The Architect and the User
Investigating designer and user practices and structures in Hawai'i

Willa J. Trimble
May 2014

Submitted towards the fulfillment of the requirements for the Doctor of Architecture degree.

University of Hawai'i School of Architecture

Doctorate Project Committee
Marja Sarvimäki, Chairperson
William Chapman
John Shaw

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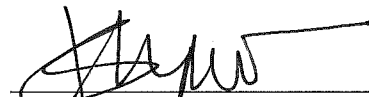
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Abstract

This project investigates a perceived disconnect between designers and the people who use the designs. The project uses the primary research tactic of the post-occupancy evaluation (supported by tactics from environmental psychology) organized in a case study method to compare user-built housing and architect-designed housing in order to determine how architects might best serve the housing typology. Residences designed and built in the last half-century on the island of O'ahu in the state of Hawai'i were evaluated. An effort was made to measure behavioral artifacts, rather than cognitive elements. A design project, implementing the findings of the previous phase, follows the research portion.

Preface

When I first moved to Hawaii, I lived in a small cottage perched above jungly state lands in the upper reaches of a neighborhood called St Louis Heights. The space was simply laid out, simply constructed and an absolute joy in which to dwell. Made by the landlord, the owner and resident of the main house on the street side of the property, the cottage, I'm sure, was built and inhabited completely illegally. (This is perhaps another conversation, but is still worth noting.) My delight in these living quarters naturally led to some perplexing questions for myself and my chosen vocation. Most urgently: if the user can design and build so well for himself, what can and should the role of an architect be?

I grew up in Seattle. We lived in an old American Foursquare or Seattle Box house; two stories with a basement and an attic, rooms at each corner, hipped roof on top and porches front and back. Investigating the history of the home, we discovered it had been built by the owner from a pattern book, probably supplied by Sears and Roebuck. That original owner was a doctor who treated patients at home and adapted the spaces to suit these needs, putting a few extra rooms upstairs for tuberculosis patients and moving the bathrooms. Eventually, we too as owners adapted the space; modernizing the kitchen, reorganizing the back rooms and adjusting the back porch to suit ourselves. While the American Foursquare is certainly not the pinnacle of any design process, my family and I certainly got a sense of freedom from its simple form and took delight in its adaptation.

When I began my formal architectural education, I started learning in the way architects have been learning for many years now: through criticism and theory and with almost no contact with users or potential users before or after development of the design. Professional architects themselves rarely go back to built projects to check if the things they felt would work a certain way are actually working that way. (There is such a thing as a "post-occupancy evaluation," but these things are mainly endeavored by social scientists and rarely related to the architect. Perhaps there could be a conflict of interest if architects were to be made responsible for objectively evaluating their own designs—which also is probably an entirely other conversation—but there is a glaring gap of accountability here.)

Being mostly educated in theory and rarely having the opportunity to check in to see if the concepts have been applied correctly began to agitate me. This increasing uneasiness coupled with my positive experiences in user-built and layman-modified housing types instigated

the early formation of my thesis question: What is our job? What do architects do? What element are we really capable of adding?

When I began investigations for this research project, I found articles discussing a growing difference in the way architects see beauty and the way a layperson does. Studies have shown the "educated" eye of the architect is significantly different than the average person walking down the street. Some architects today even explicitly say their job is to design something "beautiful" and leave it up to the user to adapt themselves and their patterns, no matter how tricky or awkward.

It's true humans can be very adaptable, and some might feel changing their patterns somewhat to be a worthy price to pay to live or work in such "art," but I worry there may be other repercussions. Anomie, especially in America but essentially all over the globe, is one of the future's greatest problems. Perhaps this too is a discussion for another time, but there is a salient bit here: when people are told over and over again by people educated in design that they are not capable of designing (or building) for themselves, they will believe it and, through giving up involvement in the design process, relinquish much of their sense of ownership. This, I don't think it's too much of a stretch to say, leads, by turns, to the anomie I'm so worried about.

At the same time, on a smaller, perhaps more relevant scale, this process of architectural arrogance leads to self-involvement within the profession and a further disconnect from the user and, I believe, from the true purpose of building structures. It so happens that unlike art, architecture is a tool that has a use—whether or not it's able to meet that use is extremely important.

As I continued investigating for this project, my original questions kept returning and were not being answered: Should the user be forced to mold themselves to whatever piece of art an architect designs? Or is the user (and society at large) better served by a community of possibly less aesthetically pleasing, simple structures, adapted and built by the users themselves?

Basically, what can I do to educate myself in contrast to the education I've been receiving.

Regardless of the real, quantitative conclusions of the entire project, I did mostly answer the more basic and personal question—What is the architect's job? What value can I add in this field?—with the thought that there is everything to be gained by being a capable listener. Fantastic

design solutions will get you nowhere without an honest client dialogue a well understood, accurate (for now and for future) program.

Perhaps another personal conclusion is realizing architecture is a social science. Getting too involved with the black-and-white ease of the hard sciences can be just as detrimental as going off the wall on one's own, inapplicable design trip.

All figures, photographs and tables created by author unless otherwise noted.

Introduction

Often, architects rely on rhetoric to get their designs sold and built. They claim a number of influences structures have on people. This project is based on the position that architecture is a tool that has a use—and that it is possible to measure whether said architecture is able to meet that use.

Architects have been led and educated by criticism and theory. It is this author's postulation that this leads to self-involvement within the design profession, a disconnect from the users. The result of this disconnect is that the opinion of the layman may be ignored or belittled, causing them to lose their sense of ownership and perhaps destroying their sense of belonging—beyond the basic possibility of the design failing at being useful for its users and at the rhetorical claims made to get the it built in the first place.

Initial Questions

This line of thinking leads to and partially answers a series of initial questions: Who should an architect work for? What is the ultimate responsibility of an architect? It is also this author's postulation that the architect's ultimate responsibility is to the user, and not to any elite cadre of critics, juries, peers or even themselves. Thence the next set of questions arises: If such a disconnect does exist, why is it there? Where did it come from? How can we fix it?

Traditionally, architects have worked by intuition, but recently, design research has been emphasized a little more—both in the profession and in academic institutions. The research is still relatively untested, yet architects cite it to make claims of what kinds of broad social effects architecture can be accomplished yet continue to design mostly by intuition. How can we make this design research better? How can we apply it?

Taking all this into account, do the users actually benefit from the added "value" of an architect? Are the proposed social effects actually happening? Could design research, if applied correctly, help resolve this suspected disconnect?

At the dawn of human history, all users were their own designers (as most creatures on the planet still are). Slowly, as our biology evolved and our social structures became more complex, specializations developed, the "architect" came into existence and designer was separated from user.

This separation has continued to develop as the specialization of the architect has developed and it has become a more threatening disconnect. Is it possible to pinpoint where this separation became a disconnect? And can this disconnect be measured? If it can be found and measured, we might be in a better position to resolve it.

Asking these questions and trying to answer them from the perspective of an architect is especially helpful. The fields of inquiry that typically investigate this area are many and varied, yet the field that could most benefit is strangely un-participative. Sociologists, psychologists and anthropologists (among others) all have realized the potential benefits of this type of research while architects merely pay lip service to the concept and do not involve themselves. This project hopes to change that attitude, or at least open a conversation about it.

Research Methods

This investigation centers around the question of a disconnect between designers and users. Interpretive-historical methods are used to investigate where the roots of the disconnect may have developed. A case study method, supplemented by tactics from environmental psychology and traditional post-occupancy evaluations, attempts to measure the disconnect.

Interpretive-historical methods are used to uncover the history of architecture and education, a small bit of the history of architecture and a brief background on housing in the United States. Data for the famous case studies is gathered using this secondary research method and contextual information for the local case studies is found using it as well.

Because the nature of the criticism of designers in this project is that they are passive, more active primary research to investigate the criticism is a fitting response. Post-occupancy evaluations, often quantitative could do a good job of informing the questions here, but the tactics can be dry and lacking in rich contextual information. The research-based field of environmental psychology includes useful tactics, usually qualitative, that can yield relatively rich data. But a case study method provides the best structure for this research design. As this research is concerned with the real-life effects of design on people in their environment, case study methodology and its treatment of subjects within their real-life context was most apt. Tactics from the formerly mentioned two methods support and inform the main framework.

A set of single case studies best fit the questions. For the sake of brevity and clarity, this project focuses its primary research on single-family, detached housing in the state of Hawaii built in the last 50 years. The case studies are organized as a series of representative, typical, single cases. They are arranged on a spectrum, not meant to correspond specifically to each other, but, since they share a common context, are meant to be considered together.

These primary case studies are supported by secondary research case studies of works of housing by known and famous architects. The famous case studies use interpretive-historical methods only, but are arranged in a similar format to the primary, local case studies for comparative purposes.

For the primary case studies, "the data are to be collected from existing people and institutions, not within the controlled confines of a laboratory, the sanctity of a library, or the structured limitations of a rigid questionnaire,"[1] so the tactics must be flexible.

People respond to stimulus in two basic ways—with their bodies and with their brains. Since cognition (the brain response) is an elusive element, efforts were made to focus on behavior (the body response) and physical traces of behavior, as a more tangible gauge of usefulness. Even though some of the wider repercussions of the suspected outcomes of a disconnect between designers and users are cognitive—and it has been argued by this author in the Preface of this document that cognitions can have very real, very valid and potentially disastrous repercussions, socially and environmentally—tangible data was preferred for this project for its simplicity and clarity of evaluation. Obviously ease of evaluation is a benefit to the researcher, but there is also a benefit to the results: there is power in clarity of presentation that creates an easier understanding for a wider audience.

Focused interviews aimed at expressions of behavior through discussion of modifications to spaces and use of spaces were the main environmental psychology tactic. Environmental psychology also gave targeted observations, wherein the spaces of each home were evaluated for use and wear.

The questionnaire is a typical post-occupancy evaluation tactic. Here, the quantitative data the questionnaire yields supports the mainly qualitative efforts of the tactics of environmental psychology.

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[1] Robert K Yin, *Case Study Research: Design and Methods*, 3rd ed. (Thousand Oaks, CA: Sage, 2006) 67.

Holistically, however, this has been qualitative research, wherein the researcher herself acts as the measurement tool. The individual social nature of the work results in a relatively informal style throughout.

Literature Review

The information reviewed here can be categorized in four groups: architecture education, designer/user tension, case studies, post-occupancy evaluations and environmental psychology.

The education process for an architect is the point at which that person ceases to be purely a user and becomes a designer. A series of resources explore how the education occurs and who's been in charge of shaping the pedagogical paradigm.

A set of articles on the growing mis-alignment between the architect and the user he or she designs for describes the tension between designers and users. Some studies illustrating the benefits of co-design practices are evaluated as well.

The case study resources are books and articles that define case study research, describe how it should be conducted and offer typical tactics. These are used to develop the framework of the research design for this project.

The post-occupancy evaluation resources are books and articles which include both studies to use as precedents and analytical pieces. These will be used partly to help shape the field work (or primary research) portion of this dissertation and partly to see how buildings have traditionally been evaluated in order to discover how that may or may not need to change given the new information the field of environmental psychology continues to provide.

The set of environmental psychology literature includes books and articles discussing this relatively new field which blends many varied disciplines in a quest to find empirical methods of proving intuitive elements.

About The Designer

Architecture School: Three Centuries of Educating Architects in North America, by Joan Ockman, is a comprehensive resource regarding architectural pedagogies as they developed through time in the United States.

Just as there are a variety of schools, there is variety among schools of thought in architects. Across a broad spectrum, from some who feel

social activism to be primary to others who ennoble the artistry of the discipline. Publications such as the collection of articles edited by Peter Blundell Jones, Doina Petrescu and Jeremy Till called *Architecture and Participation* reflect a growing trend of architects advocating more holistic interaction with the user.[2]

Besides this championing of the user, a set of architects and writers also criticize the state of architectural education. Articles like Rosie Parnell's "Knowledge Skills and Arrogance: Educating for Collaborative Practice," explore this inward-looking state of the profession, its lack of outreach and its resulting perception of arrogance in the community.[3]

Several books and articles on design thinking by Nigel Cross, Peter Rowe and Bryan Lawson are great helps in describing the disparity between a user's thought process and a designer's and the process and methods of designers. Cross, in particular, discusses how, when designers work hard to create things, they're really becoming experts in a fabricated world, separate from reality. He says, "What designers especially know about is the 'artificial world'—the human-made world of artifacts."[4] To Cross, this process has been evaluated and formulated into two blending categories, science and design. Yet, though "a desire to 'scientise' design"[5] dates from Le Corbusier's "machine for living" and before, no concrete formula is successful. There are many different ways to calculate design knowledge, but in the end it is a form of intelligence and varies as much as the humans who wield it.[6]

Nikos Salingaros, a mathematician primarily but with interests and writings in various other fields, blames design education for the tension between the designer and the user. A prolific writer, articles authored by him fit both this category and the following category. He refers to training as imbuing a type of "aesthetic hegemony" in students that, due to its

[2] Peter Blundell Jones, Doina Petrescu and Jeremy Till, eds., *Architecture and Participation* (London: Spoon Press, 2005).

[3] Rosie Parnell, "Knowledge Skills and Arrogance: Educating for Collaborative Practice," in *Writings in Architectural Education: EAAE Transaction on Architectural Education,* 15, ed. Ebbe Harder (Copenhagen: EAAE, 2003), 57-71.

[4] Nigel Cross, "Designerly Ways of Knowing: Design Discipline versus Design Science," *Design Issues* 17:3 (2001): 49.

[5] Cross, "Designerly," 49.

[6] Cross, "Designerly," 52.

intense conditioning, is difficult to overcome.[7] Salingaros has this to say about architecture school:

> *A little investigation reveals why the situation in architecture is so terribly polarized. Currently, architects go through an educational system that instills conformity to ideology, and which trains young architects in a way of thinking that accepts no revision of certain pre-formed beliefs about their discipline. The professional milieu is no better, as it continues to operate on the basis of never questioning a body of dogma (the "canons" of modernist architecture and urbanism, which are only a century old). Any non-architect can readily verify these conditions by attempting to debate architects about the soundness of their fundamental core beliefs.[8]*

Salingaros criticizes current teaching methods quite harshly. He thinks there ought to be a series of textbooks, as in the hard sciences, which lay out design methods and decisions sequentially and mathematically. Salingaros follows traditions of Christopher Alexander (with whom he worked for many years) but making the architectural process formulaic would cost the discipline its human element. "Scientising" design has not been found to be successful, as discussed by Cross.

Another root of the disconnect for Salingaros lies in modernism and the Bauhaus movement. Architect and theorist Juhani Pallasmaa also finds fault with modernism, but explores the complexity a bit more:

> *As we all know, Mies had designed one of the most important and aesthetically appealing houses of our century, but his client did not find it satisfactory as a home… When we compare designs of Modernity with those of today's avant-garde, we immediately observe a loss of empathy for the dweller. Instead of being motivated by the architect's social vision, or view of life, architecture has become self-referential and autistic.[9]*

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[7] Michael Mehaffy and Nikos A. Salingaros, "Architectural Myopia: Designing for Industry, Not People," Shareable, accessed December 17, 2013, http://www.shareable.net/blog/architectural-myopia-designing-for-industry-not-people.

[8] Nikos A. Salingaros, "Cognitive Dissonance and Non-Adaptive Architecture," P2P Foundation, 2 February 2011; reprinted by the Permaculture Research Institute, 9 February 2011; reprinted by INTBAU Essays, 17 March 2011.

[9] Juhani Pallasmaa, "Identity, Intimacy and Domicile: Notes on the Phenomenology of Home," JUHANI PALLASMAA, accessed February 16, 2014, http://www.uiah.fi/studies/history2/e_ident.htm.

Pallasmaa, later in that same essay, adds, "Many of us architects seem to have developed a kind of split personality: as designers and as dwellers we apply different sets of values to the environment,"[10] which is telling as this disconnect can be within one person, which will later be explored.

Designer/User Tension

The main section of articles inspiring this research project is a body of both editorial and scientific articles discussing the difference between designers and the people they design for.

An initial study comes from Jacqueline C. Vischer and Clare Cooper Marcus titled "Evaluating Evaluation: Analysis of a Housing Design Awards Program."[11] In investigating how and why design awards are given, the authors "compare the evaluative frameworks of four sets of people who make value judgements about buildings: the designers of housing submitted for an award, the jury in the awards competition, an environment and behavior researcher, and users of the buildings."[12] Their conclusions, unsurprisingly, are that jurors and users have very different criteria for evaluation. The authors' main criticism is that the jurors' criteria rely too much on aesthetics.[13]

In this study, non-laymen (designers and jurors) don't just see a building's beauty differently than the laymen, they're not even evaluating the same categories. Supposing the categories could be more clearly organized and the evaluations aligned, new conflicts develop.

In "The Architect Has No Clothes," an article published in *Guernica* magazine by Michael Mehaffy and Nikos A. Salingaros, there is a scathing review of the current state of architecture, both in the practices of professionals and the education of young architects.[14] Research that proves the discordance between a user's idea of space and an architect's is cited. The source of the disconnect is attributed to an out-of-date, illogical educational system built on beliefs that are fundamentally

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[10] Pallasmaa, "Identity."

[11] Jacqueline C. Vischer and Clare Cooper Marcus, "Evaluating Evaluation: Analysis of a Housing Design Awards Program," Places 3 (1986): 66-85.

[12] Vischer and Marcus, "Evaluating Evaluation," 66.

[13] Vischer and Marcus, "Evaluating Evaluation," 83.

[14] Michael Mehaffy and Nikos A. Salingaros, "Michael Mehaffy and Nikos A. Salingaros: The Architect Has No Clothes," *Guernica*, accessed September 17, 2012, http://www.guernicamag.com/blog/3176/the_architect_has_no_clothes/.

incorrect and supported, basically, by unsubstantiated gone too long without evaluation.

Salingaros has other articles equally as informative and scathing of the field of architecture but that focus on other aspects of his argument.[15] For example, in "Cognitive Dissonance and Non-adaptive Architecture" he discusses the natural tendencies of human beings and how that should directly affect, yet doesn't, the form of our buildings.[16] Salingaros' perspective, specific to the current era of architecture, is particularly helpful because it elucidates the cognitive relationship between environmental psychology and the built environment.

These articles often refer to studies, mostly done by psychologists, about users' relationship with their built environments. Studies have been rather regularly conducted since the late 1960s and consistently confirm that architects see buildings differently than users.[17] Robert Gifford, for example, finds that "architects did not merely disagree with laypersons about the aesthetic qualities of buildings, they were unable to predict how laypersons would assess buildings, even when they were explicitly asked to do so."[18]

There are a variety of lighter articles that ponder the same topics as Salingaros but less polemically. Jonathan Lehrer explores the enigmatic Building 20 on the MIT campus in an article for the New Yorker. This building "was regarded as a failure. Ventilation was poor and hallways were dim. The walls were thin, the roof leaked, and the building was broiling in the summer and freezing in the winter... Nevertheless, Building 20 quickly became a center of groundbreaking research [and has]

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[15] Nikos A. Salingaros, *A Theory of Architecture* (Solingen: Umbau-Verlag, 2006).

[16] Salingaros, "Cognitive Dissonance."

[17] Kimberly Devlin and Jack L. Nasar, "The Beauty and the Beast: Some Preliminary Comparisons of 'High' versus 'Popular' Residential Architecture and Public versus Architect Judgments of Same," *Journal of Environmental Psychology* 9, no. 2 (December 1989): 333-344; Michael Duffy, Su Bailey, Bets Beck and Donald G. Barker, "Preferences in Nursing Home Design: A Comparison of Residents, Administrators and Designers," *Environment and Behavior* 18 (1986): 246-257; Robert Glen Hershberger, "A Study of Meaning and Architecture," University of Pennsylvania, 1969; Jack L Nasar, "Symbolic Meanings of House Styles," *Environment and Behavior* 21, no. 3 (1989): 235-257; Arthur E. Stamps III, "Comparing Preferences of Neighbors and a Neighborhood Design Review Board," *Environment and Behavior* 23, no. 5 (September 1991): 618-29; Jacqueline C. Vischer and Clare Cooper Marcus, "Evaluating Evaluation: Analysis of a Housing Design Awards Program," *Places* 3 (1986): 66-85.

[18] Robert Gifford, Donald W. Hine, Werner Muller-Clemm and Kelly T. Shaw, "Why Architects and Laypersons Judge Buildings Differently," *Journal of Architectural and Planning Research* 19, no. 2 (Summer 2002): 131-148.

become a legend of innovation, widely regarded as one of the most creative spaces in the world."[19] Paul Goldberger, architectural writer and critic, also commenting through the *New Yorker*, says "There is perhaps a lurking irony in the fact that scientists, with all their love of hard data and sure proofs, are eager to let architects—an unempirical bunch as one could hope to meet—shape a new kind of work environment for them."[20] Articles like this, while not directly confronting the issue of designer interests versus user interests, shed interesting light on the question.

Another source of articles is Daniel Friedman, the Dean of the College of the Built Environment at the University of Washington.[21] Friedman is interested in the contrast between popular art and culturally high art. Exploring this tension can inform the discussion of architects' aesthetic educations versus the aesthetic tendencies of the typical user. (Devlin and Nasar conducted an interesting study on this same contrast, as specifically applied to architecture: "The Beauty and the Beast: Some Preliminary Comparisons of 'High' versus 'Popular' Residential Architecture and Public versus Architect Judgments of Same."[22])

The last subtopic under the category of tension between designer and user is a variety of literature expressing dissatisfaction with professional designers and calling for independence from perceived elitist influences. One compelling built example of this sentiment is the Yale Art and Architecture Building, designed by Paul Rudolph and completed in 1963. It was almost universally acclaimed by architects and critics, yet reviled by its users—both students and faculty. (The building suffered a terrible, and terribly suspicious, fire in 1969.) This conflict was so interesting to C.

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[19] Jonah Lehrer, "Groupthink: The Brainstorming Myth," *New Yorker*, January 30, 2012.

[20] Paul Goldberger, "Laboratory Conditions: Architects Reimagine the Science Building," *New Yorker*, September 19, 2011, 88-89.

[21] Daniel S. Friedman, "City in Five Acts: Interpreting Urban Experience," Provost Distinguished Lectures podcast video, University of Washington, May 13, 2010, http://itunes.apple.com/gb/itunes-u/provost-distinguished-lectures/id431502528; Daniel S. Friedman, "Daniel S. Friedman on the Future of the Profession," Interview with William Richards, *Architect*, January 2011, http://www.architectmagazine.com/architects/daniel-s-friedman-on-the-future-of-the-profession.aspx; Daniel S. Friedman, Joyce M. Noe and Norman Strong, *Cranbrook 07: Integrated Practice and the Twenty-First Century Curriculum*, Bloomfield Hills, MI: The American Institute of Architects and Association of Collegiate Schools of Architecture, 2008, 2007 ACSA Teachers Seminar report.

[22] Kimberly Devlin and Jack L. Nasar, "The Beauty and the Beast: Some Preliminary Comparisons of 'High' versus 'Popular' Residential Architecture and Public versus Architect Judgments of Same," *Journal of Environmental Psychology* 9, no. 2 (December 1989): 333-344.

Ray Smith, an architect, critic and teacher, he wrote an entire book on it.[23] Criticisms of the various spaces were many, but artist Chuck Close, a student at the time, sums them up thusly: "no light, no space, no privacy, no air."[24] Art Chairman Jack Tworkov puts it this way: "Nobody I ever met said that building functioned."[25] One of the main issues was the entry. Rudolph's discussion of the space's failure is somewhat telling of the entire process for him: "I wanted it to be secretive with coves out of the way and an unfolding quality that you didn't grasp all at once. It wasn't my intention to be confusing, but apparently it is for many people."[26] From this statement, the original design intent is clear, as is the resulting user behavior and the disconnect between the two.

In the conclusion to his book, Smith writes "It was a pride of architecture to feel that any architect who gave 6 months careful thought to a functional activity could redesign something brand new that would supplant, improve upon, better the functional tradition of 40 centuries, or of a tradition built up over 4 1/2 billion years by biological evolution."[27] While it seems unfair to criticize Rudolph for trying something new—new things are risky and it must be accepted that they may fail—the condemnation of architectural arrogance is legitimate.

There are other, lesser examples of this type of criticism. The Portland Building, designed by Michael Graves in Portland, Oregon, has generated a lot of positive critical feedback and popular dissatisfaction. It's been called "one of the most hated buildings in America."[28] Paul Goldberger, describes it thusly, "[The Portland Building] is more significant for what it did than how well it does it. It had a profound effect on American architecture and brought a return to classicism that brought us better buildings."[29] Did it really bring us better buildings? Better buildings for Paul Goldberger and his ilk to discuss? Or actually better buildings for the people who are in and out of them every day? Regardless, this specific

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[23] C. Ray Smith, "The Biography of a Building: Paul Rudolph's Art and Architecture Building at Yale," Unpublished manuscript, 1981, PDF of annotated typescript draft.

[24] Smith, "Biography," 11-13.

[25] Smith, "Biography," 11-6.

[26] Smith, "Biography," 11-31.

[27] Smith, "Biography," 21-4.

[28] Bunny Wong, "The World's Ugliest Buildings," *Travel + Leisure*, October 2009, accessed March 11, 2013, http://www.travelandleisure.com/articles/the-worlds-ugliest-buildings/1.

[29] Rebecca Morris, "30 Years of Planning Produce City for '90s," *The Oregonian (Portland)*, February 19, 1990.

building, despite its explicit aims to be "expressive of the humanity of the individuals who will use it,"[30] completely failed to meet its users needs.

Most of the other types of books in this category fall along the lines of *Architecture Without Architects*, by Bernard Rudofsky,[31] and both a book and a BBC documentary of the name *How Buildings Learn* by *Whole Earth Catalog* editor Stewart Brand.[32] Although the attitude of these writings can be overtly political the pieces do offer compelling points and are generally persuasive.

Architecture Without Architects is the published text of an exhibition of informal, vernacular or non-pedigreed architecture originally shown at The Museum of Modern Art in New York City in 1964-5. Rudofsky describes part of his impetus to compile these specimens thusly:

> *Part of our troubles results from the tendency to ascribe to architects—or, for that matter, to all specialists—exceptional insight into problems of living when, in truth, most of them are concerned with problems of business and prestige. Besides, the art of living is neither taught nor encouraged in this country. We look at it as a from of debauch, little aware that its tenets are frugality, cleanliness, and a general respect for creation, not to mention Creation.[33]*

The collection comprises examples, from all over the world, of low-tech, user-built structures that meet the needs of the user and the demands of the landscape perfectly.

Stewart Brand, in his book and BBC special, specifically looks at buildings which any design-educated individual would deem an eyesore. He asks why buildings are not allowed to grow and develop with their changing environment. He paraphrases Lewis Mumford: If form follows function, what happens when function changes? Brand argues that "age plus adaptability is what makes a building come to be loved"[34] and that the lack of flexibility in contemporary buildings and lack of ability for users

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[30] Brown, "Portland Cries Tilt."

[31] Bernard Rudofsky, *Architecture without Architects: A Short Introduction to Non-Pedigreed Architecture* (Albuquerque: University of New Mexico, 1964).

[32] Stewart Brand, *How Buildings Learn: What Happens after They're Built* (New York: Viking, 1994); *How Buildings Learn,* three hour, six-part series, first broadcast in 1997 by BBC, directed by James Muncie and written by Stewart Brand.

[33] Rudofsky, *Architecture Without Architects*, 5.

[34] Brand, *How Buildings Learn*, 23.

to shape and change their own spaces is a serious threat to community happiness and health.[35] In the way he supports "low road" architecture and "ugly" function over "beauty," he is making an early argument for the slum cities that are thriving and demanding study these days.

Contrastingly, of course there are examples of synchronous designer-user relationships, but these are special and rare. The style of the designer matters a great deal—Louis I. Kahn, a critical icon of the last century, thought the architect should know better than the user, even when the user was a monk who presumably had plenty of time to spend considering his needs.[36] On the other end of the spectrum, there is Samuel Mockbee, creator of the Rural Studio at Auburn University, who pioneered a new method of user-focused design in architecture school

Case Studies

The most authoritative source on case studies is Case Study Research: Design and Methods, by Robert K. Yin, which has been relied on rather heavily for guidelines on the design and conduct of the research.[37] Yin points out that this method has been misunderstood but proper technique can eliminate these misunderstandings. Most other texts describe case study research as the collection and analysis of examples, or something similar. In any case, the method is usually considered to be a small or preliminary part of other methods and rarely acknowledged as a strategy in its own right. This text substantiates the conviction of a subset of scholars that case study research is a valuable independent strategy. It is also more comprehensive than other case study-focused texts in that it covers the entire research process, from data collection and fieldwork through analysis and reporting, which has been helpful to this investigation.

Yin's description of "representative" and "typical" single case studies applies here: "The lessons learned from these cases are assumed to be informative about the experiences of the average person or institution."[38]

Post-Occupancy Evaluations

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[35] Brand, *How Buildings Learn*, 60.

[36] Louis I. Kahn and Dung Ngo, *Louis I. Kahn: Conversations with Students* (Houston, TX: Architecture at Rice Publications, 1998), 34.

[37] Yin, *Case Study*.

[38] Yin, *Case Study,* 41.

The conventional method of assessing how users are getting along in a building has been the post-occupancy evaluation (POE). Typically, this research is conducted by teams of a variety of social scientists. In all of the evaluations studied for this project, architects (of any kind) were rarely included in these teams and the designer of the project being evaluated was never involved in any way.

However conventional, these evaluations are decidedly not standard procedure. One of the earlier resources for this concern, *Techniques of Evaluation for Designers* by Henry Sanoff, is basically a call to arms for designers to begin to understand how their buildings actually hold up to their hopes and claims.[39] This book is from 1968 and yet there is no change in the way architects check on their work. The buildings that most often benefit from this research are usually large government-funded projects, where there is an opportunity to build the same type and style of building elsewhere so the specific feedback provided by a POE would be directly applicable.

Post-occupancy evaluation guides are published through various reputable sources, including the AIA, the Higher Education Funding Council for England and the National Academy Press.[40] Each includes various techniques of evaluation but it seems that the process is very far from standardized and depends almost entirely on the specific information the research designer wants to learn.

Robert W. Marans, an environmental design researcher and professor of architecture and urban planning at the University of Michigan in Ann Arbor, is a bit of an authority on post-occupancy evaluations. He has spent his career conducting primary research (unique in architecture) in the form of both socio-cultural and physical performance evaluations of many different types of buildings and has published several informative books on the subject. For this project, *Evaluating Built Environments*—a carefully compiled log of the research associated with evaluating one specific building, the Federal Building in Ann Arbor—is the most

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[39] Henry Sanoff, *Techniques of Evaluation for Designers* (Raleigh, NC: School of Design, North Carolina State University, 1968).

[40] Alastair Blyth, Anthony Gilby and Mel Barlex, "Guide to Post-occupancy Evaluation," (paper published online, Higher Education Funding Council for England, 2006), http://www.smg.ac.uk/documents/POEBrochureFinal06.pdf; *Learning from Our Buildings: A State-of-the-Practice Summary of Post-Occupancy Evaluation,* Washington, DC: National Academy Press, 2001.

[41] Robert W. Marans and Kent F. Spreckelmeyer, *Evaluating Built Environments: A Behavioral Approach* (Ann Arbor: The University of Michigan, 1981).

pertinent.[41] Formulation of the questions in the survey was influenced by this work.

Wolfgang Preiser, et al, have published a wonderfully illustrated guide with clear, accessible graphics to explain the data and the data-gathering techniques of POEs.[42] This book is refreshingly different from the dry, rote relation of tactics and results typical of most published results.

The serial publication *Environment & Behavior* is an extremely helpful resource, and a number of issues are relevant in their entirety.[43] One of the more compelling and unique articles found here is one by Janet E. Reizenstein from the December 1980 issue, titled "The Importance of Presentation Format," which specifically refers to the need for the data from POEs to be organized more accessibly.[44] If more data is formulated into diagrams, for example, people (especially visual creatures like architects) might more easily see the value in the research. This concept recalls the ideas in the designer/user tension resources (although the architects seem to be on the laymen's side of things in this scenario). This article is also why the Preiser text is a valuable complement to this review.

Environmental Psychology

Environmental psychology is a relatively new field but there are quite a few published works within the genre. Most sources describe an interdisciplinary effort, and many also begin with the physical requirements that humans have for a space they will occupy—indeed entire books focus only on the physical. *Environmental Psychology in Building Design* by John Brebner, for example, recommends lighting systems through a discussion of the structure of the eye.[45] This book covers not only the sizes and abilities of human elements but also the patterns of human psychology, like circadian rhythms, and how those patterns physically express themselves in the human senses and one's working ability. (It is one of the few sources to cover sense of smell and

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[42] Wolfgang F. E. Preiser, Harvey Z. Rabinowitz and Edward T. White, *Post-occupancy Evaluation* (New York: Van Nostrand Reinhold, 1988).

[43] Janet E. Reizenstein and Craig M. Zimring, eds, "Evaluating Occupied Environments," Special Issue, *Environment and Behavior* 12, no. 4 (December 1980).

[44] Reizenstein, "Occupied Environments," 551-558.

[45] John Brebner, *Environmental Psychology in Building Design* (London: Applied Science Publishers Ltd, 1982).

the built environment.) Further developing the idea of patterns, there is a discussion on the difficulty of reprogramming human patterns. Once a person has information organized in their brain, it's extremely difficult to re-train their brain to understand the information in a different way. All of Brebner's examples are supported with empirically researched data and case studies.

A collection of articles from a conference, *Psychology and the Built Environment*, collected by David Canter and Terence Lee, expands on the difficulty of pattern-breaking.[46] Each article is a distinct relation of specific empirical studies. One study in particular evaluated architects and their ability to design for others, with the surprising conclusion that most are incapable of it! It is interesting to recall here what Brebner pointed out about it being extremely difficult, if not impossible, for people to relearn patterns that they are unused to. These architects admitted designing only for themselves and being unable to consider living patterns that were not their own.[47]

David Canter is a psychologist specializing in the study of people, buildings and behavior. He has published many books over the course of his career but *The Psychology of Place* is especially relevant here. This book reiterates the subjectivity of the idea of place, especially when recounting experiments involving people of all ages drawing maps from memory, or recounting their space instinctively.[48] Canter concludes with the idea that the ideas and "senses" of place in people might operate in patterns similar to other methods of comprehension and if we could figure those patterns it could be extremely informative.

In 1968, when the field of environmental psychology was just budding into existence, a book was written called *Architectural Environment and Our Mental Health*, by Clifford B. Moller.[49] Moller postulates that any building or space can only be thought of by how people perceive it—which supports the thought that architecture is nothing without its use. A building, or space, has no reality but in people's perceptions—in this way space is relative, much like truth. Moller also says structured space is not a solution but should be viewed as an agent rather than as an end-

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[46] David Canter and Terence Lee, eds, *Psychology and the Built Environment* (New York: Halsted Press, 1974).

[47] But they can't even design for themselves! Just as Pallasmaa described earlier (and as this project will explore later).

[48] David Canter, *The Psychology of Place* (London: The Architectural Press Ltd, 1977).

[49] Clifford B. Moller, *Architectural Environment and Our Mental Health* (New York: Horizon Press, 1968).

product, a view that is echoed in later publications. What changes in later publications, however, is Moller's idea of perception and the fact that environmental psychology should be based on it.

A much more recent work (published in 1995), *Environmental Psychology: A Psycho-Social Introduction*, by Mirilia Bonnes and Gianfranco Secchiaroli, takes Moller's ideas and expands them.[50] Bonnes and Secchiaroli describe the field as moving away from the perception idea towards a social psychology method. However, they agree with Moller in that they assert that the research itself should be interested not in end-game outputs but in the process—for example, research should be done on how one thinks and not just what thoughts occur. This book again stresses the interdisciplinary nature of environmental psychology, gives a brief history of the field's formulation and covers the key concepts and major topics currently being researched.

The most valuable resource, in terms of this project, is the book *Environmental Psychology for Design*, by David Alan Kopec.[51] The book gives clear examples of the different types of tools environmental psychologists use to evaluate different questions and situations. It is these tools this project would like to blend with the typical process of the post-occupancy evaluation to generate a more informative and modern assessment of a building. The methods in this book informed not only the formulation of the survey, but also the qualitative tactics employed in the interviews.

Literature Review Conclusions

There is a disconnect. It is apparent that designers have been trained to think and see differently than laymen. In some cases, architects do think about the issue of usefulness but don't address this overall disconnect. There is no evidence of any investigation into this divide. It is not clear where or when this disconnect developed.

Regardless of the greater disconnect, designers do not evaluate their own designs and or the users after construction, even though tools to collect data like this exist. That being said, though tools to collect data like this exist, they have yet to be organized into a research design applied specifically to architecture and behavior. Other fields (rarely architects)

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[50] Mirilia Bonnes and Gianfranco Secchiaroli, *Environmental Psychology: A Psycho-Social Introduction* (London: Sage, 1995).

[51] David Alan Kopec, *Environmental Psychology for Design* (New York: Fairchild, 2006).

conduct post-occupancy evaluations but these mainly focus on the performance of building systems or user cognition not behavior.

Roots of the Disconnect

A person is born a user and becomes, through the course of a lifetime, a designer. A person is not born with an education in design, it grows or is engendered. A primary suspect for the root of the disconnect, therefore, would be architecture school, the place where most users, in contemporary times, are formed into designers.

On a larger time scale, somewhere in history humans began to develop specializations and the architect was created as a profession. Hence, another point in time to analyze: the development of architecture as a profession.

Initially, architects became architects by doing: the discipline was a trade passed on from master to apprentice. The learning environment was rich with context. At some critical juncture in history, the discipline moved from a hands-on apprenticeship system to a system removed from its environment with classes, teachers, ivory towers and a whole different paradigm.

Architects, to begin with, were only in charge of large, special, monolithic or sacred buildings—it wasn't until much later that they became involved in housing. Architects have developed a different understanding of beauty and usefulness than the people for whom they now design. The differences compounded once the typology became personal, like in housing.

It has been well documented that designers are disconnected from the people they design for. More than half a dozen studies conducted since the late 1960s have consistently proven architects do not understand spatial beauty the way laymen do. [52]

For example, a study by Jack L. Nasar in 1989 showed how architects were not able to predict how laypersons would feel about a design.[53] Linda Groat, in 1982, showed how designers and users evaluate buildings according to different criteria.[54]

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[52] Devlin and Nasar, "The Beauty and the Beast;" Duffy et al., "Preferences in Nursing Home Design;" Hershberger, "A Study of Meaning;" Nasar, "Symbolic Meanings;" Stamps, "Comparing Preferences;" Vischer and Cooper Marcus, "Evaluating Evaluation."

[53] Nasar, "Symbolic Meanings."

[54] Linda Groat, "Meaning in Post-modern Architecture: An Examination Using the Multiple Sorting Task," *Journal of Environmental Psychology* 2, no. 1 (March 1982): 3-22.

Perhaps most significantly, Robert Gifford found that "architects did not merely disagree with laypersons about the aesthetic qualities of buildings, they were unable to predict how laypersons would assess buildings, even when they were explicitly asked to do so."[55]

There is a comic, *Calvin & Hobbes*, which was nationally syndicated throughout the 1990s. In the strip from 1993 shown in figure 1, Calvin's assessment of the relationship between the paintings in a museum and the drawings of a comic strip embodies a substantial amount of the issues explored by this project.

The disconnect is simply expressed. Somewhere in the development of this difference between "high" and "low" art lie the roots of the disconnect. In an earlier series (shown in figures 2 and 3), Calvin explores this disconnect more specifically.

Here Calvin not only notices a difference of opinion between himself and the "philistine on the sidewalk," but exploits that difference, explicitly acknowledging it. In art there are many factors which may lead to a disconnect between art piece (or artist) and viewer, many of which may be intentional. Except, unlike art, architecture must be used. In the words of the iconic Louis I. Kahn: "The sculptor can place square wheels on a cannon to express the futility of war [but] an architect must use round wheels."[56] Which makes any disconnect that much more threatening to the vitality of the medium.

How did this disconnect happen in architecture? It may have happened when the designer was separated from the user in the span of history. Or perhaps, in the life of any one architect, it happens when they cease to be only a user and become the designer: during their education.

Architecture Education: Separation Of Designer And User

In the beginning, people were their own designers and builders. Eventually, as civilization grew and became more complex, specializations developed and the profession of architecture was born. The first recorded architect is found in Egypt: Imhotep, in the 27th century BC. In the Western world, the profession developed during the Renaissance. Originally, architects were only in charge of monolithic

[55] Gifford, "Why Architects."

[56] Louis I. Kahn and Dung Ngo, *Louis I. Kahn: Conversations with Students* (Houston, TX: Architecture at Rice Publications, 1998), 32.

Figures 1-3 *Calvin & Hobbes* comics. (All images from: "Calvin's Snowmen," The Calvin and Hobbes Wiki, accessed December 11, 2013, http://calvinandhobbes.wikia.com/wiki/Calvin's_snowmen.)

structures for the ruling class or structures with religious functions. Over time, the profession grew to include other diverse typologies.

For a long time, the method of education for a young architect, as with many professions, was by apprenticeship. Eventually, also as with many professions, the system of education moved into the academic realm and became focused in universities.

This place where architects become architects is where the "discourse is formulated and disseminated... where students become conscious of

themselves."[57] Many have postulated that school is where the "aesthetic gap," or disconnect, occurs.[58]

The first documented evidence of a school of architecture in North America appears in 1834. It was just a drawing school, neither design theory nor, specifically, designer-user relationships were discussed—it was just a few classes on how to draw lines in an architectural way. Before this time, there had only been gentlemen dabblers, or men of means who spent some amount of their spare time with the discipline (take Thomas Jefferson, for example).[59]

Abraham Lincoln passed the Morrill Land-Grant Acts in 1862, making higher education more available to everybody and diversifying architecture from the gentlemen practitioners it once was to making it more accessible to a broader cross-section of economic classes. Now there weren't just the elite bastions of Harvard and Princeton and the like, there were schools available to the less financially endowed.

But with the greater availability of education came an increased interest in distinguishing groups from one another. This separation by discipline was further developed by the professionalization of architecture. As schools began to develop and graduates to congregate, the distinction between educated designers and laymen was strengthened by the founding of the American Institute of Architects in 1857.

By the 1860s, the style of education had become less rote and more experimental. Drafting schools gave way to official schools of architecture. The polytechnic model, which had started in Germany, was brought to the University of Illinois. This style is more scientific and more hands-on than previous pedagogical methods. Taught at Illinois, it was "diametrically opposed to the more popular French system being taught in Paris at the Ecole des Beaux Arts, a system followed at MIT and the majority of new American architecture schools created around that time."[60] The school, to this day, prides itself on "teaching principles in

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[57] Joan Ockman, *Architecture School: Three Centuries of Educating Architects in North America*, (Cambridge, MA: MIT Press, 2012).

[58] Gifford, "Why Architects." Of course, just as there are a variety of social proclivities among architects, so too is there a spectrum of user and community involvement among schools. But schools, inarguably, are agents of change according to certain paradigms, whatever those may be.

[59] Ockman, *Architecture School.*

[60] "History," Illinois School of Architecture, accessed December 1, 2013, http://www.arch.illinois.edu/welcome/history-school.

relation to applied building and design practices rather than focusing primarily on the avant garde style."[61] This includes plenty of model making and work shops where students handle full-scale materials directly.

Through the 1890s, the Ecole des Beaux Arts model remained dominant. Professionals and teachers went to Europe, visited the school in Paris and came back with a kind of religious fervor—they have been stylized as "absolute believers."[62] The pedagogical tactics of clubs, competitions and boards were popularized, but the lessons of the Ecole des Beaux-Arts also became the basis of aesthetics. This lasted through the 1930s.

By the 1930s the modern era had approached. The Bauhaus system of schooling had developed in Europe and, due to political unrest and outright war, most of the founders of that influential school fled to the United States. Where they had been on the fringe in Europe, continuously marginalized and jeopardized by politics and strict social systems, they were immediately welcomed into the most elite schools and communities upon coming to the United States. In this way, their thinking and teachings were directly and dramatically injected into the major systems of thought in the United States.

To help describe the Bauhaus movement's pedagogy, figure 4 shows a chart sketched by founder Walter Gropius elucidating the teaching system as he saw it. Notice the the tracks are explicitly split with the elite professionals on one side being supported by lesser, working class peons on the other.

In the post World War II world, industrial design was introduced. Systems thinking drove much of the education system. With the introduction of the atomic bomb, urban planning studies began to explore decentralized planning scenarios. The GI Bill brought a great influx of students with these war topics on their minds.

In the 1940s and 50s there began to be government money available. Research became a big buzzword in the schools. If there was research, it was a fundable project—the suggestion of empiricism made it more possible to get money. There was a desire to make results more

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[61] "History."

[62] Ockman, *Architecture School.*

[63] Ockman, *Architecture School.*
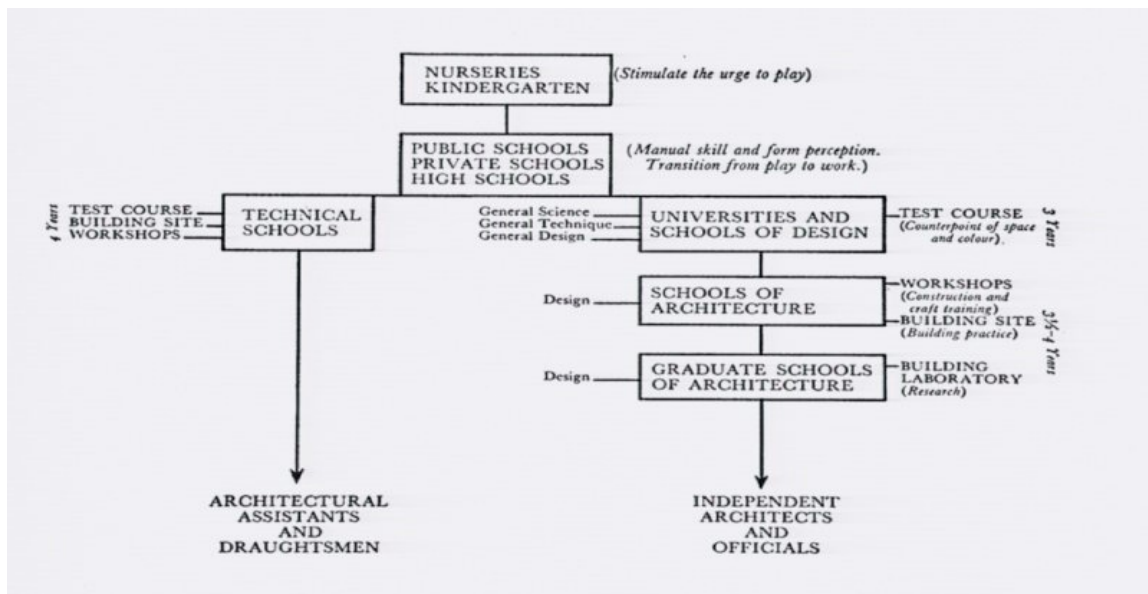
Figure 4 Walter Gropius chart. (Image from: Ockman, *Architecture School.*)

"verifiable."[63] Education became about innovation and experimentation and a "vision of the future."[64]

There was a tension between this growing phenomenon of experimentation and future studies and the embedded, entrenched traditionalists—a kind of changing of the guard had begun. By the late 1960s, Team 10 had arrived in the United States, educating the next generation. The older generation was dying off: Le Corbusier in 1966, Sigfried Gideon in 1967 and Gropius and Mies van der Rohe both in 1969. In this era, in architecture as well as society in general, there is a strong critique of the way things have been going. It's no longer just a criticism of the Beaux-Arts tradition or academicism but of modernism itself. Modernism had become the establishment.

And this "counterculture sensibility," developed in the 1960s, slowly became co-opted into the mainstream. Not only what was taught but also how it was taught was challenged. Alternative learning scenarios like experimental studio trips evolved—most notably the class that resulted in Robert Venturi and Denise Scott-Brown's *Learning from Las Vegas*.

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[64] Ockman, *Architecture School.*

All these things show how the student is the transition area between designer and user, and how that student environment has evolved and changed and grown further from the user situation over the years.

Architects And Housing: Separation In The United States

Regardless of where the disconnect occurs in the life of the designer, it is most clearly expressed in the personal application of housing. This is where users were once the most involved in their own design and construction, and this is where architects potentially have the most to learn.

In North America a certain kind of vernacular has developed, younger than most traditional typologies found around the world. Springing from European roots, already the young builders in the United States were immersed in formal architectural and styles and fashions. Examples older than the European influence are from endemic populations: the efficient Native American teepee, the supremely functional Inuit igloo, and the enduring adobe, to choose a few. Once the settlers arrived and the United States declared itself, the region's culture moved away from these site-driven, geographically linked dwellings toward a more European tradition.

What may be uniquely American is a real sense of personalization. Perhaps nowhere besides America is housing so strongly associated with independent identity. Irving Welfeld, in his book Where We Live, asks us, "Who would mistake the palace of Tony Montana, the cocaine king in Scarface, for the brownstone of the Huxtables in 'The Bill Cosby Show'?"[65] Housing, for Americans, has been, from the beginning, a deeply personal form of expression. We have had a "longstanding national tendency to view the home as an expression of self."[66] This applies not just to the public, but to a wide variety of thinkers and businessmen starting with our founding fathers—Jefferson himself believed inhabited space affected mood and social behavior, and that shaping the space was integral to shaping the new, unique American culture.[67]

The Puritans, the first arriving settlers from Europe, looked at the structures they built for themselves and lived in as tools for teaching and

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[65] Irving Welfeld, *Where We Live* (New York: Simon and Schuster, 1988) 3.

[66] Gwendolyn Wright, *Building the Dream* (New York: Pantheon Books, 1981) xvii.

[67] Wright, *Building the Dream*, 21.

as convenient guidance toward their ideally pious way of life. Specifically, this meant a plain and simple style with communal spaces and a "homogeneity of dwellings representing a shared set of values."[68] This uniformity is all the more remarkable once one considers it was an era before industrialization when every door and window had to be made by hand. These consistencies were not a matter of economy but of aesthetics.[69] The Puritan tradition and sociological understanding of housing has lasted to contemporary times in the United States.

As the decades wore on and the country grew, population-wise and economically, the classes became more divided, cities became crowded and it became difficult to provide adequate utility service.[70] The urban condition was dense and dirty. In addition (or consequently), communities and individuals spread outward and westward in a first wave of migration. This mobile population migrating to the frontier also shaped the culture.

Jefferson, "distressed about the aesthetic disarray that could result from thousands of quickly built, untutored dwellings" during this surge in rural construction, wanted to create an orderly environment that protected the values Americans held in common, yet didn't impinge on individual freedoms.[71] His belief in the power of housing to accomplish this was similar to the Puritans. The result was the development and propagandization of the "model home," which, by turns, eventually led to the development of the American tradition of pattern books starting in the 1840s.[72] These books gave a reliable guideline yet allowed a certain amount of freedom to the user, as the user still constructed the home themselves. The books were designed and advertised to capitalize on the desires of the individual. (Some offered as many as 14 variations on a design.[73]) A certain European antagonism persisted, with a desire for simple forms being seen as the remedy to the staid, elitist tastes of an older mentality. Housing models advertised themselves as "built to live in" and based on "common sense." Being generically designed for an average family, these plans for sale (including the similar kit-of-parts

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68 Wright, *Building the Dream*, 22.

69 Wright, *Building the Dream*, 32.

70 Wright, *Building the Dream*, 40.

71 Wright, *Building the Dream*, 72.

72 Wright, *Building the Dream*, 80.

73 Wright, *Building the Dream*, 83.

systems) could be seen as precursors to the modern day system of developer housing.[74]

Over the course of time, American culture began to focus even more on the individual and housing reflected it. Spaces became more delineated, private areas developed and separate bedrooms appeared. Yet morality was still central to the designs of this era—these private areas were not somewhere one went to hide away in shame, they were spaces for sincere and pious private reflection.[75]

Factories moved out of the overcrowded cities and into open, undeveloped areas. Bosses took advantage of the new location and advertised their worker's cottages as rural idylls. Again, similar to the Puritans and Jefferson, the theory of the factory owners was that a neat and orderly home space would result in more moral and honest workers.[76] "Neat and orderly" was expressed through row upon row of identical shed-like dwellings, lined up in grids. These worker grids were monitored by the factory boss who's home had a view over all. (Similarly, themes of control through/within housing and observation can also be applied to slave dwellings and their location relative "the big house.")

When the factories started moving out of the cities, the population followed. As the era of industrialization dawned, the city could not adapt fast enough to provide basic services for all the new technological gadgets—like refrigerators—and developments in servicing—like indoor plumbing.[77] Interior layouts also changed due to the gadgets. Where once, "because of noise, smells, and the activities of servants, the kitchen was always set apart from the dining room."[78] Starting from scratch in the country, it was easier to accommodate all these changes. These issues caused and fed this second, massive migration.

These industrial developments, coupled with a new feeling of social responsibility, gave rise to an interest in housing in the modern movement. Dirt, squalor, opportunity (industrialization) and education (experimentation, separation) all led up to this ultimate point: the moment

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[74] Wright, *Building the Dream*, 87.

[75] Wright, *Building the Dream*, 77.

[76] Wright, *Building the Dream*, 66.

[77] Welfeld, *Where We Live*.

[78] Ching, Francis D.K. Ching, Mark M. Jarzombek and Vikramaditya Prakash, *A Global History of Architecture,* 2 ed. (Hoboken, NJ: Wiley, 2011), 744.

modernism becomes interested in housing. At this moment the disconnect begins to be clearly expressed.

Pre-fabrication and low-cost, post-war housing was explored. For the first time, housing for the middle class, if not quite the lower class, was considered by the architectural elite. Whether this interest was successful or not remains to be seen.

By the 1960s the counterculture sensibility had taken over the country. Theory was given more credibility than it had been afforded in the past—any messages, delivered, for example, through housing, from official channels were understood to be representing a certain oppressive paradigm. Whether these messages were actually oppressive is less important than the belief. While originating from the basis of the interests of the user, this invigorated interest in and reliance on and extra power given to theory only served to distance designers from users by further cementing their disconnect.

Roots Of The Disconnect Conclusions

It's clear there's logical evidence the disconnect occurs during an architect's education. Perhaps, the wealth afforded by industrialization also caused some problems. People have become confused—too much opportunity, too many choices, can be paralyzing. Clare Cooper remarks in her book *The House as a Symbol of Self*, "the rise in the popularity of the interior decorator is in some way linked to people's inability to make decisions for themselves, since they are not sure what their 'self' really is."[79] Although identity has been strongly tied to housing for Americans, that sense of identity is being lost. This has become the duty of the contemporary architect—to help re-engender that sense of identity and belonging in the user even now that the user is no longer the designer. It's clear there's a need for the user to connect with their dwelling yet the progression of the schools of architecture have pushed the development of budding architects in an entirely different direction—away from the user.

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[79] Clare Cooper, "The House as Symbol-of-Self," HUD Challenge / U.S.Department of Housing and Urban Development 8, no. 2 (February 1977): 2-4.

Measuring the Disconnect

How might the effects of the disconnect be measured? It was mentioned in the Introduction that if one was able to find the origins of the disconnect it might help bridge the disconnect. In the Roots of the Disconnect chapter, it became clear that an expression of the disconnect could be seen in the housing of modernists in the first half the twentieth century in the United States. These houses were designed explicitly to be most advantageous for the user and yet were not. Perhaps, if there is anything to measure, it will be most noticeable these modernist houses.

Some of the more famous of these modernist houses are explored first. Next, the nature of functionalism, especially as opposed to or concerning beauty is discussed. At the opposite end of the spectrum from the highly developed theories and technology of modernism, there are dwellings built by animals. In many ways the natural homes of animals are the opposite of the glass and steel constructions of modernism, but in other ways they are quite similar. Both adhere to the same function-as-primary theory, and both can result in truly beautiful dwellings. It just happens that one typology is much more successful at achieving functionalism.

Lastly, the measuring of the disconnect by using tactics that gauge levels of efficiency, occurs through the evaluation of local cases. These cases have ben built with different amounts of theory and are working at various levels of efficiency for their users. These are the case studies researched with a primary data gathering method.

Famous Case Studies

The Roots of the Disconnect chapter concluded with the disconnect becoming most apparent in the United States at the dawn of modernism, when architects first became interested in housing on a large scale. To help this study, and to support the local case studies with more well-known, broadly applicable projects, the following is a collection of modernist projects that tackle a) the typology of housing and b) specifically aim for that housing to be more functional by intentionally breaking with unexamined architectural conventions.

It begins with Le Corbusier, an architect of the modernist era who's oft-quoted turn of phrase "a house as a machine for living" calls to mind the utmost efficiency in dwelling. One pictures the housing fitting neatly with users like perfectly complemented cogs synchronously churning out the

daily activities of life. In fact, the habitations of modernism have not been so. Modernist houses

> *prove to be some of the worst buildings in history in terms of fitness for purpose, solar overheating, heat loss, noise penetration, costs in use, and so on. It so happens that hardly any of the pioneering 'functionalist' buildings of the 20s actually remain in their original state. Those which do remain have mostly been altered to fit them for continued habitation. And whilst Le Corbusier's Maison la Roche and his Villa Savoye at Poissy have been restored to approximately their original states, it is so they could be used as museums![80]*

Corbusier's projects are not alone in this treatment: The Farnsworth House and Philip Johnson's Glass House, to name a few in the United States, have both met with similar praise and similar dysfunctional rehabilitation.

Corbusier has other examples of housing that have been admonished and modified extensively by long-time users (for example, the housing project Le Quartier de Frugés in Pessac, France). Somewhat recently a few architecturally-minded members of a younger generation have moved in and restored their houses to the originally intended states. Although they are actually living in them, and not using them as museums, they freely admit that sacrifices must be made in their daily habits in order to dwell in the space.[81] Apparently, these individuals have been so indoctrinated by whatever process created the disconnect in the first place that the sacrifice required to live in something designed by a great name is worth it to them.

Le Corbusier had almost no projects built in the United States. Here, we have Frank Lloyd Wright. Notorious for his controlling ways and sizable ego, Wright was a similarly brilliant yet dominating character. But the plans for his Broadacre City (so different from the compartmentalized layout of Chandigarh) and the social interest of his later projects differentiate him from his European colleague.

Inspired by the needs of a society in an economic downturn, Wright was

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[80] Geoffrey Broadbent, "A Plain Man's Guide to the Theory of Signs in Architecture," in *Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory, 1965-1995*, ed. Kate Nesbitt, (New York: Princeton Architectural Press, 1996), 125.

[81] Brand, *How Buildings Learn.*

"eager to show that contemporary architecture could accommodate the changed economic conditions without a loss of integrity."[82] The projects designed with this intent, the Usonian houses, were an attempt to perpetuate the "long tradition of pattern-book houses that could be constructed by local builders, without an architect,"[83] yet otherwise break with contemporary convention. Besides innovating less expensive construction materials and techniques, Wright, also somewhat radically, "fused the dining and living rooms and in some cases combined them into a single space."[84] These projects were to be emulated in idea only and were not to be explicitly copied over and over.

Similar in concept to Frank Lloyd Wright's Usonian homes, are the structures of the Case Study House project organized by *Art and Architecture* magazine. This project, and the houses that participated, are representative of the new ideas generated by modernism regarding functionality and especially, pairing modernism with a focus on housing. The magazine's emphasis was on the need for post-war housing and the program was supposed to be useable for the average American.

Many of these houses are houses built by architects for themselves. On one level, this can be seen as a variation of the user-built category. But also, these projects can inform the disconnect question by illustrating how these designers were disconnected from the user even when they themselves were the users!

This series of analyses is different than the local case studies. Since the projects were used as residences mostly in the past, it's not possible to measure user behavior in the same way it's studied for the local cases. Evidence regarding use and modifications was gathered through interpretive-historical methods and so the same amounts and types of data are not the same for each famous case study. Also, reliance will be more on pictures than on drawings for documentation for this section.

Table 1 shows the rubric for the famous case study houses. The Stahl House is Case Study House #22 and was built by architect Pierre Koenig for a family (and is where the family still lives). The Eames House is Case Study House #8 and was built by architect/designer couple Charles and Ray Eames for themselves (and is where the couple lived until their death but which is now a museum). The Schindler House was built by architect

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82 Ching et al., *A Global History*, 744.

83 Ching et al., *A Global History*, 744.

84 Ching et al., *A Global History*, 744.
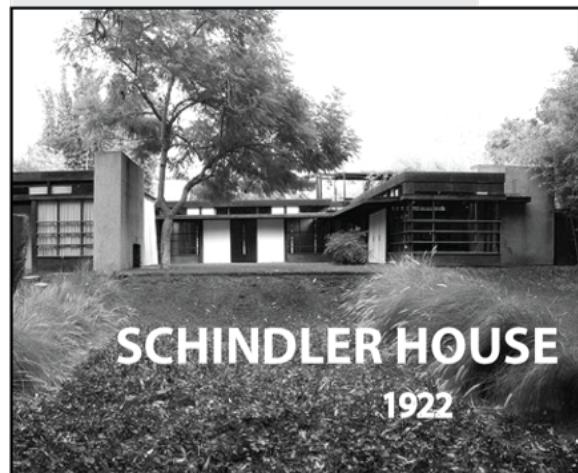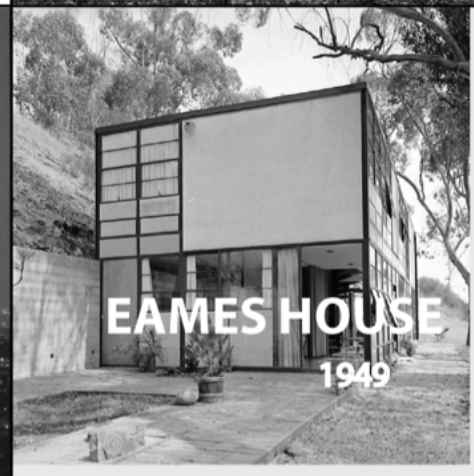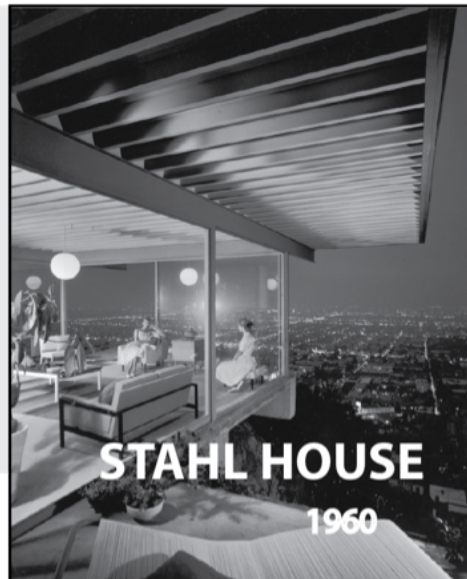
Table 1 Organization of famous cases. (Table created by author. Image sources clockwise from top right: "King's Road House Voted the Best House of All Time," Naturally Modern, accessed April 6, 2014, http://www.naturallymodern.com/wp-content/uploads/2012/05/kings-road-house_schindler_best-modern-house-of-all-time.jpg; "Eames House," Dolfpauw, accessed December 18, 2013, http://rdpauw.blogspot.com/2012/05/eames-house-1950.html; "Julius Shulman Takes On Modern Architecture," Fans in a Flashbulb, accessed December 18, 2013, http://fansinaflashbulb.wordpress.com/2010/04/30/julius-shulman/.)

Rudolf Schindler for his family and another couple as a cooperative live-work environment (and has recently been restored to original condition for use as a museum).

Figure 5 The Stahl House. (Image from: "Julius Shulman Takes On Modern Architecture," Fans in a Flashbulb, accessed December 18, 2013, http://fansinaflashbulb.wordpress.com/2010/04/30/julius-shulman/.)

Introduction

Quite a few of the most famous modernist houses were built by architects for architects. It is interesting to note, then, that this house (which provided perhaps the most iconic photograph of a modernist house) was built for and lived in by a family. And not a wealthy family seeking to patronize a famous name but by a working-class family seeking a home in which to live.

In 1954 Buck and Carlotta Stahl bought a piece of property in the Hollywood Hills. The lot was almost unbuildable—more than one architect turned them down before Pierre Koenig accepted the challenge. Buck spent the intervening years collecting scrap concrete to fill in and even out the steeper parts of the lot. In 1960 the house was built.

Physical Description

The most accurate description of the space is best left to the National Park Service Historic Register of Places application, which is as follows:

> *This house is a simple pavilion situated on a promontory in the Hollywood Hills section of Los Angeles. The one story 2,300 square foot house is L-shaped in plan and consists almost entirely of steel and glass set on a concrete pad with a rectangular swimming pool occupying the space within the L. The dwelling consists of a living-dining area, kitchen, two bedrooms and two bathrooms. In the short leg of the L are the public rooms, in the other are the sleeping area and carport. A dressing room, master bath and service area are at the juncture. The kitchen and dining-living room are entirely open and surrounded by glass with the kitchen appliances 'floating' on steel legs. A freestanding fireplace centers the living room. Deep overhangs of seven to eight feet shelter the interiors from the harshest sunlight.*
>
> *Twenty-foot wide modules allow for the large expanses of nonbearing glass walls, which face the swimming pool and the magnificent view beyond. All of the major public rooms and private spaces are oriented towards this view. Structural sections of two sizes were used in framing the house. One was a 12-inch I-beam and the other a 40-inch H-column. The columns and beams were spaced on a 20-foot grid, which allowed for 20- by 20-foot bays of uninterrupted space...*
>
> *There is an unobstructed view encompassing an angle of 240 degrees from the mountain to the Pacific Ocean. The only enclosed area, a steel decking wall, faces the street to obtain*

privacy. All other exterior walls are glass [filled with the largest lights commercially available at the time]. A concrete footbridge provides passage over the pool from the carport to the entrance.[85]

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[85] National Register of Historic Places, Case Study House #22, Los Angeles, CA, National Register #13000519.

Figure 6 Plan of the Stahl House. (Image from: Cindy Black, "Unconventional Space," Rick & Cindy Black Architects, accessed April 6, 2014, http://rickandcindy.net/unconventional_space/.)

Figure 7 Buck Stahl tending the ledge. (Image from: "Life inside a (Spectacular) Fish Bowl atop the Hollywood Hills," Modern Bungalow, accessed December 18, 2013, http://modern-bungalow.com/2011/03/20/life-inside-a-spectacular-fish-bowl-atop-the-hollywood-hills/.)

The only changes to the house have been cosmetic, and the most significant of which is probably an updating of the appliances in the kitchen.[86]

The few relatively minor concerns were dealt with one by one throughout the years:

> *The windows ... could shatter into a thousand jagged pieces if anyone were to walk—or roller skate—into one accidentally. The radiant-heated concrete floors were sleek, but they were hard and unforgiving for toddlers who fell a lot. Then there was the cantilevered living room that extended 10 feet over the hill—so dramatic, but just how did one wash all those windows or put up Christmas lights under the eaves?[87]*

That cantilevered edge was virtually impossible to reach. And so the floors were carpeted, safer glass was installed in the windows and a small wood platform was constructed for window washing and general site maintenance.[88]Also, when the children were little, intermediary protection measures (a chain link fence) were installed to keep them from rolling off the cliff. [89]

Besides the endurance of the original design, it's also notable the connection this family feels to the home. On the website maintained by the family, they describe the relationship: "Telling the story of the Stahl House one is hard pressed to draw a line between the iconic aspects of the home and the family that lived there. But that is the point, there is no line."[90]

The design of the house was a form of collaboration between the architect and the family. Buck Stahl had built a small model based on the ideas he'd generated from the time he'd spent at the site.[91] He also

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[86] National Register of Historic Places, Case Study House #22, Los Angeles, CA, National Register #13000519.

[87] Barbara Thornburg, "Koenig's Case Study House No. 22 As Home," *Los Angeles Times*, June 27, 2009, accessed November 10, 2013, http://www.latimes.com/features/home/la-hm-stahl27-2009jun27,0,3086113,full.story#axzz2mZToJJY9.

[88] Thornburg, "Koenig's."

[89] Thornburg, "Koenig's."

[90] "Stahl House Story," Stahl House, accessed November 10, 2013, http://www.stahlhouse.com/index.php?option=com_content&view=article&id=17&Itemid=114.

[91] "Stahl House Story."

"didn't believe in hallways,"[92] especially when such a fantastic view was at stake, and so insisted on not having them. This resulted in an unconventional layout: the only way to the other bedroom is through the master. Apparently one way the family coped with this is the master became a sort of second living room where much time was spent with the children and parents together as a family.[93]

About living in a glass house, son Bruce Stahl describes how the family seems to have adapted for the sake of the beauty gained:

> *You can't worry about what your neighbors think of you, because they're probably watching. I haven't really thought about it in that way, because I grew up in this house as a kid so it was really just, 'my house.' I didn't know any better. I thought everybody lived in a house like this [Laughs]. You're life in here is sort of an open book for anybody who wants to peer in. But, I've lived with it my whole life, so it doesn't bother me.[94]*

In conclusion, it seems this project wasn't the most successful in terms of being functional for housing, yet the family was satisfied because they felt a sense of participation, they were interested in keeping an art piece and were willing to sacrifice a few things toward these aims. The most functional and successful modernist element is the use of steel in housing. The cantilevering and construction on that site wouldn't have been possible without this unconventional material.

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[92] Chris Neumer, "Bruce Stahl Interview," *Stumped Magazine*, accessed November 10, 2013, http://www.stumpedmagazine.com/interviews/bruce-stahl/.

[93] Neumer, "Bruce Stahl."

[94] Neumer, "Bruce Stahl."

Figure 8 The Eames House, exterior. (Image from: "Eames House," Dolfpauw, accessed December 18, 2013, http://rdpauw.blogspot.com/2012/05/eames-house-1950.html.)

Introduction

The house was designed by Charles and Ray Eames in few months. What was built was actually the second draft for the site. Initially, the house was supposed to cantilever out over the meadow, but, being prevented from building for a few years due to war-time shortages of steel, they reconsidered. In order to preserve the site, the house was re-designed to be tucked back a bit into a hill and behind trees. Essentially an early version of the kit-of-parts system, the project was to be constructed with standard-sized members freely available from commercial fabricators and was framed by eight men in less than two days.[95]

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[95] "Classic Home 067," Architecture Week, accessed November 20, 2013, http://www.architectureweek.com/2006/0927/classic_home.html

The house was published in *Arts and Architecture* magazine in 1949 and lived in by the couple until their death almost 30 years later.

Physical Description

Again, the National Park Service Historic Register Application provides the clearest description of the project:

> *The interior of the residence features an open plan... The northern portion of the residence is divided into two stories. The lower story contains the utilitarian spaces (kitchen and dining areas), with private spaces (bedrooms and baths) above in the upper story or loft. The loft overlooks the double-height living space in the southern portion of the residence.*
>
> *Upon entering the residence through the main door on the eastern facade, a spiral staircase leading to the loft is directly ahead... The skylight located directly above the stairway filters natural light down the rectangular opening to the lower level. To the right of the entrance, a dining area along the front of the residence leads to the kitchen, which can be closed off by a folding partition... The dining and kitchen areas open onto the court to the north. Behind the kitchen, a narrow utility room separated by a corrugated fiberglass panel runs along the rear elevation.*
>
> *To the left of the main entrance, a short single-story hallway with built-in storage cabinets opens onto the double-height volume of the living room, which occupies the entire southern portion of the residence... The floor is finished with white linoleum tile, and the ceiling is exposed metal roof decking. The solid rear wall is finished with vertical wood paneling. An upper and lower row of beige pleated curtains cover the expansive double-height windows. The general openness of the living room is countered by a more intimate seating area set into a single-height alcove located under the outer edge of the loft. The seating area features a built-in L-shaped sofa and a wood shelf and upper storage cabinets. The floor in this area is carpeted.*
>
> *The upper floor contains two bedrooms, two bathrooms, and a dressing alcove. The two bedrooms occupy the loft overlooking the living room and can be closed off with three sliding canvas-covered wood partitions. A similar sliding partition separates the two bedrooms...*
>
> *A bathroom opens off of the rear bedroom... The dressing alcove, located at the rear of the loft, leads to a second, larger*

bathroom... A narrow hallway with built-in cabinetry occupies the center of the loft at the top of the staircase. Additional light comes into the upper story via the skylight above the staircase. The upper story flooring is linoleum tile throughout, with square wood panels finishing the interior walls. Upstairs windows feature horizontal sliding shades composed of fiberglass panels in wood frames.

The studio building also features an open plan. As in the residence, a portion of the studio is divided into two stories, with an upper loft overlooking a double-height space. Here, the southern portion of the studio has two levels. The ground level contains a kitchen along the east elevation, with a powder room and hallway beyond. An enclosed room situated to the rear is used for storage. The kitchen looks onto the open court to the south. The loft contains a single work space and overlooks a double-height studio area to the north. The upper story is accessed via an open steel staircase with wood treads, open risers, and simple pipe handrails. The floors are wood parquet on the first story with linoleum tile upstairs. The ceiling is exposed metal roof decking. Additional fiberglass horizontal sliding shades cover the multiple windows throughout.[96]

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[96] National Register of Historic Places, Eames House, Pacific Palisades, CA, National Register #06000978.

Diagrams
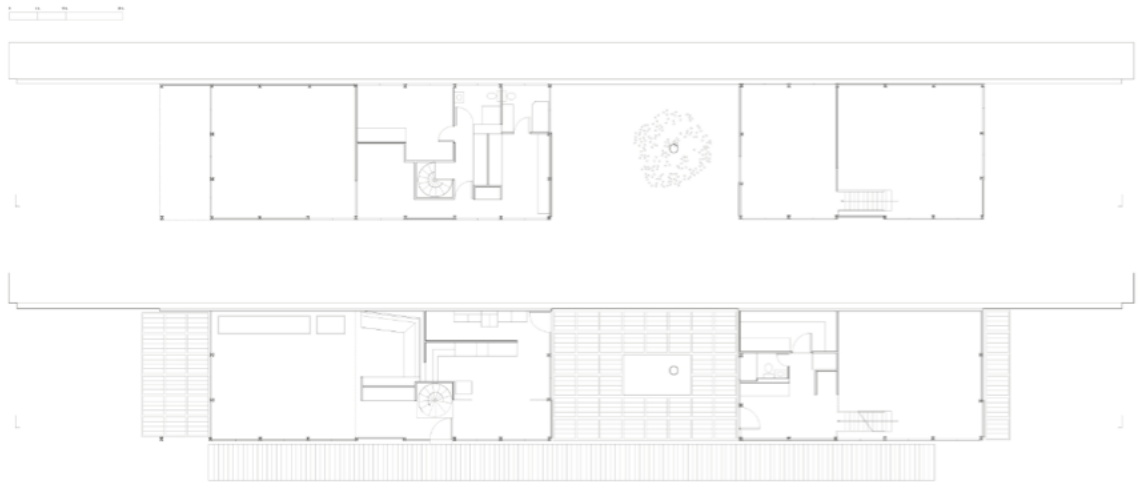
Figure 9 The Eames House plan drawings. (Image from: "The Eames House (Case Study)," Behance, accessed April 6, 2014, http://www.behance.net/gallery/The-Eames-House-(case-study)/575195.)

Figure 10 The Eames House, interior. (Image from: "The Eames House," Freud Realty Blog, accessed April 6, 2014, http://www.freudrealty.com/blog/2011/10/The-Eames-House.htm.)

This project could be considered the most successful of the Case Study Project. The self-stated aim of the project was to make acceptable housing for the average American and to test out new paradigms in housing. Both challenges were met—the novel construction technique was successful and the couple enjoyed the home for thirty years. Though it was built of steel, the house retained a warm character: "Filled with their personal belongings, the house appealed to those who otherwise considered Modernism cold and impersonal."[97] The New York Times describes it thusly: "Strikingly, the 17-foot-high living room was not a hard-edged example of modern design, but a comfortable lived-in place, rich in cultural artifacts and artful clutter." It's a type of architecture that stands back and showcases the life inside.

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[97] National Register of Historic Places, Eames House, Pacific Palisades, CA, National Register #06000978.

THE SCHINDLER HOUSE

Figure 11 The Schindler House, exterior. (Image from: "Photos: Schindler House," Moby, accessed April 7, 2014, http://www.moby.com/photos/2012-05-22/schindler-house.html)

Introduction

The Schindler House was designed by Rudolf Schindler (a protégé of Frank Lloyd Wright) after a particularly enjoyable camping trip where he felt the arrangement of the camping spaces was apt enough to build as a permanent house. The project is notable for its totally novel program: there is not a clear living room, the kitchen is communal and there are no bedrooms. The layout is for two working couples to each have space to live and to work. Each individual has a private studio to work from.[98]

Known now as one of the most iconic and earliest examples of modernist housing, the Schindler house was quite radical in its inception. While the functionality can be questioned the impact of its ideas is undeniable.

Physical Description

Here is the National Park Service Application's description:

> The house is a combination of masonry walls and light screen
> openings to private gardens and courts, with two entrances at
> corners indented and constructed of redwood. A studio

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[98] Image from: "Schindler House/ Kings Road 1921-1922," The Autobiographical House, accessed December 18, 2013, http://autobiographicalhouses.wordpress.com/2011/02/01/schindler-house/.

apartment projecting out from the west wall has an entrance oh the north.

The masonry consists of 4-ft. lift-slab concrete panels, joined together with ribbons of glass or concrete; the screen walls are of glass set in shoji-like frames of redwood, sliding canvas doors to outdoor living rooms, and a clerestory above. Two redwood sleeping porches on the second level are vertical extensions of the wood construction at the two entrances, one on the north and one on the south; the sleeping porches over-hang and protect the entrances.

The house was originally intended for two couples; the plan provided each couple with two studio rooms, an entrance hall from which was accessible the bathroom and stair to sleeping porch, and outdoor living room. A kitchen between the pairs of studios was shared by the couples.[99]

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[99] National Register of Historic Places, R.M. Schindler House, Los Angeles, CA, National Register #71000150.

Diagrams
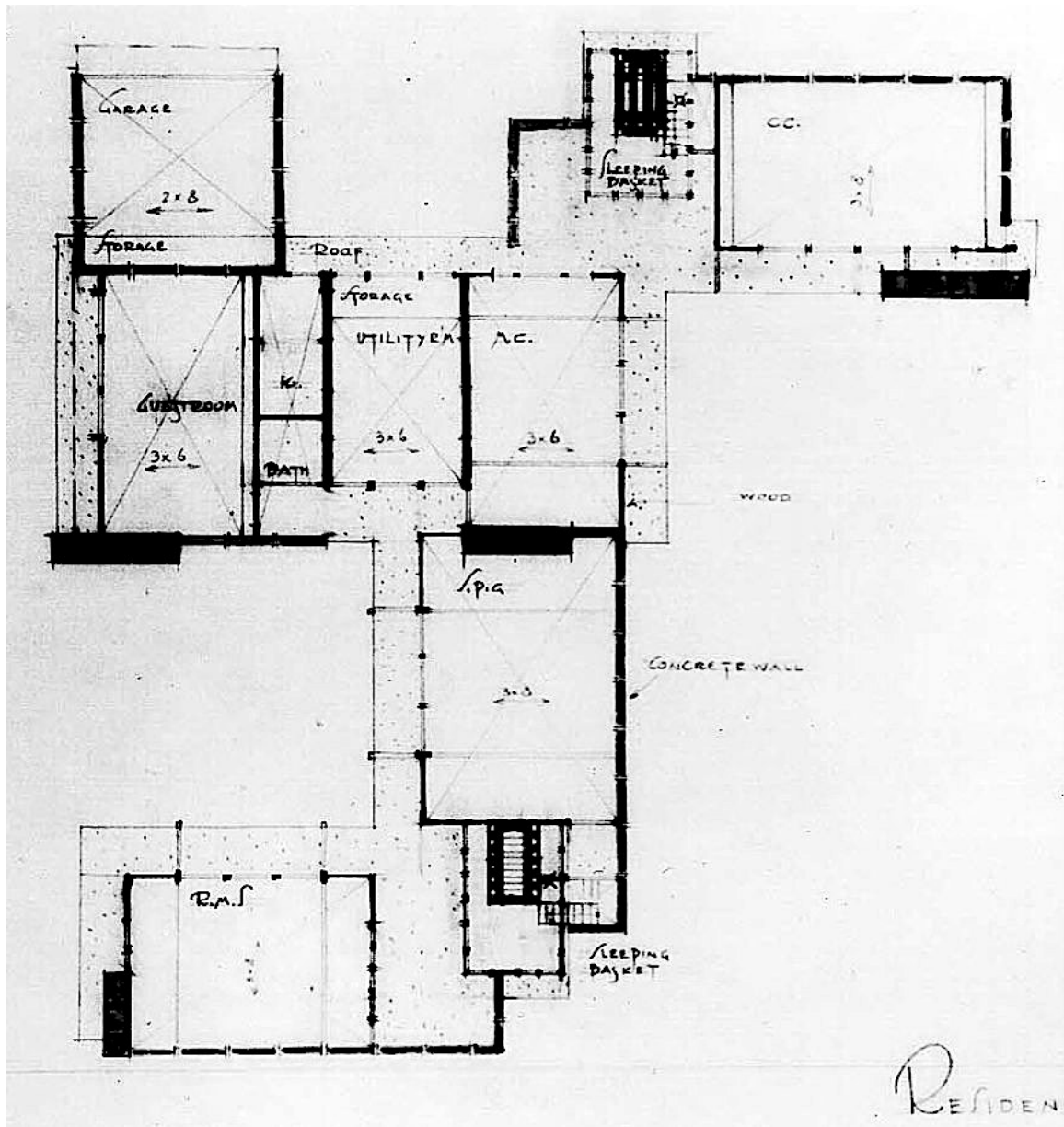
Figure 12 Original plan drawing of the Schindler House. (Image from: "The Schindler House," fosh.org, accessed December 18, 2013, http://www.fosh.org/kings_road.html.)

Figure 13 The Schindler House, interior. (Image from: "Kings Road House Voted the Best House of All Time," Naturally Modern, accessed December 18, 2013, http://www.naturallymodern.com/2012/05/14/kings-road-house-voted-the-best-houses-of-all-time-in-l-a-latimes-com/.)

Architectural critic Paul Goldberger sums it up thusly: "The house was utopian almost to the point of being unlivable."[100] Although Schindler and his wife lived there until their deaths, a number of changes had to be made to make the space inhabitable. But at each change for the sake of physical comfort, "much of the house's ideological strength [was taken away,] quashing its revolutionary energy."[101]

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[100] Paul Goldberger, "A House of the Future, Now Part of Our Past," *New York Times*, December 13, 1987, accessed December 1, 2013, http://www.nytimes.com/1987/12/13/arts/architecture-view-a-house-of-the-future-now-part-of-our-past.html?pagewanted=all&src=pm.

[101] Goldberger, "A House of the Future."

The canvas in some of the sliding doors was replaced with glass. The sleeping areas on the roof were eventually closed (as observable in fig. 13) in and a bathroom was added to one. Interior finishes were changed and amended and structural wood members were all painted.[102]

Besides the interior creature comforts, there were a few exterior changes as well. A dressing room was changed into a bedroom in 1952 and in 1965 a garage was added.[103]

Though the users sacrificed some to live in this space, it's undeniable the mark it made in the modernist movement. Even though it mostly failed at meeting the needs of its users, it did usher in a new way of thinking and challenge traditional paradigms of programming.

Perhaps this house also illustrates that architect-client relationships are so fickle they can fail even when the architect and the client are one and the same.

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[102] National Register of Historic Places, R.M. Schindler House, Los Angeles, CA, National Register #71000150.

[103] National Register of Historic Places, R.M. Schindler House, Los Angeles, CA, National Register #71000150.

Famous Case Study Conclusions

All these houses are getting old and don't work any longer (if they ever did) yet we must preserve them because they have had such high praise, may have had some historic impact or are considered beautiful. The typology has been repeated again and again beyond these enshrined original modernist experiments. Perhaps it is not these projects' fault they have generated such failures—in a sense they are victims of their own success. They were only meant to be experiments. They wanted to be functional and the mimics only want to be beautiful—they are giving the originals a bad name.

Le Corbusier took a beating in the introduction to this chapter. It must be said that some of this modernist's housing was successful: the Unité d'Habitation in Marseilles, for example, is widely regarded, by both users and designers, to be a wonderful place. Experiments sometimes fail and sometimes succeed. Truly modernist housing continues to search for the most functional design.

Exploring new methods can work and houses that are beautiful can work. Even though many modernist houses have failed on a functional level, it's possible to find some that are successful, especially if you understand and redefine the goals of the structure.

As Kahn said, the architect must use round wheels. No matter how brilliantly designed or well-laid out a building appears to be, it may not be worth much if it doesn't meet the needs of the people who are using it.

User-Builders

For all the functionalism modernist aimed for, the most functional architecture is that kind built without architects. Some of the most developed technology belongs to the animal world. To judge the works purely on an aesthetic level rather than functional, still the architecture of nature would win—a bird's nest is both perfectly functional and an ideal of beauty.

To put nature directly against modernism, they may have the same original intent (functionalism), and both may result in relatively aesthetically pleasing constructs, but they vary greatly after that. Nature's objects are meant to be primally efficient and are. Modernist constructs, typically, are not. Nature's constructs are completely of the site in which they are located. Modernist constructs are, almost by definition, not.

When a bird builds a nest, it is a beautiful thing. In nature, shelters are built purely for their efficiency, by the users themselves, yet the beauty and delight we derive from these structures is unarguable.

For thousands of years, human beings were on the same track. We built our own shelters for maximum efficiency based on what what we had around us. These structures also were beautiful—not despite their efficiency, but perhaps because of it:

> *Beauty is absolutely an inseparable part of the notion of art, but it has a complex nature. Joseph Brodsky even dares to criticize Ezra Pound for his tendency to aim directly and solely at beauty: 'The Cantos, too, left me cold, the main error was the old one: questing after beauty. For someone with such a long record of*

Figure 14-16 Nest of a swainson thrush, a tree swallow and a house finch, from left. Note the qualities of trash vernacular displayed in the house finch nest. (Images from: Sharon Beals, "Bird Nests," Sharon Beals Photographer, accessed April 7, 2014, http://sharonbeals.com/pages/nests/nests-21.html)
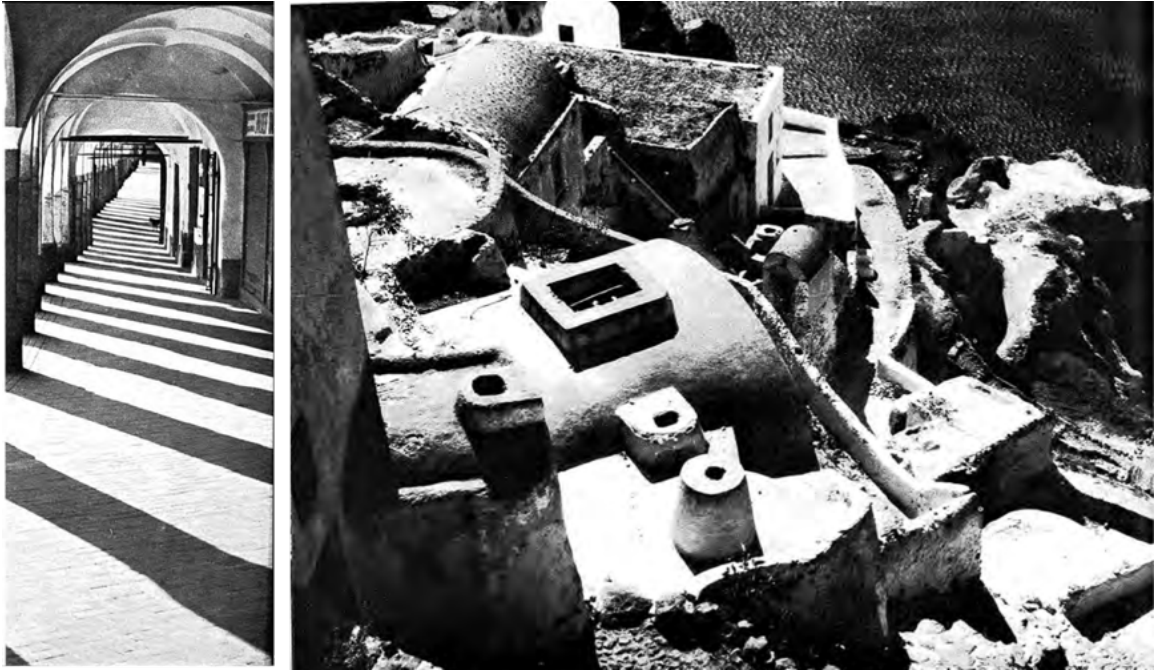
Figures 17-18 Vernacular human dwellings. (Images from: Rudofsky, *Architecture Without Architects*, 52 & 78.)

> *residence in Italy, it was odd that he hadn't realized that beauty can't be targeted, that it is always a by-product of other, often very ordinary pursuits.*[104]

Humans are also animals. Perhaps some of our most beautiful structures have been created without beauty in mind but really with only efficiency in mind, as in the art exhibit previously mentioned curated/collected by Bernard Rudofsky.

In the geography of the United States, the vernacular is expressed through the beautiful, efficient constructions of igloos, teepees, cave dwellings and adobe structures.

But all these constructions are old if not ancient. What does modern-day vernacular look like? There has been a change in the definition of the vernacular—it has been urbanized. Where once the materials were of the earth, now they are of the city. Not only are users dwelling in the city, they are dwelling of the city. These are the materials and spaces available to them, and they bring their natural spirit to these "unnatural" places and spaces.

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[104] Joseph Brodsky, *Watermark* (London: Penguin Books, 1970) 70; in Juhani Pallasmaa, "New Architectural Horizons," *Architectural Design* 77:2 (2007): 21.
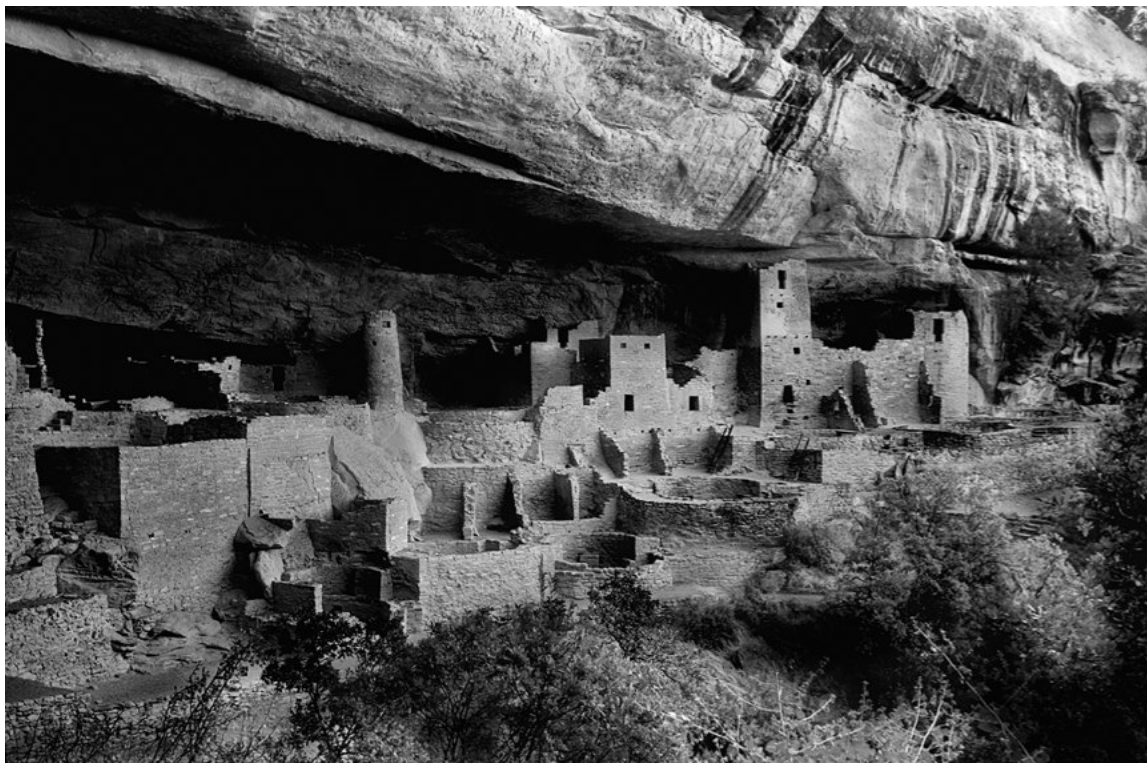
Figure 19 Mesa Verde cliff dwellings, Colorado, United States. (Image from: "Mesa Verde—My Tribute to Ansel Adams," DP Review, accessed April 7, 2014, http://www.dpreview.com/ challenges/Entry.aspx?ID=304805.)

These communities built of found urban objects "liberated from the visions of architects,"[105] or slum cities, to pick a phrase, are the housing of the future. "They're the fastest-growing human habitat today,"[106] says architect and writer Lance Hosey. The time of the planned city is over. There has been much recent academic research into this phenomenon. Hosey continues:

> [Slum cities] *have many of the earmarks of sustainable development: high density, low energy, reclaimed materials, human scale, variety, active communities. In fact, careful study of these kinds of places shows that people are so attached to them that when they can afford to leave they end up coming back because they don't want to live anywhere else.*[107]

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[105] Lance Hosey, "Reimagining the City," TED: Ideas Worth Spreading, accessed Januray 29, 2014, http:// new.livestream.com/tedx/cityenglish.

[106] Hosey, "Reimagining the City."

[107] Hosey, "Reimagining the City."

Rem Koolhaas, in an essay called "The Generic City" in his book *S,M,L,XL*, explores the indescribable growth of these cities:

> [The slum city's] *most dangerous and most exhilarating discovery is [that] planning makes no difference whatsoever. Buildings may be placed well (a tower near a metro station) or badly (whole centers miles away from any road). They flourish/perish unpredictably... The surface of the city explodes, the economy accelerates, slows down, bursts, collapses... Nobody knows where, how, since when the sewers run, the exact location of the telephone lines, what the reason was for the position of the center, where monumental axes end. All it proves is that [there is] a perpetual organic process of adjustment, standards, behavior; exceptions change with the biological intelligence of the most alert animal. In this apotheosis of multiple choice it will never be possible again to reconstruct the cause and effect. They work - that is all.[108]*

For all the study put into urban planning and city development, it is interesting to note that these unplanned, organically grown, dense, urban phenomenons simply, if inexplicably, do work. Much of the recent urban planning research has been on these cities as opposed to traditionally organized ones. Correlatively, it may be time to turn the sights of architectural research to structures grown in a similar manner.

Perhaps begun by Bernard Rudofsky with his *Architecture Without Architects*, this process of upturning has stretched from Robert Venturi's appreciation of the "messy vitality" of strip living to Rem Koolhaas' exploration of slum architecture and urban systems. The tastemaking community of the architecture world is beginning to appreciate what once was considered cheap or even worthless. And it's beginning to spread outside of purely architectural circles: photographer Iwan Baan took some beautiful pictures of the Tower of David, a squatting community which has taken over a half-built skyscraper in Venezuela, last year.[109]

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[108] Rem Koolhaas, Bruce Mau, and Jennifer Sigler, *S,M,L,XL* (New York, NY: Monacelli Press, 1998).

[109] Image from: "Tower of David," Iwan Baan | Photography, accessed December 1, 2013, http://www.iwan.com/iwan_index.php.

Figure 20 Tower of David squatter dwelling, Caracas, Venezuela. (Image from: "Tower of David,"
Iwan Baan | Photography, accessed December 1, 2013, http://www.iwan.com/iwan_index.php.)

Local Case Studies

In the local case studies, an effort was made to study people building for themselves, adapting their own spaces, as animals do in nature. If the study could be organized correctly, it might tell the culprit of the disconnect. How much the users have adapted their space to suit their needs reflects how functional the original building was. The more modifications, the more likely the culprit of the disconnect was in the nature of the building's design.

For these studies, primary research was conducted (as discussed in the Introduction). Five sites were chosen according to the rubric shown in table 2.

The "designer" category in the table is defined as someone or some group who may be licensed as an architect or architects, but who work for or within an entity not primarily concerned with architecture. The "architect" category is defined as a licensed architect working specifically as an architect. The "user" category at the bottom of the table is defined as an unlicensed, non-design educated layman. (This category could be considered a type of contemporary vernacular.) Generic, in this case, means the project was designed without a specific user in mind—it was designed for any given user. Specific, correspondingly, means a specific user was in considered when the project was developed.

Initial site visits, lasting from one to two hours, involved open-ended interviews with a qualitative emphasis and an in-depth investigation of the spaces and physical traces left within them. Surveys were left with participants to fill out and return by mail at their leisure. Examples of the survey and consent forms can be found in the Appendices.

An attempt was made to measure the disconnect through an analysis of behavior as evaluated by the level of modification that users made on their homes. The relationship between the root of the disconnect and the level of modification is explored in chart shown in figure 21.

	Generic	Specific
Designer	DG	DS
Architect	AG	AS
User		US

Table 2 Organization of local case studies.
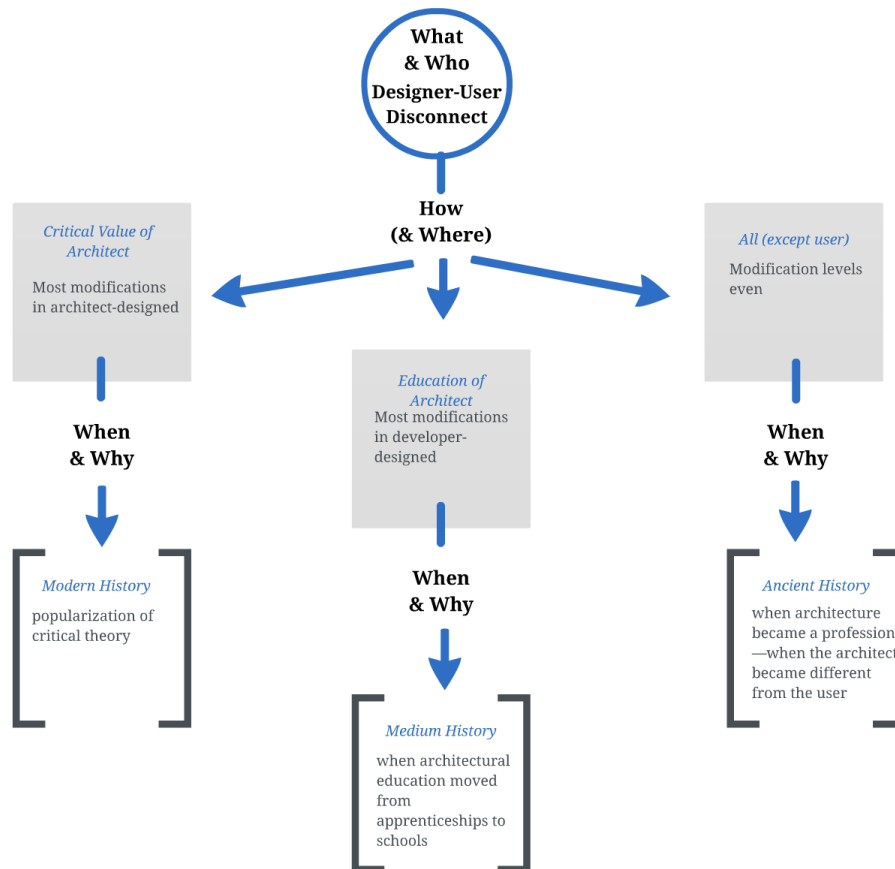
Figure 21 Possible relationships of roots of disconnect.

Depending on which type of housing generated the most modifications by users, the root of the disconnect may be able to be understood. If the most modifications are in the architect designed home, the disconnect might be rooted in the modern era, when architects became more theory-based. Since architects are encouraged more and more through school and media to experiment and innovate, they could be innovating off-track. This may be expressed through inapt designs which have to be modified to create functional conditions.

If the most modifications occurred in the developer-designed housing, the disconnect might be traced to the era when the school for designers was separated from the school for technicians. If the designers are working through schools instead of training directly under masters, in the original context of their projects, there is an added layer of separation between them and the reason for their work. This correlates to the layers which separate a designer working through a development company rather than directly with clients.

If all the modification levels are even, one must assume the disconnect would have begun back when the architect was first separated from the user, when architecture first became a profession.

As-built drawings were chosen as direct, comparable data to evaluate against the as-evaluated drawings which reflect the user modifications. User modifications were discovered through focused interviews, targeted observations and surveys.

Single-family, detached housing was chosen to be the element of evaluation for this project. The researcher admits the research would be more broad and transferable if some kind of less personal, potentially more objective commercial or public space had been studied. Unfortunately, constraints of time and manpower indicated a smaller, more manageable study was in order. In addition, housing is where the history of users building their own spaces is most rich and is potentially where architects have the most to learn. Precisely because the typology is so personal it is a challenging yet rewarding typology to study—if any solutions or indications toward solutions can be found in a study of this typology, related answers in other typologies can be more easily extracted.

Some limitations within this framework are admitted: it is a small sample size. The houses are from a broad range of eras (though an effort was made to keep them to a relatively small slice of time). Users all have different levels of "handy-ness" (though all were relatively handy). Obviously different users have different needs. As the work is not controlled in a lab but done in the rich context of the original environment, they cannot all be identical. That being said, it may have been better to study users of a more similar demographic. Still, despite these limitations, there is something worthy of study in each individual case.

As discussed in the introduction, the primary research portion of this study was conducted in the form of five case studies, collected in the form of the rubric shown in table 2.

A case study framework, supported by tactics from post-occupancy evaluations and environmental psychology, is used. A comparative table of the case studies chosen to fit each category of the rubric is shown in table 3.

All sites were visited in April of 2013. None of the users had any design education.

Category	Year Built	Designer
AS	1954	Acclaimed architect
AG	1974	Architect
DG	1979	Architects employed by developer
DS	1980	Acclaimed architect for developer
US	2000s	User

Table 3 Descriptive information for local cases.

Though all the properties are relatively old for housing, historic preservation was not a factor—all users were legally able to manipulate, change, construct or deconstruct their spaces as they wanted.

All the users were somewhat handy. They have an active interest in improving their home and engaging with their living space.

Note there has been a developer "revolution" through the 1970s where a quality product became more important. It was discovered/decided that a quality product would sell more in the long term than a low-quality, profit-maximized product.

CONTEXT

The island of Oʻahu in the state of Hawaiʻi serves as the context of this project. While the specific case study locations are in Hawaiʻi, which is arguably a very different context, it is still a part of the United States and many of the concepts are the same. The population here expects the same standard of living as the mainland. Standards of clean air and water are the same, legislation regarding property rights and land ownership are similar to other states and the weather is similar to much of the so-called "banana belt" region of the southeastern part of the country. The state is made up of small islands therefore land is a limiting factor. However, similar real estate markets are not unknown on the mainland. Highly populated urban centers such as New York (especially Manhattan) and San Francisco have similar land deficits. While the conditions of this study will not be directly replicable throughout the United States, they are similar enough to be representative.

Climactically ideal but geographically isolated with a finite amount of land, real estate opportunities are limited and expensive. This limits the number of legal user-built or co-designed structures available for study, yet the practice of modifying one's own structures or adding on a separate unit for extra rental income, quasi-legally, is widespread.

Oʻahu includes the capital and biggest city, Honolulu. The city is in the center of the south shore of the island. Most of the population of the state lives on Oʻahu and about 75% of the population of Oʻahu (just under a million people) lives within Honolulu city limits.[110] The island is about 600 square miles, just a little larger than the metropolitan area of Los Angeles.

While the island covers about the same amount of land as the metropolitan area of Los Angeles, it houses about the same number of people who live in Montana. Los Angeles has a density of about 8,000 people per square mile, the state of Montana has about seven. Oahu is somewhere in the middle with about 1,500 people per square mile.

Most of the population of Oahu is concentrated on the south side of the island in the city. Consequently, this is where most of the development is. While there are several significant towns and developments on the other coasts and inland, there are two roughly parallel mountain ranges running southeast to northwest. These cover a significant amount of land and

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[110] "Honolulu County QuickFacts," US Census Bureau, accessed March 18, 2013, http://quickfacts.census.gov/qfd/states/15/15003.html.

their slopes are too steep to settle, leaving a large portion of the island steep green jungle, which is generally state-owned park area.

ARCHITECT-SPECIFIC (MAKIKI)

This home is located an older, urban neighborhood in Honolulu. The property is at the end of a long, narrow street and is surrounded by a steep change in grade on three sides. The adjacent properties are all developed and each lot is without much area to buffer it—each lot is filled almost to the property line. Since the neighborhood is old, there are homes from all eras since the 1950s represented.

Due to the grade, the street is not straight and the lots for the homes are not laid out in a rigid pattern. Each entry is not readily apparent from the street and each house is oriented differently depending on the conditions of its specific site.

The surrounding topography is varied: there is a steep drop off to the east and the grade rises in a similarly dramatic fashion to the north and west but the approach from the south is only gently sloped.

The neighborhood, being dense, urban, and inland is warmer than the average on Oahu. However, because of the steep slopes, it is possible to catch a relatively generous wind flow. This local wind is generated by the thermal changes of the mountain slopes at the southern base of the Koʻolau range and is independent of the general northeasterly trades. This local wind is westerly.

Category:	Architect-Specific	
Layout	One story, 2 bedrooms, 1 bath	
	(One story, 3 bedrooms, 2 baths)	
Year Built		1954
	As-Built	**As-Evaluated**
Neighborhood	Urban	Urban

Table 4 Description of Architect-Specific case.

The entry is at the end of a short walk nestled between the garage and the west exterior wall of the house. Entry to the garage is on the left before the entry to the house. There is no access to the garage from the interior of the house. In 1959, the garage, originally only a roof structure, was fully enclosed.

Upon entering the house, there is a small foyer with kitchen directly across from the front door. The kitchen is a narrow slotted galley with fixtures and appliances on one side and counter space and cabinets on the other.

Beyond the kitchen, away from the entry foyer, there is a short hallway space bordered by the threshold of the kitchen and an exterior wall which is entirely glazed. Moving through the kitchen and turning left at this space brings one to the door of the addition.

The addition, made in 1973, is the most significant change to the home. It is a lot of square footage and does not particularly agree with the character of the home, but it does not significantly affect any portion of the original layout except for the exterior deck. Walking through the door to the addition puts one in the bedroom. Across the room from this door is the bathroom. The wall to the bathroom and the wall abutting the garage are paneled in wood; the other two have generous glazing or include sliding glass doors.

Returning to the entry, when one turns right when facing the kitchen there are two steps which lead to the living area. Between the living area and the kitchen there is a sort of half-functioning pass-through or half-height wall. The north exterior wall is paneled in wood on the portion closest to the kitchen and the rest is glazed. The living area and bedroom areas are bordered on the east edge by a narrow screened deck. The deck can be accessed by sliding doors at different points along that wall.

Turning right again after the steps to the living area from the entry, one enters a hallway. The first room on the left is the smaller original bedroom or office. This room shares a half-wall with the living space. There is a linen closet on the right and, moving further down the hallway, the original bathroom is on the right. At the end of the hallway is the main bedroom.

Diagrams
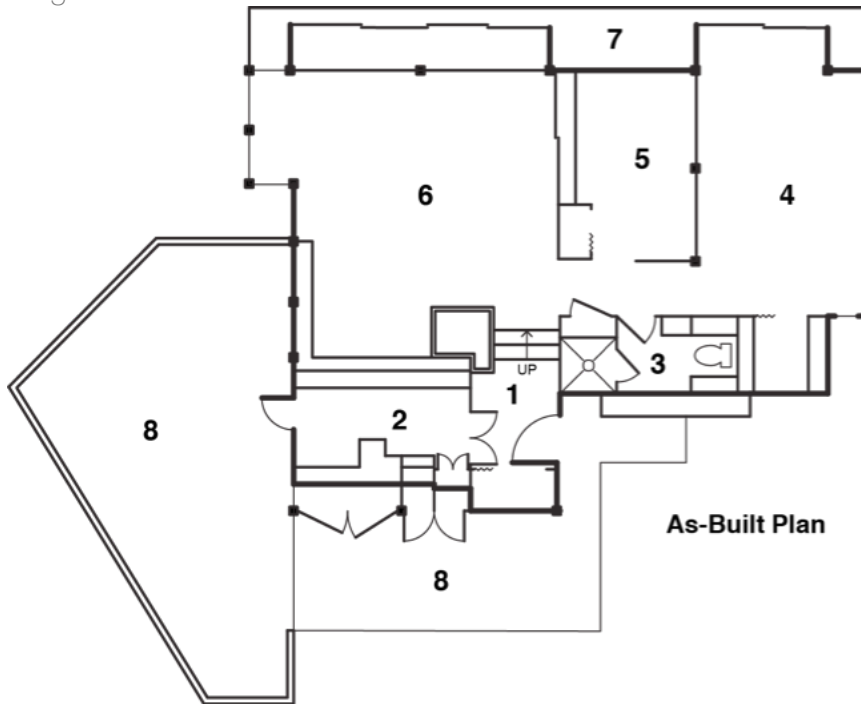
1 Entry
2 Kitchen
3 Bath
4 Bedroom
5 Den
6 Living Room
7 Deck
8 Patio

As-Built Plan
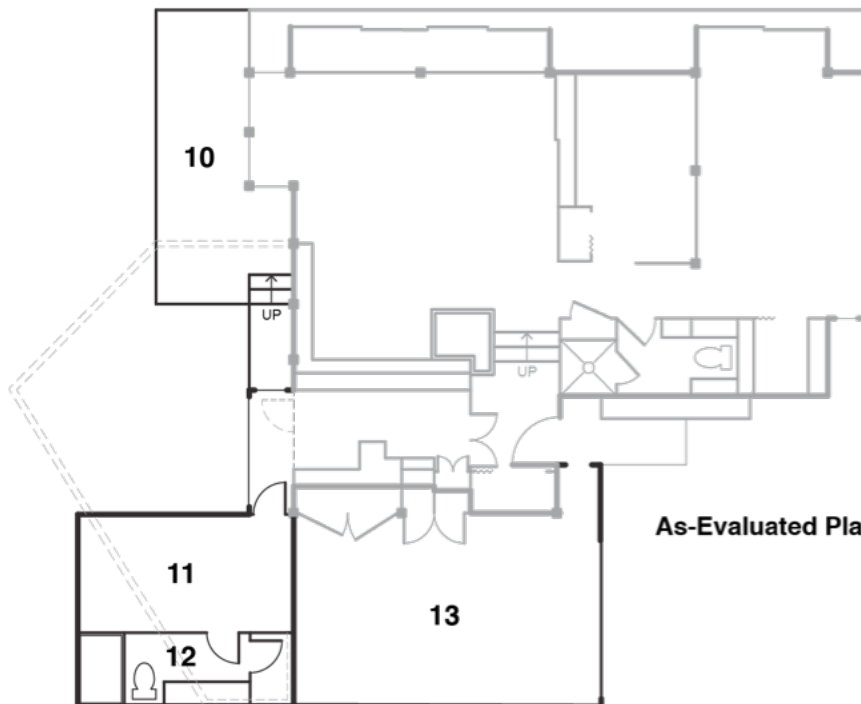
- - - Previous Form
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— Retained Form

10 Deck/Patio
11 Bedroom
12 Bath
13 Garage

As-Evaluated Plan

This home has not been occupied by a consistent user since it's construction. Different users have desired different things from the property, and so different types of modifications have been made. However, all seem to have basically respected the original intentions of the space. The current user enjoys the "wonderful feel" of the space and wishes for the house to retain its original character and is willing to make some sacrifices toward that end. The kitchen, for example, was not built for modern appliances and is not particularly suited to this user's need for workability in a kitchen. But, in order to maintain the character, the kitchen has not been changed. Similarly, all the fixtures in the bathroom and the tiling are original. Changes in lighting, however, and other less visible modernizing updates, have been made.

ARCHITECT-GENERIC (WAIMANALO)

This home is located in a small town on the windward coast of Oahu. The lot directly abuts the beach and many of the neighboring properties have been developed into multi-family vacation rentals. On these lots, the houses are large and allow very little yard space. However, there is a great variety in the neighborhood and there are also still many smaller single-family homes and a few older homes that have not been maintained well.

The surrounding topography is coastal: it is mostly flat on all sides with a gradual increase in grade toward the Koʻolau range to the northwest and away from the ocean, which is toward the southeast.

The neighborhood, being relatively sparse and coastal, is cooler than most areas of Honolulu. Because of the proximity of the Koʻolau range, the area gets more rainfall than in Honolulu. And due to the town's location on the windward side of the island, the northeastern trade winds bear directly on the property.

Category:	Architect-Generic	
Neighborhood	Waimanalo	
Layout	One story, 3 bedrooms, 2 Baths	
Year Built		1979
	As-Built	**As-Evaluated**
Neighborhood	Rural	Small Town

Table 5 Description of Architect-Generic case.

The house is raised twelve feet off the ground on wood poles. There are stairs to the main entry and to the ocean-side (makai) deck. At the landing of the stairs leading to the main entry, there are three sliding glass doors. Through this threshold, the kitchen is on the left, separated by a high counter space. Straight ahead is the main living space, which can include the bedrooms on either side or be separated from them, depending on the positions of the sliding wood panels that serve as both walls and doors. The main living area is bordered on the mauka side by the entry space and interior walls to the bathrooms and exterior glazing on the makai side. To the northeast of the living space is the first bedroom and to the southeast is the second bedroom. There is a door to the makai deck from this living space along the makai exterior wall.

Between the entry space and the main living space, there is a door to the first bathroom and laundry room. Turning the corner around the door to the bathroom and following that interior wall brings one to the entry to the main bedroom. The main bedroom space also includes a bathroom.

There have been very few changes to the house. Sometime in the 1980s the roof was replaced. Immediately after the house was built, some vents in the floor meant to opened in order to sweep debris directly out of the house had to be closed. The wind was underestimated and blew the waiting debris back into the house once the vents were opened.

Diagrams

As-Built Plan

6

4

5

4

2

3 3

4

1

UP

UP

UP

UP

UP

1 Entry
2 Kitchen
3 Bath
4 Bedroom
5 Living Room
6 Deck

0 FT   5   10   15

As-Evaluated Plan

- - - Previous Form
——— Modified Form
——— Retained Form

UP

UP

UP

UP
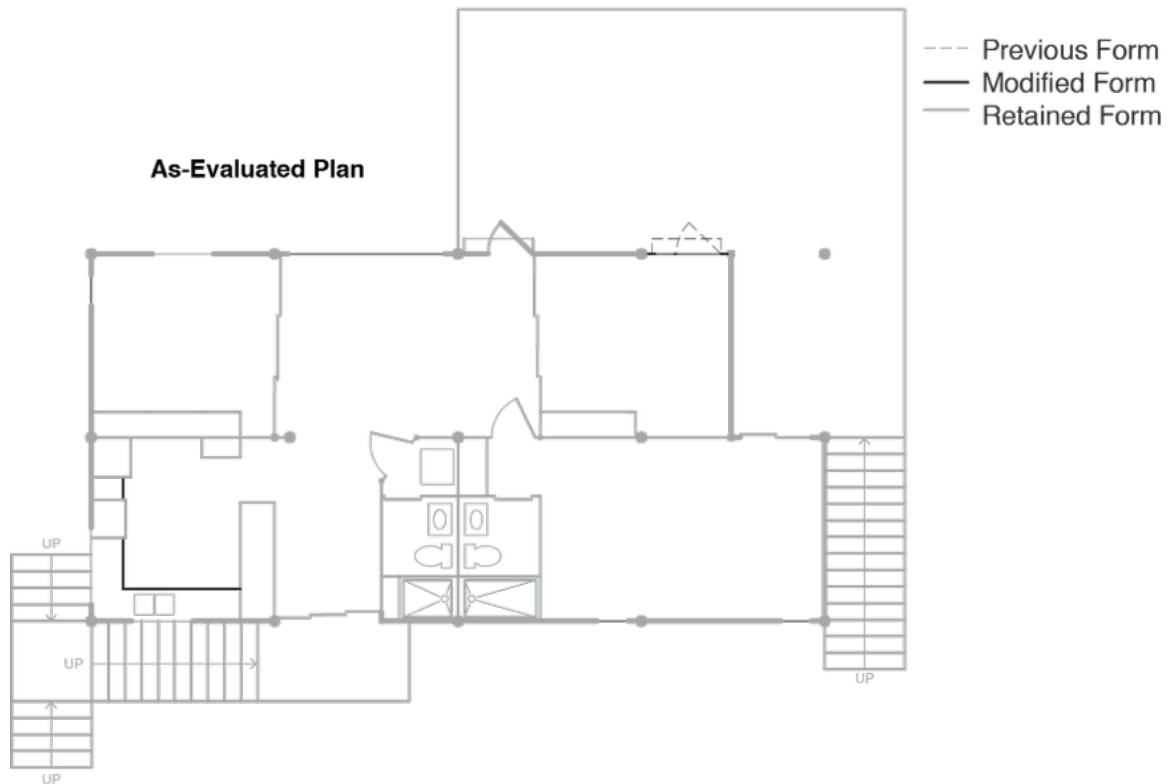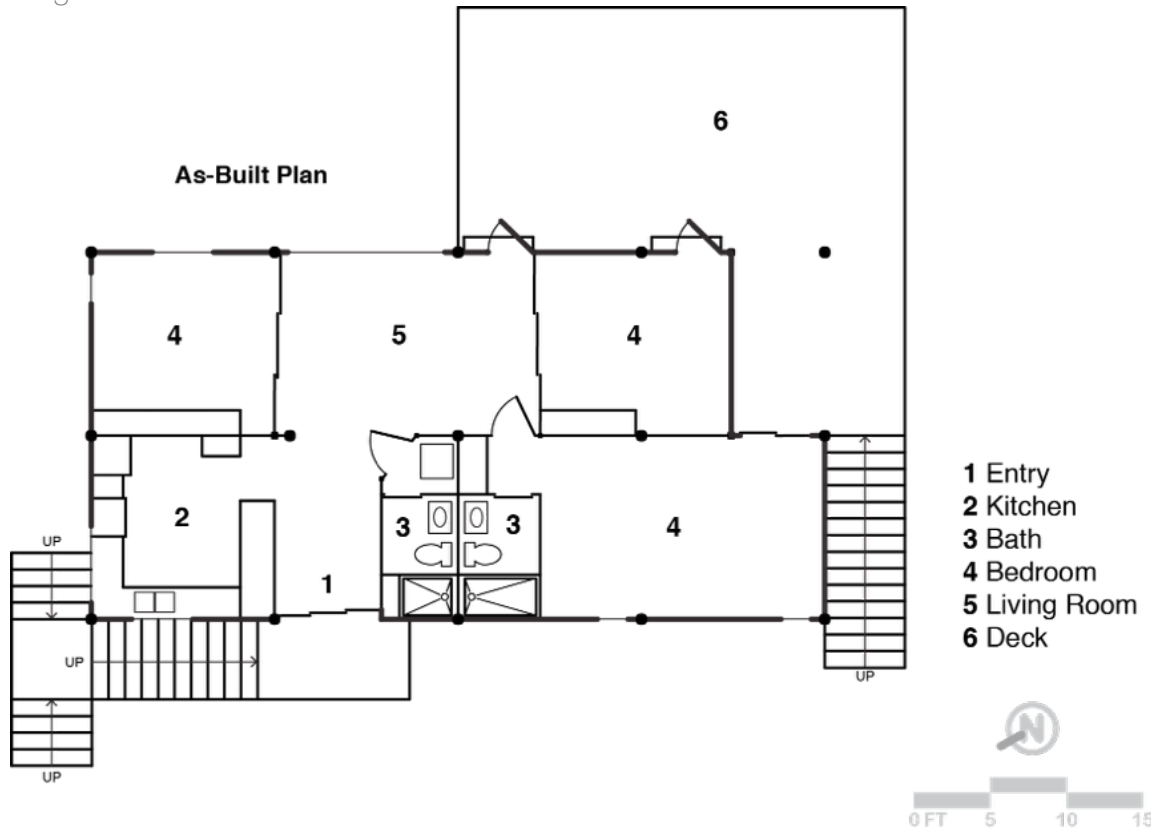
The user of this house has been continuous since its construction. The owner was involved with the community that got Waimanalo Village built and through that relationship observed the plans of the houses designed for them. This floor plan was designed to give maximum interior space with a minimum footprint. The owner appreciated the open spaces and lack of hallways and so decided to adopt the plan for her lot, only she preferred to have her house raised on poles. The owner's cultural heritage is Thai, and the raised pavilion style is what she grew up with. She drew what she wanted, which was essentially the same as what was built for Waimanalo Village but a little larger, with a few more windows, and of course raised up on poles, and she brought her sketches to a licensed architect who drafted them for the permitting process. The house was built by two young carpenters recently graduated from the University of Hawai'i.

After it was built, she recalls her Cambodian friend breaking out into jubilant song when she saw it for the first time. In this case, as evidenced by this memory and the nature of the narrative of its inception, it's apparent the user has a strong cultural, emotional connection to this house which may be a more powerful factor in than any relatively superficial behavioral needs. The house has remained almost unchanged through all its years of use and meets the needs of the user perfectly, according to the user.

There may come a time when she needs to install a ramp to the entry as both she and her friends are aging and the stairs are more and more daunting.

DEVELOPER-GENERIC (WAIPAHU)

The home was built as part of a development in Waipahu, central Oahu, organized by a real estate development company by a team of designers and architects in their employ. The house is located in a complex of similar houses. The rules about the appearance of the houses are relatively strict, so they are kept looking similar. The house is approached from a parking lot and under a trellis.

Originally, the area was undeveloped and quite rural. Now, there are several shopping complexes nearby and generally much more traffic and population. The area has grown from a rural environment to a suburban one.

The area is relatively flat with a gentle slope. The climate is warmer and tamer than climate on the coast, especially since Waipahu is toward the western side of the island which is more arid. The warmth here is generated by the natural environment (as opposed the concentration of heat that's a product of the thermal mass of concrete in the denser urban region).

Category:	Developer-Generic	
Neighborhood	Waipahu	
Layout	Two stories, 3 bedrooms, 2 Baths	
Year Built		1979
	As-Built	**As-Evaluated**
Neighborhood	Rural	Suburban
Property Value		

Table 6 Description of Developer-Generic case.

One enters the house at the base of the stairs leading up to the second story. In front is the main living space, separated from the kitchen by the kitchen island and a segment of load bearing wall acting as divider. To the left of the kitchen is a utility closet that acts as the laundry area and a table for other miscellaneous utilization (crafting, laundry organization or other household projects, for example). To the right of the kitchen, tucked under the stair, is a bathroom. Turning the corner, next to the bathroom coming back towards the entry, is an office space of a desk and cabinets

also tucked under the stair. The office space is not partitioned from the main entry/living space.

Upstairs, the private spaces branch off from a central hallway leading from the top stair landing. Directly across from the top of the stair is a linen closet, behind which is the second bathroom. This upstairs bathroom is accessed to the left of the closet as one moves down the hallway. It's possible to move through the bathroom into the galley-type closet of the master bedroom or follow the hallway around to enter the master at the other end. To the left of the door to the master are two other entries, side by side at a ninety-degree angle, before the two other bedrooms. These two bedrooms have closet spaces with sliding panel doors and which do not permit passage to other spaces as in the master.

Diagrams

As-Built Plan

1 Entry
5 Living Room
6 Yard
3 Bath
2 Kitchen
4 Bedroom
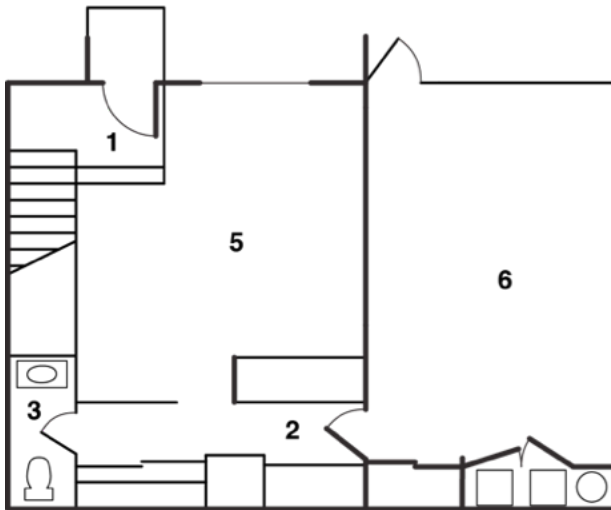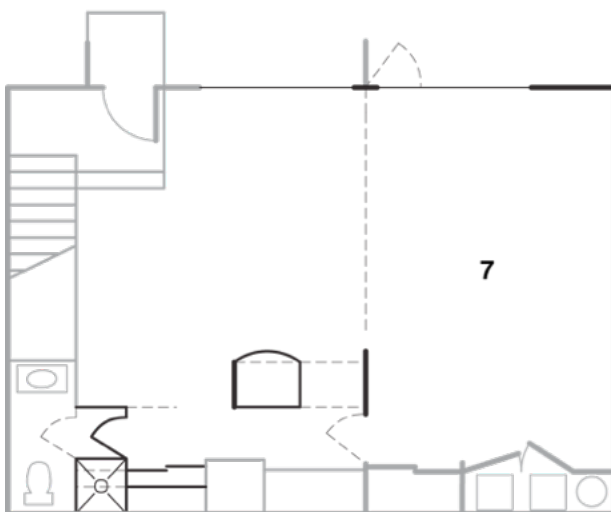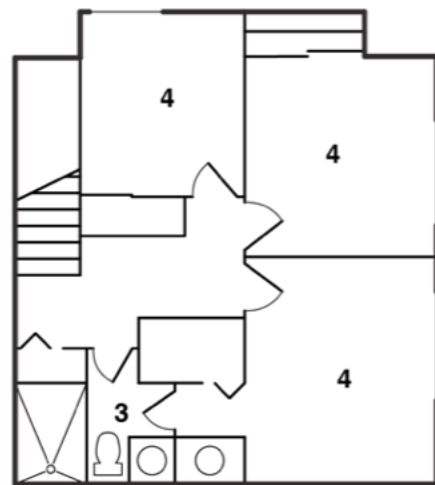
As-Evaluated Plan

7 Covered Patio

1 Entry
2 Kitchen
3 Bath
4 Bedroom
5 Living Room
6 Yard

0 FT   5   10   15
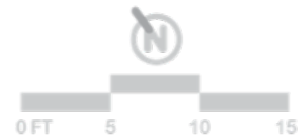
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7 Covered Patio

Analysis

The family purchased the house originally because of price. As the family grew and as the parents earned more money, the house was developed and according to their needs and ability. Some of the changes were due to a dissatisfaction with the original design, but others were due to the changing needs of a growing family.

The changes have been made continuously throughout the life of the family in a kind of nickel-and-dime fashion. Piece by piece they've managed to alter every space in the house. Most of the changes that are not seen in plan are in one of the upstairs bedrooms. There is an unusual half-height cubby that has alternately been a fort, a closet and an sleeping space for an infant, a child and a grandparent. When we spoke, that area was in transition again as the family was expecting another grandchild.

DEVELOPER-SPECIFIC (DIAMOND HEAD)

This project is a development contracted to a well-known local architect by a real estate development company. Eleven properties were developed individually on a collective site of eleven lots and common area. Each house is of a different size and shape but were designed collectively, all in the same aesthetic style with similar programs. Each design does respond somewhat to the grade and sight lines of its specific lot. At least the shape of the house (and not just the shape of the surrounding yard) changed according to the location.

This property was chosen as a sort of bridge project—not quite a development as the number of residences is small and they are designed individually but not quite an architect-designed home because there was no direct architect-client communication.

There is a steep grade in this development. The houses are arranged on the hillside and the property studied is at the bottom of the hillside directly abutting the coastline. There is a bit of wind since the site is coastal, but the weather is not as strong as it is further up the windward coast. The climate is in between that of the windward coast and the dense urban center.

Category:	Developer-Specific	
Neighborhood	Diamond Head	
Layout	Two stories, 3 bedrooms, 3 baths	
Year Built		1980
	As-Built	**As-Evaluated**
Neighborhood	Suburban	Urban

Table 7 Description of Developer-Specific case.

The house is approached from an urban arterial. The community is gated and one must be buzzed in. Winding down a narrow, neatly paved driveway, the studied house is at the bottom nearest the coast. A small, paved turn-around separates the main house from a much smaller rectangular structure originally constructed as a painters studio but which the current owner uses as an office. To the left of the entry there are stairs that lead to a garage. Above the garage, is the master bedroom.

Upon entering the space, it's clear the other spaces branch off one broad

hallway arranged perpendicularly to the coastline. To the left off this space is are two large living areas. To the right, after the stairs to the bedroom, is a dining room and then a media room which separates the kitchen from the hallway. The kitchen is the space closest to the makai exterior.

The exterior space on the makai side of the property is heavily utilized. A covered lanai off the living space to the left leads around to an open space where a barbecue station sits near the closest direct access to the kitchen. A hot tub is recessed into the paving. The ocean is about ten yards away across large lava rocks.

Diagrams
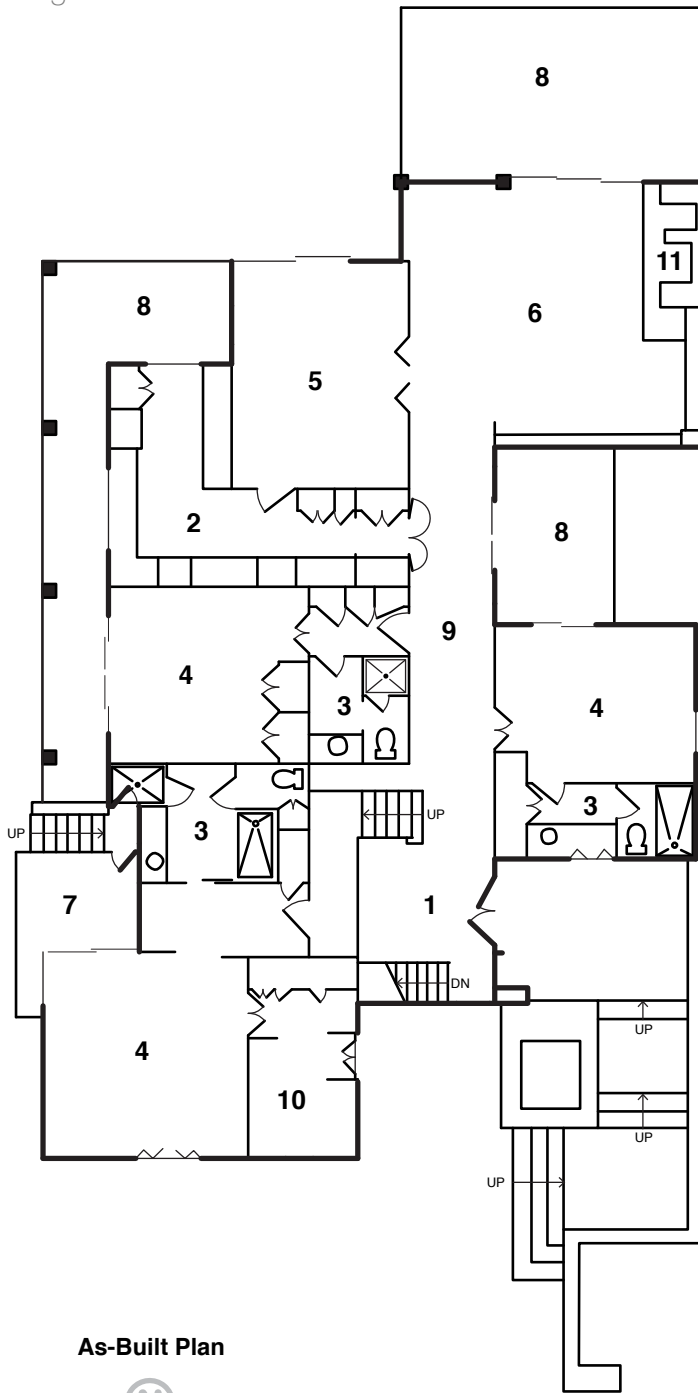
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UP

UP

7

1

4

DN

10

UP

UP

UP

1 Entry
2 Kitchen
3 Bath
4 Bedroom
5 Dining Room
6 Living Room
7 Deck
8 Patio
9 Gallery
10 Dressing Room
11 Fireplace

As-Built Plan

N

0 FT   5   10   15
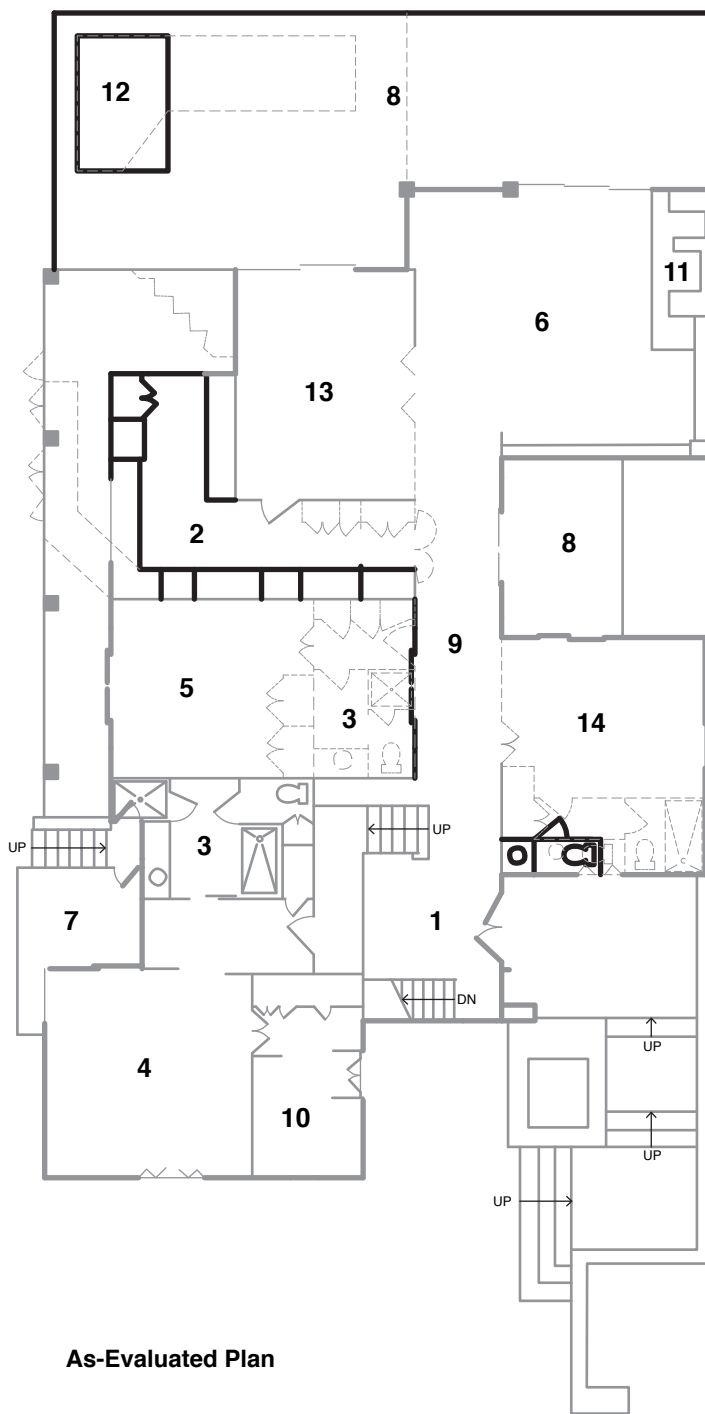
As-Evaluated Plan

Previous Form
Modified Form
Retained Form

1 Entry
2 Kitchen
3 Bath
4 Bedroom
5 Dining Room
6 Living Room
7 Deck
8 Patio
9 Gallery
10 Dressing Room
11 Fireplace
12 Pool
13 Media Room
14 Study
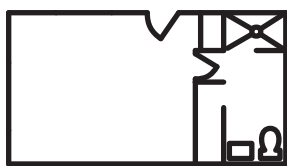
The user of this house bought purely on location. Through the qualitative interview, it was learned that the user was actually happier in the space of the previous home but the location of this home was good enough to make the sacrifice. There have been many changes made, most significantly to the kitchen, which the user described as "very poorly designed" originally.

A series of small changes were made in the kitchen area to take advantage of the views (which had been obscured before) and to create a pass-thru to the barbecue area. It's unfortunate that even in this almost architect-designed space the area most used by the people who own the home—the kitchen, where people go every day since they have to eat—was most neglected both in terms of view lines and usability.

The downstairs garage has been re-formatted into a gym. Flooring was redone throughout the spaces—interior and exterior—to give the home a more cohesive, unified feeling. A formal dining room was remodeled into a media room area and another bedroom was reformatted into the dining room.

Other small changes like skylights in the hall to "open up the feel of the space" were instituted. The user admits he is "constantly trying to get rid of walls." The lighting was updated. Almost every space was modified in some way to suit the needs of the user.

There are a whole other set of unbuilt but thoroughly drafted plans from 1983. There are a number of drastic modifications proposed here. The upper level master bedroom is completely re-arranged; closets are added, a bathroom is added, numerous spatial divisions are added. One of the downstairs bedrooms is also completely reformatted and the kitchen volume is broken off from the main volume and rotated slightly—presumably to take advantage of the view. It is unclear if these changes were ever made. Most of the areas proposed to be changed in 1983 have been changed in a different way in the current model, except for the changes in the main bedroom. Because there is no evidence of modification in the property and also because it's doubtful that these changes would have been allowed to happen because of the significant alteration of the exterior, these changes have not been included in the diagram.

Though the exterior of this property has not seen any real changes (the exterior areas have only been covered—in one case enclosed) but the

interior has been adapted and changed repeatedly and exhaustively. It could be that this property's owners have the most extra money to work with, but it could also point to less attention paid to design in the first place.

USER-SPECIFIC (KAILUA)

This project is a bit of an outlier which doesn't fit exactly into our complementary framework of architect and developer designed spaces, yet informs our question by eliminating the outward signs of a disconnect. This is a situation where the designer and the user are one and the same.

The topography is flat and green. This project is also on the windward side, as the earlier discussed project, but this one is in more of an urban environment. It's also further inland and not directly abutting the coast. Due to the increased amount of concrete, density of population and distance from the cooling ocean, this area is relatively warm but with a large amount of rainfall.

Category:	User-Specific	
Neighborhood	Kailua	
Layout	Two stories, 3 bedrooms, 2 Baths	
Year Built	1979?	
	As-Built	**As-Evaluated**
Neighborhood	Suburban	Suburban
Property Value		

Table 8 Description of User-Specific case.

The neighborhood is all single family homes filling almost to their property lines. There is some yard space in the rear of each home and each is oriented in a similar fashion and set back a similar amount from the road.

Upon entering the house there is a short hallway directly ahead which leads to an open stair case. On the right is the counter top for the kitchen. The kitchen is not separated from the living space by walls but demarcated by the formations of its countertops.

Continuing straight through the hallway and past the kitchen but veering right of the hallway, one encounters the living space. The living space is bordered on one side by the kitchen and on the other by a wall of sliding glass doors leading out to the patio area and pool. Turning the corner and entering the space behind the stair, there is an office and a guest bedroom or den. The space directly under the stair is utilized as a laundry room.

Moving through the den one can essentially complete a circuit and gain access to a hallway which leads to the other side of the entry space. Directly across this hallway is the entry to a bedroom with its own bathroom at the other end. Following the hallway toward the entry, there is another bathroom on your right, the hallway turns to the right and then the entry space is reached again.

If one were to turn left at the entry instead of moving forward to begin the aforementioned circuit, access to a mother-in-law studio apartment can be found. The door is to the left of and 180 degrees opposite to the front entry. Going through this door one is greeted by a kind of smaller entry space, with a bathroom on the right, which opens up into the bedroom area. There is access to the apartment from the exterior front entry area.

Upstairs, all the private spaces branch off from the main hallway which surrounds the staircase. After the landing, in a clockwise direction, first there is a small bathroom, and turning the corner, a linen closet and then two bedrooms. Turning the corner again, around the short axis of the stairway, there is a sitting nook and then the main bedroom. The main bedroom has a bathroom and a deck on the opposite side of the entry door. The deck looks out over the back yard and pool area.

Diagrams
As-Built Plan
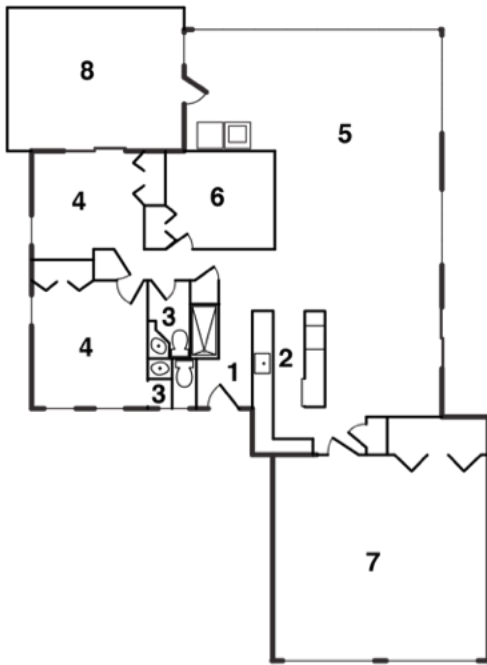
1 Entry
2 Kitchen
3 Bath
4 Bedroom
5 Living Room
6 Utility
7 Garage
8 Covered Patio

0 FT   5   10   15

--- Previous Form
— Modified Form
— Retained Form

9 Deck
10 Office
11 Den

As-Evaluated Plan
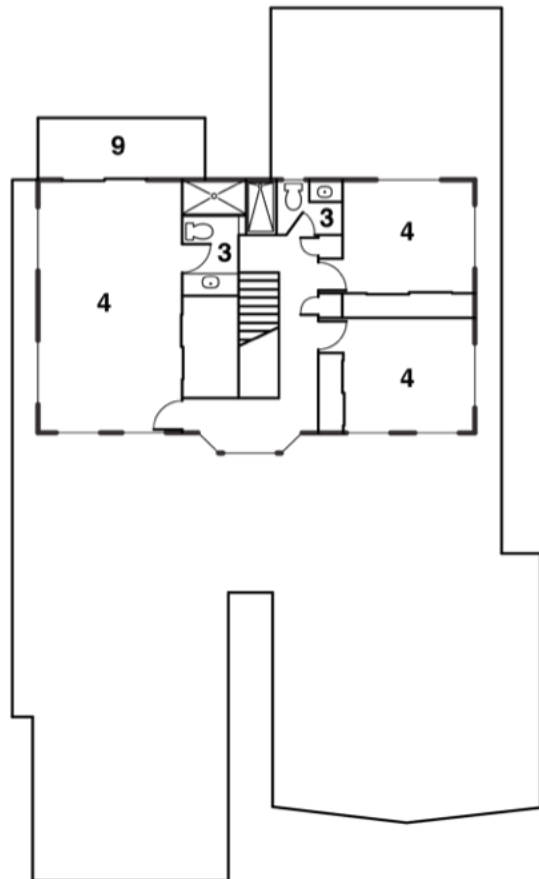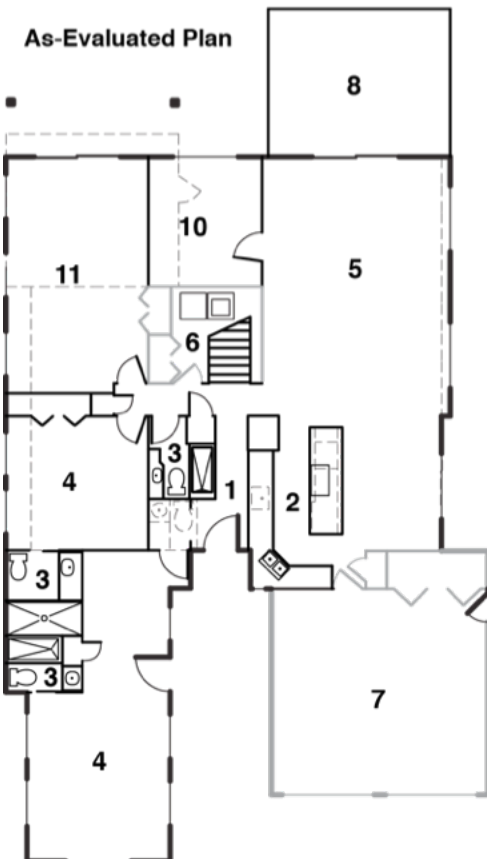
The house appears similar to every other house on the block, yet has been developed and almost completely rebuilt by the user over the course of this user's habitation. It would not be considered beautiful in an architectural sense and it would not be considered beautiful in a natural setting, and yet it's magic lies somewhere in between. It's like a new age of vernacular, where the materials available to the users are not the mud and sticks of the earth where the home is made, but the standard-sized members available at the closest Home Depot.

It is almost as if this user can't stop modifying. Like the artist constantly manipulating their oil painting, this user considers the home never finished. Pieces are added, pieces are taken away as the situation develops. As the children in the family grow older and perhaps move away, one can imagine the spaces shrinking correlated to the level of activity occurring inside the home.

LOCAL CASE STUDY CONCLUSIONS

In all cases, there was not found to be a specific relationship between the amount of time people spent in spaces and how likely they were to modify those spaces. Of course, living in a place longer meant more changes developed, but the relationship was not linear—the number of changes did not directly correlate to number of years in the property.

To a large extent, modifications made in the houses studied here are small, made gradually over time and generally under $5000 in cost. Most are unobtrusive enough to be able to live around during construction. Figure 21 shows the cost and number of changes in the projects studied.

This indicates, to a small degree, that those who live in architect-designed spaces do make sacrifices in terms of use. Some users, regardless of their education in design, have developed an appreciation of spaces more similar to those of an educated designer than the average layman.

It has also made clear that no house is a museum. It must be expected that housing, as a typology, will be adapted, no matter the intention of the owner or designer. Even the most carefully designed space will need to be adapted at some point if it is to be used as housing.

Factors found to be more significant than originally suspected were cost and location. Users bought either according to price or location—design considerations, almost universally, came second.

The projects at the developer-built end of the spectrum were found to have more changes than the other projects. According to the diagram set
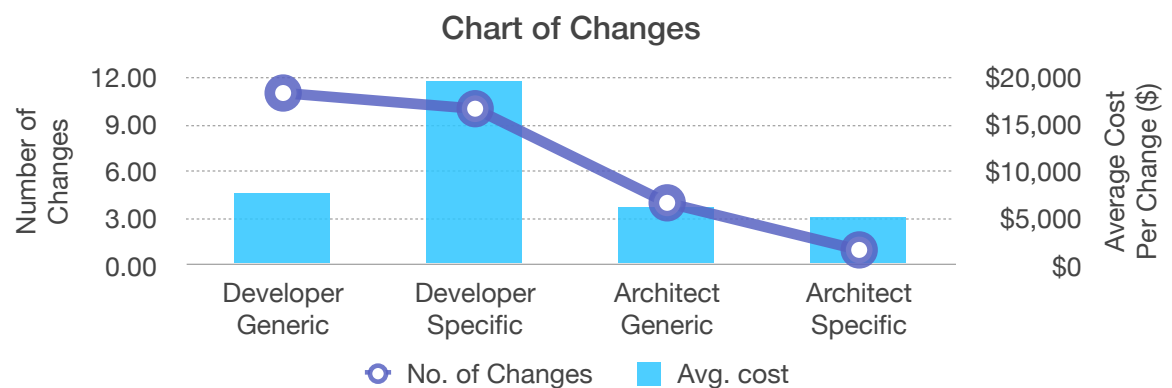
Chart of Changes

Figure 21 Chart overlaying survey result information regarding the number and cost of changes in local case studies.

up at the beginning of the study, this should point to the disconnect appearing at the time when architects were separated from contextual training, when students were tucked away into schools and lost any connection with users. But, through the course of the study, new questions have arisen. Can we trust the original diagram?

And perhaps that is enough. Maybe we don't need to know how or why they function, perhaps we don't even need to know about the disconnect. We simply acknowledge that it's there and allow that users need and will take some control of their housing. Now the question is, how can the architect facilitate this?

Confusion about the disconnect shouldn't stop designers from attempting to remedy it—simply a new way of connecting must be found. Concluding that the disconnect cannot be measured due to human complexity tells us quite a bit about what decisions should be made for the future. Trying to reduce the needs of the user to a simple program, which form can then follow, is not the answer. Paul Rudolph once said, with the characteristic stroke of ego, "There's got to be something more [than the program]. It's got to be, in my opinion, a work of architecture. Then to a degree people adapt themselves to that."[111] But this research has shown that people, however much they adapt to their spaces, adapt their spaces to themselves even more. The job of the designer may be to stand back and enable the user somehow to develop their own spaces, to thrive in their own complexity.

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[111] Smith, "Biography," 5-24.

Measuring The Disconnect Conclusions

It's clearly been established that there is a disconnect between users and designers. Somewhat less clear, but still apparent, is the fact that the roots of this disconnect seem to have appeared somewhere between the development of the Beaux-Arts tradition (which includes the beginning of the separation of designer from technician) and the modern era.

In all of these cases, local and famous, complementary designer-client relationships are rare enough that they don't always occur even if the designer and the client are the same person.

In this type of study there are many challenges. It has become apparent that the framework set up at the beginning is too loose to make any such conclusions. There are too many complicating factors. An info-graphic shown in figure 22 illustrates all the realms that can affect humans and their behavior, regardless of the question of the disconnect.

Different parts of this behavior map are studied by different disciplines: ethnography, sociology, urban planning, semiotics and narratology and all
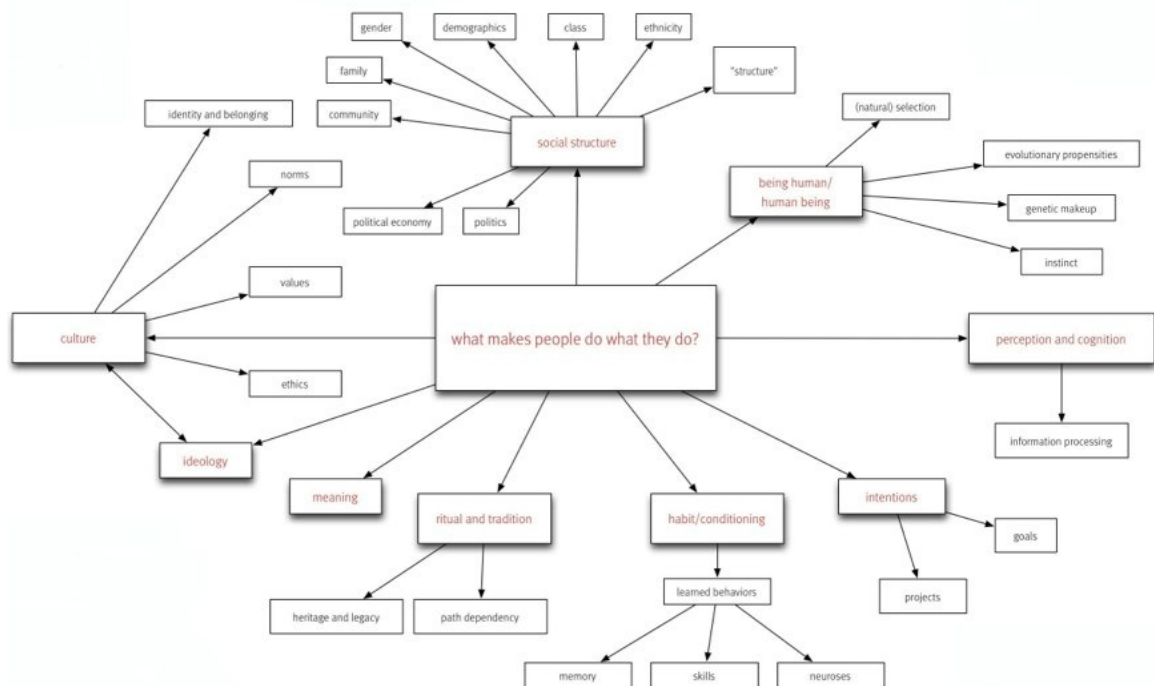
Figure 22 Info-graphic exploring factors influencing human behavior. (Image from: "Transformation and change?" Stanford Humanities Lab, Transformative Design, accessed December 18, 2013, http://humanitieslab.stanford.edu/TransformativeDesign/65.)

the cognitive sciences.[112] These factors are too complex to directly deduce simple conclusions from them. Perhaps the question could be rephrased to seek a broader answer, but still the tactics would be inadequate. Throughout this study, an attempt has been made to simplify the human condition, to reduce the situation to a simple sum of parts.

In the face of this framework and this data, the only conclusion that can be reached is that humans are not as simple as they are framed here and cannot be reduced in this way.

Due to the complexity involved, finding the root of the disconnect in order to help solve it may not be the best route to resolution. The disconnect itself can't be measured, at least not by these means. Despite the manipulation, indeed destruction, of carefully laid initial programs and forms, these housings still function. To borrow a phrase, they work—that is all.

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[112] "Transformation and change?" Stanford Humanities Lab, Transformative Design, accessed December 18, 2013, http://humanitieslab.stanford.edu/TransformativeDesign/65.

Synthesis: Research Conclusions

Human society is adapting and evolving at such a breakneck pace it's extremely difficult to try and keep up and meet each new need with its own solution. As mentioned through Rem Koolhaas' thoughts, research predicts slum cities will not work yet somehow they do. Perhaps this is the tack that should be taken when designing housing for future generations. To return to Koolhaas, these are some of his conclusions about urban planning (speaking of a development in Hong Kong he was working on):

> *Any program here would, over time, undergo a series of perpetual modifications, so it could start as a house, then become a brothel, then a factory, then a heroin plant, then become a hospital. The liberating formula of such a clump of a building could be that we would no longer have to be very intense about making buildings for specific programs.*[113]

Although the modifications studied here are much different and not as varied, the conclusions are similar: humankind may be becoming too complex to design for in the same manner than has been used in the recent past. Simply adding design research into the mix may not be the correct conclusion. The whole process may need to be turned on its head. Koolhaas continues:

> *If we consider these clumps of buildings mainly as permanent accommodation for provisional activities, there is a whole zone of potential relaxation for the architectural profession. We no longer have to look for the rigid coincidence between form and program, and we can simply plan new masses which will be able to absorb whatever our culture generates.*[114]

Essentially, for the housing typology, what should be designed is a relaxed housing that is able to absorb whatever a family generates. It should expand and contract according to the continuously iterating needs of those living within. Additionally, whatever the designer provides should not be a one-size-fits-all framework but it should be a framework in which, somehow, the users are able to readily and delightfully adapt their own spaces in a way that celebrates our shared history as user builders.

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[113] Rem Koolhaas, "Beyond Delirious," in *Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory, 1965-1995*, ed. Kate Nesbitt, (New York: Princeton Architectural Press, 1996), 332.

[114] Koolhaas, "Delirious," 332.

Recall table 2 from earlier in the project. This second part of the project fills that unfilled box in the lower middle of the table. While this author is not the user of the attempted design, it is hoped that the design research informs the author enough to create a kind of hybrid designer/user. Since no user is specified, and since there are many, though rare, examples of successful relationships between architects and specific users, the cross category will be generic. Behold the competed version in table 9.

Although the term generic implies the one-size-fits-all category mentioned earlier, the "user" factor which is also part of the descriptive is vital. Including the user in the descriptive represents the importance of their participation.

The design portion of this project is an attempt at re-defining or re-developing a new type of contemporary vernacular. In this new typology, the materials have been updated to reflect the opportunities available to a user in the current consumerist society. Part of a vernacular system is using what's readily available and it would be naive to ignore or fight against the readily available, reasonably priced off-the-shelf materials. However, it would also be a mistake not to be mindful of their use or to not develop clear ideas of alternatives.

Besides the materials, this typology also reflects the changing needs, time and abilities of the contemporary user. It is essential that the new vernacular includes user participation. Not only is this one path against the static environments of various failed housing projects, but this will also generate a sense of ownership and help alleviate anomie.

To accomplish these ends, precedents will be thrown out. Typical methods of evaluation and assessment will be questioned. What does the user really need? What are the patterns and systems of a contemporary human?

It must be mentioned that beauty is not a specific aim. This project is not meant to create a sense of ownership (or authorship) in the designer, but attempts to engender it in the user. Besides, as has been illustrated with

	Generic	Specific
Designer	DG	DS
Architect	AG	AS
User	UG	US

Table 9 Organization of local cases with design project description highlighted.

the animal architecture and human vernacular architecture, very often the most uncommon beauty is simply a by-product.

The site will be in Hawaii and, as most users studied in the research portion of this project reported price being a factor in their purchases and modifications, cheap, accessible materials will be used.

Application: Design

Introduction

Myriad factors affect human behavior regardless of the question of the disconnect. Throughout this study, an attempt has been made to simplify the human condition, to reduce shades of gray into clear strands of black and white when really those shades of gray should be elaborated and celebrated.

How do we celebrate the shades of gray? In thought, by using the critical thinking skills sowed by the architectural education, acknowledging the disconnect it creates and questioning established systems of thought. In practice, by developing a generic framework upon which the user can elaborate their own identity and engender their own sense of belonging. In the words of entrepreneur Zita Cobb, "There's a plague of sameness that is killing human joy."[115] Perhaps putting more designing power into the hands of the user can diminish this sameness.

The program for the project is a sort of anti-program, the program itself will be a framework for one family to work from throughout time. As the family grows and shrinks and functions morph, so too will the program and structure.

The site is a location in Hawai'i. The site was chosen based on factors from the design portion, but the practices are meant to be somewhat generic—applicable across many types of sites. The materials reflect this generic intention as well: prefabricated pieces available for purchase at a hardware store. For people to have the freedom to do these things on their own, they should not be chained to a certain product line or set of parts meant to be constructed together.

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[115] Zita Cobb, "Fogo Island—Part 1: Entrepreneurship," *Monocle* video, 1:43, April 6, 2014, http://monocle.com/film/business/fogo-island-part-1-entrepreneurship/.
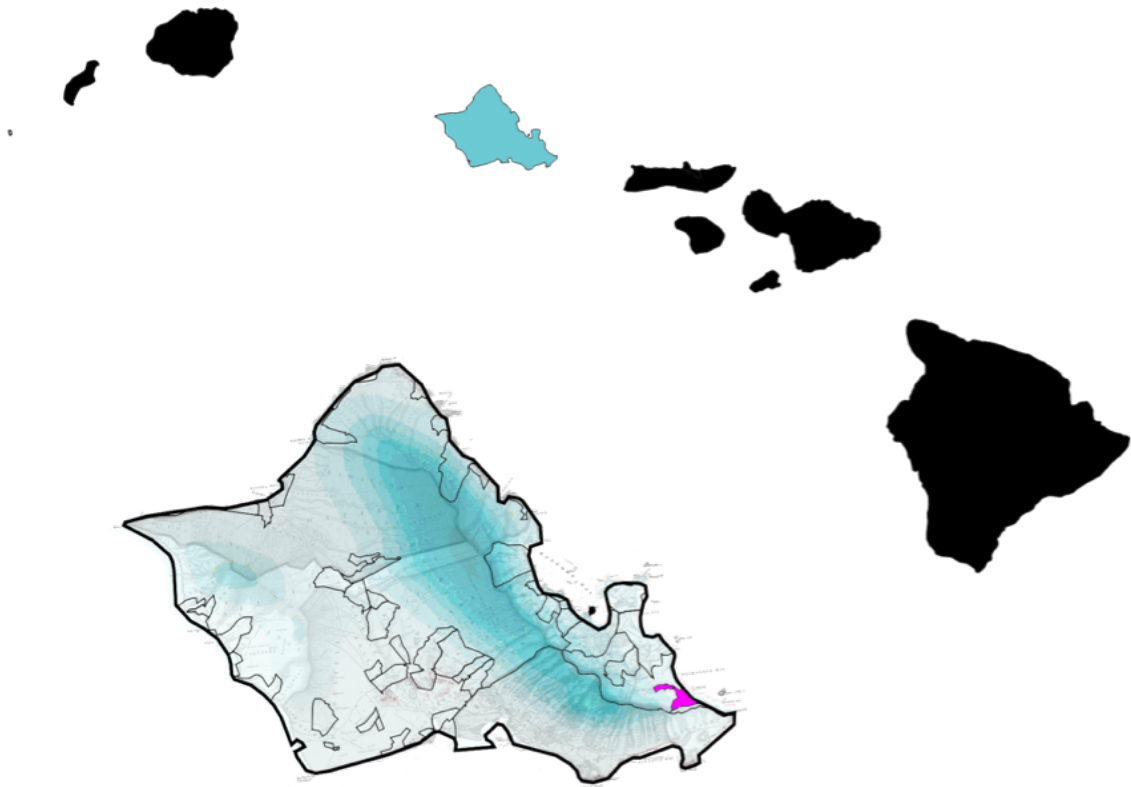
Site Analysis

Figure 23 Analysis of wider site context.

For the site analysis, figure 23 shows an outline of Oahu overlaid with some topography, the incorporated areas, traditional ahupua'a boundaries and precipitation density. Waimanalo is highlighted in purple.

Zooming in, figure 24 shows the commercial activity is focused along the spine of the highway, there is some tourist activity concentrated along the beach, and the town center is just a short distance from the chosen site. Agriculture is still a big part of the culture and economy of Waimanalo— there are many nurseries and organic farms back in that area. Figures 25 and 26 show a few close-ups of the specific site and figures 27 through 30 show the site in its current condition.

Figure 31 is a diagram illustrating the solar, wind and related factors on the site. From here the next step is to define the spaces and how the should relate to each other. This exploration is best show through a pair of diagrams, figures 32 and 33. Conventional titles were eschewed in favor of more descriptive terms of everyday use in order to help prevent conventional solutions.

Figures 24-26 Analysis of specific site context above, site images below. (Images from: "Waimanalo Beach," Google Maps, accessed November 20, 2013. Image in figure 23 modified by author.)

It is desirous to have the eating and gathering spaces be furthest from the resting and sleeping spaces. As the family grows and the uses change, additional sleeping and bathing spaces may be needed but the eating and gathering spaces should only grow, not divide or separate. It is important for these spaces to function as the nodes of the house.

Figures 27-30 The site in its current condition.
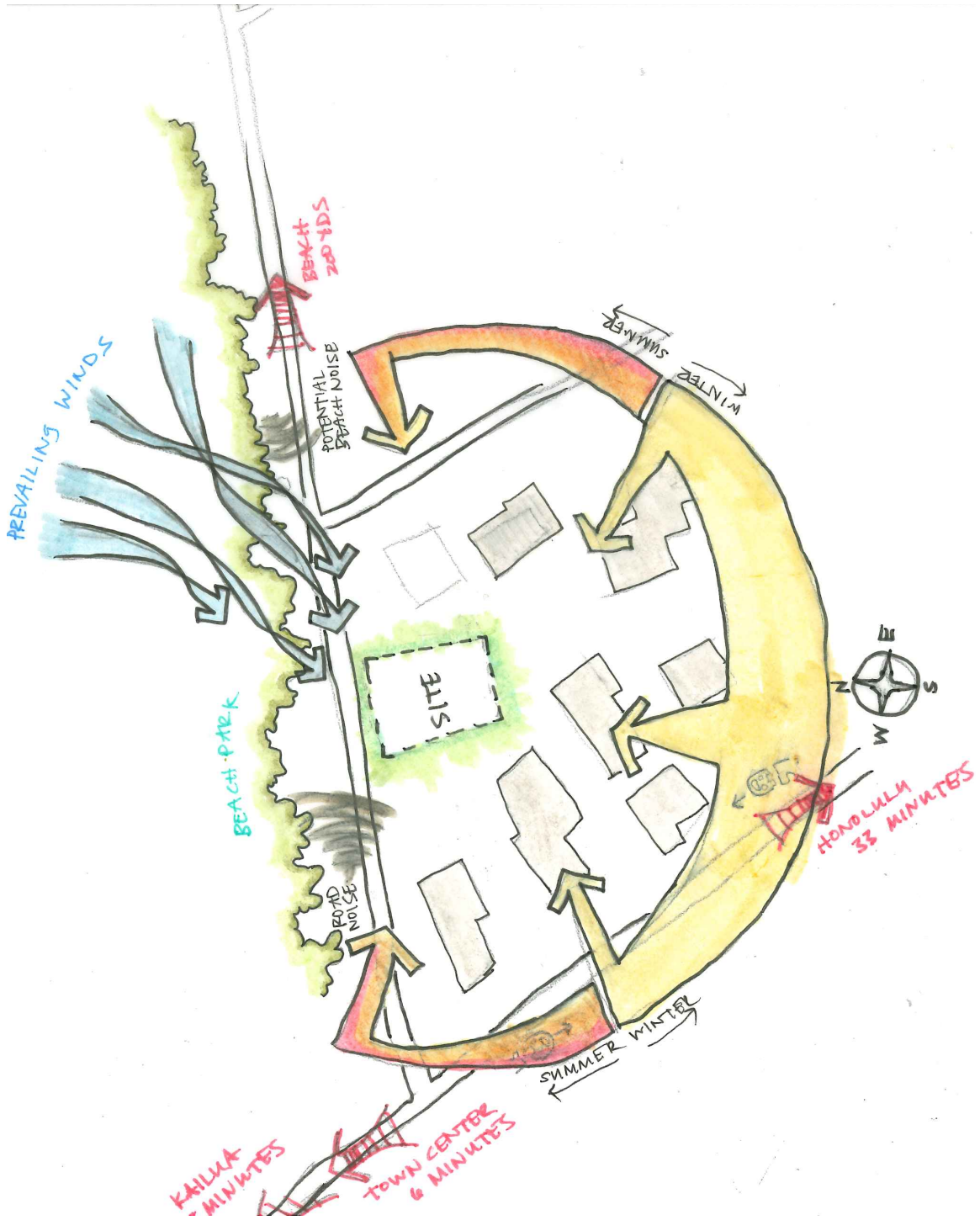
Figure 31 Site analysis diagram.
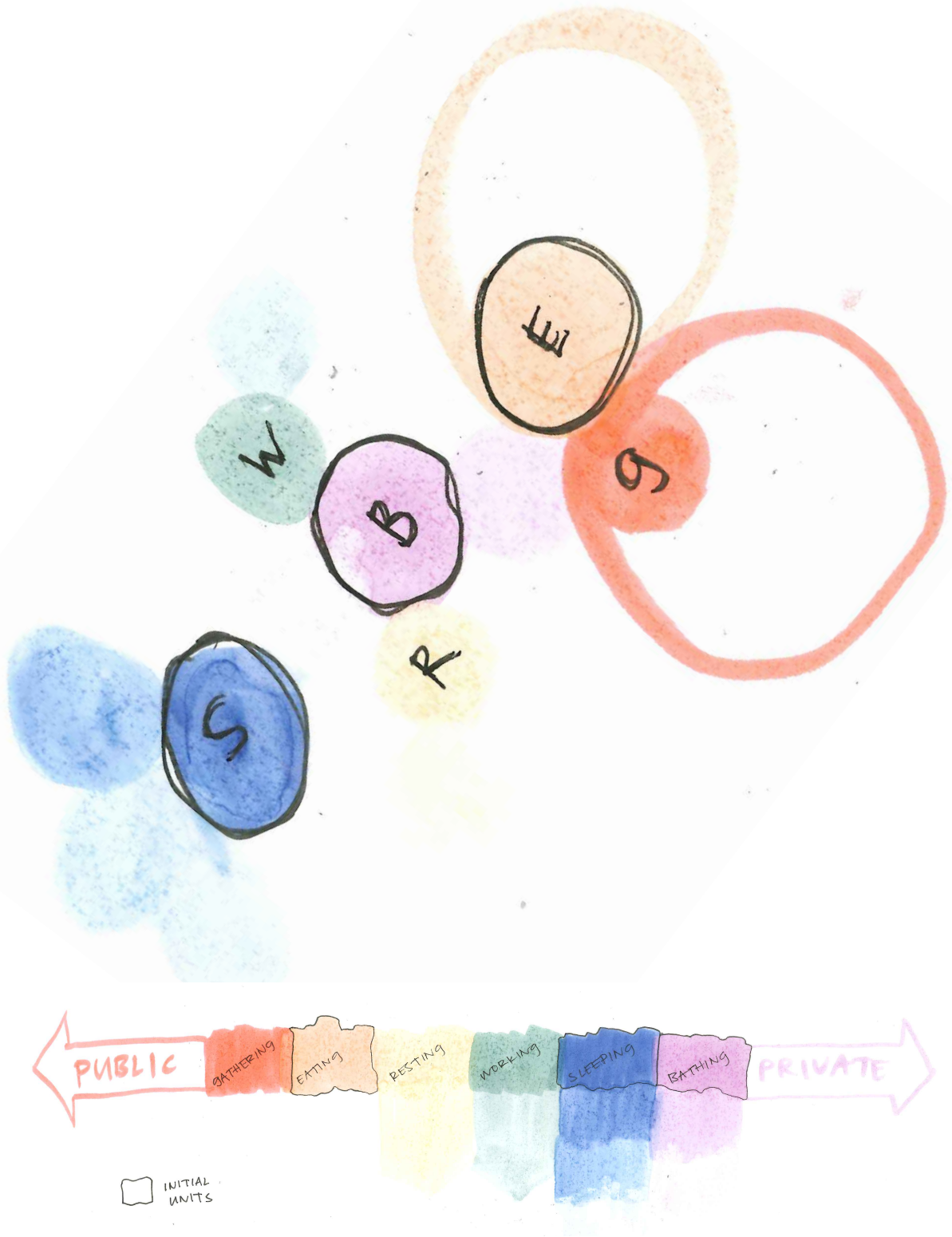
Figures 32-33 Spatial proximity diagram and key.

Process

The problem of designing in a hot humid environment is the twin challenge of ventilation and privacy. It could be said that all one needs in the tropics is a roof, but to facilitate safety and privacy more must be added. The challenge becomes: how is a delineation made that is both wall and not wall? Something the breeze can get through but which also maintains the privacy and the safety of the user? A solution that follows from the requirements developed at the conclusion of the research involves layers of readily available screens and a lifted design that capitalizes on the tradewinds.

Brick, masonry and concrete blocks were dismissed for being too permanent and too heavy for a lifted application. Additionally, though attractive to the user-built focus, bricks made on site of the site would be too labor intensive and would lack longevity in the wet environment. Steel, though potentially long-lasting in the salty environment of the site if protected and well cared for, was eventually rejected in favor of the accessibility and ease of construction of other materials.

Pole construction allows the simplicity of a continuous vertical structure. (Efficiency of material results in elegance of form, as seen in nature.) Following from the lifted pole design, wood is used for its adaptability and some local availability. Hawaiian hardwoods are often used in local construction and ohia poles are quite accessible. Engineered wood structural systems, though often branded, are available, affordable and efficient enough to be appropriate for this project.

Verandas are to be used for the triple purpose of as circulation, ventilation aid and rainscreen to offset the permeability of the walls.

Adaptability and affordability are two priorities. The primary result of this prerequisite is the use pre-made parts. Pre-made parts are obviously more affordable due to the system of their production and they make the building adaptable as each part can be replaced or exchanged at the users' whim or leisure. Non-branded pre-made parts were also a requirement. There are many precedents for kit-of-parts systems wherein one must buy every part from a certain manufacturer. It is against the nature of the freedom of construction espoused by this project to constrict the user in such a way. So non-branded, readily available pre-made parts of common dimensions are used.

To additionally aid the aim of adaptability, the structure is designed without load-bearing walls. Solid walls are to be of individual panels so

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Figure 34 Ohia pole manufacturer. (Image from: Jeff Anderson Sawmilling Services, accessed April 4,2014, http://ohiapoles.com/.)

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Figure 35 Engineered lumber manufacturer. (Image from: Wood Products/Engineered Lumber, Georgia Pacific, accessed April 4, 2014, http://www.buildgp.com/wood-i-beam-joists.)

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Figure 36 Interior wall panel option. (Image from: Barricade Insulated Wall Panels, Home Depot, accessed April 4, 2014, http://www.homedepot.com/p/Barricade-2-5-in-x-2-ft-x-8-ft-OSB-R12-Insulated-Wall-Panels-OVRX2496R12/203640690.)

movement and replacement can be accomplished with ease (one panel wall option is shown in figure 36).

The third priority is climatically appropriate design, which, in this case, means a passively cooled structure oriented around the tradewinds. Not only is this a natural fit for the ideal climatic conditions of the site, it also meets the needs of the affordability priority. To encourage and augment the cooling by the tradewinds, the enclosed structure is lifted off the ground, walls perpendicular to the winds are permeable and walls parallel to the winds are solid. Privacy is retained through the layering of the permeable walls: one layer is on the exterior of the veranda and the interior layer borders the living spaces. The layer which borders the living spaces is actually two panels which directly abut each other. These can be laterally arranged to have either their solid parts adjacent to each other (creating an opaque interior wall) or overlapping completely (creating the

OVERLAPPING   SEMI-OVERLAPPING   ABUTTING

Figure 37 Various layer states of permeable wall.

same permeable condition as the exterior layer), as shown in figure 37. Additionally, these two interior panel layers are on tracks enabling them to be tucked away in pocket closets around the house in order to completely open the interior to the verandas if desired, as shown in figure 38. The exterior layer is aided in securing the house from bugs and intruders by a layer of metal screen. The width of the veranda (coupled with the overhang of the roof) acts as a rain screen to protect the interior from moisture.
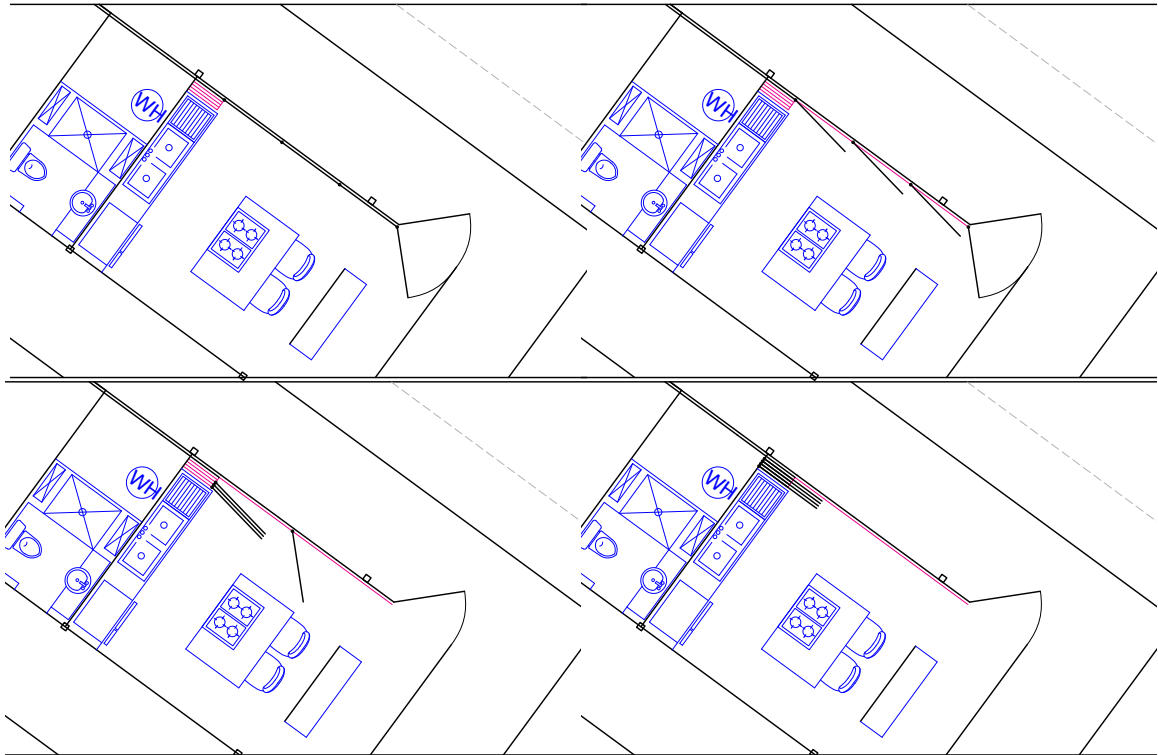
Figure 38 Pocket wall behavior.

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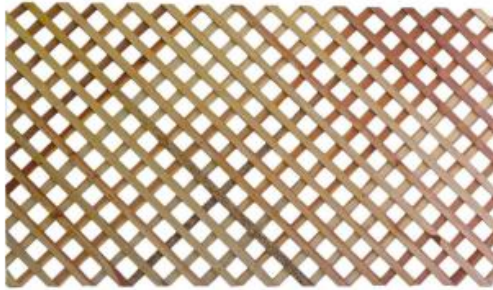
Figure 39 Perforated walls. (Image from: Garden Lattice, Home Depot, accessed April 4, 2014, http://www.homedepot.com/p/4-Ft-x-8-Ft-Garden-Lattice-01256/100005228.)

IDEAS & ITERATIONS
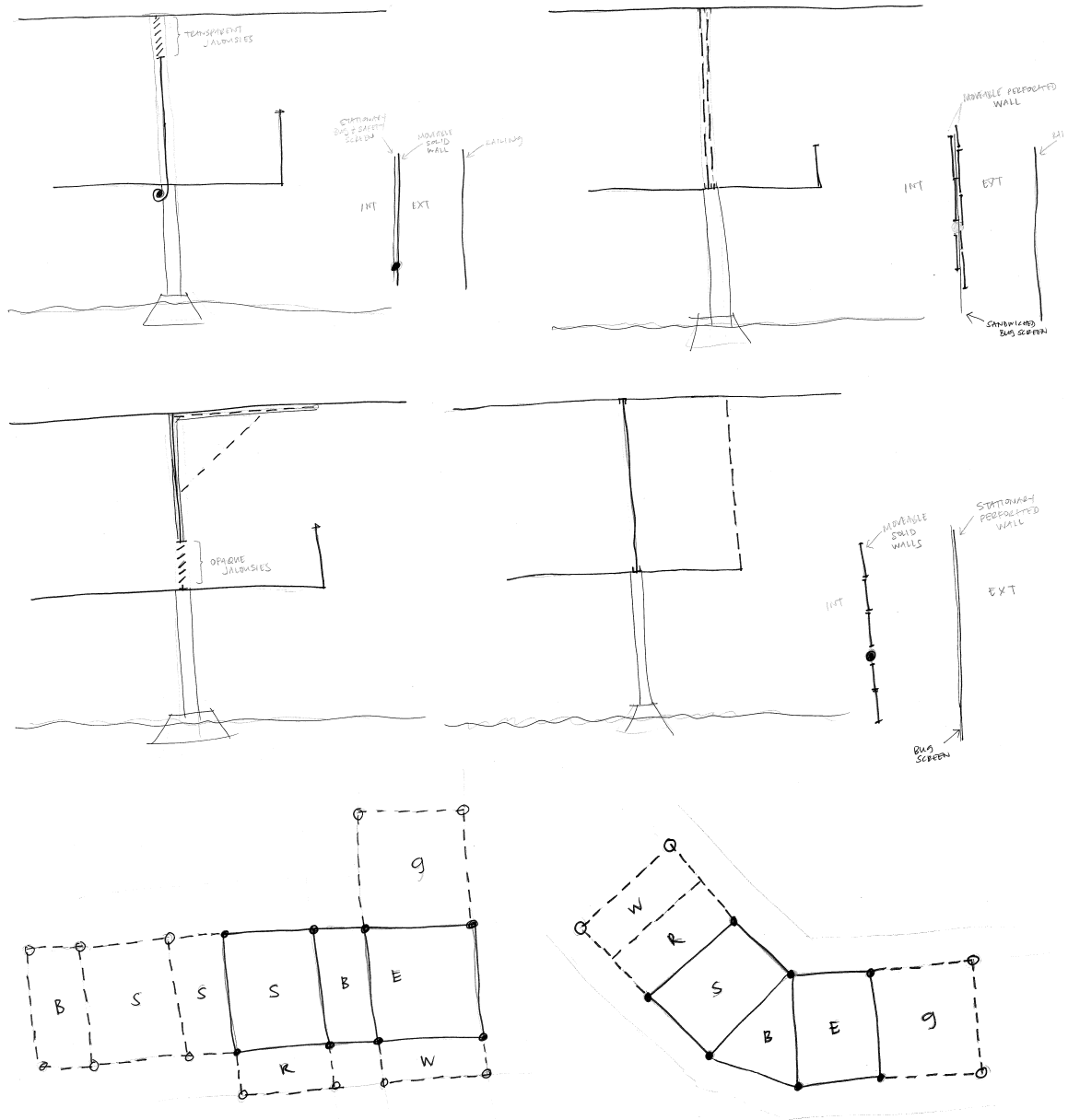
Figure 40 Assorted early process sketches.

FEEDBACK

Sequential design phases incorporated feedback that adjusted the angles of the wings to more than ninety degrees. Initially, it was considered the most affordable style of building, but upon reflection and discussion it was decided that a) since the construction is to occur at separate times the unusual angle would not be that much less cost-effective and b) whatever extra cost would be worth responding to the site in a more fitting way.

In terms of the interior layout, it was decided that a jack-and-jill style bath for the kids' or guest bedroom would be preferable. Direct access to the master bath from the master bedroom (circumventing the veranda) was discussed as a potential benefit, but it was decided to prioritize simplicity of construction and keep the veranda as the point of communication. However, the verandas on either side of the building were adjusted in width to create a hierarchy and therefore create a slightly more private communication between the bed and bath.

Additionally, creating pop-outs in the verandas where more space would be most useful was discussed, but again simplicity of construction was prioritized. As the design is flexible, alternate future scenarios could incorporate the veranda pop-outs. Various rotations of major volumes are also possible. Using the lanais as hinges, virtually any rotation is possible for additional living units.

To make the design accessible, it would be possible to add a lift which would land next to the stairs before the door. There are many manufacturers offering exterior lifts for reasonable prices: around $3,000-$5,000.

In addition, if the structure is lifted just high enough, the footprint of the house shades a large ground-level lanai, or patio, area, coincidentally creating the "ideal" structure for a hot, humid environment.

In the initial sketches, the roof was minimally sloped to accommodate additions and transitions more seamlessly. To utilize that style of roof adequately, a roof-top lanai shaded by photovoltaic panels was considered for the later phases. However, this option was eventually rejected for the excess labor and materials required to make this space safe and accessible.

When considering a more sloped roof, there are basically two options: the lowest slope available in a prefabricated truss (2/12) or the slope at the

angle best suited for capturing solar energy at the latitude of the site (5/12). In each case a mono truss, or singularly-sloped truss, is optimal for the purpose. The 5/12 truss was rejected as creating too much height over the span of the building. As for the 2/12 truss, the choice became in which direction to guide the slope. Designing the low end on the leeward side is best for capturing solar energy but significantly hampers the tradewinds in eliminating warmer air. Considering the stated low-tech aims of this project, photovoltaic technology is not a priority. Therefore, designing the low end to be on the windward side of the structure to best enable to tradewinds to clear the warm air was determined to be the best option for this truss. Excess height on the leeward side of the building is still created in this situation but the main problem is, due to the angle, the overhang is incapable of shading the entire leeward elevation. For these reasons, roofs of any slopes were rejected.

When considering a low-slope roof (essentially a flat roof), there are two main concerns: how will it be kept from leaking and what will it be used for. In terms of the first concern, the increasing efficiency and lowering cost of the EPDM rubber (ethylene propylene diene monomer rubber) commonly used for low-slope roofs, makes it a worthy choice in material. Also, when considering later additions, the seams sealing roof parts together are less complicated with a flat roof with fewer chances for mistakes. In terms of the second concern, the decision was made to create a planted roof. The roof will be planted with vegetables and other agricultural crops, partly to align with the culture of the context—Waimanalo is a farming community at heart—and partly to increase the cost-effectiveness of the home as that is a primary goal.

Figures 40 and 41 show an analysis of ventilation and sun shading of the design.
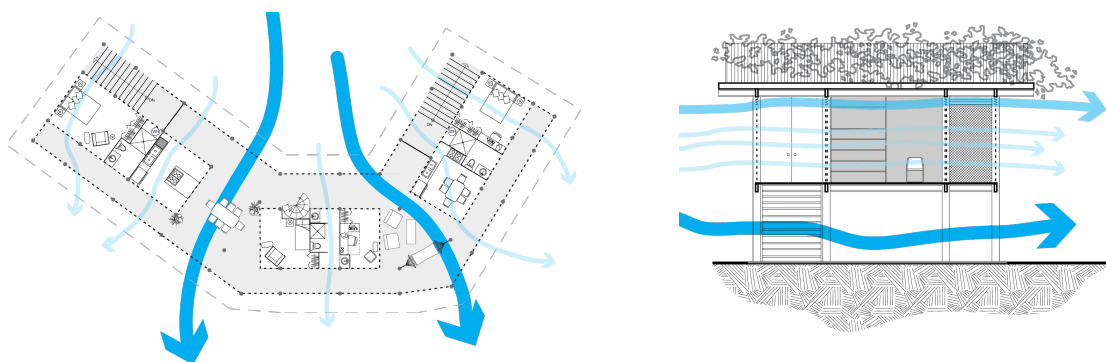
Figure 41 Ventilation diagram.
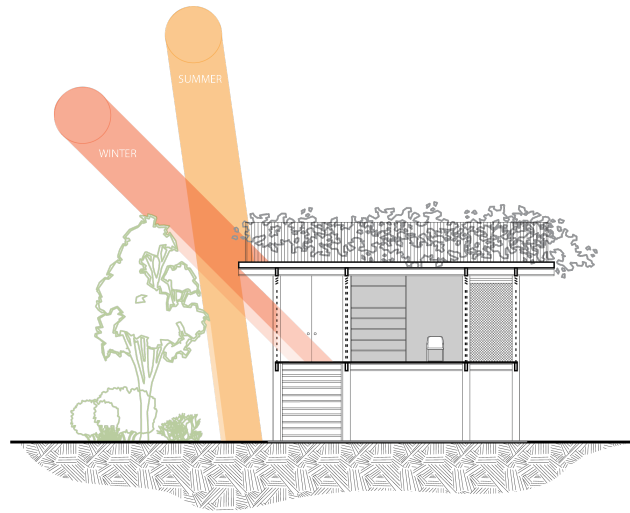
Figure 40 Sun shading diagram.

Schematics

Design Conclusions

This design is aimed at creating a system through which the user can take control of their housing options. If not built with the user's own hands, parts can be chosen and contractors hired for relatively quick construction.

In the future, packages of this design and its alternate phases could be sold as in conventional plan books. This design uniquely addresses the concept of adaptability and the requirements of living in a tropical context.

Conclusions

Since modernism, designers (including myself and this project) have been trying to discover the science of design. Yet because of the complicating human element, design can never be a primarily scientific pursuit. Architecture is not and can never be a formula. The indescribable synergy of good design is an unquantifiable, unempirical datum.

The architect can't spend the individual and constant attention each housing needs as it develops over time. If the massive disconnect currently evolving between users and architects is to be resolved, a new understanding between the two must occur. In developing a new relationship, responsibilities must shift and change.

This project is trying to move the mantle of the responsibility of synergy back on to the user—to show the user it's possible for them to do it themselves and to equip the user with the right organizational and motivational tools—through developing the skills of the architect in a different direction. The skills of the architect are not moot in this changing world, they just must be re-assessed to create, in addition to more flexible frameworks for design, a more accessible framework of knowledge.

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University of Hawaii
Consent to Participate in Research Project:
The Architect and the User
Investigating designer and user practices and structures in Hawaii

Focused Interview

My name is Willa Trimble, and I am a graduate student at the University of Hawaii. As part of my dissertation, I'm studying the differences between how architects and critics expect spaces to be used and how people actually use them, especially in regard to housing. If you choose to participate in this interview, you could help me understand how you use your home. I am asking you to participate in this project because I've identified your house as one that could hold interesting insights into this question.

Project Description – Activities and Time Commitment: If you participate, I will interview you once, on the phone or in person. The interview will last 45 minutes to an hour. I will record the interview using a digital audio recorder. Later, I will type a transcript to analyze the information. If you participate, you will be one of three designers or users whom I will interview separately. I will be asking you about the use and design of your home but the interview will be open-ended and your general thoughts and responses will guide the discussion.

Benefits and Risks: There will be no direct benefit to you for participating in this survey. The results of this project might help me and other researchers learn more about how designers make assumptions and how effective those assumptions are. There is little risk to you in participating in this project.

Confidentiality and Privacy: The data gathered from this interview will be anonymous. Any identifying information you may provide will be separated from the pertinent information and original copies of notes and audio recordings will be destroyed. The anonymous transcripts will be kept by me in a secure place until the research is completed (about two years) and then destroyed. When I type and report the results of my research project, I will not use your name or any other personally identifying information. I will use floor plans of your residence and discuss its environment in general terms, but I will carefully control any specific information that might locate it. I will use pseudonyms (fake names) and

report my findings in a way that protects your privacy and confidentiality to the extent allowed by law.

Voluntary Participation: Participation in this project is voluntary. You can freely choose to participate or to not participate in this survey, and there will be no penalty or loss of benefits for either decision. If you agree to participate, you can stop at any time without any penalty or loss of benefits.

Questions: If you have any questions about this project, you can contact me at (808) 294-6873 or willa@hawaii.edu. If you have any questions about your rights as a research participant in this project, you can contact the University of Hawai'i Human Studies Program at (808) 956-5007 or uhirb@hawaii.edu.

Please keep a copy of this page for your reference.

University of Hawai'i
Consent to Participate in Research Project:
The Architect and the User
Investigating designer and user practices and structures in Hawaii

Survey

My name is Willa Trimble, and I am a graduate student at the University of Hawaii. As part of my dissertation, I'm studying the differences between how architects and critics expect spaces to be used and how people actually use them, especially in regard to housing. Participation in this study will involve the completion of a survey. I am asking you to participate in this project because I've identified your house as one that could hold interesting insights into this question.

Project Description – Activities and Time Commitment: Participants will fill out a short survey. Questions are primarily multiple choice. However, there will be several opportunities to expand upon your answer with an open-ended narrative response. Completion of the survey will take approximately 20 minutes. Three designers or users will take part in this project.

Benefits and Risks: There will be no direct benefit to you for participating in this survey. The results of this project might help me and other researchers learn more about how designers make assumptions and how effective those assumptions are. There is little risk to you in participating in this project.

Confidentiality and Privacy: The data gathered from this survey will be anonymous. Any identifying information you may provide will be separated from the pertinent information and original copies will be destroyed. When I type and report the results of my research project, I will not use your name or any other personally identifying information. I will use pseudonyms (fake names) and report my findings in a way that protects your privacy and confidentiality to the extent allowed by law.

Voluntary Participation: Participation in this project is voluntary. You can freely choose to participate or to not participate in this survey, and there will be no penalty or loss of benefits for either decision. If you agree to participate, you can stop at any time without any penalty or loss of benefits.

Questions: If you have any questions about this project, you can contact me at (808) 294-6873 or willa@hawaii.edu. If you have any questions about your rights as a research participant in this project, you can contact the University of Hawaiʻi
Human Studies Program at (808) 956-5007 or uhirb@hawaii.edu.

Please keep a copy of this page for your reference.

Appendix C: Questionnaire

University of Hawai'i
Survey for Research Project:
The Architect and the User
Investigating designer and user practices and structures in Hawaii

Survey

INSTRUCTIONS
Greetings! I am a student at the University of Hawaii conducting a survey as part of a project that is trying to figure out how differences between designers and users affect the users. As part of this project, I would like to explore how well your house performs for you. Your answers may help improve the design of future homes and may change the design process of professionals. The results of this survey could potentially be published as part of my project but all respondents will remain anonymous.

QUESTIONS

1. Are you over 18 years of age?

   Yes O   No O

   If no, please do not complete the survey.

2. For this survey, changes can be defined as remodels or adjustments in the structure or form of one or more spaces solely to make the space easier to live in and separate from repairs or maintenance. Additions are considered changes. Have you made any changes in the time that you've lived in this house?

   Yes O   No O

   If yes, how many separate changes have you made in the time you've lived here?

1	2	3	4	5	6	7	8	9	10	10+
O	O	O	O	O	O	O	O	O	O	O

Please indicate the location and cost (in dollars) of each change:

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER PLEASE DESCRIBE: _____
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER PLEASE DESCRIBE: _____
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

3. To the best of your knowledge, how many changes have been made to the house in its lifetime?

1	2	3	4	5	6	7	8	9	10	10+
O	O	O	O	O	O	O	O	O	O	O

Please mark which spaces were changed without you:

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____
O	O	O	O	O	O	O	O

4. In an average week, how many hours do you spend in the following spaces (not counting hours spent sleeping):

HOURS	BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM
0 - 5	O	O	O	O	O	O	O
6 - 10	O	O	O	O	O	O	O
11 - 15	O	O	O	O	O	O	O
16 - 20	O	O	O	O	O	O	O
21 - 25	O	O	O	O	O	O	O
26 - 30	O	O	O	O	O	O	O
31 - 35	O	O	O	O	O	O	O
36 - 40	O	O	O	O	O	O	O
40 +	O	O	O	O	O	O	O

5. Do you plan to make any changes to your house in the future?

Yes O   No O

If yes, please indicate the location and likely cost of the change:

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER PLEASE DESCRIBE: _____
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER PLEASE DESCRIBE: _____
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

BED-ROOM	BATH-ROOM	KITCHEN	LIVING ROOM	DEN OR REC ROOM	STUDY OR OFFICE	DINING ROOM	OTHER *PLEASE DESCRIBE:* _____ _
O	O	O	O	O	O	O	O

Description of change:

0-5000	5001-10,000	10,001-15,000	15,001-20,000	25,001-30,000	35,001-40,000	45,001-50,000	50,001+
O	O	O	O	O	O	O	O

If the changes you'd like to make cost less, would you be more likely to make them?

Yes O   No O

Please explain

_____

_____
_____

_____
_____

_____
_____

_____
_____

6. Have you ever had any design education?   Yes O No O

   If yes, please explain _____

7. Do you live in this house full-time?   Yes O No O

8. How long have you lived in this house?

YEARS	1	2	3	4	5	6	7	8	9	10	10+
	O	O	O	O	O	O	O	O	O	O	O

Thank you for participating!