DWELLING WELL: AN APPLICATION OF CHRISTOPHER ALEXANDER’S THEORY OF WHOLENESS TO INVESTIGATE OCCUPANT AFFECTIVE RESPONSES TO HOMES INCORPORATING RENEWABLE NATURAL RESOURCES

By

CHERIE LYNETTE PEACOCK

A thesis submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN ARCHITECTURE

WASHINGTON STATE UNIVERSITY
School of Architecture and Construction Management

DECEMBER, 2005
To the Faculty of Washington State University:

The members of the Committee appointed to examine the thesis of CHERIE LYNETTE PEACOCK find it satisfactory and recommend that it be accepted.

___________________________________
Chair

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ACKNOWLEDGEMENTS

Through the journey that culminated in this thesis I received love and support from many people. I am grateful to my husband, Richard Torquemada, for allowing me the space and freedom to learn about myself, for his steadfast love and commitment, and for his cooking. I thank my parents, Bonnie and George Peacock, for their unconditional love, for listening with their hearts as well as their minds, for sharing creative ideas, and for just being there. I am grateful to my grandparents, Spencer and Etta Clark and Hazel Peacock, for their love, support, and company along the way. I thank Gary, Liz, Bethany, Brian, and Matthew Peacock for the joy they bring into my life. I appreciate John and Phyllis Torquemada and Kelley Torquemada as part of my family and I am honored to have their love and support.

This thesis would have taken me a lot longer to finish without the support of my writing group. I am indebted to Jena Ponti, Barb Lien, Anne Hannenburg, Elizabeth Payne, and Susie Snowdon. They gave me the gifts of their time, creative ideas, and most of all, their friendship. I thank Anne for sharing her work with me to learn from, Jena for listening when I needed to talk, Barb for sharing her expertise in creating beautiful graphs, Elizabeth for sharing the journey, and Susie for her mentorship.

I thank Sandra Brandvold, my favorite college roommate, for always being there somewhere and for her editing comments on my final draft.

I am very fortunate to have David Wang, Keith Diaz Moore, and Matt Melcher as the members of my committee. They challenged me to do my best work and were always
available and willing to lend enthusiastic support. Their involvement helped to make this research journey fun.

I thank Prof. Mike Chase for sharing ideas early on about how to structure this research project and for sending me helpful literature.

I am grateful to Dr. Jon Driessen for sharing a paper he wrote on the topical analysis of qualitative data that became the method I used.

This research project would not have been possible without the generosity of the people I interviewed. They honored me with their time and willingness to be vulnerable with their feelings. I am indebted to each of them for things they taught me.

Finally, I thank the Creator for the beauty in nature and in people.
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RESOURCES

Abstract

by Cherie Lynette Peacock, P.E., M.S. Arch
Washington State University
December 2005

Chair: David Wang

A theme in the literature suggests a healthy relationship between people and nature is achieved by building and living in homes incorporating renewable natural resources—such as straw bales, earth, wood, and solar heat and light. Christopher Alexander claims we can define wholeness as a structure and recognize it in the world by sensing it within ourselves. This study investigates the affective responses of people to dwelling environments that incorporate renewable natural resources. Alexander’s Theory of Wholeness is used to guide the interviews of twelve residents. The analysis of the results leads to a compilation of factors and themes that outline what a subjective, empirical concept of wholeness can mean, and as such, are used as measures of occupant preferences. This thesis offers a qualitative assessment of how the subjects studied explain their experience of wholeness in relation to their dwellings.
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Dedication

This thesis is dedicated to Choco and Brandy.
Chapter One

The Role of Natural Building in the Experience of Wholeness

1.1 Introduction

“I just love those curved, thick walls!” is a comment I typically hear from people visiting my straw bale home for the first time. Often they follow their visual appreciation by touching the walls, adding another dimension to their sensory experience. Even though I share it, I wonder why people have this response to the lumpy, deep walls of my house. Is it simply because the walls are different? Or is there some deeper meaning? Could this be a clue to a way of building that promotes positive feelings in people? This line of questioning formed the beginnings of this thesis endeavor.

My desire for a straw bale home is rooted in my love for nature. Straw bale structures look organic and they provide shelter that attempts to solve some of the environmental concerns with construction. Buildings can contribute to the depletion of natural resources, such as fossil fuels and wood. Straw bale structures are very energy
efficient which conserves fossil fuels and they typically use less wood than conventional construction methods. I feel good about choosing a home that helps me reduce my negative impacts on the natural world.

Straw bale architecture is an example of natural building - a concept of construction that is intended to create harmony with nature, not harm. Natural building is based on using renewable natural resources - earth, stone, and wood, solar heat and light - in an efficient way.

A theme in the literature suggests that people have a positive emotional response to naturally-built structures and that this practice can achieve a healthy relationship between people and nature (Elizabeth and Adams 2000; Kennedy, Smith et al. 2002). This concept of a healthy relationship stems from seeing everything as interconnected, or as a whole. When a relationship within a whole is healthy, it has wholeness.

Christopher Alexander, author, architect, and professor, claims physical structure cannot be understood as something separate from us; that human feeling and structure are intertwined.

“Rather it turns out that living structure is at once both structural and personal. It is related to the geometry of space and to how things work. And it is related to the human person, deeply attached to something in ourselves, even emanating perhaps from ourselves, in any case inextricably connected with what we are, who we are, how we feel ourselves to be as individuals and persons, beings whose lives are ultimately based on feeling” (Alexander 2002).
Alexander’s concept of living structure is a form that enhances human life. He describes such forms as having wholeness which we can recognize by sensing in ourselves (Alexander 2002). Wholeness refers to an all-encompassing something that infers interconnectedness and well-being. This research project applies Alexander’s theory to investigate occupant feelings in order to understand the affective responses of some people to naturally-built dwellings.

The following sections of this chapter explain natural building and discuss Christopher Alexander’s Theory of Wholeness. Chapter 2 describes how Alexander’s theory and other methods were applied in this study. The outcomes of this thesis are displayed in Chapters 3 and 4 and include case study descriptions, dwelling factors that impart a sense of wholeness, and themes common to the twelve cases studied. These themes are used to measure individual preferences and to evaluate Alexander’s theory.

1.2 The unhealthy relationship between people and nature

Like all creatures, people constantly interact with, and depend on, their environment. Even though we, along with a few other nest-building animals like birds and beavers, have the unique ability to create environments that are suitable microclimates for habitation (Heschong 1979), everything that we need is ultimately connected to the natural world.

It is easy for us to overlook the indispensable connection we have with nature because our world is dominated by the order humans create (Alexander 2002), especially the order of the built environment. We spend much of our time in human-made spaces and our connection with nature is often so invisible that we forget it. It takes new
information to remind us how much we are a part of the natural world and sometimes the
information we get is unpleasant.

For example, in 1939, when dichloro-diphenyl-trichloro-ethane (DDT) was
discovered to be an effective insecticide, it was touted as the means to eradicate insect-
borne disease and crop destruction (Carson 1962). It wasn’t until 20 years later that we
realized DDT accumulates in the fatty tissues of animals, including humans, until it
becomes toxic. The DDT that we sprayed in our environment literally became part of our
bodies. We learned that pesticides we put in the environment can have unintended
consequences.

Not only is the natural environment being polluted, it is being depleted of a
number of resources humans depend on for our current way of life. As world population
increases, competition for these resources grows. When scientists Donella Meadows,
Dennis Meadows, and Jorgen Randers modeled large-scale trends of human activities, the
results were alarming. Their model predicted that within the next 100 years the resources
of the earth would limit further growth. This model was based on present growth trends
in world population, industrialization, pollution, food production, and resource depletion
and presumed an unchanged condition. Meadows et al concluded that “the most probable
result will be a sudden and uncontrollable decline in both population and industrial
capacity” (Meadows, Meadows et al. 1992).

Yet these same scientists believe we can avoid their predicted catastrophe. We
have a choice and can alter growth trends and create long term stability, or sustainable
ecological and economic systems (Meadows, Meadows et al. 1992). Meadows et al
suggest that change in the structure of the information system is what is needed. This
system, made up of data and time, can influence behavior. If people have data in a timely manner as well as knowledge of goals, incentives, and costs, they will act on this information (Meadows, Meadows et al. 1992).

What Meadows et al are essentially prescribing is a change in our understanding of the world. Timely information allows us to see the consequences of our actions, to form new understanding, and to change destructive behaviors. Author Elisabet Sahtouris explains, “The ways in which we picture our world and our relationship to it-our stories of how things are-are our worldviews, and these have a great deal to do with the kinds of choices we make in the play of our lives” (Sahtouris 2000).

This explanation illuminates the connection between our beliefs and our actions. Our beliefs shape our world views. We choose, consciously or not, what to believe from what we learn from past experiences and other people (Bell, Greene et al. 1996). What we learn sets up memory patterns in our brains and when these patterns are compared to patterns coming in from our system of senses, we create perceived images (Sahtouris 2000). These perceived images form our reality and our way of understanding the world. Every creature has some way of understanding what it sees or senses in its environment in order to know what it needs to do to keep on living (Sahtouris 2000).

One way humans learn from each other is through the language they share. Philosopher David Bohm explains that a culture’s world views are reflected in their language and when used, that language perpetuates their way of seeing the world (Bohm 1980). The prevailing world view in the United States and other countries evolved in concert with the rise of European cultures (Sahtouris 2000) and can be traced back to the ancient Greek philosopher Aristotle. He laid the foundation by developing cause as a
way of knowing when he stated “…we believe that we know a thing only when we can say why it is as it is—which in fact means grasping its primary cause…” (Hooker 1993). Aristotle categorized the causes as material (stuff), formal (shape), efficient (desire), and final (purpose) (Hooker 1993). With this way of seeing the world, resources of nature were objectified as the material stuff for making. For example, a tree is made up of soil, air, water, and sunlight. A chair is made up of wood that comes from a tree.

In the 17th century, Francis Bacon, Rene Descartes, and Galileo Galilei built upon Aristotle’s foundation and furthered the belief that humans are separate from nature. Bacon promoted experiment, not perception, as the key for discovering the secrets of nature; the purpose of which was to learn from the past in order to increase human comfort and happiness (Bury 1932). Descartes established the invariability of the laws of nature. If the laws of the natural world were not uniform, there could be no guarantee that science could progress indefinitely (Bury 1932). Galilei connected math to experience. Experimentation showed how the laws of nature could be expressed by math and proved its invariability. These ideas bolstered the world view of objective nature that could be described in numerical terms and controlled because of its invariability. “Through the new science of mechanics, man began to subject matter to his will” (Perez-Gomez 1983).

This mechanistic view of a world made up of parts and the belief that humans can control nature is expressed in the physical order that we create. Philosopher Bohm explains that all man-made features are expressions of thought. They originate in our minds and the activity of human work is guided by thought. Vice versa, we see and interact with everything in our environment, natural and human-made, the patterns of
which “flow into our minds through perception, giving rise to sense impressions which leave memory traces and thus contribute to the basis of further thought” (Bohm 1980). Our built environment expresses our world views and in turn shapes our views of the world. The information we are now receiving however, indicates there are unintended consequences of the order we have made in the world.

If we look at the built environment of the United States, we can see places that tell us about unhealthy outcomes of our world view. “Architects Pollute” is the title of the October 2003 edition of *Metropolis* magazine. The article inside tells the story about how architect Edward Mazria came to the conclusion that 48% of the energy consumed in the United States can be attributed to architecture. He combined the energy used by residential, commercial, and industrial buildings with the embodied energy in building products. He found this to be the largest sector of energy consumption in the United States. Mazria equates energy consumption with emissions of pollutants which contribute to global climate change (Hawthorne 2003). Energy consumption also depletes fossil fuels, which are a nonrenewable natural resource. Some of our architecture is expressing our values of the economic growth derived from consumption at the expense of the health and wellbeing of the natural world and in turn, ourselves.

Mazria suggests the solutions reside in designing a better built environment. Architects must create energy-efficient buildings and specify products that require less energy to produce (Hawthorne 2003). James Wines, the author of the book *Green Architecture* sees a predicament with this approach however. When architecture is viewed as having problems to be solved with technology, innovations like recycled materials, energy efficient construction, thermal glass, and photovoltaic solar panels are
created. Although these solutions reduce energy consumption, they distract our attention from the underlying cause which is our values and view of the world. “These solutions tend to isolate the means from the mission. This ‘mission’ calls for a commitment by societies everywhere to unite in a common cause and connect to the natural environment on a more profound philosophical, psychological, and cultural level” (Wines 2000).

The mission called for by Wines includes is a renewed connection with nature on a conscious level. A world view derived from the notions of ecology - the science of the relationships between organisms and their environment – offers a different perspective of nature (Williamson, Radford et al. 2003). This world view sees and appreciates the interconnectedness of all things and comes from understanding the universe as a whole and as created from wholes, not parts. Healthy relationships are founded on understanding the interconnectedness of all things and strive to maintain the health, or wholeness, of the entire system.

Natural building is one method of creating architecture that comes from this ecological perspective of the world. Advocates of natural building strive to create healthy connection with nature as evidenced in the following quote: “Natural building provides an opportunity for us to look at how our lives interact with our buildings and how our buildings can help us live in harmony with the greater biosphere” (Kennedy, Smith et al. 2002). Following is a description of what natural building is about.
1.3 Building with nature

Part of natural building is about natural materials. Professor and author Sym Van der Ryn claims people appreciate natural materials “because they stand in opposition to the industrial appetite for disassembling the organic, for destroying the soul and spirit inherent in living materials” (Elizabeth and Adams 2000). But aren’t all building materials related to nature in some way? Wood studs come from the trees of the forest, steel from ore mined from the earth, and plastic from petroleum oil found deep underground. Sym Van der Ryn is comparing natural materials to materials that result from “disassembling the organic” however (Elizabeth and Adams 2000). Natural materials therefore must be somehow intact and unaltered from their original state. The authors of the book *Alternative Construction: Contemporary Natural Building Methods*
describe natural building as a construction method that uses earth, straw, timber frame, stone masonry, and other indigenous forms (Elizabeth and Adams 2000).

Natural building also incorporates processes of nature, such as the cycles of the sun and the local climate. The sun can be used to heat and light buildings. The mass of earth around a structure is an excellent, passive container for solar heat. Breezes and diurnal temperature changes cool indoor spaces. Nature also decomposes wastes and provides water.

Actually, natural building is not a new technique, just a new term. It describes the way people have always built with the resources they had on hand. While investigating the origins of passive solar design, author John S. Taylor discovered that many of the principles and practices were centuries old. He noted that passive solar design is just one example of a practical building technique applied by our ancestors (Taylor 1997). Many of the methods of natural building are still practiced by indigenous cultures around the world that don’t have access to foreign materials and energy sources.

Literature indicates the current interest in natural building is about far more than materials and working with the processes of nature however. It is an expression of a world view that sees the earth as sacred and alive (Kennedy, Smith et al. 2002). Advocates of natural building value the interconnectedness of all things and strive to create a healthy built environment—healthy for people, nature, and communities.

Many of the values that prompted the resurgence of natural building are also evident in the broader sustainability movement. In fact, natural building is typically considered one method of achieving sustainable architecture—a loosely defined term meaning a way of building that minimizes the degradation to the natural environment
Although the term ‘sustainable’ is often interchangeable with ‘ecological’ or ‘green’, it seems to be the paramount signifier used to describe designs that respond to environmental concerns associated with development. To be sustainable is to be maintainable over the long term (Encarta World English Dictionary 1988-2004).

The concept of sustainability was born from the debate over balancing economic growth and environmental protection. After publication of the seminal work of Meadows et al in the book *Limits to Growth*, the United Nations established the World Commission on Environment and Development (WCED) to wrestle with how to have sustainable growth—growth that maintains the natural resources it is reliant on. In 1987, the commission published their proceedings in a report titled *Our Common Future*, also referred to as the *Brundtland Report*. This report provides a commonly used definition of sustainability: “Humanity has the ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs” (Williamson, Radford et al. 2003).

Although natural building falls within the realm of sustainable development, and more specifically sustainable architecture, in literature it is explained how it is distinct. “[Sustainable architecture] has defined itself largely as conventional construction that has been improved to meet higher environmental standards—standards that in the eyes of many natural builders often represent compromised solutions rather than those reflecting a deeper ecological awareness” (Elizabeth and Adams 2000).

Natural building not only minimizes negative environmental impacts, it is intended to honor the interconnectedness of all things and to promote a conscious
relationship with nature (Elizabeth and Adams 2000). Natural builders strive to create harmony with the natural world through choice of materials and working with the processes of nature. Authors points to intangible benefits derived from experiencing naturally built spaces. “Something feels so good about bare feet on a sun-warmed adobe floor, so right about the shimmer of mica in a mud-based plaster. The gentle undulations of hand-shaped walls so sensuous and comforting, a bright mosaic on the kitchen splashboard, hearth-stones lugged from the creek-surely this is the very way we were meant to live” (Elizabeth and Adams 2000). These intangible emotions are what I see and wonder about in the visitors of my home. Why do people and literature describe positive feelings in relation to natural buildings?

Christopher Alexander offers a way to investigate the answer to this question. He theorizes that human emotion and physical structure are interconnected and that it is possible to recognize wholeness in the world by sensing it in ourselves. An explanation of his theory follows.

1.4 Christopher Alexander’s Theory of Wholeness

Christopher Alexander developed a theory of understanding architecture that calls into question the current mechanistic world view and replaces it with a perspective derived from the concept of wholeness. He proposes seeing things as wholes, not parts or fragments, and to recognize life in everything-animate and inanimate (Alexander 2002).

In his Theory of Wholeness, Alexander suggests a broader concept of life that is not based on biology alone, but something we can recognize with our feelings. In order to explain life in inanimate objects like buildings, Alexander introduces the concept of
centers. Life in a thing comes from its wholeness, which in turn creates interconnected centers. These centers are coherent entities which occur in space and can only be defined in terms of other centers and are induced by the whole (Alexander 2002). The centers or entities that become apparent when we consider a situation as a whole are different than the individual parts.

For example, if we consider a house and adjacent garden we can see the individual parts as the roof, front door, path, steps, and plants in the garden. If we look at how the house and the garden work as a whole, we see that the front door, steps, and path work as a unit, or a continuous center. We might also see the sunny spot in the garden as an entity, or center.

The difference between parts and centers is not just visual, but functional. Centers shape the events of life that happen there and the feelings people have (Alexander 2002). Alexander purports that it is possible to create centers that expand the life that occurs there. Life itself is a center affected by adjacent centers. When centers enhance each other they increase the degree of wholeness in that place.

But what is this wholeness that Alexander claims we are a part of? In attempting to describe and define it, we immediately realize the limitations of language. Language allows a thing to be described in terms of what it is and what it is not. With the concept of wholeness, there is nothing that it is not, so there is no way to compare and contrast things to describe it.

To grasp an understanding of wholeness, author Alex Gerber Jr. says we must use our intuition. This means to understand something without the use of a rational process,
or to gain a sense of something that is not evident or deducible (Morris 1981). It is our peripheral vision that will give us the clearer picture, not our straight-ahead stare.

Dictionaries define wholeness as “the state or quality of being whole” (Morris 1981). Philosopher David Bohm delves into the meaning of the word ‘whole’ and explains that it shares the same root as the English words ‘health’ and ‘holy’. The Greek ‘holos’ is the root word for ‘whole’ and ‘holistic’ and “refers to understanding reality in terms of integrated wholes whose properties cannot be reduced to smaller units” (Gerber 2001). According to Bohm, the root connections of the word ‘wholeness’ indicate humans have always sensed it is a state of being that is absolutely necessary (Bohm 1980).

By combining the various denotations and connotations of wholeness an understanding that emerges is that wholeness is an all-encompassing something inferring well-being, completeness, or interconnectedness. What we desire most deeply is a healthy, positive connection to ourselves and the rest of the world (Stein 1996). Wholeness is something that we experience, sense, or feel. It is a world view that values the “interconnectedness of creation, the oneness of being” (Gerber 2001).

Alexander’s Theory of Wholeness explains the connection between geometric structure and the human person. The geometry of space relates to how things work and how we feel about that space. What Alexander calls living structure is attached to something deep within us. He claims our lives are ultimately based on feeling and that wholeness in the world and in us are inextricably connected (Alexander 2002).

Alexander acknowledges that wholeness is enormously difficult to see but that we can know it by our feelings. “The deeper the wholeness or life which we meet in the
world, the more deeply it affects our own personal feelings. Centers which have life increase our own life because we ourselves are centers too” (Alexander 2002). Alexander claims that we can evaluate the wholeness of a structure of centers by assessing our internal feelings in relation to that structure.

In order to empirically measure the degree of wholeness in a structure, Alexander developed a method of inquiry based on observer feelings. When comparing two structures, he asks, “Which of these two makes me feel the most wholeness, life, or harmony in myself?” (Alexander 2002). By assessing this interior, subjective feeling, Alexander claims we can determine an objective truth about which system has more life or wholeness.

Therefore, Alexander claims we can create a healthy connection, or wholeness, with the natural world by creating structures that make us feel whole. “Life will increase, or it will degenerate, according to the degree in which the wholeness of the world is upheld, or damaged, by human beings and human processes” (Alexander 2002).

1.5 This research project

This research project uses Alexander’s theory and method of inquiry to investigate the feelings of twelve people living in naturally-built dwellings. Responses to interview questions were analyzed to reveal how the residents attempt to achieve a healthy, positive connection with the natural world through their built environment. Factors that create a sense of wholeness were identified and themes were derived from the interview results. The themes which are common to all the cases were used as
empirical measures to compare individual preferences and to evaluate Alexander’s theory.

The results of this thesis offer a qualitative assessment of how twelve people affectively respond to their naturally-built dwellings. These results can be used to shape further research and to describe how the people studied choose to fulfill their dwelling needs. In the end “there are not different ‘kinds’ of architecture, but only different situations which require different solutions in order to satisfy man’s physical and psychic needs” (Norberg-Schulz 1979).
Chapter Two

Methods

2.1 Purpose

The purpose of this research project is to understand the affective responses of people living in naturally-built homes. It is not the intent of this project to seek unbiased case studies or to compare the results with those from conventionally-built homes. This study focuses on understanding how residents of naturally-built dwellings make sense of their environment. Residents were chosen because people are most intimate with the buildings they inhabit.

2.2 Strategy

The strategy used follows qualitative research methods defined in works such as Architectural Research Methods by Linda Groat and David Wang, Qualitative Data Analysis by Matthew Miles and A. Michael Huberman, and Qualitative Research Methods for the Social Sciences by Bruce Berg. These authors define qualitative research as the focus on natural settings, human values, and subjective viewpoints in order to gain a holistic overview of how people make sense of their environment. Qualitative research methods emphasize “knowledge that comes from in-context human-environment interactions” (Wang 2004: class notes).

Qualitative data are “words based on observation, interviews, or documents” (Miles and Huberman 1994), generally collected in close proximity to the setting under investigation. There are multiple theoretical approaches to qualitative data analysis, and this study follows the tradition of interpretivism. Underlying this tradition is the view
that human activity is “‘text’ - a collection of symbols expressing layers of meaning” (Miles and Huberman 1994). Interpretation of these symbols is necessary in order to gain an “objective understanding of a subjective phenomenological reality” (Wang 2004: class notes).

This study is also aligned with the environment-behavior research tradition which is the study of how people behave in reaction to their environments (Zeisel 1984). Behavior in this context includes thinking and feeling.

### 2.3 Tactics

Case study was the primary tactic used in this research project. A case consisted of one person interacting with their dwelling environment. The homes selected for this study were constructed using primarily natural building techniques. Conventional construction methods and materials are incorporated in the homes studied to varying degrees but features of natural building are dominant. Other tactics included occupant drawings and one-on-one interviews.

Subjects were first asked to draw their feelings for their homes. This was intended to allow a free flow of emotions without bias. The subjects were then asked to explain their drawings, a technique used by Claire Cooper Marcus in her book *House as Mirror of Self*. Marcus’s research showed how some people feel about their homes and was based on the premise that human emotional attachment to physical environments is a necessary part of psychological development (Marcus 1995).

An interview was conducted and subjects’ responses were documented in writing and audio tape. The audio-taped interview was later transcribed. A semi-standardized
interview method was used in which “questions are typically asked of each interviewee in a systematic and consistent order, but allow the interviewers sufficient freedom to digress; that is, interviewers are permitted (in fact expected) to probe far beyond the answers to their prepared and standardized questions” (Berg 1989). This method reflects awareness that people understand the world in different ways and allows the researcher to adjust accordingly (Berg 1989).

The questionnaire used to guide interviews is located in appendix A. It was developed from questions recommended in *The Nature of Order: An Essay of the Art of Building and the Nature of the Universe, Book One-The Phenomenon of Life* by Christopher Alexander. Alexander’s questions are intended to find the structure with the greatest wholeness as determined by observer feelings when comparing two items. For example, to determine which of two things has more wholeness, Alexander suggests asking, “Which of the two makes me feel a greater wholesomeness in myself?” (Alexander 2002). Wholeness is recognized by the words ‘life’, ‘harmony’, ‘wholesomeness’, and ‘unity’. Alexander believes people recognize wholeness in the world by feeling it in themselves. “When we experience something which has deep wholeness, it increases our own wholesomeness. The deeper the wholeness or life which we meet in the world, the more deeply it affects our own personal feeling” (Alexander 2002).

In order to ground this study in Alexander’s theory, the questions asked in the interviews were based on his suggestions. For example, one question asked was, “Where in your home do you feel the greatest wholesomeness in yourself?” Another was, “What aspects of your home seem to generate a greater feeling of life in you?” By asking which
dwelling aspects generate these feelings, or where in the home they occur, occupants described factors that create the greatest sense of wholeness for them. To determine the similarities and differences between cases, questions regarding demographics were included in the questionnaire.

2.4 Data Analysis

The data collected includes photos of the dwellings, occupant drawings, and transcriptions of the audio-taped interviews. The interview data was analyzed using the methods of qualitative analysis - an iterative process of data reduction, data display, and conclusion drawing/verification (Miles and Huberman 1994). The drawings were used to verify findings of the data analysis.

A contact summary sheet, a single page summarizing the field contact, was completed as the first-step of data reduction. This summary captured the interviewer’s initial impressions of the data and is a first cut at developing a categorization strategy (Miles and Huberman 1994).

The second step of data reduction was to summarize and display transcribed interview results in tables. These tables are located in appendix B and document respondents’ actual words as much as possible.

Next, written transcripts of the audio-taped, one-on-one interviews were evaluated using content analysis - an objective categorization scheme applied to data (Berg 1989). Initial categories were derived from Christopher Alexander’s description of wholeness: “What is ecologically appropriate, what is socially and psychologically valuable, what is beautiful to the eye, what is comforting to the soul-these are all wrapped up together in
the global judgment of wholeness” (Alexander 2002). The categories gleaned from this explanation are:

- Ecologically appropriate
- Socially valuable
- Psychologically valuable
- Beautiful
- Comforting to the soul

Alexander’s categories were used to initially sort transcribed interview data. Individual factors and associated discussions were identified in the data and literally cut from the transcriptions. This information was then sorted according to Alexander’s categories. The following criteria were used to decide what data went with each category:

- Ecologically appropriate
  - Factors that address some aspect of the environmental concerns with building were included in this category. Using renewable energy sources and materials and recycling are examples of factors that were placed in this grouping.

- Socially valuable
  - This category groups data that explains a relationship with other people. This includes connecting with others such as through teaching or being set apart from others by being different.

- Psychologically valuable
o Factors that benefited the self were included in this category. For example, people described a sense of satisfaction and wholeness by living in alignment with their values and connecting with nature.

Beautiful

o Interview data that describes a positive sensory experience were placed in this category. Views, quiet, and thermal sensations such as radiating warmth or coolness are examples.

Comforting to the soul

o This category encompasses those factors that address spirituality or consciousness as described by the interviewees. Examples are feeling connected to God or becoming aware of life through the act of creation.

Once the interview data was initially organized according to Alexander’s categories, themes in the results became evident. These themes represent patterns in the respondents’ answers to the questionnaire. For instance, several residents mentioned factors that address energy such as a small house, heating with wood, or passive solar heating. The theme that was derived by grouping these factors is titled ‘Energy Efficiency’. The data was already categorized under ‘Ecologically Appropriate’ therefore ‘Energy Efficiency’ became a refining subcategory. Alexander’s theory represents an etic-level organization scheme and themes obtained from the interview results are an emic-level organization of the data.
The following image represents how Alexander’s theory was applied in this study:

![Diagram of Alexander's theory application](image)

**Figure 3: Application of Christopher Alexander’s Theory**

The analytical procedure used to identify factors and themes closely followed the method detailed in a paper titled *Topical Analysis: A Method for Collecting, Classifying, and Developing Concepts and Models from Narrative Data* by Jon Driessen. Following are the steps of this method as they were applied in this study:

1. The transcription of interview in Case 1 was read until the first factor meaningfully associated with the dwelling was identified. An example of a factor raised by an interviewee is the use of wood.

2. The discussion surrounding the identified factor was then placed in one or more of the categories derived from Alexander’s description of wholeness.
For instance, the use of wood was placed under the category Ecologically Appropriate. The applicable category was chosen based on words people used as they talked about the factor.

3. The remainder of the transcript was then searched for all other references to the factor identified in step 1 and this information was added to the same category.

4. The transcript was then read until the second factor was identified and steps 2 and 3 were repeated. This was done until all factors were identified.

5. The results of steps 1 through 4 were reviewed and themes were identified from the list of factors. These themes were used as subcategories to refine Alexander’s categories. For example, the factor of wood was subcategorized under the theme natural materials.

6. Alexander’s categories and the themes identified in Case 1 were used as a starting point for organizing the data of Case 2. Steps 1 through 5 were repeated. Themes were added to reflect new information.

7. After the first few case studies, no new themes were identified. Descriptive titles of the themes were refined slightly based on new information.

Themes recognized during analysis of the data are interpretive categories of factors that are common to all the people studied. As such, they can be used to measure and compare individual preferences. The results of applying themes as measures are
shown in Chapters 3 and 4. The themes are also empirical results of using Alexander’s theory and therefore offer an opportunity to evaluate his theory. The results of this evaluation are located in Chapter 4.

Chapter 3 contains case-specific summaries of what was learned from the interviews. These descriptive summaries are not intended to be exhaustive accounts. Their purpose is to provide a ‘snapshot’ of how the twelve people studied explained their experience of wholeness in relation to their naturally-built dwellings. Categories from Alexander’s explanation of wholeness that were used as an initial interpretive organizing scheme are subheadings in the snapshots.

The snapshots of the information learned from each case study, the list of dwelling factors, and the themes are the results of this research project.

2.5 Setting

This study is focused on naturally-built homes located in the northern Rocky Mountain region. This area is semiarid with cold winters and warm to hot summers. Sunshine is abundant during most of the year however there can be long stretches of cloudy skies in the winter. Precipitation is primarily in the fall, winter, and spring. The terrain is characterized by valleys or rolling grassy prairies in view of forested mountains.

All interviews were conducted on site and in or near the dwellings studied. The cases are located in similar ecoregions which are defined in *Ecoregion-Based Design for Sustainability* by Robert Bailey. An ecoregion is a large area of land or water with patterns of ecosystems that share similar environmental conditions (Bailey 2002). The map below shows the ecoregions of the United States:
2.6 Subjects

Twelve cases of people interacting with their dwellings were studied. In three cases, two people living in the same house were interviewed at the same time. In one case, the interviewee lived in an apartment located in a house that was also studied. Overall, eight different homes were evaluated.

Ten of the people studied own their home and two are renters. Ten have occupied their homes for less than five years and two have lived in their dwelling for six to ten years. All of the people interviewed were willing participants and reviewed the release in
appendix C prior to the interview. Only one subject was not living in their dwelling at the time of this study. This person lived nearby in a temporary structure and expected to move in to the house after its completion within two months.

The ages of people interviewed range from 23 to 87. Five were men and seven were women. Their education ranges from high school diploma to Doctorate degree. Income levels range from $10,000/year to between $51,000 to $100,000/year. Eleven people were Caucasian and one was Hispanic.

Eight of the people studied were highly involved in the design of their homes while four were not involved at all. Six were highly involved in the construction, two were somewhat involved, and four were not involved.

The interviews were conducted over a time period extending from December 2004 to April 2005. Cases 1 through 4 were studied first and additional cases were added after an initial analysis of the results. The average interview lasted about an hour and a half with some going as long as four hours.
Chapter Three

Study Results: Factors, Themes, and Snapshots of Wholeness

3.1 Overview

The results of interviews conducted in this study are displayed in a collection of summaries, or ‘snapshots’, which follow this section. These snapshots describe how twelve people explained their experience of wholeness in relation to their naturally-built dwellings. Christopher Alexander’s categories of wholeness - Ecologically Appropriate, Socially Valuable, Psychologically Valuable, Beautiful, and Comforting to the Soul - are subheadings which organize summaries. The snapshots also describe the dwellings and settings of the case studies. In these summaries, subjects’ names have been changed.

Content analysis of the interview data described in Chapter 2 resulted in a sorted list of dwelling factors that impart a sense of wholeness for the residents. The factors mentioned include building materials and features that embody memories, meaning, and feelings. These dwelling factors are discussed and described throughout the snapshots of wholeness (appendix D).

Dwelling factors were identified in the interview data as it was sorted according to Alexander’s categories of wholeness. Factors that were similar were grouped and themes, or patterns, became evident. Twelve themes were found during this step of the analysis procedure. They are shown around the inner circle in the following diagram along with how they relate to Alexander’s categories in the outer ring:
The themes displayed above are patterns of factors found in the cases studied.

Following is a brief description of each theme using the factors identified by the interviewees:

**Energy Efficiency**

Energy efficiency is often one of the primary reasons for building with alternative materials. In most of the cases studied, construction materials were chosen based on their
high insulating values, thermal mass, and/or embodied energy. These building materials include straw bales, earth, and minimally processed wood. Energy efficiency was also achieved by a small size house and heating with renewable sources such as wood or solar gain.

**Using Renewable or Recycled Natural Materials**

Since this research focused on naturally-built dwellings, it is consistent that the use of renewable and recycled natural materials were emphasized by interviewees. This was a known preference going into this study. These materials include wood, earth, adobe, straw, stone, clay tile, and cork.

**Working with Natural Systems**

Working with natural systems is also a part of natural building. Using the sun’s heat and light and electricity generating capabilities is one example. Also treating wastewater with plants and composting is another way to work with the systems of nature. In three of the cases studied, growing food was an important factor in their lifestyle.

**Connecting with Others**

The most frequently mentioned factor that facilitates a connection with others is an open interior space. Seven people mentioned that their open and connected living room, dinning room, and kitchen gave them a sense of wholeness. A connection with others was also achieved by sharing the experiences of their home and from setting an example.

**Being Different**
The desire to be different was identified by four people as the reason for living in a naturally-built home. In these cases, connecting with others was much less of a concern than living in a way that is expressly different from the rest of society.

**Living in Alignment with Values**

Nine of twelve residents indicated that living in alignment with their values is a factor that is highly important to their sense of wholeness. Two people referred to this as having their inner ethics “in tune” with their lifestyle. To some this means that their home expresses their values. For example, their choice of renewable materials and energy efficient construction show they place importance on the protection of the natural environment. Some of the residents interviewed value self-sufficiency and their homes facilitate living this principle. Practicality and economy of costs were also factors that were noted.

**Connecting with Nature**

Some of the people interviewed felt a sense of wholeness from materials, such as wood or cork, which remind them of nature. Others noted that materials, such as straw bales or recycled wood, represent an environmentally responsible choice. Anything that brought an awareness of natural cycles to residents also created a connection to nature. Cycles of the sun and the moon, life and death of vegetation, and needing to respond to weather are examples of these factors.

**Viewing Nature/Sunlight/Moonlight**

Dwelling factors identified by the residents that describe this theme include a view of the sky, wildlife, garden, weather, and surrounding vegetation. This theme also includes organic features inside the home - like rounded, irregular walls and plants.
Thermal and Acoustic Qualities

Thermal and acoustic qualities that were identified by residents include the radiating warmth from stored solar heat and coolness that was achieved by using thermal mass. Knowing that heating and cooling was achieved without the use of fossil fuels gave one occupant a sense of wholeness. Others mentioned the quietness of their homes and one noted the sound of rain on the metal roof.

Making

Some residents said they had a greater feeling of life through the creation of their home. Some mentioned joy in the act of making and others expressed wholeness by saying they felt one with their home.

Spiritual Connections

A few people studied mentioned spirituality in relation to their home. Feeling connected to others and to nature were factors that added meaning to their lives. Their homes also helped some to feel part of the universe and connected to God.

Places that Feel in Harmony with the World

In several of the case studies, people noted specific places that gave them a feeling of harmony with the world. Some said this was near a fireplace or stove with a wood fire. Others mentioned a porch or patio that overlooked nature.

Since the themes described above are common to all cases studied, they can be used to measure and compare individual preferences. At the end of each case-specific snapshot are graphs showing the results of this measuring technique. Subjects’ preferences were ranked as high, medium, or low based on a subjective evaluation of the
interview data. Contact Summary Sheets which captured the interviewer’s initial impressions were also used in the evaluation process. The graphs depict and measure what is explained in each snapshot and are referred to as Measures of Wholeness. Alexander’s categories are not shown on the individual graphs in order to highlight themes that were derived from the interview results. In Chapter 4, the graphs are compared and the results are discussed.

### 3.2 Snapshot of Cases 1 and 2-Passive Annual Heat Storage

![Figure 6. Exterior of Dwelling in Case 1 and Case 2](image)

**Ecologically Appropriate**

Tucked in at the top of a hill is the earth-sheltered home of Jack and Caroline for which they exchanged their Spokane suburban home of 35 years. Their three year old rural retreat is situated on the edge of the rolling, short-grass Palouse prairie. Jack, a veterinarian, wondered what to do with the rest of his life after he retired in 1995. He and
Caroline spent some time articulating their shared vision which is now expressed in their energy-efficient home. Their mission is to live with minimal impact to the earth and to share what they are learning and doing.

Caroline and Jack built a home that relies on solar heat and the mass of the earth instead of nonrenewable fossil fuels for heating and cooling. Their home is built into a hillside with earth surrounding the back and most of two sides as well as covering the roof. The front of the house faces south and welcomes the sun’s warmth into the interior space.

Jack and Caroline learned from a solarium addition to their in-town home that heat from the sun is not dependable in the coldest winter months of the Inland Northwest because of the long cloudy stretches. While researching energy-efficient building techniques, they learned how to store heat from the summer’s sun for use in the winter from John Hait’s book *Passive Annual Heat Storage: Improving the Design of Earth Shelters*. The passive annual heat storage system collects excess heat from direct solar gain in the earth around their house during the summer, keeping the indoor temperatures cool. To retain this heat for later use, an insulating barrier was put on top of the earth which surrounds their home. In addition, they installed a collector, called a thermosyphon, to conduct solar-heated air through the earth under the home which increases the stored heat energy.

![Figure 7. Thermosyphon Used to Collect Solar-heated Air](image.png)
heat. In theory, the stored heat radiates back into the interior spaces during the winter months keeping the indoor air temperature at comfortable levels even on days when the sun doesn’t shine. The simple heat flow principle of thermodynamics, that heat flows from warm to cool regions, runs this system (Hait 1983). Currently, Jack and Caroline use a wood stove for supplemental heat as it is expected to take several years for the heat stored in the earth to build up to an adequate level.

Initially Caroline and Jack were thinking of constructing their home of concrete which is typical of most underground structures. They quickly changed their minds however, when a local designer reminded them the production of concrete is a very energy intensive process. They explored alternative materials and settled on a combination of wood, straw bale, and salvaged concrete block. They minimized using conventional materials when they could, but did incorporate some concrete, prefabricated wood joists for the roof structure, and gypsum board on the interior partition walls. The majority of their house however is non-conventional construction.

It was important for Jack and Caroline to know the materials they were using as thoroughly as possible. The straw bales came from land within ½ mile of their home and the logs were harvested on site or from standing-dead trees near Flathead Lake in Montana-approximately 200 miles away. They used earth from the site for the thermal mass surrounding their house, to create a rammed-earth wall, and to cover the roof. They also made earth plaster, an earthen floor, and a rammed-earth tire wall for a greenhouse.
Many of the materials and even the furnishing of the home were obtained opportunistically. Used tires heading for a landfill were diverted and used to make retaining walls. Tire bales-compressed tires tied into bales with high-tensile strength wire- were stacked as walls for a cold storage room and garage. Other tires were rammed full of earth and fashioned into the greenhouse walls shown in Figure 8. Used carpeting became underlayment for the earth-covered roof. Windows, kitchen cabinets, and furniture were recycled. Some of the materials reused in Jack and Caroline’s home came with memories. For example, the large display cabinet that doubles as a wall once resided in the halls of the high school that Caroline attended.

**Socially Valuable**

At the core of Jack and Caroline’s vision is a desire to be in service to society. They could have comfortably stayed in their in-town house and benefited from the energy-efficient upgrades they did, but instead they chose to build an experimental home for educational reasons. They believe more people need to try energy efficient construction techniques to see if they work and to learn from. They now have so much to share about the place they named Patience II and refer to as a joy that their tours often last four to five hours.
The open floor plan of Caroline and Jack’s home facilitates a connection with others. The joined kitchen, dinning, and living rooms allow the cook to socialize with guests and Caroline said, “When it is open like this you feel part of everything.” In fact they identified the open floor plan as one aspect that gives them a sense of harmony with others.

Jack and Caroline value a sense of community inside and outside of their home. When their neighbors decided to bring in electrical power lines, Caroline and Jack postponed their goal of producing electricity from photovoltaic panels and connected to the grid. They had not found affordable panels anyway and felt it was important to be part of a community. Their neighbors were not interested in depending solely on solar generated electricity. Since our interview, Jack and Caroline have purchased a solar electricity generation system which they will put on-line in January, 2006.

Jack emphasized their social values when he said, “Our community is right here too. We are very like-minded as far as our relationship to our earth and with people.” Caroline and Jack are also involved in their church, a simplicity group, and the Northwest Ecobuilding Guild.

Psychologically Valuable

Since it is difficult to separate what is psychologically valuable, beautiful, and comforting to the soul into three distinct categories, some of the interview information is repeated. One recurring theme was the good feelings Caroline and Jack get from knowing where their materials came from and how they were processed. Caroline said, “It felt good that we weren’t getting something that had to be shipped from a long distance away.” These good feelings are linked to the knowledge that the resources they
used caused less harm to the natural environment than conventional materials. Materials obtained locally take less fuel to transport. Recycling diverts waste from landfills and reduces the demand for raw materials. Using waste products such as straw does the same thing.

Jack and Caroline’s choice to live in alignment with their values gives them a great sense of satisfaction. Their goal is to be as self-sufficient as possible and to live in harmony with nature. They know they can provide for most of their needs by using renewable natural resources such as sunshine and living off what they grow. Caroline and Jack feel joy when they think about how their house works for them. Jack said, “We know that when the afternoon sun comes in the bedroom window it is going to hit that rammed earth wall and it is going to be soaking up the sun’s warmth.”

Beautiful

Though Jack and Caroline sited their home primarily for solar heat gain, they have realized how beautiful sunlight is in their home. Jack said, “On a sunny day this is heaven, right here at the kitchen table. It is just such a good feeling to be sitting in this spot early in the morning.” Caroline enjoys the affects of the sunshine as it changes through the day and the seasons. She said, “I know that in the afternoon the sun is going to light up that end of the house and I look forward to that time of the day.”

The same windows that let the sun shine in also give a broad view out. Both Caroline and Jack feel close to nature by looking out onto a valley, distant mountains, and the sky. Caroline mentioned that she feels in tune with what is happening in nature by watching the weather patterns. The view was just a bonus of the more important solar
orientation for Jack but he is keen on the 275 degree view from the upstairs room that
looks onto Mica Peak.

As the saying goes, beauty is in the eye of the beholder. Perhaps there is more to
beauty than what can be seen however. Caroline and Jack are very aware of how their
house feels thermally and that gives them delight. Coming inside when it is cold out is
when Jack feels most alive. “Every time I come in the door and even though I haven’t
had a fire in here, I feel the warmth, the radiating warmth, and it reminds me of how this
house works.” Caroline noted they refer to the upstairs room as the pilot house because it
looks like it belongs on a boat. She said, “This is where you can feel like you are
outdoors and be indoors and all snuggy.” In the summer on a hot day their home stays
nice and cool without air conditioning. “In the summertime in here is fantastic” said
Jack, “I wouldn’t want to be any place else.”

Caroline also found beauty in surprising ways. “I thought I wanted Scandinavian-
style furniture,” she said. “I found I enjoy these other things that we recycled. It was
amazing to me.” Part of the appeal for their used furnishings is that they are recycled.
They represent a good deed done for the environment.

Comforting to the soul

Jack and Caroline’s drawings of their feelings for their home capture how they feel in
their soul. Jack summed it up when he wrote “House and us-total interconnection with
all of creation-we are part of creation” on the bottom of his sketch shown below. He
explained it this way, “The orientation here makes me feel like I am part of the earth. I’m
using the sun the way it’s meant to be used and I built the home in conjunction with
Mother Nature. Plus it feels good.” Jack described their deep connection to their house
when he said, “This is us growing through a whole life and this is where we are now. The house and we are one as far as I’m concerned in public with other people. That’s who we are.”

Caroline’s drawing is an abstract representation of their house. The yellow is the sun and the sunshine in the home. The brown is the earth that shelters the house and the green are the plants that grow around the site and on the roof. The birds on the left are the two bluebirds that come to visit every spring.

Figure 9. Drawing of Feelings in Case 1
This drawing represents elements of the house that are notable to Caroline and it also indicates how she sees the whole. She said, “It’s everything in tune. When things are not in tune is when I feel most upset. I feel more alive when everything relates to my values.” In tune is another way of saying harmony and Caroline strives for inner peace by living in harmony with her values and nature.

Caroline said that being part of the design and making processes gave her a greater feeling of life. She so enjoyed making their home that she turned down Jack’s offer to take her on vacation for a break from the work. She said, “I couldn’t imagine any vacation that would be more fun.”

When asked to describe her feeling toward her house if it were a person, Caroline said she feels very close to it and it has made her life a joy.

Measures of wholeness
The graph above shows Jack’s preference for the physical features of natural building as source of wholeness. These include energy efficient construction, materials that are renewable or recycled, heating and cooling techniques that work in harmony with natural cycles, and the thermal and acoustic properties of the home.

Connecting with nature and spiritual connections were also ranked high. Jack feels connected to nature through the physical features of his home. The spiritual connection has to do with the oneness the he feels with his home and the earth.

Jack expressed a very strong desire to live in alignment with his values. His home expresses these values through its physical features and facilitates living self-sufficiently and simply with minimal use of nonrenewable natural resources. Another component of his value system has to do with connecting with others which is reflected on the graph. In contrast, the theme of ‘being different’ is ranked low even though the dwelling is very different.
Similarities can be seen in Caroline’s graph such as the highly ranked themes that describe physical features. She also expressed the importance of living in alignment with her values. Caroline is very aware of nature though views, sunlight, and moonlight in her home. Connecting with others is a stronger desire than being different and making is a big part of her sense of wholeness. She has a strong desire to be creative and gets great joy out of making.
3.3 Snapshot of Cases 3 and 4-Solar Straw Bale Spec

Ecologically Appropriate

My neighbors, Mary, a retired music teacher, and her daughter Lori, purchased the sister home to mine early in 2003, just a month before I did. These two load-bearing straw bale homes were constructed in a suburban neighborhood by the Spokane County Conservation District. They wanted to promote the use of waste straw from the production of grass seed in the nearby Palouse Prairie when it became illegal for farmers to burn it.

Learning of my interest in sustainable architecture, the first house my realtor showed me was one of these “hay houses”- her term for straw bale. I walked in the door and liked it immediately. Lori and Mary had a similar first-impression experience. Lori was drawn to the idea of constructing with renewable straw bales because using a waste
product instead of lumber appealed to her, but the aesthetics clinched the deal. “I just loved it the minute I walked in.” said Lori during our interview.

The features of the house that are outstanding to Mary and Lori are the Mexican clay tile floors, the large south-facing sliding-glass doors, stucco, and the woodwork. The wood used in the house is alder, a fast growing tree. The cupboards are made of locally produced strawboard of bluegrass straw glued without toxic formaldehydes with an alder veneer. Cement stucco covers the straw bale walls inside and out with a smooth coat of gypsum plaster on the interior. The roof is a conventional truss system with asphalt shingles and in the interior walls are wood studs covered with sheetrock. The paint used on the interior has no volatile organic compounds to off-gas and the carpeting is made of recycled materials.

Design strategies were incorporated in Mary and Lori’s house to take advantage of heat from the winter sun and cooling from shade and passive ventilation in the summer. The eave overhangs are designed to allow the sun in
through the south-facing sliding-glass doors in the winter months and to keep the interior shaded in the summer. A clerestory with operable windows provides ventilation to take advantage of cool summer nights with the bonus of daylight in the interior space. Lori noted, “The sun is very much a part of our home” and her drawing of her feelings for her home emphasizes this:

![Drawing of feelings in Case 3](image)

**Figure 16. Drawing of feelings in Case 3**

Having moved from a large multi-story home, Mary and Lori appreciate the simplicity of their straw bale house. “It is small and confined and fairly practical,” said Lori. This makes it easier to clean and maintain, not to mention heat, cool, and furnish. The small size coupled with the super-insulated R35 straw bale walls and blown in cellulose ceiling insulation at R50, makes their house very energy efficient.

**Socially Valuable**
One of the aspects of straw bale construction that attracts Lori is its uniqueness. It is different from the norm which she finds appealing. Lori’s desire to be different is also expressed in her landscaping. There is no lawn to be found on their site. Instead there are rows of flowers mixed with vegetables growing in mulch. The mulch was obtained free from landscape maintenance companies looking for a place to dump chips made from removed trees.

Though Mary and Lori may like to be different, they are willing to share their home and they have opened it for a public tour. Like Caroline and Jack, Lori and Mary find the floor plan of their house facilitates a connection with others. Their kitchen, living, and dinning rooms are connected in a large open space that is central to the house. This one big room is where Lori says she feels most in harmony with the world.

Psychologically Valuable

When Mary hurt her knee on the steps in her big suburban house and she decided it was time to move. She wanted a place that allowed her to maintain independence. She said, “Here we can take care of our needs.” There are no steps and they have a place for all their things. The house works well for them and gives Mary a sense of self-sufficiency in her retirement years. It is practical and this is just what they wanted. Mary said, “We live here; we have to feed ourselves; we have to sleep; and we have to come and go. We can do all that here.”

One thing the house did not have when they purchased it was the gorgeous summer garden just outside the sliding-glass doors. It was primarily Lori that created it but the garden gives both of them great pleasure. Lori says this is where she is most comfortable and has the greatest feeling of life. She notes, “We both just really enjoy
watching things growing and changing and going through their whole cycle of life.” The large windows frame the view of this garden and seem to bring nature inside. The garden and the house connection remind Mary and Lori of one of Frank Lloyd Wright’s houses they toured in Connecticut, where he intended to bring nature into the house. Lori said of her home, “You feel like you are sitting in the garden.” The garden gives Lori a greater feeling of life. Mary remarked, “I’m very impressed with the garden. I love it.”

Beautiful

Although straw bale construction was the initial attraction to their home, Mary and Lori have a lot to say about its aesthetics qualities. They like the openness of the floor plan. Lori said, “When I first came in the house it felt open and bright and cheerful.” The south-facing sliding-glass doors let in natural light as does the overhead clerestory. In her colorful way, Mary talked about the sun that is so much a part of their passive solar home. “I keep exclaiming, ‘Oh, the sun’s in and it is so bright!’ or when it is a gloomy day I say, ‘it is so blooming dark.’” Mary’s drawing of her feelings for her home show the light from the sun and the moon as notable qualities of their house. She even drew rocks which are all around the house and are prominent in their garden. “Even the rocks are enriching is some respects, I’ll be darned. You pick up some of these rocks and wonder where the heck they came from.”
Lori describes the interior of their home as warm and cozy due in part to the clay tile floor and the wood. The clay reminds her of the desert heat in the southwest and she said, “The tile makes the house feel warm just looking at it. I love the tile on the floor.”

Lori is also attracted to the round straw bale walls and deep-set windows. Mary said of the walls, “They are kinda fun to look at.”

The south-facing clerestory invites sunlight into home that changes though the day and the seasons. Lori commented that every once in awhile they notice how the light is playing on the ceiling. She said, “You know, it is really nice to have the extra light coming in.” It is the windows on the ground level that give Mary and Lori the greatest joy however. These are the windows that frame the view of their garden.

**Comforting to the soul**

Over and over during the interview, Lori and Mary mentioned their garden as the feature that gave them the greatest sense of wholeness. Lori said the garden made her feel alive and gave her a sense of unity with herself. This is where she feels most
comfortable and relaxed. Mary loves the garden as well and when we spoke of the impending frost just the other day she expressed her dismay about the end of their summer garden. The garden gives Mary a greater feeling of life.

For Mary, memories are an important part of her house. She appreciates having a place to put the things that hold them, like family photos and small treasures. When asked how their home is most like their best self, both Lori and Mary said because it is practical. It has a place for the things that hold their memories, it facilitates their independence, and it works with their lifestyle. Lori said, “I really love this house. It is probably the easiest place I have ever lived.”

**Measures of wholeness**

![Case 3 Measures of Wholeness Graph](image)

The graph in Case 3 shows four strong preferences as sources of wholeness. Using renewable natural materials emerged from Lori’s attraction to the construction materials in her home. Although straw bale is the primary feature and was the initial
attraction, her consciousness of it has faded over time. She is very attracted to the natural clay tile floors however and mentioned them often. Connecting with others is accomplished by the open and connected living room, dinning room, and kitchen. Being different is a moderate preference. For Lori, living in alignment with values means being practical. Her house fulfills her need for shelter in a practical manner as it is small and easy to heat, cool, and maintain. Connecting with nature is an important aspect of Lori’s sense of wholeness and it is primarily accomplished through her garden. A view of the garden was noted several times during the interview.

Lori noted the quietness of her straw bale home which falls under the theme of acoustic qualities. The thermal quality was mentioned in regard to energy efficiency. These two themes were ranked as a medium preference.

Figure 19. Case 4 Measures of Wholeness Graph

Mary did not answer as many of the questions as Lori did and their interviews were conducted simultaneously. The themes that are ranked as high for Mary are for
much of the same reasons explained in Lori’s case. Mary also values practicality, the connection provided by the open living room, dining room, and kitchen, and feels wholeness though a view of the garden. Viewing the sun and the moon were also mentioned by Mary.

3.4 Snapshot of Case 5-Straw Bale and Fine Wood

![Figure 20. Exterior of Dwelling in Case 5](image)

**Ecologically Appropriate**

Kevin was installing the kitchen cabinets he had just completed when I arrived. He and his family had not yet moved into their straw bale house which is situated in the rain shadow of the Cascade Mountains. They are living in a nearby yurt and that is where we settled for the interview.
Kevin, a woodworker and university professor, embarked on the adventure of building his own home because he wants to be environmentally responsible and live as sustainably as possible. To him this means renewing a healthy relationship with nature by creating a home that is a constant reminder of his connections to the natural environment. For this purpose he chose renewable natural materials—straw bales, stone, and lots of beautiful wood. Even the stucco, which comes in a bag from the store, was formed into textures and shapes that are reminiscent of nature.

From his training in biology, Kevin understands some of the processes that shaped the natural materials used in making his home. He knows which insects left their marks on the logs that form the skeleton frame of his house. He knows these logs came from trees on his neighbor’s forested site. The wood Kevin used to make cabinets, doors, and other features came from trees on a family farm in New York. Kevin said, “The wood connects us to nature.”

**Socially Valuable**

The stories of the materials in Kevin’s home tell him about people as well as nature. People cut the trees and shaped the logs. People helped to stack the straw bale walls and trowel on the stucco. When Kevin looks through the truth window he sees these people and remembers their smiles. By their touch they left behind happiness that
radiates back into the house through Kevin’s memories. Kevin summed up the connections he feels to people though the materials in his house when he said, “We love when we look at the materials in the house and we know that our friends and people we love and this community helped to build with them.”

![The Truth Window in Kevin’s Home](image)

Figure 22. The Truth Window in Kevin’s Home

**Psychologically Valuable**

Kevin believes that a lot of environmental problems stem from the relationship people have with nature. He chose to build a home that reminds him of his connections to the natural world which, as Kevin said, “Make life a lot more meaningful.” Knowing he is using renewable resources gives him a sense of accomplishment and satisfaction. Kevin is grateful to nature and his community for his home, even though he feels guilty for using resources and having more than most other people in the world. When asked how his house reflects his best self, Kevin said, “Joyful humility.”

Through the process of creating his home, Kevin became more aware of his own life. Kevin said, “We’ve been so involved with building the house and because it has
taken so much of our time, I think that makes us more aware of our lives.” Building a home takes a lot of time and energy and Kevin described his drawing of the feelings he has for his house as joy and sweat.

![Figure 23. Drawing of Feeling in Case 5](image)

**Beautiful**

Kevin loves wood. He sees beauty in its grains and working with wood makes him feel close to nature. So do the stones and the undulating, imperfect straw bale walls that are like something found in nature. Kevin said, “The thick straw bale walls have an embracing quality that make you feel like somebody’s arms around you. The textures, the shapes of things, the way the light plays on the plaster and the view of the sky in the sun room are like nature. So that makes it. It feels wonderful.”

Kevin refers to his house as having a “holistic aesthetic”. He explained that this means knowing where materials come from and through them, recognizing and honoring his connections to nature and others.

**Comforting to the soul**
When I asked Kevin how he would feel about his house if it were a person, he said he would just love them. “They would be a sage, a musician, an artist, or the Buddha,” he said. This spiritual association is due to feeling connected to nature which he sees as something bigger than himself. He said, “You know we want to believe in something greater than ourselves and feel we are part of something big and special and that God loves us.” Feeling connected to nature through the materials of his home gives Kevin a greater feeling of life.

There is a triangular walnut bench built into the wall just as you enter Kevin’s home. The beautiful wood for this bench came from his wife’s family farm and is fashioned with the wall so that it looks like it grew there. Kevin describes this bench as having wholeness. He said, “It is like synergy, like an emergent property. These individual things, the memories, the knowledge of where the materials came from- together something comes out that is greater than the sum of the parts. It’s a wonderful feeling. Like that spiritual thing I’m talking about. I hadn’t really thought about all this stuff before.”

Kevin extends this sense of wholeness to how his home works with his family. He said, “The house is us. It flows with us. It thinks the way we think because we put it together.” Their personal touches are evident even in the electrical conduit for the light fixture that is painted like a coral snake. Kevin studies reptiles after all.
Measures of wholeness

Figure 25. Electrical Conduit Snake

Figure 26. Case 5 Measures of Wholeness Graph
One overarching theme in the results of the interview with Kevin is the sense of wholeness he gets from feeling connected to nature and others. This is evident from the above graph. This connection is accomplished by wood specifically because of its natural beauty and the associations Kevin has with it. When he looks at the wood in his home he remembers where it came from and who helped to provide it. The straw bales hold the same memories. Kevin’s association with the materials in his home is reflected in his preference for the theme ‘Using renewable or recycled natural materials’. Through these connections, Kevin is aware of being part of something much bigger than himself which he associates with spirituality. He built much of his home and through making it, has become more aware of his own life. The impetus for building his home was to create shelter for his family that expressed Kevin’s values of connecting with nature and kinship with the world.

3.5 Snapshot of Case 6-Two Story Straw Bale

Figure 27. Exterior of Dwelling in Case 6
Ecologically Appropriate

The home of Sean and his family set a precedent in the Pacific Northwest. Five years ago, working with an architect, they created the first two-story, load bearing straw bale house in that region. All structural loads are transferred to the foundation through the compressed straw bale walls that are stuccoed inside and out. The rubble trench foundation that holds the massive walls is a trench filled with crushed stone and topped with a concrete grade beam. This foundation system is uncommon in the United States but has been used for thousands of years in the Middle East and parts of Africa. It was discovered and brought to the United States by Frank Lloyd Wright around the turn of the 20th Century (Koko 2003).

When Sean took an environmental studies course in college 20 years ago he learned that humans are using natural resources faster then they can be replenished. To counter the unsustainable consumption of resources, he made a shelter for his family of renewable materials like wood, straw bale, and stone. Sean used locally available wood including some that was recycled and took a lot of work restore. To minimize the use of fossil fuels, his house is very energy efficient, with R-35 walls, passive solar heat collection, and passive cooling from convection. The house is oriented on the site to be protected from strong winds and to take advantage of views of nature. Sean lives close to town which allows him to bike to work and conserve gasoline.

On the property where Sean’s home is located is a wetland which he protected when he sited his house. Sean is working to restore this wetland so it can function naturally. He said, “Having a little bit of natural habitat around us is so important to me. We see hawks and skunks and quail and lots of song birds all the time.”
Socially Valuable

When Sean became concerned about the harm humans are doing to the natural world, he decided that one of the best things he could do was to set an example of a different way to live. His house is a big part of that. He said, “We want to demonstrate what a more sustainable type of development would be.” He used renewable materials for his shelter and sited the house to work with the local climate and terrain and to allow inhabitants an awareness of sun and the moon, the weather and the wildlife. Sean refers to his house as being “in tune with its surroundings.”

Sean’s concern for society is depicted in his drawing of his feeling for his home. “The big person and the small person are future generations, maybe 50 to 100 years from now that are happy,” he said. “I think about the future a lot because I wonder what the problems and unsustainable practices are leaving for the future.” The eyes in the drawing are people of today that are watching the way Sean and his family are dwelling. He wonders what they think.

The squiggly lines over the cliff represent Sean’s trepidation about some aspects of his house. The rubble trench foundation and the two-story straw bale walls cause him to worry. Will the foundation really hold the heavy walls? What if the bale walls got

Figure 28. Drawing of Feelings in Case 6
wet? “I have no tangible reason to worry about the foundation other than it is new to this area,” said Sean. “But I still worry.”

The living room, kitchen, and dining room are open to one another and this gives Sean a sense of connection. When asked where he feels the most wholesomeness he said, “As I’m preparing food. I like to eat and my wife and I can prepare simple meals that are healthy. I like being in the kitchen with her.”

**Psychologically Valuable**

In the process of building his home, Sean learned a great deal about himself. “A lot of times I’ve been way too stressed out to enjoy the aspect of work,” he said. “But when I’m centered, I love work. I particularly enjoy working with wood.” The things that Sean created from that centered place remind him of his positive energy. “I see things in my house and I think, ‘Oh, I was really centered when I did that.’ Like the porch. And then I see other things and I think, ‘Oh, I was really rushed.’ I don’t have good feelings about that.”

The place Sean feels most in harmony with the world is his front porch. He said, “If I’m sitting on the front porch it usually means that I’m in a calm space. I’m not distracted and I can look out on the trees and the hills and watch the clouds. Often times I am out there with my wife. At the right time of the year the birds are out.”
Beautiful

Sean loves to work with wood and particularly wood that has a story. Like the flooring that was recycled and looked really awful but became beautiful with some hard work. The wood staircase is something that Sean spoke of. He milled the wood and fashioned it into the central stairs shown in Figure 29.

Sean describes the straw bale walls as welcoming. They are massive with rounded corners that give them softness. These walls also make for a quiet interior and an acoustically peaceful place.

Sean appreciates seeing and experiencing nature through his house. The home is oriented to take advantage of passive solar heating which allows inhabitants to see the sunshine and its changes through the day and the seasons. The added advantage of this orientation is the moonlight that also graces the interior spaces on a clear night. Sean enjoys the light of the sun and the moon, watching them rise from the bedroom or kitchen windows. Through these same windows Sean can see the wetland and the wildlife that live there.

Comforting to the soul

Places that Sean built when he wasn’t rushed are his favorite locations in his home. About these he said, “I think these positive aspects are going to strengthen
through the years as I continue to pour energy into it from a more centered place.” The wood that is incorporated in the home seems to be one thing that holds positive feelings for Sean. He loves knowing the history of the wood - where it came from, how it grew, what it was used for before - and its beauty.

When asked to describe his house as if it were a person, Sean said he thought of it as a unique person with a lot of integrity. It is also a complex person of strength - internal, spiritual, emotional strength. “It’s a spiritual strength”, Sean said, “Because it’s thinking about its relationship to everything else in its universe. It’s trying to be a loving house, expressing love and consideration for the things and creatures around it.” Sean’s home even has a face peering out on the world shown in Figure 30.

![Figure 30. The Face on Dwelling in Case 6](image-url)
Measures of wholeness

Sean learned from the process of creating his home how to make things from a centered place. These places he created give back the joy and love he put there. This gives Sean a sense of wholeness. He also feels whole in relation to nature through the natural materials and solar aspects of his home. Seeing nature and participating in its cycles creates wholeness for Sean. These values are reflected in the above graph.

Figure 31. Case 6 Measures of Wholeness
Graph
3.6 Snapshot of Case 7-Straw Bale Apartment

![Figure 32. Exterior of Dwelling in Case 7](image.jpg)

**Ecologically Appropriate**

Jennifer, a student working on her master’s degree in herpetology, found out about the studio apartment in Sean’s two story straw bale house from a friend. She was initially hesitant about living in a place attached to someone’s home, but one look and she was sold. It was love at first sight. Jennifer can’t really pinpoint what it was about the studio exactly. Just a feeling she got from the interior space.

The compact, cozy studio is on the second floor with a south facing window that lets in winter solar heat and brightens up the space. The straw bale walls of the studio hold in that heat. Renewable cork covers about half of the floor of the studio, adding a sense of warmth and quiet.
Socially Valuable

Although she initially had reservations, Jennifer has come to appreciate that her studio is attached to a private residence. She said, “There’s like my own mini-community of people and I think that’s really neat.” She enjoys sharing time and food with Sean’s family as well as their caring for the natural environment. Jennifer wants to do something about the impact humans have on nature but not in a public way - just to do what she can. Sean and his family set an example by how they dwell that inspires Jennifer. She appreciates the opportunity to share in that.

Psychologically Valuable

The window gives Jennifer a view of the sky and the world around her. It also lets sunshine in. This brightens her space and her spirits. She looks forward to coming home and even finds cleaning a less arduous task. Jennifer has a comfortable chair in a corner next to the window from which she sees the entire interior of her studio, including

Figure 33. South-facing Window in Studio
the three lizards that share her space. The materials she looks out on - cork, stuccoed straw bale walls, and wood - remind her that it is possible to take from nature without destroying it.

When asked how her studio is most like her best self, Jennifer said, “It reflects very well my goal to do better as a person toward the environment. That reflects in to me doing better toward other people and every other aspect of my life. The feelings I generate here carry out to every other part of my life.” Jennifer is speaking about how everything in her life is connected - her inside feelings and her outside actions. She is also expressing that how she treats nature is also how she treats people. Her studio makes her feel good, makes her feel like she is treating nature well, and gives her the sustenance she needs to put those good feelings back out into the world. Jennifer’s good feelings beam out from her drawing.

![Figure 34. Drawing of Feelings in Case 7](image)

Beautiful

The beauty Jennifer sees in her studio comes from the sun and the natural materials. In particular she likes the cork flooring. It also comes from the layout of the
space. It is one room that reminds her of a yurt and that type of circular, open space. To Jennifer the openness of the space and the ability to see everything is a big part of the wholesomeness of her place. She describes homes with many interior walls and doors as closed environments that don’t generate any great feelings.

**Comforting to the soul**

Jennifer feels unity with herself by living in a home made with renewable and recycled natural resources. She said, “It makes me think about what I am surrounded by and my impact on the environment.” Understanding her connections with nature at a deep level is satisfying for Jennifer, as is taking actions that reflect her values of the natural environment. This works together to generate an awareness of life for Jennifer.

**Measures of wholeness**

![Case 7 Measures of Wholeness Graph](image)

Jennifer’s corner chair and the sunny spot on the rug are places that feel in harmony with the world for her. They are near the window that lets the sunshine in and a
view out on nature. Choosing an apartment that was made with renewable natural materials gives Jennifer the sense that she is living in alignment with her values of nature. These materials also remind her of their source which is, of course, nature.

3.7 Snapshot of Case 8-Hillside Straw Bale

![Figure 36. Exterior of Dwelling in Case 8](image)

Ecologically Appropriate

Lynette’s home grows out of a forested hillside near the edge of the grassy Palouse Prairie. It is a mix of construction materials including straw bales, wood, Rastra - a type of insulating concrete form - concrete, sheetrock, and stucco. Lynette and her husband were primarily concerned with creating a healthy home that was spiritually peaceful. Although they appreciate the fact that some of the materials in their home are renewable and they favor the use of natural, non-toxic products, protection of the environment was not foremost on their minds. Their choice of materials was based on their desire to make a physically and psychologically healthy home. They used an in-
floor radiant heating system and hard surface floors such as stained concrete and wood to minimize indoor air pollutants. The walls of Rastra or straw bales are soft and rounded, giving a gentle, easy feeling to the rooms. Rock and wood are incorporated and large windows embrace views of the surrounding forest.

**Socially Valuable**

Lynette explained that it is her nature to be different, to take the road less traveled, and this is what a straw bale home represented to her. Straw bale houses are more common in the southwest United States than northern Idaho and their uniqueness appealed to Lynette. When she described her home as if it had human traits, she said it is questioning the status quo or questioning what the majority believes. It is creative, welcoming, and open to new ideas.

Inside her home, Lynette feels connected to her family because the interior spaces are open to one another and connected visibly and audibly. They feel like they are together even if one is in the kitchen and another is in the living room. They can hear their son upstairs and just sort of know what other people in the home are doing.

**Psychologically Valuable**

Lynette feels connected to nature through her windows. They let Lynette see the wildlife that visit her home and make her feel connected to the world around her. The show nature puts on by constantly changing, living, growing, and dying gives her awareness of her own life. Lynette tries to remember not to get lost in the little problems of life and stay connected to and aware of the larger cycles of nature that she is a part of.
Lynette described her house as alive. The shapes that surround her are comforting, interesting, and peaceful. She said, “If my house were a person, it would be somebody who has matured and rounded their edges.”

**Beautiful**

The views of nature through the windows which change at every level of the house are like a frame for the mountains and the trees, the moon, the stars, and the sun. Lynette marvels at the sunlight that plays inside her home and which welcomes her as she comes down the stairs in the morning. The sunlight also adds another dimension to the thick, curved, irregular walls in Lynette’s home and she thinks of them as sculpture. Just touching these walls give her comfort. She intentionally designed her home to have no sharp angles and she says it makes a difference in how she feels about the space. She describes the walls of her house as sensuous.

![Figure 37. Interior Walls of Dwelling in Case 8](image-url)
Comforting to the soul

Lynette and her husband designed their home with the intention of bringing peacefulness to their souls. They wanted soft, round corners, not sharp angles, and an organic look to the house. They choose straw bale, Rastra, and wood as the main building materials and carefully incorporated lots of natural light. They worked with a designer/builder and the process of making a home gave Lynette a sense of unity within herself. She said, “It was wonderful to help design something that we love.” In describing her drawing of her feelings for her home, Lynette said, “This is a spiritual home. The heart represents family and the arms are the surrounding house with curving walls that comfort us. The gold is a God figure representing spirituality. The arms, or home, come from the spiritual center and the family feels loved in this space.”

Figure 38. Drawing of Feelings in Case 8
Measures of wholeness

Lynette’s home was designed to achieve a particular aesthetic with not as much of a concern about source of materials as the other case studies. This is reflected in the graph. Lynette wanted her home to be soft and round, a place that is nurturing to the spirit as well as different. Her home facilitates a connection to nature through large windows. They allow of view of nature and its cycles as well as inviting sunshine in.
3.8 Snapshot of Case 9-Straw Bale Farmhouse

![Image of a straw bale farmhouse in a rural setting]

Figure 40. Exterior of Dwelling in Case 9

**Ecologically Appropriate**

Greg purchased his rural Montana home because it was a good deal and the location fit his way of life as an organic farmer. He likes the looks of the house, constructed of straw bales around a wood frame structure, and agrees with the material choices made by the original owner/builders. Natural slate tile, wood, and stucco were used instead of carpeting, vinyl, or plastic. Greg wanted a home made of materials that wouldn’t off-gas chemicals potentially harmful to his young family. He was also sensitive to the type of heating system in the home and didn’t want forced air with its dust and dryness. His farmhouse is heated with a wood stove in combination with a radiant in-floor system which is very energy efficient. Greg prefers heating with wood as much as possible because it is a cheap, abundant resource.

**Socially Valuable**
Greg and his family are striving for a sustainable, natural, and healthy lifestyle and they were attracted to their home because it exemplifies these values. Although he doesn’t consider the house perfect, Greg thinks it is better than most. He said, “I don’t know how much more sustainable or in harmony we are than the rest of the world, but living in a house like this definitely makes me feel more real with that.” Living in his home Greg feels he is doing something positive for the “larger web of sustainability” as he called it.

**Psychologically Valuable**

The living room is where Greg feels in harmony with the world. The big windows frame awesome mountains that are wilderness and grizzly bear habitat. These and other windows let in lots of natural light which nurture houseplants and inhabitants alike. Greg said, “It feels like a good, safe, beautiful spot and that feels like a special thing compared to where one might be in the world. Even though it is an inside space, and doesn’t feel like it.”

His house in general is a good spot for Greg and his family. He farms the land and there is room for everyone in the house. The house was built for low maintenance and its energy efficiency allows them to maintain a warm home with a wood fire. When comparing to other places he has lived, Greg said, “It feels very organic and natural and it
just feels so much better to be in a really natural environment. It feels more right with the world and healthier.”

**Beautiful**

The contours of the walls, the curves around the windows, and the wood contribute to the organic aesthetic of Greg’s house. For him, this is nature-like. The interesting textures and lumps and bumps in the walls are reminiscent of natural shapes. The thickness of the walls makes Greg think of the solidity of a stone house. The organic look to his home makes Greg feel like the difference between inside and outside is less than conventional homes. It is like bringing nature inside.

**Comforting to the soul**

Greg feels the most wholesome on the porch. That is because it is the furthest outside he can get and still be under the shelter of his home. Being able to see nature though the transparency of his home - the windows and organic shapes - reminds Greg where he is at, what he is doing, and why he came to this place. He talked about the connection to nature he gets through the farmhouse when he described his drawing of his feelings. “I started drawing this organic shape because it’s something I feel strongly about this house. Then I started drawing a shape that represents the house and the mountain scene - something representative of the main landscape feature behind the house. I added the colors stretching from mountain to mountain because it is an amazing
place and those colors represent my feelings. Now it almost looks like an alien, organic being set the house down but that was not my intention at the time.”

Figure 43. Drawing of Feelings in Case 9

Measures of wholeness

Figure 44. Case 9 Measures of Wholeness Graph
Greg appreciates organic forms and processes. This is evident in his occupational choice as an organic farmer. Working with nature and connecting to nature are strong themes arising from this interview. So is viewing nature which is almost impossible to avoid with the awesome mountain scene as the setting for this house. Greg chose his home because it resonates with his values and fits his lifestyle and his family.

3.9 Snapshot of Cases 10 and 11-Earthship 1

Ecologically Appropriate

Not knowing what to expect when I saw Emily and Ben’s home for the first time, I faithfully followed their directions and looked for an earthship. Even though I had not seen one in person before, I recognized theirs immediately. There is just nothing else like it around.
The concept of the earthship originated with Michael Reynolds, an American architect whose idea was to create a completely self-sufficient home out of abundant local materials. In Ben and Emily’s house, discarded tires rammed with earth and aluminum cans encased in concrete form the structural walls and foundation. Logs support the roof, and the walls and roof are backfilled with earth. Earth was also used in the interior where it was mixed with straw to make an adobe finish on the inside walls. The concept is to use thermal mass to heat and cool the house. Large south-facing windows invite the sun’s warmth inside in the winter and allow sunlight and moonlight to play indoors. A roof overhang keeps the sun out in the summer for the most part. Vents above the windows and operable skylights allow passive cooling. Rainwater is captured for their gardens and grey wastewater is treated in an indoor planter. They use a composting toilet. Ben and Emily get their electricity from photovoltaic panels and batteries and they supplement the solar heat gain with a wood cook stove that also heats their hot water.

Ben said their primary reason for building an earthship was for economics. They wanted a place that was uniquely them and that they could afford without going into debt. They also considered the long term and recurring costs and chose an energy efficient dwelling that has only 1200 square feet of living space.

Ben notes that deciding to live in an earthship is a lifestyle choice. Emily agrees that they have to know what is going on in the natural world around them because that
dictates how they heat and cool their house. If it is a cloudy, cold day they may need to make a wood fire. They are also aware of how much electricity they can use before depleting the battery bank. For Emily, living within the limitations of the earth reminds her that she is a physical being, dependent upon nature, and that is reality. Ben said the fact that their dwelling heats and cools itself gives it a life of its own.

**Socially Valuable**

For Emily and Ben, their home is sort of an escape from the everyday life world they see around them. People rushing around in their cars and working hard to accumulate wealth is somewhat like a foreign culture to them. Ben and Emily prefer to be different than the majority which their earthship certainly expresses. Emily describes her house as “a little bit eccentric”. She commented, “Obviously that would reflect part of what we put into the house.”

Emily and Ben did not say they set out to create an example of self-sufficient living, though they are willing to share their home and they have helped to build other earthships. They made it easier for others to follow in their footsteps by working with and educating the state sanitarian when they needed a permit.

**Psychologically Valuable**

Ben and Emily created their small efficient home to support their lifestyle and to make something that was uniquely them. They provide for their needs with minimal external inputs which gives them a sense of security and freedom. Ben said, “I think that sustainability eases your mind and makes you less stressful. I’m not dependent and I don’t have to worry about debt or where I’m going to get my food the next day because I
grow it. So that probably makes me a happier person.” They have made “a total living situation”, to use Ben’s words.

A large part of the total living situation that Emily and Ben created is connected with and dependent upon nature. They feel good about this dependence however. Ben and Emily use indigenous natural materials like earth, logs, and straw and the sun for heat and electricity. Through this relationship with nature they feel aware of life. They see the changes of the seasons and of the day through the windows and as they watch their plants grow. Emily said, “The life of the place is the plants and the greenery. When you come in you see the plants and it is like a jungle with the light and tropical plants.” The picture in Figure 48 attests to her experience.

Ben is aware of nature because he sees it all the time through the windows. He also feels his relationship with the natural world by heating with wood and looking at the adobe walls of their home. He said, “I go out and get wood and chop it. That kind of relationship makes a connection with nature. I guess I feel the same way about the walls. They have an earthly feel to see.”
Beautiful

Emily acknowledges the importance of the functionality of their home in supporting their self-sufficient lifestyle, but the emotional impact is equally as important for her. It is from living with beauty that Emily feels good. She thinks of her house as soft and quiet and she likes the feeling of its roundness.

She enjoys seeing the sky, the seasons, and the quality of the light inside her home change. Emily said, “I think I am the happiest when the sun’s shining in and it’s twinkling on the plants or there is a full moon and the whole house is glowing silver. It is just moments like that that create joy in me. I feel like I am surrounded by beauty.”

Ben is impressed by the beautiful location of their home. The land overlooks the Bitterroot River and the serrated Bitterroot Mountains beyond. They are surrounded by an apple orchard which looks like a fairy land when the trees are blossoming. Not only does he appreciate the natural setting of his home, Ben is also attracted to the natural features inside the house. “The logs and the mud finish are more natural indirectly,” he said.

Ben and Emily noted that the places they like to hang out change with the seasons. In the summer, they like to take a nap in the hammock in the living area where it is nice and cool on a hot summer day. The kitchen near the wood stove is the place to be in the winter. Sometimes it is right next to the big windows where the light is best for
working on projects or tucked in the back in the bedroom. The interior space changes so much between day and night and the seasons that Emily described their house as having moods and as a “being with circadian rhythms”.

Comforting to the soul

“There is just something about working in the dirt and building your own house that gives you a sense of place,” Ben said. This is the foundation for families and communities and always has been.” The process of building their home was a tremendous learning opportunity for Ben and it gave him a greater feeling of life. He also said that their house has a lot of their personality in it because they built it. Knowing how to repair the things in his home and doing every day chores like chopping wood makes life more fulfilling for Ben.

“A sense of unity comes from engaging in natural events,” said Ben, “which is realized through action.” This unity comes from his connection to nature and natural cycles though his house. He said, “A typical stick house frames out the rest of the natural world and pumps what you need back in. Here it is a system, like a living entity.”

Ben’s drawing of his feelings for his home depicts some of the features he likes best as well as what the home means to him. “It is a peaceful, serene environment that gives me a relaxed feeling,” he said. “It shows the river, trees, my pets, and my wife - things that bring happiness to me and that I love. It shows the sun and the moon. The moon maybe because you can gaze out and wonder at night and day dream - a dreamy environment I guess.”
When asked to describe her feelings for her house as if it were a person, Emily said, “The house would be like a big warm mama. I come home and it’s this really safe harbor. The house is a warm mama on the inside and outside it is this really solid, protective rock grandfather that is part of the earth.” It was Ben who first came up with the notion of his house as a grandfather. He said, “You treat it like your granddad. Something that is old and has a lot of wisdom built into it.”

Both Emily and Ben experience their house as a peaceful environment. Ben mentioned that even others feel that. He said, “Maybe it is the plants, or because it’s quiet, but there is something about the building’s personality that radiates that because people are always bringing it up.”

Emily describes her drawing of her feelings for her home as a secret hideaway. “Mine’s like a secret little nook. Like where a little squirrel is living in an oak tree. You wouldn’t know it from the outside how neat it is on the inside - just warm and
comfortable. Outside is a lot of chaos and that is the black squiggles. The blue is the river. It is so peaceful and calm here and cozy.”

Figure 51. Drawing of Feelings in Case 10

Measures of wholeness

Figure 52. Case 10 Measures of Wholeness Graph
The graph of Ben’s preferences is almost filled up. This shows the many ways his home generates a sense of wholeness for him. He is least interested in connecting with others - meaning society at large. Instead Ben desires to live a very different lifestyle. He wants to be self-sufficient and in harmony with nature. Their home works with the processes of nature and Ben is in contact with nature almost constantly.

The graph for Emily is similar to the graph for Ben. She resonates more with the aesthetic qualities of their home and feels joy from its beauty. Emily was less involved in the making of their home but has more of an emotional attachment.

Economics was primary reason Ben and Emily built their home. Environmental responsibility was a close second.
3.10 Snapshot of Case 12 –Earthship 2

Ecologically Appropriate

The second earthship that I visited is located in the same Montana valley as the first. It is part of the Institute for Sustainable Living - a grassroots organization that has created a prototype sustainable community. Here the people strive to live self-sufficiently, getting their electricity from solar panels and their food from gardens and the animals they raise. Beth and her family chose to live at the institute “to get away from the rat race and live a more simple life,” she said. This simple life includes needing less money and their earthship accommodates that. Not only was their home cheaper to build because it utilized recycled tires and earth, but it is cheaper to maintain. Beth said, “It is very easy to heat because we have the thermal mass. You have the earth’s temperature in the house all the time so it is at least 55 degrees. It doesn’t take much to warm it up, just a small wood fire. And when the sun comes out you have to put out the fire otherwise it will get very warm with all the south-facing windows.”

Figure 54. Exterior of Dwelling in Case 12
In the summer the earth’s thermal mass works equally well to keep the house cool. “We designed the roof so that it would shade the windows in the summer so the sun never comes directly in.”

A desire to be environmentally responsible was another reason Beth and her family chose to live in an earthship. She said, “It’s a more economical as well as environmentally better to build this way.”

Socially Valuable

Although the Institute is invested in promoting sustainable living, Beth is more focused on her immediate community. She has a large family that absorbs most of her attention. She feels most alive in the living area. “My kitchen, living room, and dining room are all one big room and that’s of course where we spend the majority of our time,” she said. Beth also made the point that she prefers to be outside than in her house.

Psychologically Valuable

Inside Beth’s house is a large planter that doubles as a grey water disposal system. Tropical plants grow along the south-facing windows and all this greenery and the big windows give Beth a feeling of being connected to nature. She says she has become more aware of her own life by living at the Institute. “I’ve become more aware just since I’ve moved here and being more connected to the earth. Getting away from going to town all the time and living in a vehicle and going back and forth - just being able to stay here. Basically everything we need is right here.”

Beth explained that although she is not all that connected with her house, she feels peaceful and happy. “Of course I don’t know if it is so much the house as it is the place
and the environment,” she said. This explains her drawing of her feelings for her house which shows the natural environment without a structure in it.

![Figure 55. Drawing of Feeling in Case 12](image)

**Beautiful**

Beth described her earth-sheltered house as bright and open. She said, “This is brighter and I can see anything and everything. Where I lived before I’d have to get up and go see what was going on in the sky outside to see the weather coming in. Now I know what’s going on. It’s just a real openness. The only time I turn a light on is after dark because I don’t need them otherwise.”

**Comforting to the soul**

Beth does not describe her home as comforting to her soul. It is OK and provides her needs, but she is really much more attracted to the outdoors. “I am an outdoor person,” she said. “I spend as little time in the house as I possibly can.” Because she would rather be outside, she does not see anything in her home that is like her best self. Pretending her house was a person she said, “It would be someone I wouldn’t want to be around much.” She added that she thought her feelings might be different if she had
actually had a hand in building the house. “I didn’t necessarily experience that but I have talked to other people. I think it would have made a better connection between a person and their home if they actually did the hands-on work themselves.”

**Measures of wholeness**

![Case 12 Measures of Wholeness Graph](image)

In the graph of Beth preferences, her desire to be outside comes through. The most important themes have to do with viewing and connecting with nature. She desires to be different from others and to not participate in the routine of driving around to get the things she needs. The way she accomplishes this is to live in an economical home that was inexpensive to build and maintain. The location of her home also allows her to live a self sufficient lifestyle.
Chapter Four

Conclusions

4.1 Synopsis

The purpose of this study was to investigate occupant affective responses to homes incorporating renewable natural resources. Twelve people living in eight naturally-built dwellings were chosen as the study sample and research was focused on understanding residents’ sense of wholeness in relation to their homes. The results offer a qualitative assessment of how subjects explained their experience of wholeness in homes that incorporate renewable natural resources.

Preferences of the residents were measured and individually graphed (Chapter 3 and appendix E). Comparing these graphs offers a holistic overview of the study results. Figure 57 is a compilation of individual graphs indicating the number of times a theme was ranked as a high preference. For reference, the fully shaded wedge of the inner circle indicates the theme Viewing Nature/Sunlight/Moonlight was ranked high on 10 of 12 individual graphs.
Nature and Transparency

Viewing nature, which includes sunlight and moonlight, was the most highly preferred theme (Figure 57). Residents described a view of the sky, wildlife, garden, weather, sunlight, moonlight, and surrounding vegetation as factors that give them a sense of wholeness. To a lesser degree, organic features inside the home - like rounded,
irregular walls and plants – were also noted. Most of these factors, except for the walls, have little to do with the built environment. This is a surprising outcome considering the subjects studied were chosen specifically because of their preferences for naturally-built structures. In fact, the graph shows the themes under the category Ecologically Appropriate, which best describe the physical features of natural building, are only moderately preferred. One conclusion from this outcome is that a sense of wholeness for the subjects was derived more from a building’s transparency than its physical features.

Connecting with nature was also a highly preferred theme. Eight of the twelve people studied noted that awareness of the cycles of nature was a factor that gave them a sense of wholeness. These include cycles of the sun and moon, life and death of vegetation, and climate. This theme is related to viewing nature and supports the conclusion that a building that facilitates an awareness of the natural world through transparency can lead to a sense of wholeness.

A connection to nature was also achieved by seeing natural materials in the home that embody meaning. Some subjects identified materials such as wood or cork that reminds them of nature and their connection to it. Others noted materials that represent an environmentally responsible choice, such as straw bale or recycled wood. When natural materials are visible, and they embody meaning for occupants, a sense of wholeness can result.

**Living in Alignment with Values**

Nine of the twelve residents indicated that living in alignment with their values was important to their sense of wholeness. Two people referred to this as having their
inner ethics “in tune” with their lifestyle. This is an overarching theme that explains material and design choices. The subjects studied described their values of nature and their desire to protect it. The residents articulated how their homes facilitate a lifestyle which is in alignment with their values and that this is essential to their sense of wholeness. The conclusion that can be drawn from this outcome is that it is possible for a dwelling to facilitate a lifestyle that is in alignment with personal values and that this can be emotionally beneficial.

Making

Making was an unexpected theme to come out of the data. Eight of the twelve of the people studied were involved in designing and building their home. In five of these cases, Making was ranked high and in two it was ranked medium. Residents said they had a greater feeling of life through the creation of their home. Some mentioned that joy in the act of making gave them a sense of wholeness.

Tangible and Intangible

One thing that became evident during the development of the themes of wholeness is that the same factor may describe more than theme. It was difficult to draw distinct boundaries around the themes due to this overlap. In fact, Alexander’s explanation of wholeness indicates why this is so. He said, “What is ecologically appropriate, what is socially and psychologically valuable, what is beautiful to the eye, what is comforting to the soul-these are all wrapped up together in the global judgment of wholeness” (Alexander 2002). This quote explains the categories of wholeness “are all
wrapped up together”. A structure with a high degree of wholeness will fit into each of these categories. In fact an overarching theme found both in Alexander’s theory and the results of this study is that it takes the tangible and intangible together to make wholeness. It is not structure without the human element. It takes a mind to stitch the pieces together in a meaningful way, and create a pattern of wholeness. This pattern can become a dwelling when human life occurs there.

4.2 Reflection on Christopher Alexander’s Theory of Wholeness

This research was grounded in Christopher Alexander’s theory and the results offer insight into and empirical understanding of his hypothesis.

Alexander purports it is possible to identify wholeness in the world by sensing it within the self because structure and human emotions are inextricably connected (Alexander 2002). Although some interviewees didn’t have an answer to one or more of the questions asked during the interviews, almost everyone identified factors of their home that gave them a sense of wholeness. These results seem to support Alexander’s claims.

Alexander discusses the phenomenon of a sense of wholeness from the process of making in Book Four-The Luminous Ground of his series The Nature of Order: An Essay on the Art of Building and the Nature of the Universe. He claims that “people are deeply nourished by the process of creating wholeness” (Alexander 2004). This nourishment can be understood as a feeling of deep fulfillment that is achieved by making wholeness or beauty. Alexander states that this is because humans are living structure that is affected by physical structures in the world. He said, “We become whole, in ourselves,
when we make wholeness” (Alexander 2004). This is because we are putting ourselves into the things we make. Responses from some people studied regarding their sense of wholeness in relation to making support Alexander’s theory.

An essential aspect of Alexander’s theory is his claim that geometry of structure generates a sense of wholeness within us. He identified fifteen structural features which he termed “fundamental properties” that are common to forms with wholeness (Alexander 2002). Alexander claims creating structures with geometry that exhibits these properties is a path to making wholeness in the world. The fifteen properties describe physical features such as local symmetries, contrast, boundaries, and alternating repetition (Alexander 2004). Although physical elements were identified by subjects in this study, the reasons they gave for their sense of wholeness were intangible. For example, straw bale walls were identified as contributing to wholeness not only for their aesthetic qualities, but because they express values. Alexander specifically addressed straw bale construction but focused only on how it does or does not meet his prescribed geometry of wholeness, never mentioning embodied meaning (Alexander 2004). The results of this study suggest there is much more to creating a sense of wholeness than the physical properties, or geometry, of structures.

4.3 Lessons learned

Lessons were learned from this research project. First, it was difficult to find a way to ask questions about occupant feelings. Alexander’s method of inquiry was utilized and proved fruitful for this study. Other methods may yield different results.
The interviewees often gave the same answer to different questions. Therefore it appears there is redundancy in the questionnaire. The interviews typically took longer than anticipated so it would be beneficial to eliminate questions that yield similar results.

The drawings of occupant feelings captured much of the information that presented itself during the interview. This provided verification of the results but is another potential redundancy. Often drawings captured the essence of occupant feelings and the interview flushed out the specifics. Instead of drawing their feelings for their home, some people drew features that were most notable to them. Probing sometimes got to feelings as the subjects described their drawings. This was also accomplished during the interview.

4.4 Recommendations for further research

This research was conducted with a small sample of people living in naturally-built homes and therefore cannot be generalized to a larger population. Studying other types of dwellings and people with different values and preferences would test the findings of this project to see if they are representative across a broader sample.

Qualitative data presents a challenge when it comes to analysis because there are many way to evaluate the content of qualitative information. This study settled on a combination of recommendations from the book *Qualitative Data Analysis* by Matthew B. Miles and A. Michael Huberman and the paper titled *Topical Analysis: A Method for Collecting, Classifying, and Developing Concepts and Models from Narrative Data* by Jon Driessen. During analysis of the data, informed intuition was also used. Miles and Huberman verify this as a legitimate approach. Even so, checking for researcher effects
by having others review and corroborate the results could make this study more robust. Different analysis methods, such as the use of a computer program to conduct content analysis, could also be used to validate results.

Finally, the themes of wholeness that were one finding of this research represent patterns that were found in the data. As such, they are the rudiments of a substantive theory which describes and explains a studied phenomenon (Driessen). The themes of wholeness could be used as a starting point for further research that perhaps would lead to formal theory-making.

4.5 Concluding remarks

This morning at the coffee shop, a caption in the local paper caught my eye. Above a photo of a woman working in her garden it read, “Everything we do has an effect on others” (Leon 2005). The associated article told how organic gardening is a spiritual act for Gloria Waggoner, the woman in the photo. Eliminating toxic chemicals and promoting environmental stewardship “is about cherishing the earth, the gift God has given us,” she is quoted as saying. “It’s about cherishing ourselves and future generations” (Leon 2005).

The common threads between this morning’s newspaper article and this thesis seem a serendipitous, just-in-time discovery to help me craft an ending to my work. Although this study researched only twelve people, it shows how it is possible to create dwellings that express values of the natural environment and facilitate occupants living in alignment with those values. It also shows the emotional benefits and sense of wholeness achieved from making dwelling choices that are consistent with one’s beliefs. This
implies that the design and making of a home from the inside out, by understanding the beliefs and values within the person first and building upon them, can be a path to wholeness. And as Christopher Alexander claims, “Life will increase, or it will degenerate, according to the degree in which the wholeness of the world is upheld, or damaged, by human beings and human processes” (Alexander 2002).
WORKS CITED


APPENDIX A

QUESTIONNAIRE
Questionnaire

Background information:

1. In what city and state or province is your home located?  
   ________________________________________________________________

2. How long have you lived in your current home?  
   ___ 0-5 years   ___ 6-10 years   ___ 11-15 years   ___ >15 years

3. Do you _____ own or   _____ rent your current home? (if neither, please explain)  
   ________________________________________________________________

4. How were you involved in the design of your home?  
   _____ not at all   _____ somewhat   _____ highly

5. Who was the primary designer of your home?  
   _____ yourself   _____ architect/designer   _____ builder   _____ don’t know   
   _____ other (please explain)___________________________________________

6. How were you involved in the construction of your home?  
   _____ not at all   _____ somewhat   _____ highly

7. Who were the builders of your home? (check all that apply)  
   _____ yourself   _____ family   _____ friends   _____ contractor   
   _____ community (volunteers)   _____ don’t know   
   _____ other (please explain)___________________________________________
8. What material is your home made of? (check all that apply)
   ____ cob    ____ cordwood    ____ earth    ____ log    ____ stone    ____ straw bale
   ____ other (please describe) ________________________________________________
   ____ other __________________________________________________________________
   ____ other __________________________________________________________________
   ____ other __________________________________________________________________
   ____ other __________________________________________________________________
   ____ other __________________________________________________________________

9. What aspects of nature are incorporated in your home?
   ____ solar gain intentionally used as a heat source
   ____ natural ventilation designed for cooling
   ____ composting toilet
   ____ other (please describe) ________________________________________________
   ____ other __________________________________________________________________
   ____ other __________________________________________________________________
   ____ other __________________________________________________________________
   ____ other __________________________________________________________________

**Resident experiences:**

10. Why did you choose your current home?
11. What things about your home do you really like?

12. What would you change about your home if you could?

13. What aspects of your home make you feel close to nature?

- Why?

- What aspects of nature?
14. Where in your home do you feel most in harmony with the world?

- Why this location?

- Where in your home do you not feel in harmony with the world?

15. What aspects of your home seem to generate a greater feeling of life in you?

- What is it about these aspects that make you feel this way?
16. Where in your home do you feel most alive?

- Where in your home do you feel relaxed?

17. In what ways does your home make you feel most aware of your own life?

- How come?
18. What aspects of your home induce the greatest feeling of harmony within you?

- Why these aspects?

- What are the aspects of your home that do not create a feeling of harmony within you?

19. In what ways does your home make you experience a deeper feeling of unity within yourself?

- How come?
20. Where in your home do you feel the greatest wholesomeness in yourself?

• What is it about this location that makes you feel this way?

21. Pretend your home is a person for a moment. How would you feel about this person?

• What traits make you feel this way?
22. When you consider yourself as a whole that includes all your dimensions, in what ways is your home most like your best self?

23. How is the feeling of living in your current home different from other places you have lived?

24. Is there anything else you would like to share about your home?

25. Would you mind a follow-up call if there are any questions regarding your responses to this questionnaire?  ____ please do not call  ____ feel free to call, my phone number is: ______________________
Demographic questions:

26. What type of setting did you grow up in?
   _____rural    _____suburban    _____urban    _____other (please explain)

27. What is your age?
   _____18-21    _____22-29    _____30-39    _____40-49    _____50-59    _____60-69
   _____70-79    _____80 and over

28. Are you _____male or _____female?

29. What is your highest level of education?
   _____Grade school    _____Middle school    _____High school    _____Some college
   _____Associate degree    _____Bachelor degree    _____Masters degree
   _____Doctorate degree    _____Other (please explain)

30. What is your total annual household income?
   _____less than $10,000  _____$10,000-25,000  _____$26,000-50,000
   _____$51,000-100,000  _____$101,000-150,000  _____greater than $150,000

31. What is your race?
   _____White    _____Hispanic    _____African American    _____Native American
   _____Asian    _____Other
APPENDIX B

SUMMARY TABLES OF THE INTERVIEW RESPONSES
<table>
<thead>
<tr>
<th>Motives for choosing home</th>
<th>Attractions</th>
<th>Dislikes</th>
<th>Factors creating closeness to nature</th>
<th>Feelings toward home as a person</th>
<th>Experiential differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper site orientation dealing with the sun</td>
<td>On a sunny day in the winter time we can sit right here and the sun will stream in here all the way to the back end. (Straw bale ceiling insulation between TJIs.) I would not do it again because it was very labor intensive.</td>
<td>We grew our house straw bales right down there on our site.</td>
<td>It even has a name: Patience II.</td>
<td>This is us growing through a whole life; this is where we are now</td>
<td></td>
</tr>
<tr>
<td>We have a finite time on this earth and how do we want to spend it? We came up with a mission statement. We wanted to do it, to try it, to see if it worked. (passive annual heat storage to be energy efficient)</td>
<td>The orientation here makes you feel like you’re part of the earth. You’re using the sun in all this stuff the way it’s meant to be used. Orientation, building the home in conjunction with Mother Nature, how it works for you, plus it just feels good. I don’t think I would have used straw bales in the umbrella around the outside. Unknown potential for critter digging around in that kind of stuff.</td>
<td>Plus being out in nature with the critters, the deer and all this kind of stuff, and living with the cougar and the moose and all that kind of stuff…</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It isn’t just the house either. It is everything we do, almost.</td>
<td>I might put another dog door on there because of the wind.</td>
<td></td>
<td></td>
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<td></td>
<td>The view is just bonus.</td>
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<tr>
<td></td>
<td>The logs came over from Flathead Lake.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>And we are 100% in tune with the weather.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harmony w/ world</td>
<td>Disharmony w/ world</td>
<td>Greater feeling of life</td>
<td>Most alive</td>
<td>Aware of own life</td>
<td>Harmony w/ self</td>
</tr>
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<td>------------------</td>
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<td>----------------</td>
</tr>
<tr>
<td>Big open space and the kitchen right here-30 people and we are all in the same room</td>
<td>none</td>
<td>Growth and vegetation around here plus the garden-living off of what we grow out here</td>
<td>Every time I come in the door and even though I haven’t had a fire in here and you feel that warmth, the radiating warmth. It reminds me of it</td>
<td>(Giving tours) This is a real joy that way</td>
<td>Interpersonal; basically different personal-ities</td>
</tr>
<tr>
<td>Pilot house-275 degree view, retreat area, nautical</td>
<td>In the summer-time here is fantastic. I wouldn’t want to be any other place.</td>
<td>It relates to your ecological footprint.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Each one (room) has its own distinctive attachment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bedroom</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1.2
Interview Responses Regarding Wholeness
Case I-Annualized Geosolar
Table 2.1
Interview Responses Regarding Context and General Information
Case 2-Annualized Geosolar

<table>
<thead>
<tr>
<th>Motives for choosing home</th>
<th>Attractions</th>
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<th>Feelings toward home as a person</th>
<th>Experiential differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>We did it for educational reasons (to show energy efficient construction)</td>
<td>It taught me to enjoy different styles by using recycled items.</td>
<td>I’m a little concerned about bales in the ceiling because of the potential for a fire.</td>
<td>The windows. The view of the clouds and weather-you are really in tune with what is going on.</td>
<td>Very close to it.</td>
<td>I thought I would miss my home of 35 years. This became home very easily.</td>
</tr>
<tr>
<td>Somebody needed to try it and see if it worked.</td>
<td>Natural light reflected around.</td>
<td>It was hard to insulate all the pockets in the ceiling.</td>
<td></td>
<td>It has made my life a joy.</td>
<td>The others I had to readjust the design layout.</td>
</tr>
<tr>
<td>The affect of natural light at different times of the day.</td>
<td>I would possibly raise this (window) just a little bit.</td>
<td></td>
<td></td>
<td></td>
<td>We were always wishing that it could be more sustainable. (other houses)</td>
</tr>
<tr>
<td>Its kind of nice to be a part of nature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>It wasn’t part of how things are supposed to work. (other houses)</td>
</tr>
<tr>
<td>And that felt good (to use local materials)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Harmony w/ world</th>
<th>Disharmony w/ world</th>
<th>Greater feeling of life</th>
<th>Most alive</th>
<th>Aware of own life</th>
<th>Harmony w/ self</th>
<th>Disharmony w/ self</th>
<th>Unity w/ self</th>
<th>Wholesomeness</th>
<th>Mirror of self</th>
</tr>
</thead>
<tbody>
<tr>
<td>The windows. Being able to see what happens.</td>
<td>Being part of the design process.</td>
<td>When it’s open like this you feel like your part of everything.</td>
<td>First of all we have tours all the time.</td>
<td>(Living in alignment with values)</td>
<td>(Differences with designer and builders)</td>
<td>(living simply, in alignment with values, and self-sufficiently)</td>
<td>It is who we are.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being able to be creative in doing that.</td>
<td>Maybe even when I go to the bathroom.</td>
<td>That is part of the education part.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The design is cooperating with how I like to live.</td>
<td></td>
<td></td>
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<td>You feel more alive when everything really relates to your values.</td>
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<td>It’s the whole picture of how you live.</td>
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<td>It’s everything in tune.</td>
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<td>Motives for choosing home</td>
<td>Attractions</td>
<td>Dislikes</td>
<td>Factors creating closeness to nature</td>
<td>Feelings toward home as a person</td>
<td>Experiential differences</td>
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<tr>
<td>I always was fascinated with straw bale.</td>
<td>I think I like the openness of it.</td>
<td>I would put a basement in it.</td>
<td>Actually it is these windows.</td>
<td>I really love this house.</td>
<td>Less complicated.</td>
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<tr>
<td>I just loved it the minute I walked in.</td>
<td>I love the tile on the floor.</td>
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<td></td>
<td>It is wonderful.</td>
<td>This house is a lot quieter.</td>
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<tr>
<td>The straw bale was the big draw and I just liked everything else about it.</td>
<td>The house felt open and bright and cheerful.</td>
<td>I would probably make those spare bedroom just a wee bit bigger.</td>
<td>It's kind of like that FLW house. He tried to bring nature into the house.</td>
<td>I just think it is a really nice place to live.</td>
<td>It is a much more practical place.</td>
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<tr>
<td>The idea (of straw bale) I liked first of all because it was unique, it was different.</td>
<td>I like the deep set windows and all that.</td>
<td>You feel like you are sitting in the garden.</td>
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<td>It gets to that warm and cozy feeling.</td>
<td>There’s a comfort level here.</td>
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<tr>
<td>Then there’s sort of the environmental thing, that you’re using a renewable product, something that is not cutting down forests and stuff.</td>
<td>I actually have to stop and remember the house is straw bale.</td>
<td>The sun is very much a part of our home.</td>
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<td>It is probably the easiest place I have ever lived. Easy because it is small and kind of not a lot of spaces.</td>
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<td></td>
<td>I do think it is a quieter house.</td>
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<td></td>
<td>The light and lack of carpet, all that was a real positive.</td>
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<td></td>
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<td></td>
<td>You know that really is nice because you have this extra light coming in. (speaking about clerestory windows)</td>
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<td>I think more than it has been in any place I’ve ever lived. (the sun as a part of the house.)</td>
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<td></td>
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<td></td>
<td>We like the fact that it’s not carpeted.</td>
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<tr>
<td>Harmony w/ world</td>
<td>Disharmony w/ world</td>
<td>Greater feeling of life</td>
<td>Most alive</td>
<td>Aware of own life</td>
<td>Harmony w/ self</td>
<td>Disharmony w/ self</td>
<td>Unity w/ self</td>
<td>Wholesomeness</td>
<td>Mirror of self</td>
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<tr>
<td>This is all one big room. So to me it would be in here.</td>
<td>In the garage. I just feel disconnected from everything.</td>
<td>The first thing I though was the garden for me.</td>
<td>I say the garden again.</td>
<td>The warm tile floor and the wood to me that brings that sort of in.</td>
<td>The two bedrooms because they are just tiny.</td>
<td>The windows and the garden thing.</td>
<td>The living room because that is where we spend most of our time.</td>
<td>It’s practical</td>
<td></td>
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<tr>
<td>We both just really enjoy watching things growing and changing and going through their whole…</td>
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<td></td>
<td>I still say it’s probably the living room. We both sit over there and read all the time.</td>
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<td></td>
<td>The floor and the wood just had such a nice warmth and coziness to it.</td>
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</tbody>
</table>

Table 3.2
Interview Responses Regarding Wholeness
Case 3-Solar Straw Bale Spec
<table>
<thead>
<tr>
<th>Motives for choosing home</th>
<th>Attractions</th>
<th>Dislikes</th>
<th>Factors creating closeness to nature</th>
<th>Feelings toward home as a person</th>
<th>Experiential differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Smaller house and no steps)</td>
<td>I guess you could even say safer because we both agree that it would be pretty hard to burn down.</td>
<td>Damn faucet is right in your head!</td>
<td>You could pick up some of these rocks and you wonder where the heck they even came from!</td>
<td>I feel comfortable here.</td>
<td>I had a basement and a first and second floor- a lot more complicated than here.</td>
</tr>
<tr>
<td>I love that (the garden).</td>
<td>The mirror is big and far away.</td>
<td>Definitely the sun.</td>
<td>It’s a good place to live because we can take care of our needs.</td>
<td></td>
<td>You’re not really dealing with too many difficulties.</td>
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<tr>
<td>I think its fun to look at those wide, what we would call window sills.</td>
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<tr>
<td>No steps.</td>
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</tbody>
</table>
Table 4.2
Interview Responses Regarding Wholeness
Case 4-Solar Straw Bale Spec

<table>
<thead>
<tr>
<th>Harmony w/ world</th>
<th>Disharmony w/ world</th>
<th>Greater feeling of life</th>
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<th>Harmony w/ self</th>
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<th>Unity w/ self</th>
<th>Wholesome-ness</th>
<th>Mirror of self</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I’m very impressed with the garden. I love it.</td>
<td>(the living room) since I read all the time.</td>
<td>We pretty much have places to put the things we have.</td>
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<td>Wholesomeness</td>
<td>I think it sort of comes back to the house being useable.</td>
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<td></td>
<td></td>
<td>We have plants in the window sills and pictures on the walls.</td>
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<td></td>
<td></td>
<td>Almost every one of those things I can say something about.</td>
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### Table 5.1

**Interview Responses Regarding Context and General Information**  
**Case 5-Straw Bale and Fine Wood**

<table>
<thead>
<tr>
<th>Motives for choosing home</th>
<th>Attractions</th>
<th>Dislikes</th>
<th>Factors creating closeness to nature</th>
<th>Feelings toward home as a person</th>
<th>Experiential differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>We wanted to build an environmentally responsible home and to be as sustainable as possible.</td>
<td>The things we like most are the connections: to nature, to community, to the farm where Kris grew up.</td>
<td>Our house turned out to be a little bit bigger than we wanted.</td>
<td>The straw bale walls.</td>
<td>I would just love them!</td>
<td>It’s the natural materials.</td>
</tr>
<tr>
<td>It’s just also a holistic aesthetic to know where things come from.</td>
<td>We love when we look at the materials in the house we know that our friends and people we love and this community helped to build them.</td>
<td>We feel kind of guilty in some ways with a house that is just over 2000 sq ft.</td>
<td>The wood. The wood connects us to nature.</td>
<td>They would be a sage, a musician and an artist, like the Buddah.</td>
<td>Also the effort, the level of participation that we had in making the house. It’s ours! It is us.</td>
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<tr>
<td>A way of recognizing the connections we have to nature.</td>
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<tr>
<td>To honor our connections and they make life a lot more meaningful.</td>
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<tr>
<td>The stones, the design, the logs.</td>
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<tr>
<td>Even though the stucco is cement that came in a bag, the textures, the forms, the shapes, are reminiscent of nature.</td>
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<tr>
<td>The way it looks and the way it feels and knowing the source of the materials.</td>
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<td>The main thing is the beauty in the house: grains in the wood, the textures in the wall.</td>
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<td>The walls are thick…there is an embracing quality about it that makes you feel like somebody’s arms around you.</td>
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</table>
### Table 5.2
#### Interview Responses Regarding Wholeness

<table>
<thead>
<tr>
<th>Harmony w/ world</th>
<th>Disharmony w/ world</th>
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<th>Harmony w/ self</th>
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<th>Unity w/ self</th>
<th>Wholesome-ness</th>
<th>Mirror of self</th>
</tr>
</thead>
<tbody>
<tr>
<td>My guess is that it will be somewhere around the fireplace.</td>
<td>Nowhere do we not feel in harmony with the world.</td>
<td>The wood. I love wood.</td>
<td>Probably in the kitchen.</td>
<td>Knowing that our house still took a lot of resources.</td>
<td>I keep coming up with the wood...and connections to nature that that wood comes from.</td>
<td>Everywhere!</td>
<td>Joyful, humility.</td>
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<tr>
<td>The sun room because the sun and sky and being able to see nature.</td>
<td>Perhaps the least in harmony might be the basement.</td>
<td>Knowing the people who helped, the tree that they came from, the farm where Kris grew up.</td>
<td>We’ve been so involved with building the home... I think that makes us aware of our lives...</td>
<td>It’s kind of like that spiritual thing.</td>
<td>The house is fancier and more extravagant than 99% of what humanity has.</td>
<td>Looking through the truth window in the straw bale wall and remembering when the all the folks in the community came and helped...</td>
<td>One thing I worry about the house...an ostentatious nature, showiness...</td>
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<tr>
<td>The kitchen is going to be wonderful.</td>
<td>Knowing these connections.</td>
<td>It’s a wonderful feeling.</td>
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<tr>
<td>The hearth because of the stone and the fireplace and the sort of warm nurturing feeling you get there.</td>
<td>I think it is a spiritual thing...to feel we are part of something big and special and God loves us...</td>
<td>It is like a synergy of the wood, the memories, the knowledge, and something comes out that is greater than the sum of the parts.</td>
<td>Knowing we have a house that is far bigger than...</td>
<td>Knowing the joy and the smiles on their faces when they were helping us and how grateful we were to have their help.</td>
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<tr>
<td>Every room I walk in is wonderful in the house.</td>
<td>The connections add meaning to life.</td>
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<tr>
<td>The sun porch 'cuz I'm a desert rat and I grew up with that.</td>
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<td>The upstairs, the bedroom, because of the wood.</td>
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<tr>
<td>Motives for choosing home</td>
<td>Attractions</td>
<td>Dislikes</td>
<td>Factors creating closeness to nature</td>
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<tr>
<td>To demonstrate by example what a more sustainable type development would be.</td>
<td>I love all the wood that has a story behind it.</td>
<td>I would have done the stucco differently.</td>
<td>Orientation toward the south.</td>
<td>This person is fairly unique with a lot of integrity.</td>
<td>This house looks very big from the outside. I don’t want to live in an ostentatious house. I’m not into appearances.</td>
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<tr>
<td>To have a house that was more in tune to what the weather was doing.</td>
<td>I love the solar aspect of it.</td>
<td>I might have looked for a way to make it less stressful.</td>
<td>The windows that let me look out and see what the weather is like.</td>
<td>Complex person of strength, internal strength, spiritual, emotional strength.</td>
<td>It is comfortable to have this much space.</td>
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<tr>
<td>Our bedroom facing east, the sun and moon rise.</td>
<td>Build a simpler house.</td>
<td>Watching the sun come up and the moon come up.</td>
<td>Spiritual strength because it’s thinking about its relationship to everything else in its universe.</td>
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<td>Living room and the kitchen/dinning room being pretty much attached.</td>
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<td>Kitchen facing east.</td>
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<td>I love the energy efficiency.</td>
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<tr>
<td>The studio apartment that we rent out.</td>
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## Table 6.2
Interview Responses Regarding Wholeness
**Case 6-Two Story Straw Bale**

<table>
<thead>
<tr>
<th>Harmony w/ world</th>
<th>Disharmony w/ world</th>
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<th>Aware of own life</th>
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<th>Wholesomeness</th>
<th>Mirror of self</th>
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</thead>
<tbody>
<tr>
<td>The front porch. I'm in a calm space, not distracted by the day-to-day issues, looking at the trees, clouds, with my wife, birds are out.</td>
<td>The utility room- north facing, fairly dark, and it represent work.</td>
<td>East facing windows that allow me to watch the sun come up.</td>
<td>For the most part I built this house. A lot of it was me and my wood.</td>
<td>The wood projects that I was centered while doing.</td>
<td>The foundation. (rubble trench) I have no reason to worry but I still do.</td>
<td>In the last year I’ve been able to not feel as rushed and to enjoy my family and see things like the porch that were just plain fun.</td>
<td>Probably the kitchen. Judy and I together can prepare simple meals that are real healthy. And being in there with her.</td>
<td>The wood, coming from the organic aspect of the wood that’s locally grown and collected and used.</td>
<td></td>
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<tr>
<td>The lodgepole posts.</td>
<td>Bedroom because of view of trees, hillside.</td>
<td>I love the porch. I was really centered when I did that.</td>
<td>The porch. I used natural wood that I peeled, cut, and scribed together.</td>
<td>The walls that get wet in a windy rainstorm.</td>
<td>The positive aspects are going to strengthen through the years as I continue to pour energy into it from a more centered place.</td>
<td></td>
<td>The reclaimed wood that looked really awful and became nice.</td>
<td>The fact that the house is different from other homes.</td>
<td></td>
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<tr>
<td>The stairs that I built with wood that I milled.</td>
<td>The deep walls with rounded edges</td>
<td>I love working with wood.</td>
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<td>House is so quiet inside.</td>
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<tr>
<td>View out the windows to the wetlands.</td>
<td>The passive solar nature for sure.</td>
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<td></td>
<td>It is so in tune with its surroundings - position on land, view to the sky, natural habitat, wild critters.</td>
<td></td>
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<tr>
<td>Motives for choosing home</td>
<td>Attractions</td>
<td>Dislikes</td>
<td>Factors creating closeness to nature</td>
<td>Feelings toward home as a person</td>
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<tr>
<td>Had good rent, timing was perfect.</td>
<td>I really like how they are environmentally conscious about how they built this house.</td>
<td>I would put more sound proofing in the walls.</td>
<td>The window.</td>
<td>I would feel very friendly towards this person and I would expect this person to be friendly back…</td>
<td>Gargantuously better!</td>
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<tr>
<td>It was love at first sight. I was sold on it.</td>
<td>They used renewable resources and straw bale housing and alternative living.</td>
<td>The well water has a lot of silt in it.</td>
<td>The sunlight and since it’s passive solar energy it just brightens it up a huge amount in here, it keeps it warm.</td>
<td>Sort of, you know, open arms.</td>
<td>It makes you feel like you are doing something good even if you’ve has a bad day. (because of the materials)</td>
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<tr>
<td>I just got a really good feeling from the studio itself. It is more a feeling you get from inside than anything else.</td>
<td>I would buy it if I could.</td>
<td>Moisture builds up on the inside of the walls preventing the keeping of plants.</td>
<td>The fact that it’s a lot of earth materials.</td>
<td>I’d want to get to know this person better.</td>
<td>Living in a house is much more of a closed environment.</td>
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<td>I walk on the floor and I’ll think, “Oh jeez, that’s a renewable resource!” (cork floor)</td>
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<td>You know the tree shed the cork and you know the straw bale walls.</td>
<td>Here the entire space is open and you get to see everything and I think that is a big part of the wholesomeness of this place.</td>
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<td></td>
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<td></td>
<td>A friend you want to hang around.</td>
<td>The materials, the layout of the area, it’s a circular movement.</td>
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</tr>
<tr>
<td>Harmony w/ world</td>
<td>Disharmony w/ world</td>
<td>Greater feeling of life</td>
<td>Most alive</td>
<td>Aware of own life</td>
<td>Harmony w/ self</td>
<td>Disharmony w/ self</td>
<td>Unity w/ self</td>
<td>Wholesomeness</td>
<td>Mirror of self</td>
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</tr>
<tr>
<td>I kind of like sitting in that corner.</td>
<td>Over by the washing machine and the frig.</td>
<td>The whole carpeted area here.</td>
<td>Same, Right in this area.</td>
<td>The sustainable building materials used to construct a lot of this house.</td>
<td>Same answer.</td>
<td>The carpeted area.</td>
<td>It reflects very well my goal to do better as a person at least towards the environment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It’s next to a window and you get a view of the entire studio.</td>
<td>The fact that they are machines they seem out of place to me. It doesn’t seem to flow well with everything else.</td>
<td>It is always really cheery over here even on a stormy day. A lot of that is due to the light that just pours through.</td>
<td>There’s recycled wood, straw bale houses, renewable flooring, passive solar energy.</td>
<td>The materials that it’s built out of. It makes me consciously think about what I am surrounded by and my impact on the environment.</td>
<td></td>
<td>That reflects into me doing better as a person towards other people and every other aspect of my life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have a view of my lizards and I guess that is it.</td>
<td>When I have people over we gather around this area and you know…good memories here.</td>
<td>By some appliances I guess to me feel awkward.</td>
<td>It’s more similar to what I grew up with too</td>
<td></td>
<td></td>
<td>The feelings you generate at home you carry elsewhere.</td>
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</tbody>
</table>

Table 7.2
Interview Responses Regarding Wholeness
Case 7-Straw Bale Apartment
<table>
<thead>
<tr>
<th>Motives for choosing home</th>
<th>Attractions</th>
<th>Dislikes</th>
<th>Factors creating closeness to nature</th>
<th>Feelings toward home as a person</th>
<th>Experiential differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>We built it.</td>
<td>The curved walls</td>
<td>Oh the windows.</td>
<td>Openness, a softness, not a harshness.</td>
<td>Oh, much more settling.</td>
<td></td>
</tr>
<tr>
<td>It was wonderful to help design something that we love.</td>
<td>All the tile.</td>
<td>Upstairs there is a lot of cracking in the walls.</td>
<td>In the spring we often have bears on our deck.</td>
<td>I would want to put my arms around the person.</td>
<td></td>
</tr>
<tr>
<td>It’s just something about my nature to do something that’s not run-of-the-mill.</td>
<td>I like that when someone’s cooking the kitchen is large enough for us all to cook at the same time and also be together if someone is in here.</td>
<td>The floor in the kitchen is becoming very cracked.</td>
<td>We can look out the windows and see moose, deer, lamas, wild turkeys.</td>
<td>I would feel like I met a very peaceful person.</td>
<td></td>
</tr>
<tr>
<td>I liked our designer.</td>
<td>The very openness of the house.</td>
<td></td>
<td></td>
<td>I think maybe I’d find it to be an interesting person to be around.</td>
<td></td>
</tr>
<tr>
<td>I just like to take the road not taken I guess and straw bale certainly fit that for this environment and this area.</td>
<td>I like how the light plays on that one window there. It’s almost like it’s a frame for the mountain and the trees.</td>
<td>The floors upstairs, they are wooden, the came out of a church and they are not in great shape and they are hard to clean.</td>
<td>Being able to view wildlife and because the windows in here are large you almost feel part of it.</td>
<td>Feeling my walls was not anything I ever thought would bring me comfort. But you just want to feel that roundedness.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The thickness of the wall, they are very sensuous.</td>
<td></td>
<td>It doesn’t mean they can’t be opinionated but also welcoming.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I can see out different windows.</td>
<td></td>
<td>A good listener.</td>
<td>The last house we lived in, the laminated counters, the wall-to-wall carpeting, the cheapness of it.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I like having the different levels. It makes the house more interesting. The views are different because we have different levels. It separates the sleeping space from the living space.</td>
<td></td>
<td>An alive person, not a dull person.</td>
<td>And also trying to heal my son we were trying to make it as environmentally friendly as we could to see if it would make any difference.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The light.</td>
<td></td>
<td>I love the rain on the tin/metal roof. The sound is just wonderful.</td>
<td>This house is not at all sterile. (compared to tract housing) The flat walls, the corners, the room sizes just all being the same.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The warm floors.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harmony w/ world</td>
<td>Disharmony w/ world</td>
<td>Greater feeling of life</td>
<td>Most alive</td>
<td>Aware of own life</td>
<td>Harmony w/ self</td>
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</tr>
<tr>
<td>I may be more comfortable where there is a couch.</td>
<td>I don’t think there is an except.</td>
<td>Different rooms generate a different part of life within.</td>
<td>The walls, the nature, the art we’ve brought in.</td>
<td>The dog hair.</td>
<td>Helping somewhat in the design meant a lot to me.</td>
</tr>
<tr>
<td>When the wood stove is going that is very lovely.</td>
<td>Meditation room/library that is the life of knowledge.</td>
<td>The growth of the trees, the night, the stars…</td>
<td>That is an upside down, old-fashioned clothespin.</td>
<td>The cracks in the upstairs walls.</td>
<td>Bringing my ideas in.</td>
</tr>
<tr>
<td>In the summer I love sitting in the meditation room. The different views, the books.</td>
<td>Computer/hobby room would be another place I can seek knowledge.</td>
<td>When I come down stairs in the morning and the light is coming through the windows, that is very welcoming.</td>
<td>The awareness of life and awareness of how brief life is by the show of nature.</td>
<td>The shower and the stained glass window in the meditation room.</td>
<td>How dirty the walls are getting.</td>
</tr>
<tr>
<td>It is a very comforting space to me. (meditation room)</td>
<td>I can’t think of a room that doesn’t generate life. Maybe that’s why I call it a living house.</td>
<td>Life and death either from the seasonal…</td>
<td>Plants, the flowers…</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>It’s the curved walls, the texture of the walls, the bumpiness of the walls.</td>
<td>It feels friendly and soothing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The way the light plays in different windows. You just look at it and go “Wow, that is really great how the light is hitting that sculpture!”</td>
<td>I can’t look out these windows without being aware of your own life.</td>
<td>Wood, I like the cherry in the kitchen, watching it age and change color.</td>
<td></td>
</tr>
</tbody>
</table>
Table 9.1
Interview Responses Regarding Context and General Information
Case 9-Straw Bale Farmhouse

<table>
<thead>
<tr>
<th>Motives for choosing home</th>
<th>Attractions</th>
<th>Dislikes</th>
<th>Factors creating closeness to nature</th>
<th>Feelings toward home as a person</th>
<th>Experiential differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>It was a good deal.</td>
<td>I like the lines of the house, kind of simple, farmesque.</td>
<td>Although this great room here is a striking feature, I would not have done it personally. I would rather have the extra square footage upstairs.</td>
<td>Lots of windows.</td>
<td>That they were beautiful, good person to have around and flawed like the rest of us.</td>
<td>It is really just different than almost anyplace I have lived.</td>
</tr>
<tr>
<td>I saw the value in the development here.</td>
<td>The choices they made in the design, material, and layout I was pretty in line with.</td>
<td>Because of the room (living room) it takes a long time to heat up if it gets cold.</td>
<td>The fact that it is a pretty open room.</td>
<td>This place is better off for having it around.</td>
<td>It just feels so much better to be in a really natural environment.</td>
</tr>
<tr>
<td>I have an affinity towards this place already.</td>
<td>I like that it feels very organic and natural.</td>
<td>I would put a bigger woodstove in.</td>
<td>You are in an inside space but you don’t feel like you are in totally.</td>
<td>Good...Someone I’d want to be around for sure.</td>
<td>Just more right with the world and healthier.</td>
</tr>
<tr>
<td>I really was taken by what they did with this house although I have since kind of tempered some of those thoughts.</td>
<td>There’s not a bunch of vinyl and plastic and carpet. We didn’t want a house that was going to off-gas a lot.</td>
<td>I would have piped the house with radiant baseboard at least or floor heat up here and upstairs probably to make those back bedroom a little less chilly when it is really cold out.</td>
<td>I guess the organicness of it feels more nature-like. So the difference between inside and outside is even less.</td>
<td>We decided we are never going to have forced air again.</td>
<td></td>
</tr>
<tr>
<td>It’s a practical house for the most part.</td>
<td>The trim on the inside here with the natural contours of the walls.</td>
<td>The view obviously.</td>
<td></td>
<td>I really like heating with wood.</td>
<td></td>
</tr>
<tr>
<td>The natural contours of the walls...of the stucco over the straw bale...</td>
<td>I would have designed the kitchen differently. They didn’t build a dining area into this house which I find annoying.</td>
<td>We’re in a rural setting here so you are very connected to the natural world.</td>
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<td></td>
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</tr>
<tr>
<td>It’s got a lot of room to move around in.</td>
<td>I’m getting to a point in my life where I want things to be ideal.</td>
<td>We’re on a wilderness boundary here within a half mile is the main grizzly corridor...</td>
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<tr>
<td>Lack of cheapy, conventional building materials</td>
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<tr>
<td>It’s got a lot of wood and natural stucco and natural slate tile.</td>
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<tr>
<td>It is very energy efficient.</td>
<td></td>
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<tr>
<td>The curves in the windows...</td>
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<tr>
<td>The little touches like that planter spot.</td>
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<tr>
<td>It’s built for low maintenance.</td>
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</tbody>
</table>
### Table 9.2

#### Interview Responses Regarding Wholeness

**Case 9-Straw Bale Farmhouse**

<table>
<thead>
<tr>
<th>Harmony w/ world</th>
<th>Disharmony w/ world</th>
<th>Greater feeling of life</th>
<th>Most alive</th>
<th>Aware of own life</th>
<th>Harmony w/ self</th>
<th>Disharmony w/ self</th>
<th>Unity w/ self</th>
<th>Wholesomeness</th>
<th>Mirror of self</th>
</tr>
</thead>
<tbody>
<tr>
<td>In this room (living room) I guess.</td>
<td>Nowhere really I’d have to say.</td>
<td>Lots of natural sunlight.</td>
<td>I guess in here (living room).</td>
<td>In the ways that the natural world is transparent inside the house.</td>
<td>Its organicness and beauty especially on the inside.</td>
<td>Really only the finish aspects that way: plumbing, tile, certain things in the kitchen.</td>
<td>In my whole life I’m striving toward this more sustainable, natural, more healthy world…</td>
<td>I suppose I feel the most wholesome on the porch.</td>
<td>It’s doing the best job it can which is a pretty darn good job in this world.</td>
</tr>
<tr>
<td>In this room the windows are very big and you see the mountains all the time.</td>
<td></td>
<td>Lots of houseplants.</td>
<td>Reminding you where you are at and what you’re doing and why you came to this place.</td>
<td></td>
<td>The wood for sure.</td>
<td>The cabinets are poorly functional and breaking all the time.</td>
<td>This house is very exemplary in a lot of those things</td>
<td></td>
<td>Because it is the furthest interface with the outside that I can be and still be in the house I guess.</td>
</tr>
<tr>
<td>It’s got more transparency than any other room in the house.</td>
<td></td>
<td>People and family, pets-lots of life brewing around here.</td>
<td>That is more about the placement of the house than the house itself.</td>
<td></td>
<td>It’s not like perfectly flat and cornered.</td>
<td></td>
<td>Living in a house like this is just another step in creating that larger web of sustainability.</td>
<td></td>
<td>Doing more to try to be positive than the opposite.</td>
</tr>
<tr>
<td>You feel like you are in a good safe spot and a beautiful spot and it feels like a special thing compared to where one might be in the world.</td>
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<tr>
<td>It’s got sort of a sky-like ceiling.</td>
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</tbody>
</table>

In reality I don’t know how much more sustainable we are than the rest of the world…but having a house like this definitely makes me feel more real with that.
### Table 10.1
Interview Responses Regarding Context and General Information
Case 10-Earthship 1

<table>
<thead>
<tr>
<th>Motives for choosing home</th>
<th>Attractions</th>
<th>Dislikes</th>
<th>Factors creating closeness to nature</th>
<th>Feelings toward home as a person</th>
<th>Experiential differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like the location.</td>
<td>(Windows) you can see the sky change…</td>
<td>The house would be like a big warm mama.</td>
<td>It’s a step up.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part of our spirit’s built into this house.</td>
<td>We see the seasons and all that.</td>
<td>This really safe harbor.</td>
<td>Like the lap of luxury for me!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It’s just really solid.</td>
<td></td>
<td>It would be a person with moods.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You can feel in your spirit how solid this place is.</td>
<td>The sun in always hitting your retinas.</td>
<td>It’s this really solid, protective rock grandfather that is part of the earth.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>It produces its own heat by being passive solar and its got this quality of just almost being a living entity…</td>
<td>Something to cover my car so I would have to shave the frost off the windshield.</td>
<td>We look out and see the sky and the trees as they change</td>
<td>This warm mama on the inside and this protective granddaddy on the outside.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>…a lot of light and softness to it…</td>
<td></td>
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</tr>
<tr>
<td>There is the security of knowing (not dependent on electricity from an outside source)</td>
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</tr>
<tr>
<td>Harmony w/ world</td>
<td>Disharmony w/ world</td>
<td>Greater feeling of life</td>
<td>Most alive</td>
<td>Awareness of own life</td>
<td>Harmony w/ self</td>
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</tr>
<tr>
<td>In the winter it’s this room, next to the stove (the kitchen)</td>
<td>I don’t spend a lot of time in my mud room but it’s not that I feel like it’s out of harmony…</td>
<td>The light and the tropical plants.</td>
<td>That moves. It’s the same as the other one.</td>
<td>We have this path that goes through the snow in the winter.</td>
<td>Feeling happy just looking out the window or seeing the sky…</td>
</tr>
<tr>
<td>At night it’s the bedroom… you feel really tucked in.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the spring it’s like the Wizard of Oz out there with all the apple trees blooming.</td>
<td>I feel like I’m surrounded with beauty.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>In the summer we spend most of our time over there (living room, in the hammock)</td>
<td></td>
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</tr>
<tr>
<td>When I’m doing artwork I spend it by the window…</td>
<td></td>
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</tr>
<tr>
<td>I don’t know, the whole thing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It does move around depending on the season.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Since it’s a round house that also makes a difference.</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>There’s really no separate rooms in this house.</td>
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</tr>
</tbody>
</table>

Table 10.2
Interview Responses Regarding Wholeness
Case 10-Earthship 1

Harmony w/ world
Disharmony w/ world
Greater feeling of life
Most alive
Awareness of own life
Harmony w/ self
Disharmony w/ self
Unity w/ self
Wholesomeness
Mirror of self

In the winter it’s this room, next to the stove (the kitchen): I don’t spend a lot of time in my mud room but it’s not that I feel like it’s out of harmony. The light and the tropical plants. That moves. It’s the same as the other one. We have this path that goes through the snow in the winter. Feeling happy just looking out the window or seeing the sky…

At night it’s the bedroom… you feel really tucked in:

In the spring it’s like the Wizard of Oz out there with all the apple trees blooming. I feel like I’m surrounded with beauty.

In the summer we spend most of our time over there (living room, in the hammock): In the spring it’s like the Wizard of Oz out there with all the apple trees blooming. I feel like I’m surrounded with beauty.

When I’m doing artwork I spend it by the window… (being in the moment)

I don’t know, the whole thing.

It does move around depending on the season.

Since it’s a round house that also makes a difference.

There’s really no separate rooms in this house.
<table>
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<tr>
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<th>Factors creating closeness to nature</th>
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<th>Experiential differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>We wanted to build something that was uniquely us.</td>
<td>Not having a lot of bills to pay.</td>
<td>Probably a few little minor details having to do with the structure…</td>
<td>The wide open windows across the front here.</td>
<td>It will live forever and it’s not something that will be worn out.</td>
<td>We are living a more affluent lifestyle than we ever have here.</td>
</tr>
<tr>
<td>It is efficient from an economic and an energy standpoint.</td>
<td>Not being in debt.</td>
<td></td>
<td>Because you can see nature.</td>
<td>You treat it like a granddad or something.</td>
<td>It’s just a tremendous educational opportunity.</td>
</tr>
<tr>
<td>I wanted to create something that I didn’t have to spend the rest of my life paying bills.</td>
<td>I like the place that the home is located.</td>
<td></td>
<td>Using wood heat…</td>
<td>You treat it with care.</td>
<td></td>
</tr>
<tr>
<td>I was looking for something that was cost effective in the long term.</td>
<td>I think that the location is the most important aspect of our home here.</td>
<td></td>
<td>The walls—an earthy feel to see it.</td>
<td>The fact that it heats itself and it cools itself gives it a life of its own.</td>
<td></td>
</tr>
<tr>
<td>It is a lifestyle choice that goes along with it.</td>
<td>…using indigenous building materials.</td>
<td></td>
<td>The logs and the mud finish and those aspects make it more natural indirectly.</td>
<td></td>
<td>You can see all the...</td>
</tr>
</tbody>
</table>

Table 11.1
Interview Responses Regarding Context and General Information
Case 11-Earthship 1
<table>
<thead>
<tr>
<th>Harmony w/ world</th>
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<th>Unity w/ self</th>
<th>Wholesomeness</th>
<th>Mirror of self</th>
</tr>
</thead>
<tbody>
<tr>
<td>The warm spot.</td>
<td>I don’t feel very harmonic sitting on the throne. It’s plastic!</td>
<td>Building it was a big part of that.</td>
<td>Your ideas of the world and you ideas of yourself are developed at the same time.</td>
<td>The sustainability eases your mind and makes you less stressful.</td>
<td>Oh that plastic toilet.</td>
<td>Engaging in natural events and it is realized through action.</td>
<td>It has a lot of our personality involved because we built it.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I guess you could say it depends on your mood.</td>
<td>I can repair everything because I made it and that ties together a lot of aspects of living here and makes life more fulfilling.</td>
<td>We know exactly how much energy every little light bulb takes and how much power, how many watts you can use every day in the winter vs. the summer and you are just so much more aware of your surroundings and what you are using.</td>
<td>I don’t have to worry about debt or where I’m going to get my food the next day because I grow it.</td>
<td>It is the entire system that we are looking at and it is not just the physical structure of the house.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In bed would be a very harmonic place at certain times.</td>
<td>Making the effort to learn all the different trades.</td>
<td>Chopping your own wood and digging in the dirt gives you a sense of place and makes you a more well rounded person.</td>
<td>You have to take a bath when there is enough hot water and it’s exactly one load of wood.</td>
<td>(it comes from the lifestyle that it takes to live in an earthship)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You can enjoy all these different spots depending on the season.</td>
<td>Having to do all the little chores that people normally would hire out.</td>
<td>Working in the dirt and building your own house that gives you a sense of place.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 12.1  
Interview Responses Regarding Context and General Information  
Case 12-Earthship 2

<table>
<thead>
<tr>
<th>Motives for choosing home</th>
<th>Attractions</th>
<th>Dislikes</th>
<th>Factors creating closeness to nature</th>
<th>Feelings toward home as a person</th>
<th>Experiential differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>To get away from the rat race and live a more simple life.</td>
<td>It is very easy to heat because we have the thermal mass.</td>
<td>There tends to be a lot of moisture in the home.</td>
<td>All the greenery for one thing.</td>
<td>Somebody that I wouldn’t be around much. (prefers to be outside)</td>
<td>More open.</td>
</tr>
<tr>
<td>It is more economical as well as environmentally better to build this way.</td>
<td>During the winter of course we get the sun and that’s nice.</td>
<td>Because we are on solar we haven’t got all the power we want.</td>
<td>It just is close to nature!</td>
<td></td>
<td>This is brighter and I can see anything and everything.</td>
</tr>
<tr>
<td>It was equally both (environmental and economic)</td>
<td></td>
<td></td>
<td></td>
<td>All the open windows.</td>
<td>You live in a dark hole long enough and you tend to feel shut in.</td>
</tr>
</tbody>
</table>
### Table 12.2
Interview Responses Regarding Wholeness
**Case 12-Earthship 2**

<table>
<thead>
<tr>
<th>Harmony w/ world</th>
<th>Disharmony w/ world</th>
<th>Greater feeling of life</th>
<th>Most alive</th>
<th>Aware of own life</th>
<th>Harmony w/ self</th>
<th>Disharmony w/ self</th>
<th>Unity w/ self</th>
<th>Wholesomeness</th>
<th>Mirror of self</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>I've become more aware just since I've moved here just being a part of something more connected to the earth.</td>
<td>I've become more aware just since I've moved here just being a part of something more connected to the earth.</td>
<td>I have kids so there is not much peace.</td>
<td>I have kids so there is not much peace.</td>
<td>I am an outdoors person. I spend as little time in the house as I possibly can.</td>
<td>It's not like my best self.</td>
<td></td>
</tr>
<tr>
<td>The living area where all the plants and things are.</td>
<td></td>
<td>In the living area. My kitchen, living room and everything is all one big room.</td>
<td>I connect more with being outside than I do in the house.</td>
<td>I don't know if I get that from my house.</td>
<td>I have to leave the house and go be with the animals to have any peace.</td>
<td>I have to leave the house and go be with the animals to have any peace.</td>
<td>I'm really not attached to my home much at all.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Basically everything we need is right here. We've got animals and gardens.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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The living area where all the plants and things are.
APPENDIX C

CONSENT FORM
WASHINGTON STATE UNIVERSITY
CONSENT FORM

Wholeness and Sustainable Architecture: A Test of Christopher Alexander’s Theory Using Occupant Affective Responses to their Dwellings

Researchers: Cherie Peacock, Graduate Student
Master of Science in Architecture
School of Architecture and Construction Management
Phone number: 509-928-3326

Researchers’ statement

I am asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether to be in the study or not. Please read the form carefully. You may ask questions about the purpose of the research, what I would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When I have answered all your questions, you can decide if you want to be in the study or not. This process is called ‘informed consent.’ I will give you a copy of this form for your records.

PURPOSE AND BENEFITS

The purpose of this study is to research the effectiveness of sustainable architecture in residential settings. This research will focus on occupants of sustainably built dwellings and their feelings toward their homes. If it can be shown that sustainable architecture works well in residential settings, this could result in improving residential architecture for the benefit of people. If aspects of sustainable architecture are found not to work well, perhaps lessons can still be learned for incorporation in future designs.

PROCEDURES

A questionnaire will be used to gather information about you and your feelings toward your house. This questionnaire will be administered during a one-on-one interview or by mail. One-on-one interviews will be audio taped. Below is an example of the type of questions that may be asked:

“What aspects of your home make you feel the greatest wholesomeness in yourself?”
You may refuse to answer any question on the questionnaire or during the interview at any time. I will also request to take photos of your home or ask you to provide photos. You may also refuse this request. The questionnaire will take approximately 1 hour to complete.

RISKS, STRESS, OR DISCOMFORT
A possible risk of participation in this study is embarrassment from sharing the information you provide. To mitigate this risk, the data collected will be confidential. Only I and my thesis committee (Prof. David Wang, Prof, Matt Melcher, and Prof. Keith Diaz-Moore) will be able to see your name associated with the information you provide. In all other documentation, names will be omitted. You may also refuse to answer any question at any time.

OTHER INFORMATION
The data collected in this study will be used in a Masters thesis and possibly in articles. The collected data will be retained by me until May, 2008.

Subject’s statement
This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have general questions about the research, I can ask one of the researchers listed above. If I have questions regarding my rights as a participant, I can call the WSU Institutional Review Board at (509)335-9661. This project has been reviewed and approved for human participation by the WSU IRB. I will receive a copy of this consent form.

I give permission for the one-on-one interview to be audio taped and for photographs to be taken of my house under my direction.
APPENDIX D

DWELLING FACTORS


**Dwelling Factors**

- **Ecologically appropriate**
  - **Energy efficiency**
    - Earth used as thermal mass for heating and cooling
    - Small size house
    - Heating with wood
  - **Using renewable or recycled natural materials**
    - Wood
    - Earth/adobe
    - Straw bale
    - Stone
    - Clay tile flooring
    - Cork flooring
    - Recycled wood flooring
    - Recycled furniture
  - **Working with natural systems**
    - Passive solar heat gain
    - Cooling with passive ventilation
    - Daylighting
    - Photovoltaic electricity generation
    - Using plants to treat grey and black waste water
    - Composting human and kitchen wastes
    - Growing food

- **Socially valuable**
  - **Connecting with others**
    - Open interior space
    - Setting an example
    - Sharing experiences
  - **Being different**

- **Psychologically valuable**
  - **Living in alignment with values**
    - Dwelling is an expression of values
    - Self sufficiency
    - Practicality
    - Memories
    - Affordability without debt
  - **Connecting with nature**
    - Materials that remind of nature as source
    - Awareness of natural cycles
    - Knowing lifestyle minimizes negative impacts
Beautiful

- Viewing nature/sunlight/moonlight
  - View of garden, wildlife, vegetation, sky
  - Organic interior features

- Thermal and acoustic qualities
  - Radiating warmth from stored solar gain
  - Interior space cooled by thermal mass
  - Quiet

Comforting to the soul

- Making
  - Joy in the act of creating
  - Awareness of life through creation and learning
  - Residents feel one with their dwelling

- Spiritual connections
  - Feeling a part of the universe and connected to God
  - Connection with others and nature adds meaning to life
  - Dwelling is in harmony with natural surroundings

- Places that feel in harmony with the world
  - Front porch
  - Patio overlooking nature
  - Near fireplace or stove with a wood fire
APPENDIX E

INDIVIDUAL MEASURES OF WHOLENESS GRAPHS