

Pono Kauhale: Multi-Generational Housing in Big Island's Pahoia Village

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Abstract

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The Island of Hawaii is experiencing a housing shortage so extreme many Hawaiians face a choice of homelessness or relocation. However, even more damaging to the Native Hawaiians is the lack of cultural sensitivity this has caused and the architectural disconnect created by the housing shortage, a figurative and literal separation between 'āina, the land, and the rich Hawaiian heritage. In a culture so intimately connected to the natural environment, this startling break from traditional vernacular design must be corrected. This thesis addresses both the physical needs of lodging and celebrates the ties between Hawaiians and āina through a proposed architectural design including multi-generational housing, a cultural center, and a spacious public garden in the village of Pahoia.



PONO KAUAHALE:

MULTI-GENERATIONAL HOUSING IN BIG ISLAND'S PAHOA VILLAGE

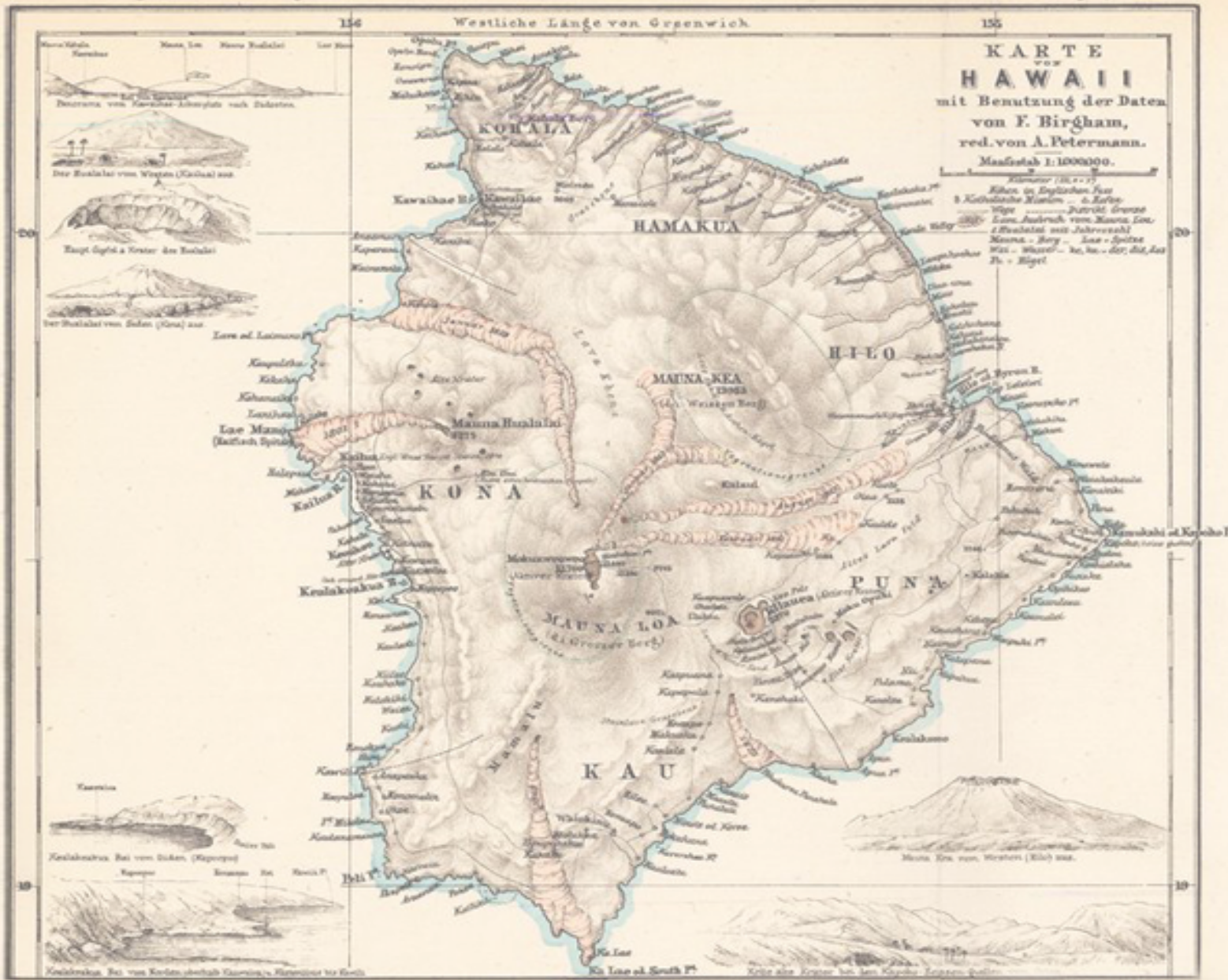


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PREFACE

My parents raised me in Grand Haven, Michigan. When I was a child, my mother kept a mason jar filled with sand and sea shells. A white puka shell necklace was carefully stored with her string of pearls and her other precious jewelry. My father made the necklace for her from the naturally occurring “pukas” found on the beaches of Hawaii. He spent a week scouring the beach shoreline on Maui searching for the shells, organizing them from largest to smallest to fit the short thread. When I asked my mother about the jar she told me a story about the island of Oahu, where she grew up as kama‘āina, a local girl.

She told me about soft sandy beaches, and water that was the bright color of gemstones: green and blue and even gold. There were leaves as tall as my father and the weather was always sunny and warm. (fig. 03)

She told me the story of a princess, Lili‘uokalani, who became a queen. This queen was beloved by her people and she loved her homeland and subjects so much that when she was betrayed and held captive, she refused to let anyone fight or die for her.

And so her kingdom was lost.

My mother cried telling me this story. She told me I was hapa, or of mixed origin, and this was my legacy too. Such fairy tales were very different from the pine forests and gray skies I knew. When I asked why we didn’t live there she told me it was complicated and maybe someday we could go and visit. But she told me in the manner of telling a fairy tale, a place and a time long ago and far away, impossible to reach except in stories. This thesis is inspired by these childhood memories, the loss of connection to my homeland, and dedicated to all Kānaka Maoli with much aloha.

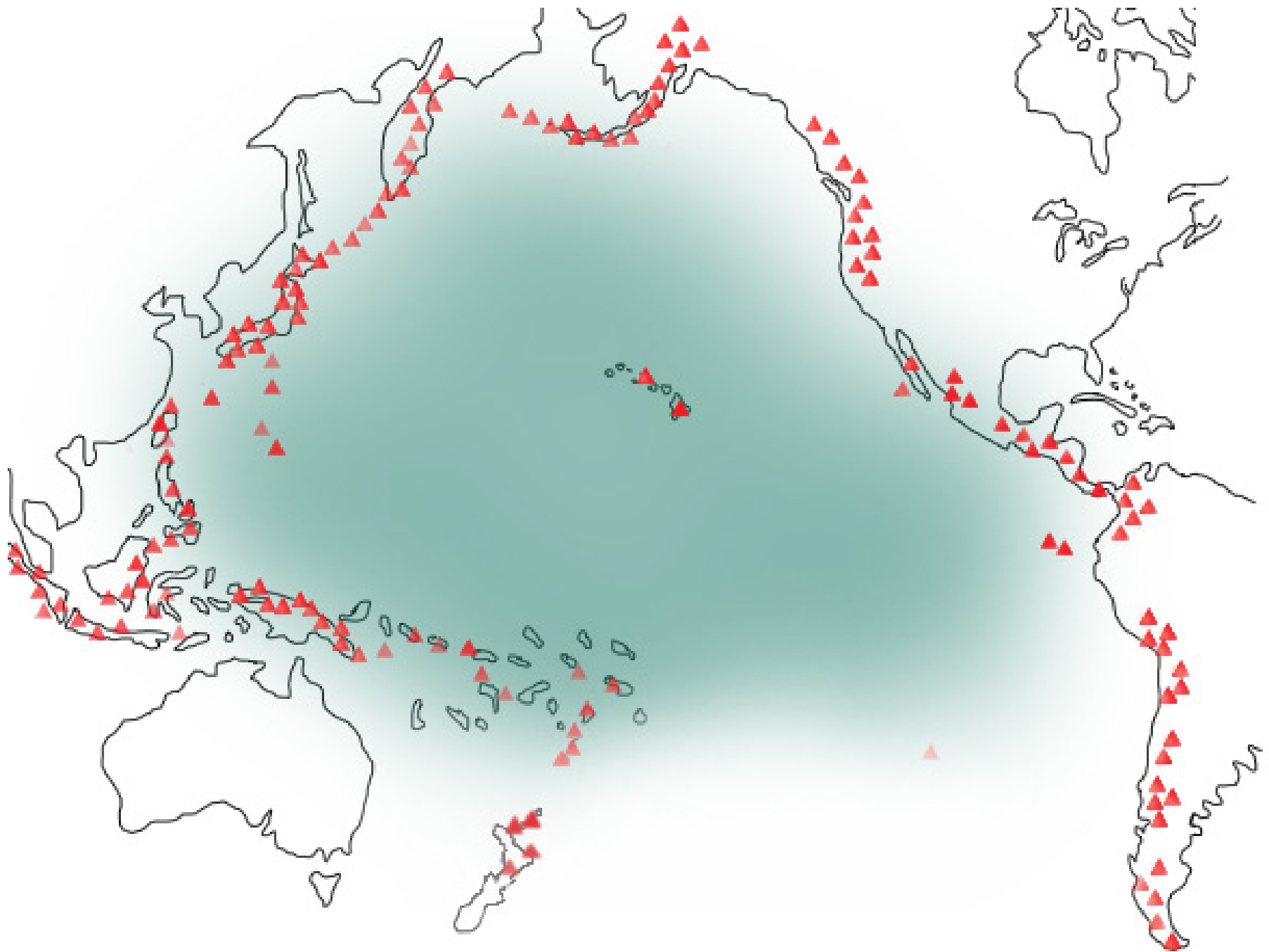


fig. 03 | scenes from big island. 2008

Selection of the site; design and orientation of individual houses and features in clusters and enclosures; selection of timbers and materials, their preparation and transportation from forest to site; and probably overall supervision of construction of high chiefs' houses and temples were the duties of the royal architect (Kuhikuhipu'uone). Much responsibility rested on his shoulders. It was believed that a kingdom could be lost if the architect misbuilt; or won if he was right.

Russ Apple, *Hawaiian Thatched House: Use, Construction, Adaptation.*

chapter 1 : INTRODUCTION



Rising from the ocean like a chain of green jewels, the Hawaiʻian archipelago is unlike any other. Hawaii is well known as a tropical paradise, a chain of islands in the Pacific surrounded by a string of volcanoes called the Ring of Fire. (fig. 04) Visitors travel from across the globe to experience this paradise of green, white, and black sand beaches, gentle breezes and deep forests, and experience the rich culture imbued by the spirit of Aloha. Every year many visit the islands in search of once-in-a-lifetime memories and every year thousands dream of and move to the islands, taking a leap in order to have their own exotic adventure.

Yet, even with the vast amounts of money flowing through the state's economy, one out of six present day Hawaiian residents live in poverty.¹ With the influx of foreign investors and mainlanders purchasing second homes or booking what were once true rental properties for long term vacations, the cost of living in Hawaii has skyrocketed. Since the recession of 2008 the housing market has climbed to unseen heights, meaning a quick online search shows that finding any property below half a million dollars difficult on any of the islands. The housing shortage is causing increasing levels

of desperation for those with low income. The choice of an affordable home requires many Kānaka Maoli (people of Native Hawaiian descent) to relocate and accept the sacrifice of abandoning Hawaiian culture.

“Āina” and “moana”, the land and the sea in Hawaiian, are regarded as family members, as precious and respected literal ancestors. “Hale”, the home, serves as one of the most important ways in which Hawaiians understand and relate back to the environment, the solidification of their beliefs. For those living on the islands for generations, the ability to own land and hold onto a sense of place is becoming an impossible dream. The connection to the hale is not just as a means to sustain the physical body, but also a means to nourish the mind and spirit. “The term ‘āina is derived from the root word ‘ai, broadly translated as ‘that which feeds’ ”² Many Hawaiian families are forced to leave their native culture and home for the mainland because they cannot afford to remain. This possibility for greater integration with American culture comes with a high sacrifice as many lose even the most tenuous connection to Hawaiian traditional beliefs.

¹ Mary Vorsino. “Census: 1 in 6 Hawaii residents live in poverty.” Hawaii News Now, September 13th 2016. <http://www.hawaiinewsnow.com/story/33087891/census-1-in-6-hawaii-residents-live-in-poverty>

² Carlos Andrade. *Hā'ena: Through the Eyes of the Ancestors* (Honolulu: University of Hawai'i Press, 2008), 6.



The problem with inadequate low-income housing in Hawai'i is insidious: beyond the loss of home is a loss of self and of cultural identity. For Native Hawaiian families caught in a cycle of poverty the damage to heritage and belief systems has been catastrophic.

The limited housing currently available may address some of the physical needs of lodging but completely ignores and marginalizes the rich cultural ties between the natural environment and the home. (fig. 05) The soil is a sacred ancestor for Hawaiians and the built environment is perceived as an extension of the landscape, as much a part of the local environment as the black stones in the ground or the lava flowing into the ocean. As seen in traditional Hawaiian structures, architecture has the potential to connect with the surrounding environment rather than separate and resist natural forces. Architecture can engender a sense of community and facilitate a way of living "pono" or in a way that is balanced between the past and the present. However, currently the housing shortage has caused a disconnect, an architectural rift between the ideas of "āina, the land, and the rich Hawaiian heritage of community, family and the spirit of the land.

This separation from vernacular Hawaiian architecture need not exist. A return to strict tradition is impossible but a new architectural approach is- one that makes use of a hybrid of historic strategies and contemporary methods. In the past in the building of their homes Hawaiians worked with the wind, sun and topography. These same strategies should be aggressively pursued not just because of tradition, but because doing so makes sense.

The Island of Hawaii is experiencing a housing shortage so extreme many Hawaiians face a choice of homelessness or relocation. However, more damaging to the Native Hawaiians is the lack of cultural sensitivity and the disconnect created by the housing shortage. There is a figurative and literal separation between āina, the land, and the rich Hawaiian heritage. In a culture so intimately connected to the natural environment, this startling break from traditional vernacular design must be corrected. This thesis addresses both the physical needs of lodging and celebrates the ties between Hawaiians and āina through a proposed architectural design that includes multi-generational housing, a cultural center, and a spacious public garden in the village of Pahoā.

To investigate the intrinsic sacred and secular connection between the Island of Hawai'i and its inhabitants this thesis focuses on one of Hawai'i's nine districts, Puna. Puna is not only the poorest district on the island but also coexists with the powerful natural force of the volcano of Kilauea. (fig. 06) The proposed project site is Pahoā village, the central hub of the rural district of Puna. Pahoā services more than its immediate residents as a center for culture, entertainment, and commerce.

Existing low-income housing in the Puna district is limited not only in availability and accessibility to those in need, but also its interaction with the surrounding environment. Design strategies conducive to tropical housing are limited and cultural connectivity is nonexistent. This thesis proposes a design for multi-generational residential housing, a cultural center, playground and public pea-patch gardens. This proposed complex explores the uses of local resources and materials on the Island of Hawai'i, in the Puna district. While the proposal acknowledges pre-existing limitations in terms of access to civic infrastructures, the inclusion of programmatic framework in later project phases seeks to address this within the larger scheme of sacred and secular.

Methods for approaching this investigation include site visits, research into local building materials and environmental conditions across the archipelago as well as into existing physical and social conditions of housing within the Puna district. Historic examples within the Hawaiian culture and more contemporary precedents from outside and are examined for practical application, resilience and longevity. Special consideration of volcanic requirements are also addressed in the final architectural design.

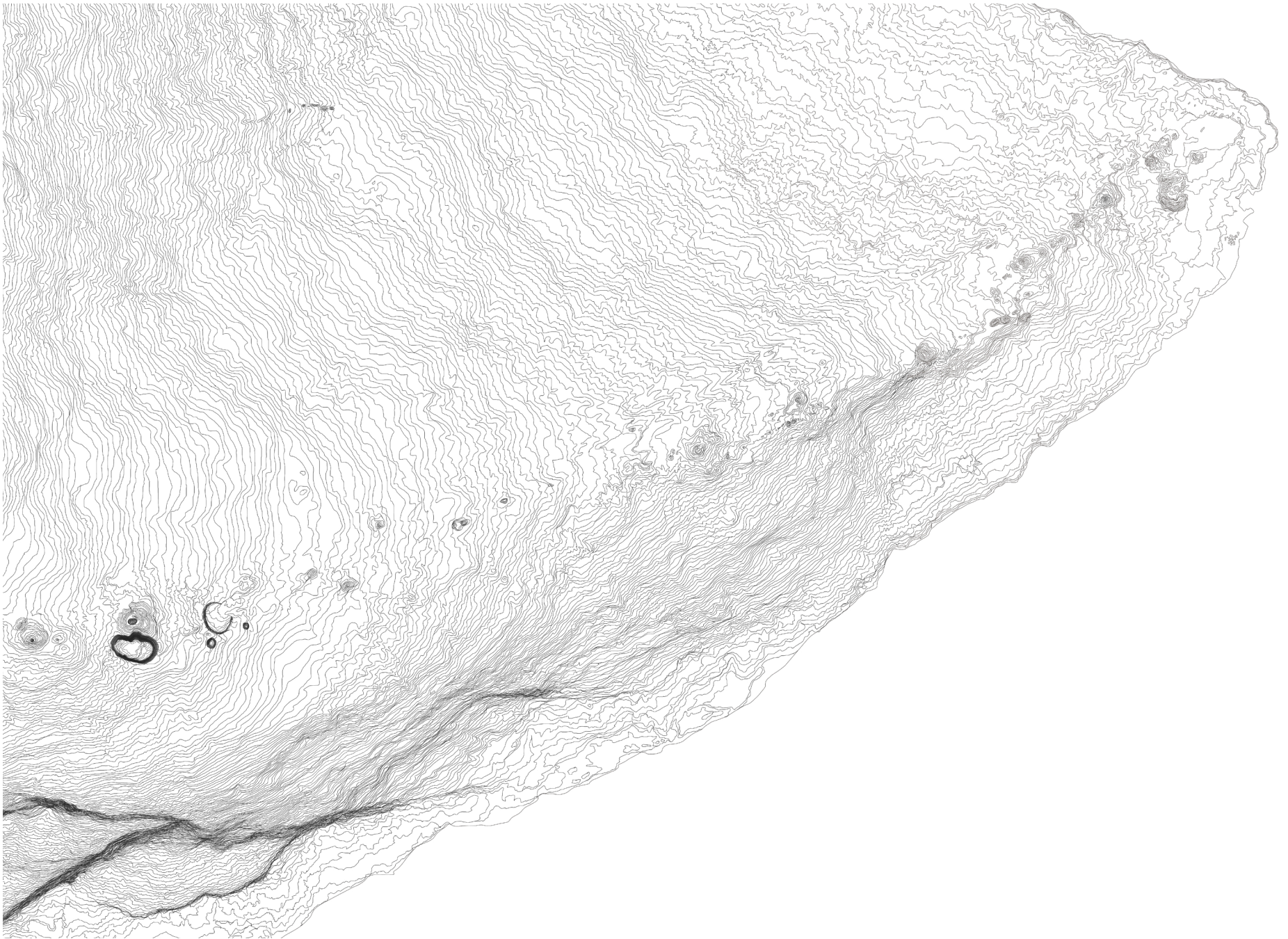


fig. 06 | detail of puna district topographical map illustrating volcanic craters

Place is intertwined with identity and self-determination of today's Native Hawaiians in complex and intimate ways. At once the binding glue that holds Native Hawaiians together and links them to a shared past, place is also a primary agent that has been used against them to fragment and alienate. Yet, place, in all of its multiple levels of meaning, is one light that many Hawaiians share in their spiritual way-finding to a Hawaiian identity, one that is greatly significant to their existence as a people and culture, both past and present.

Shawn Malia Kana'iaupuni and Nolan Malone. *This Land is My Land: The Role of Place in Native Hawaiian Identity.*

chapter 2 : FRAMEWORK



2.1 tourism on the islands

To confront the need for low-income housing in Puna's Pahoia Village, an understanding of Hawaii as a greater whole must first be established, however brief and incomplete. The framework for building begins by establishing a sense of place and the story of connection defining Hawaiian culture. Like Hawaiians their homeland, housing and the history of the islands are interconnected in many irrevocable ways. The construction of a path through this dense history is winding and overlapping. The process begins first by examining the opposing conditions of tourism for outsiders and of homelessness for locals.

While the Island of Hawai'i is suffering a shortage of low income housing, the majority of current Western-centric solutions lack sensitivity to local culture. The results are standardized low-income types without a connection to the local people and their environment. Hawaii's housing calls for a unique spiritual connection with the land as required by native Hawaiian beliefs and practices. This thesis not only addresses the desperate need for multi-generational housing on the island of Hawai'i,

but also the need for culturally sensitive architecture that respects and reinforces the living heritage of the land. This thesis searches for the sacred, the connection to the revered land, in proposing multi-generational housing on the Big Island of Hawai'i.

Hawaii is a tropical paradise fueled by eager tourists ready and willing to pay for a taste of Hawaiian culture. (fig. 07) The exotic allure requires no passport, no doctor's inoculations, and only a five-hour plane ride from California. "Hawaii's visitor industry continues to be the largest generator of jobs among the major industry sectors in the state, providing 152,864 jobs in 2010."³ The islands and the people welcome visitors of increasing numbers every year. In 2016, 8.9 million tourists stayed on the islands, meaning every day there were nearly 220,000 visitors in the state.⁴ Tourism drives the state's economy as the largest source of private capital. Strategies currently in place are designed to embrace the continuous flow of new visitors. These push with growing momentum toward increasing the \$12.4 billion of guest spending and tax revenue generated

³ Hawaii Tourism Authority. "Tourism Helps Provide for Hawaii's Economy." 2017. <http://www.hawaiitourism-authority.org/news/articles/tourism-helps-provide-for-hawaiie28099s-economy/>

⁴ HNN Staff. "2016 Was Another Record Year for Hawaii Tourism." January 31, 2017. <http://www.hawaii-ewsnow.com/story/34381765/2016-was-another-record-year-for-hawaii-tourism>

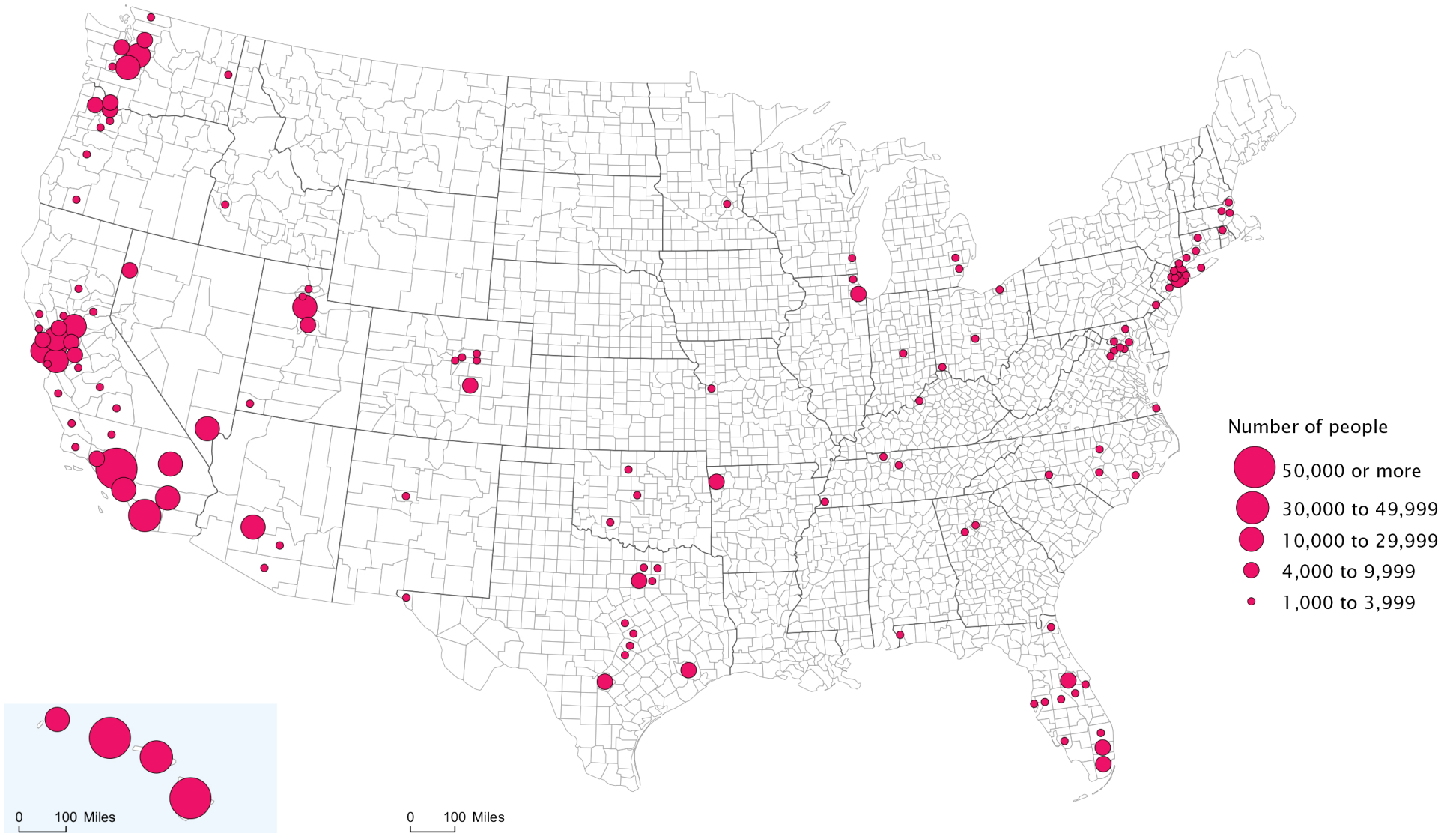


fig. 08 | lindsay hixson, bradford b. hepler, and myoung ouk kim. “native hawaiian and other pacific islander alone or in combination by county: 2010 (counties with native hawaiian or other pacific islander population of at least 1,000 are included in the map).” may 2012. u.s. department of commerce: economics and statistics administration. redistricting data public law 94-171) summary file, table p1.

from 2016.⁵ However, the revenue created by the large influx of tourists visiting the islands only adds to and exacerbates existing issues of housing, homelessness, and the displacement of Hawaiian culture. (fig. 08)

Tourism in Hawaii is a major powerhouse for the economy but nevertheless is not welcome by all local people. To create greater commercial appeal, many meaningful traditions have been repackaged and trivialized. Trask Haunani-Kay observes how Hawaiian culture has been commercialized for a public audience:

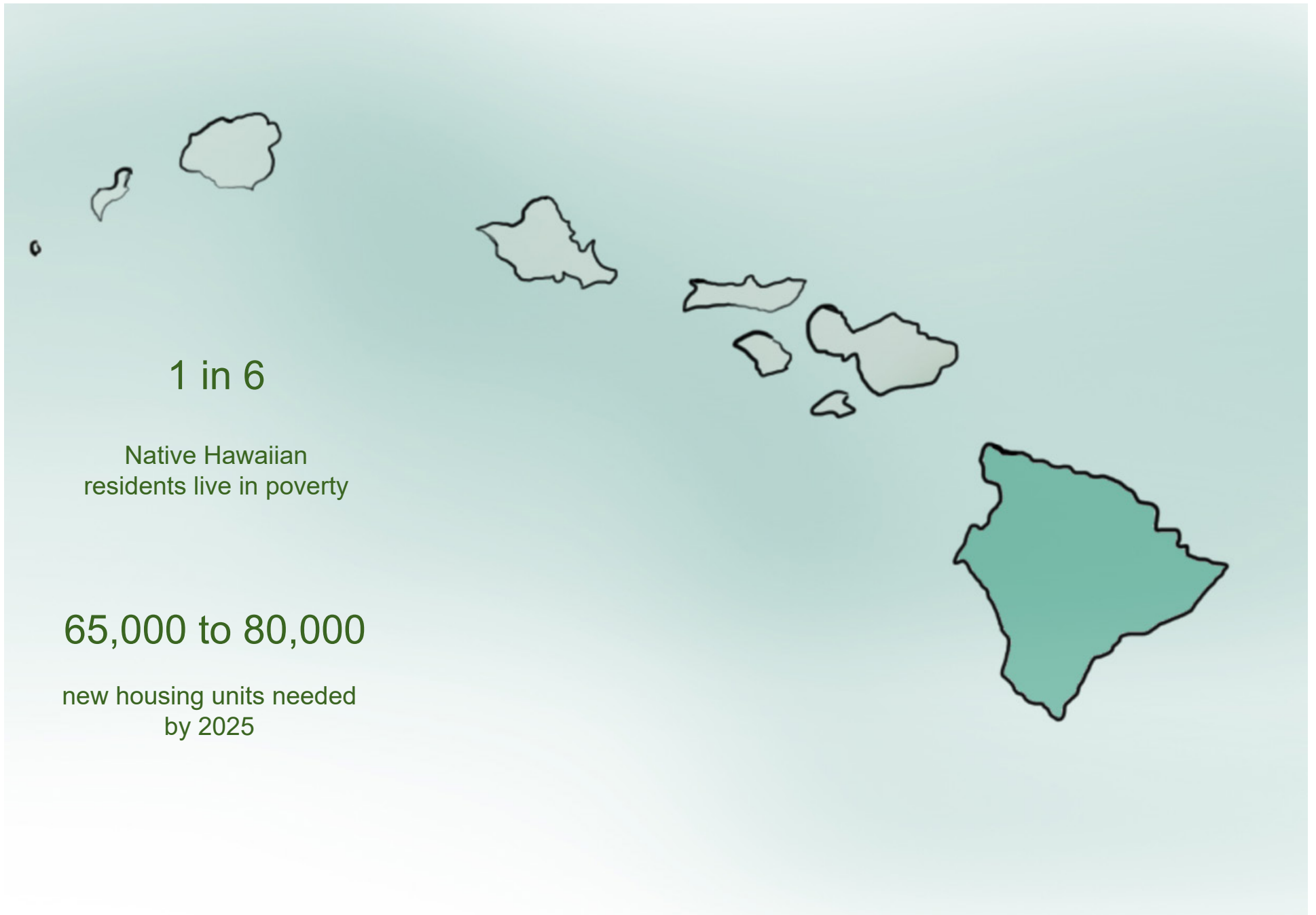
Thus hula dancers wear clown-like makeup, don costumes from a mix of Polynesian cultures, and behave in a manner that is smutty and salacious rather than powerfully erotic. In the hotel version of the hula, the sacredness of the dance has completely evaporated while the athleticism and sexual expression have been packaged like ornaments. The purpose is entertainment for profit rather than a joyful and truly Hawaiian celebration of human and divine nature.⁶

The faster paced Tahitian hula substitutes for the slower, more melodic dance in popular culture. Trask observes that audiences complain if a 'traditional' Hawaiian luau lacks Samoa's famous flaming knives. Grass skirts and coconut bras appear in abundance, though they hold no actual context. To draw visitors in, the talents and skills of distinct Polynesian peoples are represented as a single entity, a homogeneous, yet exotic bauble. "The selling of these talents must produce income. And the function of tourism and the State of Hawai'i is to convert these attributes into profit."⁷ Time-shares and hotel packages advertising complicit, smiling faces are an easier sale than the truth of a legitimate country illegally overthrown and made to dance.

5 HTA. Ibid.

6 Trask Haunani-Kay, "Tourism and the Prostitution of Hawaiian Culture" Cultural Survival Quarterly Magazine. March 2000. <https://www.culturalsurvival.org/publications/cultural-survival-quarterly/tourism-and-prostitution-hawaiian-culture>

7 Haunani-Kay. Ibid.



Aloha” is perhaps the most famous Hawaiian concept repackaged and sold for tourism. Aloha is a greeting and a farewell. This word signifies respect, love, compassion, and charity in Hawaiian.

Aloha was eventually co-opted as a “slang” to drive tourism. Hawaii became a ‘she’ – mystical, magical, and hospitable. Hawaii welcomes you with open arms when you need an escape from your demanding job; she awaits you with a smile, fresh lei, and Mai Tai. She, Hawaiian culture, is your erotic prostitute, ready to act out your fantasies.⁸

As Amy Sun argues, this fantasy of a foreign yet domesticated paradise is appealing. The majority of visitors continue to be made aware of an altered history endorsing a kind of extended manifest destiny into the Pacific. These myths perpetuate the idea the islands were fated to be annexed to the United States.

There is no rational path towards tapering the flow of Hawaii’s largest industry. In 1959, when Hawaii gained statehood 60 years ago, residents outnumbered tourists by more

than 2 to 1. As of 2000, tourists outnumber residents by 6 to 1 and outnumber native Hawaiians by 30 to 1.⁹ Tourism is the largest source of income but is also the main cause of population growth. The common belief is that citizens of the United States of America have an absolute right to move to and occupy the sacred lands of Hawaii. Historian Eleanor Nordyke notes:

Moreover, that growth ensures the trend toward a rapidly expanded population that receives lower per capita income. Tourism drives up the cost of single family housing. As a result, families spend a large share of their income on housing. [...] A tourism economy encourages foreign investment, which drives up inflation, and thus the cost of living.¹⁰

Hawai’i is a small island chain, with limited space and a finite number of homes and apartments available to residents. (fig. 09) More money spent does not necessarily mean a better quality of life for Kānaka Maoli.

8 Amy Sun. “3 Myths about Native Hawaiians You Ought to Know Before Visiting Paradise.” *Everyday Feminism Magazine*. January 9, 2015. <http://everydayfeminism.com/2015/01/myths-about-native-hawaiians/>

9 Eleanor C. Nordyke. *The Peopling of Hawai’i*. (Honolulu: University of Hawai’i Press, 2nd edition 1989) 134-172.

10 Haunani-Kay. *Ibid*.

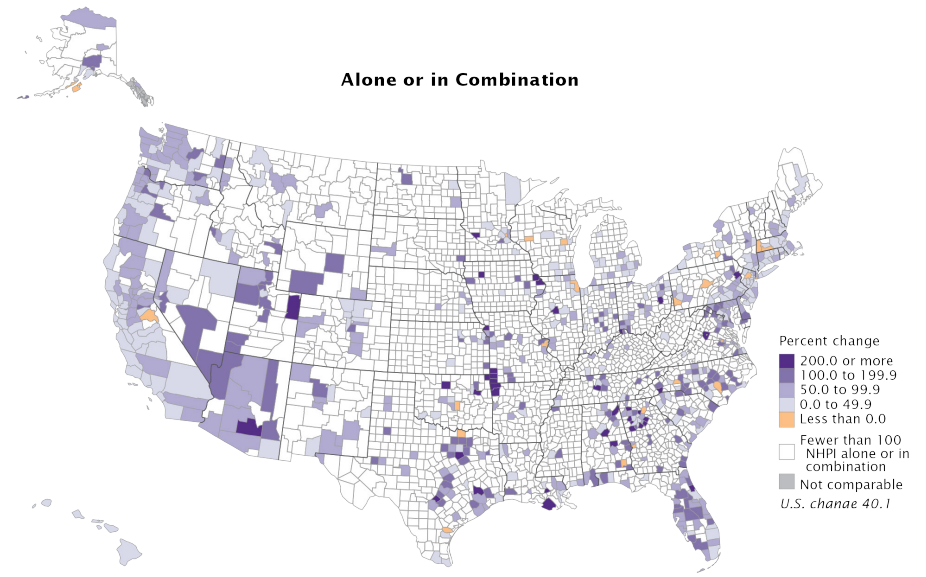
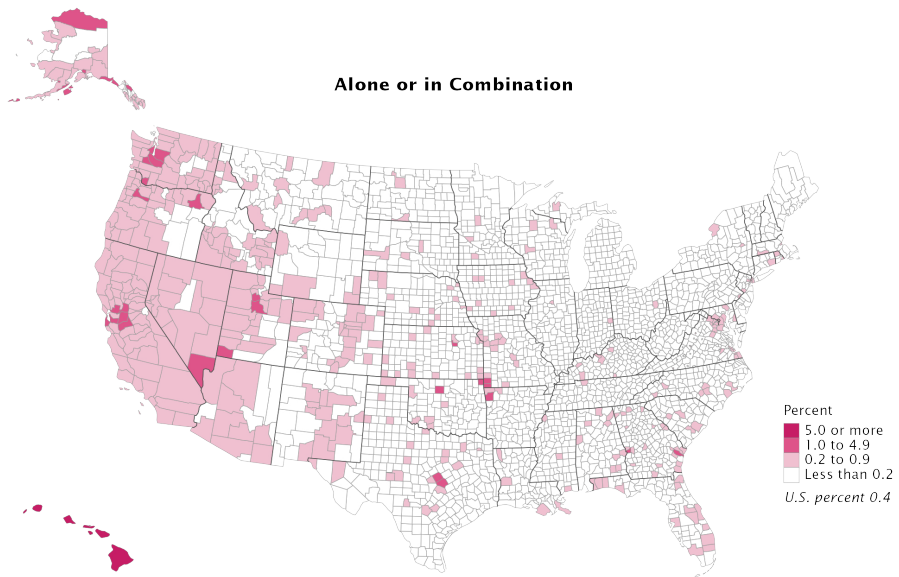
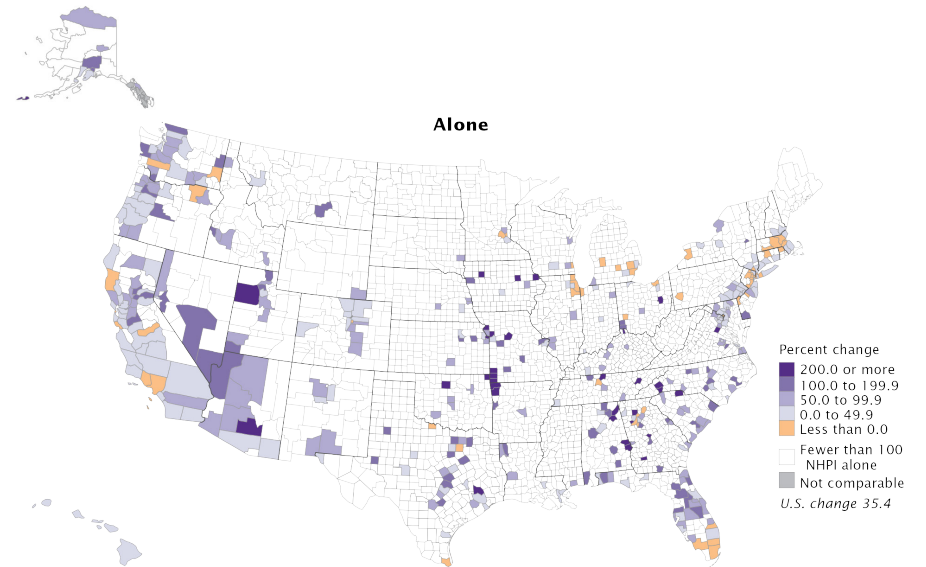
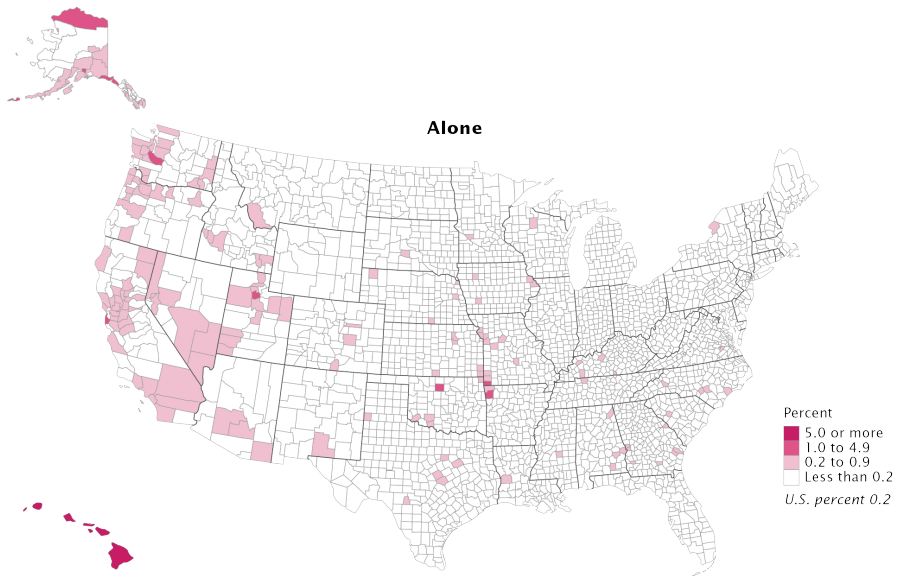


fig. 10 | lindsay hixson, bradford b. hepler, and myoung ouk kim. "native hawaiian and other pacific islander as percentage of county population 2010." may 2012. u.s. department of commerce: economics and statistics administration. redistricting data (public law 94-171) summary file, table p1.

fig. 11 | lindsay hixson, bradford b. hepler, and myoung ouk kim. "percent change in native hawaiian and other pacific islander (nhpi) population: 2000 to 2010" may 2012. u.s. department of commerce: economics and statistics administration. redistricting data (public law 94-171) summary file, table p1.

2.2 homelessness in hawaii

An important distinction exists between a resident of Hawaii, or someone who happens to live in Hawaii, and a Native Hawaiian or Kānaka Maoli . Kānaka Maoli are people descended from the original Polynesians who settled the Hawaiian archipelago 17 centuries ago. “Native Hawaiian” as defined by United States government authorities is “a person who is at least 50% Native Hawaiian.”¹¹ The burden of proof rests with the individual claiming Hawaiian ancestry and can only be validated through birth certificates, marriage licenses, and blood tests. In order to address the larger issues of housing, this thesis does not make a distinction by blood percentage between those of Native Hawaiian ancestry. However, where needed, distinctions between Kānaka Maoli (native), Kama’āina (local), and hapa haole (mixed native and European descent) are be presented in context.

The housing shortage occurring within the Hawaiian islands is severe enough to force Kānaka Maoli into a choice of relocation or homelessness. (fig. 10 & 11) Anthropologist Jan Rensel and Margaret Critchlow observe

that “ordinary homelessness in Hawai’i – the rule, not the exception – is a consequence of the steady rise in housing costs, the replacement of low-income with luxury housing, and the erosion of residential space by resort space.”¹² When scholars and activists breach the topic of homelessness within the built environment, the general focus tends to be on emergency housing. Temporary buildings are typically seen as necessary for individuals in desperate need of space because of forces outside of their ability to control. The impact of earthquakes, mudslides, flooding, and war creates an immediacy of need that is often so overwhelming that ideas of “home” are overlooked. The situation in Hawaii lacks this supposedly “acceptable” rationale for the lack of attention to the social aspects of housing.

In Hawaii, a 700 square foot home averages approximately \$475,000, or \$679 per square foot. This amount does not necessarily include the cost of purchasing the land. According to the White House Initiative on Asian Americans & Pacific Islanders (WHIAAPI) fact sheet, almost 20% of Native Hawaiians and Pacific

¹¹ Sun. Ibid.

¹² Jan Rensel, and Critchlow, Margaret Editors. *Home in the Islands: Housing and Social Change in the Pacific*. (Honolulu: University of Hawai’i Press, 1997) 199-200.



Islanders live in poverty.¹³ More than 80 percent of low income families pay over half their income to rent, and for every 100 extremely low-income family there exists only 29 affordable units. A 2015 study by the Hawaii State Department of Business, Economic Development and Tourism shows “nearly 66,000 housing units are needed during the next decade, including 25,847 units for Honolulu County, 19,610 units for Hawaii County, 13,949 units for Maui County and 5,287 units for Kauai County.”¹⁴ Competition for housing is fierce at every level of income.

The Hawaiian State government does have a program that is meant to address the housing needs of the native population. “In 1921, Congress passed the “Hawaiian Homes Commission Act,” which was designed to rehabilitate the Native Hawaiian population and their loss of native lands — by setting aside [...] 3% of the total land for Native

Hawaiians.”¹⁵ However, individuals of 50% Hawaiian blood can add their name to the Hawaiian Homestead waiting list for as long as seventy years without ever receiving their land.¹⁶ Those that do receive land are granted a homestead lease for 99 years within their family. However, once the bloodline dilutes to less than 25%, tenants are evicted if no living parent or grandparent with a greater percentage occupies the land.¹⁷ Thus “if you happen to have a blood quantum [...] of one-quarter, because someone in your family tree loved a non-Hawaiian, you’re not Hawaiian enough. You lose your right to homestead.”¹⁸ (fig. 12) Grandchildren can lose the right to live on their ancestor’s homestead if they are hapa haole, or part Hawaiian | part white, and miss the necessary blood percentage. In such cases when Kānaka Maoli are forcibly removed the chances of reconnection to the land are all but non-existent.

13 “White House Initiative on Asian Americans and Pacific Islanders Key Facts and Data” U.S. Department of Education, 2012. <https://www2.ed.gov/about/inits/list/asian-americans-initiative/facts-data.html>

14 Department of Business, Economic Development & Tourism. *Measuring Housing Demand in Hawaii, 2015 – 2025*. State of Hawaii: DBEDT. March 2015.

15 Sun, *Ibid*.

16 Britany Lyte. “Hawaiian Natives Have Been Waiting Since 1920 for Promised Land.” Aljazeera America. July 11, 2015. <http://america.aljazeera.com/articles/2015/7/11/hawaiian-natives-waiting-for-land.html>

17 Department of Hawaiian Homelands. “Residential Lessee Handbook.” Hawaii.gov/dhll. 2017. <https://dhhl.hawaii.gov/wp-content/uploads/2011/09/Lessee-Handbook.pdf>

18 Sun, *Ibid*.



In other instances, as on the mainland, some individuals cannot afford to pay taxes, or are unable to make a mortgage. Additionally, not all the Hawaiian Homestead Lands meet federal standards for occupation. Although people may have lived on the lands for years the plots may not qualify due to a lack of viable access to water or roads. (fig 13) Local resident, Nancy Malia Pi'ilani observes:

[...] Hawaiians had all their land, 'cause get lot of taro, [...] lot of taro, everything. Had lot of Hawaiians, lots of Hawaiians. But when they took the land away uh you know the State or whatever, the land from my uncle and, condemn the place they said that they was going to make roads and park or something. But look they only talk and take the land away from the Hawaiians plus what they give him?¹⁹

Once separated, the path towards regaining a sacred connection with the land is long and difficult. Governmental assistance helps at times, hinders in others, but the pervasive state of poverty among native Hawaiians curtails already restricted options.

¹⁹ Carlos Andrade. *Hā'ena: Through the Eyes of the Ancestors*. (Honolulu: University of Hawai'i Press, 2008). 101.



2.3 a village makes a home

This thesis addresses both the physical needs of lodging and the social needs of local residents, by celebrating the ties between Native Hawaiians and 'āina. It argues that Hawaiian housing calls for a unique spiritual connection to the land, requiring an architecture that respects and reinforces this living cultural heritage. (fig. 14) In order to do so, the proposal must begin with the largest scale of human settlement - the kauhale or village. An understanding of kauhale comes only with acceptance of what it means to belong to a community, the greater ohana (family), and the ever-present sense of aloha. To first understand the hale (home) an understanding of the connection between the family and the village must be established.

Hawai'i has the highest cost of living in the United States and the highest state homelessness per capita at 465 per 100,000. The next nearest are New York at 399 and California at 367.²⁰ However, in Hawaii homelessness is not seen as a single individual's problem. Among neighbors and between strangers, the idea of having a home

is always connected to the land, to the community, and to the people. Being housed is not just a question of physical shelter but is a feeling of aloha and the creation of true ohana, or family. It is a pillar of Hawaiian mentality.

Conflicts between this Hawaiian perception of the home and accepted governing norms and zoning regulations often arise. Rensel and Critchlow state: "In 1981, the Honolulu City Council [on the island of Oahu] passed a zoning regulation that borrowed from traditional Hawaiian living arrangements. This allowed for what is termed "ohana housing", or incorporating relatives into an existing structure or building an 'accessory to the principal permitted single family dwelling' for extra residents."²¹ However, less than ten years later complaints arose from those arguing the "ohana housing" was being exploited by some for personal gain. Strangers, not family, were making use of the regulation seemingly for financial gain. Therefore, an official end was put to the housing arrangement with those continuing to do so threatened by fines and legal punishment.

²⁰ *Homeless Rates By State: Hawaii, New York, and California Top the List.* AGRM. 2017. <http://www.agrm.org/NewsBot.asp?MODE=VIEW&ID=579>

²¹ Jan Rensel and Margaret Critchlow, Editors. *Home in the Islands: Housing and Social Change in the Pacific.* (Honolulu: University of Hawai'i Press, 1997) 201.



'āina
|land|



mo'omeheu
|culture|



kauhale
|village|



mea kanu
|plants|



holoholona
|animals|

fig. 15 | diagram illustrating interconnected nature of kauhale

However, as noted by Judith Modell in her article, “(Not) In My Back Yard: housing the Homeless in Hawaii,” allowing so-called strangers to live in one’s home is not a foreign concept. In Hawaii the family:

is composed of people connected by ties of love and loyalty, duty and obligation. Members of an ‘ohana may or may not be blood kin; they are related by virtue of sharing sustenance and support. The definition suggests a permeability of household boundaries and an expansion of the meaning of ‘co-resident.’ The ‘ohana also recalls that “home” is more than a roof over one’s head and “residing” more than a matter of having a place in which to eat and sleep.²²

A hale or home is not just a place for a group that is legally recognized as kin, but of individuals that are linked by their shared ideals.

Concept of the “ohana” is exemplified in an event that took place in the summer of 1991 on the island of Oahu. To tackle issues of homelessness in Waimanalo, a task force was formed by the state. A presentation of the governor’s plans to create a removed cluster village to house the homeless were met with loud opposition from the local residents. Jan Rensel argues that this negative response was

not an illustration of NIMBY-ism (Not In My Backyard) ideas but rather:

the residents of Waimanola [...] embraced a kind of “IMBY-sim.” They did not want the homeless to go away and be someone else’s problem. They proposed instead that the homeless be given housing in their own backyards – within the community and incorporated, not separated and stigmatized. Even more notably, the suggestion was not just figurative but literal: The residents of Waimanola intended to “house” people in the backyards and front yards of existing structures.²³

Yet, another example of the significance of ohana in Hawaiian culture is the local response to a State proposal of a family foster care program in the early 1990s. This proposal acknowledged: “While their particular needs are diverse, all homeless families need basic shelter. What better place to provide such shelter than with families who are willing to reach out as individuals and offer such shelter in their own homes?”²⁴ Much like “ohana housing”, the foster care program drew upon existing practices of bringing together community and creating connections. (fig. 15) For the locals and families who had been informally fostering families and individuals for

²² Rensel. Ibid.

²³ Rensel. Ibid. 195.

²⁴ Rensel. Ibid. 206-207



fig. 16 | images of everyday life and community in hawaii

years, this inclusive alternative to relocation was a simple and obvious solution. These examples demonstrate the active engagement of local residents in the concept of ohana. (fig. 16) The most important aspect in finding a solution to homelessness has traditionally not been a matter of getting rid of people who did not belong, but insuring a sense of belonging among everyone involved. Ohana connects individuals into a village, a kauhale, by choosing to make a place for the displaced.



fig. 17 | images of 'āina and moana: everpresent elements twined with hawaiian culture

2.4 connection to the land

Sociologists studying the Pacific Island diaspora note the dispersion of Native Hawaiians from Hawaii is increasing exponentially with each new generation. Trask Haunani-Kay states, “The very high cost of living in Hawai’i has encouraged the Native people to leave their island home in search of better economic conditions on the American continent.”²⁵ Those who decide to stay face the physical and social deficits created by the housing shortage. The majority of low-income and affordable housing currently being built on the islands would be recognizable anywhere in the United States. Sustainable design is superfluous as it seems that including vernacular passive strategies are too time consuming when the budget is fixed and barely sufficient. Developers driven by the demands of tourism find little reason to reinvest funding into basic shelter for the locals. Those who do tend to adopt the strategy of building fast and cheap for residents who are grateful for any improvement to their living situation.

Perhaps even more treacherous are the wealthy investors interested in purchasing property and building a luxury getaway in order

to supposedly “protect” the local heritage and gain stewardship over the land. The presumption is that the land needs an outside savior to guard and conserve it rather than depending on those who have lived there for generations. In some cases, such as the recent land purchase by Facebook creator Mark Zuckerberg, this “protection” includes purchasing acres of property and building a six-foot wall around the entire property. This action effectively cuts off all access to these lands for the Kānaka Maoli and ‘āina, violently severing the ancient spiritual link essential for Hawaiian identity.

As noted by journalists Julia Carrie Wong and Jon Letman, the purchase of 700 acres of land in Kauai by Zuckerberg drew a great deal of attention to the cultural cost of losing Hawaiian land to outside entities.²⁶ In the article, Kapua Sproat, a law professor at the University of Hawai’i, was quoted as saying, “This is the face of neocolonialism [...] it’s the last nail in the coffin of separating us from the land. For us, as Native Hawaiians, the land is an ancestor. It’s a grandparent,” she added. “You just don’t sell your grandmother.” (fig. 17)

²⁵ Haunani-Kay. Ibid.

²⁶ Jon Letman and Julia Carrie Wong “Hawaiians call Mark Zuckerberg ‘the face of neocolonialism’ over land lawsuits,” *The Guardian*, January 23, 2017. <https://www.theguardian.com/technology/2017/jan/23/mark-zuckerberg-hawaii-land-lawsuits-kauai-estate>



Carlos Andrade, professor of Hawaiian studies and current director of the Kamakakuokalani Center for Hawaiian Studies at the University of Hawai'i recognizes these familial ties as a necessary and intrinsic aspect of Hawaiian understanding:

The people of Hawai'i perceived themselves as younger siblings of the 'āina, the islands, which provided nourishment for body, mind, and spirit. [...] The word "āina means far more than the simplistic English term land suggests. Derived from the term 'ai (food, to eat) or more broadly, "that which feeds or nourishes," 'āina goes far beyond the material feeding of the physical body. [...] 'āina also refers to the nourishment of mind and spirit. The dual aspects of spirit and mind remain inseparable from Native understandings of 'āina, which nourish Hawaiian identity, and mystically and genealogically connect the people to the islands and to generations of ancestors who came before them. This understanding of 'āina is critical to the continued well-being of the Hawaiian people. The concept embraces much more than simple land or real estate.²⁷

Thus 'āina can be seen as forming the foundation of what it means to be Hawaiian. The connection between the people and the land and sea, and to the living spirit of mana

or divine power permeates the environment and infuses it with meaning. (fig. 18) "Because yes, we own our own land, we pay our land tax, we 'bought' our properties, that is not the native Hawaiian concept. [...] You in Hawaii, you bought your land, you know where it is [...] but the native Hawaiian viewpoint is this: we will *never* own our land."²⁸ The land is held in trust for future Kānaka Maoli, 'āina is the living ancestor acting as the mother, the little brother, the kupuna.

Ohana means family – but family is more than blood relatives. Hawaiians perceive themselves as related to the land they stand upon, the plants giving shade and the food they eat, tracing back two thousand years to the first landing of the great canoes on the shores of Big Island's Ka Lae. "[The land] preserves the memories of many generations, forming a repository, a foundation for their identity as a people. The 'āina (the land) not only provides food, sustaining physical bodies, but also nurtures the social, cultural, and spiritual senses of the Hawaiian people."²⁹

²⁷ Carlos Andrade. *Hā'ena : Through the Eyes of the Ancestors*. (Honolulu: University of Hawai'i Press, 2008) 76.

²⁸ Big Island Video News. "Lava Diversion Talk Rebuked". YouTube video, 11:23.[September 2014]. <https://www.youtube.com/watch?v=7tBnIAG371o>

²⁹ Andrade. Ibid.

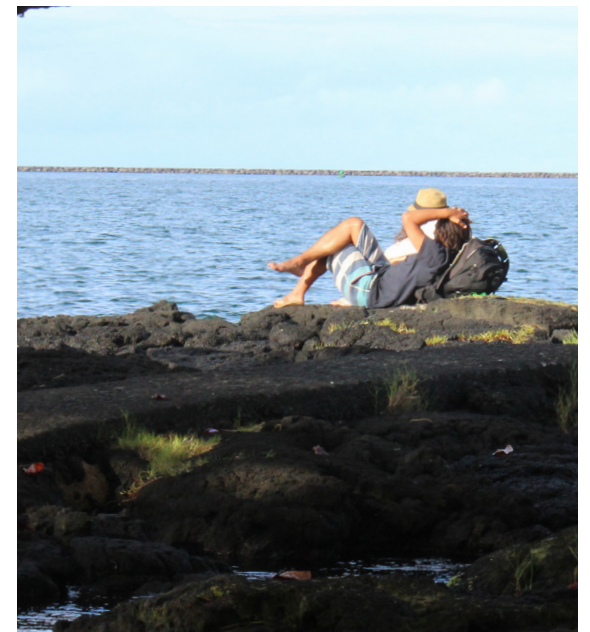
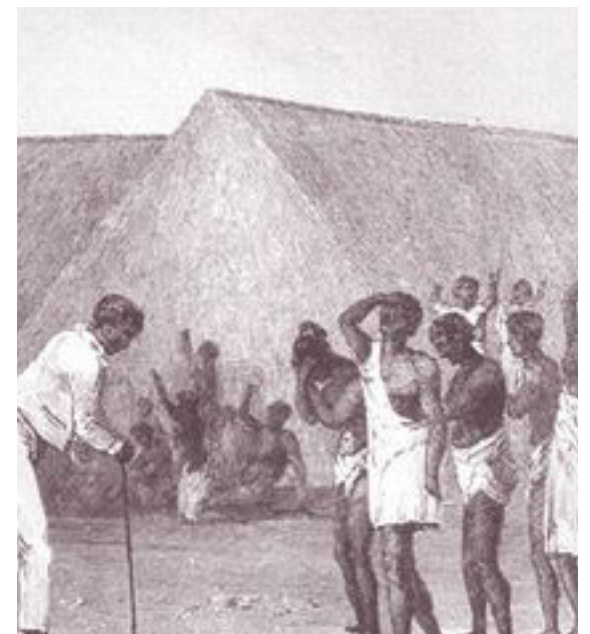


fig. 19 | images of downtown hilo, hawai'i. 2017

Due to the vast importance of this connection to the land, this thesis therefore argues that any built intervention must be considered within this system of connections between the land and the people, and from village to the house. (fig 19) The design proposal consists of multi-generational housing, focused on blurring interior and exterior distinctions, a sprawling community garden with playground to inspire and initiate interaction within the kauhale and between generations, and a cultural center for kama'āina and residents to gather, "talk story," hold luau, and share aloha.



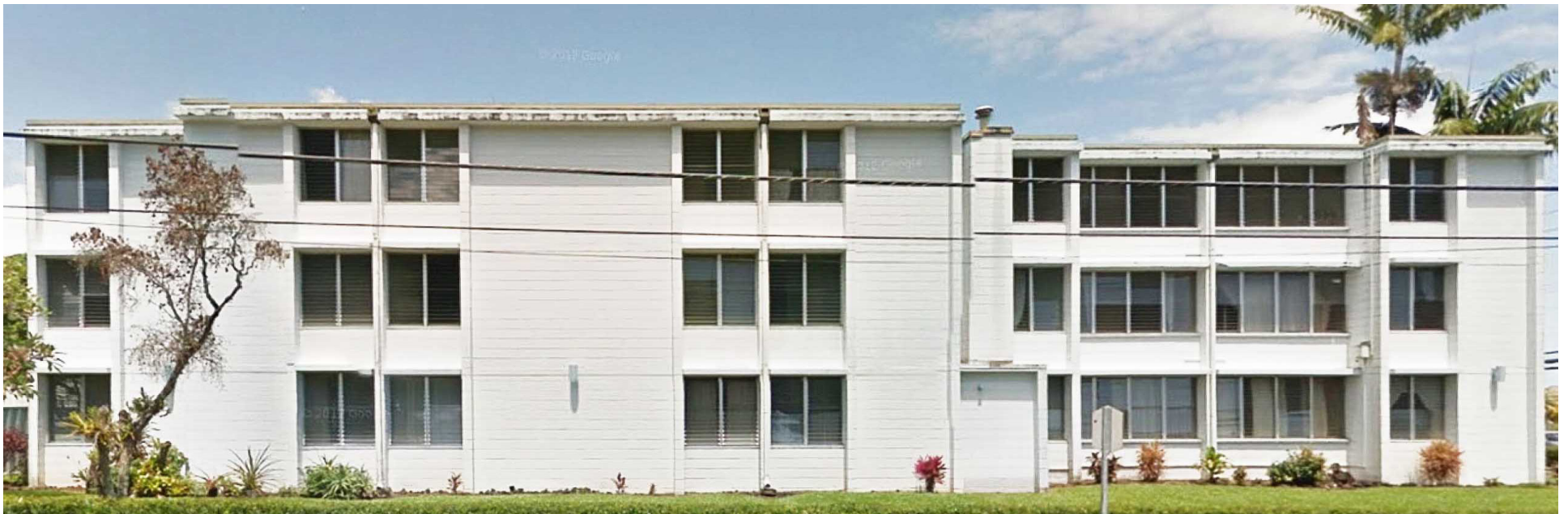
2.5 from kauhale to hale

Having established the nature of housing in Hawaiian culture as a social and physical need, the issue of the hale or home can finally be addressed. Hale means home, but like so many Hawaiian words, hale requires some unpacking before the full meaning is laid bare. The house is interwoven with the concepts of family and community and of the land and environment:

There were many lōina (rules) associated with the construction of hale. The kahuna ku'iku'i pu'uone, priest who chose the location for a hale, had the final word on the important decision of site selection. The building of a new house was marked with ritual and a feast of dedication. The "birthing" ceremony of a new dwelling centered around the doorway of the house with the cutting of the piko (center, symbolizing the umbilical cord) of the house and offerings of fish. The kahuna o Lono recited a Pule Ho'ola'a Hale (House Dedication Prayer). Hale were built by Kānaka Maoli with millennium old understandings of the land on which they lived. They were familiar with the winds, rains and the other natural elements that would affect the house in the many years to come.³⁰

In Hawaii the hale is more than four walls, a floor, and a roof; not just a construct but a living thing. In a sense, hale is a microcosm: concepts of 'āina, moana and mana, the land and ocean and spirits, work together with community. (fig. 20) Just as the relationship of humanity to the world is explained in terms of family, so is the relationship of the spirit of mana to the land expressed in the form of the hale. The Hale is given meaning, made greater, by the literal and figurative position it occupies within the assembled community.

30 E.S. Craighill Handy and Elizabeth Green Handy with the collaboration of Mary Kawena Pukui. *Native Planters in Old Hawaii: their Life, Lore, and Environment*. Bernice P. Bishop Museum bulletin 233. (Honolulu: Bishop Museum Press, 1991) 294-295.



The history of the house in Hawaiian architecture reveals a mismatch of styles and influences. “[Hawaiian architecture] is New England colonial architecture thought by Protestant missionaries to be appropriate for the Sandwich Islands. It is the improvised work of ex-seafaring men who skillfully designed and assembled buildings with bits and pieces of ships’ timbers and with coral blocks. It is Victorian architecture and American Florentine architecture – a commodious backdrop for the stage-like pomp and grandeur of Hawaii’s monarchy.”³¹ The aesthetic gap between this architecture of the last two centuries and the ancient thatched home has left architectural historians at a loss to discuss the character of Hawaiian architecture.

Contemporary apartment buildings in Hawaii leave much to be desired in seeking the meaning of the hale. Concrete, multi-story affordable and low-income housing typically have failed to evoke a sense of a natural aloha. Focusing on a typical sense of privacy and separation, the layout and appearance of the housing being built today do not align with Hawaiian customs of integration, unity and community. Double loaded, single corridor

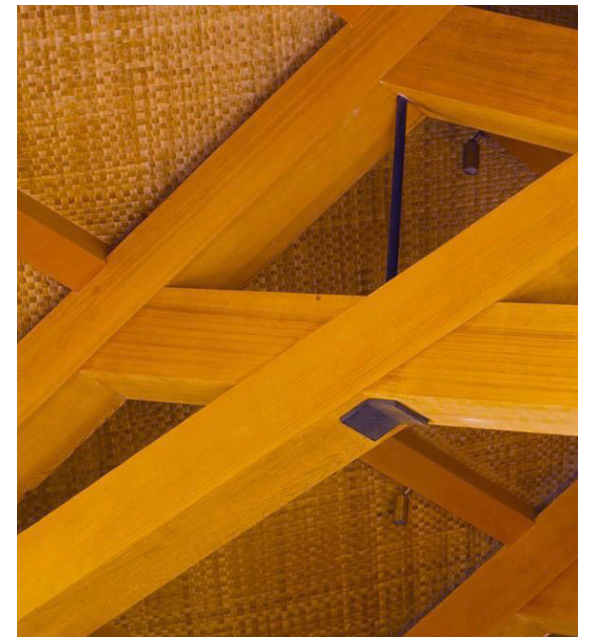
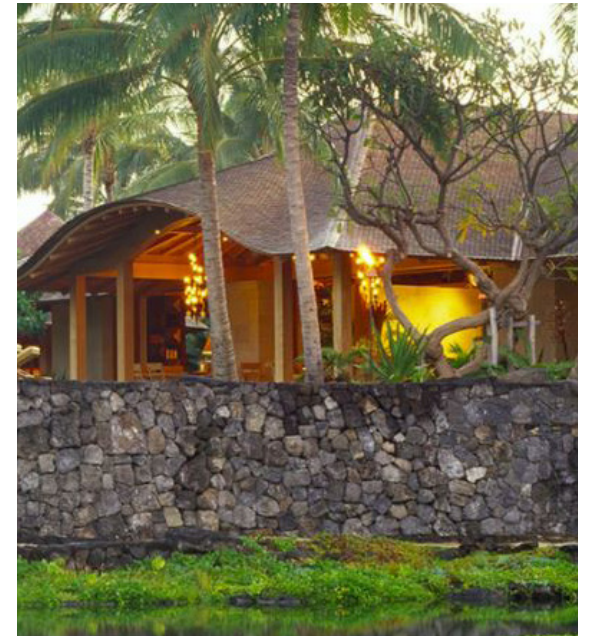
apartments fail to respond to common-sense, vernacular design for tropical regions. Deforestation and limited landscaping is a hollow representation of ‘āina in a culture where light, air and the environment play such vital roles in everyday life.

Not far from the rural district of Puna, two typical examples of affordable housing located in Hilo are E Komo Mai Apartments, built in 1971, and Hale Ho’aloha Apartments, built in 1972. (Fig 21) Both embody the lack of attention to local character or care for cultural sensitivity. As stacked, double loaded corridors, with mostly plain white facades, the two buildings could be located almost anywhere in the United States. From the subdued color palette, flat roofs without overhangs, and shallow or missing balconies, the architectural details reveal a lack of recognition of the location and the people.

Fairfax and Regan observe: “In the design of houses [in Hawaii] the tendency has been to borrow the California tract house concept, to add one lanai, to subtract one fireplace, and to erroneously claim that this equation results in an Hawaiian house.”³²

31 Geoffrey W. Fairfax and Rick Regan. *The Architecture of Honolulu. An Island Heritage Book.* (Norfolk Island, Australia: Island Heritage; Distributed by W.W. Distributors, Honolulu, 1971) 7.

32 Fairfax. *Ibid.* 15.



Private contemporary examples of Hawaiian vernacular thrive – illustrating basic archetypes such as wide low roofs, post and beam construction with traditional tectonics and wall-less or perforated open plans blurring and disintegrating the lines between interior and exterior spaces. But what should be common is reserved for the affluent. (fig. 22)

Currently, Nani O Puna, built in 1976, exists as one of three examples of low income housing in the Puna district and is the only one located within or near the immediate vicinity of Pahoā. The design incorporates elements of Hawaiian architecture including a wide roof and elevated flooring, showing some awareness of the local climate. However the small number of windows for passive cooling and lighting, and size of these single units do not respond to the particular needs of the Hawaiian ohana. Additionally, their reliance on the expensive electrical grid and restrictive tenant requirements limit their affordability and viability for local families.

Such single and two bedroom units do not reflect the Hawaiian context of ohana. These existing housing projects fail to address the

multi-generational needs of Hawaiian families in their size and layout. A poll conducted by Caring Across Generations revealed “among Hawaiian adults between the ages of 45 and 70 one-third reported that they currently help care for an aging person in their home.”³³

This means beyond the housing shortage requirements necessary for young adults and families, there also exists a parallel need for homes for the elderly.

When addressing someone older, Hawaiians refer to that person as auntie or uncle, or to show deference, kapuna. For an elder or a grandparent, this is a sign of deep respect and love for their accumulated wisdom and to bestow dignity on their life experiences. Hawaiians consider caring for their parents and grandparents a part of their social identity.

33 Christina Cauterucci. “Elder Care Is a Looming Crisis. Hawaii Is Facing It Head-On.” Better Life Lab. June 5, 2017. http://www.slate.com/blogs/better_life_lab/2017/06/05/hawaii_is_facing_down_a_looming_elder_care_crisis.html



When the time is right, kapuna are taken into a child's or grandchild's home and cared for by family. Local resident Thomas Hashimoto observes:

My parents would always remind us, respect. That's why all the old kupuna we call them grandma or grandpa, you know, never by their name. You've got to aloha because that's the way. So thereafter you know while you're growing up you're thinking about this. That was the guideline already. That was the way of life.³⁴

In 2015, when Care Across Generations began advocating for legislation for universal long-term care for seniors in Hawaii, CAG's political director, Kevin Simowitz, was taken aback by the staunch push-back his group received from locals. Despite widespread appeal across the mainland, they found Hawaiians were hesitant regarding the CAG's approach. "I was surprised at how often, early in the conversation, people would say some version of, 'I don't think this is somebody else's responsibility. I think care is my responsibility. My parents are getting older—I should take care of them.'"³⁵ Like the homelessness task force on Oahu back in 1991, Care Across

Generations discovered locals do not want to separate themselves from their ohana.

The Kapuna Caregiver Assistance Program grew from those initial talks. (fig. 23) The goal is not to relocate kapuna into an assisted living facility, but to "help a family caregiver continue to work outside the home, get some necessary breaks in care-giving work, and give her the money to pay a fair wage to the care workers she hires."³⁶ Although the culture of care remains strong despite adversity, such programs aid in strengthening community and familial bonds.

As the population in Hawaii continues to age, alternatives to assisted living facilities continue to grow in popularity. Multi-generational housing is a needed and desired extension of these social programs.

³⁴ Andrade. Ibid. 23.

³⁵ Cauterucci. Ibid.

³⁶ Cauterucci. Ibid



fig. 24 | images of cooled lave from kilauea flow on chain-of-craters road

In addition to these social needs, the unique environmental conditions of the Puna district must also be considered. In 1990, Kalapana was a wealthy coastal town with ocean views, located near Chain-of-Craters road, south of Pahoa. Kalapana Gardens was a subdivision filled with retirees and families happy to have found a piece of paradise. All that changed when the lava flow from Kilauea Volcano altered course and began moving towards the east. In total, all 125 homes of Kalapana Gardens were abandoned and evacuated as the lava flowed towards the community. Since the volcano began erupting above the surface on January 3, 1983, almost two hundred homes have been lost.³⁷

Up until recently, lava diversion tactics in the region have been aggressive. Because the lava flowing from Mauna Loa and Kilauea can travel long distances underground, the idea behind lava diversion seeks to force the molten rock to take a different, less disruptive path. (fig. 24) If not redirected, then the lava tubes beneath the earth's surface can be broken or

blocked so the supply of lava will lessen. Earthen berms and concrete walls have been erected, dykes have been dug, massive explosions have been released and aerial bombs dropped in the hope of preventing millions of dollars in damage to property and real estate. Even attempts to chill and prematurely harden lava with water have been made. But history has proven such tactics simply do not work in Hawaii.

The history of lava diversion began as early as the eruption of 1881, when explosives were suggested as a means to divert the lava threatening the city of Hilo, Hawai'i. Explosives were first used in 1935, without much success. Mauna Loa was bombed again in 1942, without any "significant effects." In 1975 and 1976 "the U.S. Air Force conducted extensive testing of large aerial bombs (to 900 kg) on prehistoric Mauna Loa lavas" and determined a particular type of spatter cone to be especially fragile. This could potentially be applicable as a successful technique for lava diversion.³⁸ However, the explosions created massive

37 Associated Press. "Fast-Moving Lava Is Threatening To Engulf Rural Hawaiian Town." *New York Times*. April 28, 1990. <http://www.nytimes.com/1990/04/28/us/fast-moving-lava-is-threatening-to-engulf-rural-hawaiian-town.html>

38 J.P. & Torgerson Lockwood and F.A. Bull. "Diversion of Lava Flows by Aerial Bombing" (*Lessons for Mauna Loa Volcano, Hawaii*. December 1980, Volume 43, Issue 4). 727–741. <http://link.springer.com/article/10.1007%2F02600367>



and irreparable damage to ancient and sacred Mauna Loa, scarring the earth and causing outrage and anger among native Hawaiians.

Because of these failed attempts of the past, talk of lava diversion is met with extreme hostility by locals and Native Hawaiians. Using destructive means is no way to treat a relative, especially if the severe damage done to the 'āina accomplishes nothing. Although the lava has the potential to cause millions in property damage, the Hawaiian lava flow is not an issue of concern for immediate life safety. There has not been any loss of life in the past due to lava.

Hawaiian lava is known by two names: pahoehoe and a'a. Pahoehoe forms when lava is slow to cool, this type of lava is ropey and moves in loops and swirls like molasses spilling. A'a is thick, chunky and oddly fluffy, forming when lava loses heat quickly. Pu`u `O`o is the name of the on-going eruption along the southern coastline of Puna. Therefore, lava moves at a steady pace so residents know well in advance of its approach.

Thus, in 2014 when the flow from Kilauea Volcano began encroaching upon Pahoa Village, resistance to lava diversion was polite but firm. Residents defended the lava flow as an act of Pele – the goddess of the volcano and fire - a force to be respected rather than feared. Local Puna resident Ihilani Niles explains:

As a native Hawaiian, Pele doesn't work like that. Who is Pele to us? And I'm telling you guys this because it seems to fall on deaf ears when you tell 'we got to be sensitive to this culture.' This is our culture, this is the native people of this place. Native Hawaiians, Pele is our kupuna. She's our ancestor. So, you wonder where all the native Hawaiians are, some of us are here, but we're home preparing for an important guest. That's what we do when an important guest, or our Kupuna, is coming. Okay? So, we're at home preparing.³⁹

In town meetings, and on social media the message was clear to uninformed residents: Pele will not be diverted. (fig. 25)

This is Pele's home; and to come in and say "Pele, you go here" in Her house, is hewa, and we need to stop, like my tutu said 'knock it off already.' We do one thing: we keep the people safe – two things actually: we stay informed, and we keep our people safe, the visitors here as well as us. So, mahalo to you guys, but we are not diverting Her.

39 Big Island Video News. "Lava Diversion Talk Rebuked". YouTube video, 11:23. [September 2014]. <https://www.youtube.com/watch?v=7tBnIAG371o>



[...] If anybody that is not informed, or ignorant to our culture, needs to get in touch, I'm around. This is where we live and raise our kids. Ask. We like to inform people so we don't come up here unnecessary. This is Her place. And if She feels that She needs to clean Her house, then let Her clean her house.⁴⁰

the significance of recognizing the cultural environment and treating Hawaiian beliefs with respect cannot be emphasized enough.

Among experts in the scientific community, the question of whether or not to use lava diversion is similarly answered. Hawai'i County Civil Defense Director Darryl Oliveira states of the Puna lava flow: " We are not exploring or pursuing a diversion because of the uncertainty as to whether or not it would work or if it would actually make problems worse. It could divert a flow into another subdivision, spare one and compromise or sacrifice another. [...] We are very sensitive to the cultural aspects of what the volcano represents in our communities."⁴¹

In Hawai'i then, the lava flow is an accepted part of life, a risk not dissimilar to owning a home in Tornado Alley in Kansas, or living anywhere in Florida. The question is not 'if' but 'when' a tornado or a hurricane hit. (fig. 26) Preparation is key and life and health safety are of the utmost importance. Nevertheless,

40 Big Island Video News. Ibid.

41 Big Island Video News. Ibid.



2.7 precedent analysis

In order to properly evaluate related planned community precedents of similar housing, a set of strict guidelines have been established for this thesis in order to choose the following case studies. Is the project located in a similar environment and/or social climate? Was the community built and if so is it architecturally successful: does it fit the social and natural environment? While many proposals sought to achieve cultural awareness, the reality of these realized communities are well intentioned but poorly executed plans without staying power. Research reveals that few examples remain beyond the ten year mark. These communities generally lacking the ability to self-sustain or grow either architecturally or in population.

Auroville (Fig. 27)

1968 Tamil Nadu, India (South India) Architect:
Roger Anger
Client | Founder: Mirra Alfassa (the Mother)
Location: Tamil Nadu, India (Southern India)
Construction: 1968
Population: approximately 2,400

The township of Auroville was established in India in 1968 by Mirra Alfassa, also known as the Mother. Originally planned for 50,000

residents, the current population, after almost fifty years of growth, has reached approximately 2,400. Half of the population is of Indian descent, with a noticeable presence of French, German, and Italian residents. There are about 84 people from the United States. Although the population appears sparse for a community, its continued survival speaks well of its ability to maintain itself as a small town. According to the Auroville website: "It wants to be a universal town where men and women of all countries are able to live in peace and progressive harmony, above all creeds, all politics, and all nationalities. The purpose of Auroville is to realize human unity."⁴² Auroville seeks to be both a social community as well as a physical development.

The architecture contains a variety of forms and styles, ranging from traditional thatched roofed and mud brick homes, to extreme modernist and sharp deconstructivist forms of glass and steel. Certain aspects of the architecture seeks to respond to the environmental conditions and follow logically with the climatic conditions. However, the detached nature and the heterogeneity of the appearance results in a gap between community of the surrounding land and people.

⁴² Auroville. Auroville: City of Dawn. November 18, 2014. <http://www.auroville.org/>



Cinderland (Fig. 28)

Architect: None

Client | Founder: Jezuz (Eugene Andrews)

Location: Kapoho, Puna District (Big Island, Hawai'i)

Established: 2001

Population: rotating, approx. 40-50

Cinderland is an EcoVillage established in Kapoho on the Big Island of Hawai'i not far from this thesis site of Pahoa Village. Their mission statement reads: "Our vision is a world where everyone lives in ecological harmony. Cinderland's mission to build a self-sustaining community started from barren land and minimal funding." The residents plant their own food, use catchment systems for potable rainwater, are clothing optional and prohibit use of wifi. This is an ideal for living off grid on a tropical paradise, imbued with the powers of positive thinking and self-actualization through commune living. Cinderland has reached a level of success in having been occupied for seventeen years, but the population remains small with a general max of fifty residents.⁴³

The spiritual connection to mana and 'āina becomes nothing more than a weekend camping trip in the jungle. Deeper reading of their published information reveals the continued success of the EcoVillage hinges on the establishment acting as a quick turn bed and breakfast or hostel, rather than a true community. Their advertising literature provides no mention of Hawaiian culture or the people. "Cinderland was truly a no man's land where nothing grew but a patch of hardy weeds."⁴⁴ The description, taken from the Cinderland official website, strikes a particularly naive chord in a place so desperately in need of true cultural sensitivity. Even in remote areas, Hawaiian tourism pushes itself forward as an easy source of income and a perfect excuse to bottle and sell the sacred connection between 'āina and Kānaka Maoli. Visitors get a taste of living off the land in a Hawaiian jungle and then they go home.

⁴³ Cinderland. Cinderland EcoVillage. 2017. <http://cinderland.org/welcome-home/>

⁴⁴ Cinderland. Ibid.

Perhaps the most critical question that lies before us now is, what is Hawai'i's future, and where are its Native people in those plans? As Hawai'i suffers everincreasing challenges of overdevelopment and environmental degradation, we all, whether indigenous or not, must work together to protect this place. And yet, for whom is Hawai'i being developed, when more and more of its indigenous population cannot afford to live on and care for our precious 'āina? These questions require answers that account for our place as a people not only now, but also in another 50, 100, or even 1,000 years.

Shawn Malia Kana'iaupuni and Nolan Malone. *This Land is My Land: The Role of Place in Native Hawaiian Identity.*

chapter 3 : METHODS



fig. 29 | murals of pele within pahoia village. 2017.

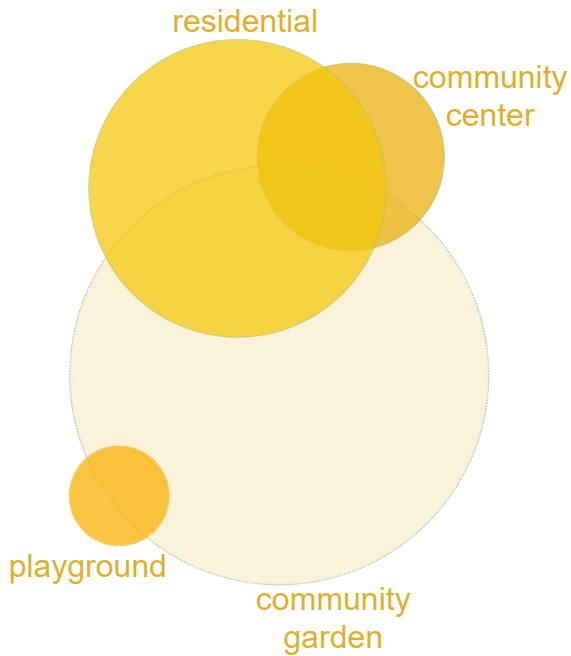
3.1 thesis goals

The proposed thesis goes beyond fulfilling the need for affordable island housing by proposing a self-sustaining community that creates a bridge between kauhale and 'āina: the village and the land. This thesis aims at making a true cultural connection between Native Hawaiians to the land through the built environment. In the creation of self-sufficient housing in Pahoā village, the goal is more than shelter. This provides not only a place for Hawaiian families to live and work but also to create and cultivate a connection with their land and culture. The project is architectural in nature but seeks to impact the spirit of the people it houses:

In the Polynesian past, what was important was not when something happened, but where, how, and in what sequence events occurred. Hawaiian traditions pinpoint places as landing spots of ancestral navigators, as locations where the people emerged into the world, or as arenas in which they lived, fought battles, engaged in love affairs, and buried the dead. These named places were, and still are, considered sacred by the Hawaiian people.⁴⁵

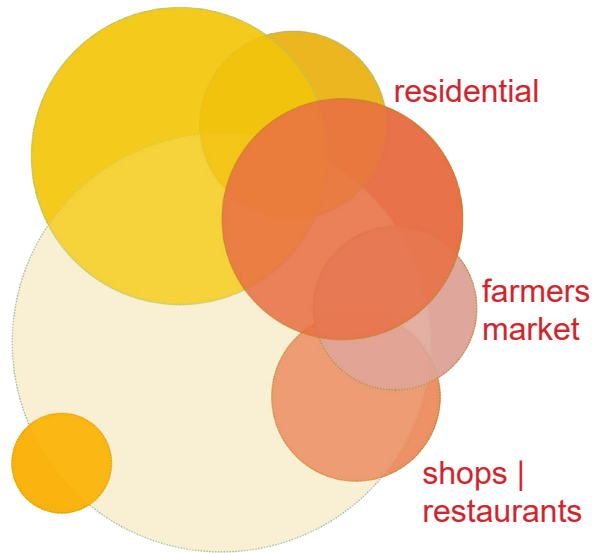
As Carlos Andrade observes, this connection can be readily located in the sacred nature of place. This thesis seeks to make visible this spiritual quality of the built environment in a proposal mapping out a new construction type for all of Puna district. (fig. 29)

⁴⁵ Andrade. Ibid.



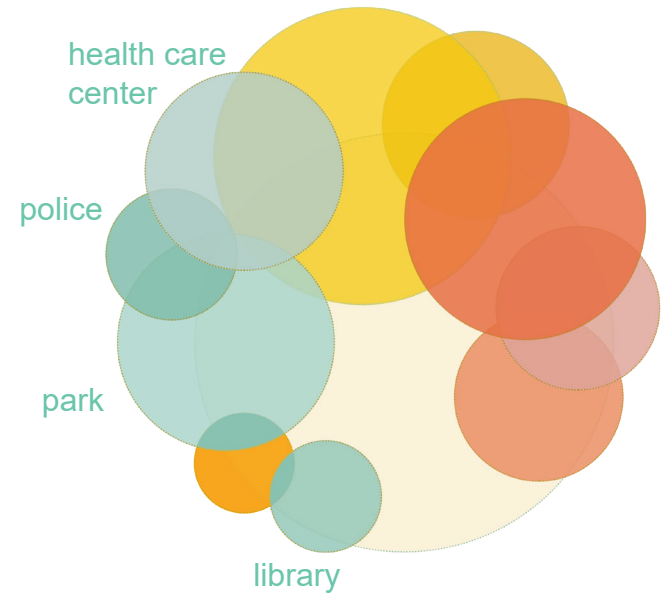
phase 1

- 60 - 80 multi-family units
- childrens playground, picnic area
- community center
 - gallery, library, offices, venue space
- community garden
 - taro, play area



phase 2

- 200 multi -family & single units
- farmers market
 - local produce, meats, dairy
- shopping plaza
 - small, indepently owned



phase 3

- police station
 - 10 officers or 3.5 per 1000 people
- health care center
- public park
 - soccar, baseball, pavillion
- public library

3.2 program of spaces

The program for the proposed design project must take into account the connection between village and family. The design considers the needs for housing of individual families and of the larger community through a series of phases. (Fig. 30) The proposed design project focuses on the first phase of new construction within Pahoia village:

| Multi-generational Housing |
| Community Center | Public Gardens |

Up to five stories high, the tall hale focuses on using local materials whenever available: lava rock dug from the earth, locally harvested bamboo, and harnessing available resources whenever possible:

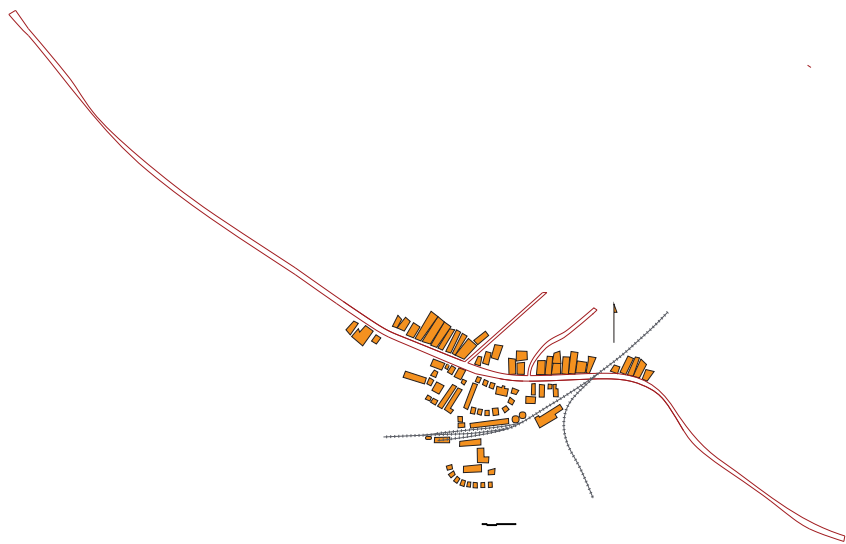
What is really needed is a stronger integration between the interior and exterior spaces-so that the ending of one and the beginning of the other is hardly perceptible. [...] There is a need for imaginative thinking in relation to natural ventilation – in the roof form, through the spaces within the house and below the house. There is a need for the broader use of truly durable materials, materials that are not adversely affected by salt air, by insects or by dampness. There is a need too for prefabrication keyed to regional design.⁴⁶

The goal of the project is to follow the common vernacular approach of natural materials and ventilation as well as stronger integration between interior and exterior.

However aiming towards a successful future kauhale, this thesis projects a population growth within the small village of just under 1,000 residents in Pahoia to over 20,000 over the next 25 years. This necessitates a second phase (Fig 31-32) - for an improved local economy through residential expansion and markets, privately owned farmers market stalls, retail stores and restaurants. Following this is a third phase consisting of increased social and public infrastructure. A dedicated police station, health care center with pediatric wing, public library, and family park are among much needed development projects.

The Puna district is growing and as urban density increases, plans to accommodate an expanding population must be in place. The Pahoia Pono Kauhale project is the first step in a broader connection of future possibilities.

⁴⁶ Fairfax. Ibid. 15.



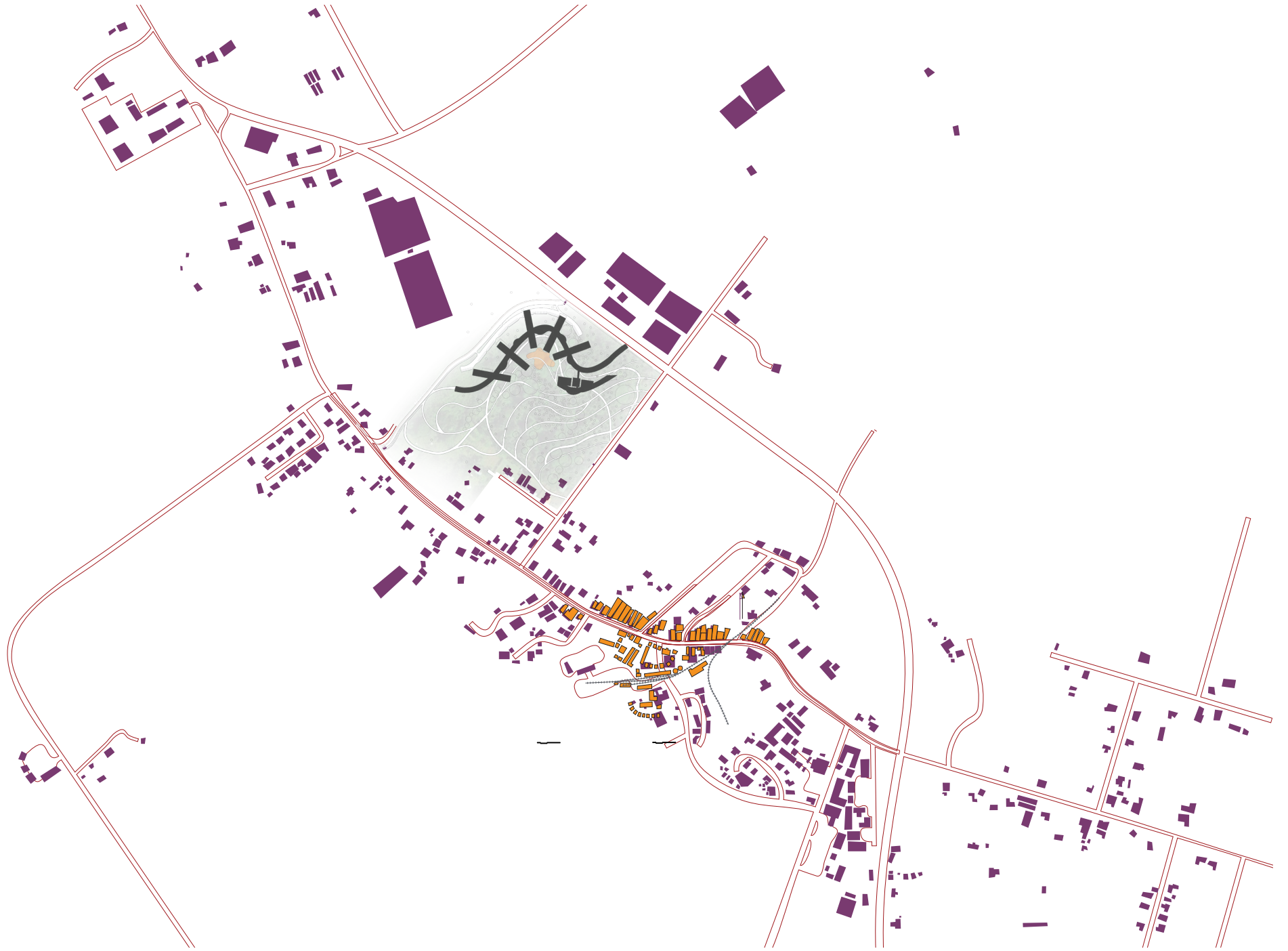


fig. 32 | map of pahoā village with pono kauhale design proposal: 2020

As our ancestors encountered many challenges discovering, settling upon, and passing through archipelagos to the south to arrive and flourish here in these northern seas, adapting to and overcoming each new test, so too can we adapt to and thrive in the places we inhabit today without giving up our unique identity as a people, despite being confronted by newer issues and challenges.

Andrade, Carlos. *Hā'ena : Through the Eyes of the Ancestors.*

chapter 4 : PONO KAUIHALE



fig. 33 | images of pahoia 's historic buildings and local flare

4.1 site conditions | analysis

The site for this thesis is in Big Island's Puna district, Pahoa village. Pahoa Village was officially established in 1909, although the region was settled by Native Hawaiians long before. As a plantation town, Pahoa Village was home to the major companies of the Pahoa Lumber Mill and the Puna Sugar Company.⁴⁷ The word "pāhoa" means a short dagger or sharp stone, as in a weapon.⁴⁸ When pointed downwards this is a symbol of peace and strength in Hawaiian culture, exhibiting a power beyond simple aggression. The form of the dagger inspired the actual layout of the village which is organized between two major roads: the Keaau-Pahoa road and the Pahoa Bypass.

Pahoa's history as a plantation boomtown can still be read in its built environment. Travel guides describe it as "Big Island's 'hippie capital', a place where New Agers, hippies and others living an alternative lifestyle reside. The pride of 'downtown' Pahoa is its raised wooden sidewalk, the false-front stores and the numerous old buildings, which give it a 'Wild West' atmosphere."⁴⁹ Pahoa is home to the oldest collection of historic buildings on the island, with many structures original to the

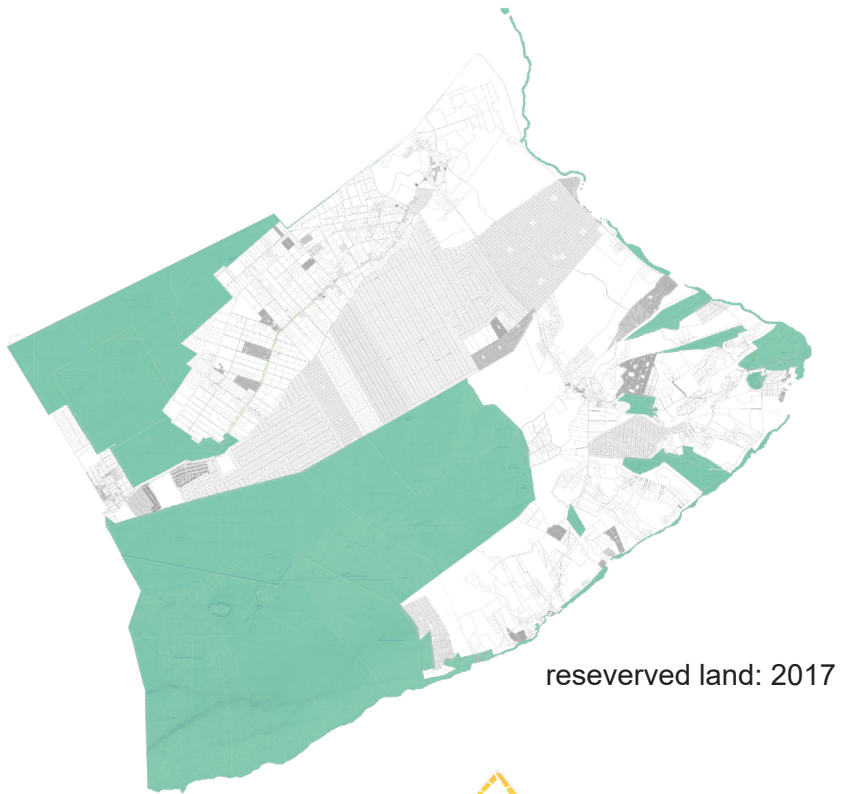
plantation period of the early 1900's. (fig 33)The original residents were mainly European and Japanese immigrants with native Hawaiians living outside the official boundaries. For many years, expectations for Pahoa's growth followed a steady course of continued development and success. However growth of the village stalled and slowed.

Pahoa today is a rural village with a scattering of residential and agricultural buildings spread across approximately 2 square miles. Due to the housing shortage, this thesis predicts a densifying and urbanization of the village. By 2120 Pahoa village will belong to one of the most densely populated regions of Hawai'i. In the entirety of the islands, this region has the most reasonably priced lands and the greatest available space for expansion. With its centralized location in Puna, Pahoa is the most rational location to act as an anchor for for the broadening community. Pahoa will be the largest kauhale, embracing its neighboring villages with true aloha.

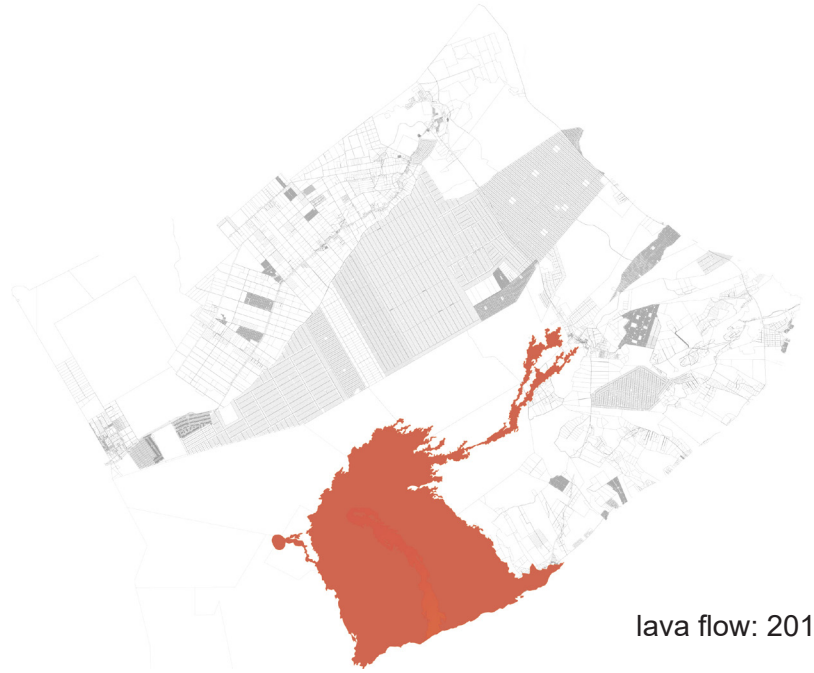
47 Viet Doan. "Hidden Hawaii: Historic Pahoa Village on the Big Island." Wander Wisdom. October 6, 2016. <https://wanderwisdom.com/travel-destinations/Hidden-Hawaii-Historic-Pahoa-Village-on-the-Big-Island>

48 Pukui. Ibid.

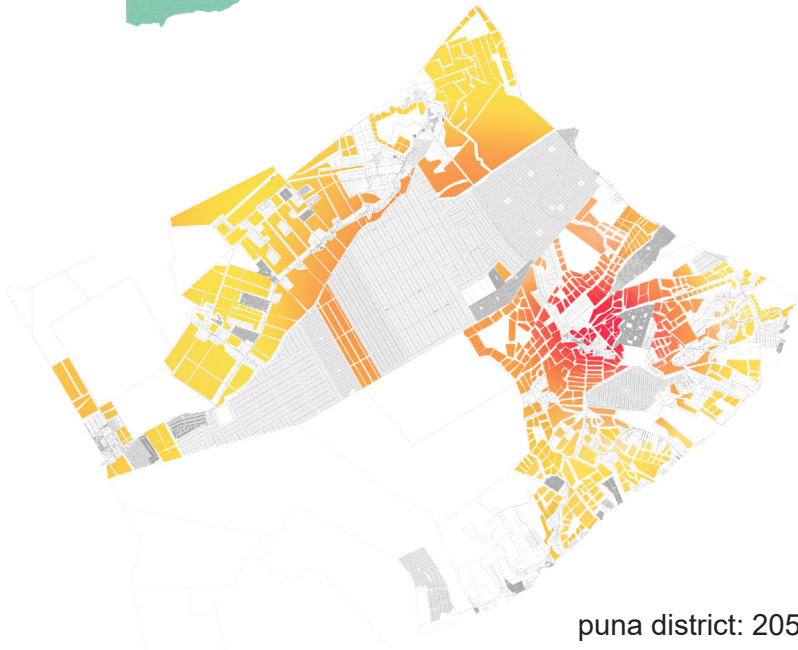
49 To Hawaii.com|Hawaii Travel Guide. Pahoa. 2017. <https://www.to-hawaii.com/big-island/cities/pahoa.php>



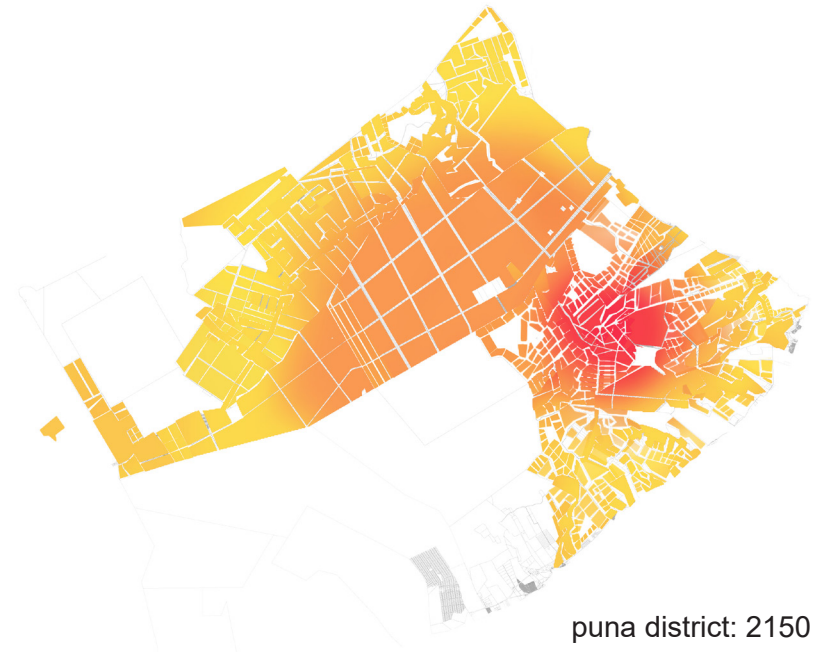
reseverved land: 2017



lava flow: 2017



puna district: 2050



puna district: 2150

4.2 environmental conditions

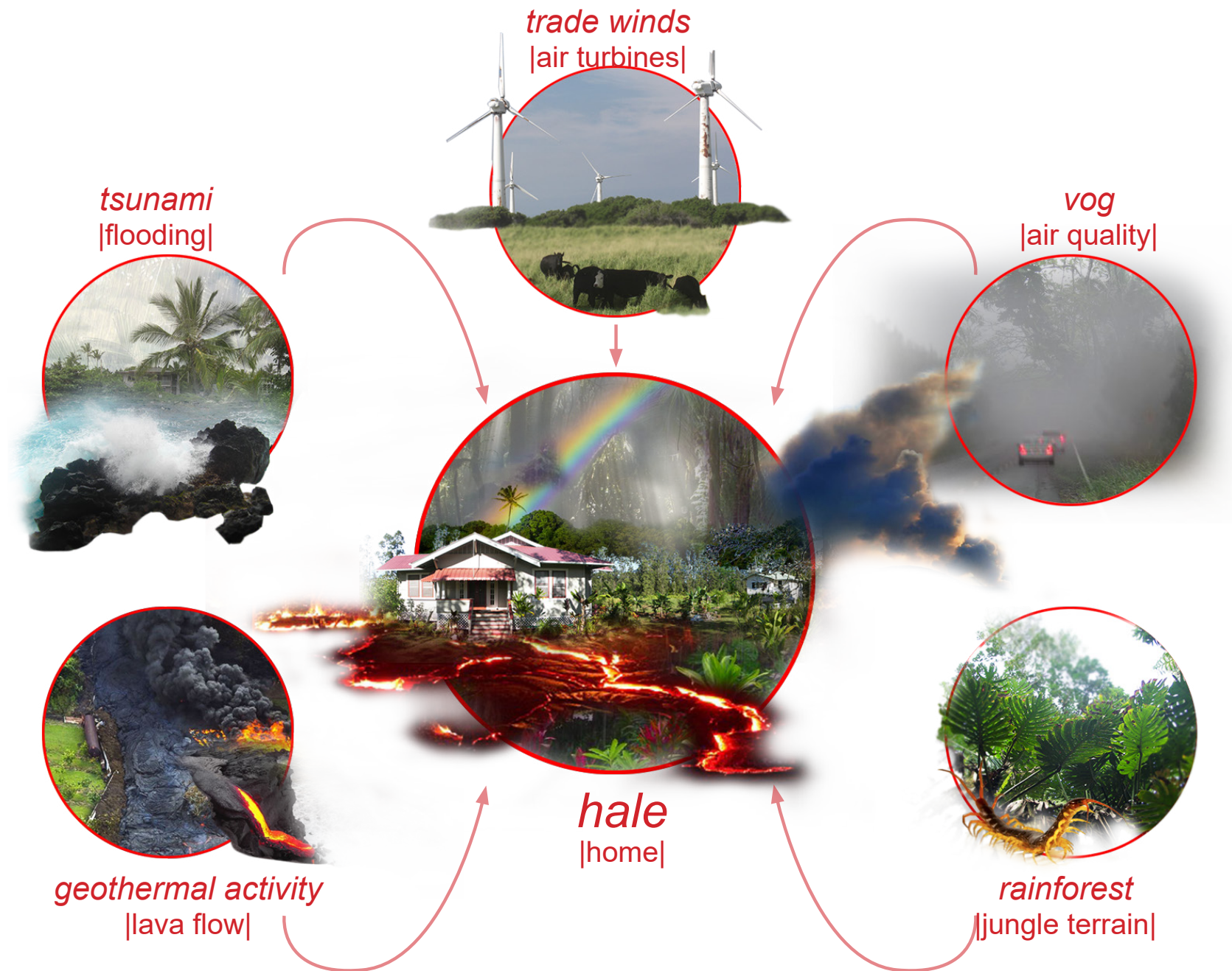
From an objective standpoint, the Puna district is remarkable for several reasons. There are a few pockets of urban density – clustered near main roads and the coast but any built environment within the Puna district is at risk to possible lava damage. Despite this threat this thesis predicts a steady increase of development over approximately the next 25 years, followed by an explosion of density and population in the next 100 years. (fig. 34) However, for this growth to be successful, a closer look is needed to address unique environmental conditions of the area.

The Island of Hawai'i, or Big Island, is 4,028 sq miles. By comparison, this is almost twice the size of King County, Washington - which measures 2,307 sq miles. The Puna district measures 499.45 sq miles, and has Hawai'i Island's second highest population, at 31,335 people. This district is larger than the islands of Oahu, Maui, or Kauai. Although the median household income is approximately \$45,000, many families earn less than \$19,000 a year. Pahoia itself is 2.19 sq miles, has a population of 945, and a per capita income of \$13,850.⁵⁰ The land is rocky, uneven, and filled with jungle flora and fauna. Mosquitoes are plentiful,

centipedes are considered an apex predator, and coqui frogs are an annoyance one must learn to live with.

This site in the Puna district was chosen not only for the local economic adversity of many residents, but also for the literal clashing between the natural land and built environment in evidence there. Lava diversion is a topic raging through not just Pahoia Village but all of Puna. Living in the shadow of Kilauea, the lava flow is an ever-present reminder that the island's most powerful and destructive forces lay just beneath the surface.

⁵⁰ United States Census Bureau. American Fact Finder: Pahoia CDP, Hawaii. 2017. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml



From the scale of the kauhale the thesis then focuses in on the design of the hale. When considering hale – the Puna district offers a variety of challenges within the natural environment. These conditions range from constant geothermal activity, to flooding, to the dense volcanic fog (or vog), and to the surrounding thick jungle landscape. (Fig. 35) The event with the greatest destructive potential, however, remains Kilauea's fire goddess, Pele, and the lava flow.

As mentioned previously, Pahoa was a boom town populated mainly by immigrants in the early 1900's. In the past little consideration was given to the extreme environmental conditions existing within the region. Most buildings were wood construction built low to the ground, easy fuel for fire should Pele come to call. The region is considered sleepy, laid back, a haven for hippies – a place to relax. Without disturbing this long-held outlook, an element of disaster preparedness in all new construction is considered a necessary addition towards furthering the goals proposed. This thesis investigates how one possibility, using common sense strategies that address the danger of lava flow while not seeking to control it.



The lava has flowed consistently since 1983 and natural disaster is always only a slow crawl away. (fig. 36) Time and again lava diversion has proven fruitless. Successes are short-lived, and homes are consumed in fire as soon as the lava touches them. Since 2014, however, when the flow inched as close as the waste transfer station and Pahoa marketplace, the threat has become more present in the minds of residents. For the first time in 100 years, Pele was making a visit to Pahoa. (fig. 37) Luckily for Pahoa residents, the flow stopped on December 25, 2014 and has not returned – redirecting back into the ocean to the south. When the larger Puna district is considered a greater site the danger increases exponentially. Rather than fight the inevitable and destroy the mountain with bombs or a series of failed walls, acceptance and eventual rejuvenation is the path many take. Lava flow is an extreme condition, reaching temperatures of over 2000°F but like earthquakes and other natural disasters we can plan and design for it.

To directly address this extreme condition, this thesis proposes the use of high strength, heat resistant columns, approximately 20 ft in height. “The use of high-strength concrete (HSC) is widespread in the construction

industry. Such material can be subjected to high temperatures in the event of fire, engulfment by lava flow, or nuclear meltdown. [However] high-strength concrete (HSC) will experience thermal microcracking, explosive spalling, and undesirable chemical changes when exposed to high temperatures.”⁵¹ The columns work through layering: first a 3ft sacrificial layer of high strength, heat resistant fused silica concrete, fiber reinforced and resistant up to 2000°F (fig. 38) Nestled inside this concrete shell an insulation layer of loose aggregate surrounds heat release pipes to alleviate longterm heat exposure and prevent the penetration of high temperatures to the core. The core of the column is structural reinforced fused silica concrete.

These columns elevate a new building plane and protect the built environment while maintaining a respectful distance from Pele. (fig. 39) The oval shaped columns are angled towards the direction of the eruption, allowing lava to flow around unhindered. Residents are able to evacuate immediate danger zones without fear homes and property will be destroyed. The elevated platforms are turned away from the lava flow, preventing the molten rock from clinging to the ramping walkway.

⁵¹ J.F. Muir 1977. “Response of Concrete Exposed to a High Heat Flux on One Surface. [PWR, BWR]”. United States.

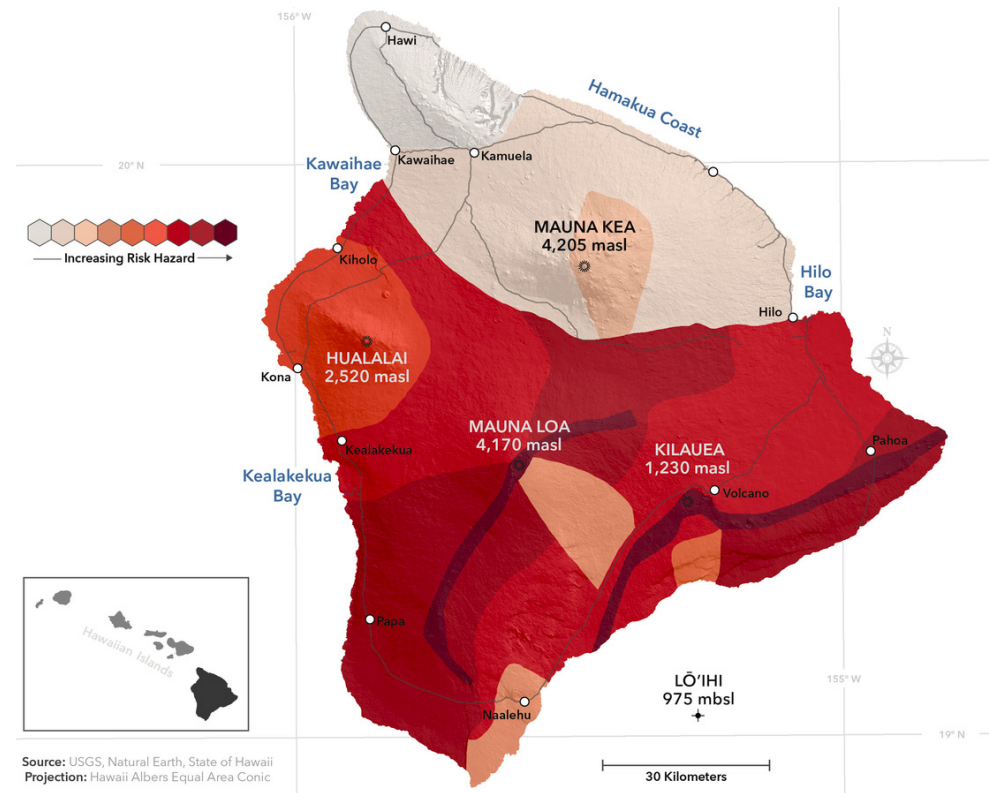
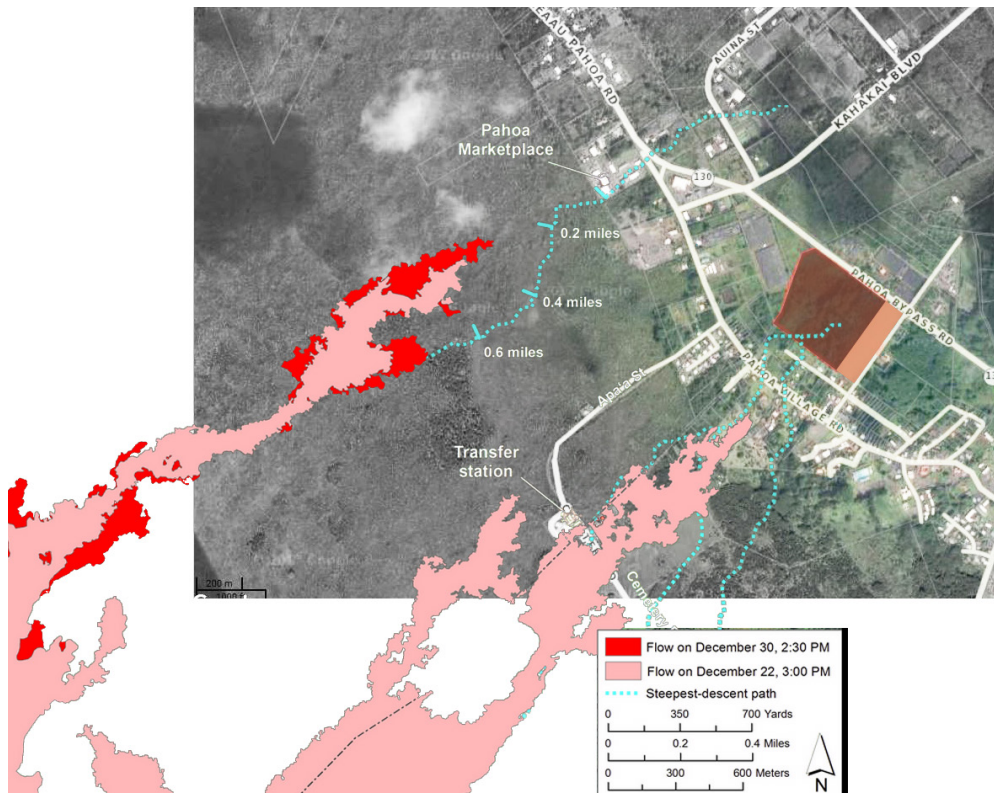


fig. 37 | lava flow near pahoia village and USGS map of big island risk zones. digital image. usgs volcano hazards program. accessed june 12, 2017. https://volcanoes.usgs.gov/observatories/hvo/faq_lava.html

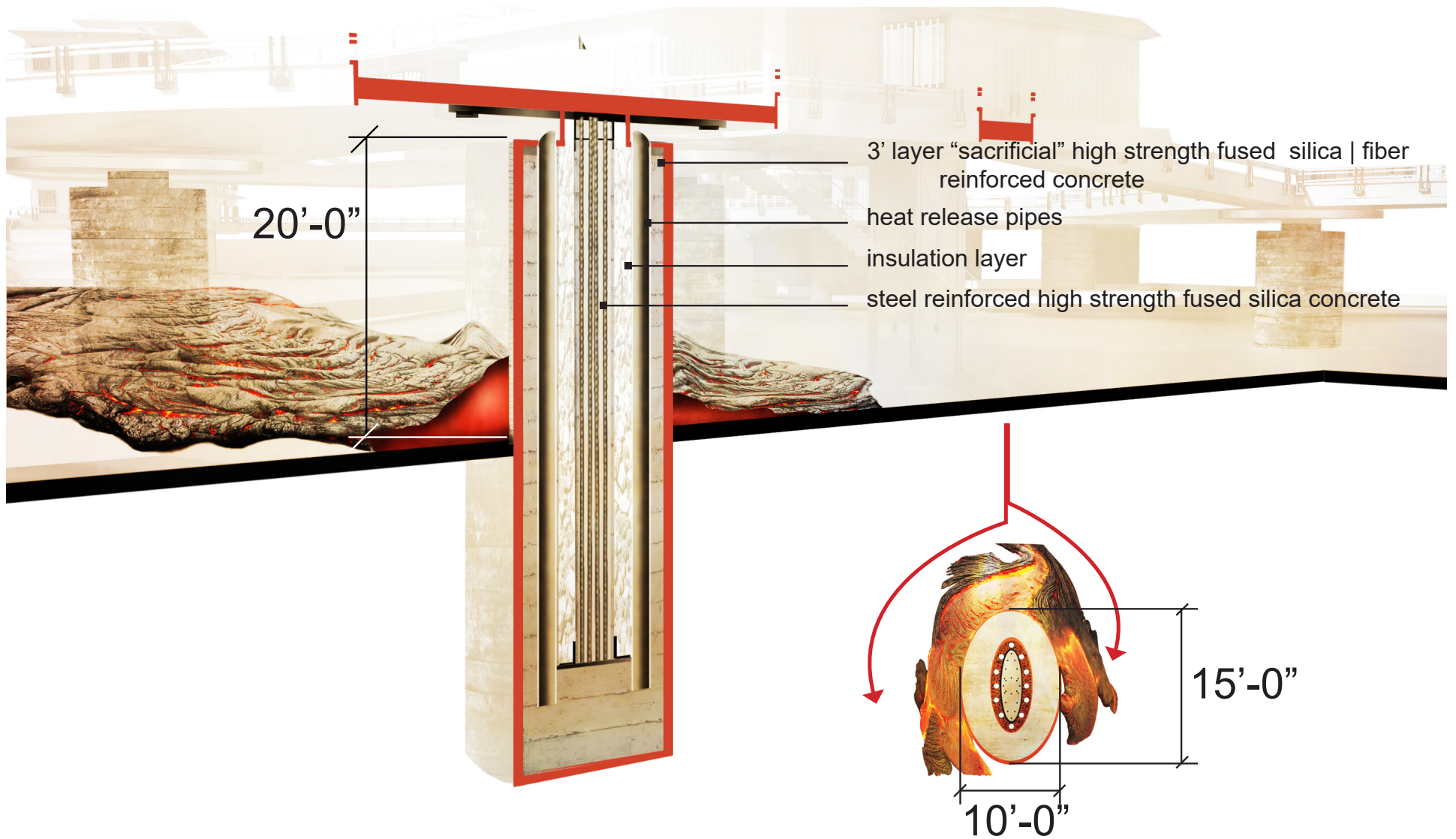
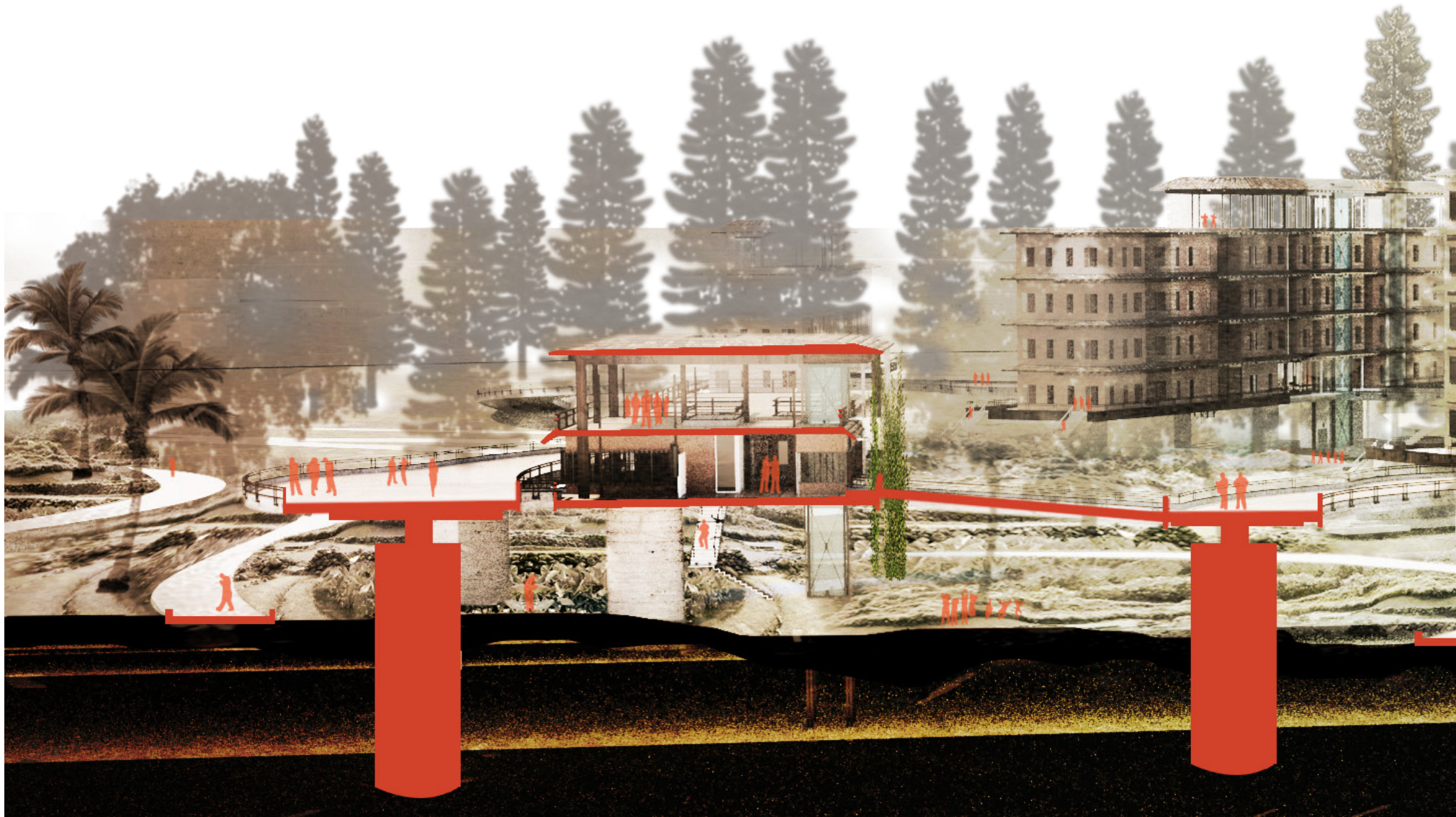


fig. 38 | diagram of lava resistant column



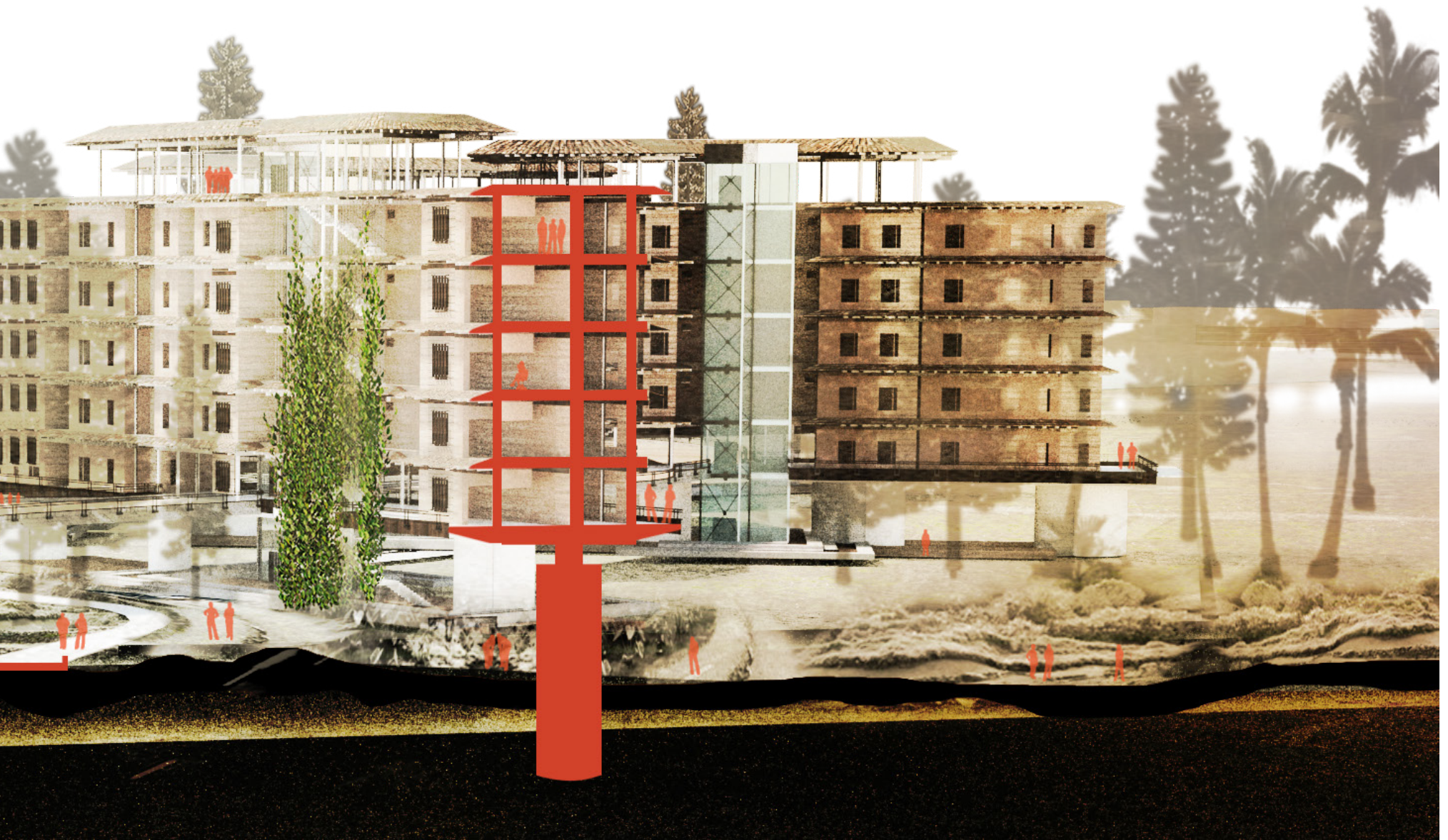
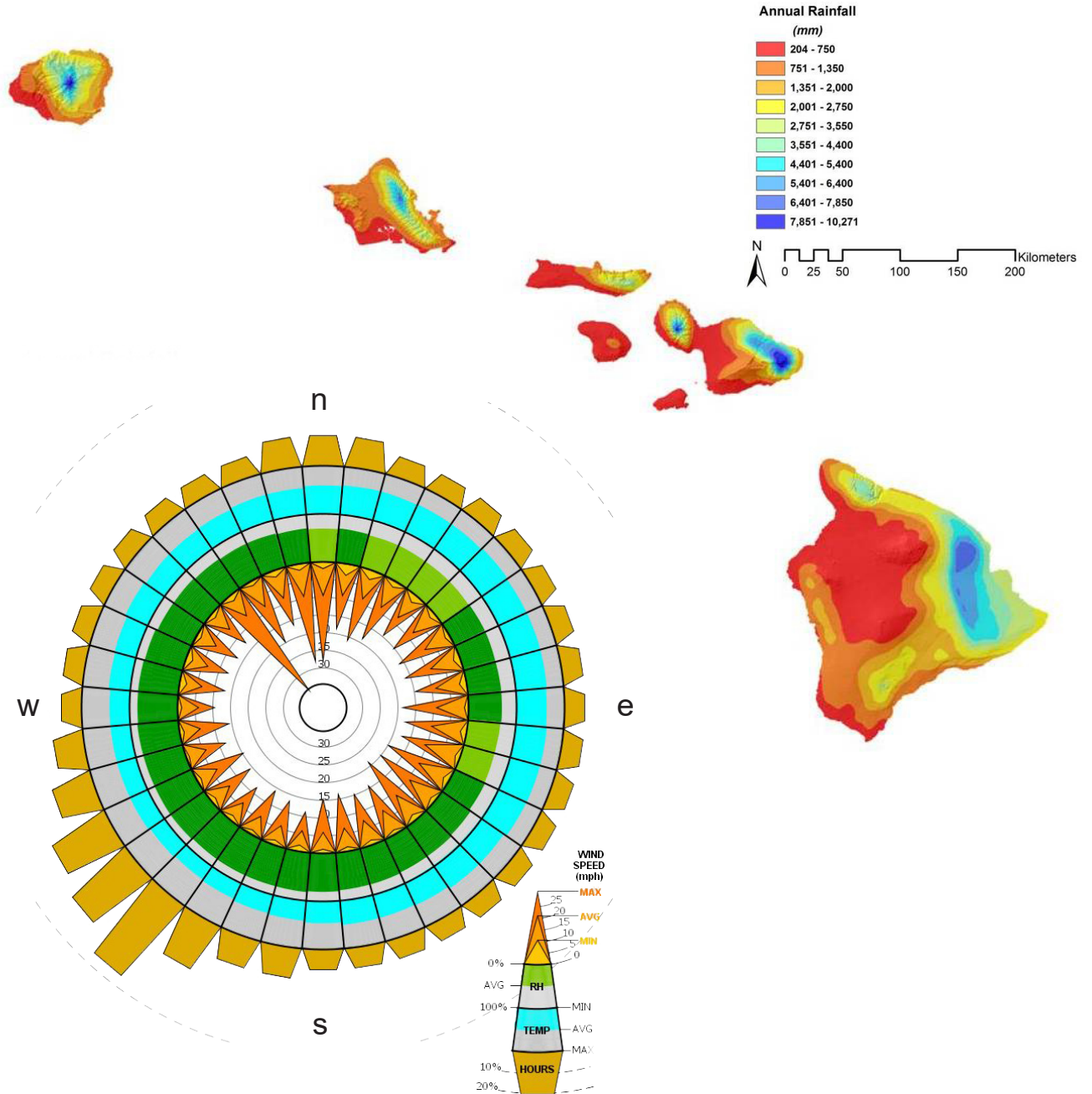
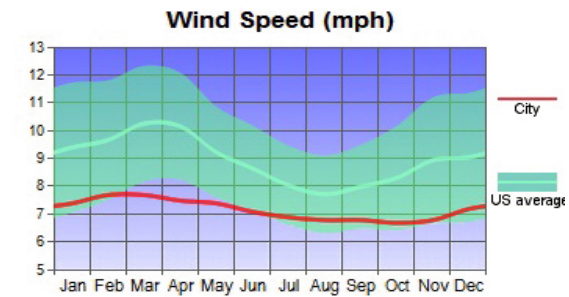
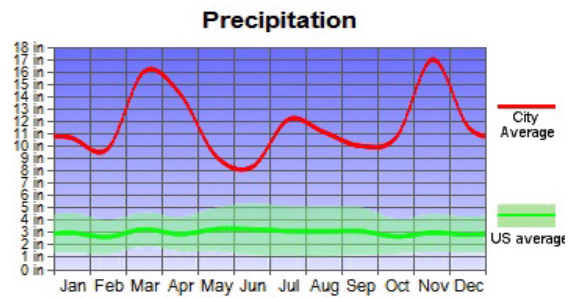
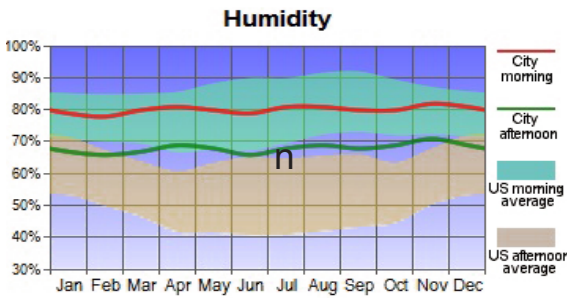
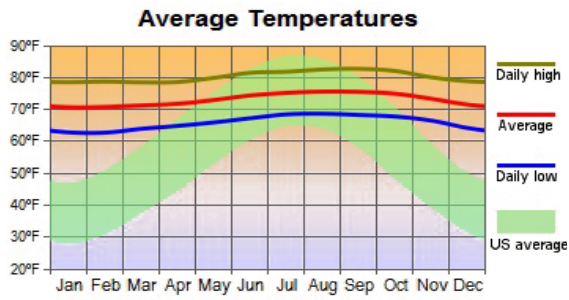


fig. 39 | building section looking north illustrates lava resistant columns supporting elevated building plane



However, normal weather conditions in Hawaii are mild with constant trade winds, sunshine and temperatures that rarely stray more than 10 degrees from 74°F. Hawai'i rains every day, allowing the "wet" eastern side of the island to flourish with verdant flora and fauna. (fig. 40) Sometimes these rains arrive as little bursts of sun showers, sometimes as though the sky overturned a massive bowl of water on the earth and somehow managed to hurl it sideways. Although somewhat relieved by cloud cover tropical sunlight is also intense throughout the entire island.

As demonstrated through lighting analysis within the proposed residential space, without the use of any shading devices the spaces are well outside a comfortable level, averaging over 1000 lux consistently. (fig. 41) Glare alone renders spaces useless for a majority of the day as every task is performed with squinting eyes.

The rain and strong light can be addressed with simple architectural solutions. The particular local aesthetic of oversized roofs developed from a practical necessity for rain protection. A four-foot overhang prevents horizontal rain from entering living spaces and exterior vertical blinds serve to counteract the intensity of the natural light. The example lighting study is based on a fixed fin set at 45 degrees, however,

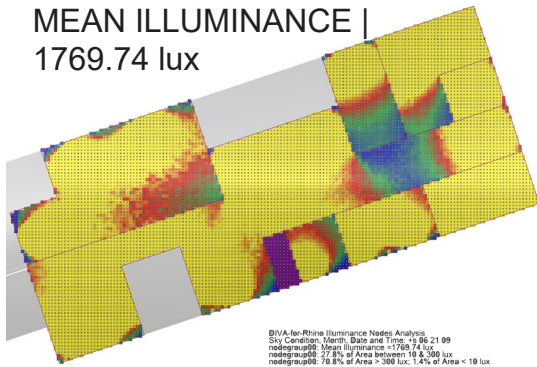
pivoting blinds better serve residents so they can adjust the lighting as needed. (fig. 42)

A wide roof with exaggerated overhang aids in providing both shade during the summer and a surface for water collection as a first step in a catchment system. This is coupled with a series of clerestories for increased daylight in the winter and gridded solar panels to reduce reliance on Helco (Hawai'i Electric Co.) electricity.

The extended form of the roof provides space for later completion of solar heating of water. Multiple wide windows encourage passive ventilation and create greater connectivity between interior and exterior spaces providing long views into the natural environment. (fig. 43-44)

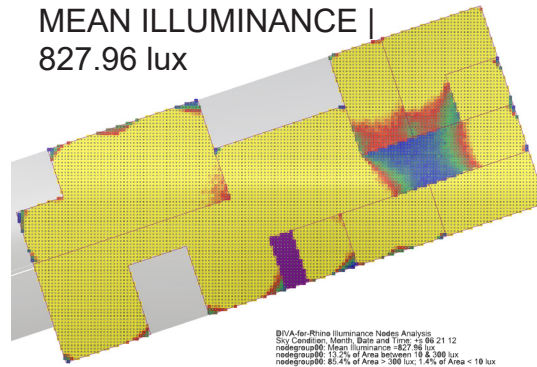
The elevated ramps creates an artificial plane, raising new construction twenty feet off the ground. This system protects against excessive damp and invasive insects as well as allowing new construction to maintain a safe and respectful distance from Pele when she next visits Pahoā. In addition to creating a unique local aesthetic and additional protection of the hale from future lava flows, the space beneath becomes extended public space.

JUNE 21 9:00
MEAN ILLUMINANCE |
1769.74 lux



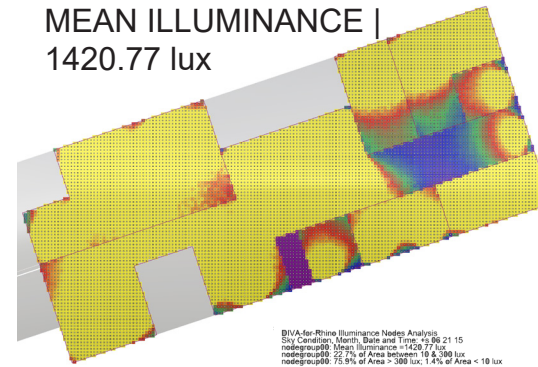
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nodegroup00: 70.8% of Area > 300 lux; 1.4% of Area < 10 lux

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MEAN ILLUMINANCE |
827.96 lux

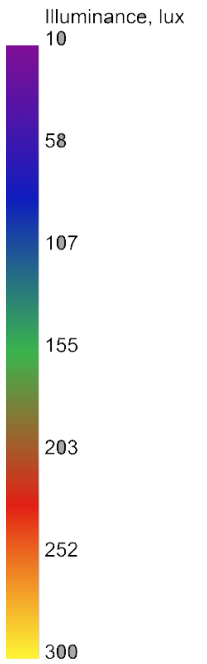


DIVA-for-Rhino Illuminance Nodes Analysis
Sky Condition: Month, Date and Time: +9 06 21 12
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nodegroup00: 17.7% of Area between 19.8, 300 lux
nodegroup00: 83.4% of Area > 300 lux; 1.4% of Area < 10 lux

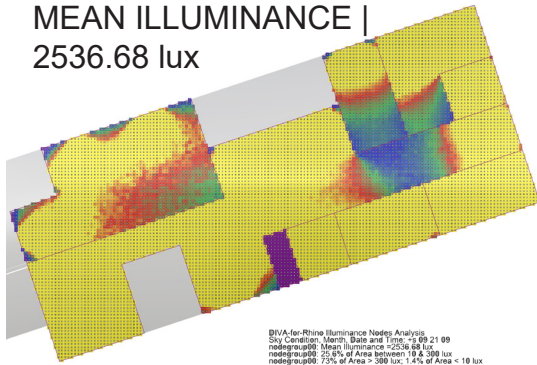
JUNE 21 15:00
MEAN ILLUMINANCE |
1420.77 lux



DIVA-for-Rhino Illuminance Nodes Analysis
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nodegroup00: 75.9% of Area > 300 lux; 1.4% of Area < 10 lux

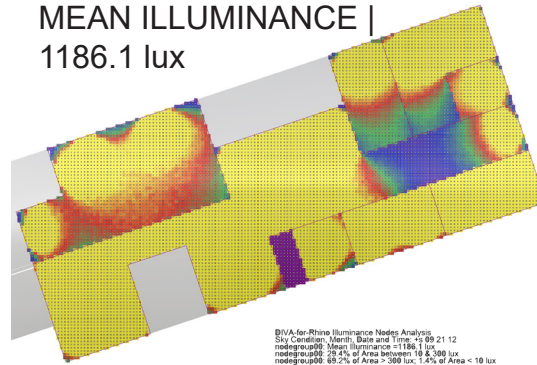


SEPT 21 9:00
MEAN ILLUMINANCE |
2536.68 lux



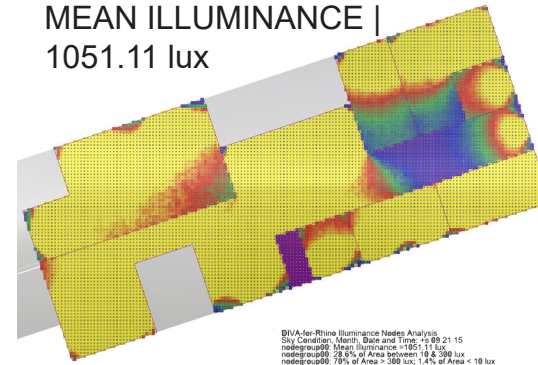
DIVA-for-Rhino Illuminance Nodes Analysis
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nodegroup00: 25.8% of Area between 19.8, 300 lux
nodegroup00: 75% of Area > 300 lux; 1.4% of Area < 10 lux

SEPT 21 12:00
MEAN ILLUMINANCE |
1186.1 lux



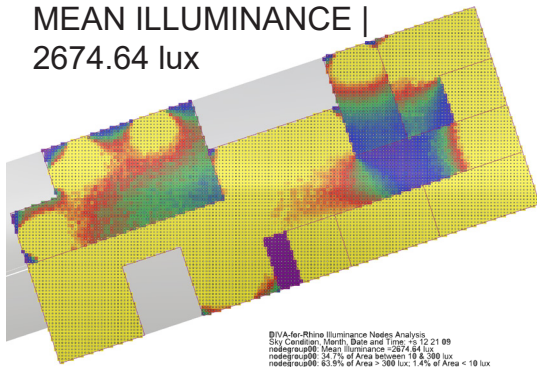
DIVA-for-Rhino Illuminance Nodes Analysis
Sky Condition: Month, Date and Time: +9 09 21 12
nodegroup00: Mean illuminance = 1186.1 lux
nodegroup00: 25.4% of Area between 19.8, 300 lux
nodegroup00: 69.2% of Area > 300 lux; 1.4% of Area < 10 lux

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1051.11 lux



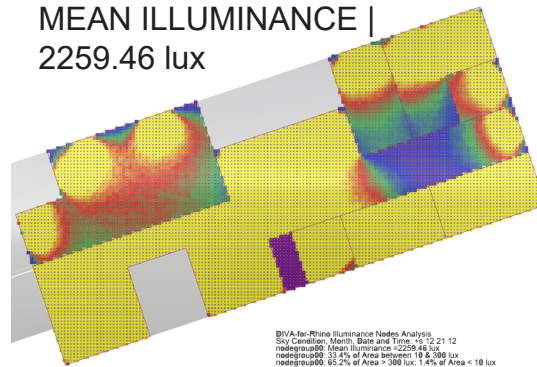
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Sky Condition: Month, Date and Time: +9 09 21 15
nodegroup00: Mean illuminance = 1051.11 lux
nodegroup00: 28.6% of Area between 19.8, 300 lux
nodegroup00: 78% of Area > 300 lux; 1.4% of Area < 10 lux

DEC 21 9:00
MEAN ILLUMINANCE |
2674.64 lux



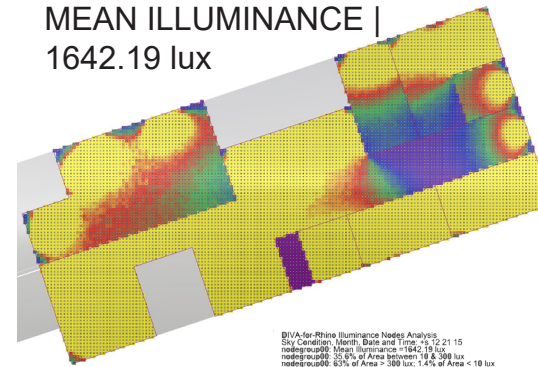
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nodegroup00: 63.9% of Area > 300 lux; 1.4% of Area < 10 lux

DEC 21 12:00
MEAN ILLUMINANCE |
2259.46 lux



DIVA-for-Rhino Illuminance Nodes Analysis
Sky Condition: Month, Date and Time: +9 12 21 12
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nodegroup00: 35.4% of Area between 19.8, 300 lux
nodegroup00: 65.2% of Area > 300 lux; 1.4% of Area < 10 lux

DEC 21 15:00
MEAN ILLUMINANCE |
1642.19 lux



DIVA-for-Rhino Illuminance Nodes Analysis
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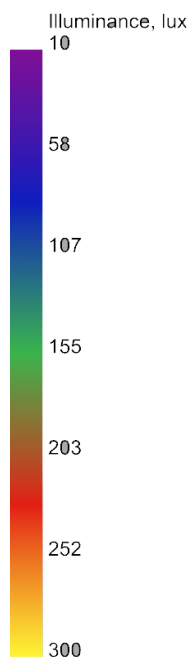
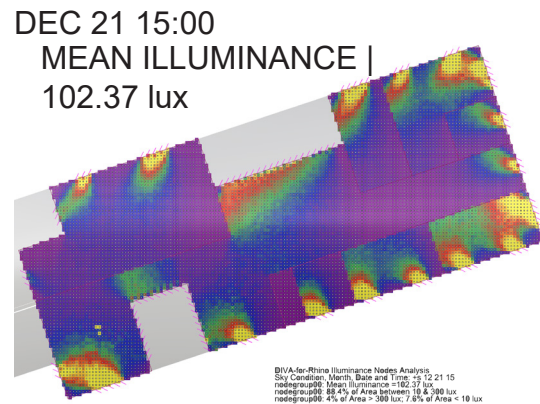
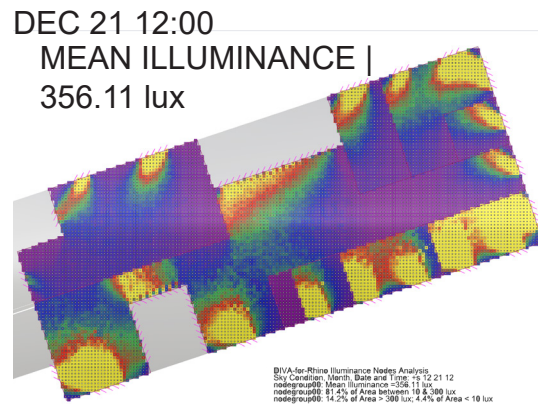
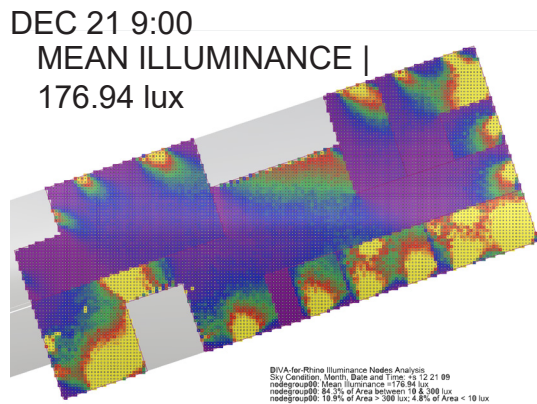
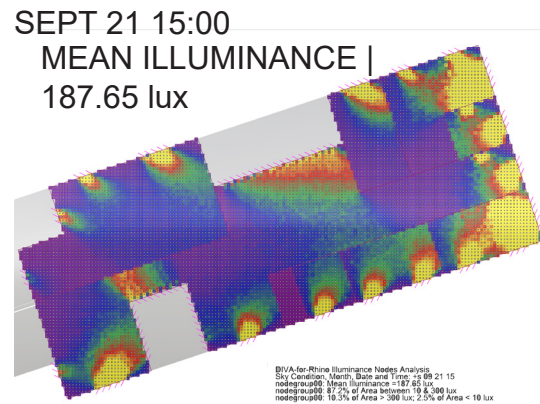
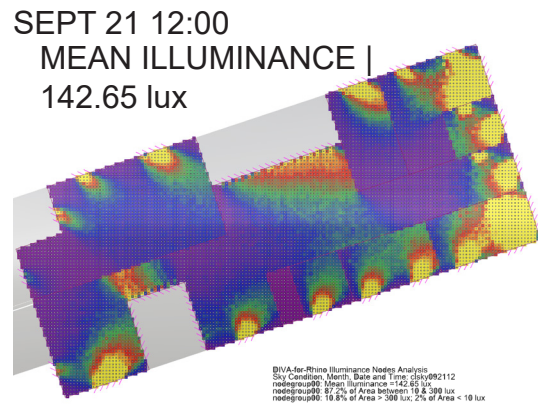
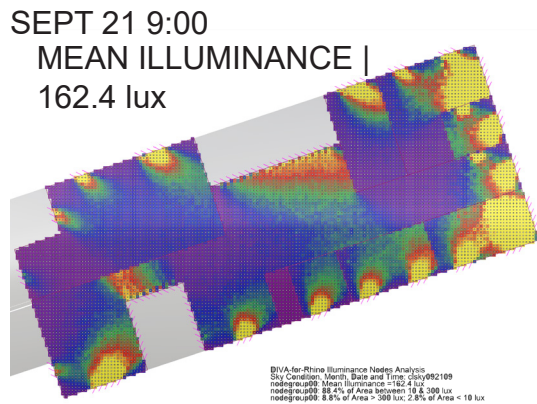
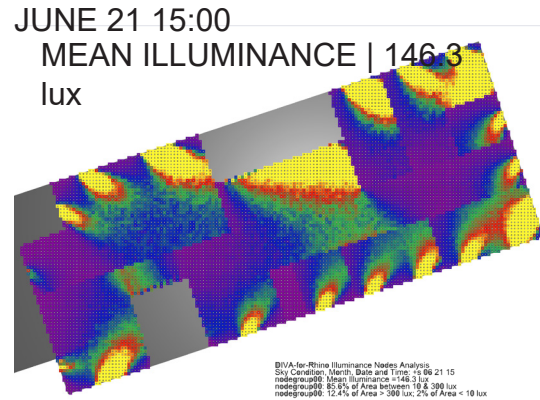
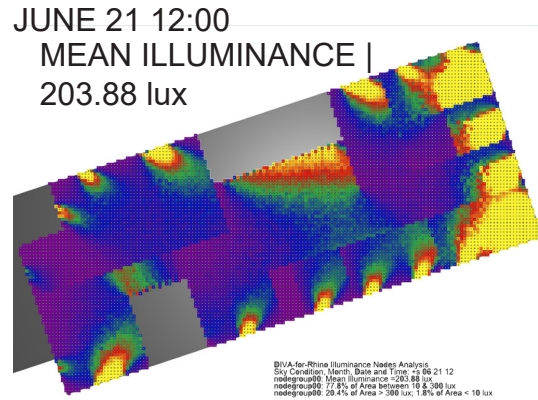
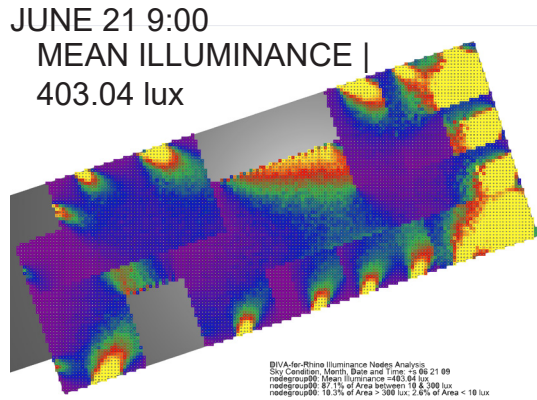
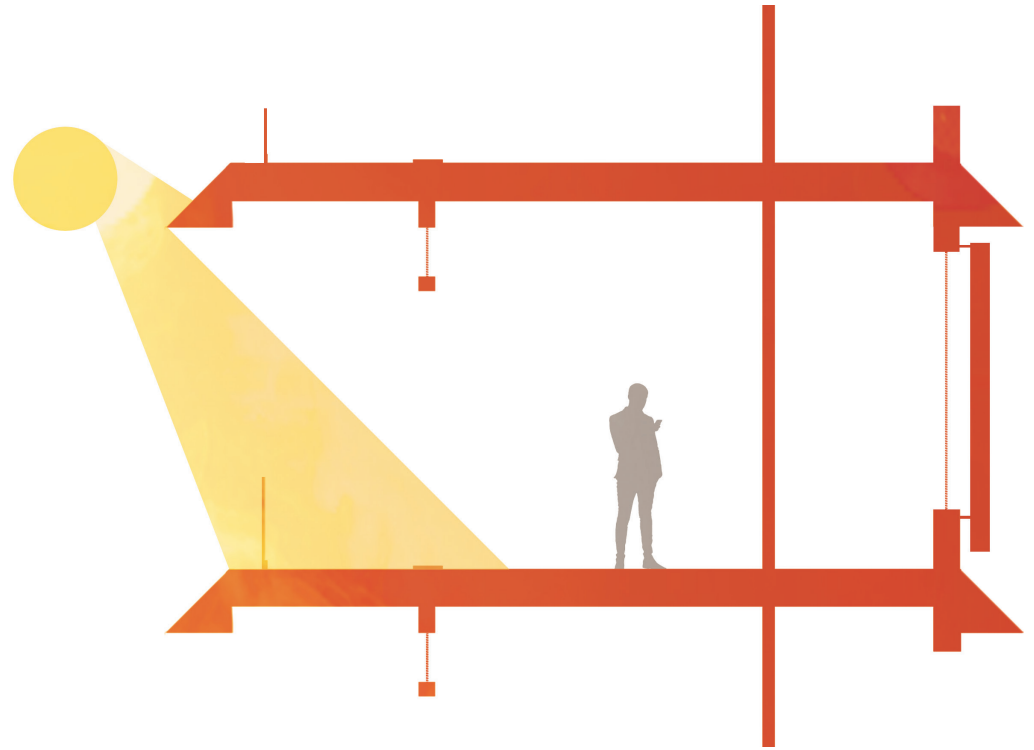
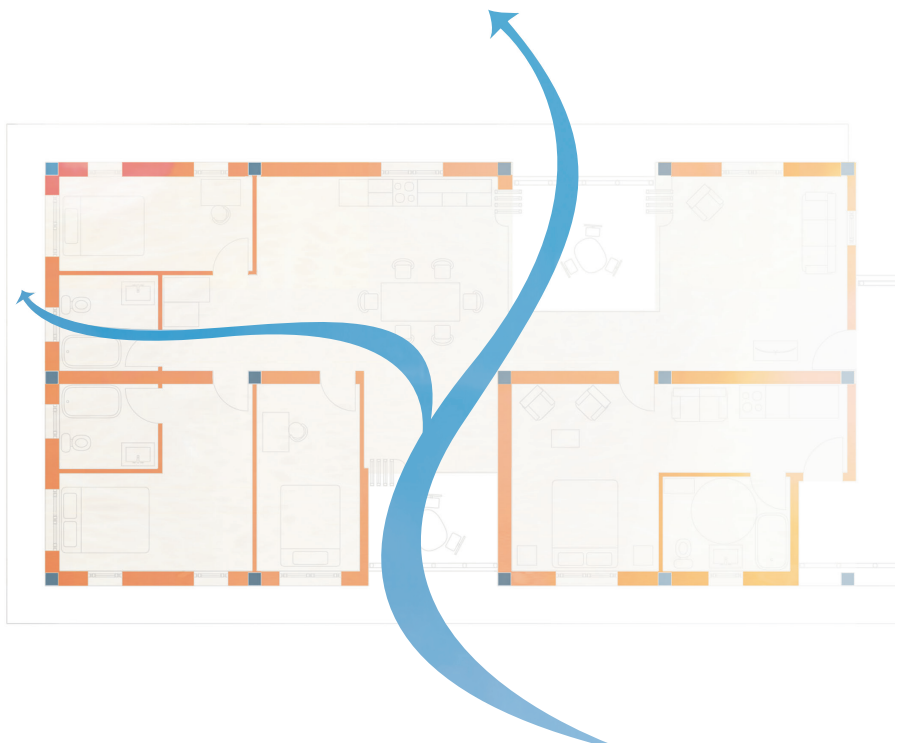


fig. 42 | natural lighting inside residential space: with exterior pivoting vertical shades and 4 ft overhang. generated using diva program.



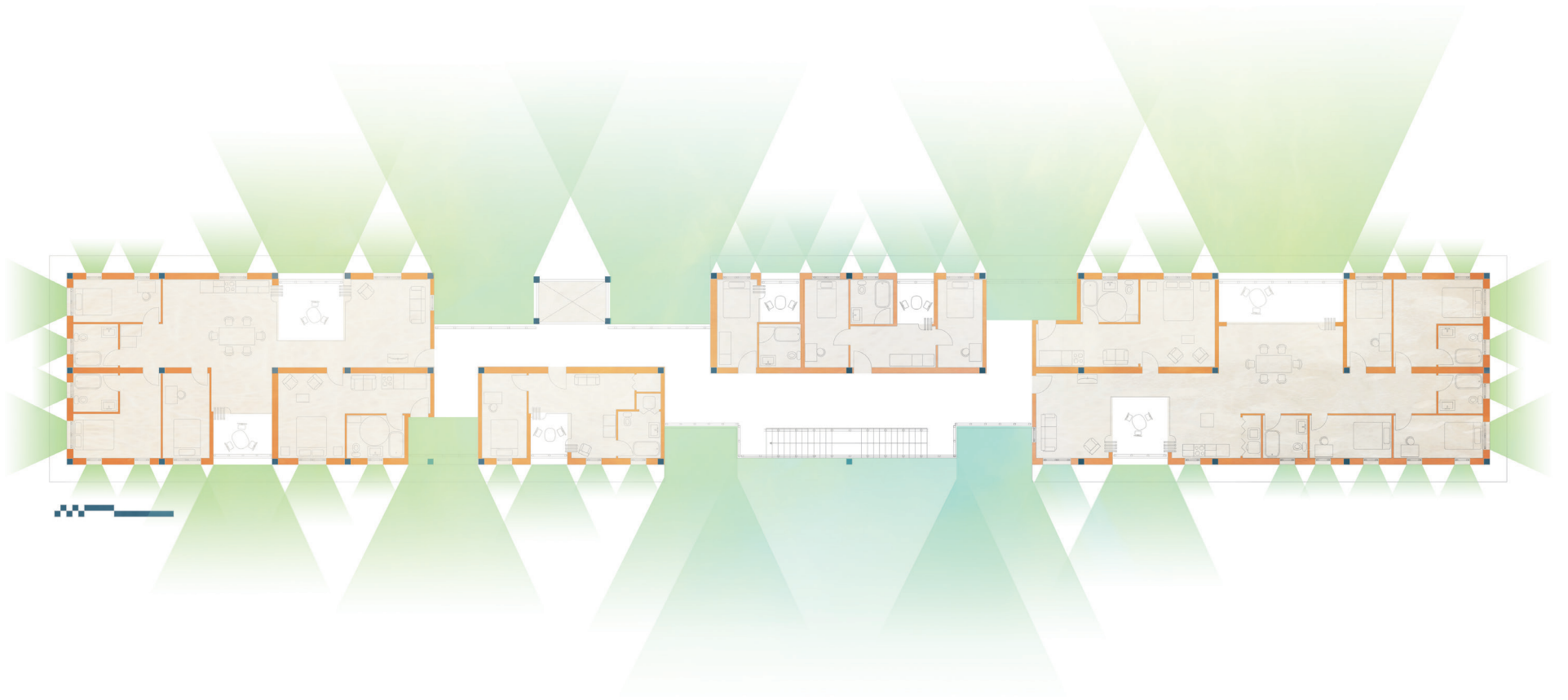
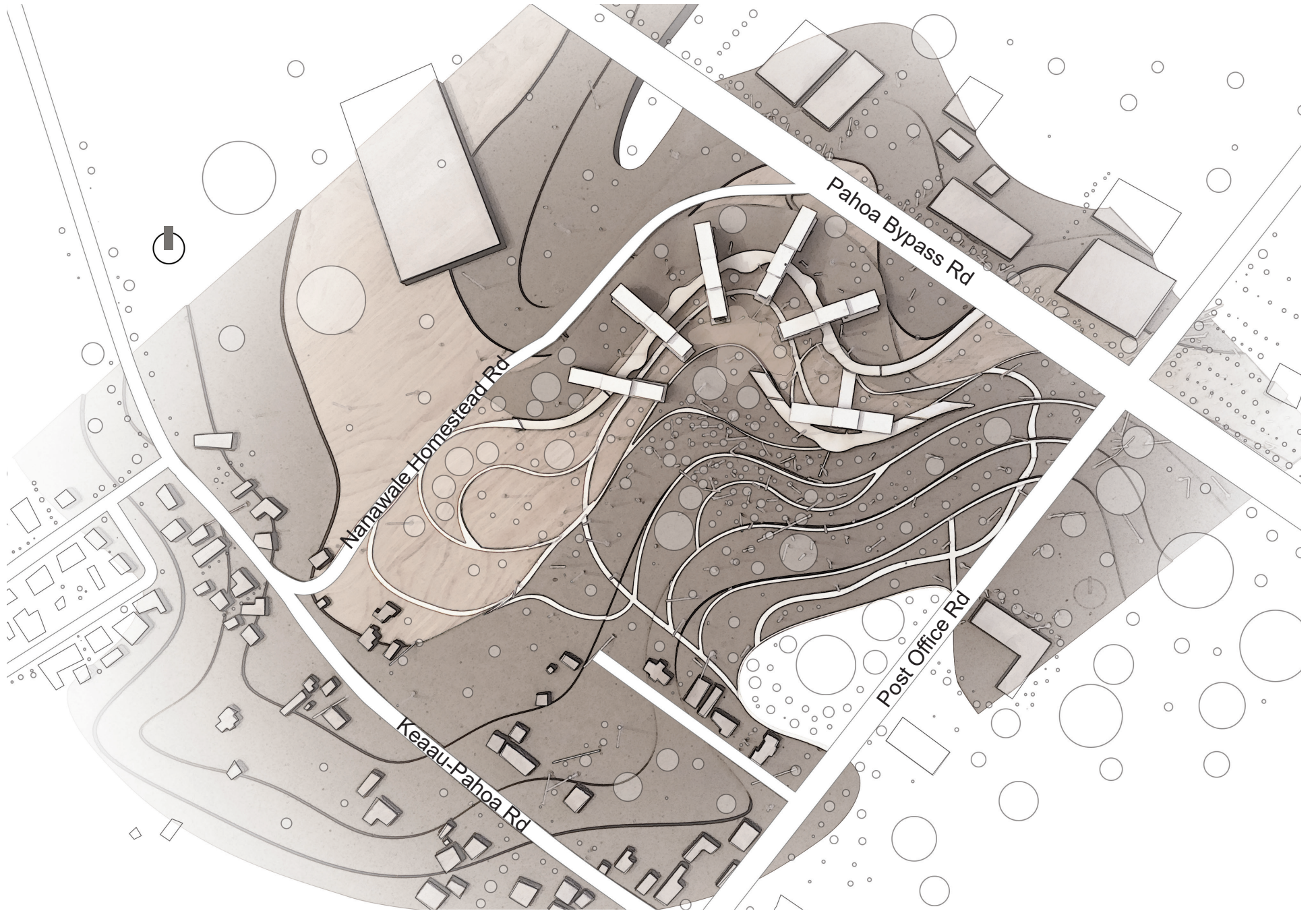


fig. 44 | diagram: long views available from all areas of residential housing



4.3 cultural conditions | wayfinding:

A close consideration of the site of Pahoa village provides additional benefits to the proposed design, both architecturally and culturally. The plot of land chosen for the site of this thesis project is a 33.4-acre plot located just north of the Pahoa's main road, settled between Keaau-Pahoa Rd and the Pahoa Bypass Rd, just down the street from the local post office. (fig. 45) This side is in the physical center of Pahoa village. The land is well positioned between both the Hawai'i Academy of Art & Sciences and Pahoa's public elementary, intermediate, and high schools. It is within walking distance of the Malama and Island Natural Markets as well as the Pahoa Community Aquatic Center and the skateboarding park.

As a former logged site, the location was re-planted but never harvested. As such, the site retains a plethora of quality organic rot and ready soil for working and farming of proposed pea-patch gardens. (fig. 46-49) The underbrush must be cleared for light access but the foundation for the public garden already exists. Other locations in Pahoa require either purchased topsoil or a time consuming regiment of rigorous composting before gardening or farming can begin. In keeping with the cyclical nature of the returning and retreating lava flow, the wide spacing

between the garden and the elevated platform raised by the columns encourages a cycle of rejuvenation and growth in the public garden. Once the lava cools, a hard shell landscape of black basalt covers the earth. Averaging the height of the cooled lava from the 2014 flow at 6 ft, residents and locals have space beneath the raised building plane to recharge the basalt layer using intensive composting to begin recovery of the site.

Additionally, the site is well located for cultural conditions as wayfinding is key in Hawaii. Positioned near the Pahoa Bypass Rd, the buildings exist as the tallest in the region and signify a second entry into Old Pahoa if the main entry is missed.





fig. 47 | pahoā site images, hawai'i. july 2017.



fig. 48 | pahoā site images, hawai'i. post office road. july 2017.



fig. 49 | pahoā site images, hawai'i. july 2017.



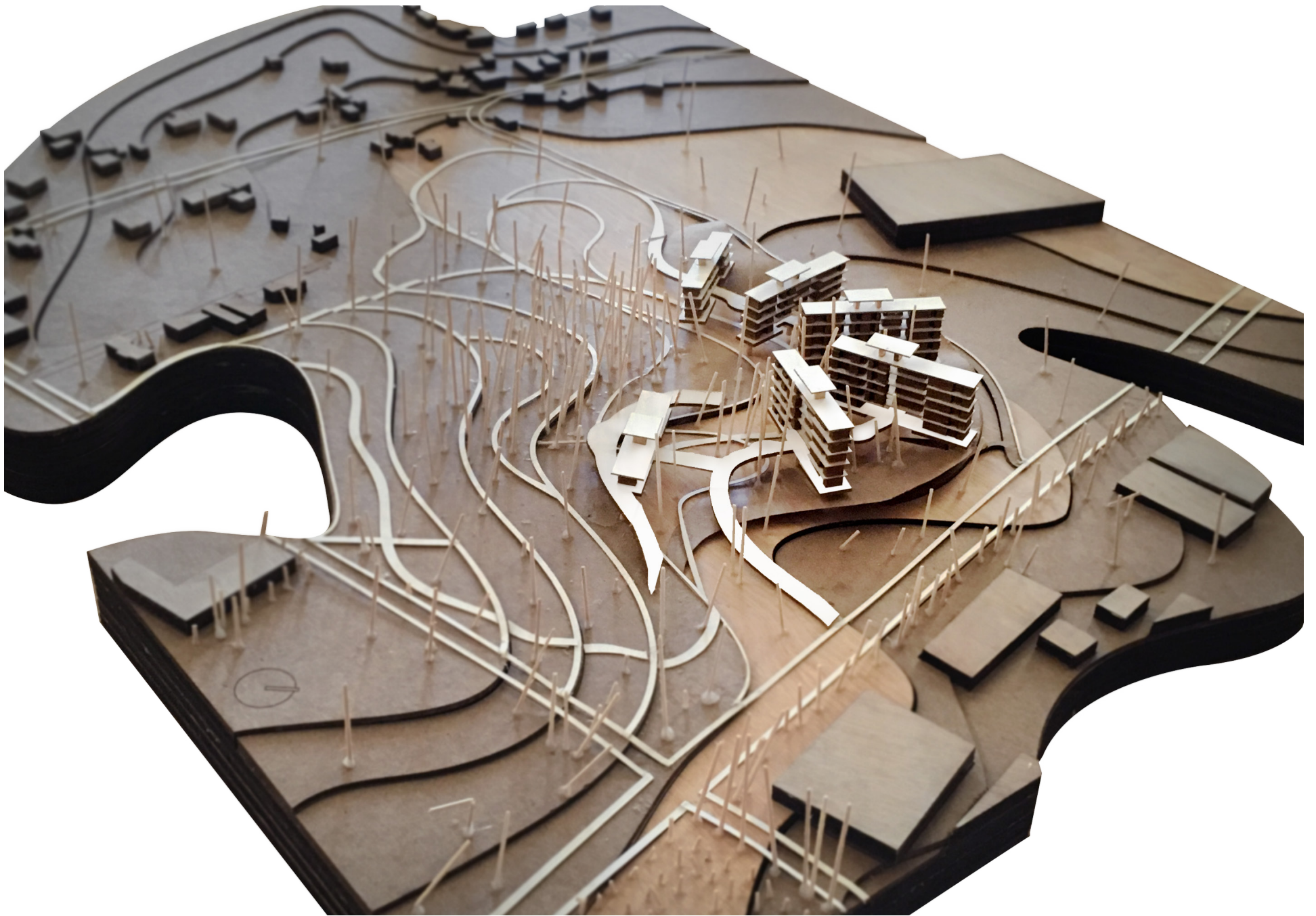
However, the importance of the Hawaiian culture and its ties to the 'āina should not be abandoned or set aside. (fig. 50) Always in the foreground of the design process exists a keen understanding that, as Judy Rohrer notes “the 'āina, the land, [...] is alive – it can do things, want things, know things. [Hawaiians], in fact, are the offspring of a union between the earth and sky, making the 'āina a direct relative.⁵²

Following this line of logic, the architectural design draws inspiration from the extreme environmental conditions surrounding the site and reflects the looping flow of pahoehoe lava. The undulations in the ramping platforms flows over the topography and connects back to the land both literally and figuratively. Arranged to the elevated platforms, the rising apartment buildings are angled and to best capture the trade winds. The intentional thinness of the buildings never exceeds 30ft in depth and assists in any inconsistencies or changes in wind directions while also ensuring steady quality natural lighting. (fig. 51-52)

A rhythm of fenestrations creates continuous visual contact with the land. (fig. 53) This persistent relationship with the natural

environment is an aggressively pursued design tactic. No matter the location, inside or out, residents and visitors have a connection to the land. With Pono Kauhale no partition of the interior and exterior is hard-set or guaranteed. Āina surrounds the apartments and is as much a part of the design as the architecture: the land is a member of the village.

⁵² Judy Rohrer. *Haoles in Hawai'i. Race and Ethnicity in Hawai'i*. Honolulu: University of Hawai'i Press, 2010. 14.



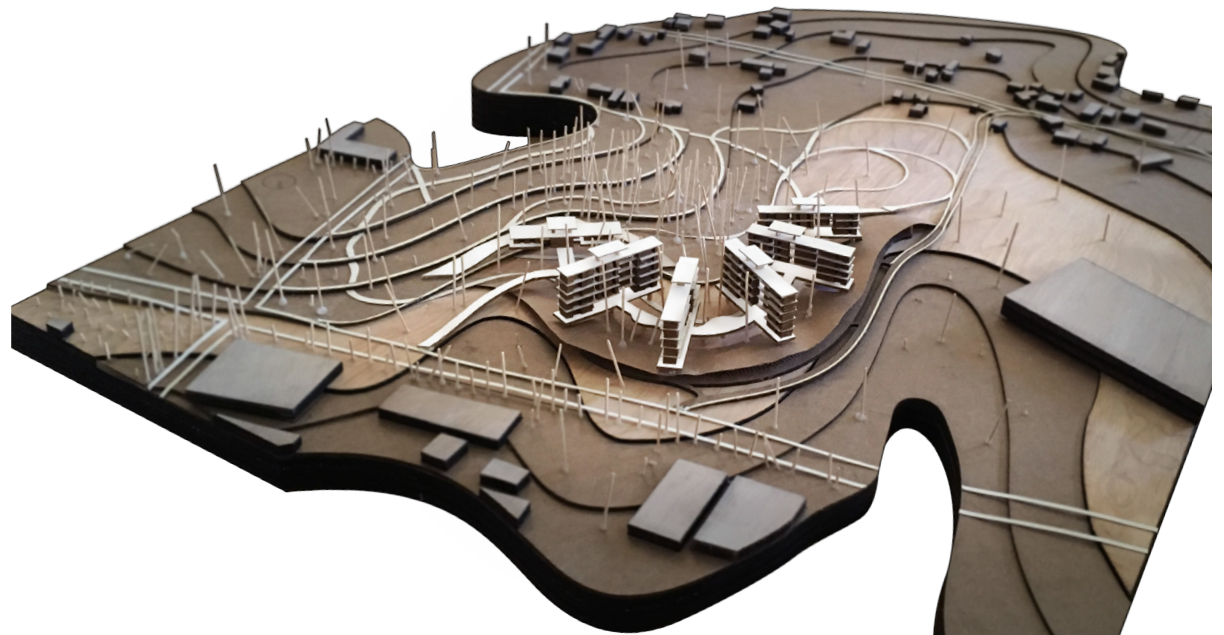


fig. 52 | view towards old pahoia village & detail images of physical model



elevation | e



elevation | s



elevation | w



elevation | n

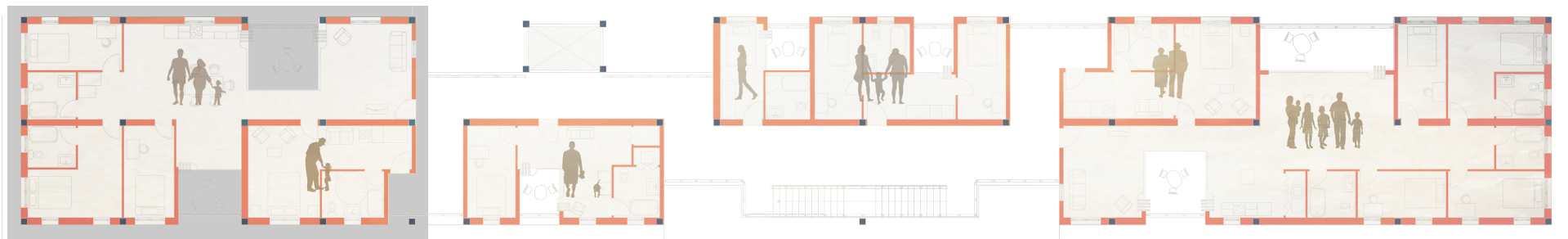
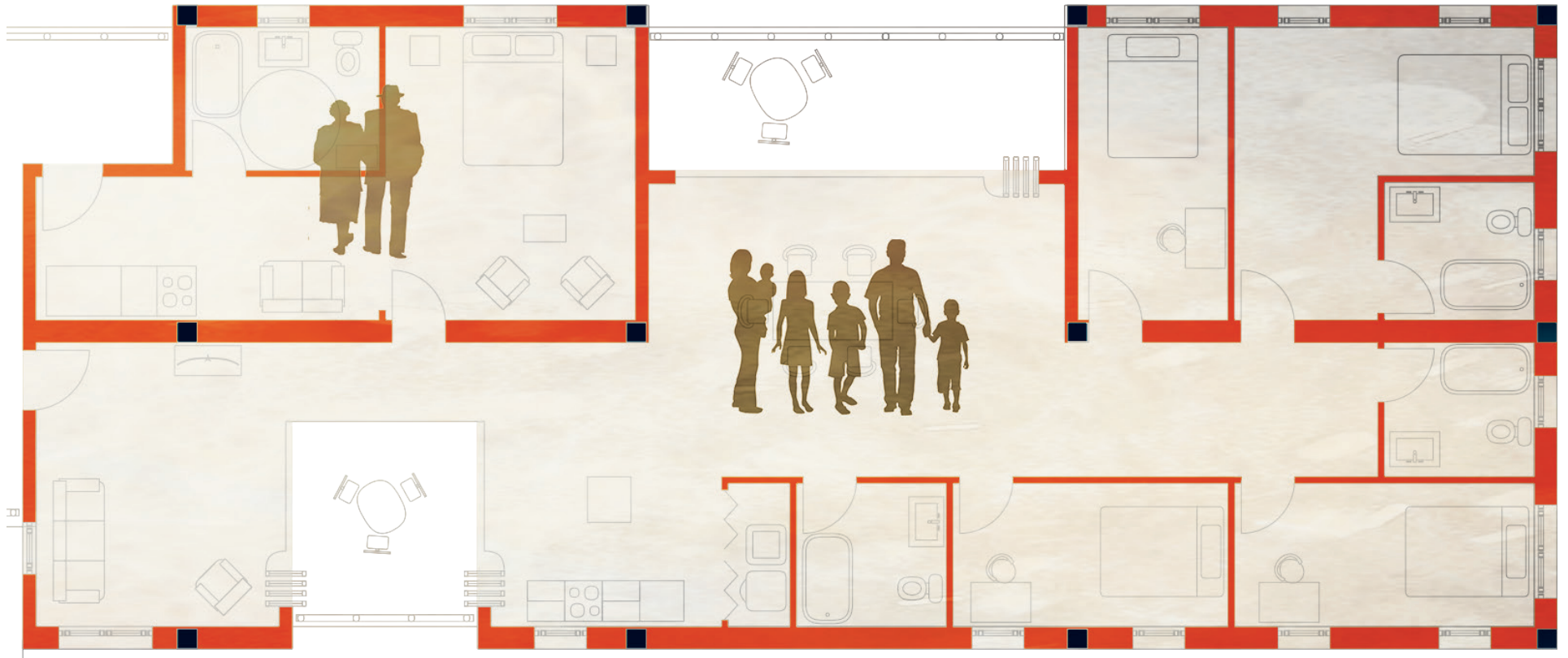
fig. 53 | pono kauhale elevations



Traditional Hawaiian villages consisted of small clusters of families. The largest of these residences has 32 units; these apartments embrace a large family dynamic, with grandparents, adult children, and kids all together. As of 2010, the oldest of the baby boomer generation reached 65 years of age and every year more kapuna achieve retirement age. While mainlanders may consider moving to communities focused on older care, in Hawaii few are willing to send kapuna to an assisted living facility. Independence is an important aspect of American contemporary culture, but sometimes it is necessary to have help: carrying groceries or getting a ride to the doctors. Elders apartments have a private entry, with ohana in easy reach. As always, communication and community between generations is key for both ohana and kauhale. (fig. 55-56)

The cultural center acts as a connection and a draw for the larger community. (fig. 57) With a central gallery space to showcase local artists and a computer library for students, the center generates its own funding by renting out offices and providing a large space for rotating venues from childrens first birthday parties to formal wedding events or business conventions.

The gardens surrounding the built environments meander across 35 acres of land terraced and irrigated with a system allowing water to flow downhill and to the east. These gardens intertwine with the built environment. (fig. 58) Within a series of winding paths, the land is divided into small pea patch gardens, maintained by Pono Kauhale residents and members of the Pahoia community. Nearer the apartments the garden gives way to a children's playground where keiki can gather after school and play on weekends. (fig 54)



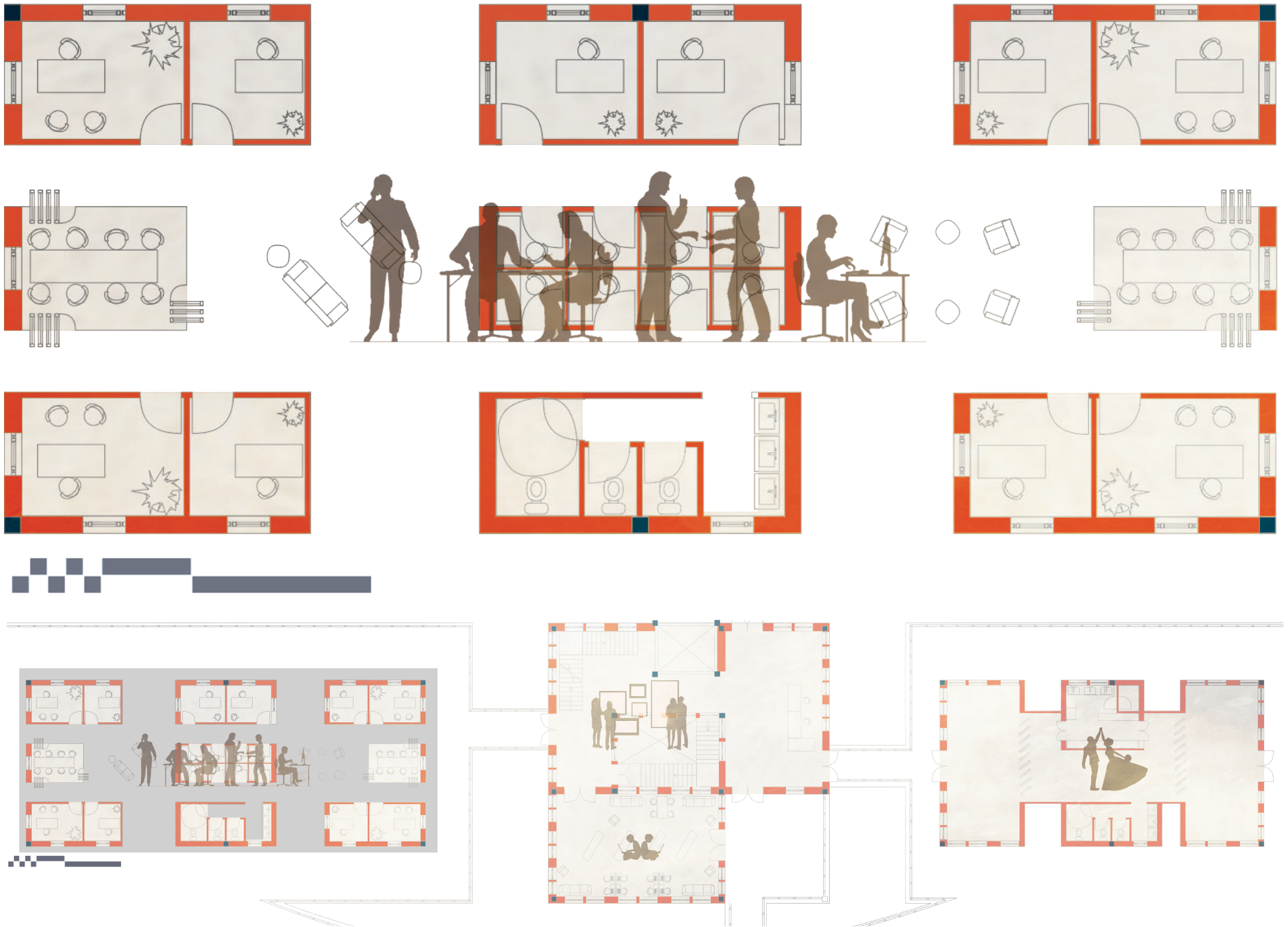


fig. 56 | cultural center plans: spaces include offices, gallery for local artists, study library, and venue/ event space





fig. 58 | exterior entry to residential vertical circulation. structural elements also act as climable surfaces for living walls.

Housing is much more than shelter. [...] Home is a place in a community.

Margaret Rodman. *Home in the Islands: Housing and Social Change in the Pacific*

chapter 5 : CONCLUSION

This thesis began as a project with a very specific goal in mind – explore the possibilities of a new building type for Pahoia village. Pono Kauhale strove to create something strong, something durable, something to last generations - even if the final project exists only within the theoretical. Beyond the scope of simple tectonics emerged the challenge of creating an architecture to bring together the scattered Kanaka Maoli, the kama'āina, and all the people who love Big Island and Puna district as much as I do.

The issue of lava and lava diversion has always been present in my mind. From my porch in Orchidland Estates in Puna I used to look at the red glow reflected off the clouds at night and wonder where the lava flowed: to the sea or over the land. (fig. 59) However, the project has never been about designing architecture to withstand Pele. In the complex social and political landscape existing in Hawai'i and across the Hawaiian Islands, dangerous environmental factors play only a small part in approaching the research and design of Pono Kauhale.

The extreme poverty many indigenous people in Hawaii encounter reflects in the built environment they inhabit. Little to nothing

remains of the influence of the traditional thatched pili hale, or the emphasis placed on peoples actively seeking to live, eat, and work together. As noted by Russell Apple:

The few thatched structures found in Hawaii [...] were built for exhibition purposed and most are suspect as to authenticity. They are not used as dwellings but as landscape features. [...] The structural types, built entirely of native materials and of Hawaiian design found in Hawaii in 1778 -- and the ways of Hawaiian life which evolved them and found them suitable -- have gone.¹

Concrete blocks, vinyl siding, and asphalt lack the necessary mana to sustain the Hawaiian people. Negligent decisions on housing conventions broke a sacred connection by ignoring the land and building for convenience rather than linking community. This thesis attempts to amend that mistake, bridging the divide and bringing the land and the built environment together. Creating residential buildings to address the housing shortage is only one aspect of this project.

Each attempt at researching a direct approach created a new issue. The spiritual connection to the land is broken, but how can this be addressed architecturally during a housing

¹ Russell Apple. Hawaiian Thatched House : Use, Construction, Adaptation. San Francisco: Office of History and Historic Architecture, Western Service Center, 1971.202.



fig. 59 | 16-148 auli'i street: orchidland estates

shortage? There is a desperate need for more housing felt across all the islands, yes, but at the same time what about the increasing number of kapuna living with adult children. What about the connection with community? With 'āina and mana? Each layer brought to the forefront a new issue, not separate but interconnected and worth confronting. For a successful kauhale, not only Hawaiian culture and housing but also elder care, community integration, general safety and wellbeing all required special attention. The design itself is an attempt to build for and express all the many nuanced layers required of a real community. Building architecture to withstand the fiercest elements became a balancing act of designing a plausible network of systems which, once in place and released, could sustain themselves and spread throughout the Puna district indefinitely.

Pono Kauhale is a first step towards a better solution for the layered landscape of challenges that exist within the issue of housing in Hawaii. By fearlessly assessing the wider scope, looking at the bigger picture and asking questions, these complex issues are approached as an interconnected unit instead of as separate problems able to be conquered independently of one another. The proposed architecture is an armature for the kauhale.

It seeks to serve as a spine from which the community can draw strength and grow. (fig. 60) A cycle of destruction and rejuvenation is embedded within the spirit of Hawai'i and the people inhabiting the land. Portions of the built environment can be destroyed; the hale will survive because the kauhale exists and the community will rebuild.

The Hawai'ian archipelago is the most isolated, continuously populated location in the world and maintains an exceptional and distinctive climate and culture. BeingWW responsive to this very specific environment and being sensitive to the cultural and physical needs of the kauhale is of utmost importance. Ultimately, this thesis is not about sustainable affordable housing. It is not an urban design or landscape project. It is an architectural puzzle – creating a bridge between kauhale and 'āina. It creates a generational connection between Hawaiians and their environment through the home. Taking the spirit of the land and creating a reasonable form of expression that is both respectful of the culture and resilient enough to survive is not a simple gesture. This thesis is meant to empower the people already living in the area and to embrace the unique and beautiful Hawai'ian aloha of Puna.



fig. 60 | pono kauhale: children play along raised boardwalks winding between lava resistant columns.

DEFINITION OF TERMS¹

'Āina.....	the land
Aloha.....	love, affection, compassion, mercy, sympathy, pity, kindness, sentiment, grace, charity, duty, a greeting and a farewell.
Hale.....	home
Hapa.....	portion, fragment, part, mixed blood, a person of mixed heritage, usually of Hawaiian European descent
Haole.....	a person of European ancestry, mainland
Hawe.....	crime, wrongdoing
Kānaka Maoli.....	people of Native Hawaiian descent, full blooded
Kama'āina.....	native-born, born on the islands, host
Kapuna.....	elder, grandparent, ancestor
Kauhale.....	village
Kapu.....	forbidden
Keiki.....	children
Ku'iku'i pu'uone.....	priest, royal architect
Lāhui.....	nation, people
Limu.....	a general name for aquatic plants: kelp, seaweed
Mana.....	spirit of the land and people, divine power
Mahalo.....	thank you
Moana.....	the ocean
Ohana.....	family, relative, kin
Pahoa.....	Short dagger; sharp stone, especially as used for a weapon
Pono.....	goodness, uprightness, morality, correct and proper procedure, true connection, natural, living rightly, righteous
Puka.....	a small hole
Tutu.....	grandmother, grandfather, elder

¹Pukui, Mary Kawena, and Samuel H. Elbert. Hawaiian Dictionary: Hawaiian-English, English Hawaiian. Rev. Ed. Honolulu: University of Hawai'i Press. 1986.

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