over 80 degrees in the summer. The amount

of precipitation is fairly average dipping lower in the end of winter, but Peacham in the summer typically sees more rain. Humidity and wind speed is fairly normal as well. One place in climates where Peacham excels beyond the national average is with regards to snow fall, the average in December and January can almost reach up to twenty inches per month. More than 40 percent of the days are cloudy, leading to a low level of sunshine, particularly in the winter.



Figure 31. Vermont State Map – significant towns near the site at Peacham Pond, by road

Existing Site Analysis

Peacham Pond is a small body of water; it is part of the Winooski river system that runs through the state of Vermont. Two smaller streams, in the southern part of the pond, are dammed to create the pond, see Fig. 33. This is not a recent obstruction, the wildlife and shoreline as adapted to the change. The pond is large enough to allow for watersport, typically canoeing, kayaking and smaller motor boats, but in recent years a waterskiing course has been set up for the summer.

The southern edge of the pond where there is no road access, see Fig. 32, is where the Groton State Forest is. This allows for some wildlife that might not be able to thrive if the whole shoreline were developed. Most notably, there is at least one mating pair of loons on the pond each year. Onion Point, where the site is located, is close to the boat access as well as having a view of the undeveloped state forest. While it is on a dirt road, it is one of the best maintained and most easily accessible roads on the pond.

A different feature of the pond from other bodies of water in Vermont that allows for ease of construction is the water level. In the winter the water is lowered over four feet, this exposes the shoreline, sea walls, and docks. Most of the sea walls and docks are permanent; they are not removed in the winter to avoid damage from shifting ice. Having the lower water level also means the pond fully freezes over creating a winter recreational area that other bodies of water typically do not have, this can be used for activities like cross country skiing. Approximately eighty to ninety percent of the buildings on the pond are summer camps.

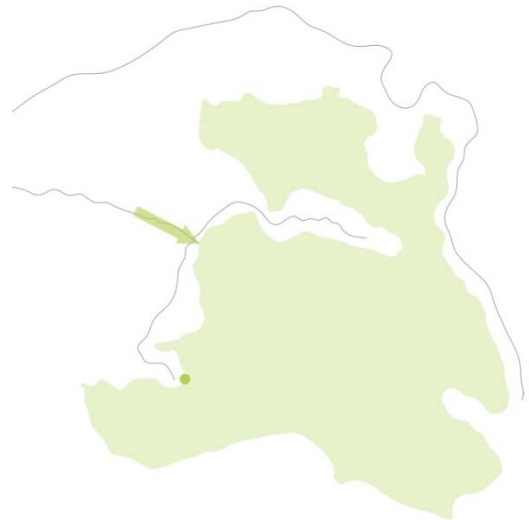


Figure 32. Peacham Pond Map – Roads that access the pond, the arrow indicated a boat access that is maintained by the Vermont Fish and Wildlife Department

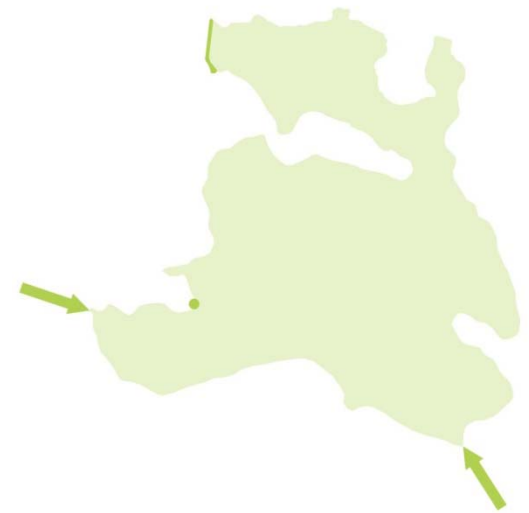


Figure 33. Peacham Pond Map – Indicates two water sources of Peacham Pond with arrows, and the location of the dam.

The site is located near the tip of Onion Point; the closest neighbors are to the north and the south and are two older small white camps. The site itself is slightly smaller than a quarter acre with approximately a hundred feet of lakeshore. It is accessed by Onion Point Road, a dirt road that comfortably fits one larger vehicle, though with room for vehicles to pull off to allow another to pass. The eight existing buildings on the point form somewhat of a cluster around a central small hill; this is mainly to take advantage of the lakeshore.



Figure 34. Onion Point Road – Buildings that neighbor the site on Onion Point, as well as the location of the only road in the area.

Circulation issues. The parking area needs to be addressed; currently three cars can tightly fit in the parking area. A more comfortable solution can be created by slightly widening the area. Perhaps a carport should be provided to add to the formal designation of this area and give the cars protection from the elements and trees.

Circulation from the parking area to the main building requires a lot of work. Currently there is a simple footpath taking the shortest route from the parking area to the main entrance on the south side of the building. The new home is not necessarily going to be in the same location, but a new path will provide a transition within the site with a more circuitous path hugging the trees on the southern border before taking the users into the main entrance of the home.

The access to the water also should be taken into consideration. This needs to allow users access for swimming and small water craft. The current access is a small, extremely small beach to the south of the seawall.

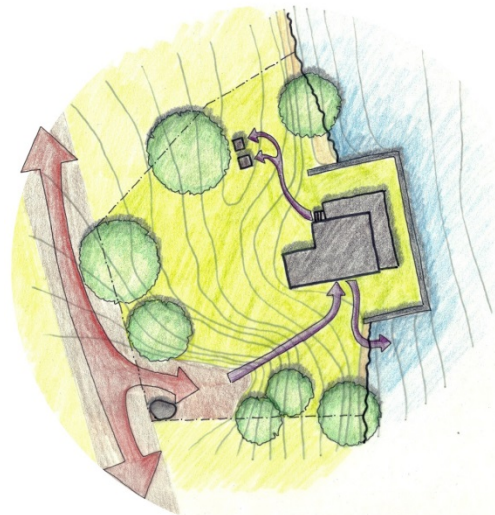


Figure 35. Existing Site Conditions – The vehicular access to the site is indicated with red arrows, while the existing pedestrian circulation within the site is denoted in purple. This includes access to the existing building from the parking area, travel from the building to the water, and the journey from the building to the outhouses.

Natural Environmental Issues. Currently the site is covered with vegetation. Most of this is undergrowth that has flourished with neglect rendering the site unusable. Leaving the larger trees (as indicated in Figure 31) will open up the site; however the line of sight from the neighbors should be taken into consideration, for everyone's privacy. A benefit of cleaning the site is better sun access, primarily allowing sunsets to be enjoyed. The trees are deciduous, blocking the sun in the summer while allowing for it to provide passive heating in the winter when the leaves drop in the fall. Eliminating the trash trees will also promote more wind circulation within the site to provide natural ventilation to the building.

An unexpected environmental issue with this particular site is the outhouses. While these probably have not been used for over a decade, their current location should be tested to ensure it is not hazardous and then treated with environmentally friendly product if needed. Several things should be located above this area, a cleansing garden or an indoor bathroom.

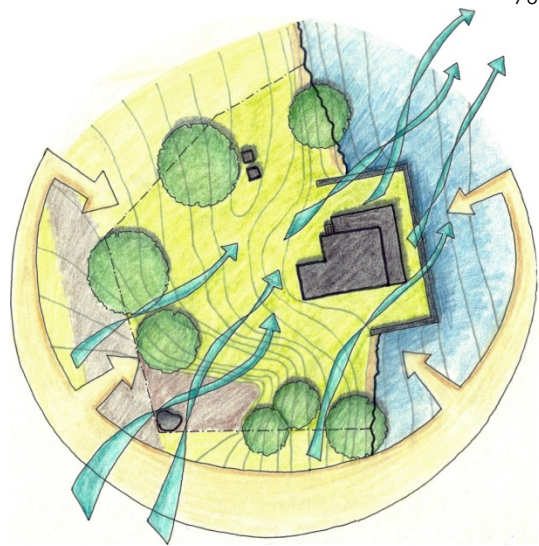


Figure 36. Existing Site Conditions – The orientation of the site is towards the east with the pond in that direction, which enables views of the sunrise. Observed wind patterns come from the southwest and travel towards the northeast.

3.2 Client

The client for this project is the Bacon family from Vermont and their rabbit Leiserl. It is a small family with the mother, Elan, a son, Jeremiah, and a daughter, Spirit, both of whom are teenagers. Currently they are looking to design a home they can transition to from their rental home in central Vermont. They are hoping for a new home that will give them more room than they have at their current home, as well as giving outdoor space for the children and rabbit to enjoy. The property they have found is in a more rural area of the state in the town on Peacham.

Mother. Elan Bacon

Son. Jeremiah Bacon

Daughter. Spirit Bacon

Rabbit. Leiserl

3.3 Program

First Floor. The first floor is the main floor that users of the site enter straight from their vehicles. The surrounding site can suggest how the home should be placed and where certain rooms should be located.

Mudroom/Entry. The mud room will double as the main entry point to the home to allow the family and guests to transition from the indoors to outdoors and vice versa. There should be storage for seasonal equipment and apparel to be neatly tucked away. The space should have enough room for multiple people to get prepared at one time and durable materials are preferred. The area can be enclosed as a separate room or can be an area within another space (garage, living, or kitchen); however there should be one or two walls for locating storage elements.

Living Space. What Elan is looking for in a living room is a comfy relaxing gathering space for her family. Once again, this does not have to be its own formal room; she'd prefer it not to be. Even though it might be an area within a larger room, the living space should have a clear delineation from the other areas. This can be achieved through colors, materials, or textures. There should be ample seating for a family of three, but also seat a larger group for socializing. Built-in storage is also desired to store items that may be used within the space. Typical to the American family, Elan uses her living room as the location for her television. However, she doesn't have a television in the traditional sense. Elan uses a projector attached to her laptop to project an image; this requires a larger blank wall within this space. The living room should take advantage of the view of the pond.

Dining Space. Elan sees no need for a formal dining room. She prefers more informal gatherings that can flow from the kitchen, to the dining and living spaces. However, the area that contains the dining table should be able to accommodate a large table. Most of

the space should be flexible, but could have a built in bench. This also may double as a spot for Spirit and Jeremiah to do homework to promote family bonding. It would be nice if this space could have a view of the pond, but not necessity.

Kitchen. Elan wants her kitchen to be the heart of her home. She wants it to be a generous space that is open to the living and dining areas. An island with enough room for food preparations and informal seating is desired in this space, could possibly contain the sink or oven. Elan uses the kitchen for practical purposes of making meals, but her daughter Spirit has quite an interested in cooking and baking. Ideally the kitchen would support her needs. Specific elements within the kitchen include a refrigerator, large sink that has a good view, oven, dishwasher optional (Elan believes that washing dishes by hand builds character) and a pantry. Smaller items to consider are a microwave, mixer, and coffee maker. There should be ample cabinet space for storage of food items (pantry) and cooking tools, silverware, dishes, etc. The kitchen doesn't need to have a view of the pond, but the sink should have an interesting and dynamic view.

Powder Room. Near the living, dining, and kitchen areas there should be a small powder room. Does not a need a view, but natural ventilation through a window is preferred.

Storage. A small closet should be located on the first floor for storage of cleaning supplies and other miscellaneous items.

Second Floor. The second floor marks a separation between public and private.

Master Bedroom. The master bedroom should be a refuge for Elan to escape from her children, work, and everyday life to relax. Elan does not want a grandiose bedroom; she wants something that comfortably holds at least a full sized bed with room left over for

a bureau, chest, and perhaps a chair. One thing she does enjoy is the sunsets, but the house is oriented with the best views to the east. Having her bedroom on the second floor, Elan can have a small balcony that will overlook the western side of the peninsula while being taller than the neighboring camps. To account for this, she understands that she may have to give up an eastern view of the pond.

In addition to the bedroom, Elan would like to have a closet. While a walk-in closet would be nice, she can live with an ample regular closet. One thing she wants taken into consideration with closet space is a potential spouse. Even though she is single now, she wants to take an additional person's need for space taken into consideration when designing the master suite.

Jeremiah's Bedroom. Jeremiah wants a room where he, as the only male in the house, can retreat to for privacy. As a room for a high schooler who is transitioning to a college student and part time inhabitant. At this time it's a teenager's room, but it could become a guest room while he is away. The room should be large enough to accommodate a twin bed, but perhaps a full size bed or futon as well as a small desk space. The main purpose of the room is not for him to be totally separated, but he still needs space to store his homework when he is done at the dining room table. Jeremiah will also need storage for clothing and other belongings; this can be resolved with a smaller closet than Elan's as well as a set of drawers in either a bureau or built in. Jeremiah's hobbies are mainly focused on technical activities including computers and robots. He also enjoys sketching, the room should accommodate these interests and storage.

Spirit's Bedroom. Spirit's bedroom has a similar purpose to Jeremiah's, it is her personal space in the house. She is a couple of years younger than Jeremiah so her room

must allow for transitioning from middle school, to high school, to college. She needs personal storage as well, once again similar to Jeremiah, her needs can be resolved by a closet as well as a set of drawers. Like her brother, Spirit is also interested in technology, but more of the mechanical side of things. If space allows, perhaps a shared workspace for the two would allow them to bond over similar interests while still having their own spaces.

Bathroom(s). The family does not see the necessity for everyone to have their own bathrooms, if there is space Elan would like her own bathroom as part of a master suite. If not, she does not mind sharing a bathroom with Jeremiah and Spirit. A shared bathroom should have enough space for everyone. Elan has a preference towards bathtubs rather than a shower stall. There also needs to be room for a linen closet either within the bathrooms or a shared one on the second floor.

Basement. The site has a steep slope allowing for a walkout basement. The floor will be separated by passive spaces that don't require natural lighting and active spaces that will be on the side facing the pond that opens out to the yard.

Office. Elan is a small business owner as well as an author. She works from her home and would appreciate a specific room to complete these tasks in a quiet room, free of distractions. This room needs natural lighting and therefor will be on the side facing the pond.

Guest Bedroom. If there is enough space in the basement facing the pond it could be allocated for a guest bedroom. If there isn't enough space, the office can be enlarged to allow for it to be transitioned into a guest room.

Laundry. A well-organized space should be designated for laundry. This shouldn't be just thrown into a dark corner in the basement,

though it doesn't necessarily need to be its own room.

Storage Space. In addition to personal storage spaces attached to the bedroom, there should be additional space allotted for various paraphernalia (seasonal decorations and equipment). There are several different types of storage within the home; articles that need to be accessed readily and frequently, possessions that are used only a few times a year, and objects that are desirable and should be on display. Built-in cabinets and closets can help resolve some of this issue. Seasonal belongings can be stored in an attic or basement in a spot that has a less desirable view.

Mechanical Space. This space, while not needing any special designs, it is still an important space when creating the home. It should not be an afterthought, but placed in an advantageous location that takes accessibility and efficient use of services into consideration. The most logical place for the mechanical space in this project is in the basement, utilize part that does not face the water.

Deck/Porch. To take advantage of the outdoors, a deck or porch can create a transitional space from indoors to outdoors.

It can also house a grill for cooking during the warmer months.

Outdoor Living Space. In addition to the indoor space, the outdoor space surrounding the home is important. Elan and the kids are passionate about the outdoors and the yard can become a natural playground for them. There needs to be outdoor storage for their toys and lawn equipment, this could be incorporated in the basement or be a separate structure.

Carport/Driveway. Elan has two vehicles, a Subaru and a motorcycle. Ideally, she would like another designated parking spot for visitors or as the children get old enough to drive. To keep a lower impact on the site, Elan would prefer a carport to a garage. Having a carport would also lessen obstructions in the neighbors' views.

Rabbit Hutch. The Bacon family has a pet rabbit, Leiserl. She is a standard rex rabbit with a thick plush coat that allows her to be an outdoor rabbit. Leiserl needs to have a hutch with enough space for her to stretch her legs and relax as well as an outdoor fenced in area that is protected from predators including neighboring dogs. The hutch should relate to the house not only for the Bacon family viewing pleasure, but also so they can monitor Leiserl.

3.4 Size Requirements

| | |
|----------------------------|-------------------------|
| First Floor | 1130 square feet |
| Mudroom/Entry | 130 square feet |
| Living Space | 30 square feet |
| Dining Space | 60 square feet |
| Kitchen | 240 square feet |
| Powder Room | 40 square feet |
| Stair | 60 square feet |
| Circulation | 170 square feet |
| Second Floor | 1070 square feet |
| Master Bedroom | 190 square feet |
| Master Bathroom | 100 square feet |
| Master Closet | 40 square feet |
| Deck | 70 square feet |
| Jeremiah's Bedroom | 120 square feet |
| Closet | 10 square feet |
| Spirit's Bedroom | 120 square feet |
| Closet | 10 square feet |
| Children's Bathroom | 110 square feet |
| Storage | 10 square feet |
| Stair | 90 square feet |
| Circulation | 80 square feet |
| Basement | 800 square feet |
| Stair | 50 square feet |
| Office | 290 square feet |
| Guest Room | 175 square feet |
| Guest Bathroom | 45 square feet |
| Mechanical Space | 240 square feet |
| Deck/Porch | 400 square feet |
| Rabbit Hutch | 20 square feet |

3.5 Process

Second Meeting

After the first meeting with Elan where we went over what she wanted was looking for in her home, six different schemes were developed. There were four distinct types of buildings, centralized, linear, traditional and angular. Each option had different layouts to give Elan choices to figure out what she was looking for. At the next meeting, I walked Elan through the plans, to get her feedback. She identified what elements in each of the plans she preferred to be incorporated in the next iteration of plans.

Option 1

Site. The first option tucks the proposed building farther back from the water than the existing building to create more privacy for the house as well as a usable front lawn. The parking is in the same location, but expanded to accommodate two vehicles parking side by side and a formal path that leads users from the parking to the home. In the upper corner a new kitchen garden is located as well as a restorative garden where the outhouses used to be. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous.

Lower Floor. The lower floor plan is pushed into the hill to minimize the visual impact of the building on the site. The eastern side opens up onto the front lawn under the deck above. The deck shields the office/guest room from direct sunlight in the summer months. There are windows to take advantage of the pond view and doors taking users to the front lawn. A small bathroom and closet are located nearby for the convenience of the guests and potential clients if Elan chooses to use the office professionally. In addition to these rooms, there are two secondary spaces. Next to the stairs is a room for the mechanical equipment as well as some storage. There is a smaller room for storage of outdoor maintenance equipment. To access the equipment there is a small overhead door leading to the front lawn as well as a door to the downstairs hall.

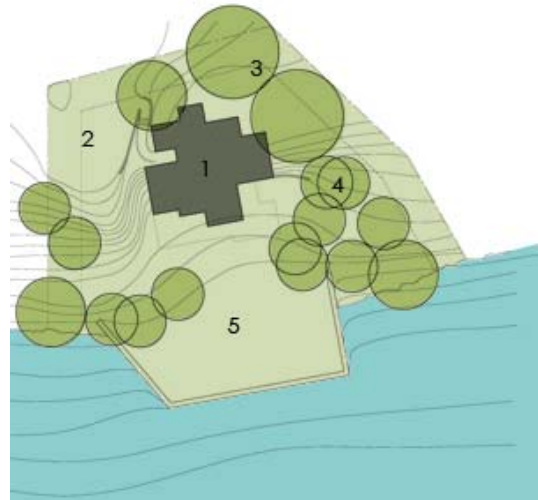


Figure 37. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

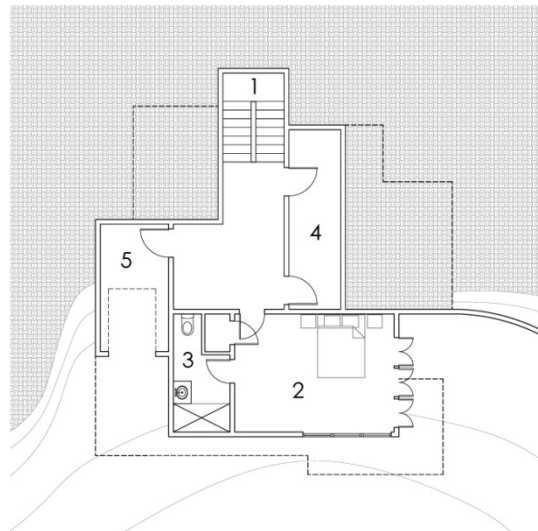


Figure 38. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room 5. Storage

First Floor Plan. The first floor plan has the primary living areas. A path from the parking area leads users to the entry. Passed the stairs and coat closet, the living space opens up. While the three main entities, kitchen, living and dining are all connected in this larger open space, they are their own designated bays. The kitchen is in the eastern portion of the space with a door leading towards the garden. The prime areas are given to the living and dining areas. The dining and living spaces have corresponding spaces on the deck for summer use.

Second Floor. The second floor is designated for more private rooms; the bedrooms and bathroom. This option is smaller with a single shared bathroom. On the southern side is the master suite. The private deck is placed to the west because of the request for sunset views. The closets create a small hallway to transition between the bedroom and the deck. The bedroom also has a view of the pond. On the northern side are the children's bedrooms. One room has a view towards the west while the other has a pond view.

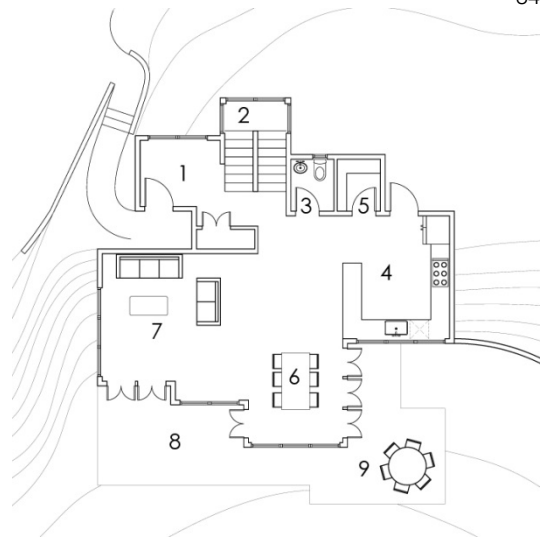


Figure 39. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living 8. Deck 9. Outdoor Dining

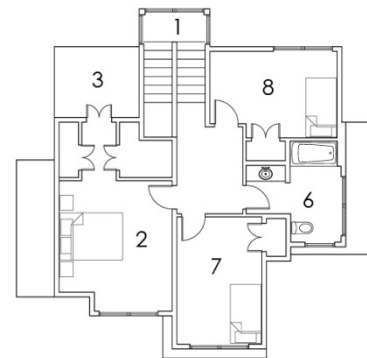


Figure 40. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom

Option 2

Site. The second option tucks the proposed building farther back from the water than the existing building similar to the first option. The building is located to preserve as many of the large trees as possible, though the rest of the site will be cleaned up from overgrowth. The parking is in the same location, but expanded to accommodate two vehicles parking side by side and a formal path that leads users from the parking to the home. In the upper corner a new kitchen garden located as well as a restorative garden where the outhouses used to be. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous.

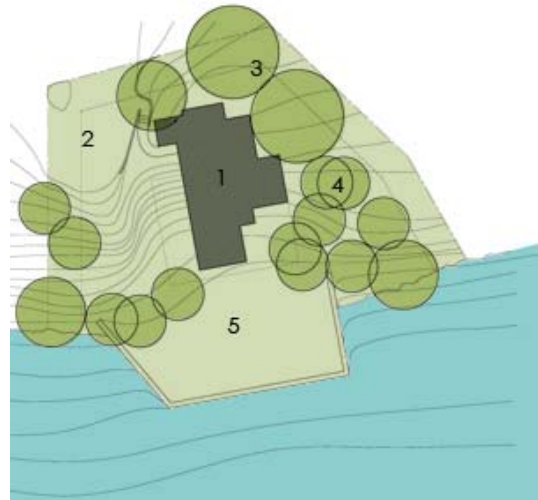


Figure 41. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

Lower Floor. The lower floor plan is pushed into the hill to minimize the visual impact of the building on the site. The eastern side opens up onto the front lawn under the deck above. The deck shields the office/guest room from direct sunlight in the summer months. There are windows to take advantage of the pond view and doors taking users to the front lawn. A small bathroom and closet are located nearby for the convenience of the guests and potential clients if Elan chooses to use the office professionally. In addition to these rooms there are two secondary spaces. Next to the stairs is a room for the mechanical equipment as well as some storage. There is a smaller room for storage of outdoor maintenance equipment. To access the equipment there is a small overhead door leading to the front lawn as well as a door to the downstairs hall.

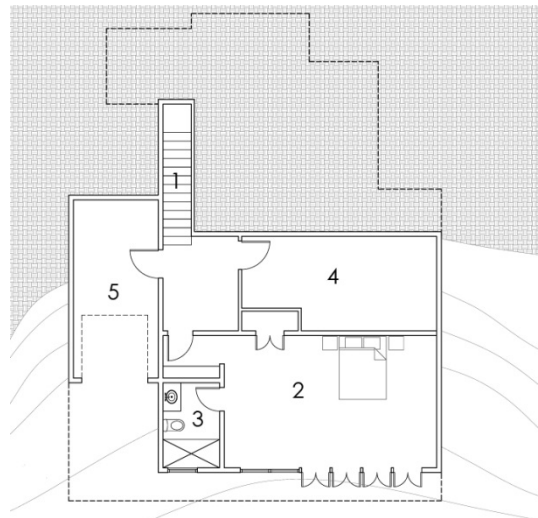


Figure 42. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room 5. Storage

First Floor. The first floor plan has the primary living areas. A path from the parking area leads to the entry. Users then move passed the kitchen before entering the living/dining area. The stairs are linear to emphasize the linear nature of the plan. However, the spaces have clear designated zones they are all still visually connected together in an open space. The living room in this option has a higher ceiling height for air circulation. Similar to the first option, the dining and living spaces have corresponding spaces on the deck for summer use.

Second Floor. The second floor is designated for more private rooms; the bedrooms and bathroom. This plan also has a singular shared bathroom. This layout differs significantly from the first in the views that the different rooms have. The master bedroom doesn't have a view of the pond, but the two children's bedrooms do. The master bedroom has the view of the sunset that the client wanted, to take advantage of it there is a large set of windows in the bedroom as well as a deck to the south of the bedroom. Similar to the first option, the closets make a hall to separate the bedroom and deck. Elan doesn't mind not having a view of the pond from her bedroom as long as the main living spaces do.

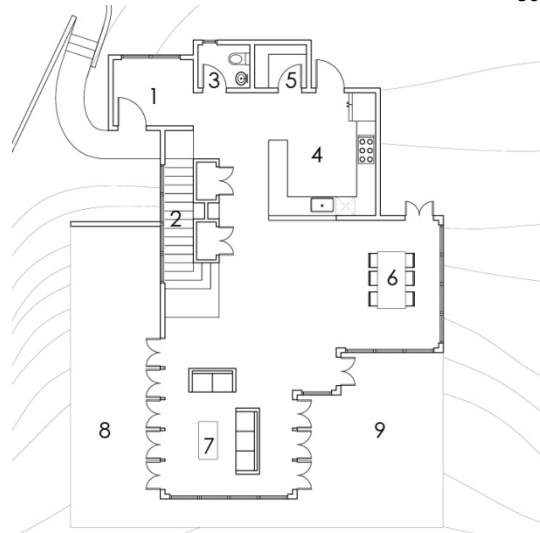


Figure 43. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living 8. Deck 9. Outdoor Dining

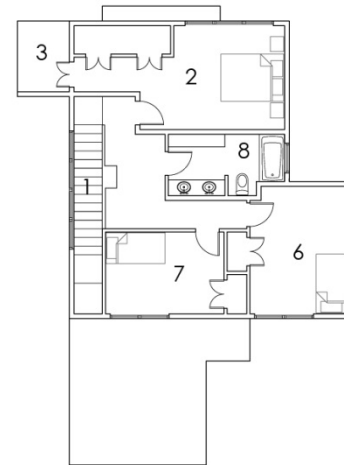


Figure 44. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom

Option 3

Site. The third option tucks the proposed building farther back from the water than the existing building similar to the previous options. The building is located to preserve as many of the large trees as possible, though the rest of the site will be cleaned up from overgrowth. The parking is in the same location, but expanded to accommodate two vehicles parking side by side and the path in this option wraps around the front of the parking area rather than along the side since the building is placed closer than the previous. In the upper corner, a new kitchen garden located as well as a restorative garden where the outhouses used to be. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous.

Lower Floor Plan. The lower floor plan is pushed into the hill to minimize the visual impact of the building on the site. The eastern side opens up onto the front lawn under the deck above. The deck shields the office/guest room from direct sunlight in the summer months. There are windows to take advantage of the pond view and doors taking users to the front lawn. A small bathroom and closet are located nearby for the convenience of the guests and potential clients if Elan chooses to use the office professionally. In addition to these rooms, there are two secondary spaces. Next to the stairs is a room for the mechanical equipment as well as some storage. Since there is no room for storing outdoor equipment, there needs to be a storage shed separate on the property.

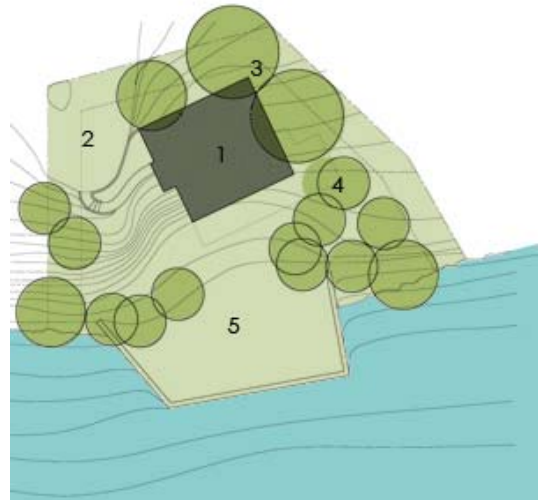


Figure 45. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

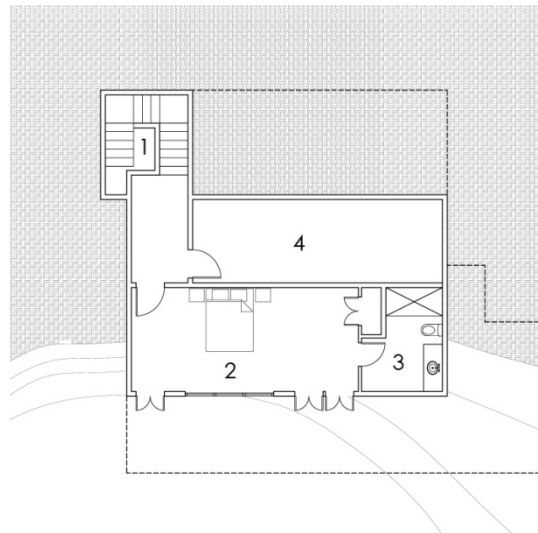


Figure 46. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room/Storage

First Floor. The first floor plan has the primary living areas. The floor plan is more open and connected within the clear rectilinear form of the building. This plan reflects the prevailing historic building style of its neighbors. The entry is more centrally located on the southern wall, bringing people into the middle of the open middle space. Each corner has a different specific use to try to keep them separated, but connected. In the North West corner is the kitchen with a door leading to the garden. This leaves the corners to the east open for the living and dining areas. Similar to the other options, the dining and living spaces have corresponding spaces on the deck for summer use.

Second Floor. The second floor is designated for more private spaces; the bedrooms and bathroom. With the more concise form, it was easier to place the second floor rooms. It also allowed for larger rooms and two bathrooms. The master suite is in the north west corner with the deck in a niche along the western façade. The master bedroom has windows oriented to the west as well. The master bathroom is tucked in between master bedroom and a child's room. The children's bathroom is opposite the master bathroom down the hall. Both of the children's bedrooms have a view of the pond.

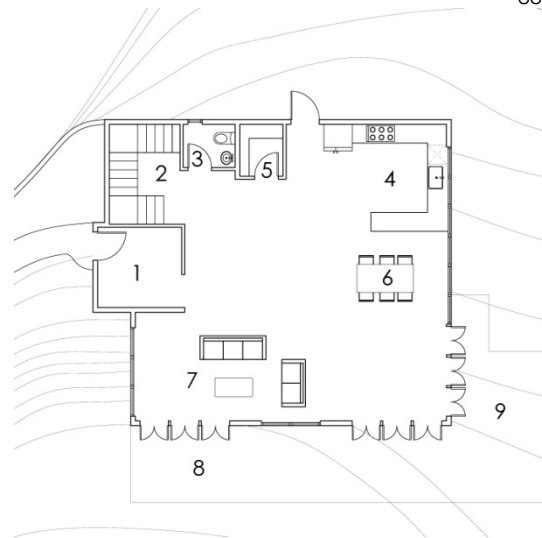


Figure 47. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living 8. Deck 9. Outdoor Dining

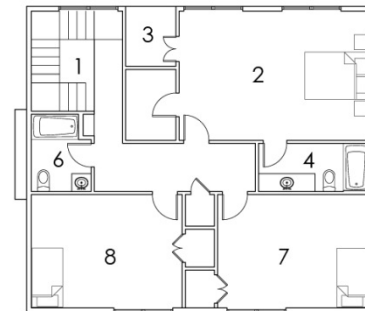


Figure 48. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 4. Master Bathroom 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom

Option 4

Site. The fourth option tucks the proposed building farther back from the water than the existing building similar to the previous options. The building is located to preserve as many of the large trees as possible, though the rest of the site will be cleaned up from overgrowth. The parking is in the same location, but expanded to accommodate two vehicles parking side by side and the path in this option wraps around the front of the parking area rather than along the side since the building is placed closer than the previous. In the upper corner, a new kitchen garden located as well as a restorative garden where the outhouses used to be. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous.

Lower Floor. The lower floor plan is pushed into the hill to minimize the visual impact of the building on the site. The eastern side opens up onto the front lawn under the deck above. The deck shields the office/guest room from direct sunlight in the summer months. There are windows to take advantage of the pond view and doors taking users to the front lawn. A small bathroom and closet are located nearby for the convenience of the guests and potential clients if Elan chooses to use the office professionally. In addition to these rooms, there are two secondary spaces. Next to the stairs is a room for the mechanical equipment as well as some storage. Since there is no room for storing outdoor equipment, there needs to be a storage shed separate on the property.

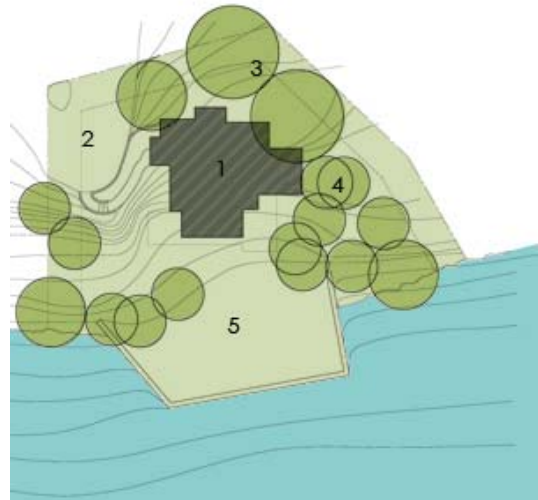


Figure 49. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

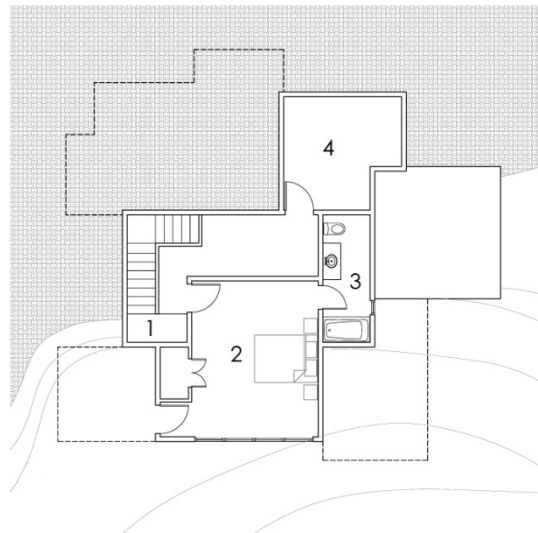


Figure 50. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room 5. Storage

First Floor. The first floor plan has the primary living areas. This plan is similar to option 1 with a centralized plan. From the entry, users wind around into the open living area. The kitchen is in the same area with a door leading to the garden. To create a further division between the spaces while keeping them connected, but introduces level changes. The dining room steps down from the kitchen and living room and it too opens out to the lawn. As in the other plans, there is a deck with living and dining spaces that are accessed through the living room.

Second Floor. The second floor is designated for more private rooms; the bedrooms and bathroom. The master suite is located in the western side of the house. In the bedroom, there is a window seat on the south wall and a deck in a niche on the western side. To the north is the master bathroom. The children's rooms are to the east and north of the master suite with their own bathroom separating them. This plan also allowed for a laundry room on the second floor, in the other options it would be located on the lower floor.

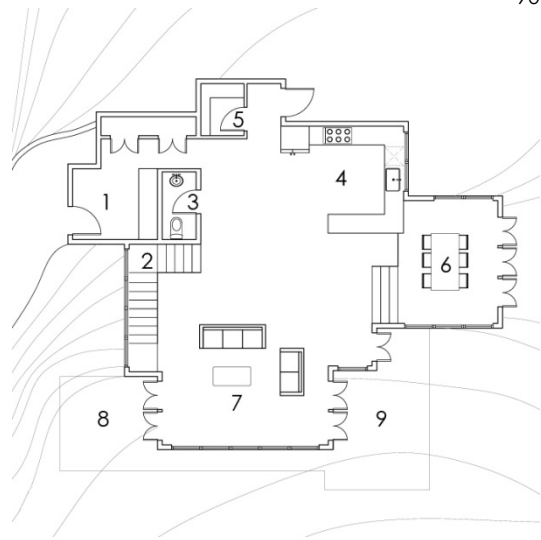


Figure 51. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living 8. Deck 9. Outdoor Dining

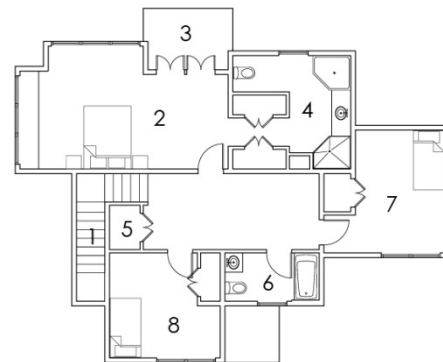


Figure 52. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 4. Master Bathroom 5. Laundry Room 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom

Option 5

Site. The fifth option tucks the proposed building farther back from the water than the existing building similar to the previous options. The building is located to preserve as many of the large trees as possible, though the rest of the site will be cleaned up from overgrowth. The parking is in the same location, but expanded to accommodate two vehicles parking side by side and the path in this option reverts to the earlier option along the side but winding back to the entrance. In the upper corner, a new kitchen garden located as well as a restorative garden where the outhouses used to be. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous.

Lower Floor. The lower floor plan is pushed into the hill to minimize the visual impact of the building on the site. The eastern side opens up onto the front lawn under the deck above. The deck shields the office/guest room from direct sunlight in the summer months. There are windows to take advantage of the pond view and doors taking users to the front lawn. A small bathroom and closet are located nearby for the convenience of the guests and potential clients if Elan chooses to use the office professionally. In addition to these rooms, there are two secondary spaces. Next to the stairs is a room for the mechanical equipment as well as some storage. Since there is no room for storing outdoor equipment, there needs to be a storage shed separate on the property.



Figure 53. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

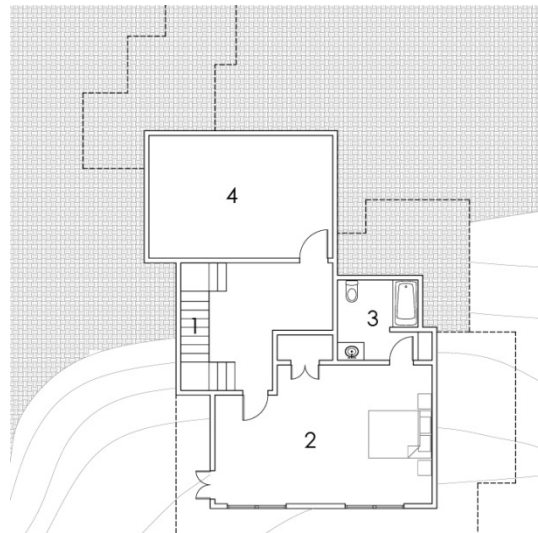


Figure 54. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room/Storage

First Floor. The first floor plan has the primary living areas. This plan is similar to the second option. However, instead of a direct linear plan this has a diagonal organization. From the entry, the path goes past the kitchen into the main living area. The diagonal allows each space its own niche away from the others, but are all connected by the area near the stairs. The spaces are separated by glass to connect them to the outdoors. The living room has a higher ceiling for air circulation. Similar to the other options, the dining and living spaces have corresponding spaces on the deck for summer use.

Second Floor. The second floor is designated for more private rooms; the bedrooms and bathroom. The diagonal orientation gives each bedroom its own niche. The master suite is on the western side of the second floor. The deck is to the western most area of the building with closets between it and the main room. A smaller master bathroom is adjacent to the children's room located over the kitchen to cut down on plumbing. The children's rooms are to the east and north of the master suite. The diagonal orientation allows each of the bedrooms to have at least one window facing the pond.

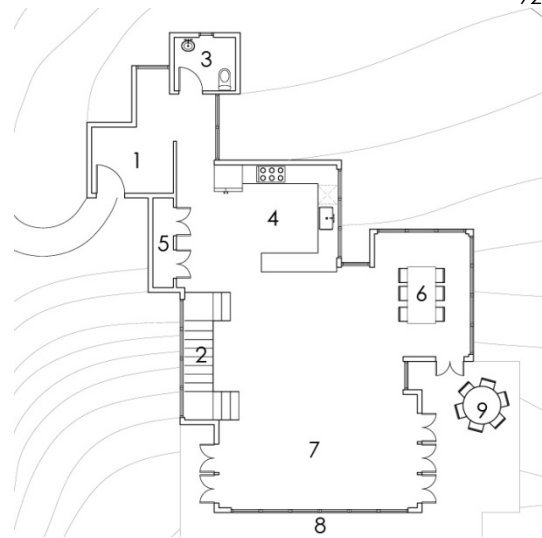


Figure 55. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living 8. Deck 9. Outdoor Dining

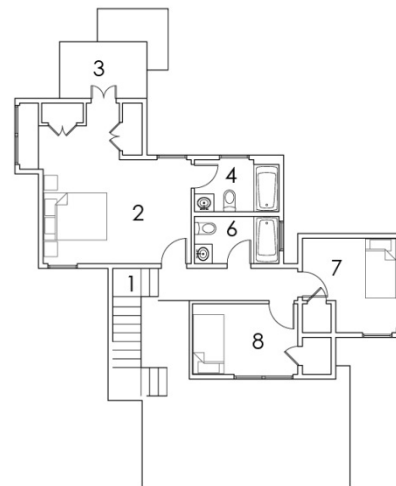


Figure 56. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 4. Master Bathroom 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom

Option 6

Site Plan. The sixth option tucks the proposed building farther back from the water than the existing building similar to the previous options. The building is located to preserve as many of the large trees as possible, though the rest of the site will be cleaned up from overgrowth. The parking is in the same location, but expanded to accommodate two vehicles parking side by side and the path in this option reverts to the earlier option along the side but winding back to the entrance. The form is derived from the site constraints rather than orthogonal angles. In the upper corner, a new kitchen garden located as well as a restorative garden where the outhouses used to be. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous.

Lower Floor. The lower floor plan is pushed into the hill to minimize the visual impact of the building on the site. The eastern point opens up onto the front lawn under the deck above. This allows sunlight into the office/guest room and bathroom but the deck can be sized to shade them in the summer. In addition to these rooms, there is storage space for mechanical equipment. This plan has a more open approach. When a guest is using the room there is not necessarily a reason for someone else to come down, so perhaps there is no need for a door. Since this plan does not have a designated area for outdoor equipment storage, a separate structure will have to be located on the site.

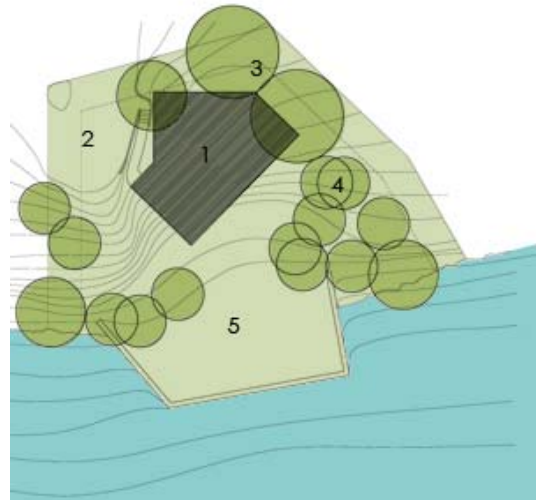


Figure 57. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

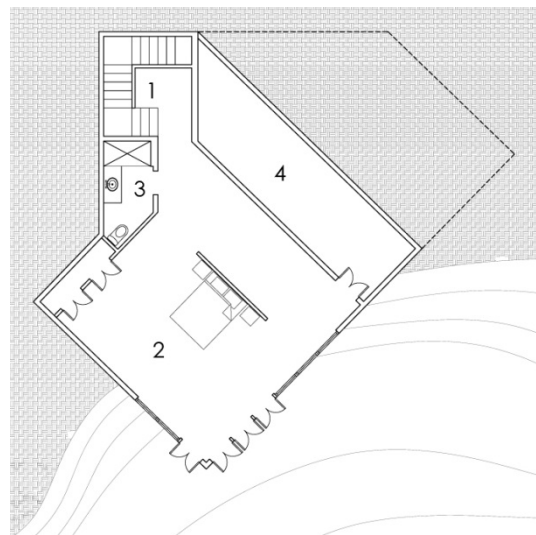


Figure 58. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room/Storage

First Floor. The first floor plan has the primary living areas. In this space, the angles allow each space to have its own area while not intruding upon one another yet still is connected to each other. The entry located is further down than the other options orienting the users back up towards the kitchen. Along the north eastern wall is the living and dining areas. Having the point facing directly at the pond allows for more privacy within the building. While there is still a significant amount of glass, it does not directly face the pond or the neighbors. Similar to the other options, the dining and living spaces would correspond to spaces on the deck for summer use.



Figure 59. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living

Second Floor. The second floor is designated for more private rooms; the bedrooms and bathroom. The master suite is the on the northwestern corner with the deck on the western point. The master and children's bathrooms are next to each other. While they are long and narrow, they are designed to create privacy. The children's bedrooms are on the southeastern area of the building. All the bedrooms have views of the pond because of the diagonal orientation. There is also ample space within the circulation around the stairs for a reading space or organized workspace for the children.

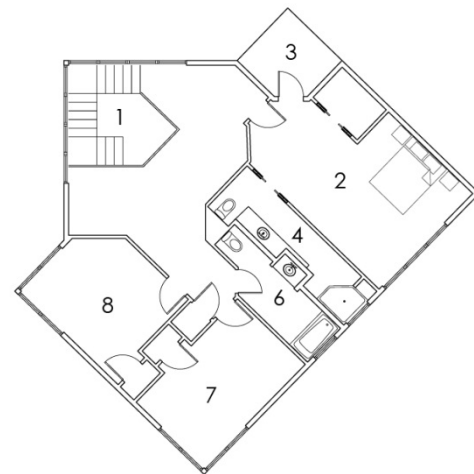


Figure 60. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 4. Master Bedroom 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom

Client Reaction. After meeting with Elan and going over the six different options with her, I gave her some time to think over the different proposals. After a week, she came back with these reactions.

Option 1. Elan liked the circuitous flow within the floor plan and the connection from the indoors to the outdoors. The second floor is similar to how her current residence is layout, which seems to work well for them. She liked the windows surrounding the stair landings, however she would like the stairs to be grander, less tucked away.

Option 2. The axial orientation does not appeal to Elan. Looking at a future with children in college, she feels the longer space would be potentially less cozy for a singular occupant. She also expressed a concern about the cathedral ceiling and heat loss, though if it acted as a heat chimney to other parts of the house she would like that. She also liked the grand gesture that the stairs make connecting to the living room. What Elan liked about the second floor was the double sinks in the singular bathroom. If they are going to share a bathroom, the more space the better. If the porch has the potential of having a view towards the pond, take advantage of it!

Option 3. The openness was what Elan was looking for, but there needs to be a little bit of separation to at least create diversity in the design. She did appreciate the master bathroom. Overall, she found this option boring and while there are plenty of windows, it is not as connected to nature as Elan would like.

Option 4. The central layout appeals to Elan in this option as it did in the first one. She appreciates that the stairs engage with the living space more. The different levels are also something she would like to explore more. Her favorite part of the plan was the master bathroom and the window seat in the master bedroom.

Option 5. The uneasiness that Elan felt with the longer orientation of the second option was compounded by the diagonal nature of this floor plan. She did like the windows separating spaces creating solids and voids. She was also uncomfortable with the scale of the master bedroom to the children's bedrooms.

Option 6. Elan appreciated the angles of the plan and the more dynamic flow that is created within the floor plan because of it. However, she feels there is too much open space, similar to option 3. She liked the idea of a reading space on the second floor.

Conclusions. Based on the reactions it seems best to proceed with a hybrid of Option 1 and 4. Using the circuitous circulation pattern and stair layout with the glass surround the landing from Option 1, but relocated the stairs to be more connected to the living space. Option 4 offers the grand master bathroom of Elan's dreams and creates a more dynamic first floor plan with different levels to avoid the boredom she felt with Option 3. She liked the solid and voids from Option 5 to create isolated views of outside and introduce some of the angles that Option 6 proposed. Elan also liked some of the smaller details of a reading niche for the kids and the window seat in the master bedroom.

One thing that was addressed in this meeting was entry to the property. Elan's biggest concern was access to the site. She was happy with the singular entry point from parking area, but also wanted to ensure that the pond and kitchen garden would also be readily accessible.

Third Meeting

Based on Elan's feedback on the first six floor plans, three schemes resulted. These schemes are much more similar than the previous six, instead of large elements like the building form itself the options are narrowed to smaller things on the interior. The three options explore angular and curved components that facilitate the circulation, different level changes, and various options for the second floor. Similar to the first meeting, I walked Elan through the plans. She gave more feedback and identified what she liked in each of the plans she preferred over others.

Option A

Site. The first option tucks the proposed building farther back from the water than the existing building to create more privacy for the house as well as a usable front lawn. The parking is in the same location, but expanded to accommodate two vehicles parking side by side and a formal path that leads users from the parking to the home. In the upper corner a new kitchen garden located as well as a restorative garden where the outhouses used to be. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous.

Lower Floor. The lower floor plan is pushed into the hill as in the previous options to minimize the visual impact of the building on the site. The eastern side opens out onto the front lawn while being sheltered by the deck above. This allows sunlight into the office/guest room and bathroom but the deck can be sized to shade them in the summer. Keeping the open concept from Option 6 with minimal doors, privacy to the space comes from the closet and how the stairs separate it from the public spaces upstairs. It opens out onto the front lawn through a set of French doors to give Elan is thinking of using either a futon or a murphy bed in the guest room so that it can easily transition from the everyday use of an office to the occasional guest room. In addition to these rooms there is storage space for mechanical equipment and combined with it is storage for outdoor equipment which can be access through either a small overhead door or a simple hinged door.

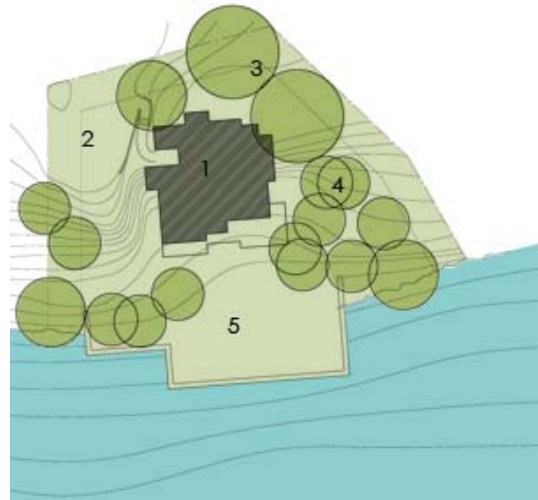


Figure 61. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

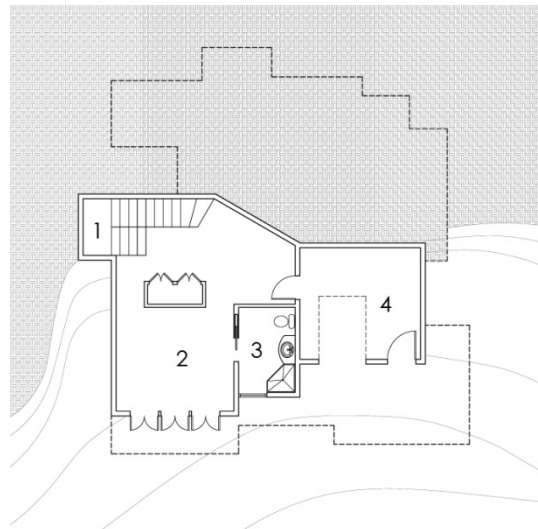


Figure 62. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room/Storage

First Floor Plan. The first floor plan has the primary living areas. The floor plan is open with the spaces connected together, but area that has a specific use has its own niche. The introduction of angles within the floor plan creates more of a circuitous path through the space. Further separation between the areas would be highlighted by the articulation of the structural system in the ceiling. In a small niche off the living area is a low built in that would house the media controls for the projection system as well as audio equipment. There is corresponding spaces for the dining and living rooms on the deck to the east as well as a door leading to a kitchen garden on the west. The stairs are more centrally located opening into the living space.

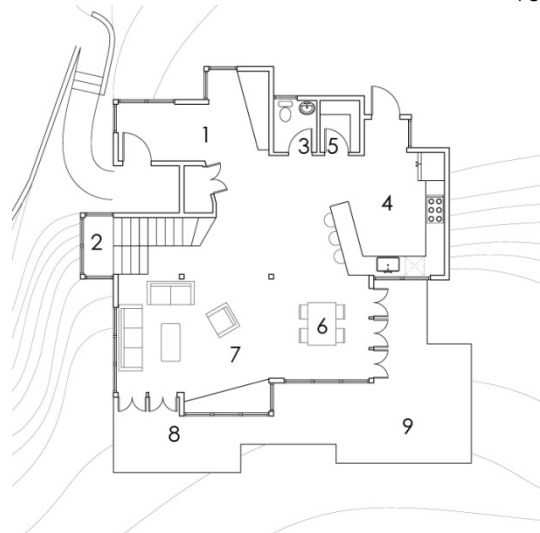


Figure 63. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living 8. Deck 9. Outdoor Dining

Second Floor. The second floor is designated for more private spaces; the bedrooms and bathroom. The master bedroom is on the western side to take advantage of the sunsets Elan enjoys. A passageway between two closet leads to the master bath wrapping around one of the closets to create a private alcove. On the southern side is a porch with a window seat looking out onto it. Inside the bedroom itself, the bed is tucked against the western wall with windows surrounding it. On the eastern, pond facing side is the children's bedrooms. Their closets act as an auditory barrier between the two. Their bathroom is smaller and next to the master bath. The two bathrooms are placed over the kitchen for ease of plumbing as well as the laundry room. There is another window seat at the top of the stairs as a more quiet space for reading.

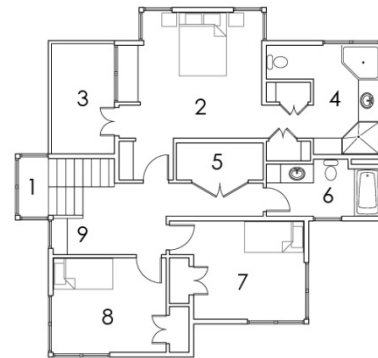


Figure 64. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 4. Bathroom 5. Bathroom 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom 9. Reading Niche

Option B

Site. The second option tucks the proposed building farther back from the water than the existing building similar to the first option. The building is located to preserve as many of the large trees as possible, though the rest of the site will be cleaned up from overgrowth. The parking is in the same location, but expanded to accommodate two vehicles parking side by side and a formal path that leads users from the parking to the home. In the upper corner, a new kitchen garden located as well as a restorative garden where the outhouses used to be. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous.

Lower Floor. The lower floor plan is pushed into the hill as in the previous options to minimize the visual impact of the building on the site. The eastern side opens out onto the front lawn while being sheltered by the deck above. This allows sunlight into the office/guest room and bathroom but the deck can be sized to shade them in the summer. Keeping the open concept from Option 6 with minimal doors, privacy to the space comes from the closet and how the stairs separate it from the public spaces upstairs. It opens out onto the front lawn through a set of French doors. Elan is thinking of using either a futon or a murphy bed in the guest room so that it can easily transition from the everyday use of an office to the occasional guest room. In addition to these rooms, there is storage space for mechanical equipment and combined with it is storage for outdoor equipment that can be accessed through either a small overhead door or a hinged door.

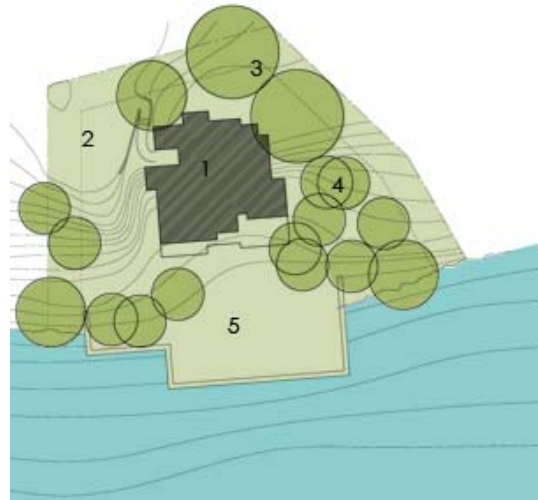


Figure 65. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

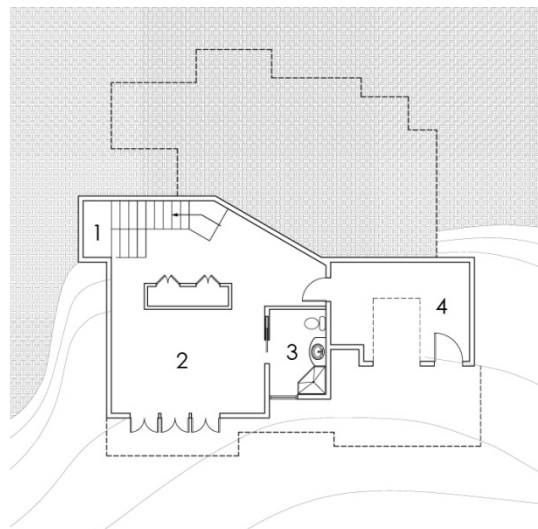


Figure 66. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room/Storage

First Floor. The first floor plan has the primary living areas. This floor plan gives a more separation between the areas while maintaining the open floor plan. This is achieved through low bookshelves delineating spaces and level changes between kitchen and living, living and dining. Instead of angles curved forms promote flow throughout the space. In a small niche off of the living area is a low built in that would house the media controls for the projection system as well as audio equipment. There is corresponding spaces for the dining and living rooms on the deck to the east as well as a door leading to a kitchen garden on the west. The stairs are more centrally located opening into the living space with a bookshelf being accessed from the stair side. A corresponding bookshelf is in the dining area with a planter on top.

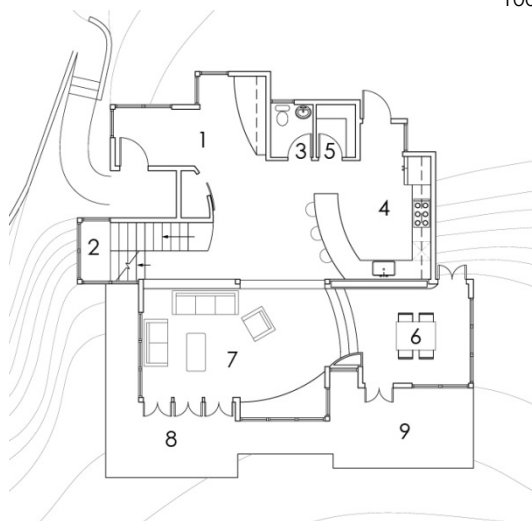


Figure 67. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living 8. Deck 9. Outdoor Dining

Second Floor. The second floor is designated for more private spaces; the bedrooms and bathroom. The master bedroom is on the western side to take advantage of the sunsets Elan enjoys. A passageway between two closet leads to the master bath. This room wraps around one of the closets to create a private alcove. On the southern side is a porch with a window seat looking out onto it. Inside the bedroom itself the bed is tucked against the western wall with windows surrounding it. On the eastern, pond facing side are the children's bedrooms. Their closets act as an auditory barrier between the two. Their bathroom is smaller and next to the master bath. The two bathrooms are placed over the kitchen for ease of plumbing as well as the laundry room. There is another window seat at the top of the stairs as a more quite space for reading.



Figure 68. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom 9. Reading Niche

Option C

Site. The third option tucks the proposed building farther back from the water than the existing building similar to the previous options. The building is located to preserve as many of the large trees as possible, though the rest of the site will be cleaned up from overgrowth. The parking is in the same location, but expanded to accommodate two vehicles parking side by side and the path in this option wraps around the front of the parking area rather than along the side since the building is placed closer than the previous. In the upper corner a new kitchen garden located as well as a restorative garden where the outhouses used to be. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous.

Lower Floor Plan. The lower floor plan is pushed into the hill as in the previous options to minimize the visual impact of the building on the site. The eastern side opens out onto the front lawn while being sheltered by the deck above. This allows sunlight into the office/guest room and bathroom but the deck can be sized to shade them in the summer. Keeping the open concept from Option 6 with minimal doors, privacy to the space comes from the closet and how the stairs separate it from the public spaces upstairs. It opens out onto the front lawn through a set of French doors to give. Elan is thinking of using either a futon or a murphy bed in the guest room so that it can easily transition from the everyday use of an office to the occasional guest room. In addition to these rooms there is storage space for mechanical equipment and combined with it is storage for outdoor equipment which can be access through either a small overhead door or a simple hinged door.

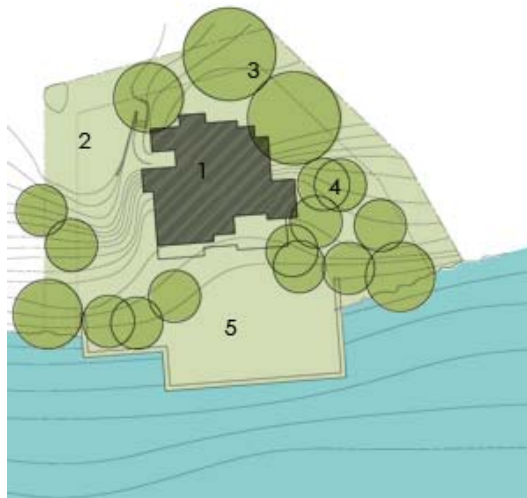


Figure 69. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

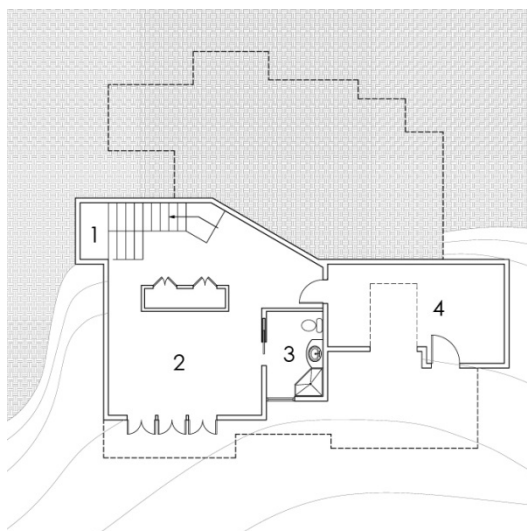


Figure 70. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room/Storage

First Floor. The first floor plan has the primary living areas. This floor plan is a hybrid of the first two. The separation between each area is from structural articulation as well as level changes between the living room and dining room. The plan has gone back to the angular forms to dictate the circulation path. In a small niche off the living area is a low built in that would house the media controls for the projection system as well as audio equipment. There is corresponding spaces for the dining and living rooms on the deck to the east as well as a door leading to a kitchen garden on the west. The stairs are more centrally located opening into the living space.

Second Floor. The second floor is designated for more private spaces; the bedrooms and bathroom. The master bedroom is on the western side to take advantage of the sunsets Elan enjoys. A large walk in closet is on the northern side of the bedroom. On the southern side is a porch with a window seat looking out onto it. Inside the bedroom itself the bed is tucked against the western wall with windows surrounding it. On the eastern, pond facing side are the children's bedrooms. Their closets are act as an auditory barrier between the two. Instead of two bathrooms, one larger bathroom is designed for privacy. There are two sinks when first entering the bathroom that leads to a larger shower stall separating a toilet alcove and a tub room that still takes advantage of the western views. While there are no doors in between the spaces within the bathroom, it is designed for multiple users. Their bathroom is smaller and next to the master bath. The bathroom as well as the laundry room is placed over the kitchen for ease of plumbing. There is another window seat at the top of the stairs as a more quite space for reading.

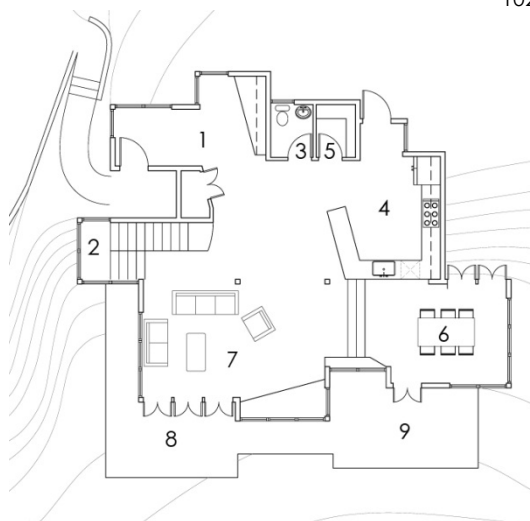


Figure 71. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living 8. Deck 9. Outdoor Dining



Figure 72. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 4. Master Bathroom 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom 9. Reading Niche

Client Reaction. Elan went over the three revised plans and during the next meeting went over what she liked and disliked about each, overall she liked progression of the floor plans. Elan preferred Option B with the curved forms. She has always found rounded building alluring and this keeps the actual house simpler while still having the flow on the interior. One thing she was concerned about was the many level changes between the spaces. She liked the third option where there was just a couple of steps to the dining area so that there would be a door straight out to a lawn.

For the second floor, Elan definitely prefers the two bathrooms if space allows, which it does. Otherwise, she appreciated the slightly more generous bedrooms for the kids than in some of the initial options. Elan also liked the laundry room. Even though it is a large closet, she favored it on the second floor since that is where the most laundry will be generated.

Fourth Meeting

Narrowed down to a singular plan, this was a reflection of the feedback Elan gave over the previous two meetings. Final changes after this were mostly fine tuning parts of the building with regards to the research previously conducted in the first part of the document.

Final Concept

Site. The final scheme has the building tucked farther away from the water than the existing building, the same as all the previous options. It is located within the existing trees to preserve the older growth while cleaning up the overgrowth to expand as well as provide open space around the building. The parking is in the same location, but expanded to accommodate two vehicles parking side by side. A carport shelters the vehicles and protects the users from the elements as they make their way to the path that wraps around the hill bringing them to the entry. In the upper corner a kitchen garden located as well as a restorative garden where the outhouses used to be. The kitchen garden is in raised beds and provides much of Elan's produce needs through the summer. While the restorative garden is intended to cleanse the area where the outhouses were located and is more for aesthetics. The existing seawall is in disrepair and needs to be replaced; the new seawall creates a larger front lawn than the previous. The southern edge of it is curved to reflect the prevalent flow of the water.



Figure 73. Site Plan - 1. House 2. Parking 3. Garden 4. Garden 5. Front Lawn

Lower Floor Plan. Elan was pleased with how open the office/guest room was. Her intent for the space is to use it as an office for her small business as well as a place to research and work on future books. Elan liked the position of the desk; it is located on the pond side of the room, so it can take advantage of natural light. While Elan can take advantage of the view of the pond for inspiration, the desk is oriented away to minimize distraction. It is also situated so that it does not interrupt the flow between the stairs and the door opening out onto the front lawn. As part of her work, Elan prefers to have a personal library. Tucked next to the stairs is a reading area with shelving and seating. This can transition into a sleeping area for guests by utilizing convertible seating, from this space users can see out the windows. Since that is the eastern side, it is sheltered from direct sunlight disturbing the guests in the morning. An alternative use for the basement that Elan could see in the future is as a small apartment. The sleeping area remains the same, but the office space can become more of a living area with a kitchenette in the storage cabinets along the south wall.

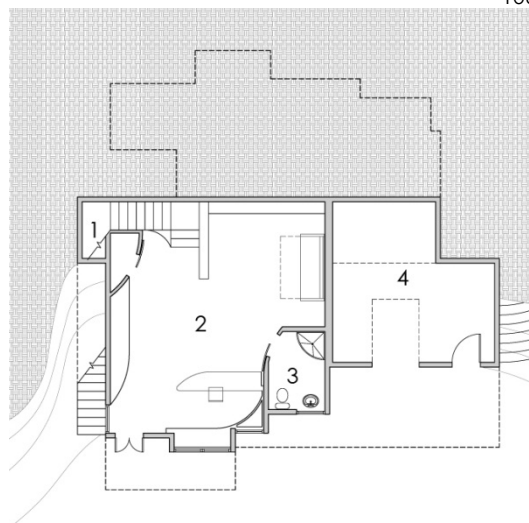


Figure 74. Lower Floor Plan - 1. Stairs 2. Office/Guest Room 3. Bathroom 4. Mechanical Room/Storage

First Floor. The entrance is located in the southwestern corner, users walk past a set of cubbies where Elan and her children store their things behind panels. Around the corner is the kitchen which has a door leading out to the kitchen garden. Beyond the kitchen, towards the pond is the living and dining areas. The dining area is several steps down from the rest of the floor allowing it to have its own door that opens out onto a small reflective space outside. The living opens out onto a deck that can be used during the summer months.

Elan appreciated how the curves facilitated the flow within the space. One of her concerns with having curvilinear forms within the home was fitting furniture and fixtures within and against curved walls. Instead the rounded surfaces are introduced in the storage spaces as well as built-ins. While looking over the floor plans, Elan liked the seating at the peninsula in the kitchen. With that addition to the program, she imagines that other than family dinners the dining room table will be a good spot for the children to do their homework. One thing that she suggested was screening in the deck area directly adjacent the living room, to have an outdoor space that is bug free.

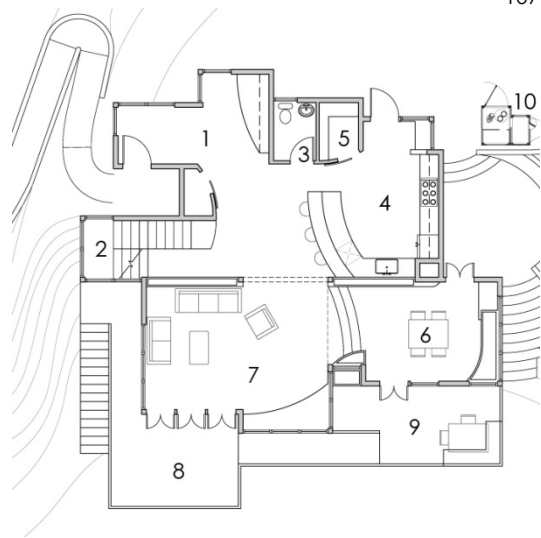


Figure 75. First Floor Plan - 1. Entry 2. Stairs 3. Powder Room 4. Kitchen 5. Pantry 6. Dining 7. Living 8. Deck 9. Outdoor Dining

Second Floor. The master suite is on the western side of the house. A private deck is over the entry giving the sunset views she was looking for. Across the room from the deck is a short hall leading to the master bathroom which is separated by closets. Adjacent to the master bathroom is the children's bathroom that includes a niche for the washer and dryer. On the eastern side are the children's bedrooms. They both have a view of the pond. The two rooms are separated by closets to create a buffer.

Elan liked the addition of the curves into the second floor to create the same effect on flow they had on the first floor. This also helped eliminate the wasted space of the rather wide hall. Elan was excited by the small niche and window seat adjacent to the stairs. The same guides for the curves on the first floor prescribed these walls as well. Elan also appreciated a slight reorganization of the master bathroom to create more closet space and buffer the master bedroom from plumbing noises. The walls around the laundry niche were thickened to buffer as well. When first going over the program, Elan initially thought the laundry should be in the basement. I had asked her to look at how she does her laundry now and what spaces generate the most laundry. After the analysis, she found that she'd prefer the washing machine to be on the second floor.

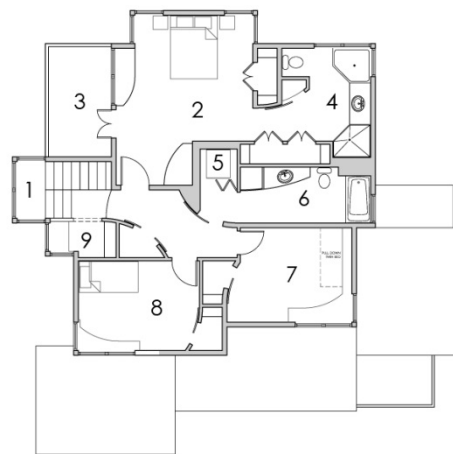


Figure 76. Second Floor Plan - 1. Stair 2. Master Bedroom 3. Deck 4. Master Bathroom 6. Bathroom 7. Jeremiah's Bedroom 8. Spirit's Bedroom 9. Reading Niche

3.6 Final Design

Once the final concept was worked out with the client, some small changes were made upon further analysis of the research as well as further consultation with the client. The following conceptual drawings show the finalized plans, elevations and sections.



Figure 77. Site Plan - 1" = 20'-0"



Figure 78. First Floor - 3/32" = 1'-0"

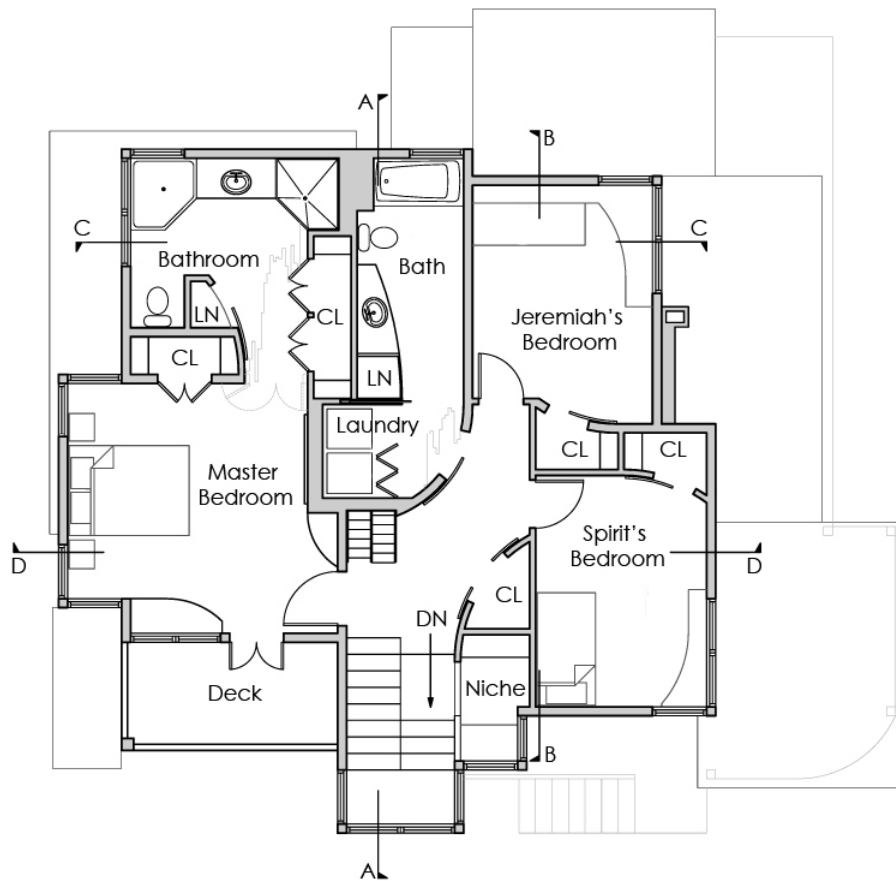


Figure 79. Second Floor - 3/32" = 1'-0"

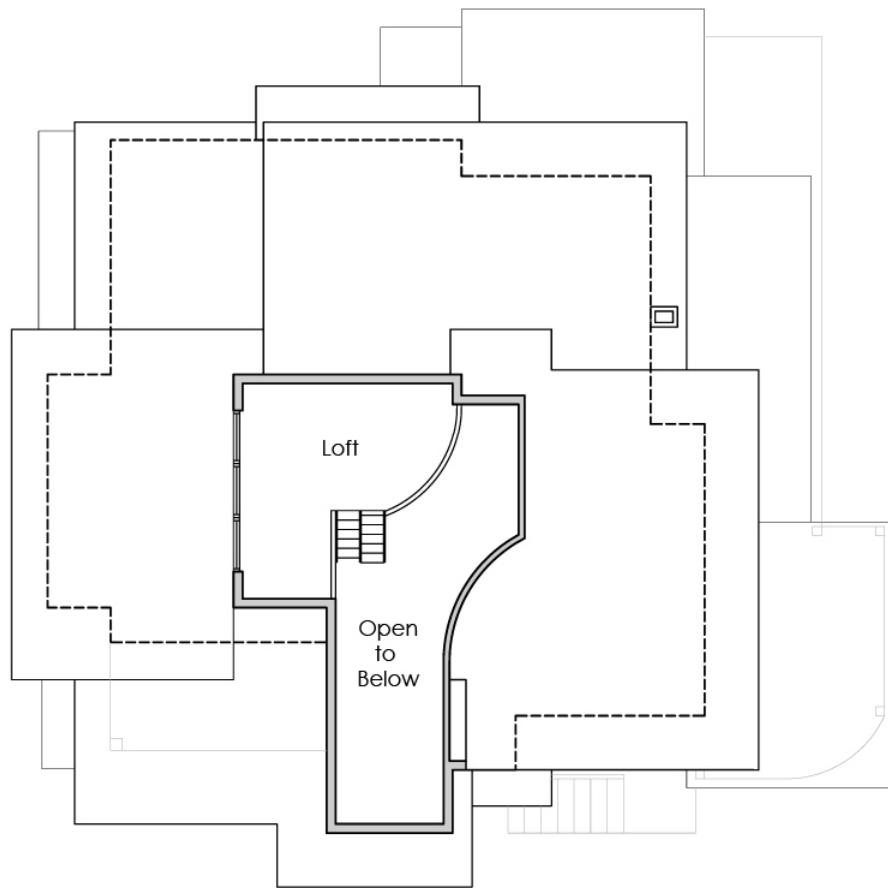


Figure 80. Loft - 3/32" = 1'-0"

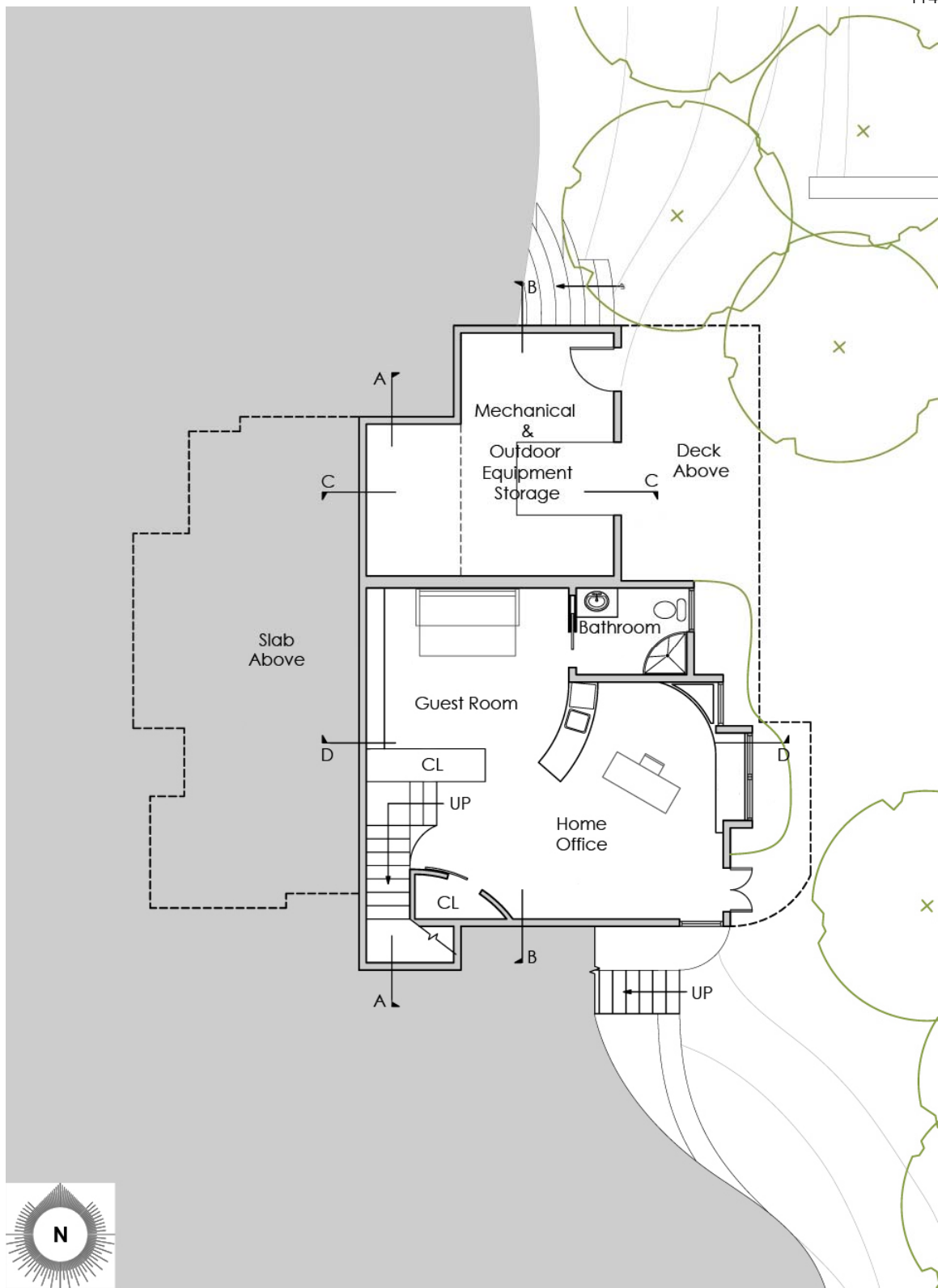


Figure 81. Lower Floor Plan - 3/32" = 1'-0"

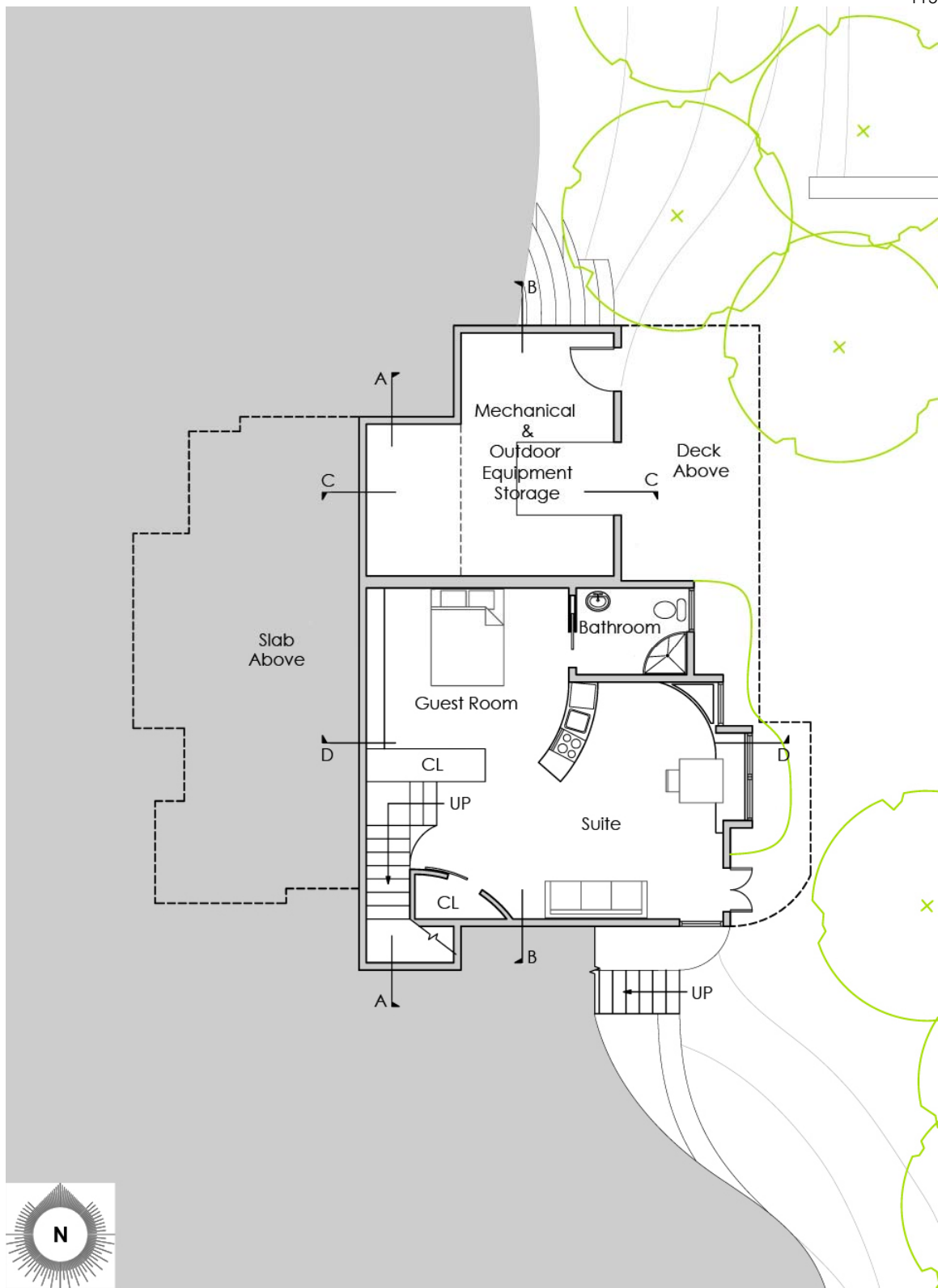


Figure 82. Alternate Lower Floor - 3/32" = 1'-0"

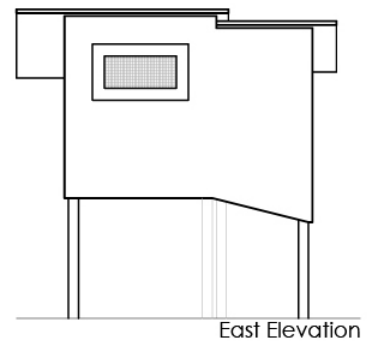
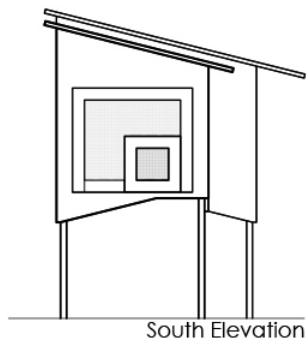
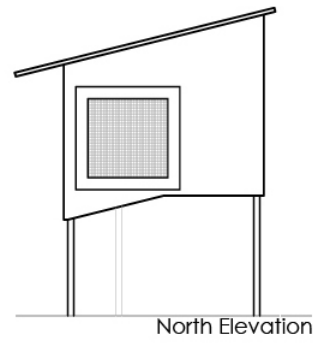
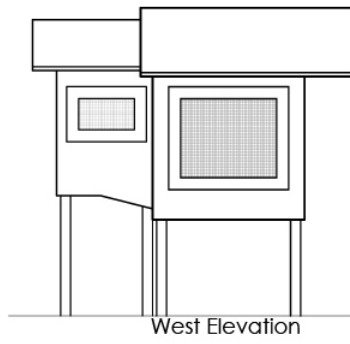
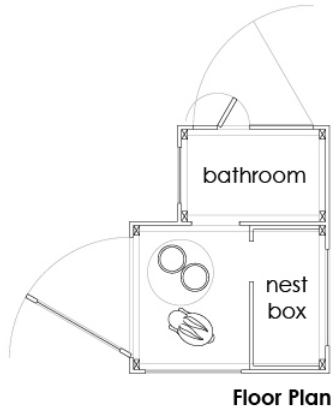


Figure 83. Rabbit Hutch, plans and elevations - 1" = 1/4"



Figure 84. Section 'A-A' - 3/32" = 1'-0"



Figure 85. Section 'B-B' - 3/32" = 1'-0"



Figure 86. Section 'C-C' - $3/32'' = 1'-0''$



Figure 87. Section 'D-D' - Scale $3/32'' = 1'-0''$



Figure 88. West Elevation – not drawn to scale



Figure 89. West Elevation – with tree silhouettes



Figure 90. West Elevation – showing aged materials



Figure 91. North Elevation – not drawn to scale

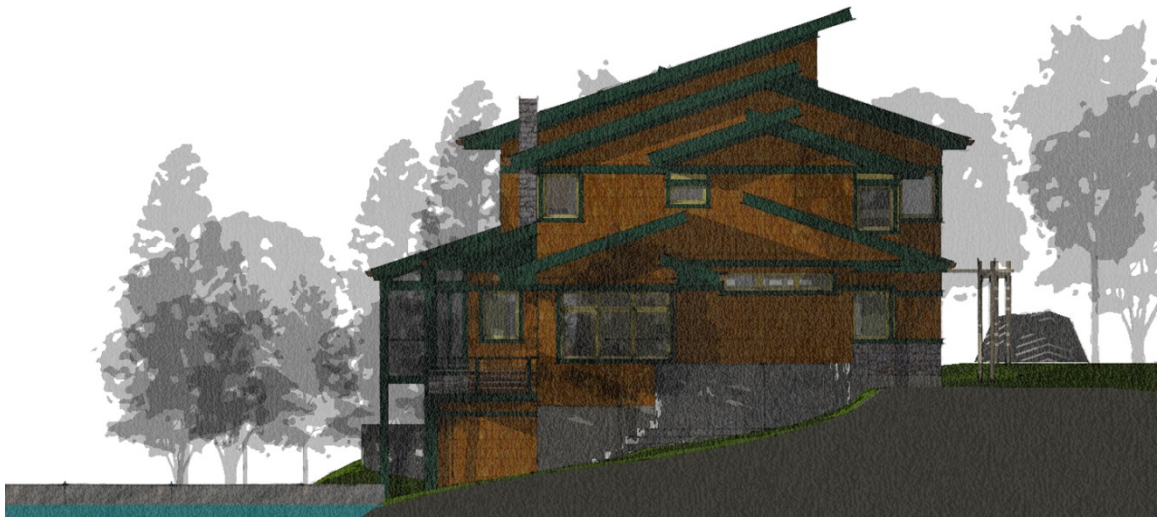


Figure 92. North Elevation – with tree silhouettes

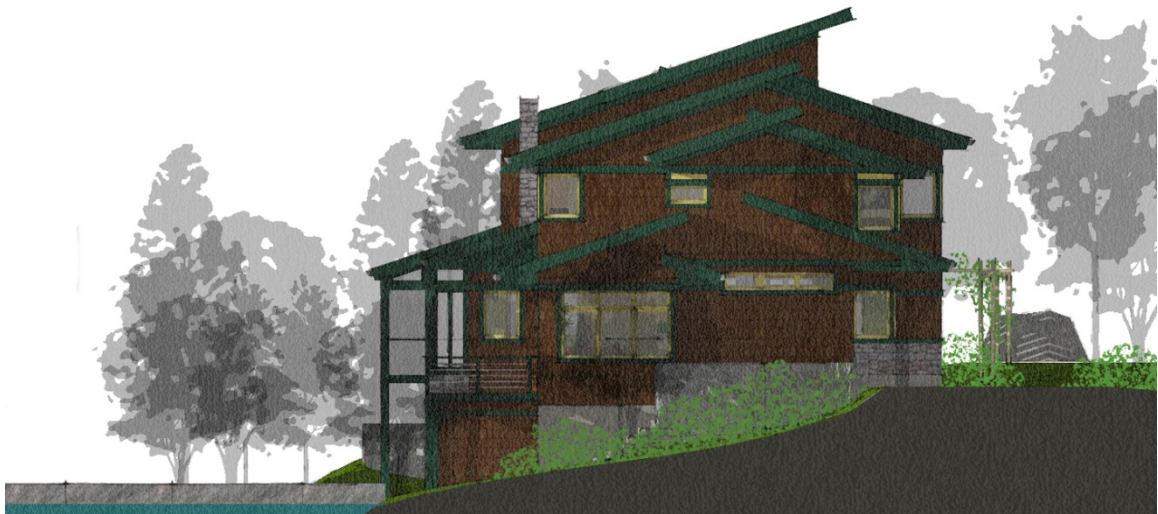


Figure 93. North Elevation – showing aged materials



Figure 94. East Elevation – not drawn to scale



Figure 95. East Elevation – with tree silhouettes



Figure 96. East Elevation – showing aged materials



Figure 97. South Elevation – not drawn to scale

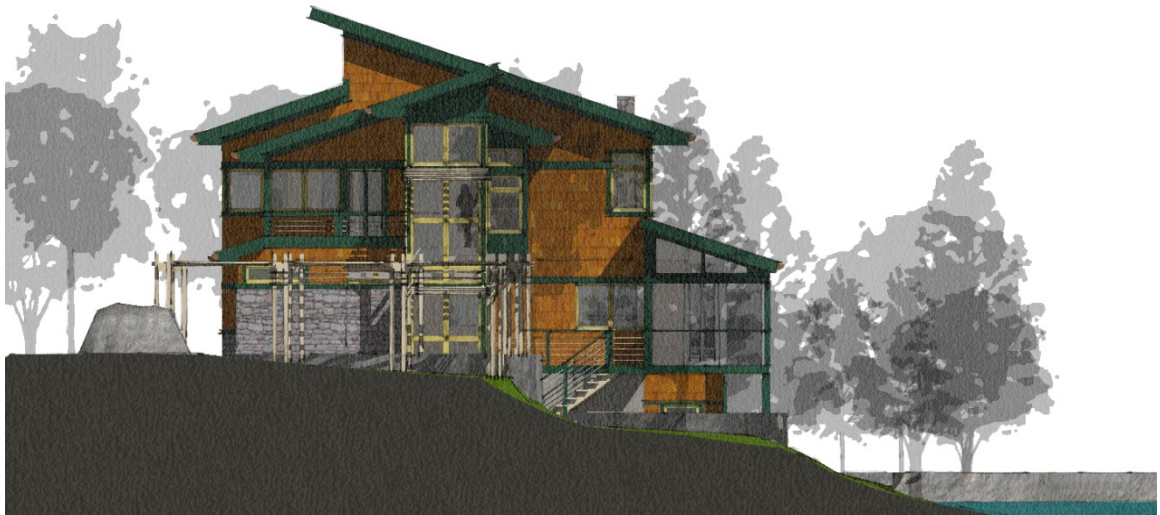


Figure 98. South Elevation – with tree silhouettes



Figure 99. South Elevation – showing aged materials



Figure 100. Rendering - view of home from across the pond



Figure 101. Rendering - view of home from pond in winter



Figure 102. Rendering - view of carport from Onion Point Road



Figure 103. Rendering - view of front lawn

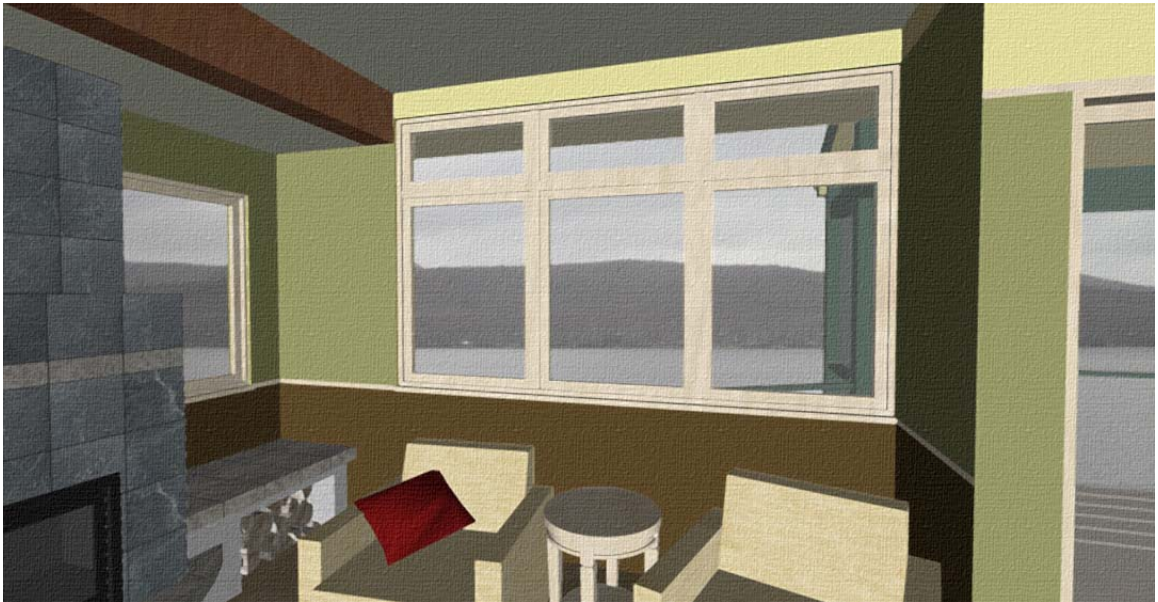


Figure 104. Rendering - view of pond from living room

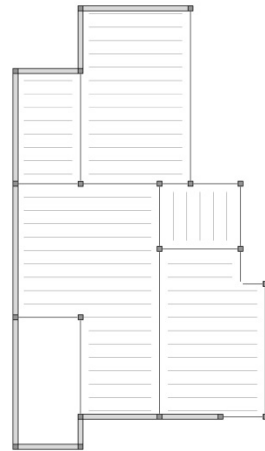


Figure 105. Lower Floor Structural System - diagram showing the proposed structural components of the lower floor

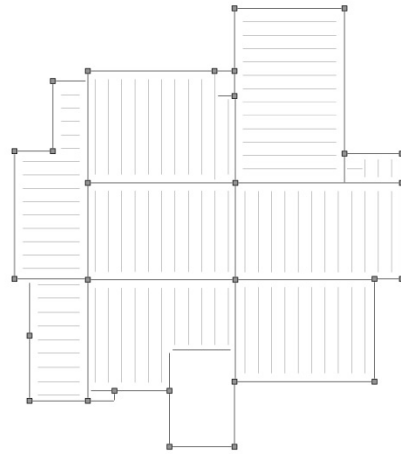


Figure 106. First Floor Structural System - diagram showing the proposed structural components of the first floor

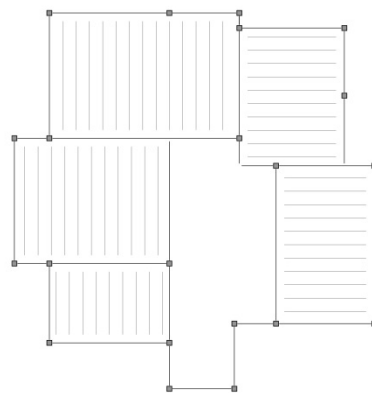


Figure 107. Second Floor Structural System - diagram showing the proposed structural components of the Second Floor

3.7 Conclusion.

Site Plan. When looking at the entry for the site, it was best to keep the parking in the same area it presently is in. To accommodate visitors, the parking is extended forward towards the pond and a carport shelters Elan's vehicles. The carport is intended to be minimal with a translucent layer to keep the elements off the cars, this allows plants that are encouraged to grow on the trellis to be seen from underneath.

A low stone wall creates a boundary from the parking area and the terraces down to the front lawn. It also guides users towards a flagstone path leading to the front door. Another formal flagstone path leads from the road towards the front door for pedestrian usage. Flanking this path are two small gardens with a low stone wall creating an informal potential seat. Adjacent the door way along the sides of the house are two gardens to help ground building as well as highlight the entry and guide the paths.

The northern area of the front lawn has two smaller gardens contain herbs corresponding to the kitchen in that area of the home. Leading from the primary path to the kitchen door is an informal path to create hierarchy between the three paths. This is also where Leiserl's hutch is located. The hutch is located in a fairly sheltered area of the lawn, but allows for passive cooling through natural ventilation in the summer. The garden closest could possibly contain plants to supplement Leiserl's diet.

Traveling further around the home is a meditative outdoor space. It is several steps down from the lawn near the road, connecting it to the dining room. There is a built in seat for users and a low wall that could possibly have a living fence. This with the addition of gates on either side can create a secure space for Leiserl to be outside. Flowing down from this area are steps that disappear into the hill side, these aren't meant to be too formal but make it easier to get to the front lawn. Next to the

steps is a restorative garden that is meant to cleanse the area where the outhouses used to be.

A rebuilt sea wall encloses the front lawn. For the most part it follows the same perimeter of the existing sea wall. Since it would have to be replaced due to deterioration, the southern edge is expanded in a form that would work with the prevailing flow of the water. Since the water is dropped in the winter, maintenance to the sea wall can be worked on during those seasons. The lawn contained within the sea wall is exactly that, a natural grass lawn. In the north eastern corner are several raised vegetable garden beds. This is one of the few areas on the site that gets a significant amount of sunlight during the summer months.

The final spot in the site is the terrace on the southern side. Creating an intermediate step between the carport and front lawn is an informal outdoor living area. Only accessed from either the deck or the front lawn, there are permeable pavers. This creates diversity between the front lawn, terrace, deck, and screened deck.

First Floor Plan. The first space that greets users to the space is the entry. Guided by the two primary paths from the road or carport, users are initially greeted by a distant view inside of vines growing in a planter. On either side of space in front of the door are two secondary spaces. To the right is a mudroom with cubbies for Elan and her children, a closet for seasonal equipment storage and users apparel. There is also a bench to help with the preparations to go outdoors. On the left side is the powder room. Just beyond these two areas is a phone desk tucked behind the mudroom closet and next to the stairs. The desk is there to have a phone with a land line and store mail as well as other secretarial items used for every day household business.

The next area that users find while moving through the space is the kitchen. On the exterior of the curved peninsula is a breakfast bar with storage beneath the countertop with outlets to allow laptops to be charged. On the other side of it is the range and the potential location for a dishwasher. The dishwasher is located within close proximity to the sink for ease of use. The sink looks into the dining room, but also has a glass door opposite to give a view towards the pond. There is also a planter near the sink. Creating the triangle is the refrigerator tucked against a plumbing and mechanical chase for the second floor. The rest of the counter next to the refrigerator is kept open for work space. Additional storage is found in a pantry just off the main kitchen area. A small entry area leads to the herb gardens and the rabbit.

Towards the eastern side of the home are the living and dining rooms so that they can take advantage of the views of the pond. Tucked away from the primary path is the main living room area. While it is a fairly living room setting it can be expanded out into the space towards the masonry wood stove or during the summer months out onto the screened deck through the moveable wall system. A smaller more intimate seating area is located near the masonry woodstove in front of a set of larger windows. The masonry wood stove creates transitional point between the living and dining rooms along with the steps setting the dining room lower. This complements the site slanting down towards the pond. The dining room is sized for a family dining table, larger gatherings would be held up near the masonry stove in the living room spilling towards the kitchen. There are two doors exiting out of the dining room; one into the meditative outdoor space and an open air deck with a built in eating area.

Walls and spaces are fairly orthogonal in the plan but are contrasted by curved built-ins, furniture, or minor walls to facilitate movement. There are also ceiling height changes within the spaces to create

different experiences within the different areas as well as help delineate a fairly open floor plan.

The final space not discussed are the stairs. To minimize the footprint the stairs leading up and down are stacked. They are pushed out of the exterior perimeter to bring light in on three sides to the land space.

Second Floor Plan. As users make their way up the stairs to the second floor there is a landing just before the final step that leads to a small reading niche with a window seat and bookshelf. It's a small unexpected private space that allows a single user. On the other side of the bookshelf is a general storage closet for the second floor.

The first door encountered upon reaching the second floor is the master suite. There are three main spaces within the suite; bedroom, bathroom and deck. The bedroom is kept simple with ample space surrounding a bed. The bed is pushed back to allow for circulation between the three areas. A particular request that Elan had was a deck which would take advantage of the sunsets. On the southern side of the bedroom is the deck. While it is sheltered with walls on two sides and a roof, it opens towards the west. Opposite on the northern side of the room is the master bathroom. Closets, in between, act as buffers. There is the potential for a set of doors between the two spaces for privacy. The bathroom is arranged for the most amount of privacy with the space wrapping around a linen closet.

The children's bathroom borders along the master bath to keep plumbing to a minimum. It's long and narrow with a small laundry closet at the entry. A pocket door allows this space to be separated from the main bathroom area.

The bedroom farthest down the hallway is Jeremiah's. It is a transitional space for him with a bed that can fold away into a

bookshelf. The shelf is integrated into a desk. The rest of the room is kept open with the door to the closet near the entry door.

Spirit's bedroom is the last room on the second floor. Hers is quite similar to Jeremiah's to keep rooms equal between siblings. She has a standard bed and separate desk as well as a closet. The closet combined with Jeremiah's create a sound buffer between the two rooms.

Similar to the first floor is the contrast between orthogonal and curvilinear forms focused around circulation. Transitions are also facilitated to a degree by flooring material. There is a cohesive surface between the bedrooms and the hall, but as it transitions into the more private and moist bathrooms the material changes to a more appropriate surface.

Loft. An element not discussed on the second floor is a small alternating tread stair that leads up to a loft. To take advantage of the space below the roof that might otherwise be wasted, the section that can accommodate a person's height has been opened into the hallway. This allows for a small space with windows that bring light into the hallway. While this could be used for storage, in this situation it creates a space that is just for the children to use. It's important to have a space that is just for the children, but having it open to the hallway allows for it to be monitored by Elan.

Lower Floor Plan. Down, below the main floor and tucked into the hill is the lower floor plan. The floor plan is open using built-in furniture to delineate spaces. Primary spaces are a guest room, home office, bathroom and mechanical/storage.

The stairs open up into the main area which has the primary purpose as a home office for Elan's business. The work space is focused towards the eastern side where natural light can come in. In the main window alcove is a window seat with storage below. The

adjacent window has a planter rounding out the corner. A desk is centrally located for control of the space. A small kitchenette cabinet separates the office space from the guest room.

Since there won't always be guests using the space, it is designed to be transitional. A built-in closet separates the space from the stairs coming down and along the foundation wall are bookshelves. The main piece of furniture is a futon that can become a bed for guests; otherwise the space can act as a reading room or library.

For the convenience of guests as well as potential clients there is a small bathroom tucked away in the corner.

An alternative to the guest room/office layout is a mother-in-law suite. The guest room and bathroom stay the same with just a change in furniture for the bedroom. The kitchenette acquires a small range and the window seat becomes a bench for a dining room table. Along the southern wall either a small seating area or a couch can be located as a "living room". The suite is not intended to be self-sufficient. Rather whoever occupied it would interact with the family, but would be able to separate from them if desired.

The final area of the lower floor plan is the mechanical and outdoor equipment storage. The water heater, electrical panel as well as equipment for the geothermal system and radiant heating are kept here. The entrance is from the eastern exterior below the deck from either a standard door or a small garage door. In addition to the mechanical equipment, the tools for lawn care, gardening or outdoor leisure can be stored within this space.

Rabbit Hutch. In addition to the home design, Leiserl's hutch was also taken into consideration. There are two parts to her hutch, the main living area and the more private bathroom area. Both have large

doors for cleaning and general care of Leiserl. The main piece of "furniture" is a nesting box in the back of the main living area where Leiserl can use hay to build a nest during the winter. The rest of that area has her water and food bowls. The windows are filled with half inch screen to allow for natural ventilation during the summer months. In the winter simple storm windows can be affixed to the exterior of the larger windows to prevent the elements from entering the interior. There is also a bracket system for a standard chicken coop heater to be installed under the water bowl to keep it from freezing and potentially allow Leiserl to sit on it as well. The overall aesthetic is designed to complement the main house design.

Sections. Four sections are taken of the building to show the vertical aspect of the design. The section cuts are identified in the floor plans as well as a small key on the section itself.

Section 'A-A' takes a section looking east towards the pond. In the main floor this shows the kitchen's connection to the stairwell. The vertical volume of the stairwell can be seen here with a space that height of the stairwell that, other than the stairs is open for all three stories. The southern façade of the stairs is primarily glazed with shading devices for summer. This leads to the rest of the second floor which cuts through the transitional space and children's bathroom. A small part of the loft can also be seen above the laundry niche. The lower floor shows the openness and connectivity within the office space.

Section 'B-B' looks west within the similar area as section A. This section, on the main floor, shows the living room and dining room, specifically the change in floor height there is between the two. The impact this has with the other floors can also be seen. The floor between dining room and Jeremiah's bedroom is thickened rather than matching

the change below. The ceiling of the mechanical room however does.

Section 'C-C' changes orientation from the previous two and faces south. The section cuts through the dining room and kitchen of the main floor. Here, how the building is pushed into the hillside is shown. An exit through the kitchen leads out into the garden towards the road while the mechanical room opens into the front lawn.

Section 'D-D' faces north providing similar information as section C, but also shows the loft more fully as well as the screened deck off the living room.

Elevations. There are three iterations of each elevation shown; the standard elevation, a version with the silhouettes of the trees, and with the materials aged.

The materials used in the exterior were selected to reflect local resources or at least materials that complement the vernacular of the other camps around the pond. The primary sheathing material is a cedar siding. Horizontal dark teal banding trim is used to break up the facades focused around the headers of the windows and doors. Contrasting the teal is yellow trim around the windows as well as under the eaves. The roof is a dark brown standing seam metal roof with copper gutters. Grounding the façade by the road is local stone around the entry area as well as on the pond side with the chimney. Most of these materials will also change and age over time, which the third elevation shows.

Looking at the overall form and after explorations into various roof forms, a shed roof was found to complement the site the best. There are two levels of roofs to break up the façade and tuck the building further back into the natural hill of the site. It also has a pitch that will shed snow in the winter. Precautions have been taken in the design to avoid snow dumping on inopportune areas.

4.1 Introduction

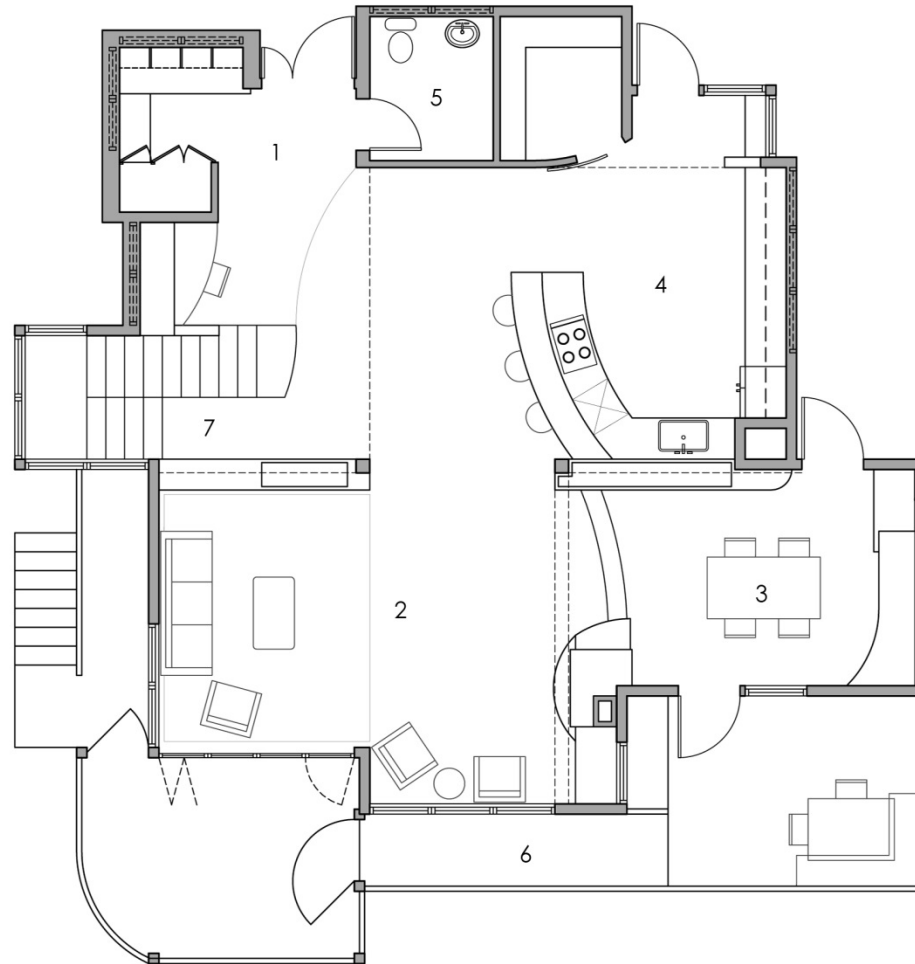
The previous section introduced the design project portion of the research document. It focused on the process working with the client to achieve the final design. Not only did the client's input go into the design, the previous research was also taken into consideration. The following analysis takes each room and identifies how it reflects elements discussed in the Attributes of the Home section of the research.

The analysis is broken down first by floors in the same order as the final floor plans are presented. Each floor is then broken down into the individual zones and then analyzed.

Each analysis is introduced with a floor plan that visually pinpointing which room is being discussed within the overall context. Below the floor plan is a matrix identifying the elements from the research that can be found in that room. Cross referencing the elements are the three approaches; biophilic design, environmental psychology, and *feng shui*. If the element is discussed by a particular approach the square is then filled in. Further description of each room accompanies interior perspective to give context to each space. Diagrams and vignettes are then used to show specifically how the elements are used within the spaces.

This final step brings the research and design together. The client input combined with recommendations found in the research has the potential to create a design that is more attuned to the client's well-being.

4.2 First Floor



- 1 – Entry/Mudroom
- 2 – Living Room
- 3 – Dining Room
- 4 – Kitchen
- 5 – Entry
- 6 – Deck
- 7 – Transitional Spaces

- pg 137
- pg 144
- pg 151
- pg 158
- pg 165
- pg 169
- pg 174

4.2.1 Entry/Mudroom

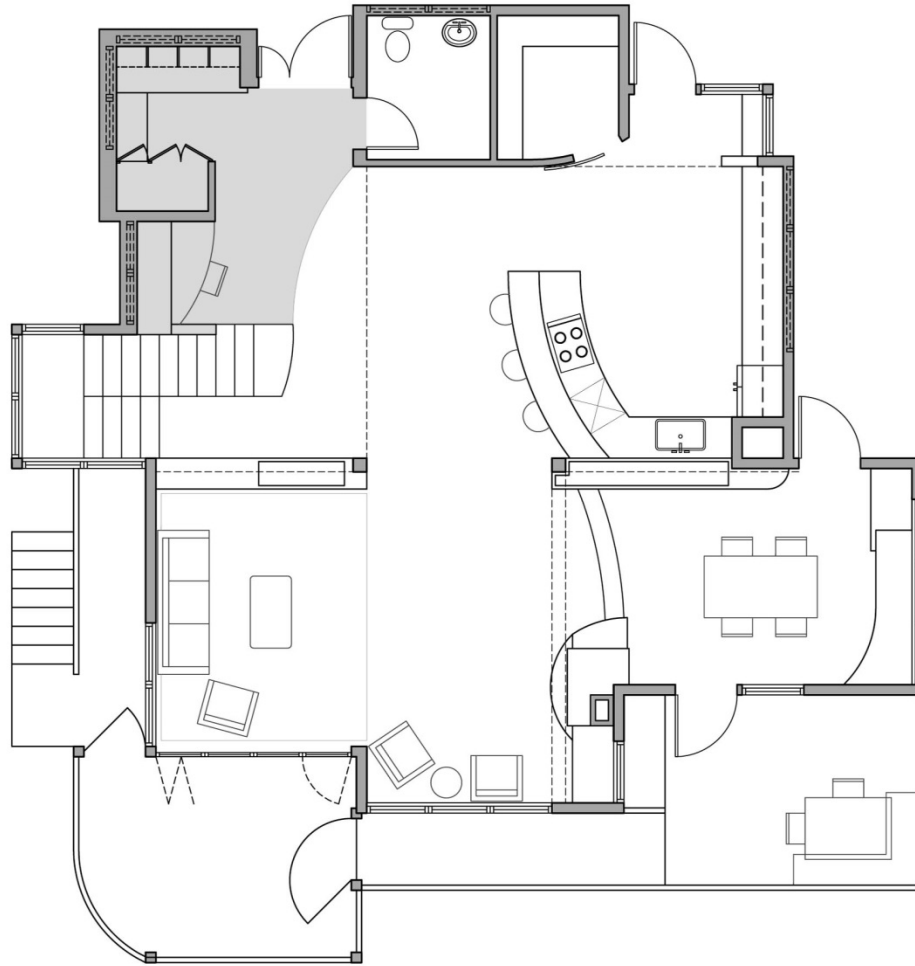


Figure 108. Entry/Mudroom

| | Circulation | View | Orientation | Storage | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|--------------|-------------|------------|-------------|-----------|---------------|------------------|----------------------|--------------|----------------------|
| Feng Shui | Orange | Light Orange | Brown | Dark Brown | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green | Dark Green |
| Biophilic Design | Orange | Light Orange | White | White | White | Blue-Gray | Yellow-Green | White | Light Green | Medium Green | Dark Green |
| Environmental Psychology | Orange | Light Orange | White | Dark Brown | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green | Dark Green |

The entry is the space that welcomes users to the home. Once entering users can either proceed straight into the main area of the home near the kitchen and stairs or go into the two adjacent spaces. Immediately to the right of the door is a small mudroom. The mudroom has a set of cubbies for Elan and her kids to store their everyday things. Opposite the cubbies is a closet and a bench between the two. Around the corner from the mudroom is a desk for general household business.



Figure 109. Entry - view of phone desk and closet

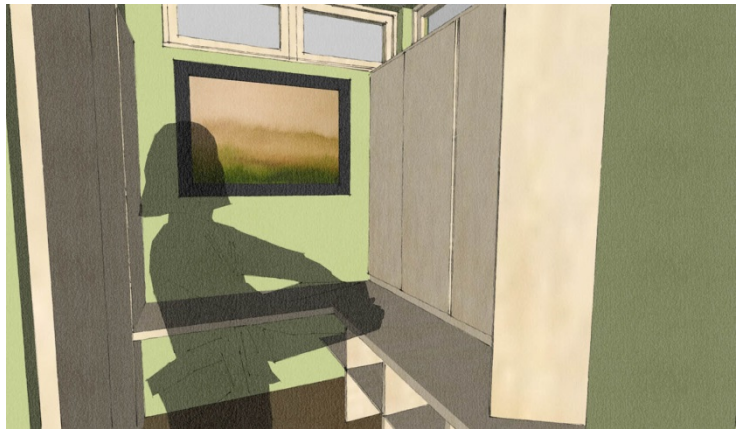


Figure 110. Entry - view of mudroom cubbies

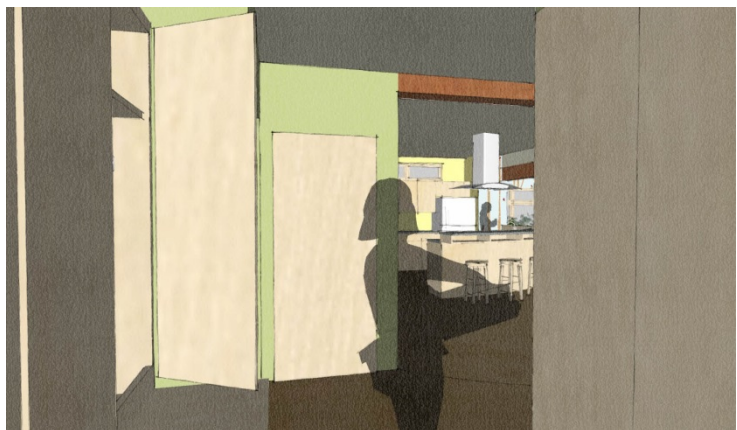


Figure 111. Entry - view from mudroom

Circulation

- Pathways – kept simple and straight forward
- Pathways – kept clear of objects
- Space – ample room around objects for ease of movement

View

- Layered – gives depths into the space
- Open – nothing too close to create a claustrophobic feeling
- Nature – vines screen view into living room

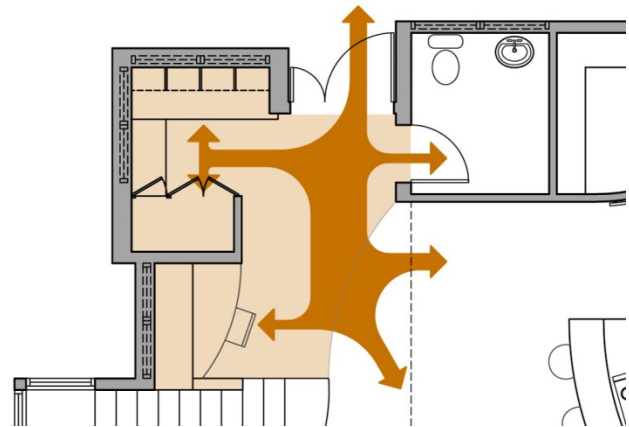


Figure 112. Entry/Mudroom – circulation diagram

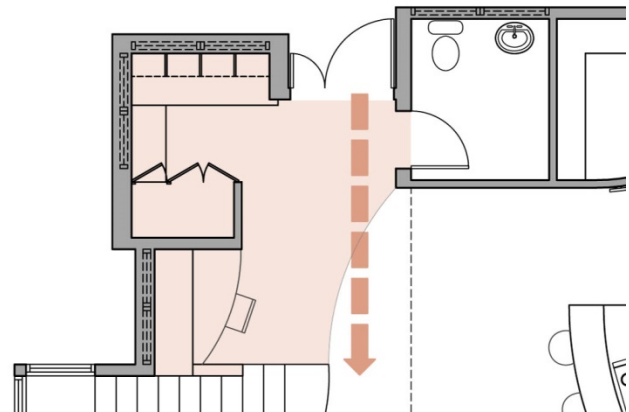


Figure 113. Entry/Mudroom - initial view diagram



Figure 114. Entry - initial view upon entry

Orientation

- Spine – space has a clear central “corridor”
- Spine – different areas come off horizontally

Storage

- Closet – primary storage for seasonal equipment and guests' coats
- Cubbies – storage for family's everyday equipment
- Phone desk – storage of household business items.

Scale

- Lower ceiling – kept lower than the rest of the first floor
- Lower ceiling – keeps smaller space with a smaller footprint from feeling too cavernous

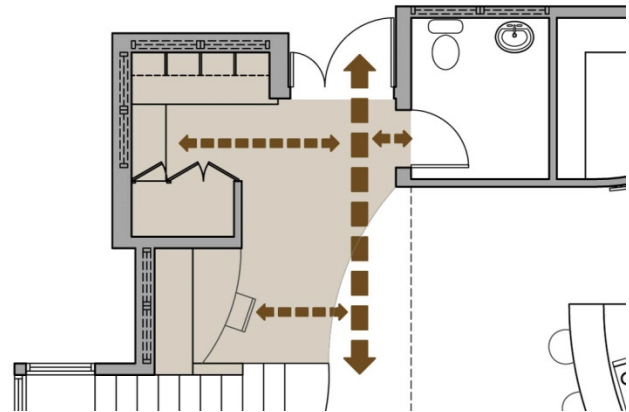


Figure 115. Entry/Mudroom – orientation diagram

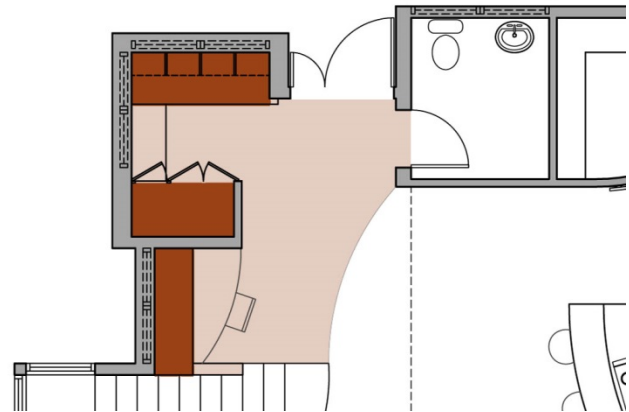


Figure 116. Entry/Mudroom - storage diagram

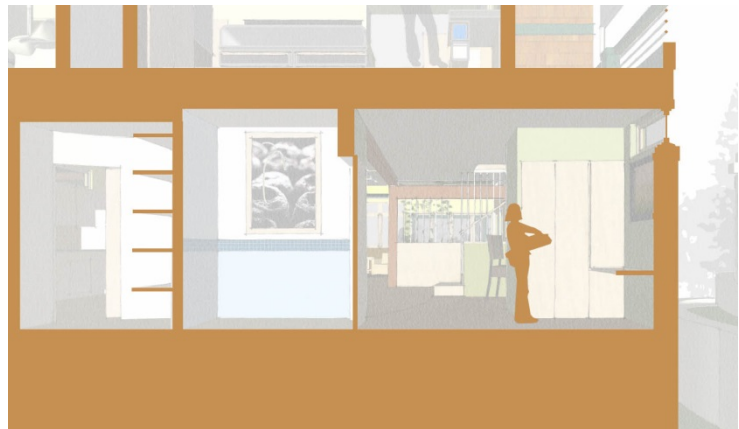


Figure 117. Entry/Mudroom - human scale

Climate

- Temperature – connected to the rest of the first floor
- Ventilation – operable awning windows prevailing winds
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises

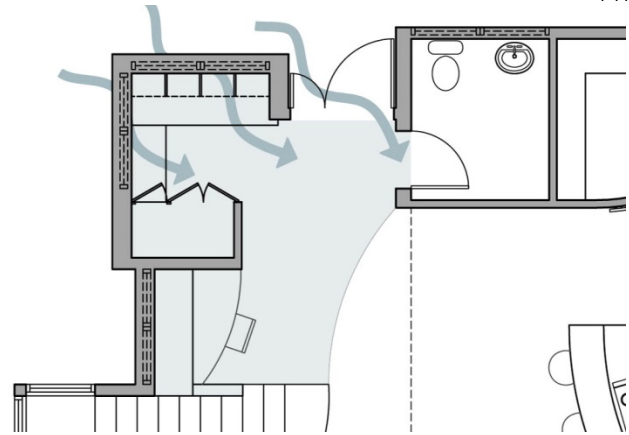


Figure 118. Entry/Mudroom - climatic diagram

Natural light

- Dynamic light – windows bring in minimum light from south and west directions
- Shading – summer sun is blocked by roof overhang

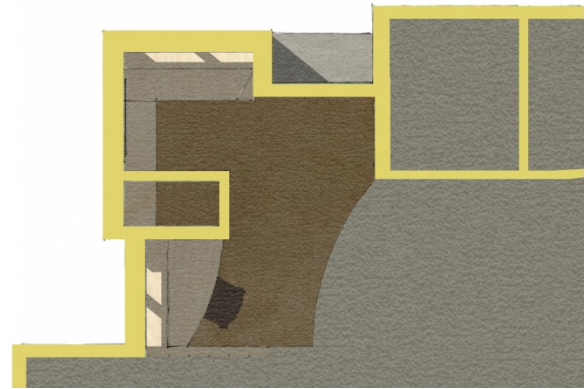


Figure 119. Entry - Natural light 3/21 at 2 pm

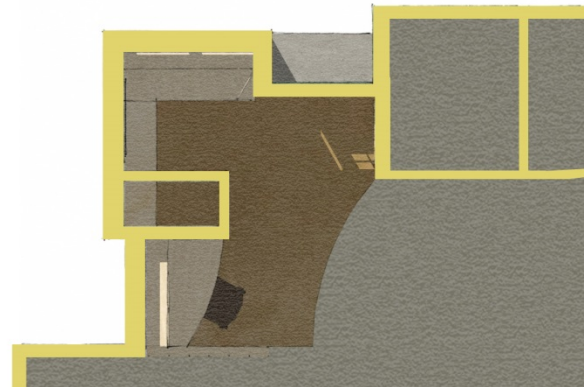


Figure 120. Entry - natural light 6/21 at 2 pm

Artificial lighting

- Function – at exterior entry to highlight main doorway
- Function – at interior entry
- Function – task lighting near desk
- Function – lighting within closet
- Function – lighting near cubbies
- Function – provide visibility for circulation after dark
- Effect – neutral light to avoid altering wall color

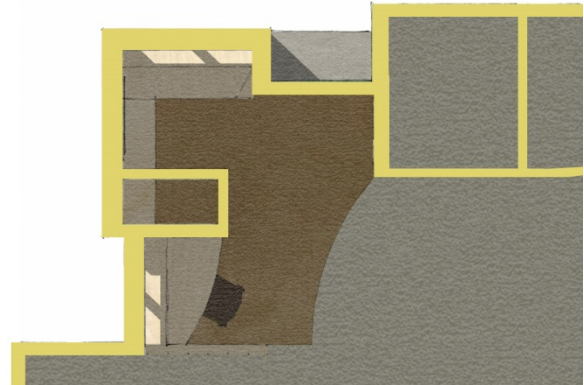


Figure 121. Entry - natural light 9/21 at 2 pm

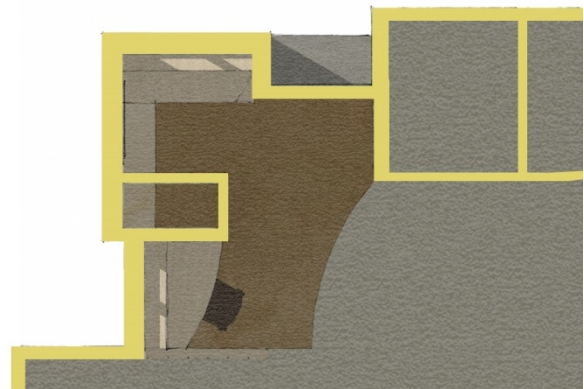


Figure 122. Entry - natural light 12/21 at 2 pm

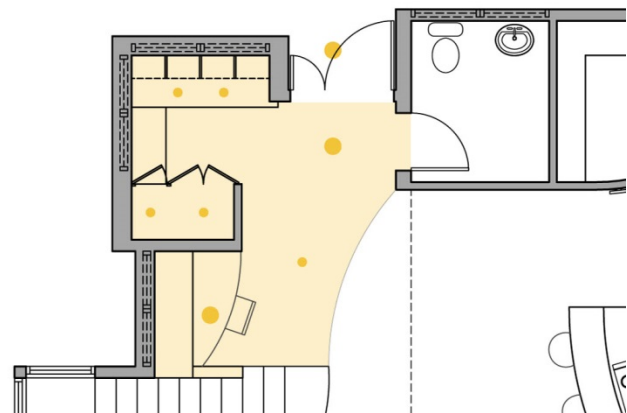


Figure 123. Entry/Mudroom - artificial light diagram

Patterns and materials

- "Earth" material – concrete slab deck
- Locally sourced materials – light colored hardwood accents and built ins
- Coloration of walls – muted calm color
- Organic Patterns – abstract natural landscape



Figure 124. Entry - materials and patterns

Colors

- Earth tone color palette
- Polished Concrete Floor – ground the space
- Polished Concrete Floor – dyed a warmer color
- Sage – neutral muted color for walls
- Sage – welcoming color
- Accents – darker green near desk
- Accents – orange artwork complements green.



Figure 125. Entry – color palette²⁶⁷

Connection to nature

- Windows – brings in minimal light
- Windows – allow sound to come in
- Windows – allow smells to come in
- Materials – use of local materials
- Colors – earth tone scheme
- Artwork – natural/scientific organic themed
- Plants – view of vines from the front door

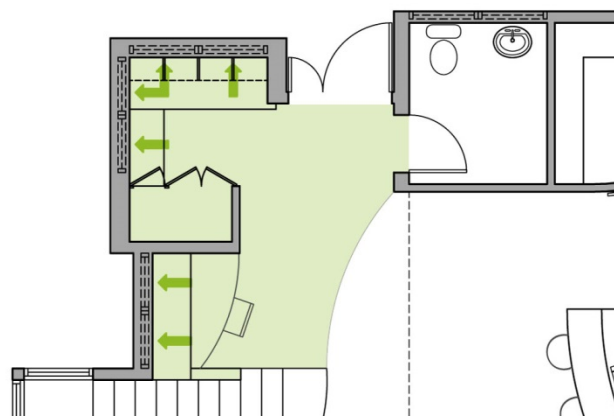


Figure 126. Entry/Mudroom – connection to nature diagram

²⁶⁷ N.B. unless otherwise noted the color palette is utilized to exemplify different color schemes. Choices in colors can be quite personalized and while there are some instances where a best color can be recommended, if a client adverse to that it is best to go consider their opinion. In the situations where a particular color is more advantageous this design focused on that and specifically called that out in the analysis otherwise colors are based off of personal preference.

4.2.2 Living Room

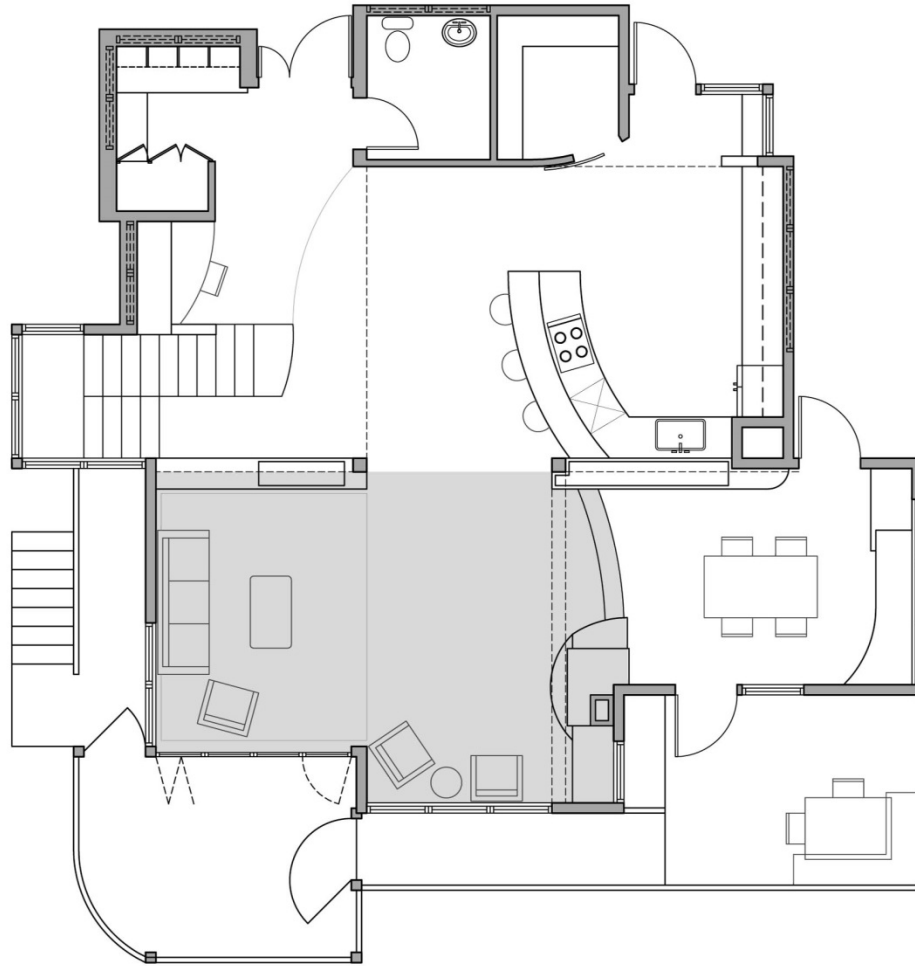


Figure 127. Living Room

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|------------|-------------|-------------|-----------|---------------|------------------|----------------------|-------------|----------------------|
| Feng Shui | Dark Brown | Dark Brown | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Light Green | Light Green |
| Biophilic Design | White | White | Orange | White | Blue-Gray | Yellow-Green | White | Light Green | Light Green | Light Green |
| Environmental Psychology | White | Dark Brown | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Light Green | Light Green |

The living room is situated on the first floor to take advantage of the view of the pond. Within the living room there are two main spaces. A larger seating area for socializing in larger groups or just relaxing as a family is in the southern part of the space. A smaller, more intimate seating area is tucked to the east near the masonry stove. While the living room is its own distinct space separated by a low built-ins, ceiling changes, and floor plane changes; it is still very connected to the rest of the first floor. During the summer it can also be extended out onto the deck through a moveable wall system.



Figure 128. Living Room - view of main seating area



Figure 129. Living Room - view from main seating area



Figure 130. Living Room - view of intimate seating area and masonry stove

Orientation

- Command position – furniture placed to make users feel comfortable
- Orientation – furniture placed to promote connections to each other
- Orientation – furniture placement takes advantage of focal points i.e. fireplace or views
- Grounded – most furniture placed with wall behind

Storage

- Built In – storage for accessories and equipment for room
- Built In – storage for audio visual equipment
- Bench – hidden wood storage for masonry wood stove



Figure 131. Living Room - overall view



Figure 132. Living Room - orientation diagram

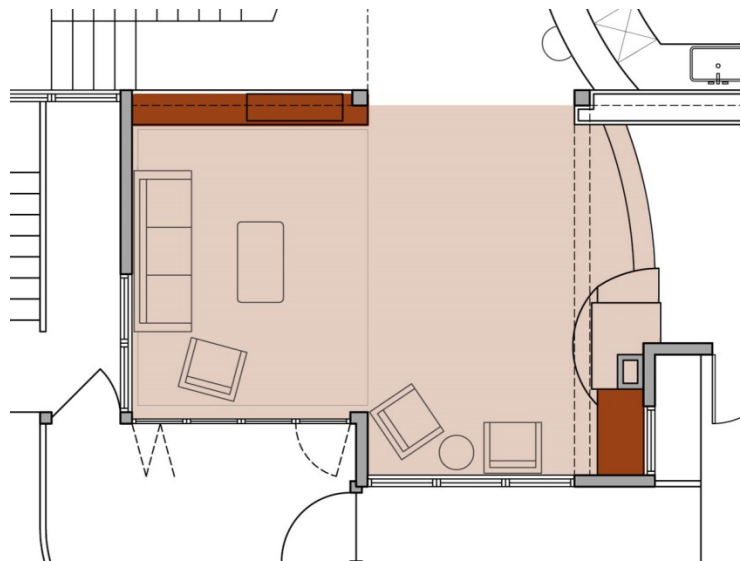


Figure 133. Living Room - storage diagram

Circulation

- Pathways – kept simple and straight forward
- Pathways – kept clear of objects
- Space – ample room around objects for ease of movement

Scale

- Higher ceiling – larger room allows for higher ceiling
- Larger footprint – keeps ceiling from feeling too overwhelming

Climate

- Temperature – radiant heating
- Temperature – masonry woodstove backup
- Ventilation – operable casement windows
- Ventilation – movable wall system
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows may bring in less desirable noises

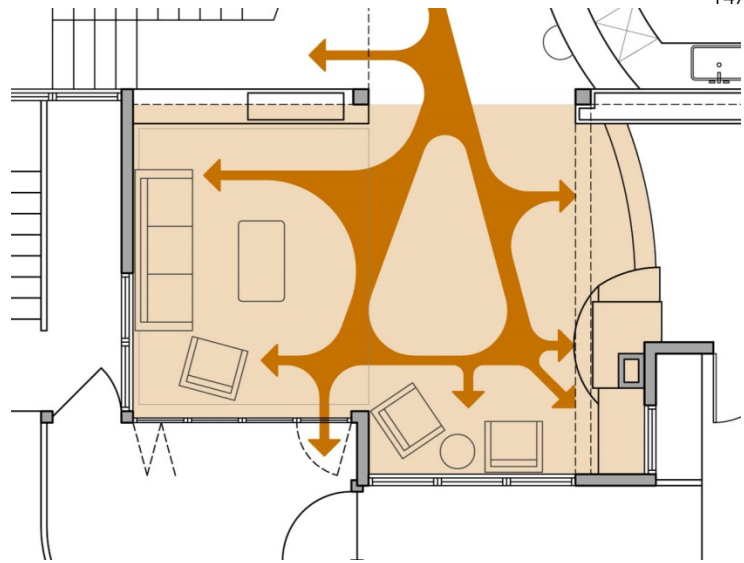


Figure 134. Living Room - circulation diagram



Figure 135. Living Room - human scale

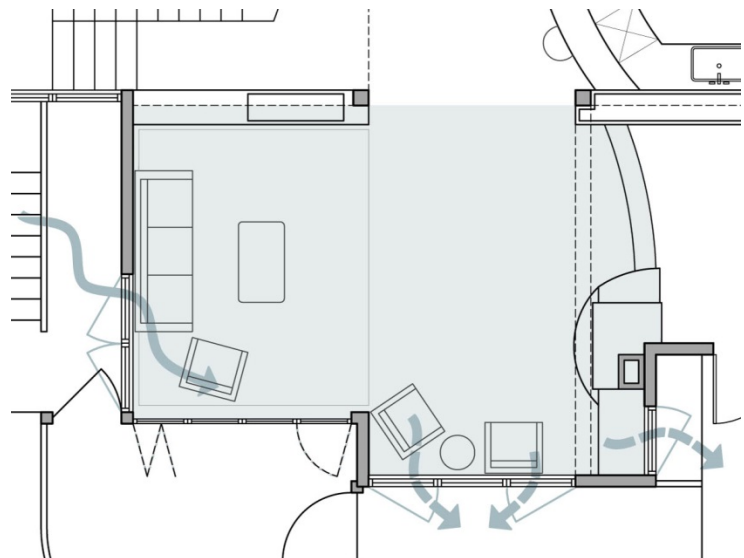


Figure 136. Living Room - climatic diagram

Natural light

- Dynamic light – windows facing east and south creates movement of shadows
- Shading – summer sun is blocked by roof overhang



Figure 137. Living Room - natural light 3/21 at 2 pm

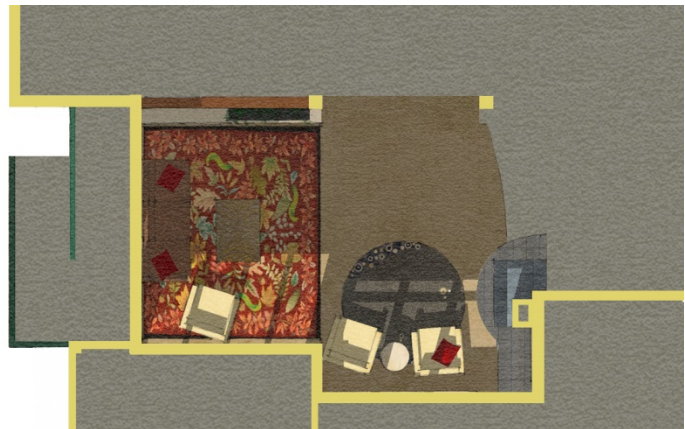


Figure 138. Living Room - natural light 6/21 at 2 pm



Figure 139. Living Room - natural light 9/21 at 2 pm

Artificial lighting

- Function – near smaller seating area
- Function – provide visibility for circulation after dark
- Mood – dimmer to control quality of light
- Effect – neutral light to avoid altering wall color

Patterns and materials

- “Earth” material – concrete slab deck
- “Earth” Material – dark rugs with natural organic motifs
- Locally sourced materials – light colored hardwood accents and built ins
- Coloration of walls – dark to light colors mimic earth to sky
- Organic Patterns – natural patterns within textiles
- Accents – local soapstone masonry woodstove

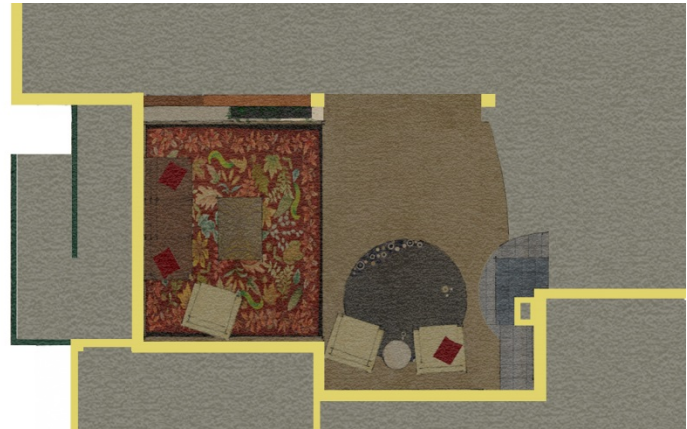


Figure 140. Living Room - natural light 12/21 at 2 pm

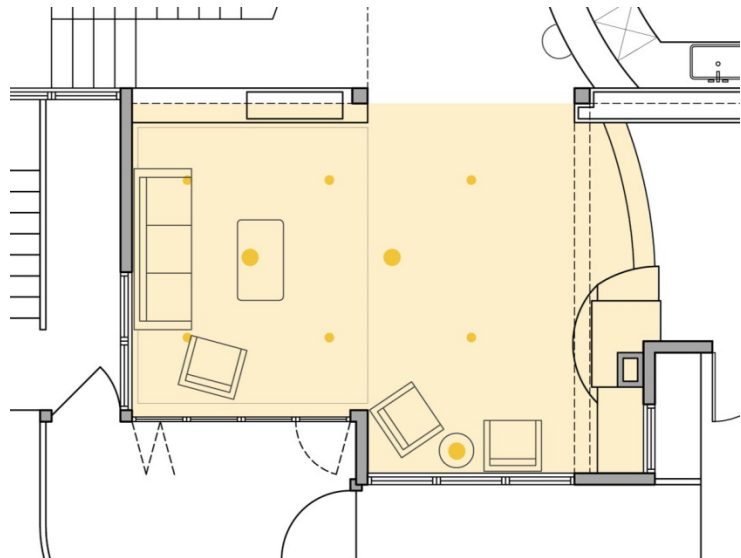


Figure 141. Living Room - artificial lighting diagram



Figure 142. Living Room - patterns and materials

Color

- Analogous Color Palette – earth tones
- Polished Concrete Floor – ground the space
- Polished Concrete Floor – dyed a warmer color
- Darker colors – represents “earth” below chair rail on the wall
- Lighter colors – represents “sky” on the walls
- Yellows – primary color in larger part of room
- Yellow – warm promotes socialization
- Green – primary color in smaller niche transitions from yellow
- Accents – dark brown in niche
- Accents – brown, yellow, and burgundy textiles

Connection to nature

- Indoor plants – planter with a climbing plant
- Windows – bring in light
- Windows – allow sounds to come in
- Windows – allow smells to come in
- Windows – provide views to the surrounding area
- Deck – allows a controlled exterior experience
- Materials – use of local materials
- Colors – scheme that follows dark to light; earth to sky



Figure 143. Living Room - color palette

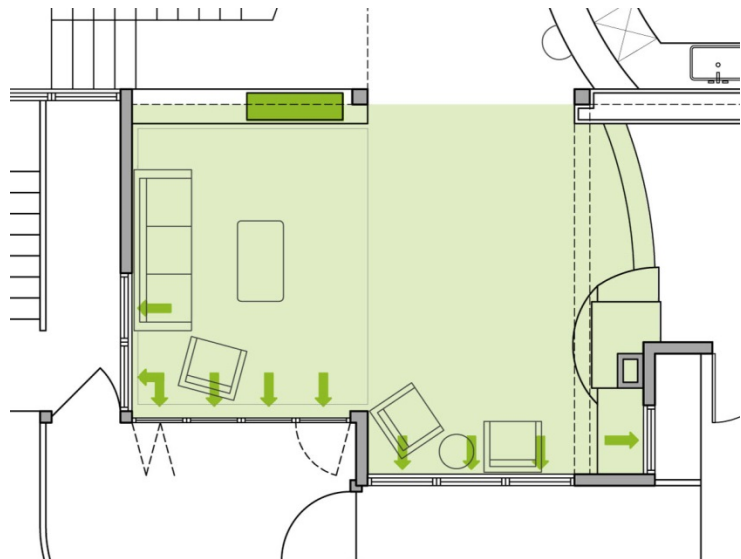


Figure 144. Living Room - connection to nature diagram

4.2.3 Dining Room

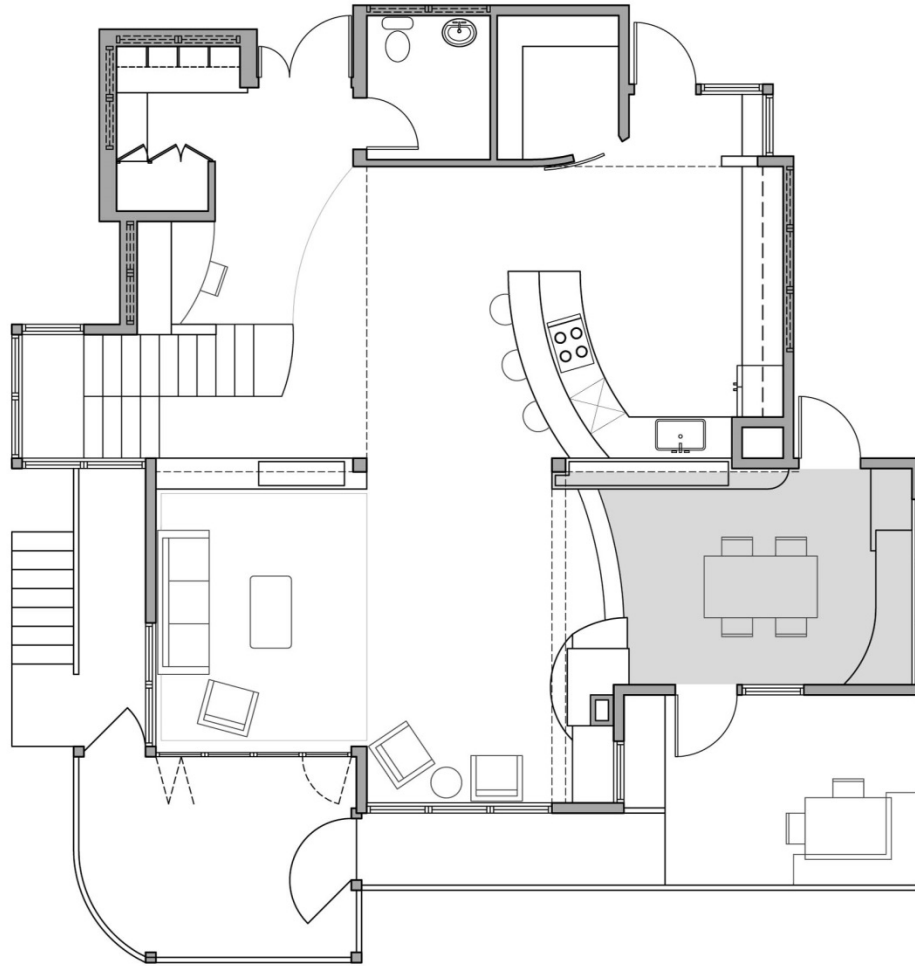


Figure 145. Dining Room

| | Circulation | Storage | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|-------------|--------------|---------|---------------|------------------|----------------------|--------|----------------------|
| Feng Shui | Orange | Dark Orange | Light Orange | Blue | Yellow | Yellow | Green | Green | Green |
| Biophilic Design | Orange | White | White | Blue | Yellow | White | Green | Green | Green |
| Environmental Psychology | Orange | Dark Orange | Light Orange | Blue | Yellow | Yellow | Green | Green | Green |

The dining room is tucked away next to the living room and kitchen. To reach it, users enter from near the living room and go down several steps. It's smaller than the adjoining rooms, but large enough to accommodate a family sized table.



Figure 146. Dining Room - view from living room



Figure 147. Dining Room - view towards deck



Figure 148. Dining Room - view toward steps

Circulation

- Pathways – kept simple and straight forward
- Pathways – kept clear of objects
- Space – ample room around objects for ease of movement
- Space – room for chairs to be pulled out

Storage

- Built in – shelves below planter
- Built in – seat with storage near door
- Built in – low banquet in corner



Figure 149. Dining Room - view towards kitchen

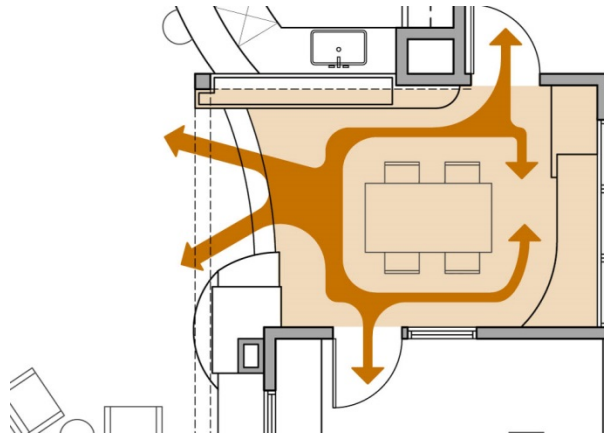


Figure 150. Dining Room - circulation diagram

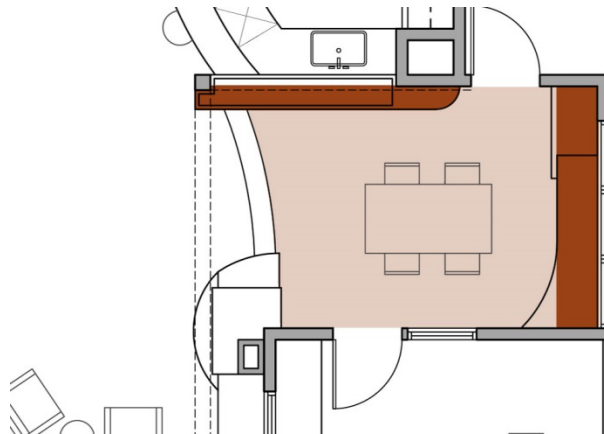


Figure 151. Dining Room - storage diagram

Scale

- Higher ceiling – same ceiling height as first floor, but steps down
- Window – windows create banding

Climate

- Temperature – radiant heating
- Ventilation – operable casement windows with awnings
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows may bring in less desirable noises

Natural light

- Dynamic light – windows to the north and east bring in morning light as well as ambient light
- Shading – summer sun is blocked by roof overhang

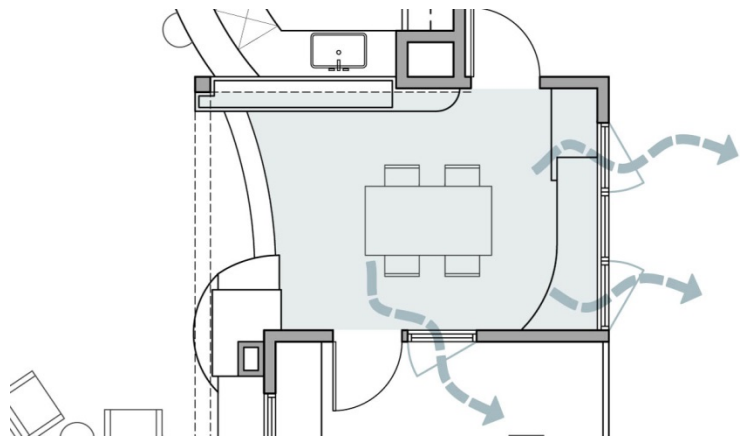
**Figure 152. Dining Room - human scale****Figure 153. Dining Room - climatic diagram****Figure 154. Dining Room - natural light 3/21 at 9 am**



Figure 155. Dining Room - natural light 6/21 at 9 am



Figure 156. Dining Room - natural light 9/21 at 9 am



Figure 157. Dining Room - natural light 12/21 at 9 am

Artificial lighting

- Function – centered ceiling light over table
- Function – provide visibility for circulation after dark
- Mood – dimmer to control quality of light
- Effect – neutral light to avoid altering wall color

Patterns and materials

- “Earth” material – concrete slab deck
- “Earth” Material – dark rug
- Locally sourced materials – light colored hardwood accents and built ins
- Walls – vertical pattern
- Organic Patterns - geometric rug pattern
- Organic Patterns – natural patterns within textiles

Color

- Analogous Color Palette – earth tones
- Polished Concrete Floor – ground the space
- Polished Concrete Floor – dyed a warmer color
- Dark tan – represents “earth” below chair rail on the wall
- Light blue – represents “sky” on the walls
- Accents – dark red promotes appetite

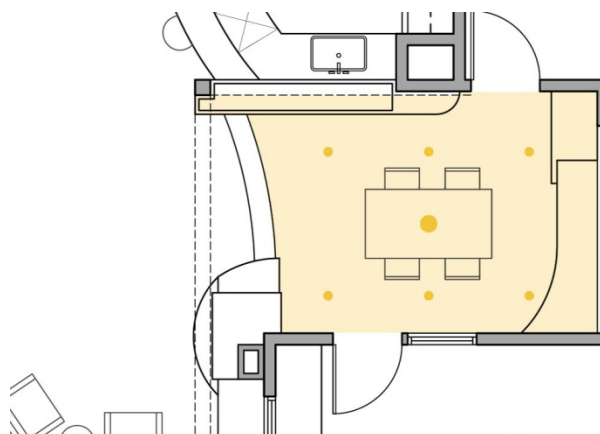


Figure 158. Dining Room - artificial lighting diagram



Figure 159. Dining Room - patterns and materials

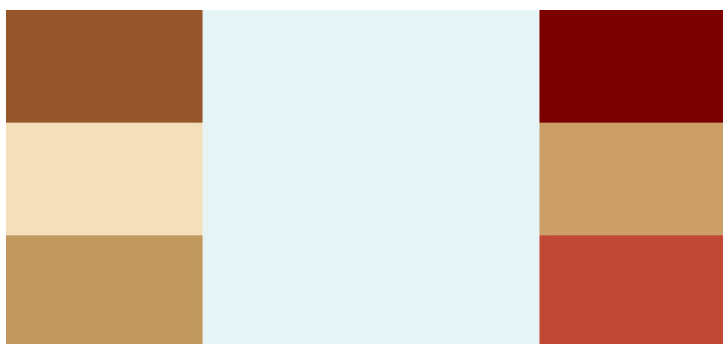


Figure 160. Dining Room - color palette

Connection to nature

- Windows – bring in light
- Windows – allow sounds to come in
- Windows – allow smells to come in
- Windows – provide views to the surrounding
- Deck – allows a slightly controlled exterior experience
- Materials – use of local materials
- Colors – scheme that follows dark to light; earth to sky
- Plants – low plants between kitchen and dining room
- Plants – potted plants on built-in in front of north facing windows

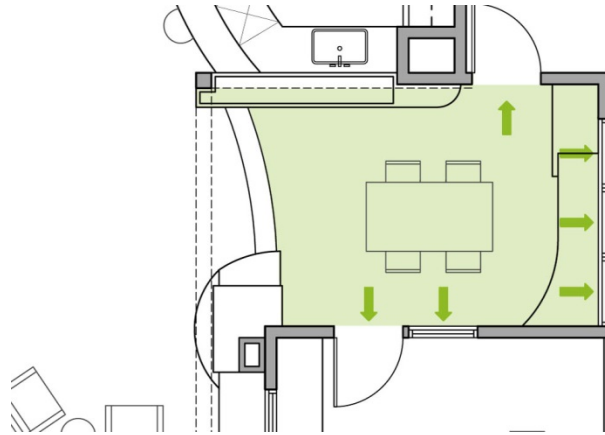


Figure 161. Dining Room - connection to nature diagram

4.2.4 Kitchen

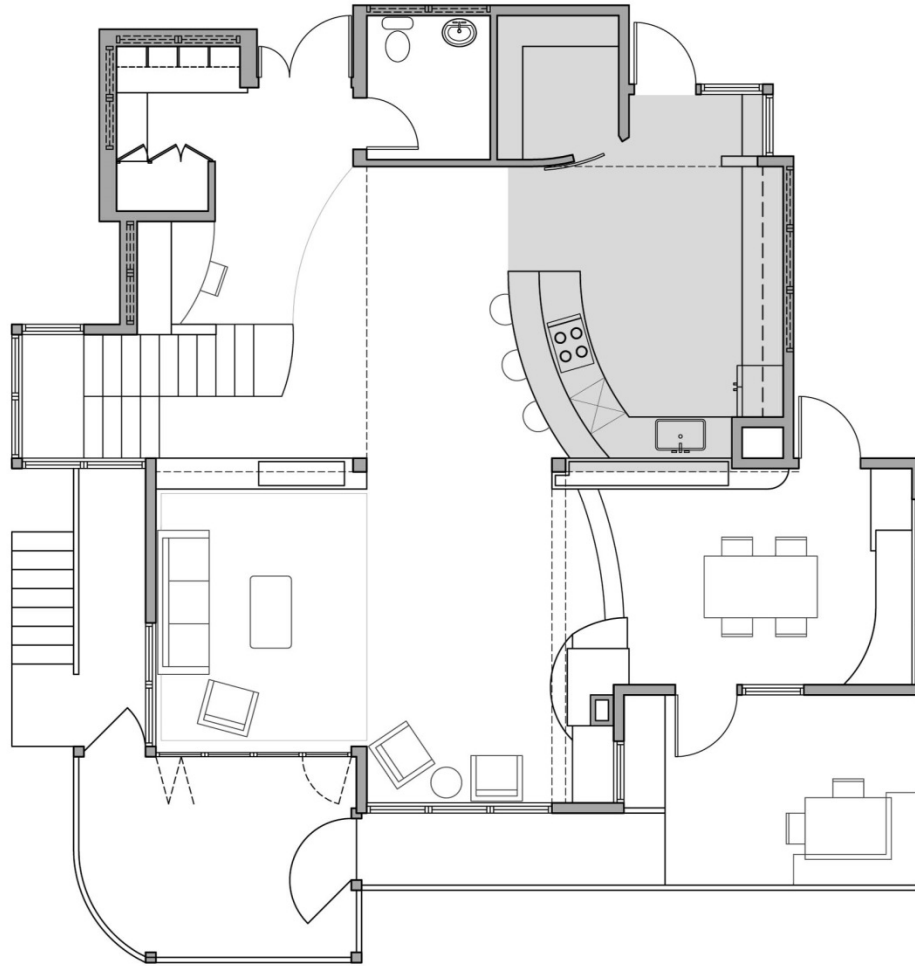


Figure 162. Kitchen

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|------------|-------------|-------------|------------|---------------|------------------|----------------------|-------------|----------------------|
| Feng Shui | Dark Brown | Dark Brown | Orange | Light Brown | Light Blue | Light Yellow | Yellow | Light Green | Light Green | Light Green |
| Biophilic Design | White | White | Orange | White | Light Blue | Light Yellow | White | Light Green | Light Green | Light Green |
| Environmental Psychology | White | Dark Brown | Orange | Light Brown | Light Blue | Light Yellow | Yellow | Light Green | Light Green | Light Green |

The kitchen is in the north west corner of the first floor giving it close access to the entry. The kitchen is 'U' shaped with one edge acting as a peninsula with seating. The equipment is triangulated at the base of the 'U' with preparation area along the northern wall. For more storage there is a pantry separated to the west.



Figure 163. Kitchen - overall view



Figure 164. Kitchen - view of equipment



Figure 165. Kitchen - view from standing at the range

Orientation

- Command position – direct views of surrounding area from stove
- Triangulation – connection between sink, stove and refrigerator

Storage

- Pantry – supplement storage for the kitchen
- Cabinets – primary storage for kitchen



Figure 166. Kitchen - view of pantry

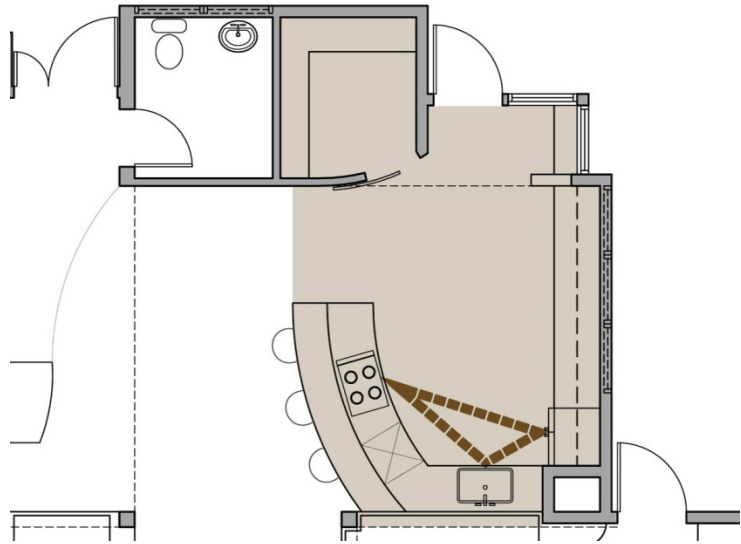


Figure 167. Kitchen - orientation diagram

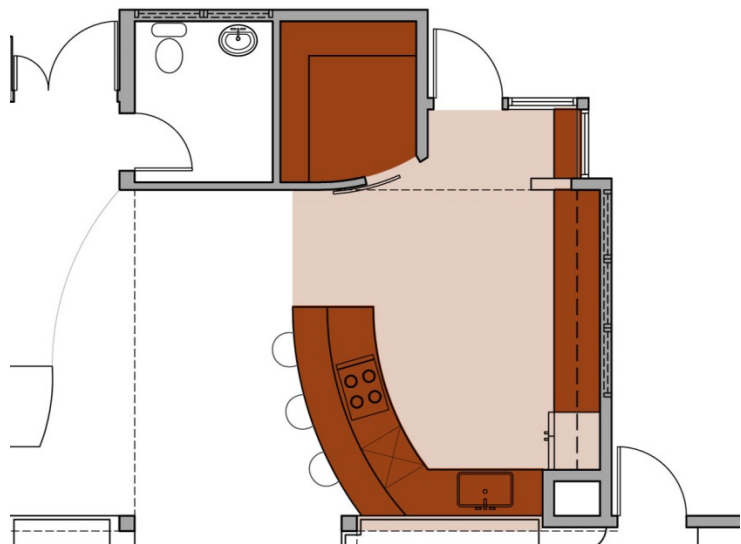


Figure 168. Kitchen - storage diagram

Circulation

- Pathways – kept simple and straight forward
- Pathways – kept clear of objects
- Space – ample room around objects for ease of movement

Scale

- Higher ceiling – larger room allows for higher ceiling
- Larger footprint – keeps ceiling from feeling too overwhelming

Climate

- Temperature – radiant heating
- Ventilation – operable awning windows
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows may bring in less desirable noises

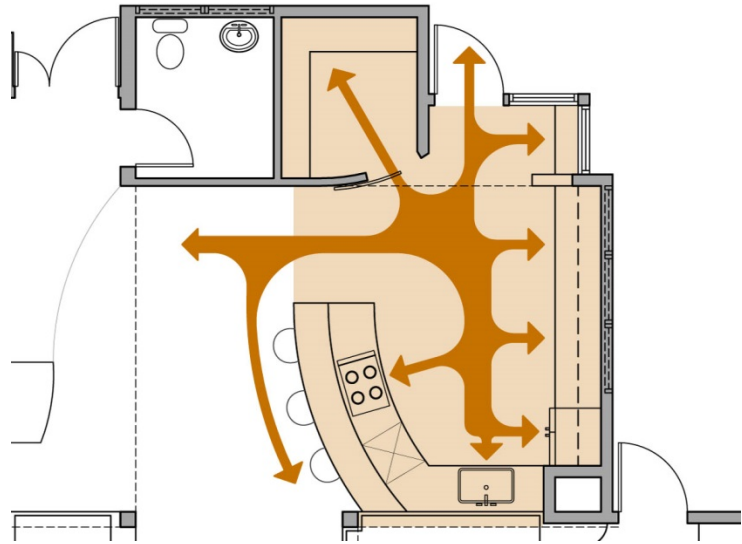


Figure 169. Kitchen - circulation diagram



Figure 170. Kitchen - human scale

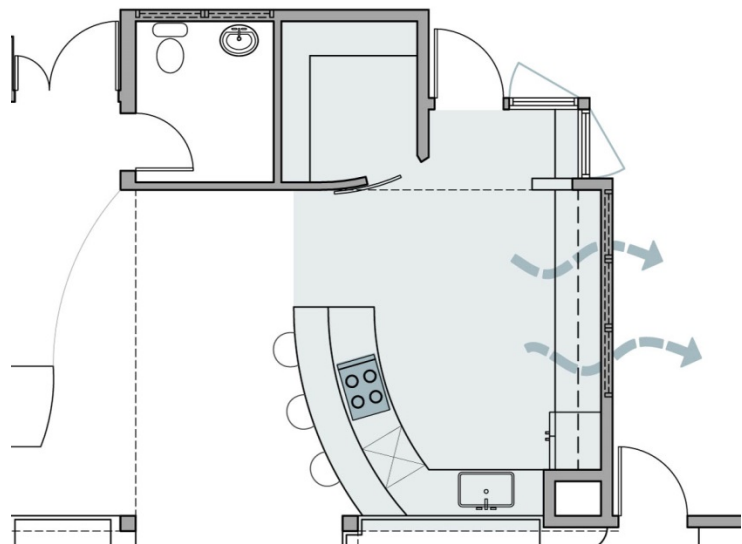


Figure 171. Kitchen - climatic diagram

Natural light

- Dynamic light – windows to the west and north
- Ambient light – northern windows
- Shading – summer sun is blocked by roof overhang

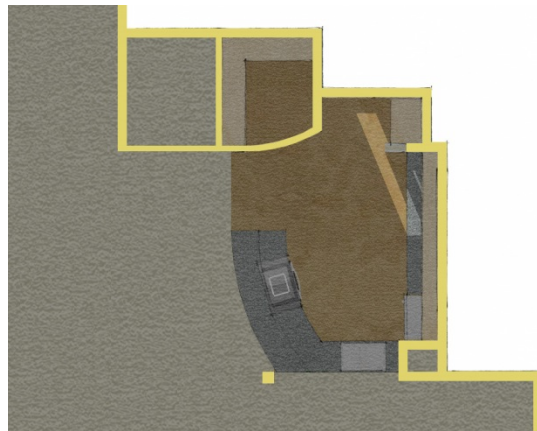


Figure 172. Kitchen - natural light 3/21 at 4 pm

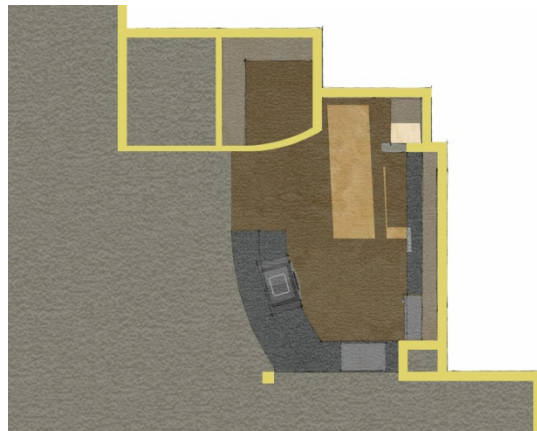


Figure 173. Kitchen - natural light 6/21 at 4 pm

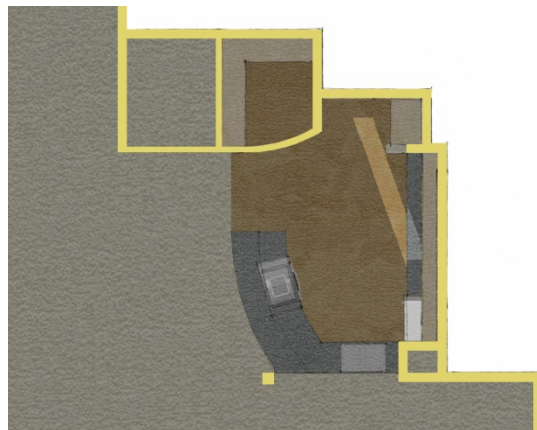


Figure 174. Kitchen - natural light 9/21 at 4 pm

Artificial lighting

- Function – provide visibility for circulation
- Function – task lighting near appliances and under counters

Patterns and materials

- “Earth” material – concrete slab deck
- Locally sourced materials – light colored hardwood accents and built ins
- Locally sourced materials – Barre granite countertops
- Walls – light yellow walls

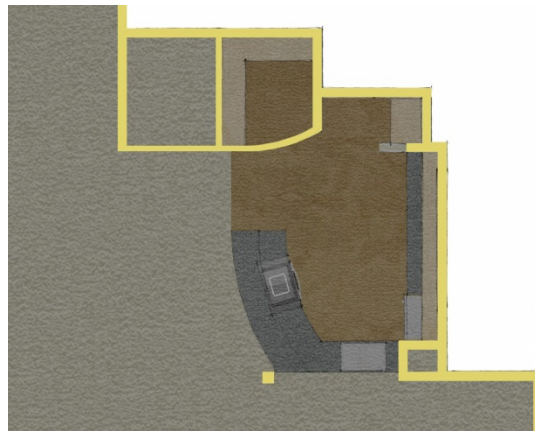


Figure 175. Kitchen - natural light 12/21 at 4 pm

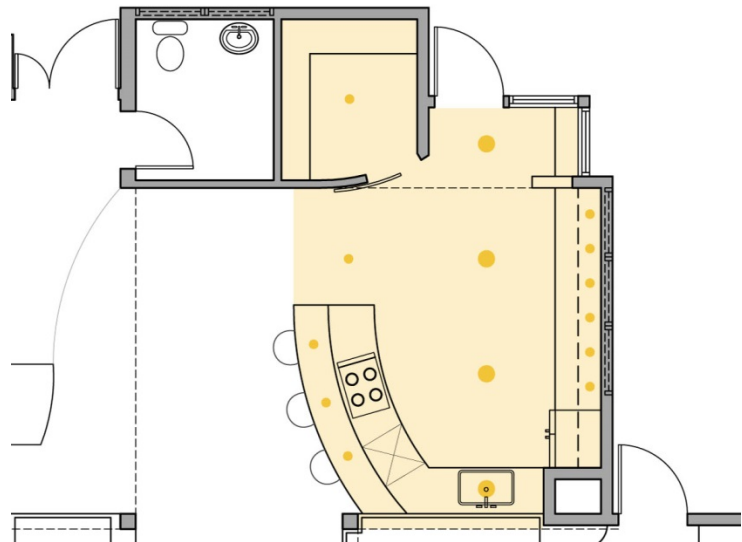


Figure 176. Kitchen - artificial light diagram

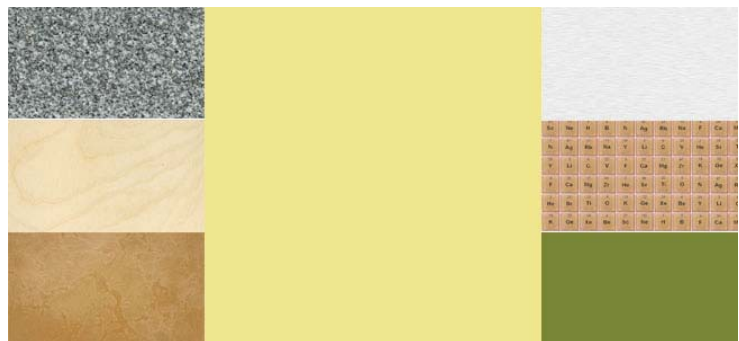


Figure 177. Kitchen - patterns and materials

Color

- Analogous Color Palette – earth tones
- Polished Concrete Floor – ground the space
- Polished Concrete Floor – dyed a warmer color
- Light Yellow – warms color to brighten room
- Accents – green and yellow textiles to contrast purple

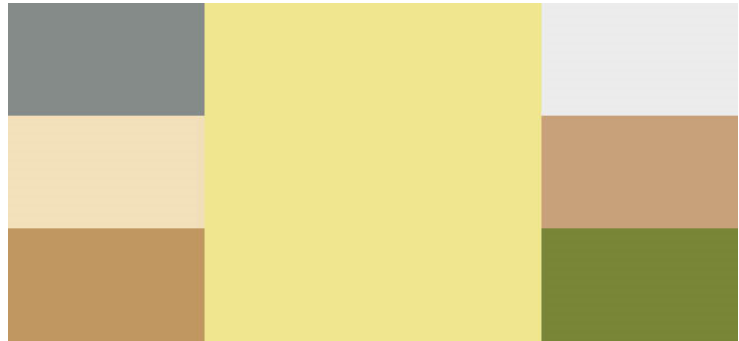


Figure 178. Kitchen - color palette

Connection to nature

- Windows – bring in light
- Windows – allow sounds to come in
- Windows – allow smells to come in
- Windows – provide views to the surrounding
- Materials – use of local materials
- Plants – low plants in planter that separates dining room and kitchen near sink

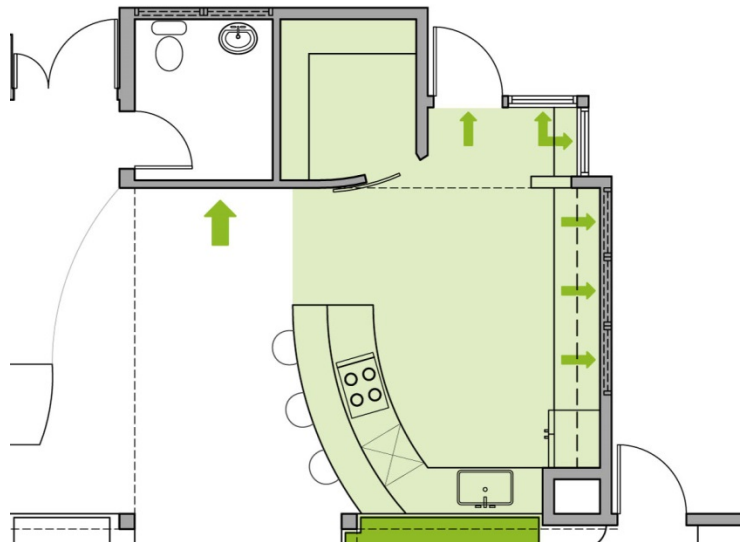


Figure 179. Kitchen - connection to nature diagram

4.2.5 Powder Room

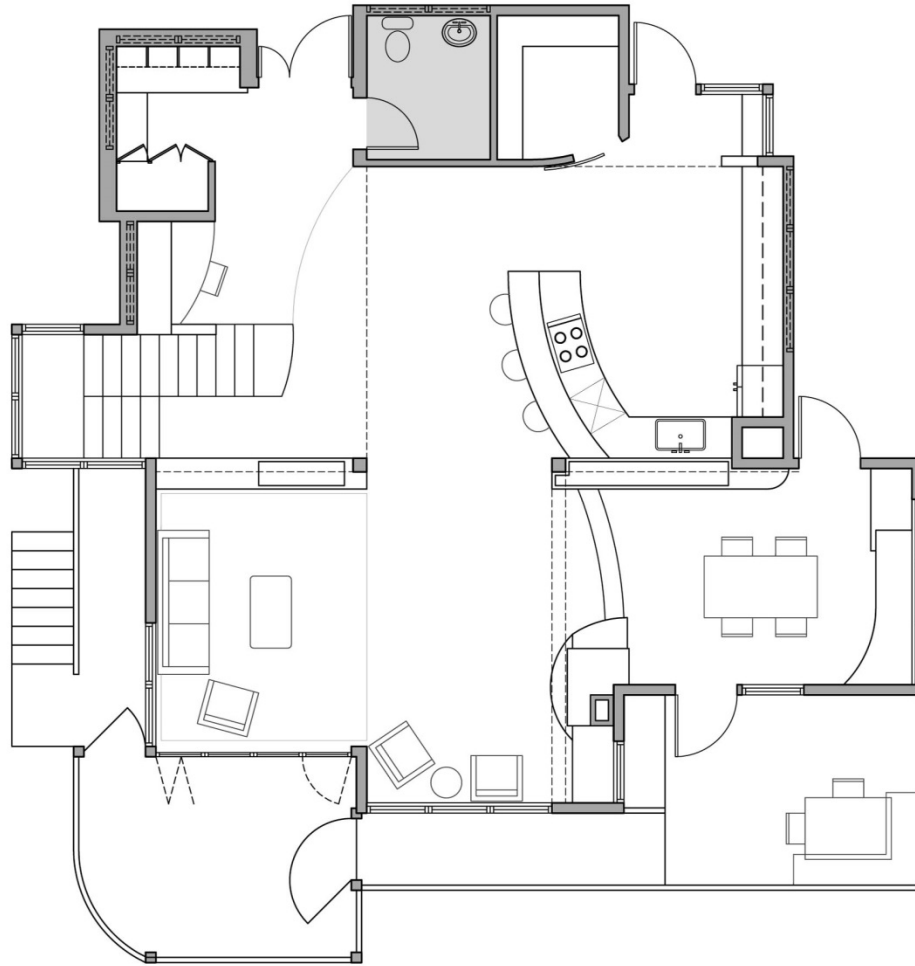


Figure 180. Powder Room

| | Orientation | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors |
|--------------------------|-------------|-------------|-------------|-----------|---------------|------------------|----------------------|--------------|
| Feng Shui | Dark Brown | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green |
| Biophilic Design | White | Orange | White | Blue-Gray | Yellow-Green | White | Light Green | Medium Green |
| Environmental Psychology | White | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green |

In addition to the primary living spaces on the first floor, there is a powder room. This is primarily for the use of visitors since there are bathrooms on the second floor and lower floor. It's a small and basic room with just a toilet and sink within.

Orientation

- View upon entry – allows for privacy

Circulation

- Pathways – kept simple and straight forward
- Pathways – kept clear of objects
- Space – ample room around objects for ease of movement

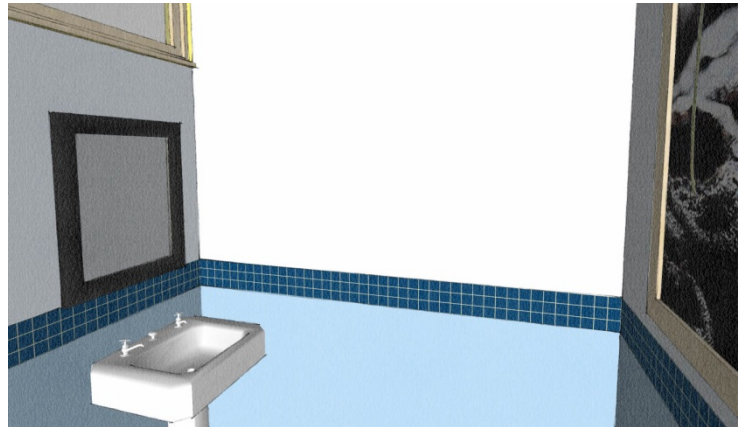


Figure 181. Powder Room - initial view

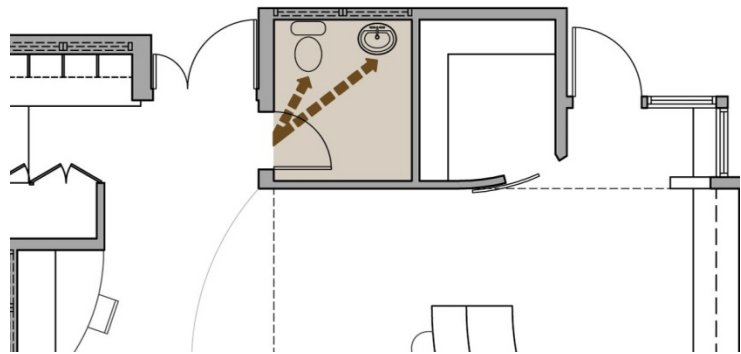


Figure 182. Powder Room – orientation diagram

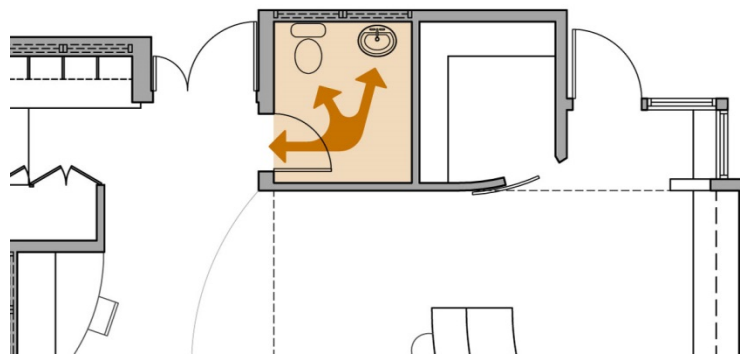


Figure 183. Powder Room - circulation diagram

Scale

- Lower ceiling - keeps the room from feeling too cavernous
- Lower ceiling - creates a more intimate feeling

Climate

- Temperature – radiant heating
- Ventilation – operable awning windows for prevailing winds
- Ventilation – artificial backup fan
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises

Natural light

- Dynamic light – windows in three of the cardinal directions creates movement
- Dynamic light – gives users a sense of passage of time, keyed into diurnal cycles
- Shading – summer sun is blocked by roof overhang

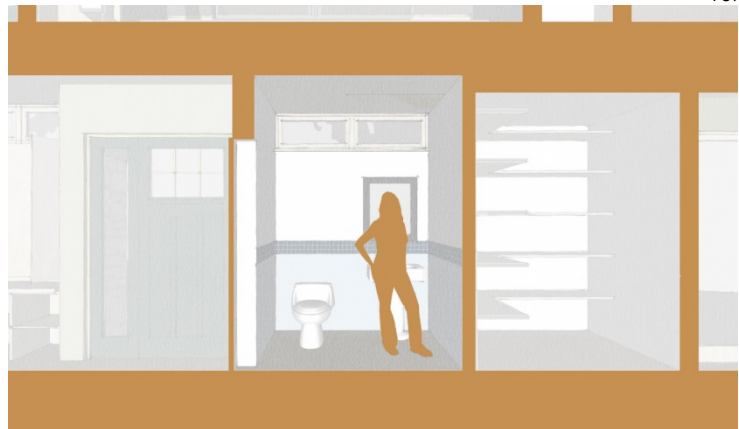


Figure 184. Powder Room - human scale

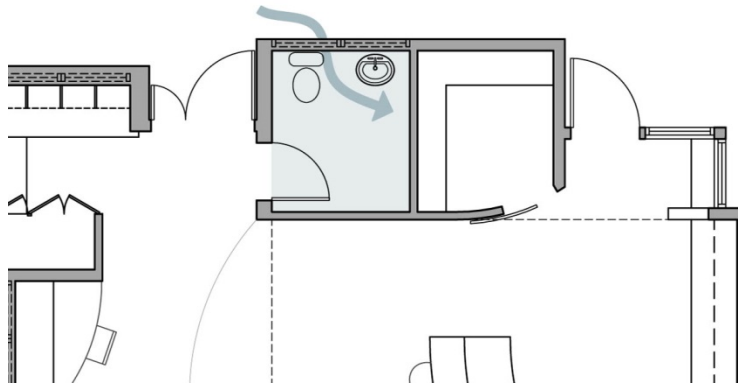


Figure 185. Powder Room - climatic diagram

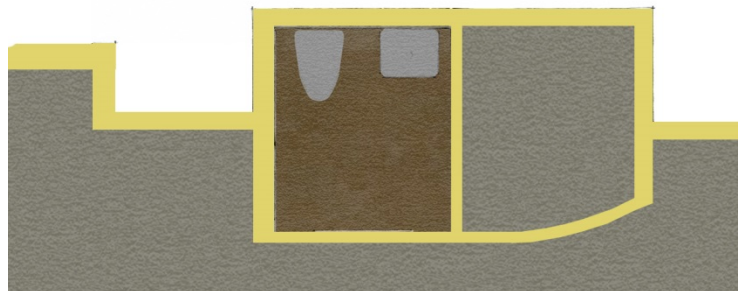


Figure 186. Powder Room - natural light while not seen on the floor due to height of window and length of room, afternoon sunlight tracks up the eastern wall

Artificial lighting

- Function – central light
- Function – task lighting sink

Patterns and materials

- “Earth” material – concrete slab deck
- Coloration of walls – dark to light colors mimic earth to sky
- Organic Patterns – natural themed artwork

Color

- Monochromatic Color Palette - blue
- Polished Concrete Floor – ground the space
- Polished Concrete Floor – dyed a warmer color
- Pale blue – light calming color
- Accents – darker blue used in tile

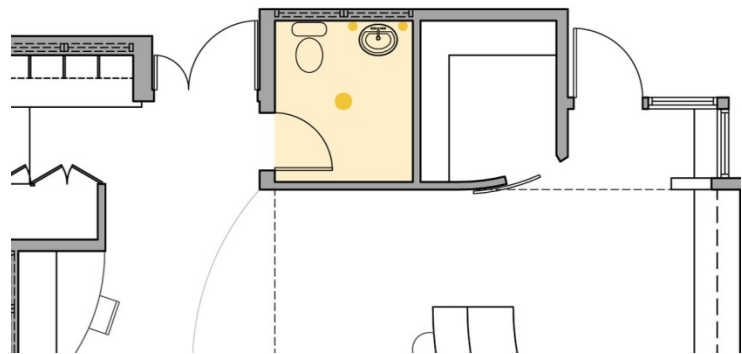


Figure 187. Powder Room - artificial lighting diagram

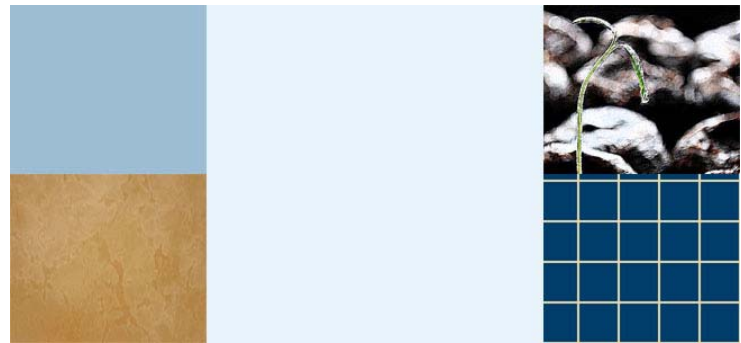


Figure 188. Powder Room - patterns and materials

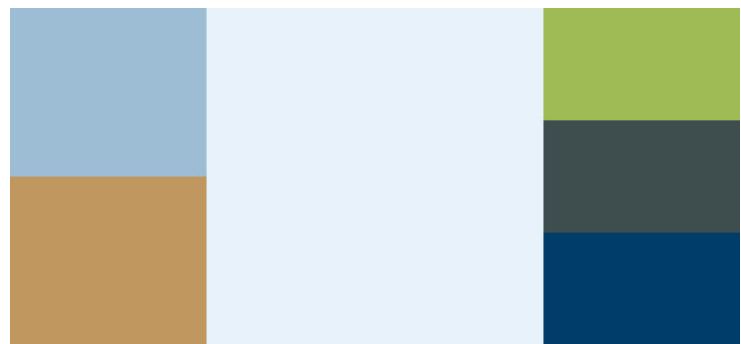


Figure 189. Powder Room - color palette

4.2.6 Deck

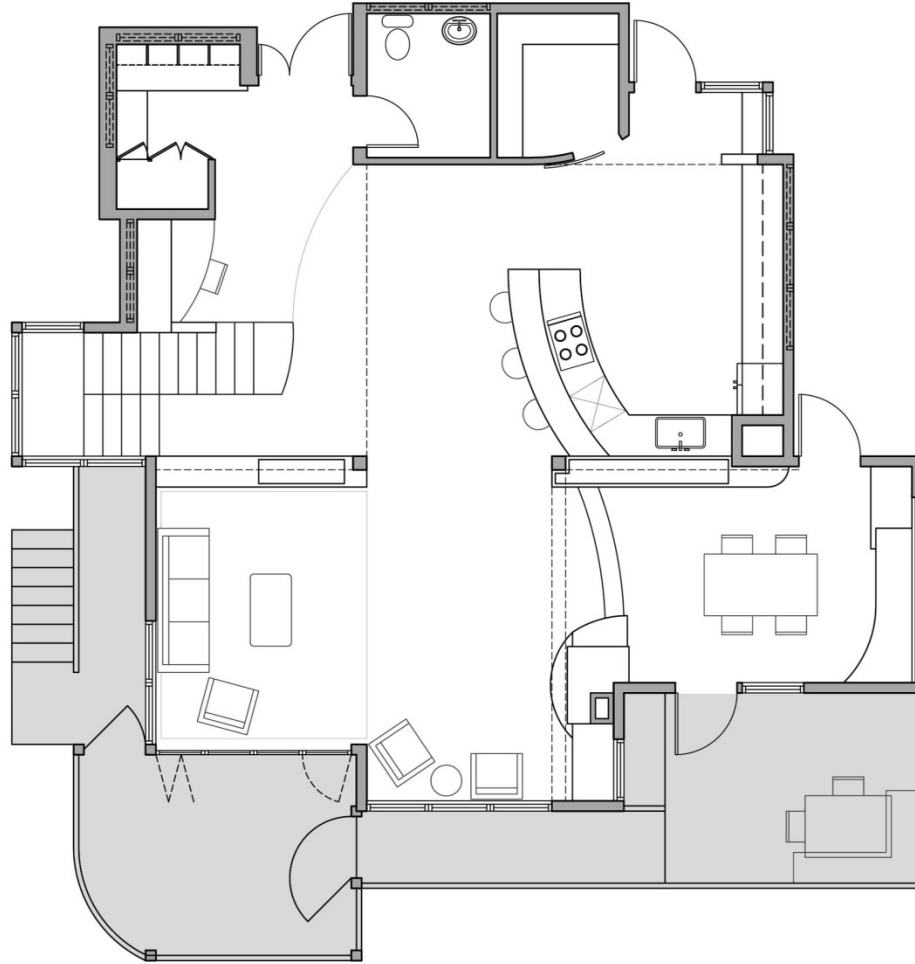


Figure 190. Deck

| | Circulation | Storage | Scale | Natural Light | Artificial Light |
|--------------------------|-------------|------------|-------------|---------------|------------------|
| Feng Shui | Orange | Dark Brown | Light Brown | Light Green | Yellow |
| Biophilic Design | Orange | White | White | Light Green | White |
| Environmental Psychology | Orange | Dark Brown | Light Brown | Light Green | Yellow |

To take advantage of the outdoors during the summer, there is a deck on the eastern façade of the home towards the pond. There are several areas within the deck that relate to the spaces indoors. Previously discussed is a screened in room outside the living room with a moveable wall system that can be opened to create a singular larger living area. A sheltered ramp brings users down to an outdoor eating deck outside of the dining room. This space is totally open and has a built-in corner bench with a table. From the deck there is a stair that leads down to the yard from outside the screened in area.

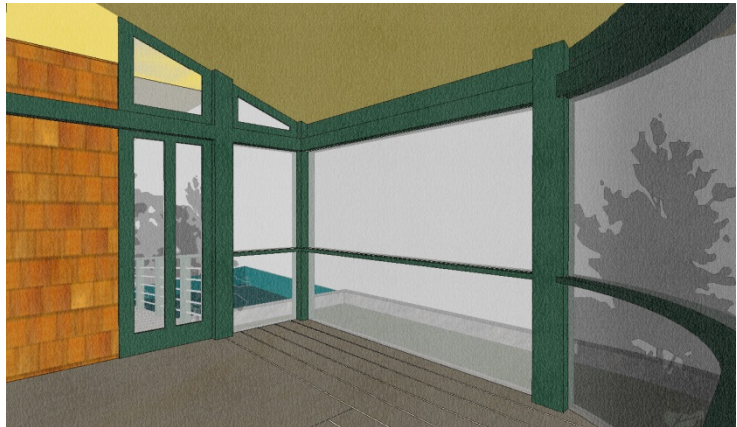


Figure 191. Deck - view of screened in porch



Figure 192. Deck - view of screened in porch towards living room

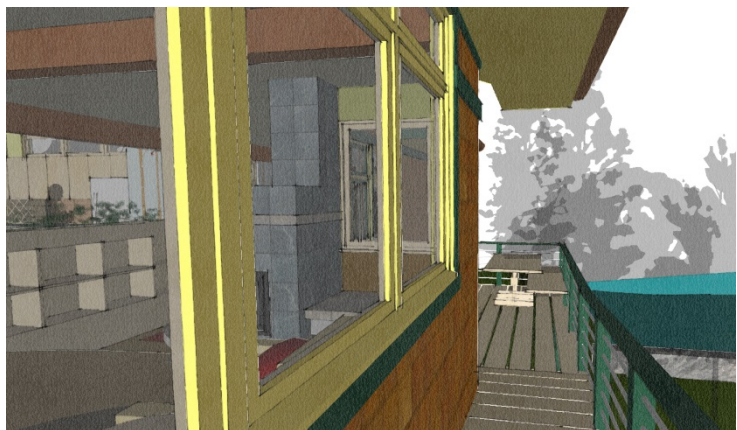


Figure 193. Deck - view down ramp

Circulation

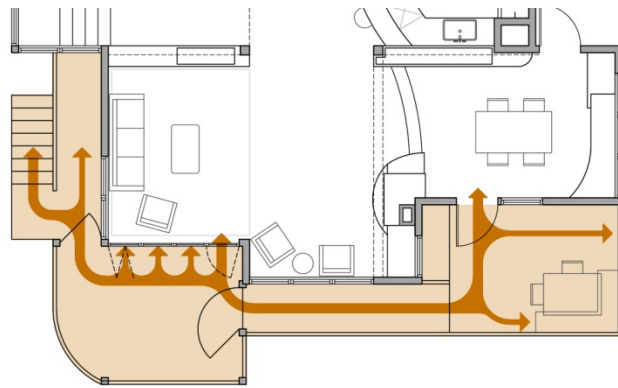
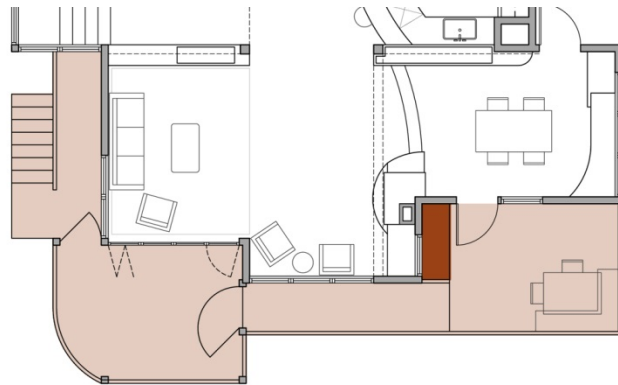
- Pathways – kept simple and straight forward
- Space – ample room around objects for ease of movement

Storage

- Bench/box – storage for possible outdoor equipment

Scale

- Cathedral ceiling – promotes air movement

**Figure 194. Deck - circulation diagram****Figure 195. Deck - storage diagram****Figure 196. Deck - human scale**

Natural light

- Dynamic light – eastern and southern exposure creates movement
- Shading – sun is blocked by roof overhang in screened-in deck
- Shading – sun is blocked to the indoor spaces by covered screened-in deck

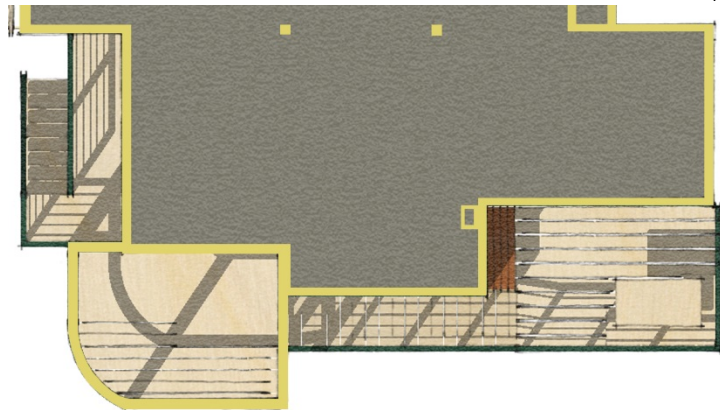


Figure 197. Deck - natural light 3/21 at 9 am

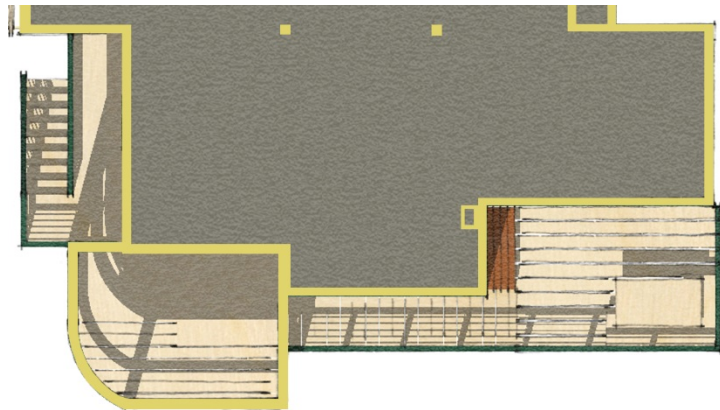


Figure 198. Deck - natural light 6/21 at 9 am

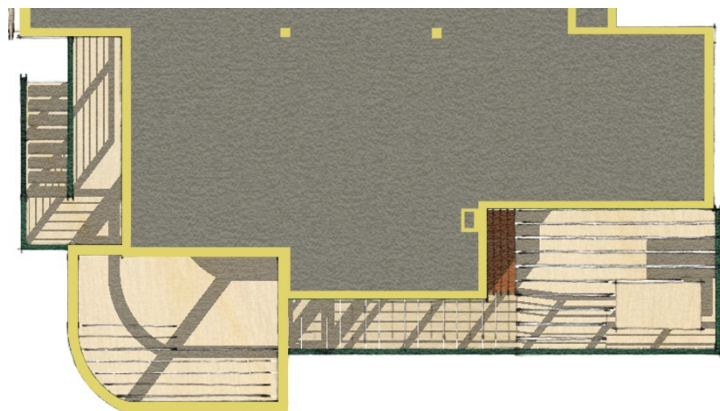


Figure 199. Deck - natural light 9/21 at 9 am

Artificial lighting

- Function – provide visibility for circulation after dark

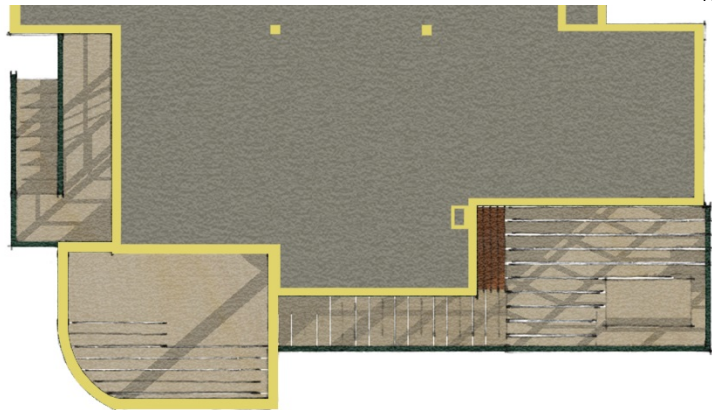


Figure 200. Deck - natural light 12/21 at 9 am

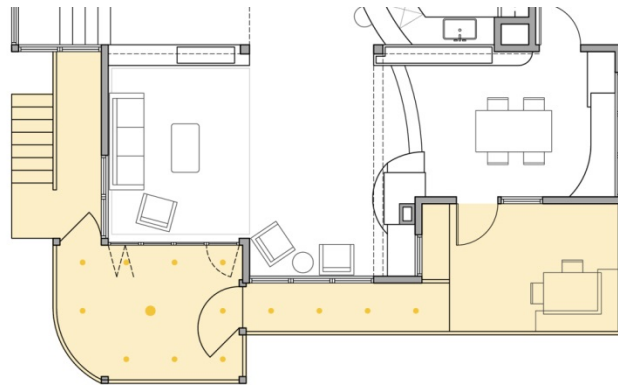


Figure 201. Deck - artificial lighting diagram

4.2.7 First Floor Transitions

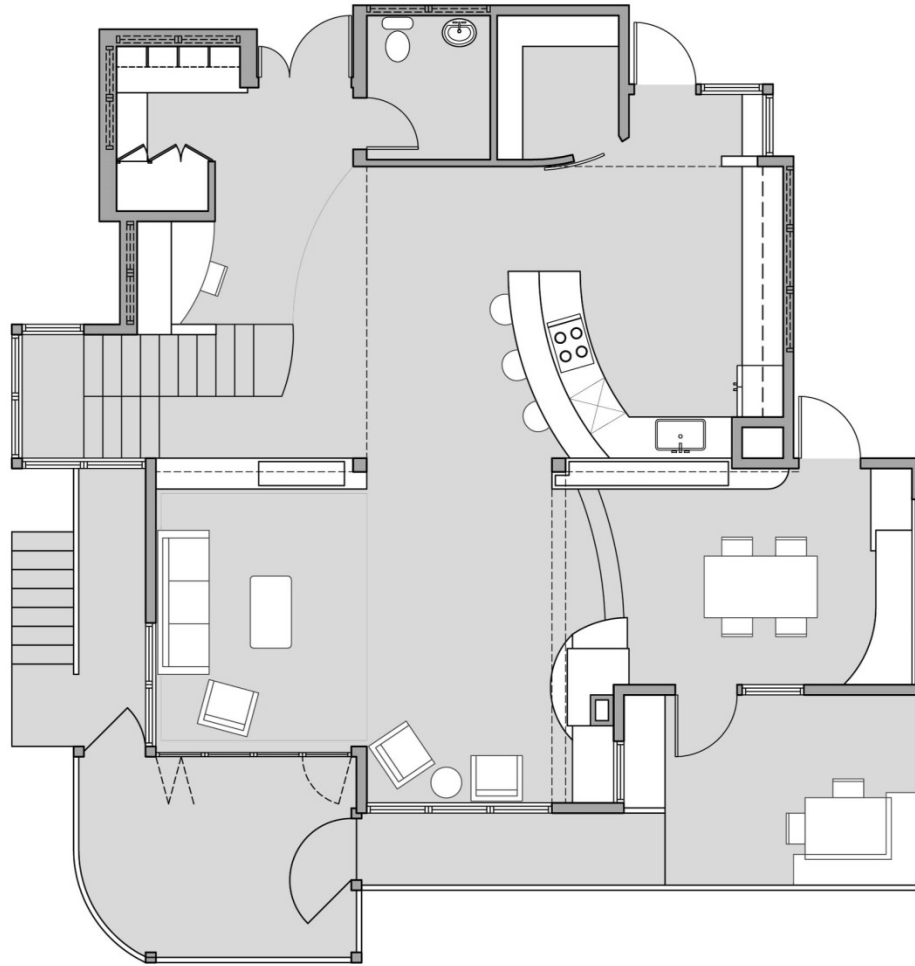


Figure 202. First Floor Transitional Space

| | Flow | Vertical | Connections | Alcove | Natural Light | Artificial Light | Patterns & Materials | Colors |
|--------------------------|--------|----------|-------------|--------|---------------|------------------|----------------------|--------|
| Feng Shui | Medium | Medium | High | Low | Medium | High | High | Medium |
| Biophilic Design | Medium | Medium | Low | Low | Medium | Low | High | Medium |
| Environmental Psychology | Medium | Medium | Low | Medium | Medium | High | High | Medium |

The transitional spaces are hard to define since the first floor is an open floor plan. While there are primary paths within the spaces there are no specific "hallways" instead built-ins and furniture guide users through the rooms. The only clearly defined transitional space is the stairs taking users up to the second floor or down to the lower floor. The stairs are stacked upon each other to save floor space.



Figure 203. First Floor Transitional Space - view of entry and stairs



Figure 204. First Floor Transitional Space - view of phone desk



Figure 205. First Floor Transitional Space - view of central area

Flow

- Pathways – uncomplicated
- Pathways – kept clear of objects
- Pathways – promotes natural curvilinear paths
- Space – wide enough for multiple users

Vertical

- Stair – simple circulation
- Stair – open for air circulation
- Stair – closed tread and riser
- Landing – pause in stair

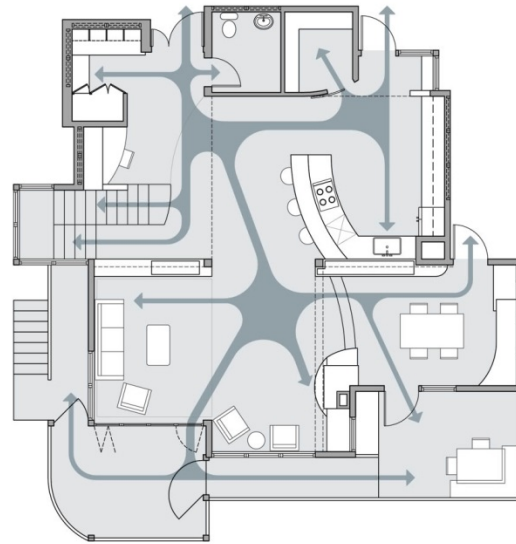


Figure 206. First Floor Transitional Space - flow diagram

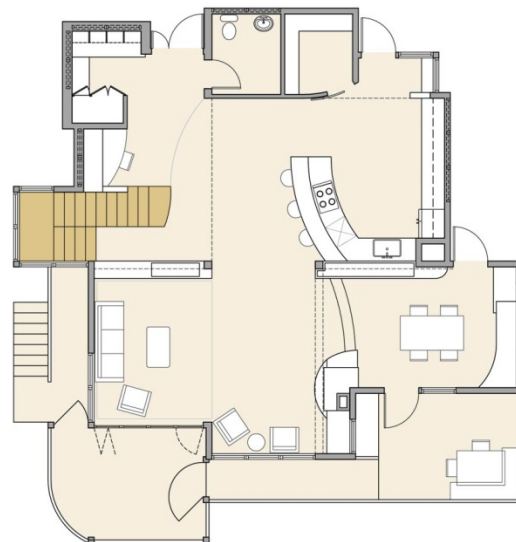


Figure 207. First Floor Transitional Space - vertical circulation diagram

Connections

- Standard Door – pivot hinge
- Standard Door – dynamic articulation between door and wall
- Standard Door – clear slab of wood
- Curved Door – runs along a track similar to a bar door
- Curved Door – dynamic articulation between door and wall
- Curved Door – slab of wood, maybe articulated for ease of opening
- Room Separation – beams articulating spaces on ceiling plane
- Room Separation – level change in the floor

Alcove

- Scale – small niche near front entry
- Scale – for one person
- Function – desk

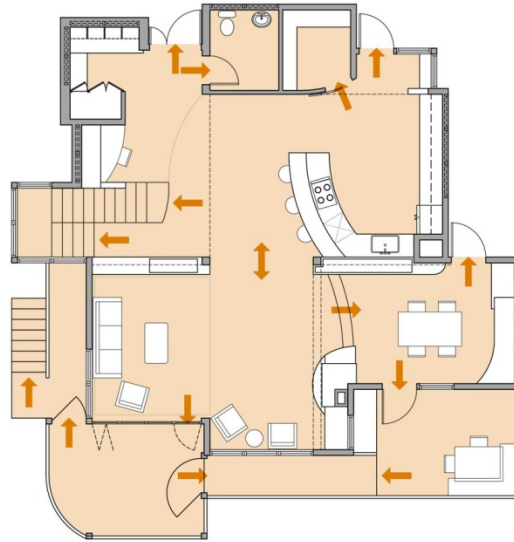


Figure 208. First Floor Transitional Space - connections diagram

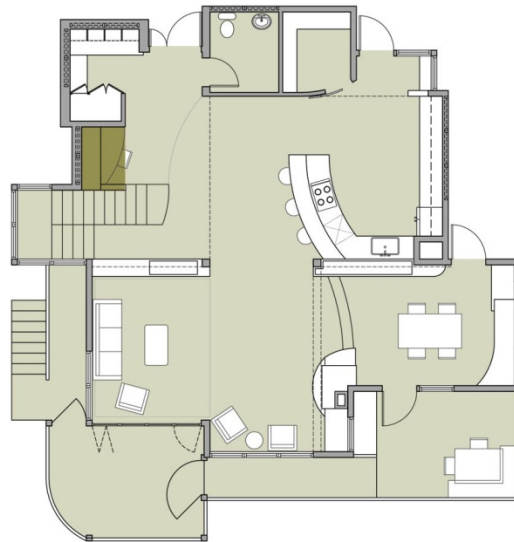


Figure 209. First Floor Transitional Space - alcove diagram

Natural Light

- Dynamic light – windows in three of the cardinal directions creates movement
- Dynamic light – gives users a sense of passage of time, keyed into diurnal cycles
- Shading – summer sun is blocked by roof overhang



Figure 210. First Floor Transitional Space - natural light 3/21 at 11 am



Figure 211. First Floor Transitional Space - natural light 6/21 at 11 am



Figure 212. First Floor Transitional Space - natural light 9/21 at 11 am

Artificial Light

- Function – near the head of the bed
- Function – provide visibility for circulation after dark
- Mood – dimmer to control quality of light
- Display – lighting to emphasize artwork at head of bed
- Effect – neutral light to avoid altering wall color

Patterns & Materials

- Complements materials on first floor

Colors

- Complements earth tone palette in first floor



Figure 213. First Floor Transitional Space - natural light 12/21 at 11 am

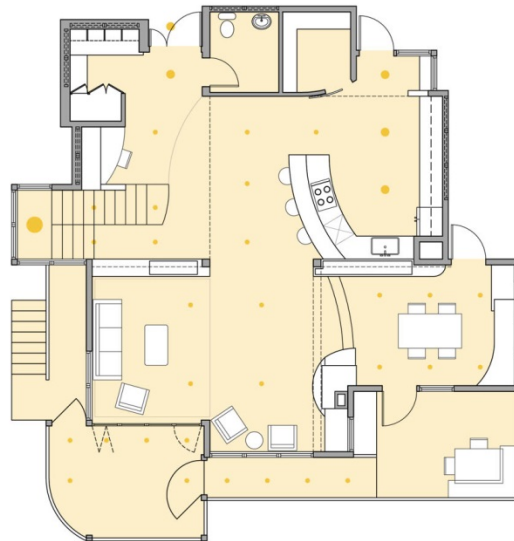
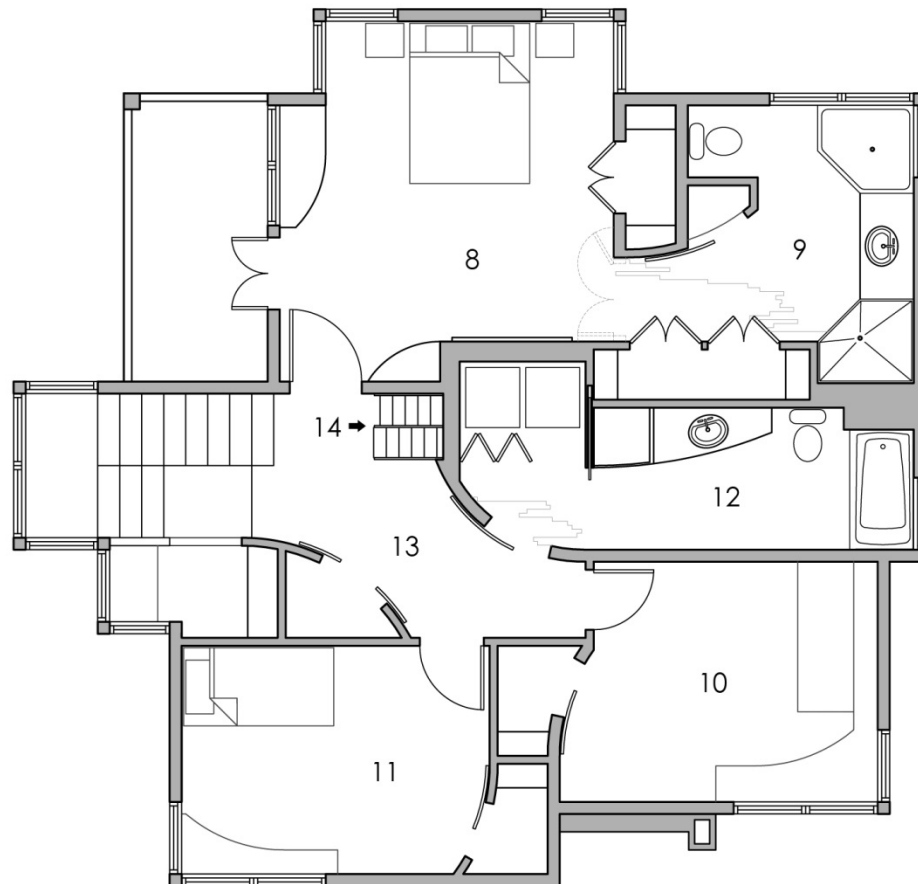


Figure 214. First Floor Transitional Space - artificial light diagram

4.3 Second Floor



- 8 – Master Bedroom
- 9 – Master Bathroom
- 10 – Jeremiah's Bedroom
- 11 – Spirit's Bedroom
- 12 – Children's Bathroom
- 13 – Second Floor Transitional Spaces
- 14 – Loft

- pg 181
- pg 188
- pg 195
- pg 202
- pg 209
- pg 215
- pg 222

4.3.1 Master Bedroom

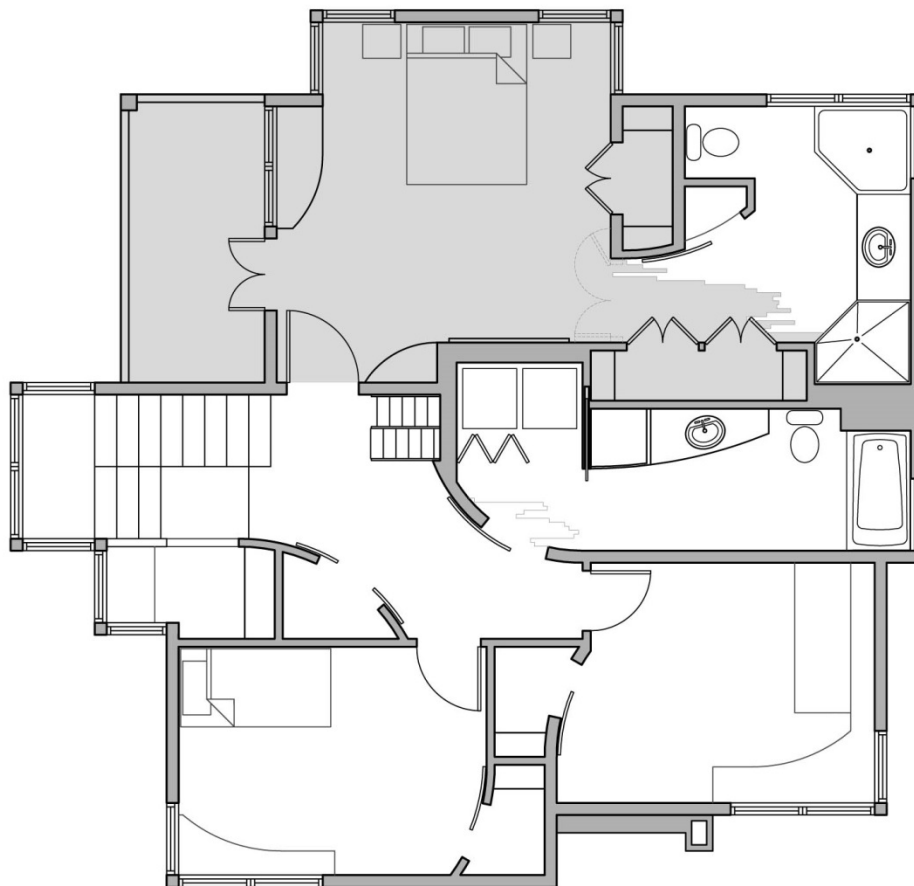


Figure 215. Master Bedroom

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Shapes | Colors | Connection to Nature |
|--------------------------|-------------|----------|-------------|-------------|---------|---------------|------------------|----------------------|-------------|-------------|----------------------|
| Feng Shui | Dark Brown | Dark Red | Orange | Light Brown | Blue | Yellow | Yellow | Light Green | Light Brown | Light Green | Light Green |
| Biophilic Design | White | White | Orange | White | Blue | Yellow | White | Light Green | Light Brown | Light Green | Light Green |
| Environmental Psychology | White | Dark Red | Orange | Light Brown | Blue | Yellow | Yellow | Light Green | Light Brown | Light Green | Light Green |

Elan's main request for her bedroom was to have a space for herself that allows her to enjoy sunsets. Typically a client would want their bedroom to have the best view, which logically would be the eastern side towards the pond and then tuck the children's bedrooms in the back towards the road. However with Elan's preference towards the western view, the master suite is on that side of the house.



Figure 216. Master bedroom - view of the room from the bathroom hall

There are two parts of the master bedroom, indoor and outdoor spaces. As Elan enters her room there is a small table to place small items as she enters or pick up as she leaves or a land line could reside for the second floor. From the entry, the room opens up to the main space that houses the bed. Across from the entry the bed is against the west wall in its own niche. To bring light in around the bed there are windows facing north and south as well as on the western wall. Not only do these windows give natural light to the space, they also give the occupants in the bed a way to be aware of outdoor activity on the site. A mirror across from the bed also adds to this.



Figure 217. Master bedroom - view of entry to the room

The outdoor space is a small personal sheltered deck oriented to the south and west. It is covered with a roof to protect it from the sun and minimize snow accumulation in the winter. From the interior the deck can be accessed by a pair of glass doors and enjoyed from a window seat adjacent the doors.



Figure 218. Master bedroom - view looking towards bathroom

Orientation

- Command position – direct view of the entry door from the bed
- Offset from entry – avoid energy flow from the entry
- Grounded – bed is supported by the headboard
- Orientation – bed facing east
- Dynamic light – shadows travel from windows in the three cardinal directions
- Views – mirror shows site entry and carport

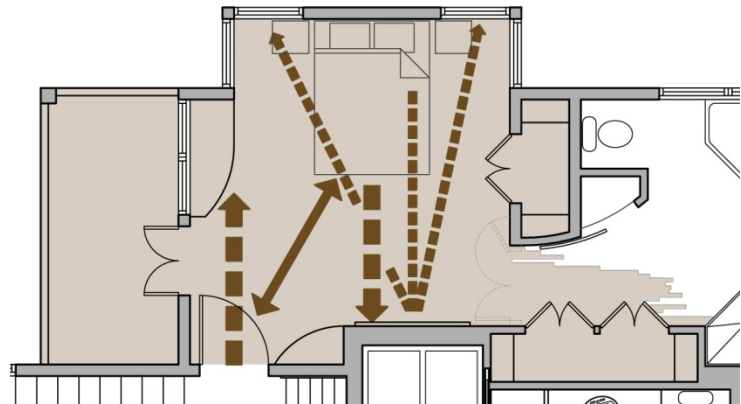


Figure 219. Master Bedroom – orientation diagram

Storage

- Closet 1 – primary clothing and equipment storage
- Closet 2 – secondary storage for Elan or primary storage for a second users
- Window seat – book storage
- Entry table – storage for incidental items

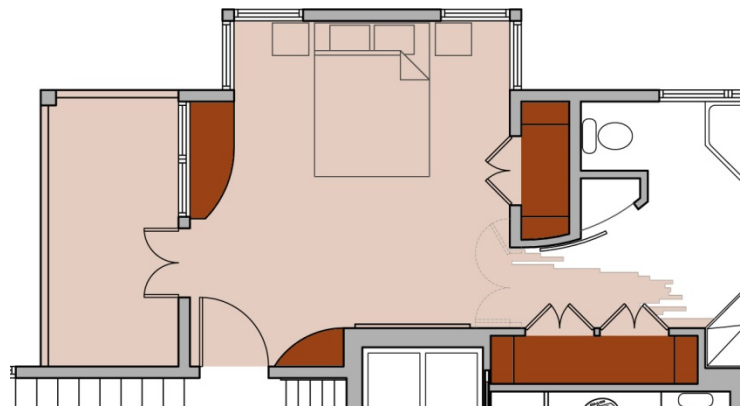


Figure 220 – Master Bedroom – storage diagram

Circulation

- Pathways – kept simple and straight forward
- Pathways – kept clear of objects
- Space – ample room around objects for ease of movement

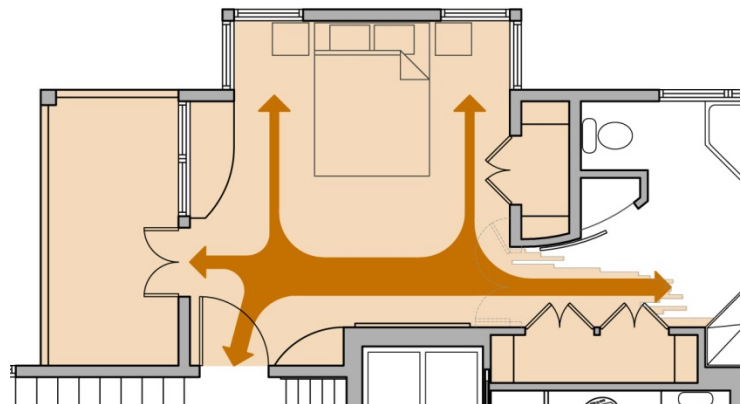


Figure 221. Master Bedroom - circulation diagram

Scale

- Lower ceiling - keeps the room from feeling too cavernous
- Lower ceiling - creates a more intimate feeling

Climate

- Temperature – radiant heated floors
- Ventilation – operable casement windows with awnings for prevailing winds
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises
- Noises – interior noises from plumbing buffered by insulated walls or storage spaces

Natural Light

- Dynamic light – windows in three of the cardinal directions creates movement
- Dynamic light – gives users a sense of passage of time, keyed into diurnal cycles
- Shading – summer sun is blocked by roof overhang



Figure 222. Master Bedroom - scale diagram

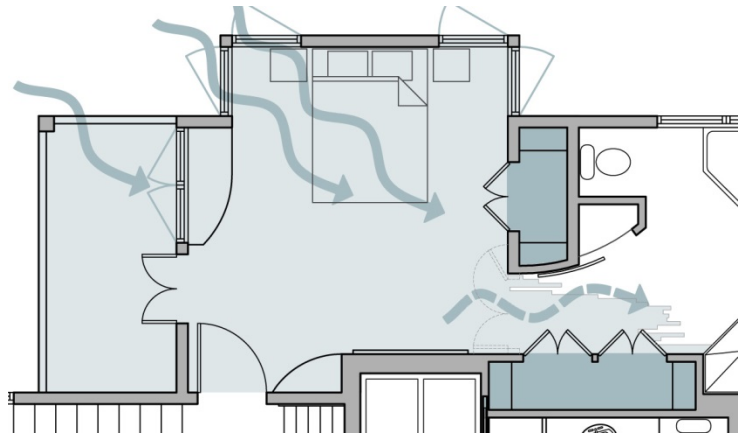


Figure 223. Master Bedroom - climatic diagram



Figure 224. Master Bedroom - natural light 3/21 at 2 pm

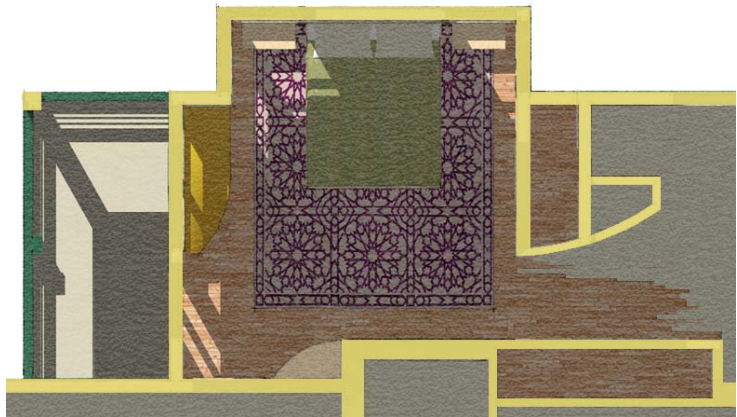


Figure 225. Master Bedroom - natural light 6/21 at 2 pm

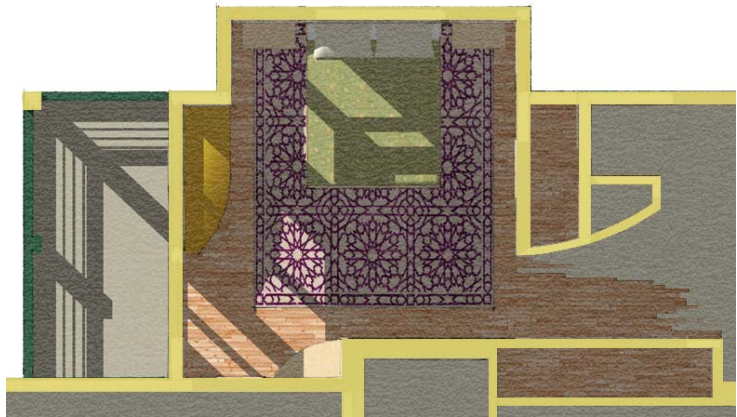


Figure 226. Master Bedroom - natural light 9/21 at 2 pm

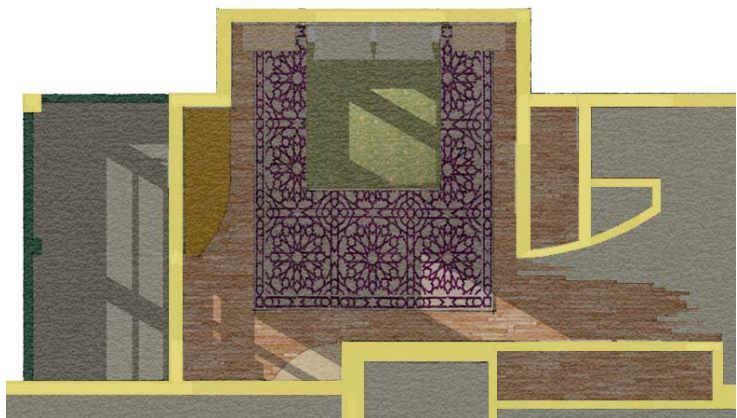


Figure 227. Master Bedroom - natural light 12/21 at 2 pm

Artificial Lighting

- Function – near the head of the bed
- Function – provide visibility for circulation after dark
- Mood – dimmer to control quality of light
- Display – lighting to emphasize artwork at head of bed
- Effect – neutral light to avoid altering wall color

Patterns & Materials

- “Earth” material – concrete slab deck
- Locally sourced materials – reclaimed wood floor
- Locally sourced materials – light colored hardwood accents and built ins
- Coloration of walls – dark to light colors mimic earth to sky
- Organic Patterns – natural patterns within textiles
- Organic Patterns – abstract artwork above bed derived from particle splitting

Color

- Contrasting Color Palette – triangulation of colors
- Wood floor – ground the space and provides a warm feeling to the space
- dark brown – represents “earth” below chair rail on the wall
- Lavender – represents “sky” on the walls
- Lavender – provides a gender neutral color that is relaxing
- Accents – dark purple artwork above headboard
- Accents – mauve in carpet ties purple color down to the floor
- Accents – green and yellow textiles to contrast purple

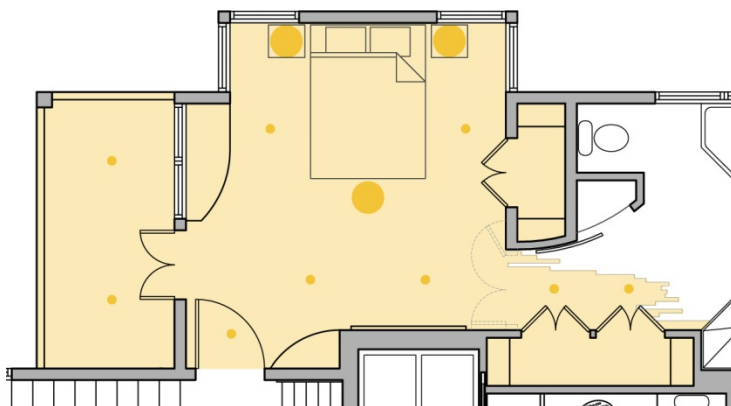


Figure 228. Master Bedroom - artificial lighting diagram



Figure 229. Master Bedroom - Patterns and Materials



Figure 230. Master Bedroom - color palette

Connection to Nature

- Windows – bring in light
- Windows – allow sound to come in
- Windows – allow smells to come in
- Windows – provide views to the surrounding
- Deck – allows a slightly controlled exterior experience
- Materials – use of local materials
- Colors – scheme that follows dark to light; earth to sky
- Artwork – natural/scientific organic themed

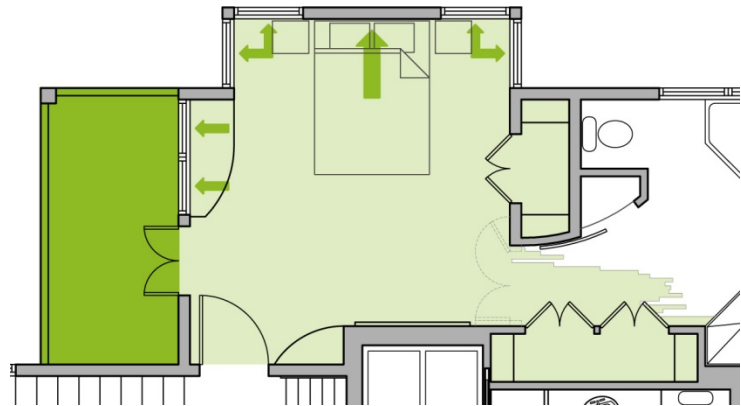


Figure 231. Master Bedroom - connection to nature diagram

4.3.2 Master Bathroom

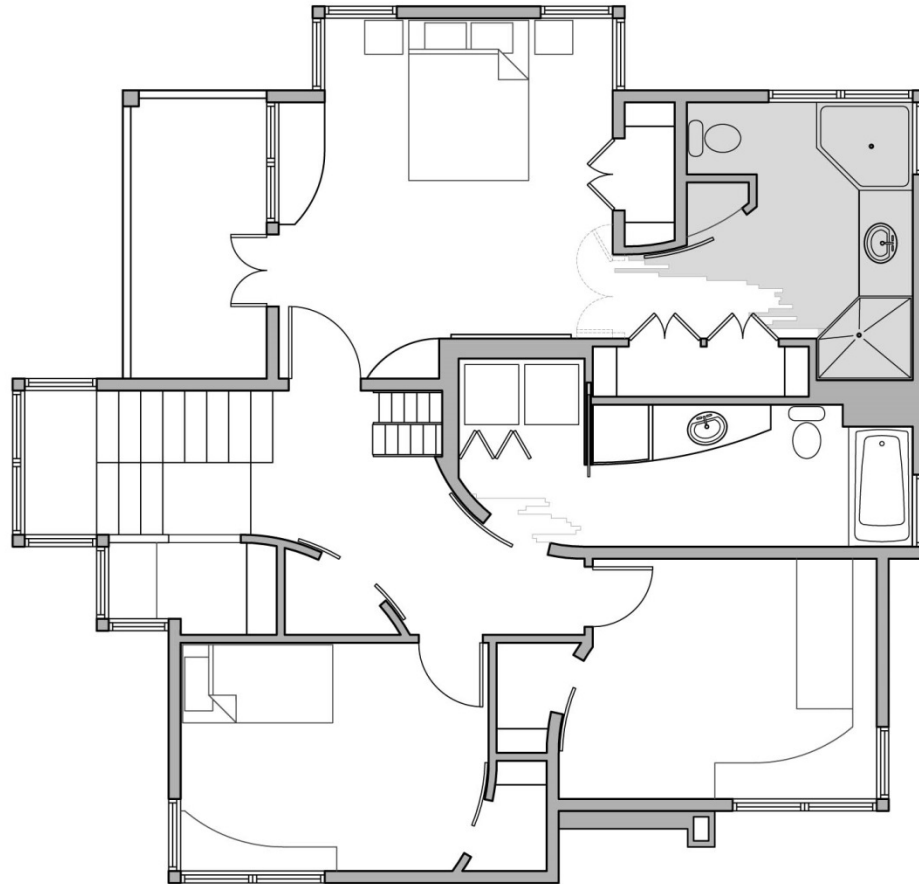


Figure 232. Master Bathroom

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|----------|-------------|-------------|---------|---------------|------------------|----------------------|-------------|----------------------|
| Feng Shui | Dark Brown | Dark Red | Orange | Light Brown | Blue | Yellow | Yellow | Light Green | Light Green | Light Green |
| Biophilic Design | White | White | Orange | White | Blue | Yellow | White | Light Green | Light Green | Light Green |
| Environmental Psychology | White | Dark Red | Orange | Light Brown | Blue | Yellow | Yellow | Light Green | Light Green | Light Green |

Adjacent to the master bedroom on the western side of the building is the master bathroom. These two are connected by a short transitional space that is lined by a closet on one side and a small linen closet on the other. The overall arrangement of the master bathroom is to have privacy within the space without segmenting out rooms for each element. Elan's only request for her bathroom was a large tub. The tub is located so that she can relax and enjoy sunsets. In addition to the tub there is a shower that is mirrored across the sink vanity. Wrapping around the linen closet, a niche for the toilet is tucked away.



Figure 233. Master Bathroom - view from entry



Figure 234. Master Bathroom - view of toilet niche



Figure 235. Master Bathroom - view of sink and shower

Orientation

- Initial view into the bathroom
- Toilet tucked around the corner
- Sheltered view of tub and shower

Storage

- Linen closet – primary storage for bathroom supplies
- Vanity sink – secondary storage for personal grooming items

Circulation

- Pathways – uncomplicated
- Pathways – kept clear of objects
- Space – ample room around fixtures for ease of movement of multiple occupants
- Singular entry point – for privacy and control of space
- U shaped – creates privacy for users

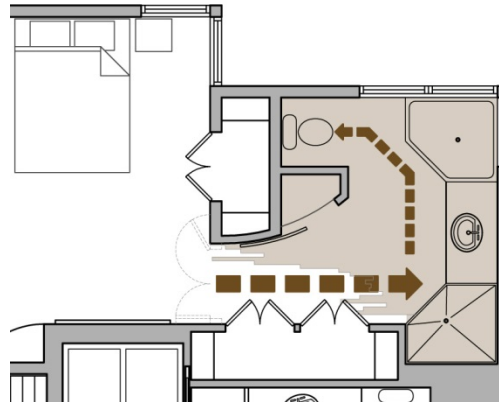


Figure 236. Master Bathroom - orientation diagram



Figure 237. Master Bathroom - storage diagram

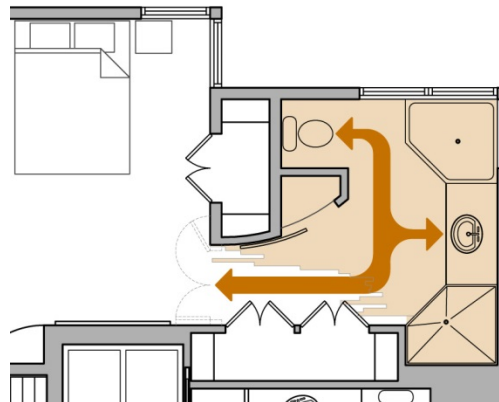


Figure 238. Master Bathroom - circulation diagram

Scale

- Lower ceiling - keeps the room from feeling too cavernous
- Lower ceiling - creates a more intimate feeling

Climate

- Temperature – radiant heated floors
- Ventilation – operable casement windows for prevailing winds
- Ventilation – additional mechanical ventilation near tub/toilet and shower vented directly outside
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises
- Noises – sounds from this room are buffered by storage spaces for the master bedroom
- Noises – acoustical insulation from the children's bathroom in wall

Natural Light

- Ambient light – north west corner does not provide much direct sunlight
- Shading – summer sun is blocked by roof overhang



Figure 239. Master Bathroom - scale diagram

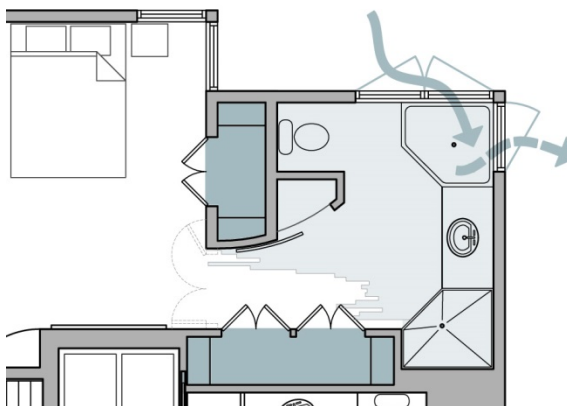


Figure 240. Master Bathroom - climatic diagram



Figure 241. Master Bathroom - natural light 3/21 at 2 pm



Figure 242. Master Bathroom - natural light 6/21 at 2 pm



Figure 243. Master Bathroom - natural light 9/21 at 2 pm



Figure 244. Master Bathroom - natural light 12/21 at 2 pm

Artificial Lighting

- Function – primary lighting source due to location and lack of natural light
- Function – visibility for circulation
- Function – lighting near the sink
- Mood – light fixture over tub for ambiance
- Effect – warm lighting to complement the walls

Patterns & Materials

- “Earth” material – dark cork flooring
- Practicality – cork flooring water proof and soft
- Locally sourced materials – light colored hardwood accents and built ins continued from master bedroom
- Locally sourced materials – local Barre granite countertops
- Coloration of walls – dark to light colors mimic earth to sky
- Organic Patterns – natural themed ceramic tile accents
- Organic Patterns – larger version of accent tile used as artwork over toilet

Color

- Contrasting Color Palette – triangulation of colors
- Cork – ground the space and provides a soft, warm feeling to the space
- dark brown – represents “earth” same height as master bedroom
- Pale Yellow – represents “sky” on the walls
- Pale Yellow – brightens the room to compensate for the lack of direct light

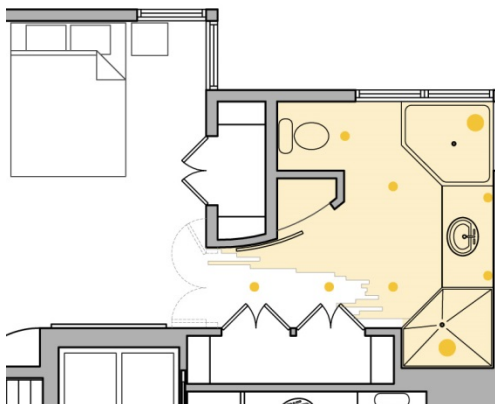


Figure 245. Master Bathroom - artificial lighting diagram

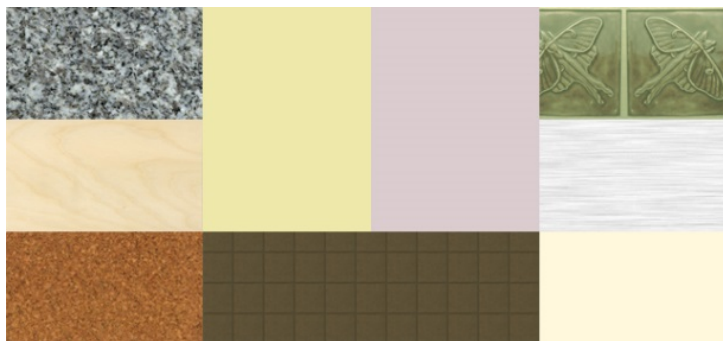


Figure 246. Master Bathroom – patterns and materials



Figure 247. Master Bathroom - color palette

- Pale Yellow – muted shade for a calming feeling
- Accents – lavender from master bedroom transitions into master bathroom
- Accents – brushed steel hardware
- Accents – off white porcelain in tub and sink for a softer atmosphere
- Accents – sage green accent tiles complement the pale yellow as well as bring in the green from the master bedroom

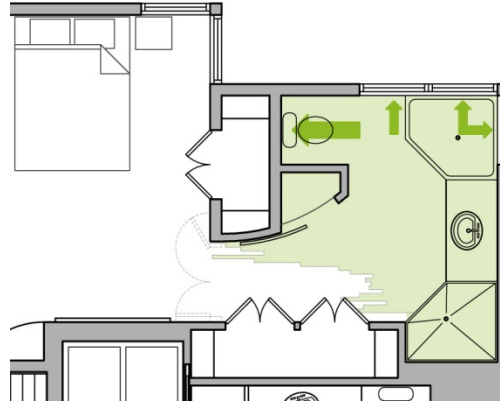


Figure 248. Master Bathroom - connection to nature diagram

Connection to Nature

- Windows – allow sound to come in
- Windows – allow smells to come in
- Windows – provide views to the surrounding area
- Materials – use of local materials
- Colors – scheme that follows dark to light; earth to sky
- Artwork – natural/scientific organic themed

4.3.3 Jeremiah's Bedroom

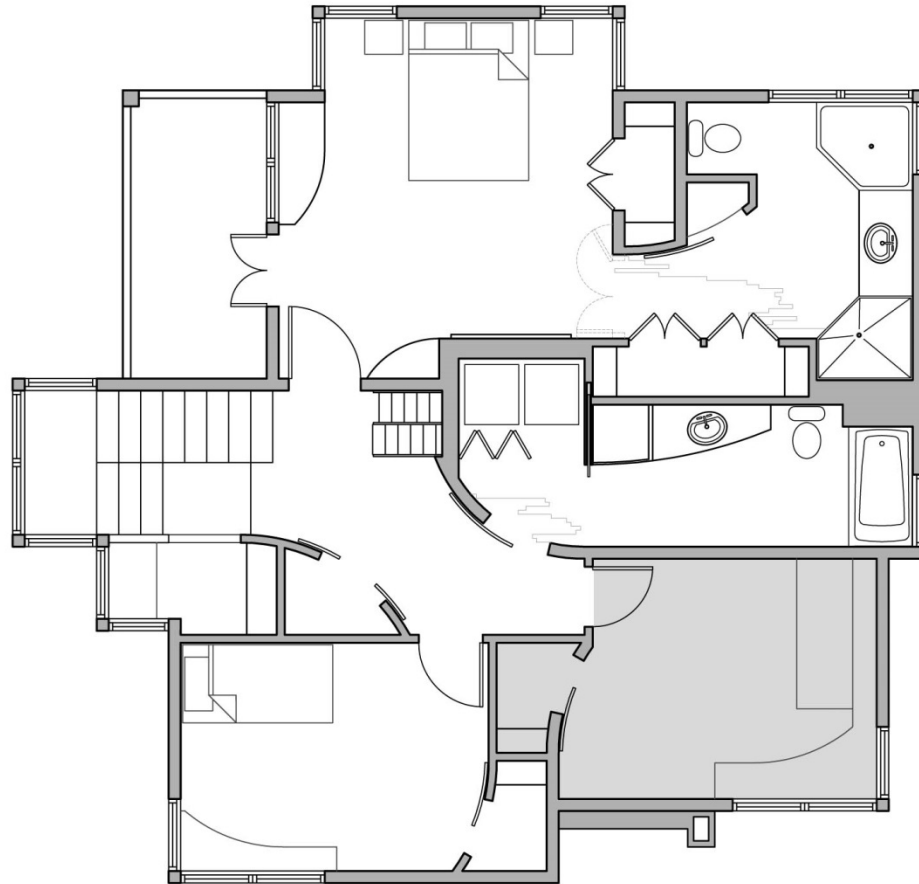


Figure 249. Jeremiah's Bedroom

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|----------|-------------|-------------|---------|---------------|------------------|----------------------|-------------|----------------------|
| Feng Shui | Dark Brown | Dark Red | Orange | Light Brown | Blue | Yellow | Yellow | Light Green | Light Green | Light Green |
| Biophilic Design | White | White | Orange | White | Blue | Yellow | White | Light Green | Light Green | Light Green |
| Environmental Psychology | White | Dark Red | Orange | Light Brown | Blue | Yellow | Yellow | Light Green | Light Green | Light Green |

At the end of the second floor hall is Jeremiah's bedroom. He was looking for his own personal space to work on his technical hobbies. His room is a modest size with windows facing north and east giving a view of the pond. One thing both Jeremiah and Elan wanted his room to have is the ability to transition. Currently he is a high school student and is starting to look at colleges. While he will still come home for vacations, Elan wants his room to be able to be used for other things while he's away. To accommodate these requests there is a built-in desk on the western wall taking advantage the view. The built-in wraps around to the north wall with storage as well as a twin bed.



Figure 250. Jeremiah's Bedroom - view from entry



Figure 251. Jeremiah's Bedroom - view of bed tucked away



Figure 252. Jeremiah's Bedroom - view towards closet

Orientation

- Command position – view of the entry door from the bed
- Command position – not the most advantageous location to avoid conflict with parents
- Orientation – bed facing east
- Dynamic light – shadows travel from windows in the three cardinal directions
- View – desk has a view towards the pond
- Adaptability – bed can be tucked away

Storage

- Closet – primary clothing and equipment storage
- Desk – shelves and storage incorporated within the desk

Circulation

- Pathways – kept simple and straight forward
- Pathways – kept clear of objects
- Space – ample room around objects for ease of movement

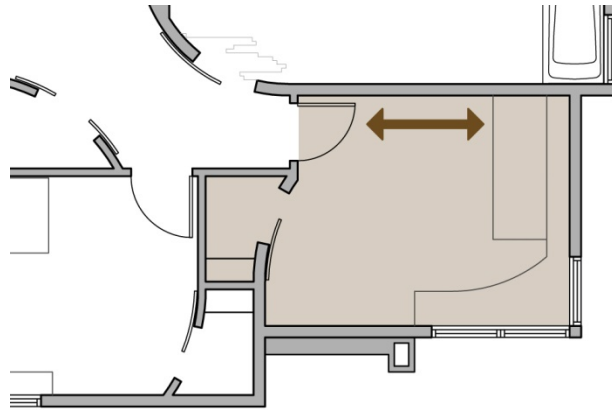


Figure 253. Jeremiah's Bedroom - orientation diagram

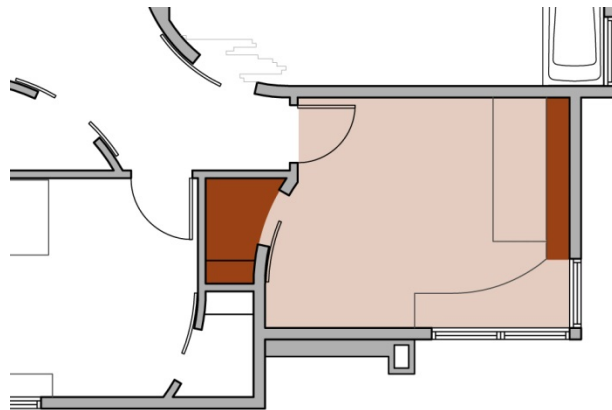


Figure 254. Jeremiah's Bedroom - storage diagram

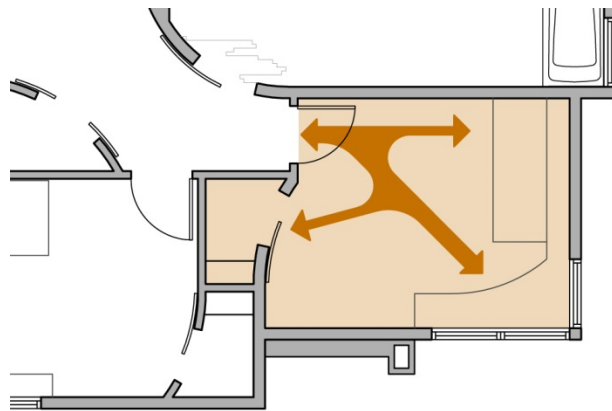


Figure 255. Jeremiah's Bedroom - circulation diagram

Scale

- Lower ceiling - keeps the room from feeling too cavernous
- Lower ceiling - creates a more intimate feeling

Climate

- Temperature – radiant heated floors
- Ventilation – operable casement windows not oriented toward prevailing winds but still allows natural ventilation
- Ventilation – augmented by a small fan
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises
- Noises – interior noises from plumbing buffered by insulated walls or storage spaces

Natural Light

- Dynamic light – windows in two of the cardinal directions create movement
- Dynamic light – gives users a sense of passage of time, keyed into diurnal cycles
- Shading – summer sun is blocked by roof overhang
- Orientation – eastern sun as natural alarm clock



Figure 256. Jeremiah's Bedroom - scale diagram

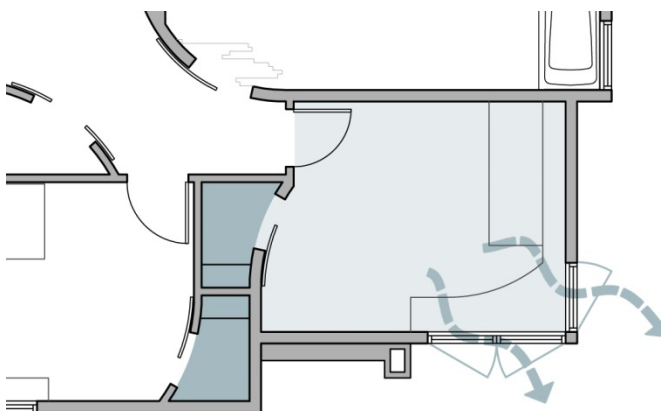


Figure 257. Jeremiah's Bedroom - climatic diagram

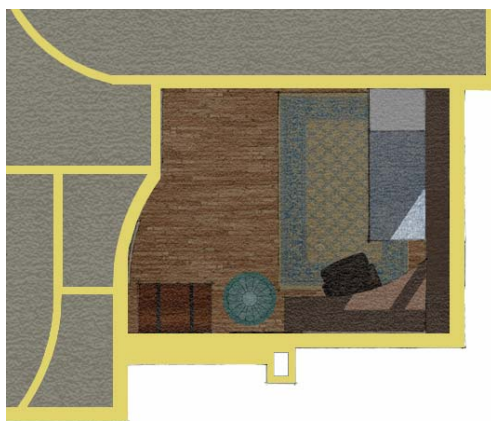


Figure 258. Jeremiah's diagram - natural light 3/21 at 9 am

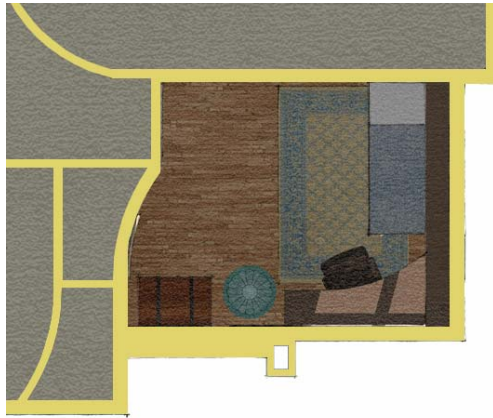


Figure 259. Jeremiah's Bedroom - natural light 6/21 at 9 am

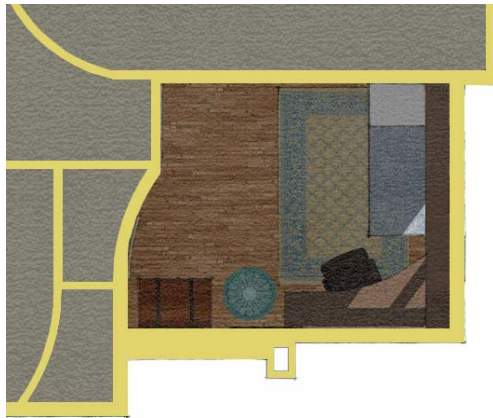


Figure 260. Jeremiah's Bedroom - natural light 9/21 at 9 am

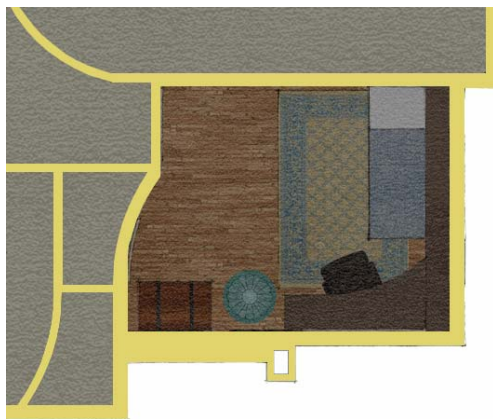


Figure 261. Jeremiah's Bedroom - natural light 12/21 at 9 am

Artificial Lighting

- Function – near the head of the bed
- Function – provide visibility for circulation after dark
- Effect – neutral or warm light to avoid altering wall color

Patterns & Materials

- Locally sourced materials – reclaimed wood floor
- Locally sourced materials – darker hardwood for accents
- Walls – dark to light colors mimic earth to sky
- Walls – fabric for a warm texture and pattern
- Walls – mural
- Artwork – a combination of natural and cyber related artwork per client's interests
- Organic Patterns - geometric rug pattern

Color

- Monochromatic Color scheme – changes in tonal value
- Wood floor – ground the space and provides a warm feeling to the space
- black – used just in book shelves to keep it from being too overwhelming
- Tan – warm lighter color for the walls
- Accents – blue in rug, textiles and accessories
- Accents – brass along the edge of the desk
- Accents – light tan contrasts the darker shelves

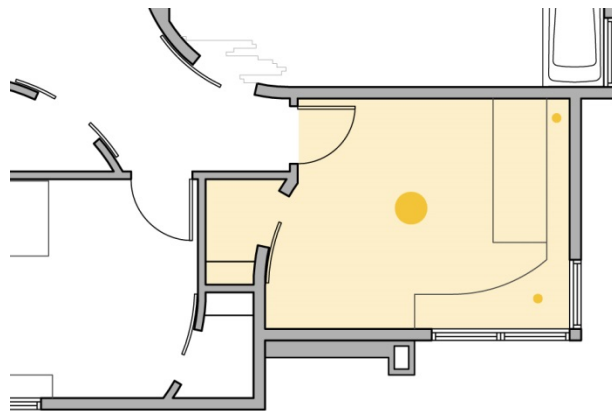


Figure 262. Jeremiah's Bedroom - artificial lighting diagram

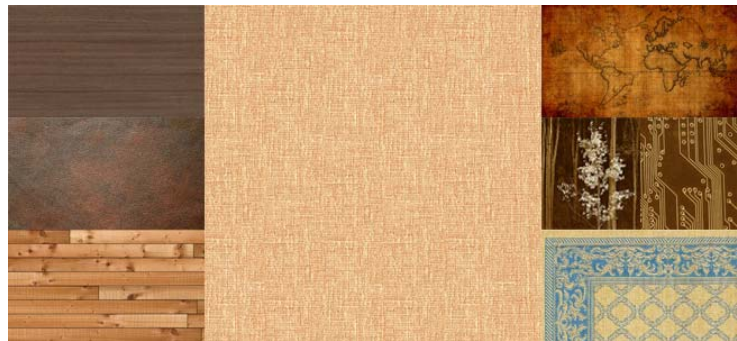


Figure 263. Jeremiah's Bedroom - Patterns and Materials



Figure 264. Jeremiah's Bedroom - color palette

Connection to Nature

- Windows – bring in light
- Windows – allow sound to come in
- Windows – allow smells to come in
- Windows – provide views to the surrounding area
- Materials – use of local materials
- Colors – earth tone
- Artwork – natural/technologically themed

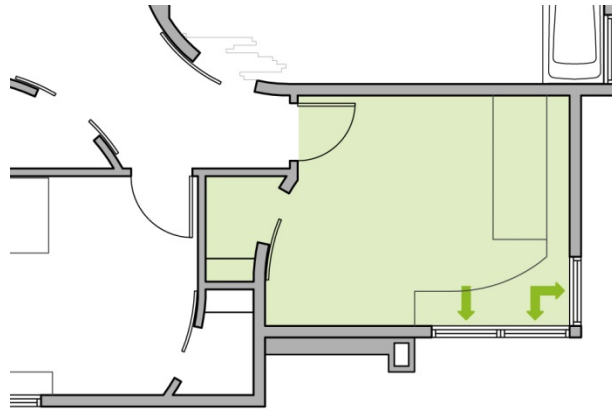


Figure 265. Jeremiah's Bedroom - connection to nature diagram

4.3.4 Spirit's Bedroom

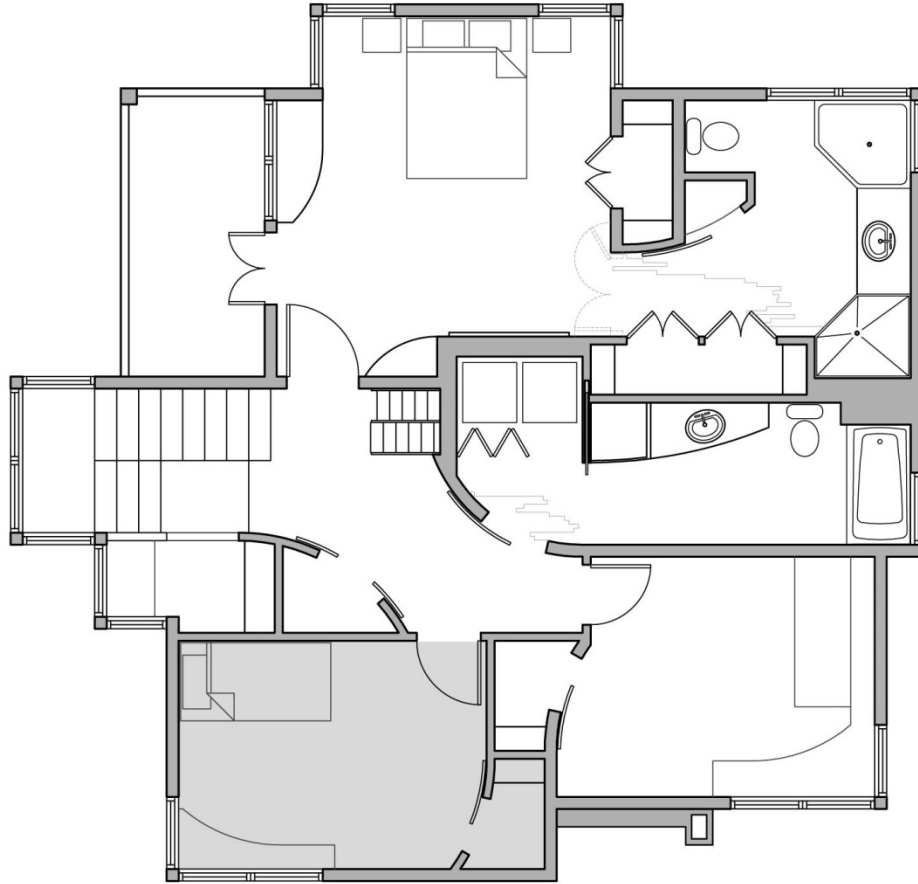


Figure 266. Spirit's Bedroom

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|----------|-------------|-------------|---------|---------------|------------------|----------------------|-------------|----------------------|
| Feng Shui | Dark Brown | Dark Red | Orange | Light Brown | Blue | Yellow | Yellow | Light Green | Light Green | Light Green |
| Biophilic Design | White | White | Orange | White | Blue | Yellow | White | Light Green | Light Green | Light Green |
| Environmental Psychology | White | Dark Red | Orange | Light Brown | Blue | Yellow | Yellow | Light Green | Light Green | Light Green |

Spirit's room is very similar to Jeremiah's, however it is a bit smaller. To make up for the slight difference in size she has an added transom windows above the casements to the south and east. She too has an eastern view of the pond. The room is intended to serve as a refuge for Spirit to escape to and have space to explore her hobbies. Since she is younger her room has a bit more permanence as she isn't looking to leave any time soon.



Figure 267. Spirit's Bedroom - view from entry



Figure 268. Spirit's Bedroom - view of bed



Figure 269. Spirit's Bedroom - view of closet and entry

Orientation

- Command position – view of the entry door from the bed
- Command position – not the most advantageous location to avoid conflict with parents
- Dynamic light – shadows travel from windows in the three cardinal directions
- View – desk has a view towards the pond

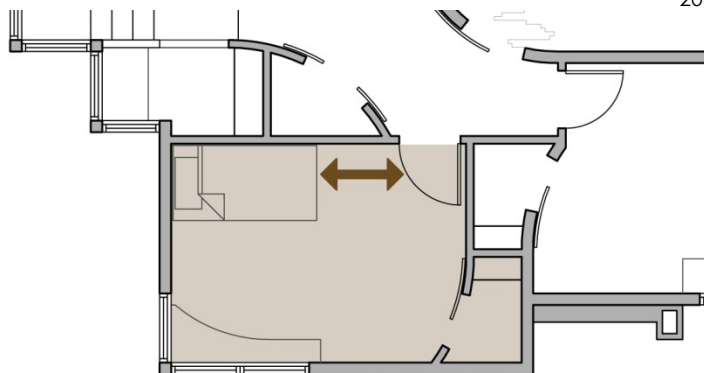


Figure 270. Spirit's Bedroom - orientation diagram

Storage

- Closet – primary clothing and equipment storage
- Desk – shelves and storage incorporated within the desk

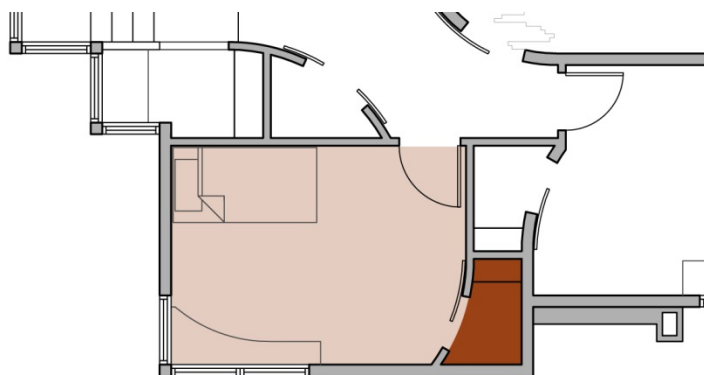


Figure 271. Spirit's bedroom - storage diagram

Circulation

- Pathways – kept simple and straight forward
- Pathways – kept clear of objects
- Space – ample room around objects for ease of movement

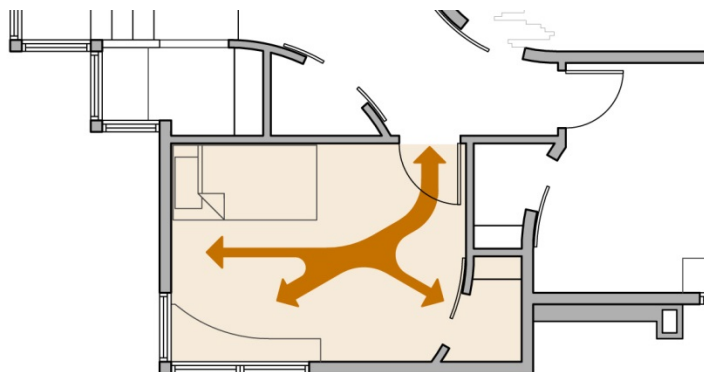


Figure 272. Spirit's Bedroom - circulation diagram

Scale

- Lower ceiling - keeps the room from feeling too cavernous
- Lower ceiling - creates a more intimate feeling

Climate

- Temperature – radiant heated floors
- Ventilation – operable casement windows with awnings for prevailing winds
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises
- Noises – interior noises from plumbing buffered by insulated walls or storage spaces

Natural Light

- Dynamic light – windows in three of the cardinal directions creates movement
- Dynamic light – gives users a sense of passage of time, keyed into diurnal cycles
- Shading – summer sun is blocked by roof overhang
- Orientation – eastern sun as natural alarm clock



Figure 273. Spirit's Bedroom - scale diagram

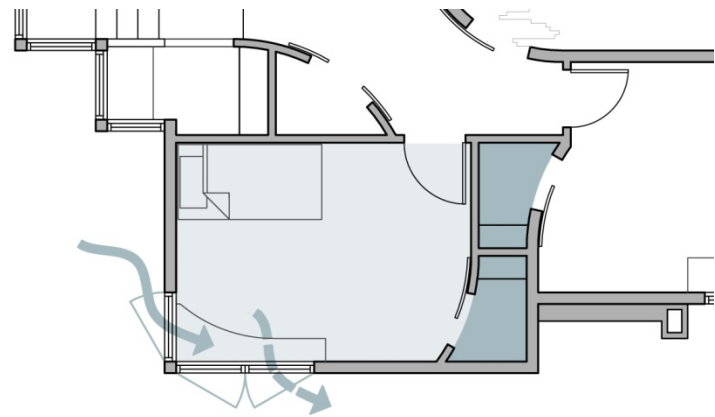


Figure 274. Spirit's Bedroom - climatic diagram



Figure 275. Spirit's Bedroom - natural light 3/21 at 9 am



Figure 276. Spirit's Bedroom - natural light 6/21 at 9 am



Figure 277. Spirit's Bedroom - natural light 9/21 at 9 am



Figure 278. Spirit's Bedroom - natural light 12/21 at 9 am

Artificial Lighting

- Function – near the head of the bed
- Function – provide visibility for circulation after dark
- Effect – neutral or warm light to avoid altering wall color

Patterns & Materials

- Recycled materials – PET Carpeting
- Locally sourced materials – blond hardwood for accents
- Walls – dark to light colors mimic earth to sky
- Walls – vertical oriented natural design
- Organic Patterns - geometric textiles

Color

- Analogous Color Scheme – yellows and greens
- Floor – dark green plush carpet mimicking grass
- Brown – darker bead board representing “earth”
- Yellow – warm lighter color for the walls “sky”
- Accents – green, silver/gray, and cream textiles and accessories

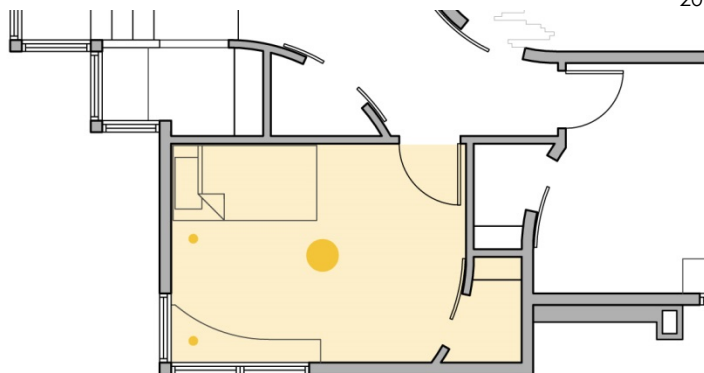


Figure 279. Spirit's Bedroom - artificial light diagram

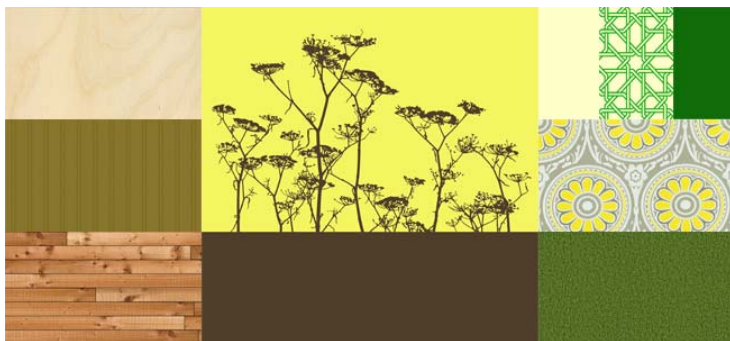


Figure 280. Spirit's Bedroom - patterns and material



Figure 281. Spirit's Bedroom - color palette

Connection to Nature

- Windows – bring in light
- Windows – allow sound to come in
- Windows – allow smells to come in
- Windows – provide views to the surrounding
- Materials – use of local materials
- Colors – earth tone
- Artwork – natural/technologically themed

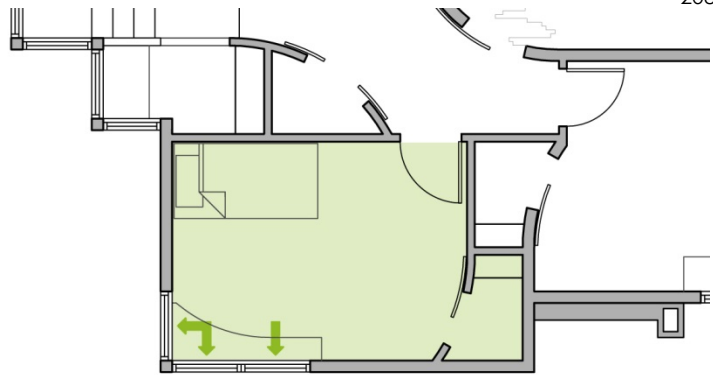


Figure 282. Spirit's Bedroom - connection to nature diagram

4.3.5 Children's Bathroom

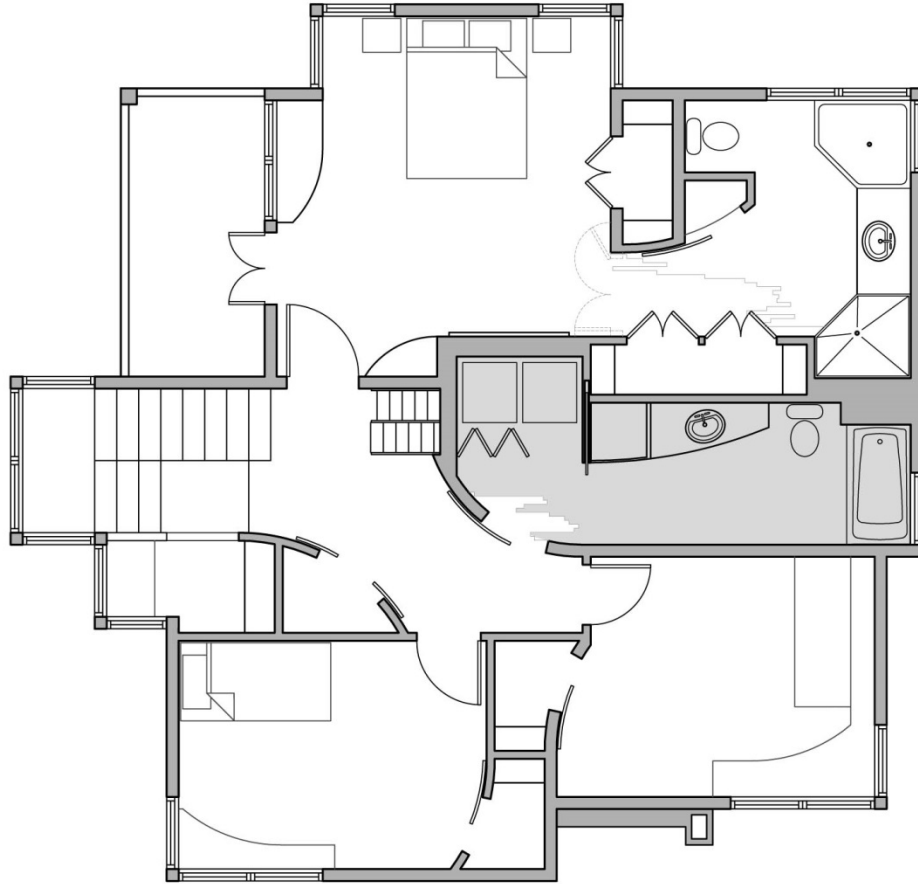


Figure 283. Children's Bathroom

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|----------|-------------|-------------|-----------|---------------|------------------|----------------------|--------------|----------------------|
| Feng Shui | Dark Brown | Dark Red | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green | Dark Green |
| Biophilic Design | White | White | Orange | White | Blue-Gray | Yellow-Green | White | Light Green | Medium Green | Dark Green |
| Environmental Psychology | White | Dark Red | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green | Dark Green |

In between the master bathroom and Jeremiah's bedroom is the children's bathroom. It is partnered with the master bathroom to keep plumbing in one area of the house. Contained within the bathroom is the laundry niche with space for a washer and dryer. Beyond that is the actual bathroom, starting with a small linen closet. The vanity with a sink is curved to open up the bathroom towards the toilet and tub/shower.



Figure 284. Children's Bathroom - view from entry

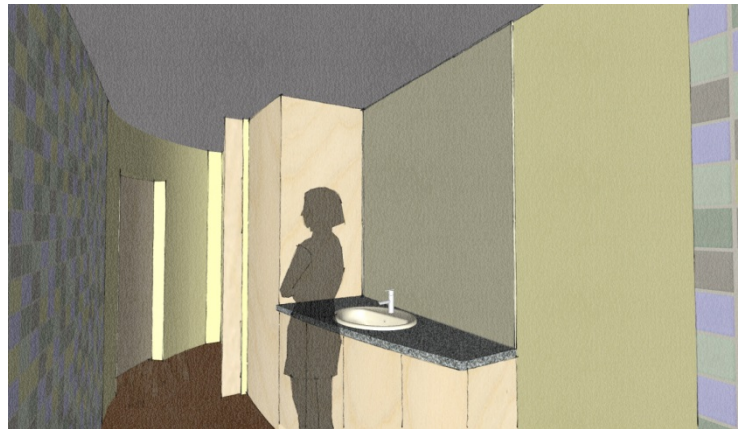


Figure 285. Children's Bathroom - view towards entry

Orientation

- Initial view into the bathroom
- Toilet tucked out of initial view upon entry
- Sliding divider for privacy between laundry and bathroom

Storage

- Linen closet – primary storage for bathroom supplies
- Vanity sink – secondary storage for personal grooming items

Circulation

- Pathways – uncomplicated
- Pathways – kept clear of objects
- Space – ample room around fixtures for ease of movement of multiple occupants
- Singular entry point – for privacy and control of space

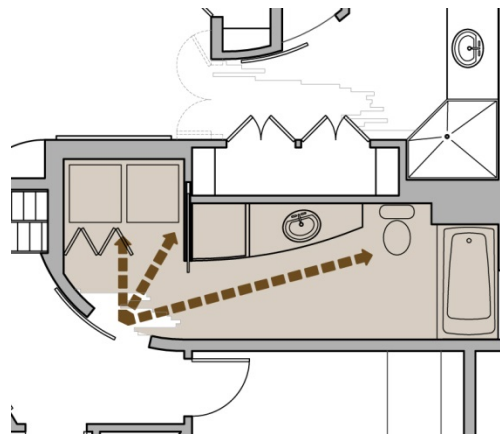


Figure 286. Children's Bathroom - orientation diagram

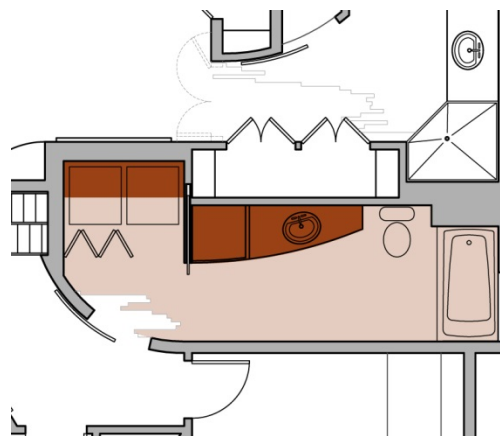


Figure 287. Children's Bathroom - storage diagram

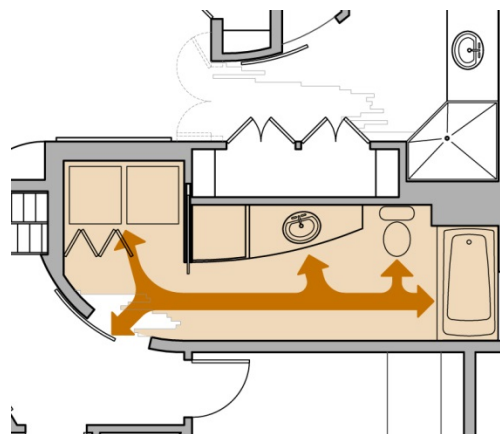


Figure 288. Children's Bathroom - circulation diagram

Scale

- Lower ceiling - keeps the room from feeling too cavernous
- Lower ceiling - creates a more intimate feeling

Climate

- Temperature – radiant heated floors
- Ventilation – operable casement windows
- Ventilation – additional mechanical ventilation near tub and toilet
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises
- Noises – sounds from this room are buffered by storage spaces for the master bedroom

Natural Light

- Ambient light – north facing window does not provide much direct sunlight
- Shading – summer sun is blocked by roof overhang



Figure 289. Children's Bathroom - scale diagram

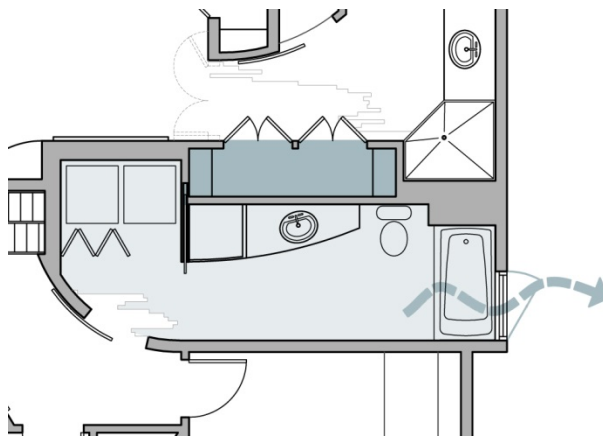


Figure 290. Children's Bathroom - climatic diagram

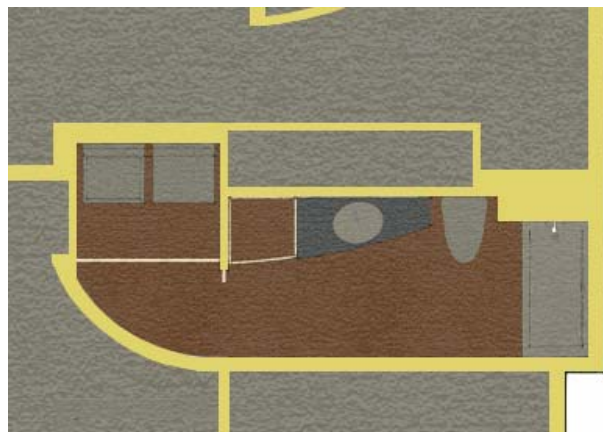


Figure 291 - Children's Bathroom - natural light in bathroom is ambient due to northern orientation

Artificial Lighting

- Function – primary lighting source due to location and lack of natural light
- Function – visibility for circulation
- Function – lighting near the sink
- Effect – warm lighting to complement the walls

Patterns & Materials

- “Earth” material – dark cork flooring
- Practicality – cork flooring water proof and soft
- Locally sourced materials – light colored hardwood accents
- Locally sourced materials – local Barre granite countertops
- Coloration of walls – light gender neutral colored tiles

Color

- Cork – ground the space and provides a soft, warm feeling to the space
- Pale Yellow – brightens the room
- Pale Yellow – muted shade for a calming feeling
- Tile – Light blue, sage green, pale brown and yellow tiles are gender neutral colors to complement the pale yellow walls
- Accents – brushed steel hardware
- Accents – off white porcelain in tub and sink for a softer atmosphere

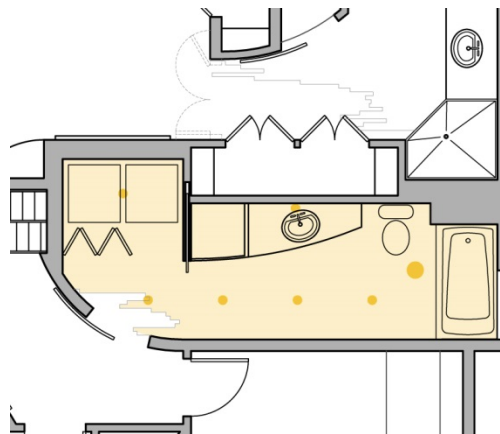


Figure 292. Children's Bathroom - artificial light diagram

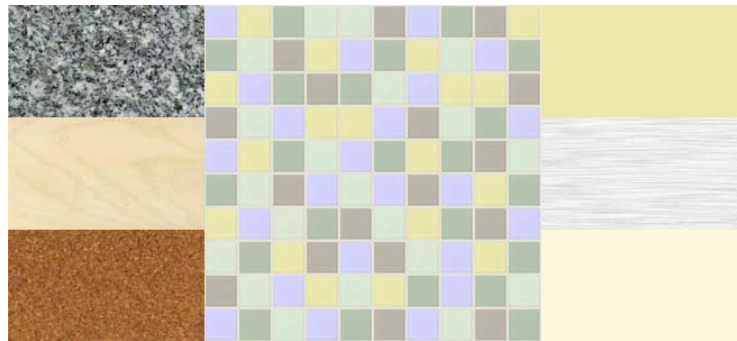


Figure 293. Children's Bathroom - patterns and materials

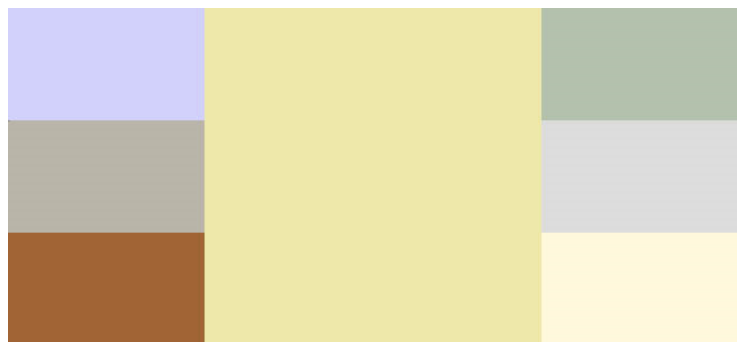


Figure 294. Children's Bathroom - color palette

Connection to Nature

- Windows – allow sound to come in
- Windows – allow smells to come in
- Windows – provide views to the surrounding
- Materials – use of local materials
- Plants – the eastern wall has room for moisture loving hanging plants

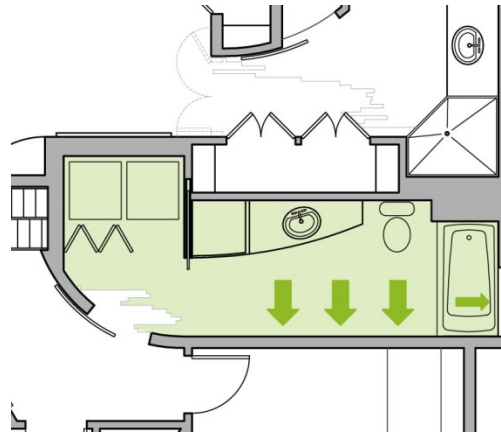


Figure 295. Children's Bathroom - connection to nature

4.3.6 Second Floor Transitions

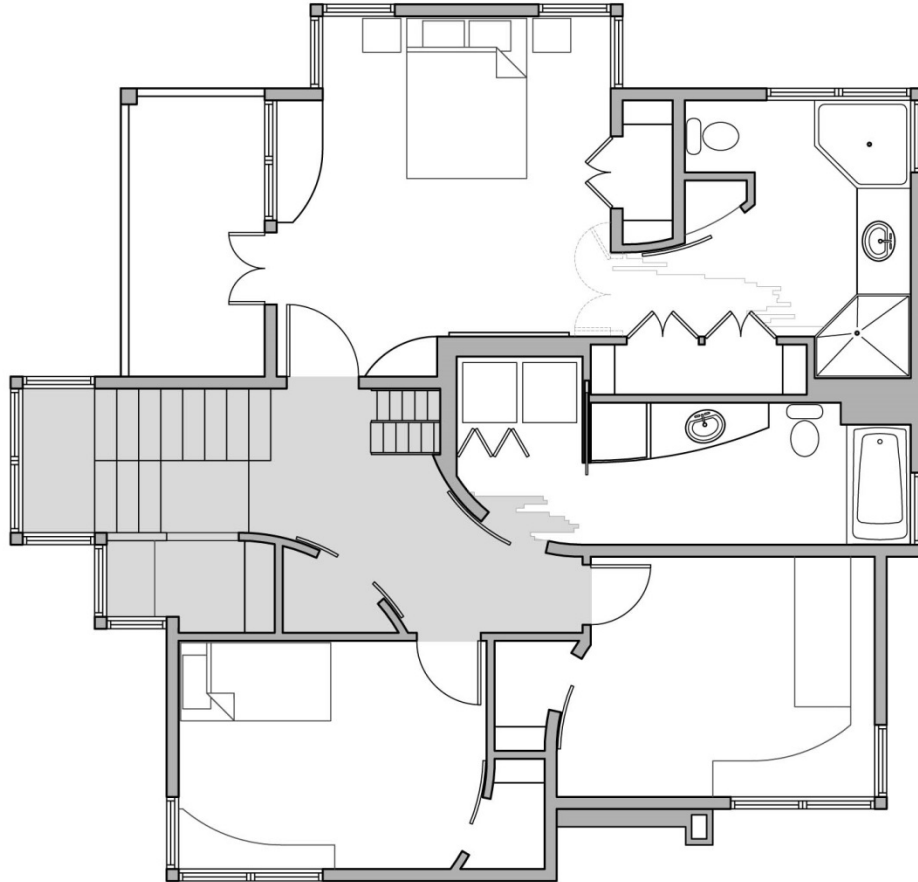


Figure 296. Second Floor Transitional Spaces

| | Flow | Vertical | Connections | Alcove | Storage | Scale | Natural Light | Artificial Light | Patterns & Materials | Colors |
|--------------------------|------------|-----------|-------------|-------------|------------|-------------|---------------|------------------|----------------------|--------------|
| Feng Shui | Light Gray | Light Tan | Orange | White | Dark Brown | Light Brown | Light Yellow | Yellow | Light Green | Medium Green |
| Biophilic Design | Light Gray | Light Tan | White | White | White | White | Light Yellow | White | Light Green | Medium Green |
| Environmental Psychology | Light Gray | Light Tan | White | Light Green | Dark Brown | Light Brown | Light Yellow | Yellow | Light Green | Medium Green |

The primary transitional spaces on the second floor include the stairway and hall. From the first floor, the stairs bring users up to a landing that is surrounded by windows before they turn and proceed up to the second floor. They are then deposited in the hallway that leads to the bedrooms as well as the children's bathroom. The first room immediately to the left of the stairs is the master bedroom. The hall then compresses and curves in between a closet and the bathroom to open up for the doors leading to the children's rooms. Several spaces adjacent to the hall and stairs include a small reading alcove, the closet previously mentioned and an alternating tread stair that leads up to the loft.

Flow

- Pathways – uncomplicated
- Pathways – kept clear of objects
- Pathways – promotes natural curvilinear paths
- Pathways – kept short and direct
- Space – wide enough for multiple users



Figure 297. Second Floor Transitional Spaces - view of hallway from staircase landing



Figure 298. Second Floor Transitional Spaces - view of hallway towards staircase

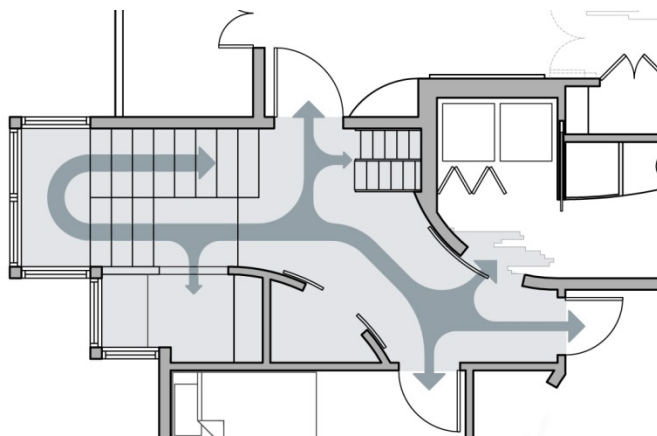


Figure 299. Second Floor Transitional Space – flow diagram

Vertical

- Stair – simple circulation
- Stair – open for air circulation
- Stair – closed tread and riser
- Landing – pause in stair
- Alternating Tread – space conscious vertical circulation
- Alternating Tread – open tread to create transparency
- Alternating Tread – tread becomes shelf for storage or display

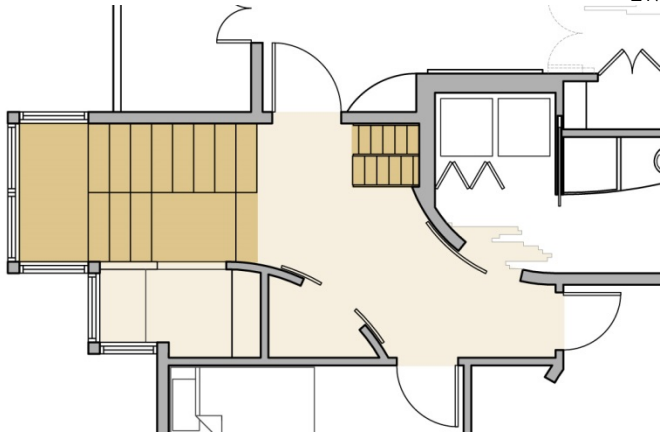


Figure 300. Second Floor Transitional Space - vertical circulation diagram



Figure 301. Second Floor Transitional Space - view of stairwell



Figure 302. Second Floor Transitional Space - view of alternating stair leading to loft

Connections

- Standard Door – pivot hinge
- Standard Door – dynamic articulation between door and wall
- Standard Door – clear slab of wood
- Curved Door – runs along a track similar to a bar door
- Curved Door – dynamic articulation between door and wall
- Curved Door – slab of wood, maybe articulated for ease of opening

Alcove

- Scale – small niche off of main staircase
- Scale – for one person
- Function – bookshelf
- Function – window seat

Storage

- Closet – primary storage for the second floor including cleaning supplies, extra linens, etc.
- Alternating Tread Shelves – storage or display for smaller items on extended treads that become shelves

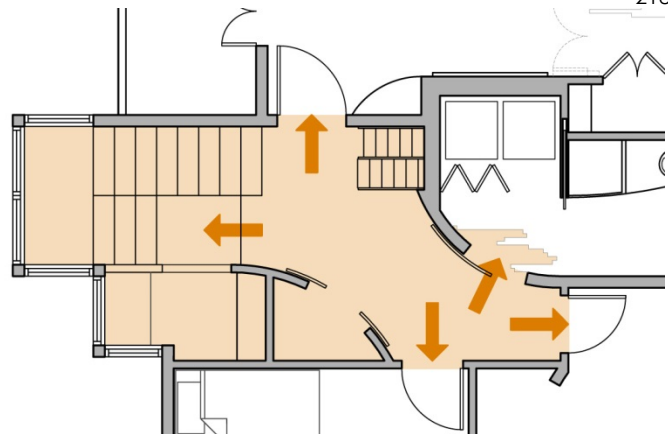


Figure 303. Second Floor Transitional Space - connection diagram



Figure 304. Second Floor Transitional Space - view of niche from stair landing

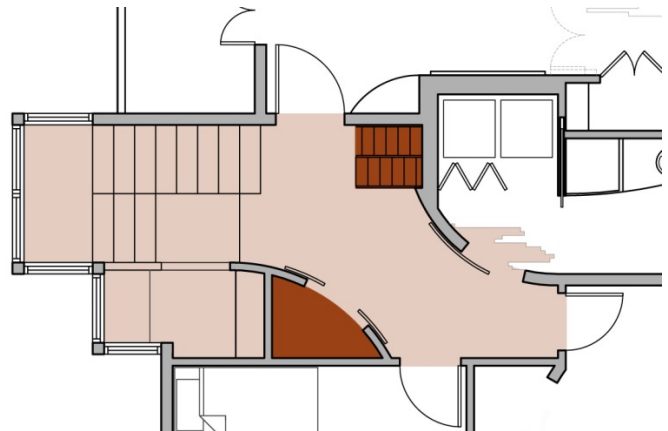


Figure 305. Second Floor Transitional Space - storage diagram

Scale

- Cathedral ceiling – follows the underside of the roof
- Cathedral ceiling – opens up into loft area to keep hall from becoming too cavernous
- Cathedral ceiling – opens up to natural light from loft
- Cathedral ceiling – air movement

Natural Light

- Sunlight – south facing windows allows sunlight to come in from the stairwell
- Sunlight – windows in the loft brings in western light
- Shading – summer sun is blocked by roof overhang
- Shading – summer sun is blocked by exterior shading device



Figure 306. Second Floor Transitional Space - section perspective diagram showing scale



Figure 307. Second Floor Transitional Space - natural light 3/21 at 12 pm



Figure 308. Second Floor Transitional Space - natural light 6/21 at 12 pm

Artificial Light

- Function – supplemental lighting source
- Function – visibility for circulation
- Function – lighting near the sink
- Display – statement light highlights landing
- Effect – warm lighting to complement the walls



Figure 309. Second Floor Transitional Space - natural light 9/21 at 12 pm



Figure 310. Second Floor Transitional Space - natural light 12/21 at 12 pm

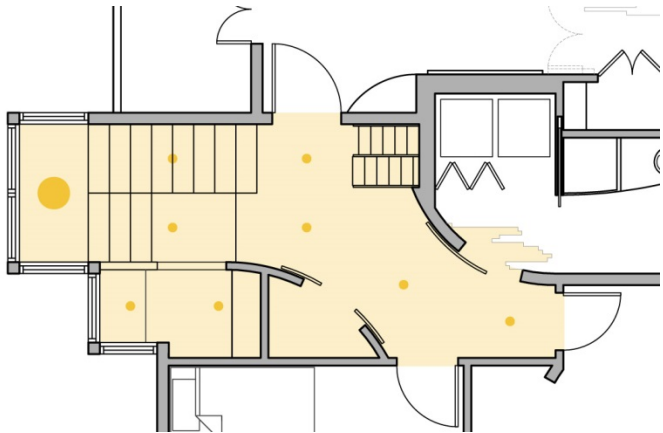


Figure 311. Second Floor Transitional Space - artificial lighting diagram

Patterns & Materials

- Locally sourced materials – reclaimed wood floor
- Locally sourced materials – light colored hardwood accents
- Consistency – same flooring found in bedrooms
- Orientation – flooring perpendicular to stair drawing users into hall
- Coloration of walls – light neutral colored tiles
- Accents – natural wood handrails, bookshelves and doors
- Accents – stainless steel integrated into railing for light feeling
- Textiles – colorful banners complementing wall color in alcove

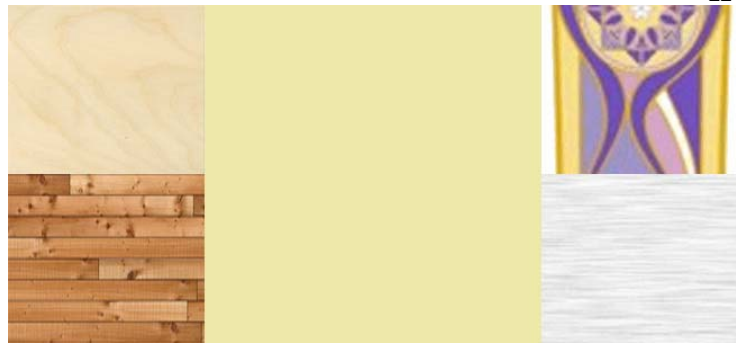


Figure 312. Second Floor Transitional Space - patterns and materials

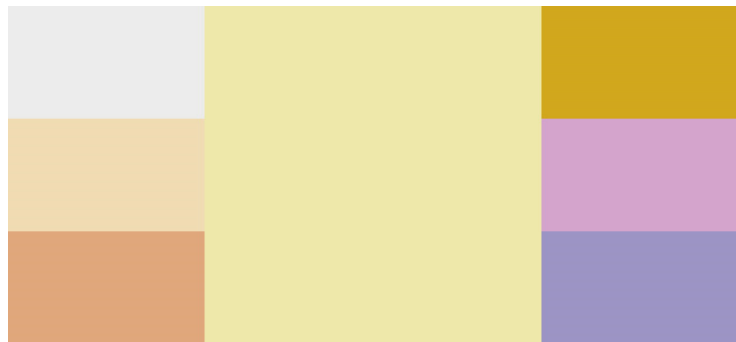


Figure 313. Second Floor Transitional Space - Color Palette

Colors

- Complementary Color Palette
- Wood Floor – ground the space and provides a soft, warm feeling to the space
- Pale Yellow – brightens the space with a neutral color
- Pale Yellow – muted shade for a calming feeling
- Textiles – lavender and purple colors complement walls
- Accents – brushed steel in stair railing
- Accents – light wood in handrails, bookshelves and doors

4.3.7 Loft

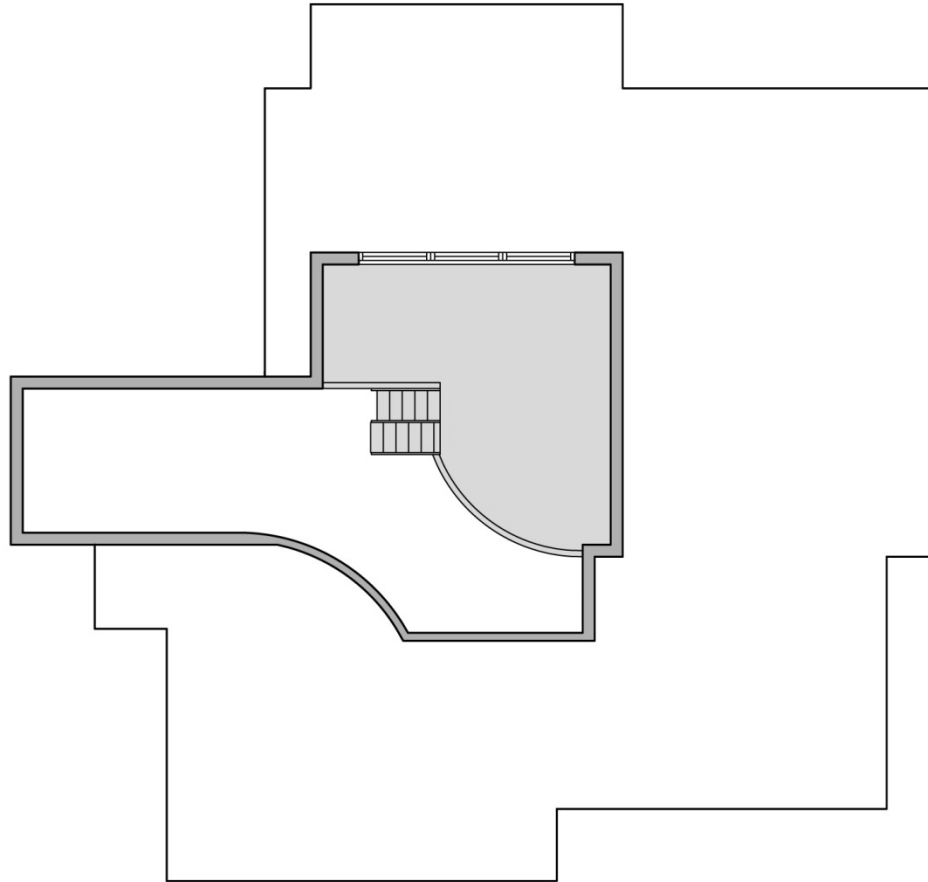


Figure 314. Children's Loft

| | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|-------------|-----------|---------------|------------------|----------------------|-------------|----------------------|
| Feng Shui | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Light Green | Light Green |
| Biophilic Design | Orange | White | Blue-Gray | Yellow-Green | White | Light Green | Light Green | Light Green |
| Environmental Psychology | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Light Green | Light Green |

To make use of space created under by the roof the area that a human would comfortable stand up in has been opened into the hallway to create a loft. For Elan's family this space serves as a specific area for Jeremiah and Spirit. This space could also serve as storage, though the only access to the space is by an alternated tread stair.

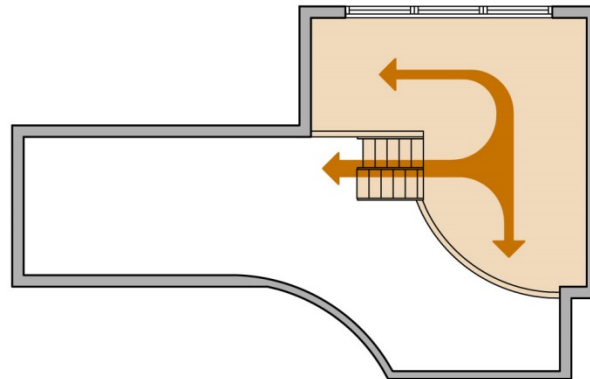


Figure 315. Loft - circulation diagram

Circulation

- Pathways – open
- Pathways – alternating tread stair leading up to the space

Scale

- See Figure 306
- Lower ceiling - keeps the room from feeling too cavernous
- Lower ceiling - creates a more intimate feeling

Climate

- Temperature – ambient temperature from the second floor
- Temperature – operable windows allow warm air to escape
- Ventilation – operable casement windows for prevailing winds
- Ventilation – provides ventilation for second floor transitional space
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises

Natural Light

- Dynamic light – Figure 307-310
- Shading – summer sun is blocked by roof overhang

Artificial Lighting

- Function – provide visibility for circulation after dark
- Function – continuation of hallway lighting
- Effect – neutral or warm light to avoid altering wall color

Patterns & Materials

- Continuation of second floor transitional spaces – Figure 312

Color

- Continuation of second floor transitional spaces – Figure 313

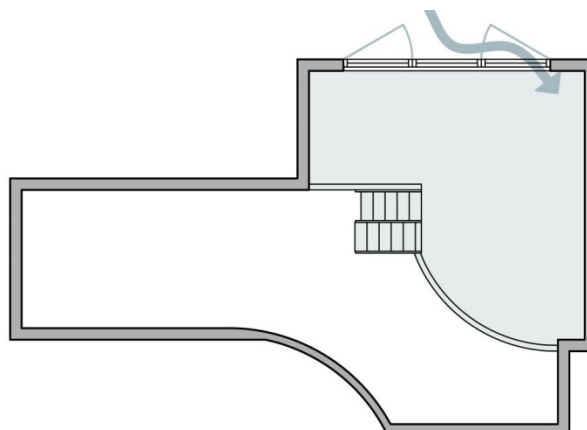


Figure 316. Loft - climatic diagram

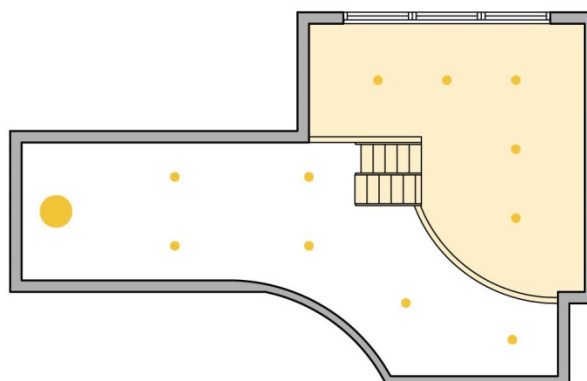


Figure 317. Loft - artificial light diagram

Connection to Nature

- Windows – brings in light
- Windows – allows sound to come in
- Windows – allows smells to come in
- Windows – provides views to the surrounding
- Materials – use of local materials
- Colors – earth tone

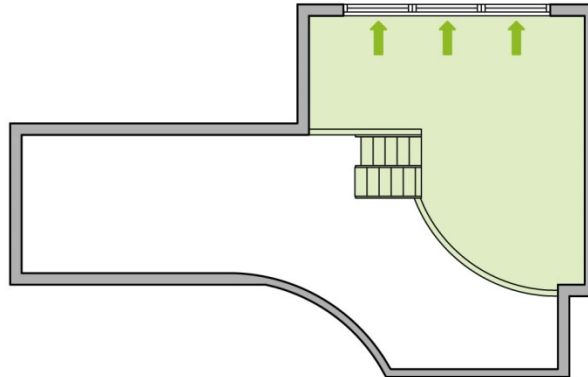
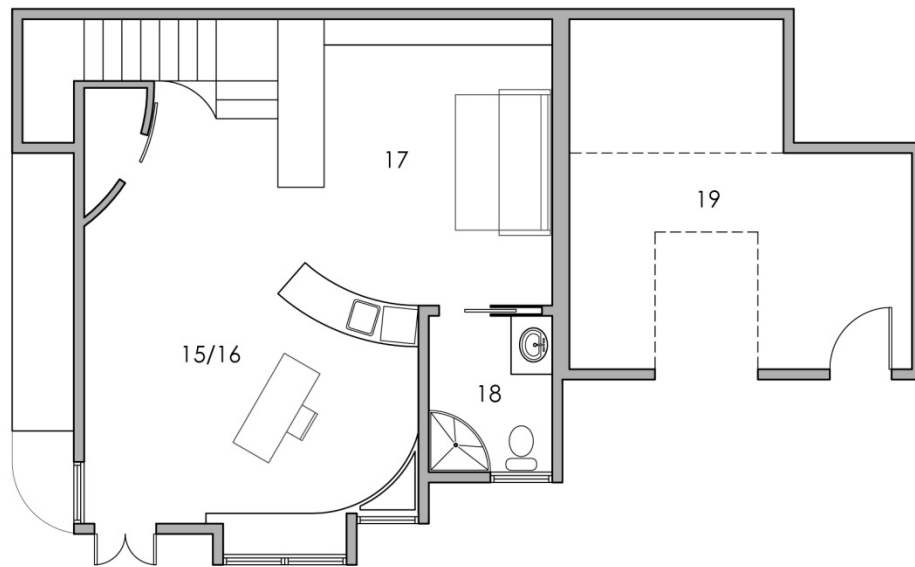


Figure 318. Loft - connection to nature diagram

4.4 Lower Floor



- 15 – Office
- 16 – Alternative Layout - Suite
- 17 – Guest Room
- 18 – Guest Bathroom
- 19 – Mechanical and Outdoor Equipment Storage

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4.4.1 Office

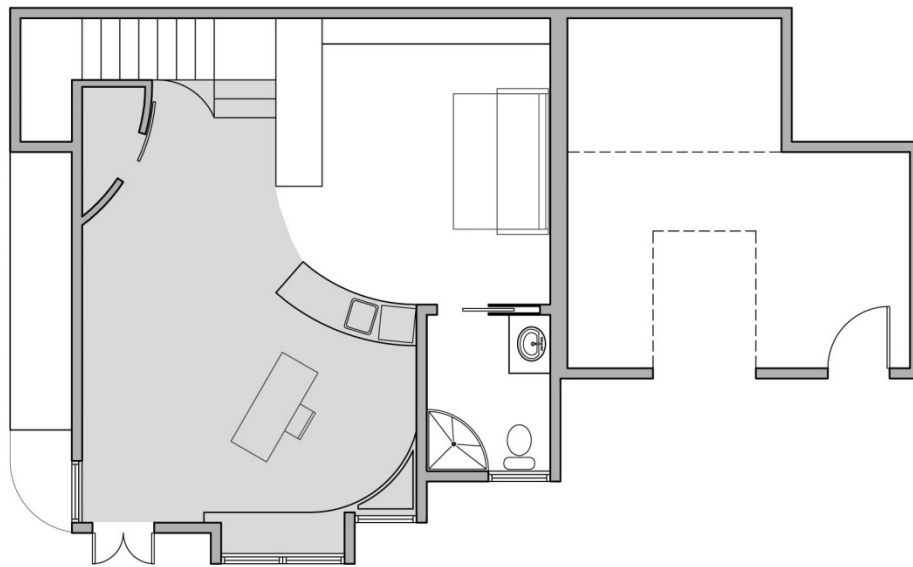


Figure 319. Office

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|----------|-------------|-------------|-----------|---------------|------------------|----------------------|-------------|----------------------|
| Feng Shui | Dark Brown | Dark Red | Orange | Light Brown | Blue-Grey | Yellow-Green | Yellow | Light Green | Light Green | Light Green |
| Biophilic Design | White | White | Orange | White | Blue-Grey | Yellow-Green | White | Light Green | Light Green | Light Green |
| Environmental Psychology | White | Dark Red | Orange | Light Brown | Blue-Grey | Yellow-Green | Yellow | Light Green | Light Green | Light Green |

The main part of the lower floor is devoted Elan's office. She is an accountant as well as an author, both tasks she'd work on here. The stair from the main level follows the back wall to turn and deposit users into the lower floor in between the two main sources of storage for the floor. The primary office furniture is located closest to the pond to take advantage of natural light as well as the views. A small counter creates a niche where Elan can sit at her desk. The rest of the room is left open to accommodate the potential for larger meetings with clients.



Figure 320. Office - view from stairs



Figure 321. Office - view of desk area



Figure 322. Office - view in office towards guest room

Orientation

- Command position – desk oriented towards entry to space through stairs
- Command position – desk oriented towards entry from outdoors
- Defenses space – niche creates a safe domain for back of users at desk

Storage

- Closet – primary storage for lower floor
- Cabinet – small storage in addition to small sink and refrigerator
- Window seat – cubbies below window seat

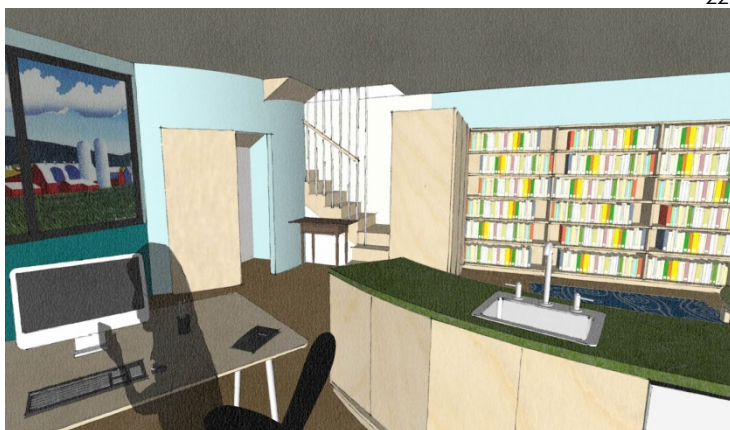


Figure 323. Office - view in office towards stairs

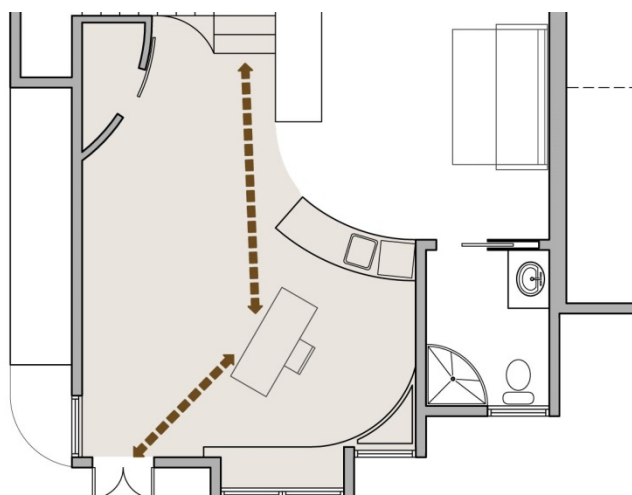


Figure 324. Office - orientation diagram

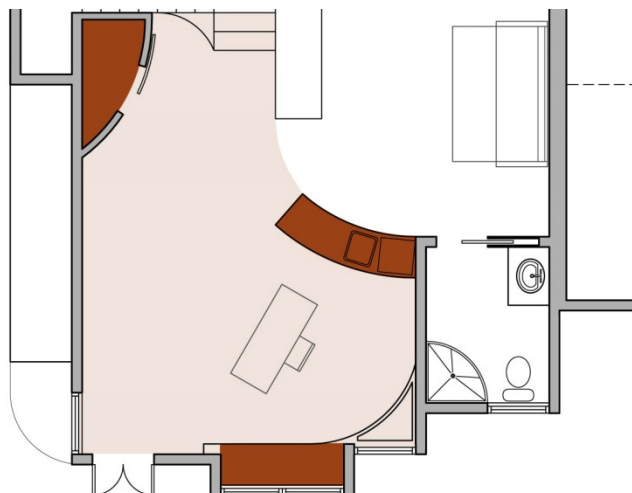


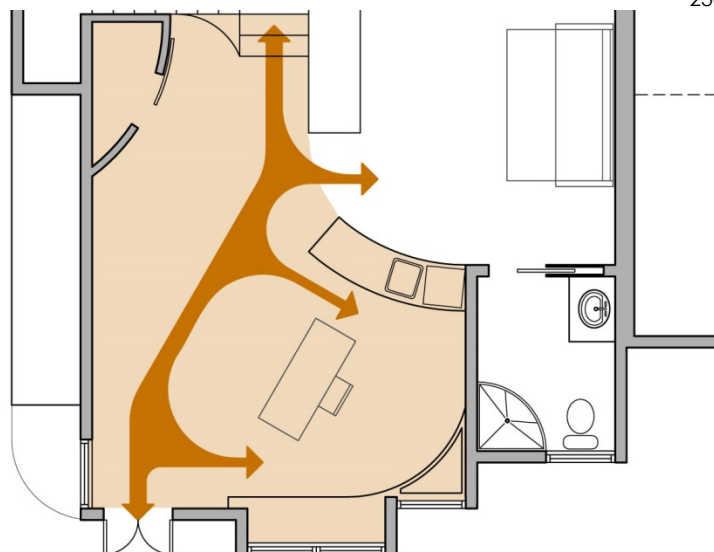
Figure 325. Office - storage diagram

Circulation

- Pathways – uncomplicated
- Pathways – kept clear of objects
- Space – ample room around fixtures for ease of movement of multiple occupants
- Entry – stair from main floor

Scale

- Ceiling Height – larger open space, taller ceiling (9 feet high)
- Ceiling Height – taller ceiling to keep space from feeling claustrophobic
- Ceiling Height – relatively low to keep room from feeling cavernous

**Figure 326. Office - circulation diagram****Figure 327. Office - scale**

Climate

- Temperature – radiant heat
- Temperature – passive solar heating
- Temperature – passive cooling from earth
- Ventilation – operable casement windows
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises
- Noises – sounds from the bathroom

Natural light

- Sunlight – east facing windows creates dynamic shadows
- Shading – summer sun is blocked by deck above

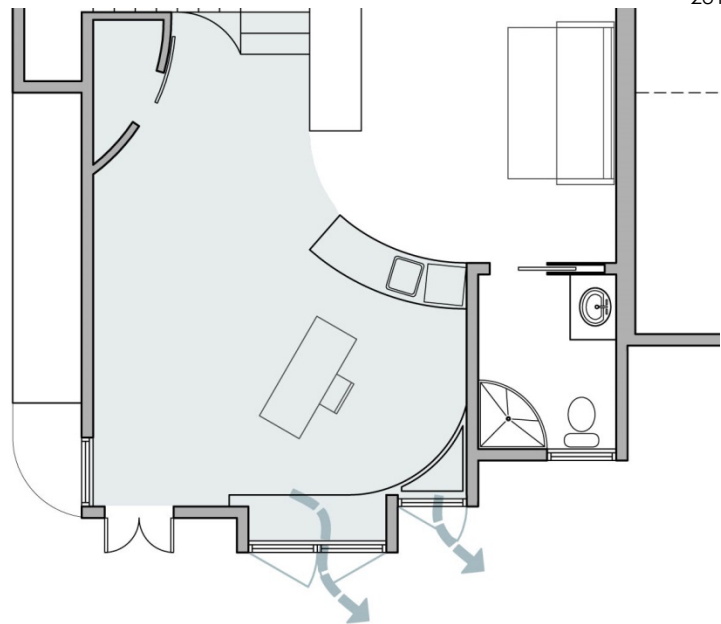


Figure 328. Office - climatic diagram



Figure 329. Office - natural light 3/21 at 9 am

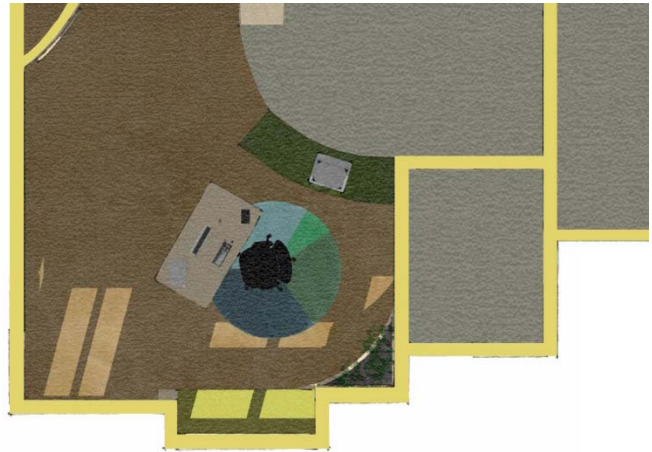


Figure 330. Office - natural light 6/21 at 9 am

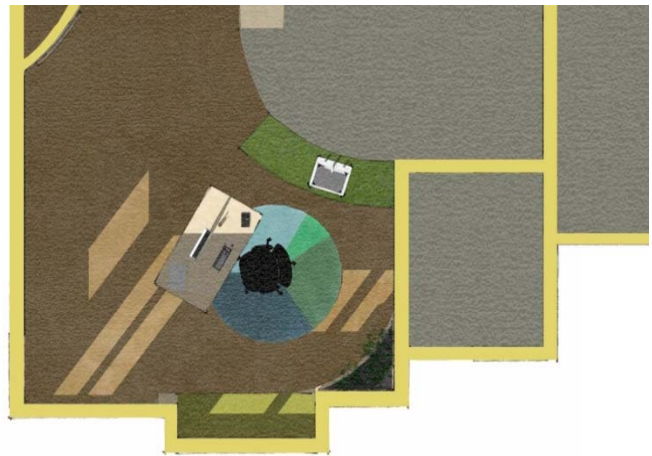


Figure 331. Office - natural light 9/21 at 9 am

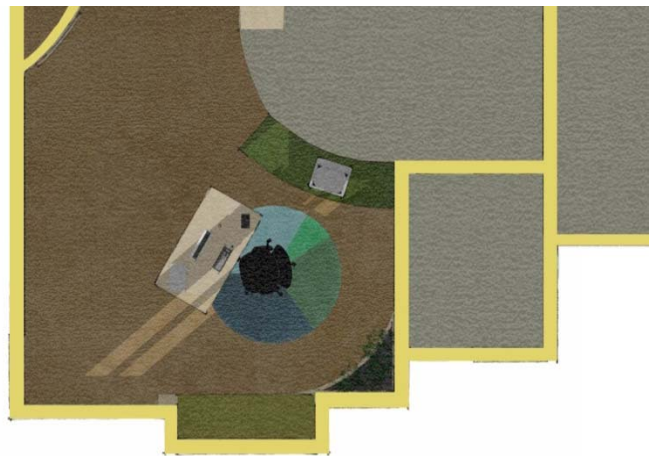


Figure 332. Office - natural light 12/21 at 9 am

Artificial Lighting

- Function – supplemental lighting source
- Function – visibility for circulation
- Function – lighting near the sink and refrigerator
- Function – task lighting on desk
- Function – large light highlighting central work area
- Effect – warm lighting to complement the walls

Patterns and Materials

- "Earth" material – polished concrete slab
- Locally sourced materials – light colored hardwood accents and built ins
- Coloration of walls – dark to light colors mimic earth to sky
- Organic Patterns – geometric rug pattern
- Organic Patterns – local natural landscape artwork

Color

- Analogous Color Palette
- Dyed Concrete Floor – warmer tone to soften the space
- Dyed Concrete Floor – ground the space
- Teal – brightens the space highlighting office space
- Pale Teal – lighter tone to brighten walls farther away from natural light
- Green – countertops introduces neighboring color in small amounts



Figure 333. Office - natural light diagram



Figure 334. Office - patterns and materials



Figure 335. Office - color palette

- Blue – rug introduces neighboring color in a small amount
- Accents – light wood in handrails, bookshelves and doors
- Accents – dark wood in small amounts to contrast lighter wood

Connection to nature

- Windows – allows sound to come in
- Windows – allows smells to come in
- Windows – provides views to the surrounding
- Materials – use of local materials
- Plants – planter box in the northeastern corner of work space



Figure 336. Office - connection to nature diagram

4.4.2 Alternate Layout - Suite

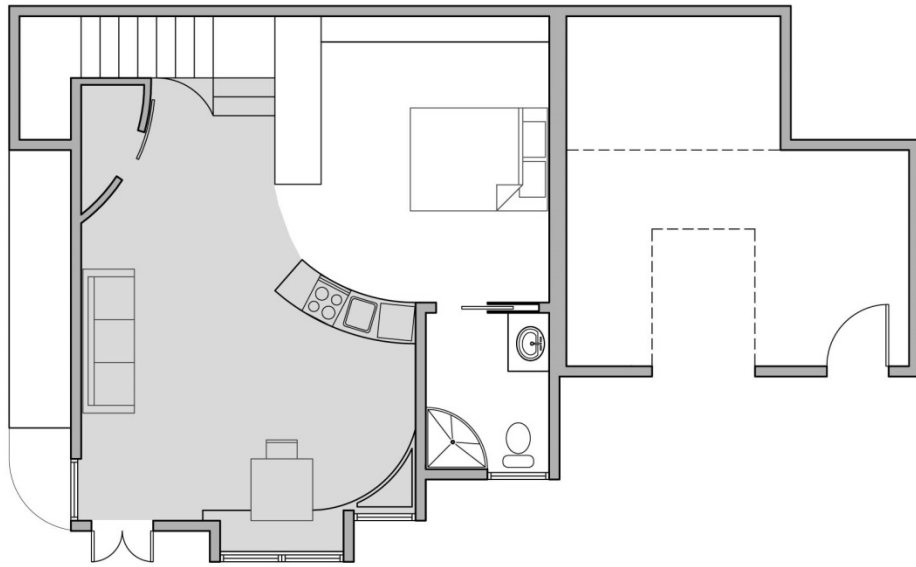


Figure 337. Suite

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|----------|-------------|-------------|-----------|---------------|------------------|----------------------|--------------|----------------------|
| Feng Shui | Dark Brown | Dark Red | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green | Dark Green |
| Biophilic Design | White | White | Orange | White | Blue-Gray | Yellow-Green | White | Light Green | Medium Green | Dark Green |
| Environmental Psychology | White | Dark Red | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green | Dark Green |

Orientation

- Command position – kitchenette has direct view towards entry through stairs
- Command position – seating area has direct view towards entry through stairs
- Command position – seating area has secondary view towards from outdoors
- Triangulation – functions are orientated in a triangular manner to allow for communication between the three

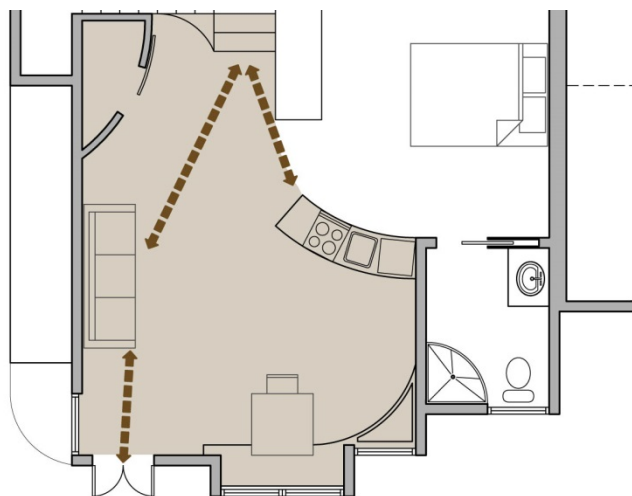


Figure 338. Suite - orientation diagram

Storage

- Same as initial concept – see Figure 325

Circulation

- Pathways – uncomplicated
- Pathways – kept clear of objects
- Space – ample room around fixtures for ease of movement of multiple occupants
- Entry – stair from main floor
- Entry – door way from outdoors

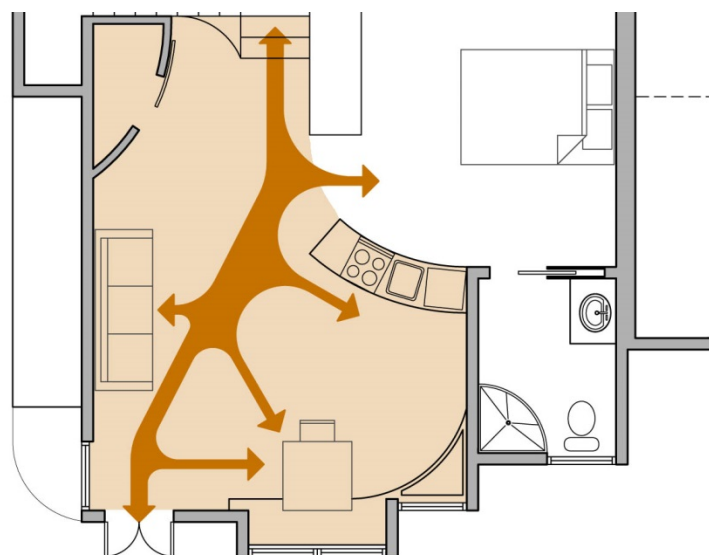


Figure 339. Suite - circulation diagram

Scale

- Same as initial concept – see Figure 327

Climate

- Same as initial concept – see Figure 328

Natural Light

- Same as initial concept – see Figure 329-332

Artificial Lighting

- Function – supplemental lighting source
- Function – visibility for circulation
- Function – lighting near the sink and refrigerator
- Function – task lighting on desk
- Function – large light highlighting central work area
- Function – additional task lighting around new furniture
- Effect – warm lighting to complement the walls

Patterns and Materials

- Same as initial concept – see Figure 334

Color

- Same as initial concept – see Figure 335

Connection to Nature

- Same as initial concept – see Figure 336

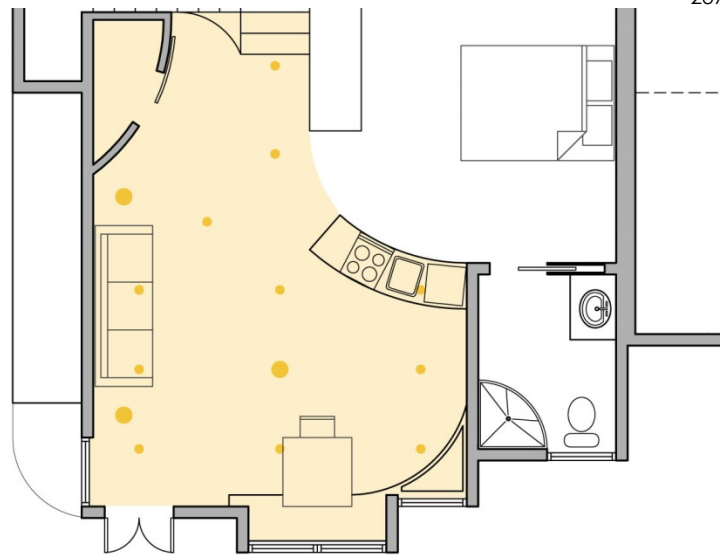


Figure 340. Suite - natural light diagram

4.4.3 Guest Room

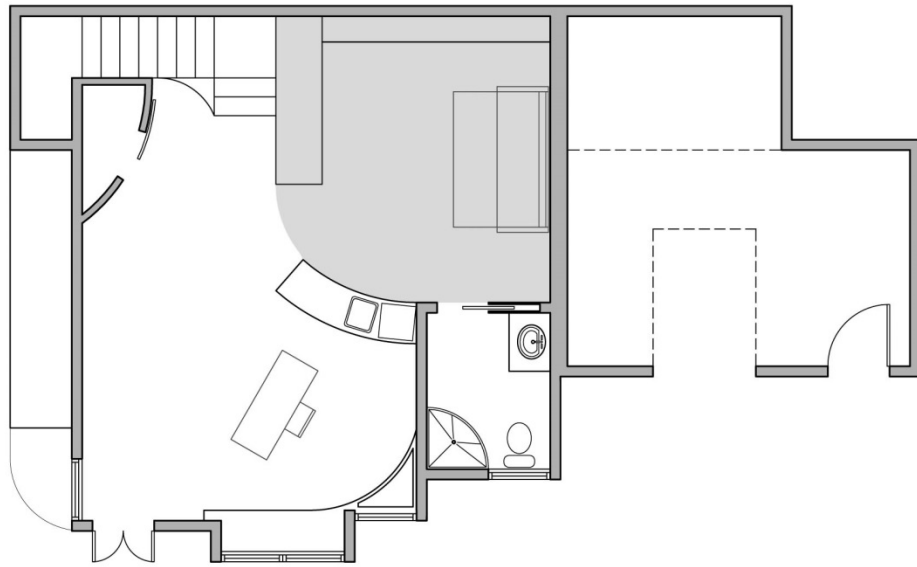


Figure 341. Guest Room

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors |
|--------------------------|-------------|----------|-------------|-------------|-----------|---------------|------------------|----------------------|--------------|
| Feng Shui | Dark Brown | Dark Red | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green |
| Biophilic Design | White | White | Orange | White | Blue-Gray | Yellow-Green | White | Light Green | Medium Green |
| Environmental Psychology | White | Dark Red | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Medium Green |

Adjacent to the office space is a guest room that doubles as a library. For accounting as well as research for writing, Elan has a significant number of books. Having them in this area keeps them close by, but also tucked away to keep from being distracting. The furnishings are rather simple with just a futon that can be flattened for use as a guest room. Separating the guest room from the stair is a closet.



Figure 342. Guest Room - view of storage



Figure 343. Guest Room - view of guest room with futon laid out

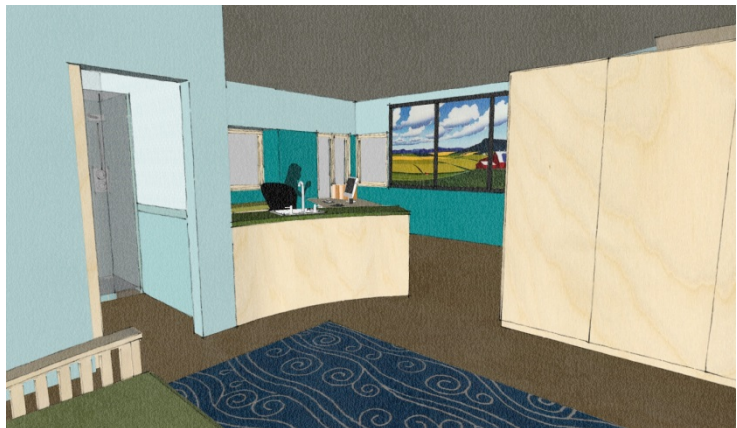


Figure 344. Guest Room - view towards office

Orientation

- Command position –
Futon has a direct view
to the main entrance to
the area

Storage

- Bookshelf – along west
wall protected from
sunlight
- Closet – primary storage
for guests as well as linen
storage

Circulation

- Pathways –
uncomplicated
- Pathways – kept clear of
objects
- Pathways – curved path
from office to bathroom
- Space – ample room
around fixtures for ease
of movement of multiple
occupants
- Door – bathroom door
out of way
- Entry – main entry from
office between closet
and cabinet

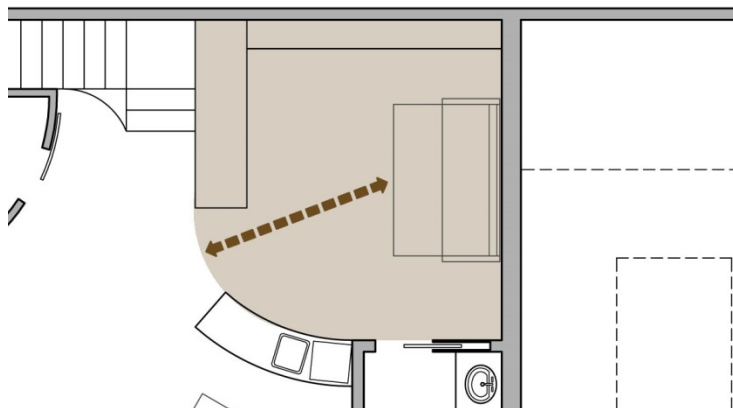


Figure 345. Guest Room - orientation diagram

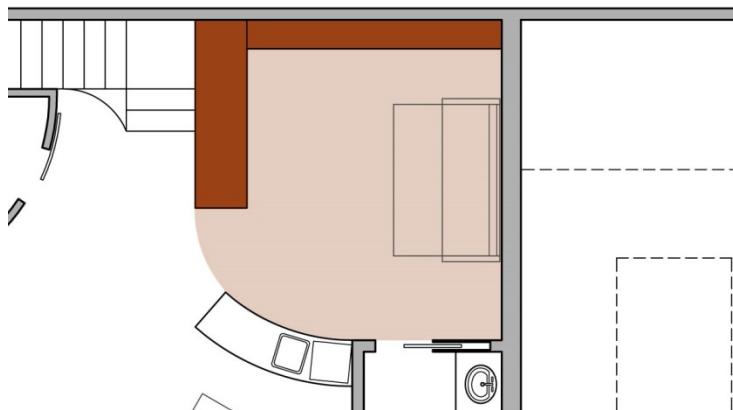


Figure 346. Guest Room - storage diagram

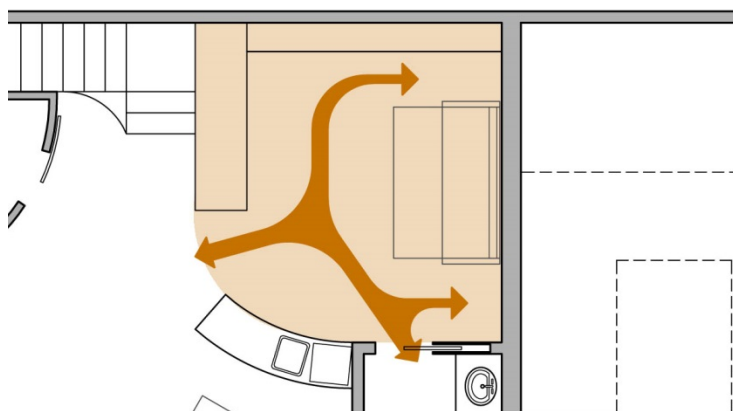


Figure 347. Guest Room - circulation diagram

Scale

- Ceiling Height – nine foot tall consistent with office ceiling
- Fixture height – seven feet tall bringing scale down within guest room
- Fixture height – two foot gap between fixture and ceiling to connect guest room with the rest of the lower floor

Climate

- Many climatic concerns are tied to the offices – Figure 328
- Noise – insulated thickened wall between guest room and mechanical room

Natural light

- Shaded – no natural light

Artificial lighting

- Function – primary lighting source
- Function – visibility for circulation
- Function – large central light
- Function – additional task lighting around furniture
- Effect – warm lighting to complement the walls



Figure 348. Guest Room - scale

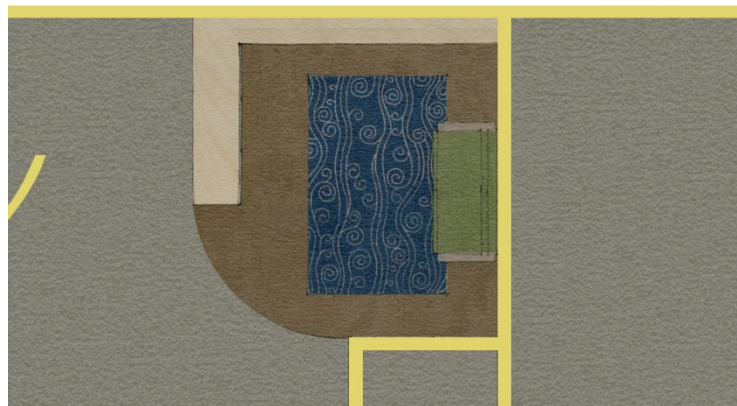


Figure 349. Guest Room - natural light or lack thereof

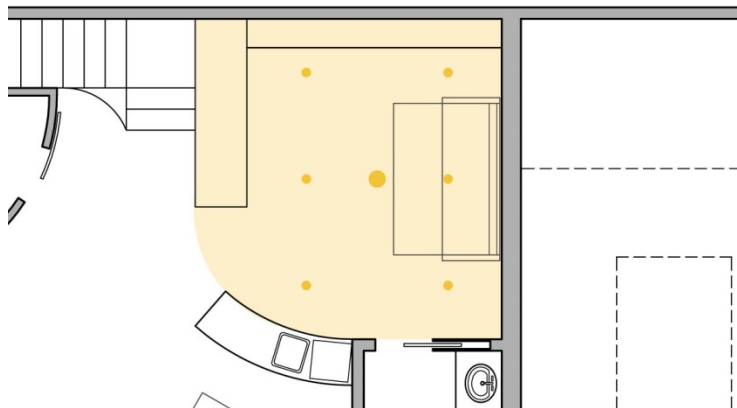


Figure 350. Guest Room - artificial lighting diagram

Patterns and materials

- "Earth" material – polished concrete slab
- Locally sourced materials – light colored hardwood accents and built ins
- Coloration of walls – light color to brighten the space
- Organic Patterns - geometric rug pattern
- Organic Patterns – local natural landscape artwork



Figure 351. Guest Room - patterns and materials

Color

- Analogous Color Palette consistent with office
- Dyed Concrete Floor – warmer tone to soften the space
- Dyed Concrete Floor – ground the space
- Pale Teal – lighter tone to brighten walls farther away from natural light
- Green – countertops and textiles introduces neighboring color in small amounts
- Blue – rug introduces neighboring color in a small amount
- Accents – light wood in handrails, bookshelves and doors
- Accents – charcoal accents in very small amounts

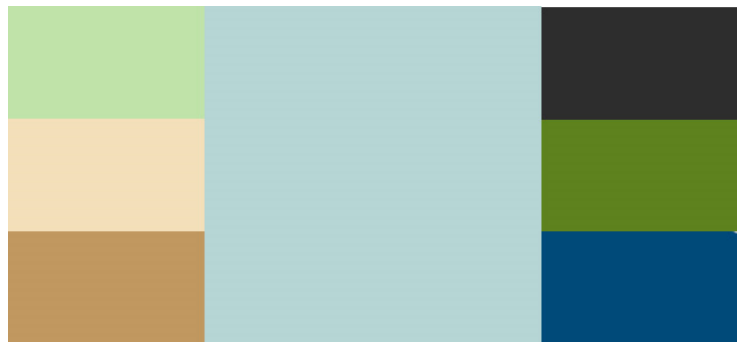


Figure 352. Guest Room - color palette

4.4.4 Guest Bathroom

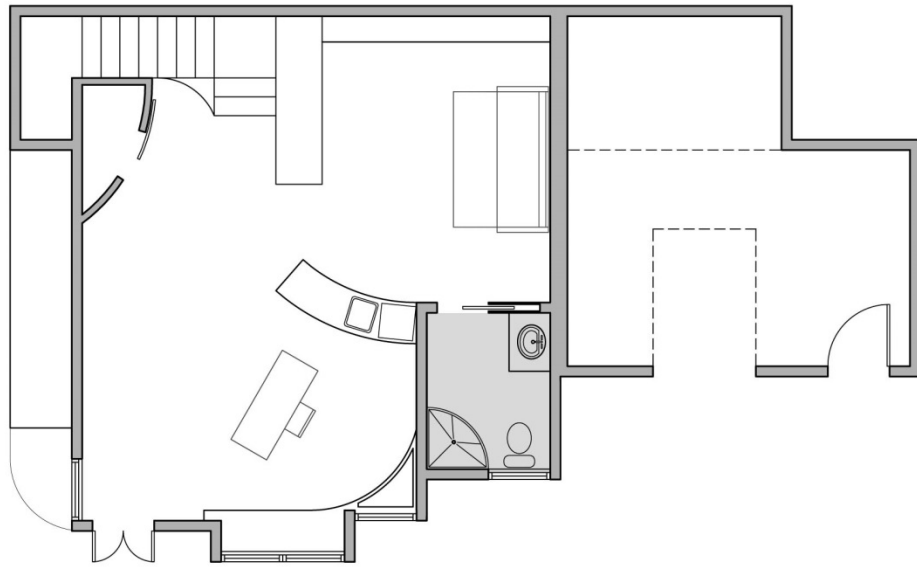


Figure 353. Guest Bathroom

| | Orientation | Storage | Circulation | Scale | Climate | Natural Light | Artificial Light | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|-------------|----------|-------------|-------------|-----------|---------------|------------------|----------------------|-------------|----------------------|
| Feng Shui | Dark Brown | Dark Red | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Light Green | Light Green |
| Biophilic Design | White | White | Orange | White | Blue-Gray | Yellow-Green | White | Light Green | Light Green | Light Green |
| Environmental Psychology | White | Dark Red | Orange | Light Brown | Blue-Gray | Yellow-Green | Yellow | Light Green | Light Green | Light Green |

The guest bathroom is kept small and simple since it is not the primary bathroom. A pocket door slides back to reveal a sink immediately adjacent to the entry and a corner shower tucked in diagonally opposite. In the remaining corner is the toilet with a window above it for ventilation.



Figure 354. Guest Bathroom - entrance to bathroom

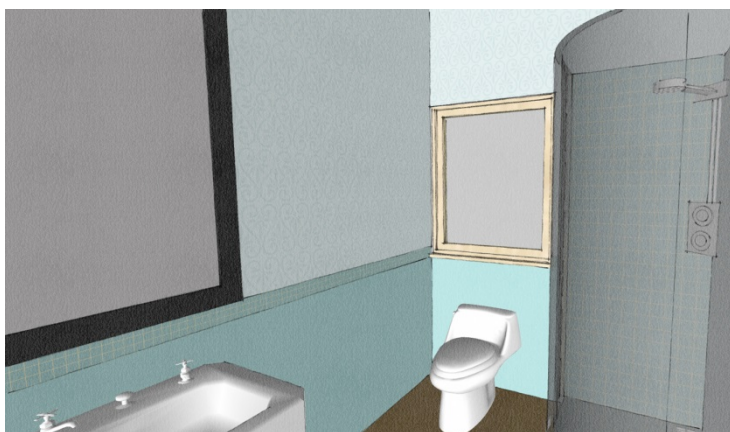


Figure 355. Guest Bathroom - view of bathroom



Figure 356. Guest Bathroom - view towards entrance of bathroom

Orientation

- Initial view into the bathroom
- Toilet tucked out of initial view upon entry

Storage

- Closet – the primary storage is in guest room for linens and cleaning materials
- Pedestal sink – select a sink with ample space along the edge for storage of small hygiene items, i.e. toothbrush

Circulation

- Pathways – uncomplicated
- Pathways – kept clear of objects
- Space – room around fixtures for ease of movement
- Singular entry point – for privacy and control of space

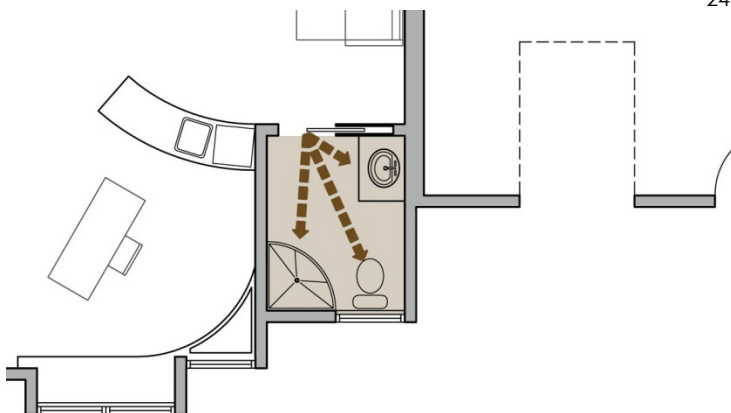


Figure 357. Guest Bathroom - orientation diagram

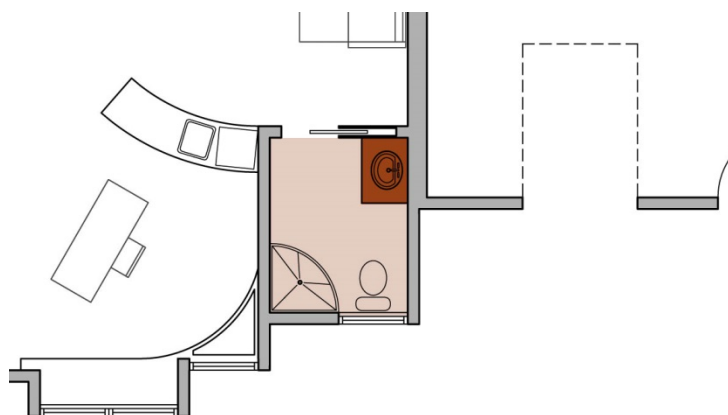


Figure 358. Guest Bathroom - storage diagram

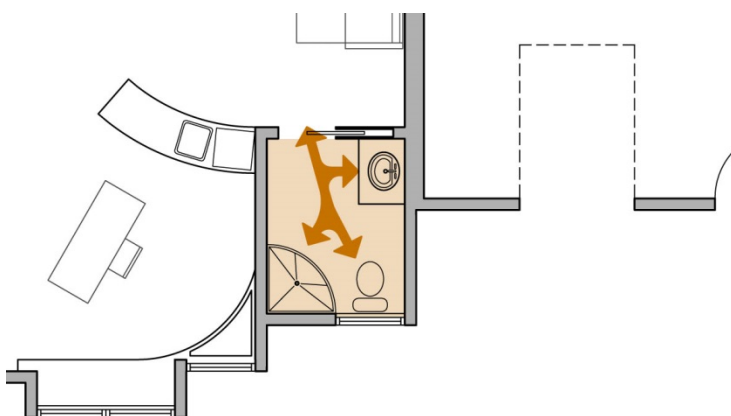


Figure 359. Guest Bathroom - circulation diagram

Scale

- Lower ceiling - keeps the room from feeling too cavernous
- Chair rail – splits wall, making it feel shorter

Climate

- Temperature control
- Ventilation – operable casement windows
- Ventilation – additional mechanical ventilation near shower and toilet
- Noise – operable windows bring in ambient natural noises
- Noise – operable windows bring in less desirable noises
- Noises – sounds from this room are buffered by insulated walls

Natural Light

- Natural light – East facing window provides natural light for the room
- Natural light – light tracks along the north wall not floor
- Shading – summer sun is blocked by deck above



Figure 360. Guest Bathroom – scale

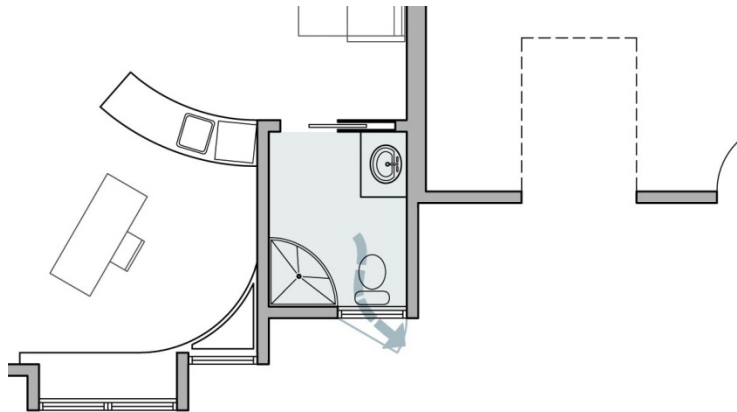


Figure 361. Guest Bathroom - Climatic Diagram

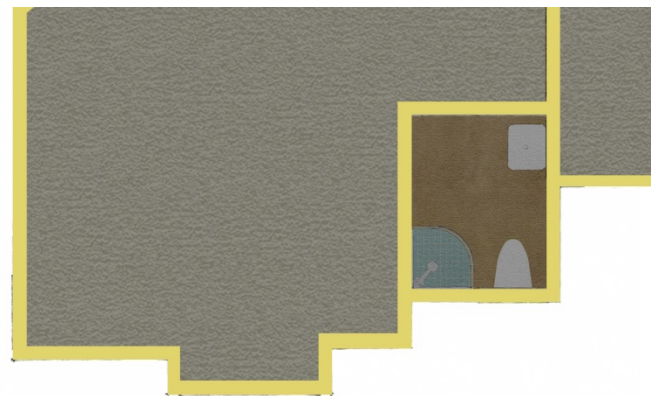


Figure 362. Guest Bathroom - natural light while not seen on the floor due to the overhang above the light does climb up the north wall

Artificial Lighting

- Function – supplement for natural light
- Function – singular central light since it's a small space
- Function – lighting near the sink
- Effect – warm lighting to complement the walls

Patterns & Materials

- “Earth” material – polished concrete flooring
- Locally sourced materials – light colored hardwood accents
- Scale – accent tile in multiple sizes
- Coloration of walls – light color with subtle pattern to create a texture on the walls

Color

- Analogous Color Palette consistent with office
- Dyed Concrete Floor – warmer tone to soften the space
- Dyed Concrete Floor – ground the space
- Pale Teal – lighter tone to brighten walls farther away from natural light
- Tile – Light blue darker than wall color
- Accents – brushed steel hardware
- Accents – off white porcelain in tub and sink for a softer atmosphere

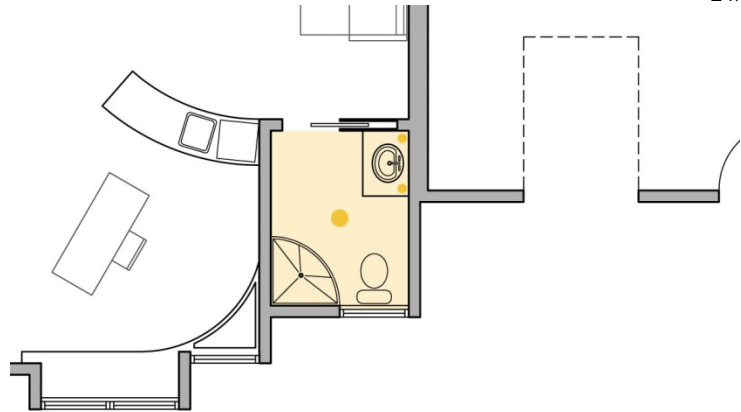


Figure 363. Guest Bathroom - artificial light diagram



Figure 364. Guest Bathroom - patterns and materials



Figure 365. Guest Bathroom - color palette

Connection to Nature

- Windows – allow sound to come in
- Windows – allow smells to come in
- Windows – frosted glass provide obscured view of the surrounding
- Materials – use of local materials

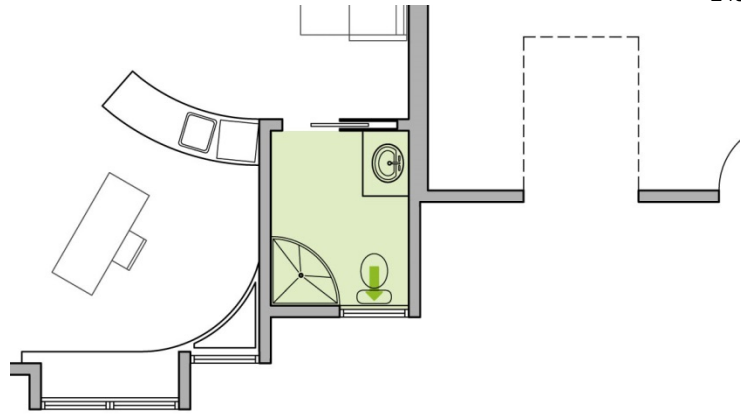


Figure 366. Guest Bathroom - connection to nature diagram

4.4.5 Mechanical/Storage

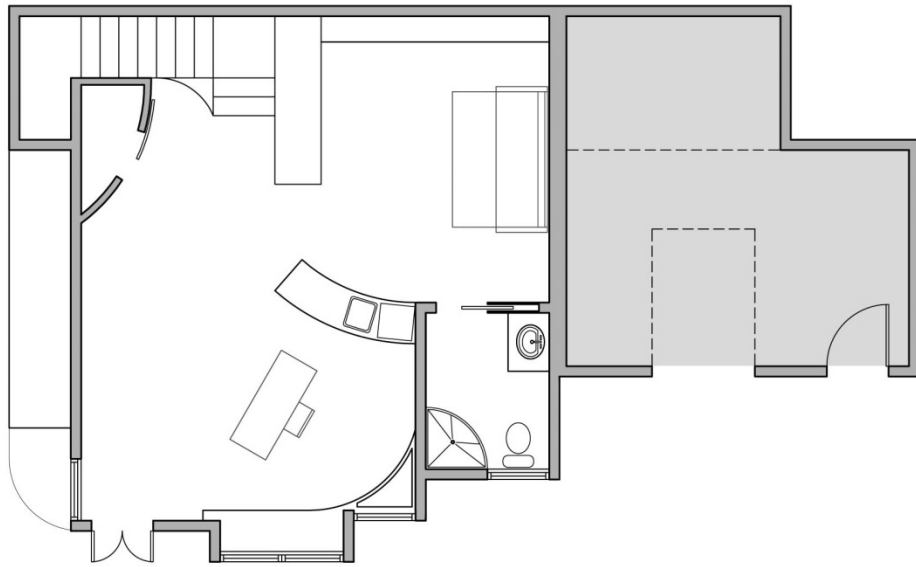


Figure 367. Mechanical/Storage Space

| | | |
|--------------------------|-------------|-------------|
| | Orientation | Circulation |
| Feng Shui | | |
| Biophilic Design | | |
| Environmental Psychology | | |

The remaining space in the lower floor is the mechanical and outdoor equipment storage. It is accessed from either a standard door for general use or a small garage door for larger equipment. The front area is used primarily for storage of tools for lawn maintenance, gardening or recreational equipment. The back area has the mechanical equipment. This includes the standard electrical panel, tank less hot water heater and heating equipment for the home. The primary source of heat is a radiant floor system; the equipment is along the back wall. This is tied to a geothermal heating system that runs along the bottom of the pond.

Layout

- Storage – space for outdoor equipment storage towards doors for access
- Mechanical – tucked in back
- Mechanical – below ground for geothermal system

Circulation

- Pathways – uncomplicated
- Pathways – kept clear of objects
- Space – room around fixtures for ease of movement
- Space – room in rear for maintenance
- Entry – door and small garage door

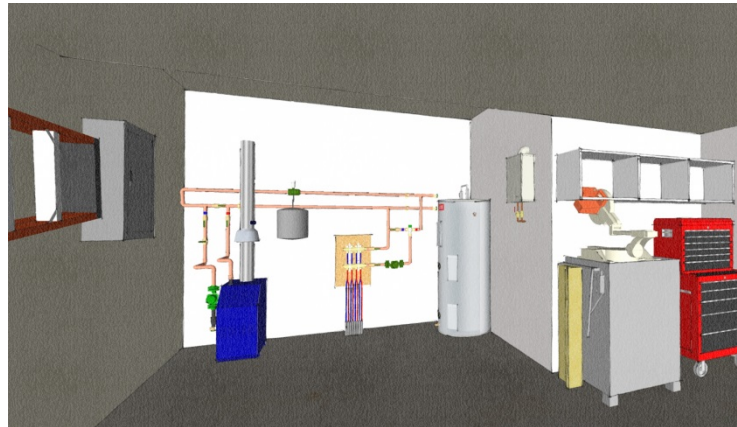


Figure 368. Mechanical and Storage - view of mechanical equipment

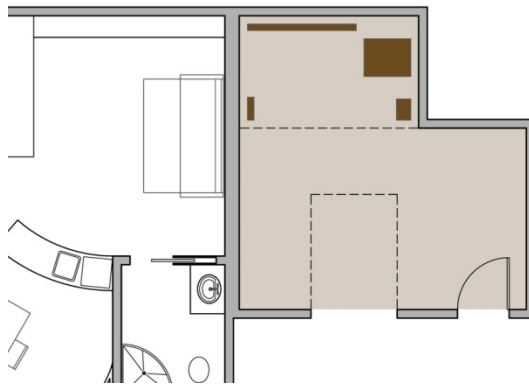


Figure 369. Mechanical and Storage - layout

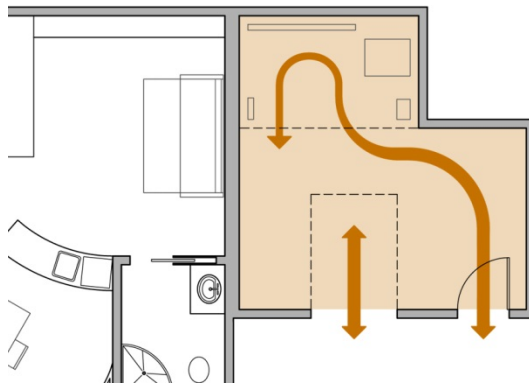


Figure 370. Mechanical and Storage - circulation

4.5 Site

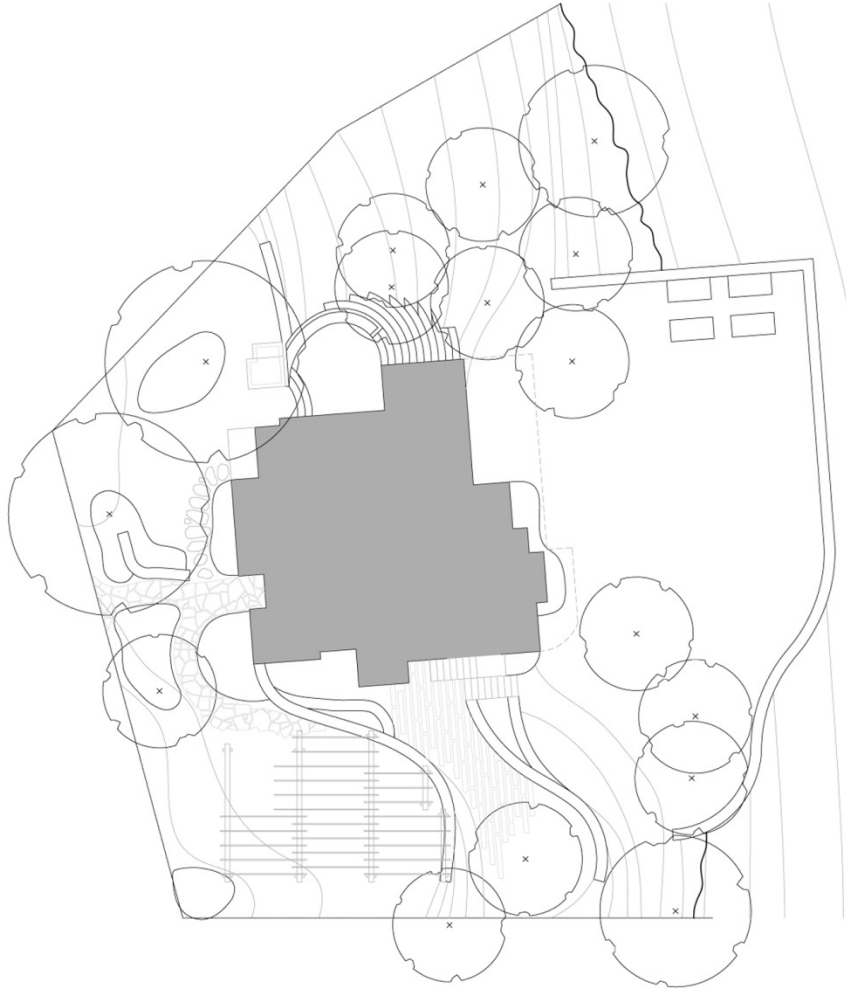


Figure 371. Site

| | View | Circulation | Orientation | Scale | Patterns & Materials | Colors | Connection to Nature |
|--------------------------|--------------|-------------|-------------|-------------|----------------------|--------------|----------------------|
| Feng Shui | Light Orange | Dark Orange | Dark Brown | Light Brown | Light Green | Medium Green | Dark Green |
| Biophilic Design | Light Orange | Dark Orange | White | White | Light Green | Medium Green | Dark Green |
| Environmental Psychology | Light Orange | Dark Orange | White | Light Brown | Light Green | Medium Green | Dark Green |

The final piece of the design is the site. As with most residential designs in this area, the interaction with the site starts with the vehicle. In the south western corner near an existing stone is the driveway. This is based off of the existing driveway, but extended towards the pond to accommodate more than two vehicles. To shelter Elan's cars is a trellis carport with a transparent sheet to protect from rain.

From this area there is a path circling around towards the front entry. This meets up with the primary pedestrian path straight from the road. From this node, a secondary path leads towards the kitchen garden and entry. There are gardens that buffer these circulation spaces from one another and from the main public road.

Around the north side is Leiserl's hutch as well as a meditation circle and restorative garden. Steps from the meditation circle lead down along the side of the house, past the garden to the front lawn.



Figure 372. Site - view (existing) Onion Point Road end, driveway on the left

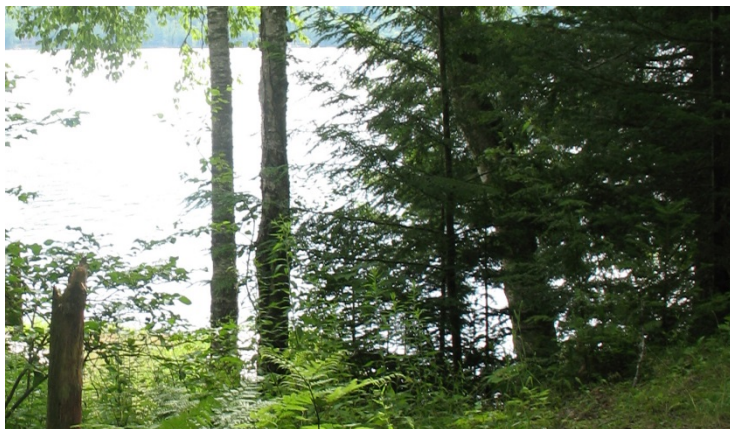


Figure 373. Site - view (existing) from driveway



Figure 374. Site - view (existing) from driveway in winter

The lawn is kept as an open clear grass area besides several raised garden beds in the north eastern corner. A new seawall protects this area from erosion. The lawn is kept open to allow for various activities that can range from some simple lawn chairs or picnic tables to a temporary volleyball or badminton court. The sea wall is extended from the original footprint towards the south with a form that complements the prevailing flow of the pond. This helps protect a pair of existing trees. All trees on the site should be tested and the larger ones preserved.

The last area of the site is to the south of the building. The area is terraced to create habitable space and to discourage movement from the carport directly towards the pond. The main area has permeable pavers to create a patio like area. It can be accessed from a stair leading down from the deck and another stairway towards the front lawn.

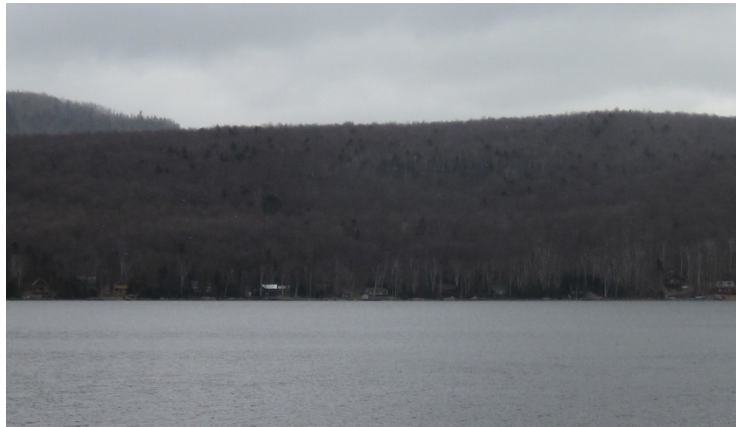


Figure 375. Site - view (existing) from house in winter



Figure 376. Site - view (existing) from house in summer



Figure 377. Site - view (existing) from front lawn to the left towards bay

Circulation

- Vehicular Pathways – direct from the road
- Vehicular Pathways – allows for two vehicles side by side
- Vehicular pathways – sheltered below carport
- Entry – from carport or street
- Pathways – hierarchy for guidance
- Pathways – directed access for clarification of entry
- Pathways – directed access to front lawn for privacy
- Front lawn – no direct paths for different use of space
- Pond – minimal access at existing sandy beach

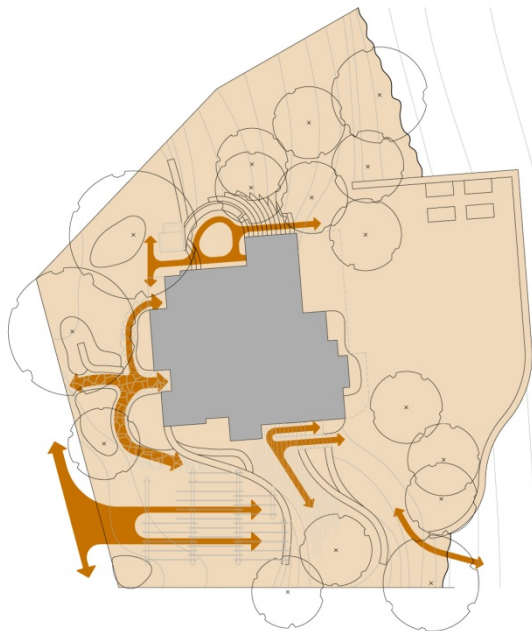


Figure 378. Site - circulation diagram

Orientation

- Neighbors – building located away from pond to keep out of line of sight of northern neighbor
- Neighbors – building located away from pond to keep out of line of sight of southern neighbor

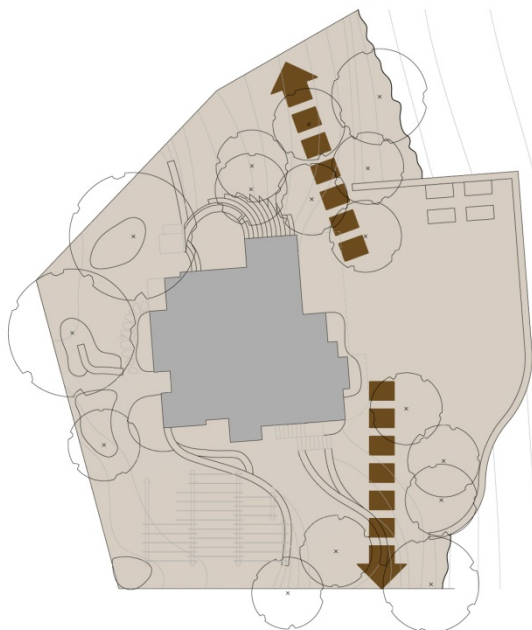


Figure 379. Site - orientation diagram

Scale

- Stepped back – building is pushed back into hill to minimize visual scale from road and pond

Patterns & Materials

- Fieldstone – pathways from local stone
- Cedar Siding – complements natural surroundings
- Cedar Siding – complements other structures
- Cedar Siding – ages to a darker color, same as existing building
- Stone wall – retaining wall out of local stone
- Stone wall – surrounding entry to ground elevation with local stone
- Teal – trim breaking up verticality of siding
- Yellow – window trim
- Yellow – soffits
- Copper – gutters which age to a teal color
- Standing Seam Roof – sheds snow from lower sloped roof

Color

- Fieldstone – material represents “earth”
- Siding – warm natural color
- Siding – dynamic with color change
- Gutter – dynamic with color change
- Trim – teal to complement siding as well as gutter
- Soffit – yellow to make the soffit feel lower
- Roof – dark color to melt snow and blend into natural environment



Figure 380. Site - scale



Figure 381. Site - patterns and materials



Figure 382. Site - color palette

Connection to Nature

- Organic Forms – curved retaining walls
- Organic Forms – non rectilinear gardens
- Trees – preserve as many existing larger trees as possible
- Materials – use of local materials
- Materials – use of material that change over time creating a dynamic transformation

Connection to Nature - Trees

- Existing trees - evaluated for health
- Existing trees – larger trees preserved
- Existing trees – overgrowth removed
- New Trees – if an existing tree is removed another must be planted on the site
- New Trees – local species selected
- New Trees – deciduous trees to the south
- New Trees – consider views from home
- New Trees – consider views for neighbors



Figure 383. Site - connection to nature



Figure 384. Site - Connection to nature - trees

Entry Gardens

- Planting – larger shrubs framing entry to home and site
- Planting – height stepping down from larger to smaller
- Planting – guides users from carport
- Planting – less strong guidance towards kitchen, opening to a small lawn
- Planting – bulbs for low maintenance spring
- Plantings – larger plants perennials
- Plantings – smaller plants annuals to allow for customization
- Hardscape – stone wall guides along north of pedestrian path from road, acts as informal seating
- Hardscape – formal fieldstone pedestrian path from road and parking area
- Hardscape – informal minimal stepping stone path towards kitchen entrance
- Hardscape – local stone to harmonize with surroundings
- Colors – warm welcoming colors
- Colors – highlighting entry points for circulation paths to direct users
- Colors – diverse planting to provide color through seasons
- Colors – dogwood bushes has red bark in winter



Figure 385. Site - entry gardens diagrams



Figure 386. Site - entry gardens pathway materials



Figure 387. Site - entry gardens lawn area



Figure 388. Site - entry gardens colors

Meditative Circle and Restorative Garden

- Planting – herb garden near kitchen and rabbit hutch
- Planting – central large rosemary bush, keeps shape through winter
- Planting – larger herbs transitioning from rosemary, i.e. lavender
- Planting – smaller herb annuals filling out garden
- Planting – restorative garden over former site of outhouses
- Planting – plants selected to cleanse the earth
- Planting – larger bushes ground retaining wall and create a natural low wall
- Planting – plants step down towards hardscape elements and trees
- Plantings – lower creeping plants merge into hardscape steps
- Planting – grass within meditative circle
- Planting – living fence surrounding meditative circle, morning glories
- Hardscape – stone retaining wall separates front lawn from rear
- Hardscape – stone wall forms seating around perimeter of circle
- Hardscape – flagstone steps leading towards pond
- Hardscape – local stone to harmonize with surroundings



Figure 389. Site - meditative circle and restorative garden

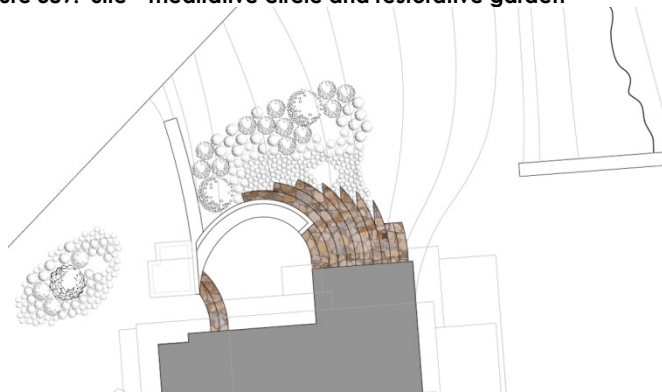


Figure 390. Site - meditative circle pathway materials

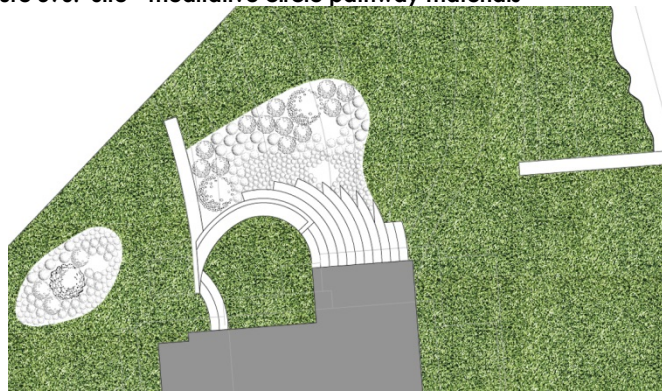


Figure 391. Site - meditative circle lawn



Figure 392. Site - meditative circle colors

- Colors – cooler contemplative colors for personal reflection

Front Lawn with Raised Garden Beds

- Planting – vegetable gardens
- Planting – raised beds for ease of access
- Planting – one bed for children to plant
- Planting – diversify plants within beds
- Planting – grass lawn
- Hardscape – concrete seawall
- Hardscape – raised beds made from a nontoxic material i.e. cedar, recycled composite, or some metals
- Compost – contained composting unit located near gardens, downwind from most of the site

Terraced Patio

- Planting – draping plant for visual impact from stairwell
- Planting – low plant near steps leading down towards pond
- Planting – grass around permeable pavers
- Hardscape – curved stone walls retaining walls
- Hardscape – retaining walls made from local stone to harmonize with surroundings
- Hardscape – permeable pavers
- Colors – warm colors within planters
- Colors – if tree is replaced, flowering tree should replace it

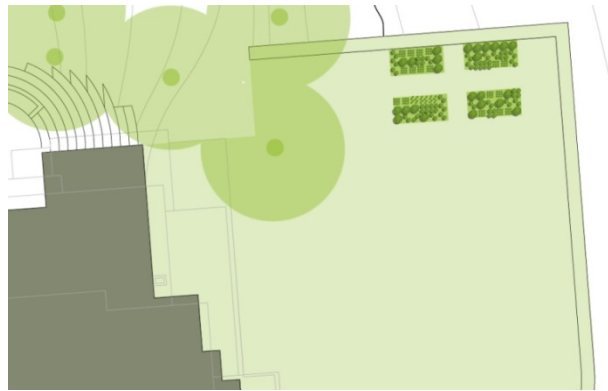


Figure 393. Site - front lawn with raised garden beds



Figure 394. Site - terraced patio

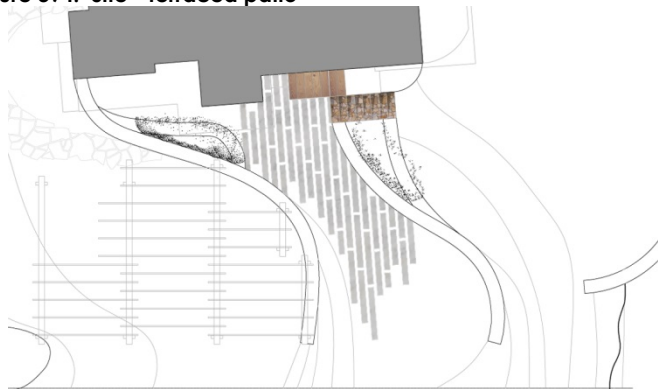


Figure 395. Site - terraced patio pathways



Figure 396. Site - terraced patio lawn

Rabbit Hutch

Animals can have a beneficial effect within the home. Elan has a pet rabbit, Leiserl, who lives in an outdoor hutch. The hutch was also designed to complement the house, while ensuring a space that would create a happy rabbit.

Leiserl is a sized standard rex, a medium sized rabbit six to ten pounds. Her dense fur allows her to be relatively comfortable through the winter months. She is a sweet playful rabbit.

The hutch is designed to accommodate the boisterous rabbit; there is a large main open space. Within it there is a box in the back creating a private nesting area for Leiserl. It's accessed through a small opening in the front face as well as from the top. The box is tall enough for her to fit within it, but low enough for her to hop up on top of; food bowl can be placed up there for extra exercise. The front part of the space is open with the water bowl on a heater in the winter. Through an arched doorway a more secluded private space acts as a bathroom area for Leiserl.

While this analysis is geared towards a pet rabbit, the general principles can be utilized for other pets.

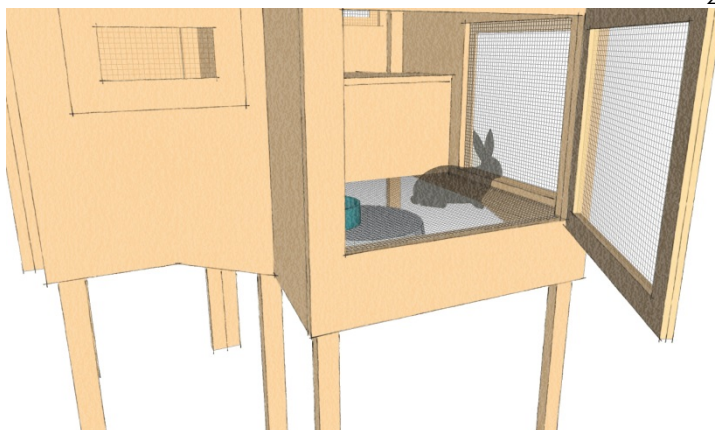


Figure 397. Site - rabbit hutch view of front door

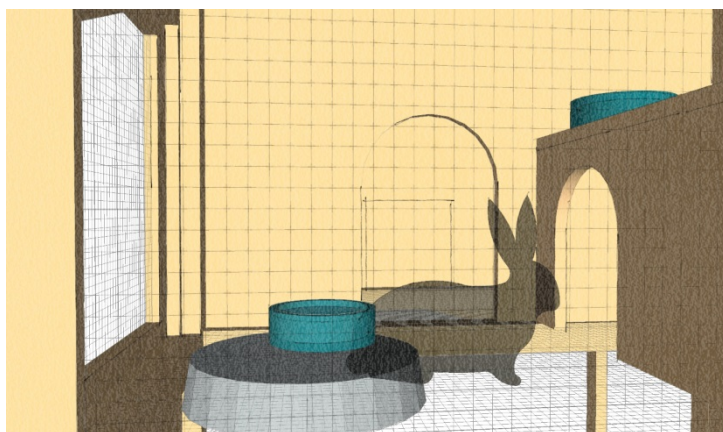


Figure 398. Site - rabbit hutch view of interior living space with heater and water bowl

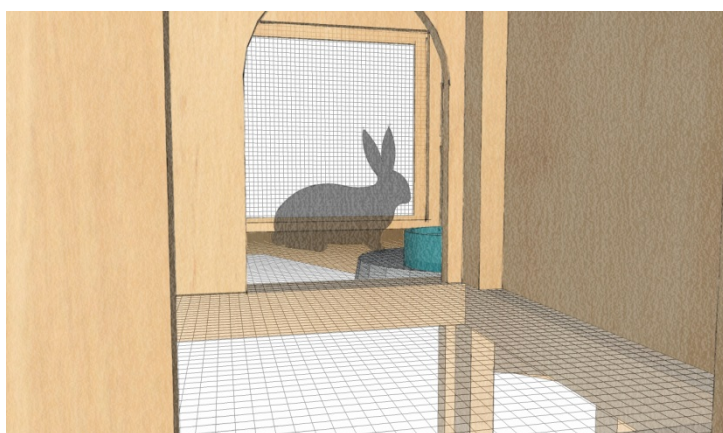


Figure 399. Site - rabbit hutch view towards interior living space from back door

Rabbit Hutch Analysis

- Circulation - simple, straight forward paths
- Circulation - simple for safety
- Circulation - complex enough to keep interest
- Circulation - wide enough doorways for pet's size
- Circulation - enough space for minimal exercise
- Scale - ceiling height to accommodate rabbit height when on hind legs
- Scale - ceiling height low enough to have a comfortable feeling of safety
- Scale - cathedral ceiling allows for second level for rabbit to hop up on
- Scale - cathedral ceiling allows for air circulation
- Climate - oriented to allow for natural ventilation
- Climate - oriented to promote cooling from summer breezes
- Climate - box blocks wind giving options
- Climate - storm windows in winter to block wind
- Climate - hay provided for "insulation" in winter
- Climate - heater to keep water from freezing

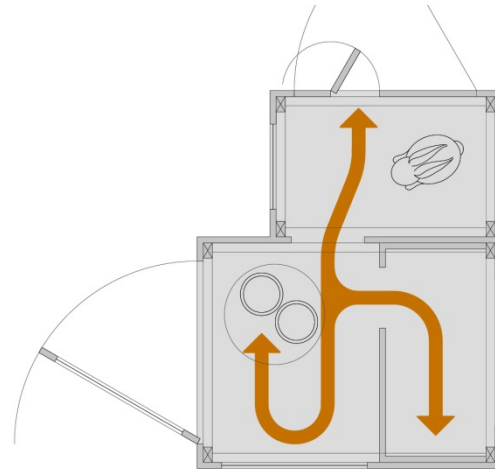


Figure 400. Site - rabbit hutch circulation diagram

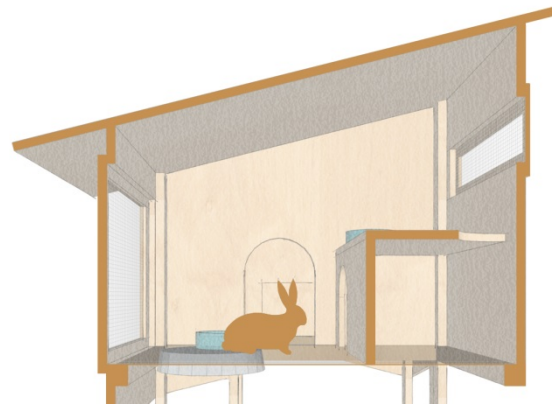


Figure 401. Site - rabbit hutch scale

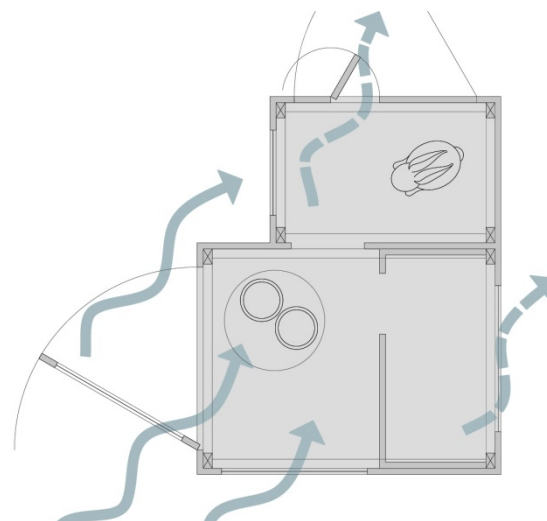


Figure 402. Site - rabbit hutch climate diagram

4.6 Conclusion

The main floor of the home has most of the public spaces. The elements found here are similar to elements found in the private areas, what is different is how the elements are implemented. The second floor and lower floor contain the more private areas.

Orientation is addressed in the living room, kitchen, and master bedroom. The kitchen gives whoever is working the ability to monitor the floor. Seating in the living has a similar goal, which gives users a comfortable, safe feeling. In the master bedroom, all of those factors are taken into consideration for locating the bed.

Almost every room has some form of storage within it. It is either integrated into build-in furniture or separate closets. While there is a significant amount of storage, enough to keep everything organized, but not enough to build up clutter.

When looking at the ceiling height of the room, the footprint was taken into consideration. In the primary living spaces since they are open to each other there are nine foot ceilings. In smaller areas of the first floor and the entire second floor the ceilings are eight feet high.

The overall design takes the natural climate into consideration to minimize the need for the artificial climate, primarily natural ventilation and solar heating. Heating is provided by a radiant system and masonry woodstove. It is broken into zones to allow for user control and comfort.

Natural light was optimized in the entire house for winter providing light and heat. It is blocked by roofs and other shading devices for summer months. The purpose of the artificial lighting is principally to supplement the natural light.

The patterns, materials and colors are mostly based off of personal preference for the client. Warmer earth tones were used in the main living space to create a welcoming space. The bedrooms were much more personalized, but kept gender neutral. The motifs found within the home focus on natural and scientific schemes per the client's interests.

Connection to nature is a very important element for the home. Besides the patterns and materials, plants are used strategically within the space. They are incorporated into the built-ins to act as room dividers as well as decorative dynamic elements. Windows are also used to take advantage of the natural views surrounding the site.

The totality of these elements combine within the building to create a home that promotes, as the title says, holistic dwelling.

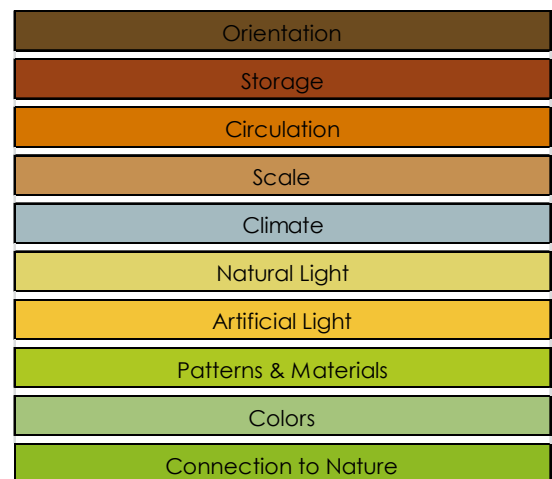


Figure 403. Elements from public and private rooms

5 Concluding Statement

Reflecting upon the entirety of the research, design and analysis, one can see how many different components can be integrated into home design. Every element and detail within a home can have symbol significance and importance for users while impacting their well-being.

The foundation for the document is formed in the research section at the beginning. Background information on biophilic design, environmental psychology and *feng shui* are introduced and explored to produce recommendations for the attributes of the home. The intention of conducting this research was to approach home design in a manner that combined the three methods and develop a way to design that was advantageous from both a psychological and physical stand point for the well-being of the users.

All three methods share some elements with each other despite the diverse history of each. There is a significant overlap between biophilic design and environmental psychology. This includes some contributors publishing documents for both topics. This is not to say one belongs to another. Biophilic design is a relatively new field of study created by a biologist, but has expanded to touch on the fields of psychology, anthropology, sociology, architecture, among others.

Environmental psychology is a much older field, but a continually evolving field. Natural influences in the built environment have always been an interest within environmental psychology, but it has become more prevalent in recent years with the architectural fields focusing on sustainability. Environmental psychology does tackle more than what biophilic design focuses on as well, a significant portion of the publications centered on human behavior within the built environment.

The third branch of this document is *feng shui*. This brings a different point of view to the research from a cultural and historic standpoint. Biophilic design and environmental psychology are both predominantly European based, whereas *feng shui* was developed in China. *Feng shui* is the oldest of the three methods and while historically it was used in an Asian culture, a significant amount of the teachings can be used universally. Recently, it has become increasingly popular to utilize *feng shui* in designs throughout the world. This is partially due to the intuitive method *feng shui* implements within its approach to design.

There are differences that can be found between the three methods. Primarily those are derived from the perspectives and goals that are inherent in each method. Biophilic design, as previously mentioned, narrowly focuses on nature and human well-being within buildings. This goal is shared by the other two, but biophilic design has the traditional scientific basis to the field. A more technical approach can be found in environmental psychology, most of the products focus on the 'why' of elements within design versus telling 'how' or 'what' elements can be implemented. *Feng shui* has a much more all-inclusive approach to design, with the cultural differences introducing different tactics to achieve positive results. Some of these methods include astrological analysis to determine outcomes, though many make sense from the environmental perspective.

From this research, recommendations for attributes of the home were identified from each method and compared against each other. Not all of these attributes are supported by all three of the methods. Most of the attributes have at least two methods supporting them, very few are specific to an individual method. Just because a method doesn't support a particular attribute, it doesn't mean the attribute is negative or detrimental to the home. Typically that

particular attribute isn't a focus of the method. These attributes were used while developing a design and later pinpointed in the analysis section.

The design project section of the document takes the research and utilizes it in an actual home design scenario with a volunteer acting as a client. Through a series of meetings with Elan Bacon, information was gathered about her family and what their needs and desires were for a home. Further interactions concentrated on the designs and fine tuning specifically what Elan found desirable. Having a client was essential to evaluating the validity of the research. A design program can be developed but without the input of the future inhabitant, the success of the house can be questioned. From the series of meetings, a final design was developed. In the document it is represented through traditional plan, sections, elevations, and renderings.

Due to the site location there was an attempt to create a sustainable home. This is directly related to biophilic design philosophies, though wasn't the focus of this overall document. *Feng shui* and environmental psychology also encourage the green building practices as well, but it was the site that dictated choices.

The first two sections of the document are brought together with the analysis. This final section shows how the attributes of the home identified in the research are integrated within the design for Elan's home. The analysis is quite extensive including both the architectural elements within the home and interior elements that are relevant to the attributes of the home such as colors or patterns and materials.

There are some things to keep in mind while reading over the document and utilizing the content. This document represents *a* technique of designing, not *the* method of design residential architecture. As extensive as the document is, it just scratches the

surface of possible research. Further exploration utilizing simulations could be conducted to confirm the proposed research or expand upon the existing body of knowledge.

Additionally, when working with variables like clients, the results will and should be different depending on different clients, as well as sites. The design and therefore the analysis fit Elan and her family on this particular site. While this design exemplifies the attributes of the research it does not mean that the design will be the best solution for everyone everywhere. Some elements within the home took resale into consideration, but it is focused on Elan's needs and desires.

One thing to consider when designing within guidelines is not to forget the clients' opinion within the design process. Even if everything points towards an element being the best solution to a particular design problem, if a client vehemently disagrees, it is best to go with what the client wants. Part of this interaction should include explaining the theory behind the certain element in an attempt to convey the importance to the client. While an architect shouldn't stubbornly feel they're right and dismiss the clients' thoughts, they also shouldn't bend over backwards to follow what the client wants. The designer has a set of skills the client most likely doesn't, however the client knows what they want and how they live. The solution is communication and education between the two parties as well as a willingness to learn from each other, for which this thesis offers a method.

This critical aspect of communication is supported by all three of the methods examined in this document. A healthy relationship between the client and architect can translate into a design that creates a home that is more attuned to the clients well-being. It will also leave the client with a positive impression with the process that will translate into their feeling of their new home.

6 **Glossary**

Aesthetic. Pertaining to physical appearance typically associated with a pleasing or appealing appearance.

Analogous colors. Colors that are directly adjacent to the desired source color on the color wheel.

Ancient Chinese. The originators of *feng shui*, approximately 4000 BCE.²⁶⁸

Bagua. A tool used in *feng shui* that is made up of the eight trigrams from the *yi jing*. It is a symbol of cosmic wholeness.

Biomimicry. A process where elements from nature are studied and analyzed to solve issues within humankind, most notably within architecture. It is made up from two Greek words, *bios*(life) and *mimesis* (to imitate).

Biophilia. A hypothesis described by Edward O. Wilson that explores the innate connection between humans and the natural world.

Biophilic Design. A recent design methodology that explores Wilson's *Biophilia* with relation to the built environment, focusing on popular sustainable building practices and how they contribute to the inhabitant's well-being.

Biophobia. Avoiding natural elements that the users are frightened of or have adverse feeling towards.

Black hat feng shui school. A school of thought within *feng shui*, that has been embraced in the western world based on combination of traditional *feng shui* and modern science, psychology, and spirituality.

Buddhism. A religion founded in Asia based on the teachings of Buddha.

Climate. The condition of a set area. This could pertain to the meteorological which addresses temperature, precipitation, or wind. It can also address the indoor environment also relating to the temperature, ventilation, noise, humidity, and lighting.

Closedness. A more contained introspective approach to design where the building or the site focuses inwards shielding the users from the outside world in either a positive or negative manner.

Collative Properties. The psychological model developed by Daniel Berlyne that hypothesized that humans respond to stimuli and how this affects their future judgments.

Color theory. Observations of how colors relate, interact and mix with each other.

Color wheel. A diagram that shows colors, starting with the primary colors; red, yellow, and blue. It can be expanded to display three, secondary colors that have been created by mixing the original primary colors; purple, orange, and green. The combination between the six creates another set of colors that are in between the primary and secondary colors.

²⁶⁸ <http://www.balancefs.net/fstimeline.htm>

- Command Position.* A way to orient the user through furniture location within a space that gives that person the best control over the area. This is an ideal position within the practice of *feng shui*.
- Communal.* A household or cluster of households that contain unrelated families or multiple generations of a family, not typical in western societies.
- Communality.* Buildings that have similarities, such as appearance, style, materials or building methods.
- Compass school.* A school of study in *feng shui* which is popular with modern China. It focuses on a magnetic compass that is used to determine the most auspicious orientation of space based on the head of the house's birthdate, astrological symbol, etc.
- Complementary colors.* Colors on the color wheels that relate to the color that is found directly across each other. These pairs can intensify each other.
- Complexity.* Elements that can be or have intricate or convoluted properties.
- Confucian Customs.* Elements found in early *feng shui* that are based on the teachings of the Chinese philosopher Confucius.
- Control Theories.* Environmental psychology suggests that humans are most comfortable within spaces that allows them to control aspects that they can control.
- Defensible Space.* Areas that allow for security that gives a pleasurable sense of protection to users.
- Design psychology.* A concept founded by Toby Israel that uses psychology as a way to create architecture and interior design for the benefit of the users.
- Differential association.* The interaction of individuals with others that support their behavior.
- Differential reinforcement.* The anticipated rewards the people expect as a result of their behavior.
- Differentiated.* Buildings that have many segmented room or spaces.
- Dipan.* A round moveable plate within a *feng shui* compass, it translates to the heaven plate.
- Divination.* A set of trigrams the ancient Chinese developed to interpret relationships within their environment. These trigrams include: wisdom, earth, fire, heaven, lake, mountains, thunder, water, and wind.
- Dominionistic.* Pertaining to one's dominion or territory
- Ecotherapy.* A type of therapy that uses the relationship between humans and nature to heal.
- Elements of Legibility.* A method Kevin Lynch developed of analyzing settings using paths, edges, districts, nodes and landmarks.
- Environmental psychology.* A field of study that incorporates multiple disciplines that analyzes the relationships between humans and their surroundings.

Extroverted. Individuals that focus primarily externally rather than internally.

Feeling. A physical awareness.

Feng shui. Literal translation is wind and water, sometimes considered the art of placement. It developed from the ancient Chinese practice of divination. It provides guidance in how individuals should orient themselves.

Five Elements. Fundamentals within *feng shui* that comprise of fire, earth, metal, water, and wood.

Fluorescent. A type of lighting source that emits a cooler shade.

Form school. One of the schools within *feng shui*, it is the oldest of the three most popular. It uses physical forms to make its recommendations.

Fractals. Geometric figures that repeat in different scales and relate to the overall whole.

Geomancy. An element used within *feng shui* similar to divination.

Golden rectangle/ratio. A rectangle that follows the ratio of 1:1.618. It is believed to be the most pleasing ratio, therefore an attractive rectangle.

Homogeneous. Buildings with little segmentation, the opposite of differentiated.

Human-Environment Relationships. A theory in Environmental Psychology that explores the factors in human surroundings that affects them.

Humanistic. Attributes that pertain to humans or values for humans within design.

Identity. A building that is separated from its surroundings by appearance, style, materials and building methods; the opposite of communality.

Incandescent. A type of lighting source that emits a warmer, more yellowish, shade.

Integration (Integral). Elements that are related or tied together.

Intensity. The brightness of a color and how it impacts the users.

Introverted. An individual who is more inward focused verses external, the opposite of extroverted.

Intuition. The initial feel or sense that one feels without reasoning.

Leadership in Energy and Environmental Design (LEED). A system created by the U.S. Green Building Council that is used to evaluate buildings with regards to sustainable building practices and are awarded different levels of achievement.

Light-emitting diode (LED). A type of lighting source.

Locus of control. A concept that Julian Rotter developed that analyzes how humans build their beliefs and the conclusions they make.

Loupan - geomancer's compass. A magnetic compass used in *feng shui* that incorporates time and space that relates to astrological elements.

Monochromatic color scheme. Colors that use a singular base color and derive colors that complement it by adding different amounts of white or black.

Monotone color scheme. A color scheme that uses one color of the same exact hue, tone and chromatic value.

Moralistic. Elements pertaining to a moral or ethical aspect of designing

Naturalistic. Connections within a design that relate to nature.

Negativistic. Components that potentially could be or are unhealthy physically or psychologically for the inhabitants or the natural environment.

Neutral colors. Colors that fall within the gray, white or beige range.

Noise. Sounds that can be classified in a more negative manner.

Noncommunal. Residences that house small groups of people, typically families. The opposite of communal.

Northern New England. New England is a region of north eastern United States of America. The northern states are Maine, New Hampshire, and Vermont.

Openness. An entity that is more oriented towards the public, this can refer to a property or home.

Order. Elements that can be or have properties that are organized or simple, opposite of complexity.

Permanent. A dwelling that is not easily moved and is meant to last a significant amount of time. The opposite of temporary.

Pleasure-Arousal-Dominance Hypothesis. A theory Albert Mehrabian and James A. Russell developed that ascertains human emotional reaction to their environments.

Preference Framework. Rachel and Steven Kaplan created an outline that explores environmental inclination.

Privacy. A situation where people can be free of public awareness.

Private. An element that is controlled by an individual or a group of individuals.

Probabilistic Lens Model. A theory that Egon Brunswik developed that analyzes the relationship of humans and their environment inclusively.

Public. Concerning a group of people or community.

Qi. A term in *feng shui* that describes the force that bonds human life and destiny and how it is connected with the universe and nature.

Representative design. A simulated environment that can be manipulated for experimentation.

Residential building. A building whose primary purpose is dwelling.

Restorative environmental design. A new design paradigm developed by Steven Kellert that has a low impact on the natural environment while creating a healthy environment for the inhabitants that allows them to be connected to the natural world.

Seasonal Affective Disorder (SAD). A disorder that is caused by the lessening of natural light on a seasonal basis.

Security. Elements aiding in or a feeling of freedom from hazards or danger.

Sense of place. A feeling of being tied or connected to a location or structure.

Sensing. A psychological preference towards information that is obtained through the five senses.

Sha. The negative aspect of *qi*.

Shade. A combination of an original color and black. Different shades can be achieved through different amounts of black.

Shipan. The earth plate on a magnetic compass used in *feng shui*.

Siting. The surrounding area of a building, this could include other buildings, roads, or natural elements.

Social Learning. A theory that the psychologist Julian Rotter developed that combines learning and personality theories to observe human behavior.

Sound. A pleasing auditory noise.

Stimulation Theories. The idea that environments attraction to all five senses that is translated to allow humans to understand the said environment.

Sustainability. Building practices that have a low impact on the natural environment if not promote them.

Sying. A tangible factor of *feng shui*, which includes elements, structure, door position, and furniture placement.

Symbolic. An element, property, material, etc., that is representative of something else.

Tao. An underlying principle of the universe believed by the ancient Chinese.

Temporary. A building that is mobile or not anticipated to endure.

Territory. The area that one believes or feels is their own.

Tianpan. Heaven plate on a Chinese compass.

Tints. A change in lightening or darkening of a color.

Topography. The shape of the surface, used primarily to describe the earth's surface in this document.

Transitional. Spaces or rooms within a home that move or shift users to other rooms or spaces.

Trigrams. Symbols that represent overarching concepts in *feng shui*. Commonly used around the center of the compass.

United States Green Building Council. Nonprofit organization that uses programs and services to encourage healthy, environmentally friendly buildings to live and work in.

Utilitarian. Elements in a building that can be categorized as practical and functional.

Yang. The complement and opposite *feng shui* element to Yin. It represents male, active, warmth, odd numbers, etc.

Yin. The complement and opposite *feng shui* element to Yang. It represents female, passive, cold, and even numbers, etc.

Zen. A school of Buddhism, used in this document to refer to meditation, contemplation, or calming.

7.1 Transliteration Chart

| <i>Wade-Giles</i> | <i>Pinyin</i> | <i>Meaning</i> |
|-------------------|---------------|-----------------------|
| Pa-k'ua | Bagua | Eight trigrams |
| Tui | Dui | Western trigram |
| Ken | Gen | Northeastern trigram |
| Kua | Gua | Natal trigrams number |
| K'an | Kan | Northern trigram |
| K'un | Kun | Southwestern trigram |
| Li | Li | Southern trigram |
| Lo p'an | Loupan | Chinese compass |
| Ch'i | Qi | Life's breath |
| Ch'ien | Qian | Northwestern trigram |
| Sun | Xun | Southeastern trigram |
| I Ching | Yijing | Book of Changes |
| Chen | Zhen | Eastern trigram |
| | | |

7.2 Project Location Demographics

Information for the town of Peacham

Elevation – 1310 feet

Latitude – 44.33 N, Longitude – 72.18 W

Land area – 46.7 square miles

Population density – 14 people per square mile

| | |
|---------------------|----------|
| Population (6/2009) | 662 |
| Males | 329 |
| Females | 333 |
| Median resident age | 43 years |

Financial Statistics

| | |
|---|-----------------------|
| Estimated median household income (2009) | \$48,471 |
| Estimated per capita income (2009) | \$25,967 |
| Estimated median house or condo value (2009) | \$229,336 |
| Median property taxes paid for housing units (2000) | \$1994 |
| Mean prices (2009) | |
| Housing units - | \$262,578 |
| Detached houses - | \$262,602 |
| 2-unit structure - | \$215,502 |
| 3-4 unit structure - | \$432,927 |
| Mobile homes - | \$151,181 |
| Cost of living (2011) | 97.8 (100 US average) |

Demographics

Races in Peacham

| | |
|-------------------|-----|
| White (alone) | 649 |
| Hispanic | 7 |
| Black (alone) | 3 |
| Two or more races | 3 |
| Asian (alone) | 2 |
| American (alone) | 1 |

Ancestries

| | |
|----------|-------|
| English | 34.9% |
| Irish | 17.6% |
| Scottish | 15.5% |
| Italian | 11.3% |
| German | 10.4% |
| French | 9.9% |

Education Level of population over 25 years old

| | |
|---------------------------------|--------------|
| High School or higher | 91.3% |
| Bachelor's degree or higher | 52.5% |
| Graduate or professional degree | 22.8% |
| Unemployed | 3.5% |
| Mean travel time to work | 22.8 minutes |

Marriage statuses over 15 years old

| | |
|---------------|-------|
| Never married | 20.0% |
| Now married | 58.3% |
| Separated | 1.7% |
| Widowed | 8.1% |

Divorced 11.9%

There are no registered sex offenders living in Peacham (7/2011)

Most common industries

| | |
|-----------------------------------|-----|
| Construction | 15% |
| Educational Services | 9% |
| Agriculture, forestry, fishing | 8% |
| Scientific and technical services | 8% |
| Public Administration | 7% |
| Accommodation/Food services | 5% |
| Food/Beverage stores | 5% |

Proximity

City Proximity –

| | |
|------------|--------------------------|
| 50,000+ | Manchester, NH (107,006) |
| 200,000+ | Boston, MA (589,141) |
| 1,000,000+ | Bronx, NY (1,332,850) |

School –

- Peacham Elementary School (15 miles)
- Danville Elementary School (12 miles)
- Danville High School (12 miles)
- St. Johnsbury Academy (20 miles)

Library –

- Jaquith Public Library, Marshfield (6 miles)
- Peacham Public Library, Peacham (15 miles)

Store –

- Marshfield Village Store, Marshfield (5.4 miles)
- Name Brand Supermarket, St. Johnsbury (22 miles)
- Name Brand Supermarket, Barre (22 miles)

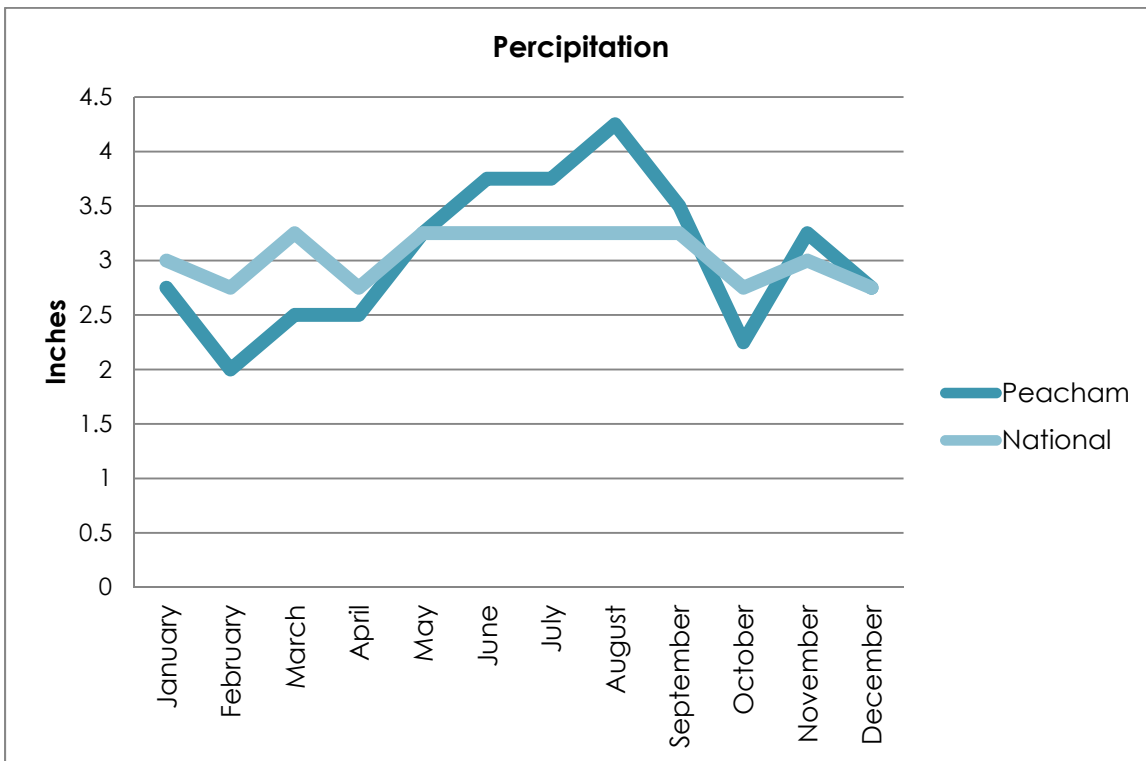
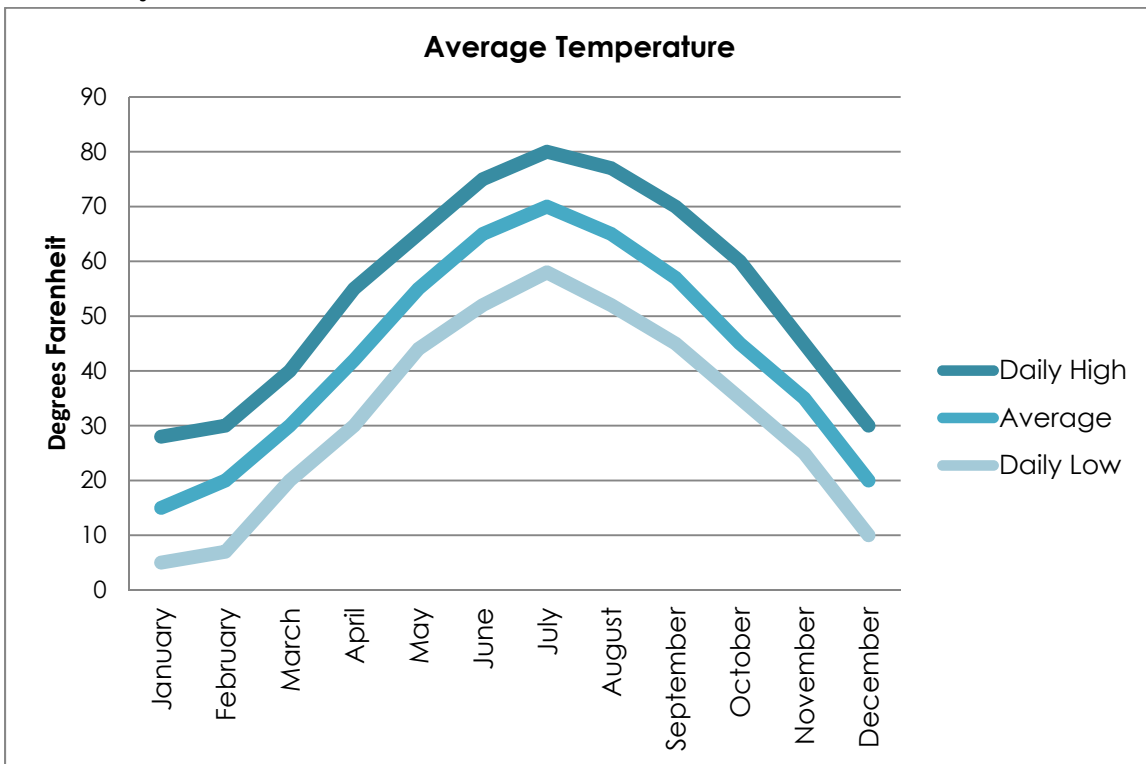
Hospitals –

- Danville Health Center, Danville (23 miles)
- Northeastern Vermont Regional Hospital, St. Johnsbury (25 miles)
- Central Vermont Medical Center, Berlin (25 miles)
- Dartmouth-Hitchcock Medical Center, Hanover, NH (60 miles)
- Fletcher Allan Health Care, Burlington (60 miles)

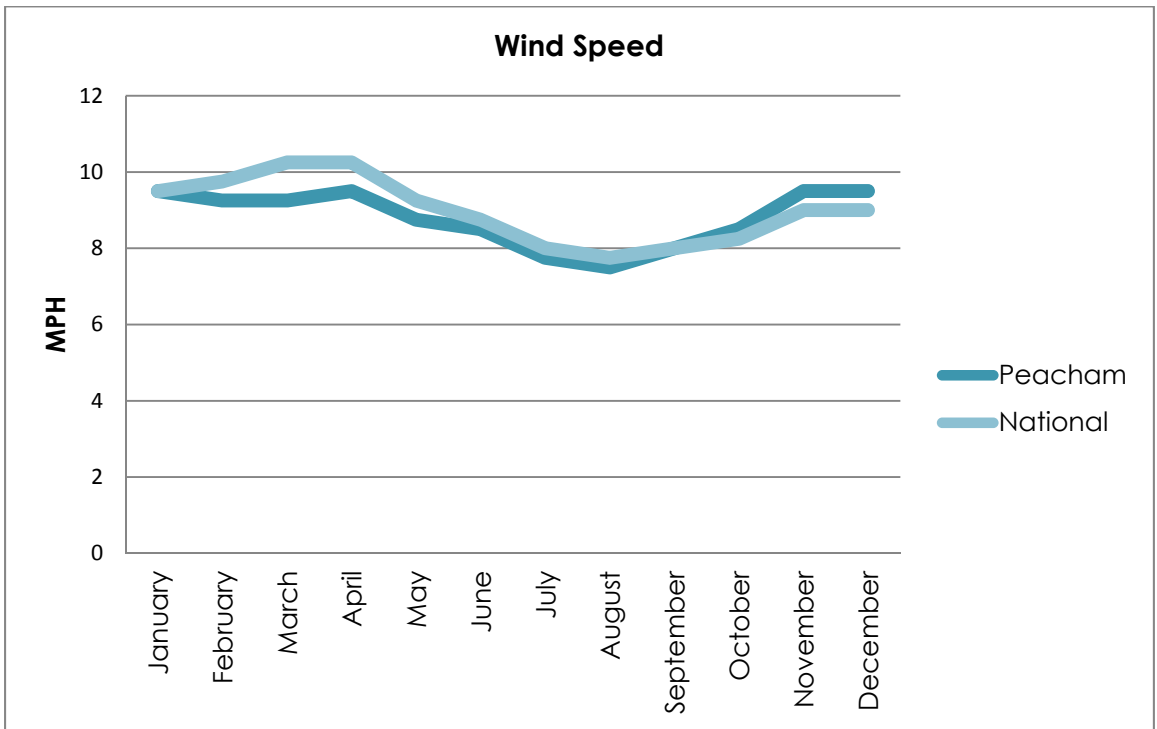
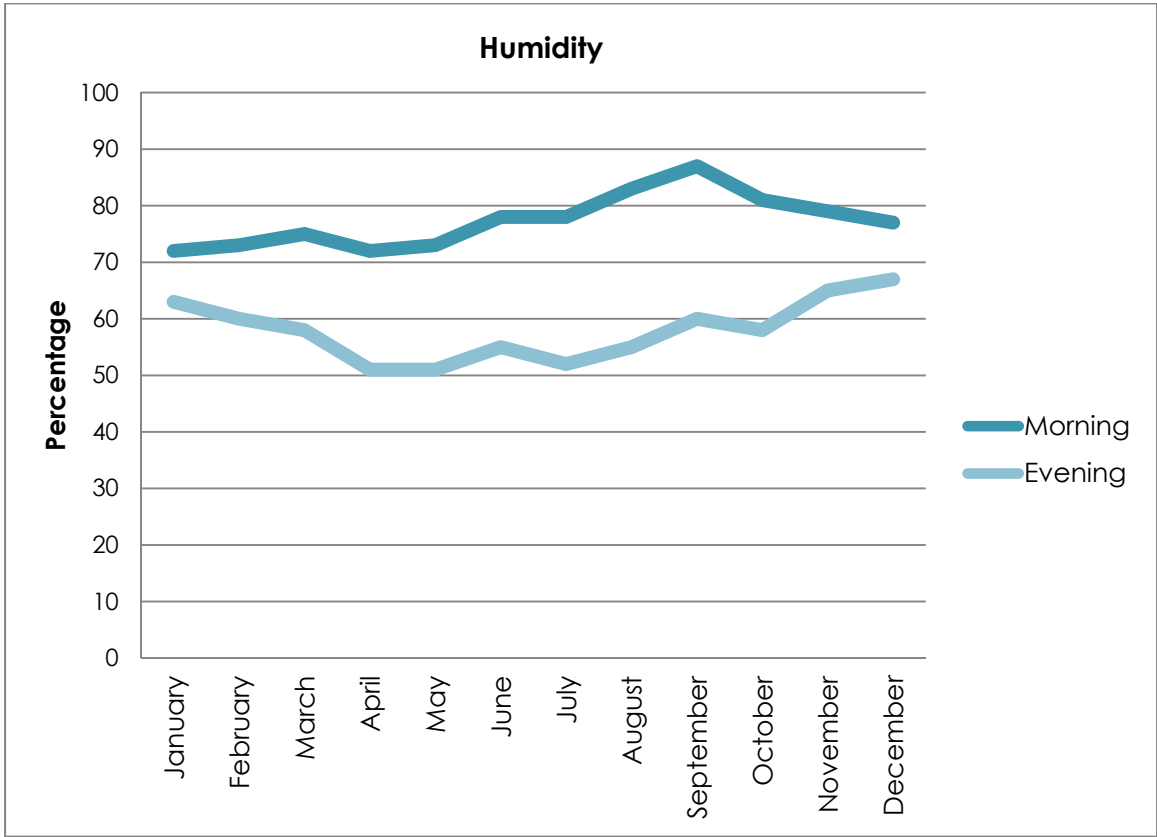
Emergency facilities –

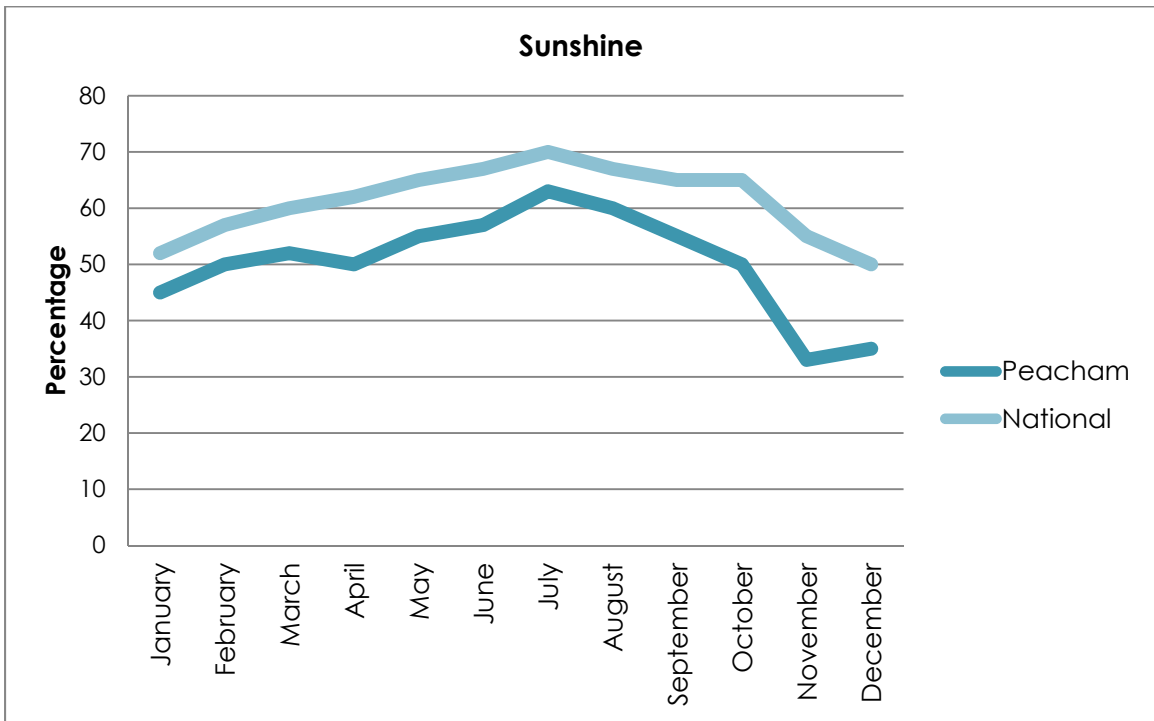
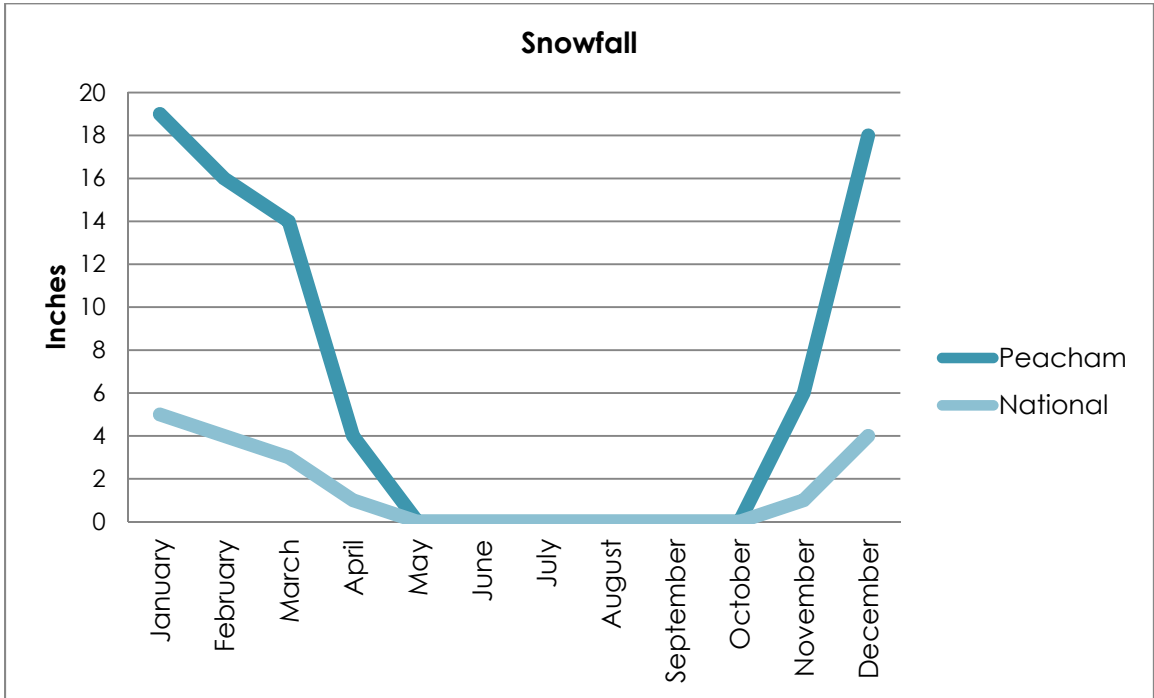
- Marshfield Fire Department (6 miles)
- Peacham Fire Department (8 miles)
- Danville Rescue (12 miles)
- Cabot Ambulance (37 miles)

7.3 Project Location Climate Data²⁶⁹



²⁶⁹ Data from <http://www.city-data.com/city/Peacham-Vermont.html>





7.4 Existing Site Photographs



Figure 404. Historic Photographs – earliest known photograph of property from pond taken 1924, unknown photographer



Figure 405. Historic Photographs – view of property from pond in winter taken in the 1970's by George Hudson



Figure 406. Historic Photograph – view of camp in the fall showing context taken in the late 1970's by George Hudson



Figure 409. Historic Photograph –view of northern beach in fall taken in the late 1970's by George Hudson



Figure 407. Historic Photograph - view of property from the north in the fall taken in the late 1970's by George Hudson



Figure 410. Historic Photograph - view from existing house towards outhouses in north west corner of property in fall taken in the late 1970's by George Hudson



Figure 408. Historic Photograph - view of southern beach in fall taken in the late 1970' s by George Hudson



Figure 411. Historic Photographs - view of property behind existing house in the fall taken in the late 1970's by George Hudson



Figure 412. Historic Photograph - view along shore to the north of the house in fall taken in the late 1970's by George Hudson



Figure 415. Historic Photograph - view of pond from house in fall taken in the late 1970's by George Hudson



Figure 413. Historic Photograph - view towards the shore to the south of the house, partially sold in the 1980s in fall taken in the late 1970's by George Hudson



Figure 416. Historic Photograph - view of house from near outhouses in fall taken in the late 1970's by George Hudson



Figure 414. Historic Photograph - view of southern area of property towards the pond in the fall taken in the late 1970's by George Hudson



Figure 417. Historic Photograph - view of excavation for addition showing soil composition taken in the late 1970's by George Hudson



Figure 418. Existing Photograph - view of existing house condition from pond taken March 2012 by author



Figure 419. Existing Photograph - view from driveway of existing house and pond taken March 2012 by author



Figure 420. Existing Photograph - view of pond from north edge of front lawn pond taken March 2012 by author

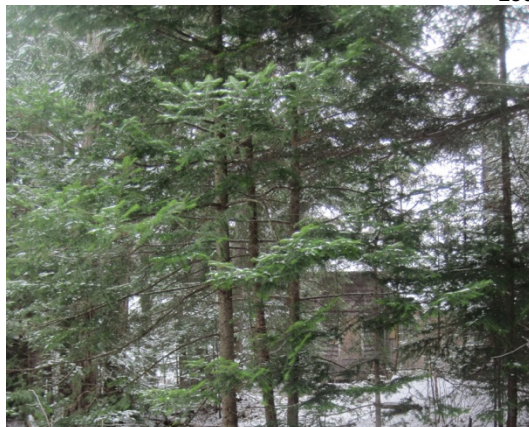


Figure 423. Existing Photograph - view of house through trees from the road taken March 2012 by author



Figure 421. Existing Photograph - view of front lawn and contemporary context taken March 2012 by author



Figure 424. Existing Photograph - view of property from north west corner along road taken March 2012 by author



Figure 422. Existing Photograph - view of existing entry path to site from driveway taken March 2012 by author



Figure 425. Existing Photograph - view of site from road taken March 2012 by author



Figure 426. Existing Photograph - view of site from road taken March 2012 by author



Figure 429. Existing Photograph - view along northern shore taken March 2012 by author



Figure 427. Existing Photograph - view along northern property line from road taken March 2012 by author



Figure 430. Existing Photograph - view from the south taken March 2012 by author



Figure 428. Existing Photograph - view of shore to the north of the existing house taken March 2012 by author



Figure 431. Existing Photograph - view of western side of house taken March 2012 by author



Figure 432. Existing Photograph - view of site from across the pond located in between two white camps to the left taken March 2012 by author



Figure 433. Existing Photograph - view of site from across the pond showing existing house (center) taken March 2012 by author



Figure 436. Existing Photograph - view of existing driveway from road taken March 2012 by author



Figure 434. Existing Photograph - view of existing site from neighboring property showing relationship with northern neighbor taken March 2012 by author



Figure 437. Existing Photograph - view from house of pond taken March 2012 by author



Figure 435. Existing Photograph - view of site from road showing thick dense overgrowth, taken March 2012 by author



Figure 438. Existing Photograph - detail of sea wall failure taken in March 2012 by author



Figure 439. Existing Photograph - view of rock at entry to the site taken July 2012 by author



Figure 442. Existing Photograph - view of outhouses taken July 2012 by author



Figure 440. Existing Photograph - view of parking area from site taken July 2012 by author



Figure 443. Existing Photograph - view of proposed location of new home from the east taken July 2012 by author



Figure 441. Existing Photograph - view of entry path from driveway taken July 2012 by author



Figure 444. Existing Photograph - view of proposed location for new home from driveway taken by author



Figure 445. Existing Photograph - view of pond access to the south of the seawall taken July 2012 by author



Figure 448. Existing Photograph - view towards pond in front of driveway taken July 2012 by author



Figure 446. Existing Photograph - view along northern shore taken July 2012 by author



Figure 449. Existing Photograph - view of pond access taken July 2012 by author



Figure 447. Existing Photograph - view of front lawn and contemporary context taken July 2012 by author



Figure 450. Existing Photograph - view of camps across the pond taken July 2012 by author

7.5 Site Context



Figure 451. Site Context - view of Montpelier, Vermont taken July 2012 by author



Figure 454. Site Context - view of larger traditional home near Peacham taken July 2012 by author



Figure 452. Site Context - view of industrial building in Montpelier, Vermont taken July 2012 by author



Figure 455. Site Context - view of local store near Peacham taken July 2012 by author



Figure 453. Site Context - view of traditional home near Peacham taken July 2012 by author



Figure 456. Site Context - view of a more modern home near Peacham taken July 2012 by author



Figure 457. Site Context - view of local church near Peacham in July 2012 by author



Figure 460. Site Context - view of sugar house near Peacham in July 2012 by author



Figure 458. Site Context - view of traditional home near Peacham in July 2012 by author



Figure 461. Site Context - view of local business near Peacham in July 2012 by author



Figure 459. Site Context - view of local business near Peacham in July 2012 by author



Figure 462. Site Context - View of a more modern home near Peacham in July 2012 by author



Figure 463. Site Context - view of large barn near Peacham in July 2012 by author



Figure 466. Site Context - view of Onion Point Road taken in July 2012 by author



Figure 464. Site Context - view of traditional residence near Peacham in July 2012 by author



Figure 467. Site Context - view of camp on Onion Point Road taken in July 2012 by author



Figure 465. Site Context - view of Onion Point Road taken in July 2012 by author



Figure 468. Site Context - view of camp on Onion Point Road taken in July 2012 by author



Figure 469. Site Context - view of a camp farther away from Onion Point Road taken in July 2012 by author



Figure 472. Site Context - view of Onion Point Road taken July 2012 by author



Figure 470. Site Context - view of a camp farther away from Onion Point Road taken in July 2012 by author



Figure 473. Site Context - view of a camp on Onion Point Road taken July 2012 by author



Figure 471. Site Context - view of a camp farther away from Onion Point Road taken in July 2012 by author

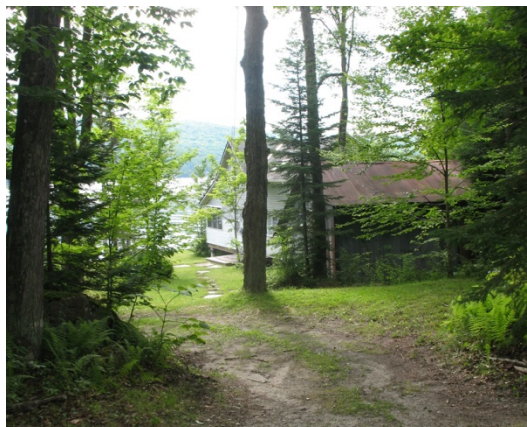


Figure 474. Site Context - view of a camp farther away from Onion Point Road taken in July 2012 by author



Figure 475. Site Context - view of Onion Point Road closer to site taken in July 2012 by author



Figure 476. Site Context - view of neighboring camp taken July 2012 by author



Figure 477. Site Context - view of Leiserl in her existing hutch taken December 2012 by author

*Photographs unless otherwise noted taken by author during site analysis visits. Historic photographs were scanned with permission of the original photographer, George Hudson. Figure 404 comes from the personal collection of the Hudson family and scanned with permission.

7.6 Heating Systems

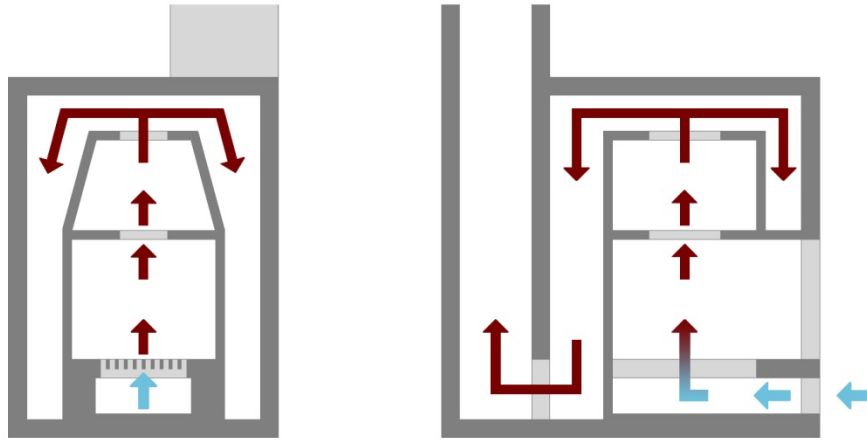


Figure 478. Masonry Woodstove - cool air enters wood stove and fuels the wood fire in the firebox. Heat from fire circulates from the primary combustion chamber, out into the air gap between walls heating the entire unit. Flue draws warm air around and out the rear of the unit.

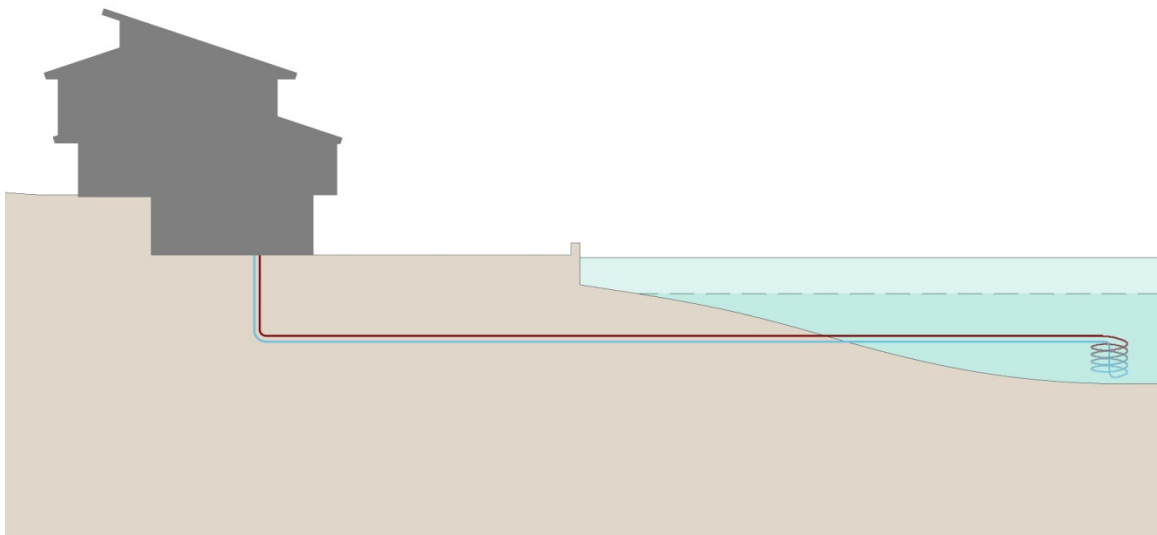


Figure 479. Geothermal System - Collector coils submerged at least eight feet below winter low water mark in pond. In the mechanical room, equipment includes: heat pump to extract heat from fluid and compresses it to achieve a higher temperature liquid, water storage cylinder and Additional Heating Boiler. Primary purpose of the geothermal system is to run the radiant heating for the home.

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*images unless otherwise noted are created by author

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