CITING THE NATIVE GENIUS

A Thesis Submitted to the Department of Architecture
Harvard University Graduate School of Design, by

TAYLOR COOK

In Partial Fulfillment of the Requirements for the Degree of
[Masterof Architecture]

JANUARY 2021

"The author hereby grants Harvard University permission to reproduce and distribute copies of this thesis, in whole or in part, for educational purposes."



Taylor Cook



Jeffry Burchard

Abstract

Citing the Native Genius
Thesis Design Project
https://www.vernacularhawaii.com/
By Taylor Cook
Advised by Jeffry Burchard

Candidate for MArch I, Fall 2020.

For over 120 years Americanization has tried to demean and erase Hawaiian language, culture, and architecture. In contemporary discourse, the vernacular architecture of Hawai'i is mostly referred to as ancient and vague.[1] As with many Indigenous cultures, Western perspectives tend to fetishize or patronize the Hawaiian design aesthetic. Within this hierarchy of knowledge is a systemic assumption that Hawaiian vernacular architecture cannot effectively serve as a precedent resource for contemporary architects. Those who do reference the original vernacular will often classify it as utilitarian or resourceful. Regardless of intent, this narrative takes design agency away from the people involved. As a corrective, a respectful use of vernacular domestic form would benefit designers that are struggling to connect with Hawai'i's cultural and architectural traditions. Fluent communication through form requires analysis and classification.

Mining the European gaze and influence out of revivalist publications, archeological surveys and historic images reveal unique characteristics of Hawaiian domestic space.

Geometric quotation and symbolic referencing are the foundational instruments in applying the discrete components, form, and organizational logic of the vernacular. The result is a design process that creates an amalgamation of decolonized form and contemporary technique. This residential project intends to revive Hawai'i's erased domestic experience by revisiting the precolonial vernacular style. The outcome suggests that when designers look to the original vernacular as a primary source to solve architectural problems, a culturally unique and deeply symbolic space can emerge from the process.

Contents

Abstract 2
Contents 3
Narrative 6-33
Historical context 34-39
Cultural context 40-43
Two acts 44-45
Archeological evidence 46-47
5 moments 48-51
2 vernaculars 52-53
Timeline 54-57
Anonymity 58-59
Architectural genealogy 60-67
Residential charater 68-71
Moderist culprit 72-85
Precedent approach 86-89
Precedent analysis plan 96-115
Precedent analysis form 116-133
Aesthetic principles 134-135
Abstracted design 136-137
Site selection & analysis 138-145
Geometry 146-147
Framed perspectives 148-149
Site Plan 150-151
Floor Plan 152-153
First house 154-159
Second house 160-165
Lanai 166-171
Work house 172-177
Site Section 178-179
Recap 180-183
Conclusion 184-187
Endnotes 188-189

Do not duplicate without authors permission.

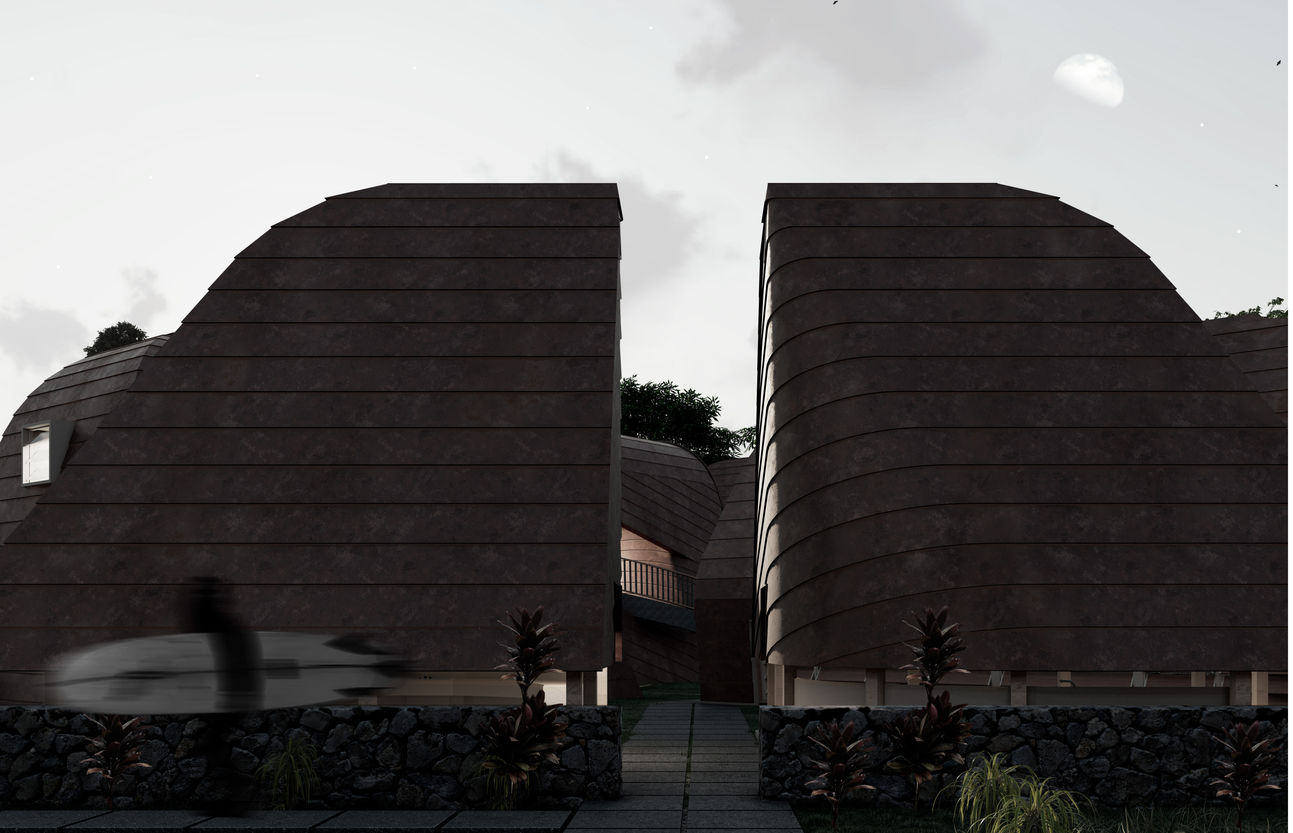


A residential plan that is developed out of the hearth is common throughout the world and organizes homes so that people to look into the center of a space and away from the world. Where Semper says, “hearth formed that sacred focus around which the whole took order and shape” Kamakau tells us that Hawaiians always had a “houses for cooking” (p96)[2].

Looking into a nuclear space provides comfort to people in these western cultures. This experience is inverted in Hawaii. The hearth is replaced by the lanai (detached veranda) or Kahua (open space)[3]. Comfort in hosting and gathering is found in a pavilion space that organizes people to look out into the surrounding Landscape to find their comfort.

The narrative spaning pages 6-32 explores an imagined day in the life of two housholds sharing one residential duplex. In this experience, spatial manifestations of an exterior hearth concept and the desire to reintroduce a forgotten dualism in the dwelling place results in a doubling, spliting and sharing of space that is unique to Hawai'i.

Do not duplicate without authors permission.

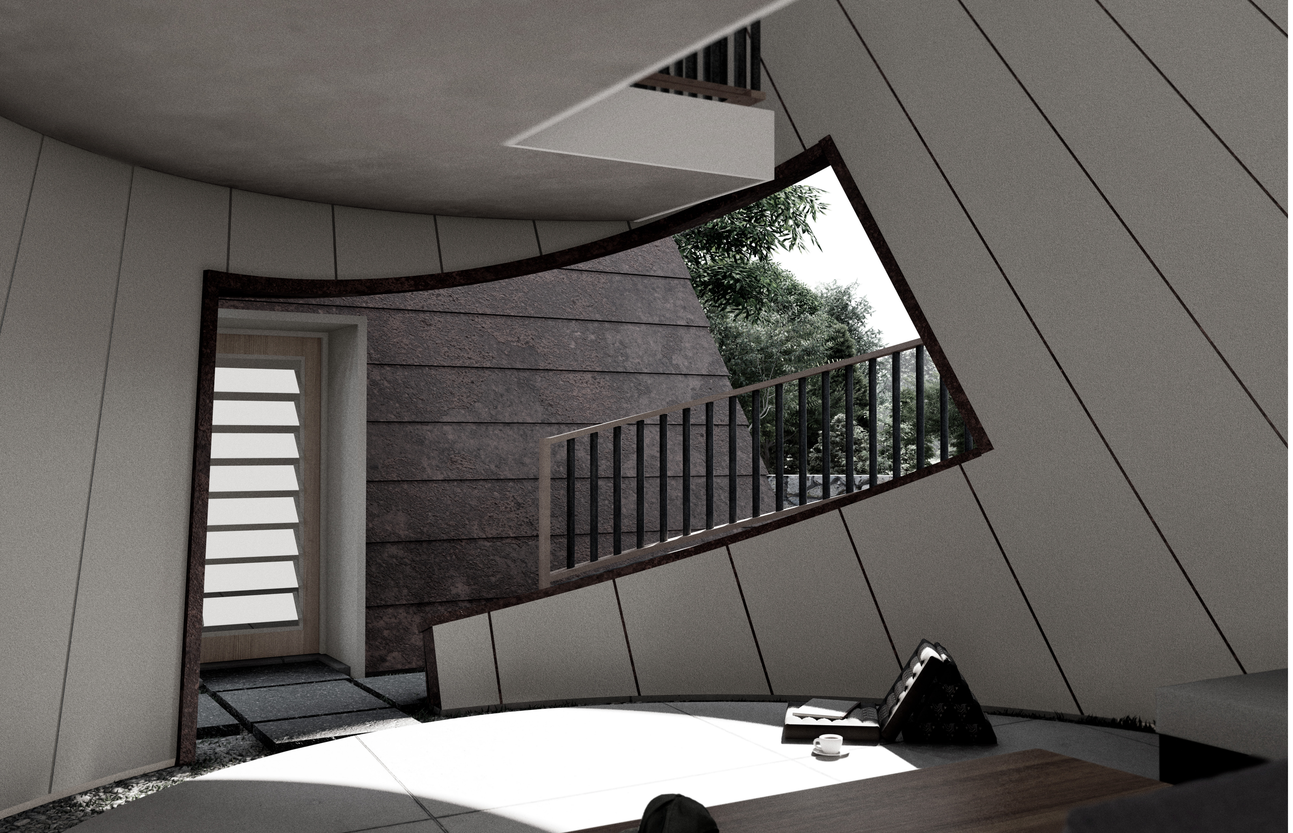


Koa is a 30 year old mahi'ai. As a Hawaiian farmer he knows that his day must start early but today instead of going straight to work, he's heading to the beach. Today he woke up before the roosters, limu-lipu'upu'u - the wind of his neighborhood has calmed. The sounds and smells of a calm morning are rare and treasured experiences. His body's corporal reaction to the fluctuating conditions create a cerebral response. He contemplates his connection to the environment of his ancestors.

Form and Material:

The pā pōhaku (stone wall) that surrounds the duplex acts as a boundary sign and historical symbol. Constructed of natural stone that locals believe have a living energy called mana, these stones define the sanctuary of the duplex. Like kia'i (guards) the stones stand firm to protect the homestead. Beyond the pā pōhaku the resident is exposed to all the elements of the world.

Do not duplicate without authors permission.



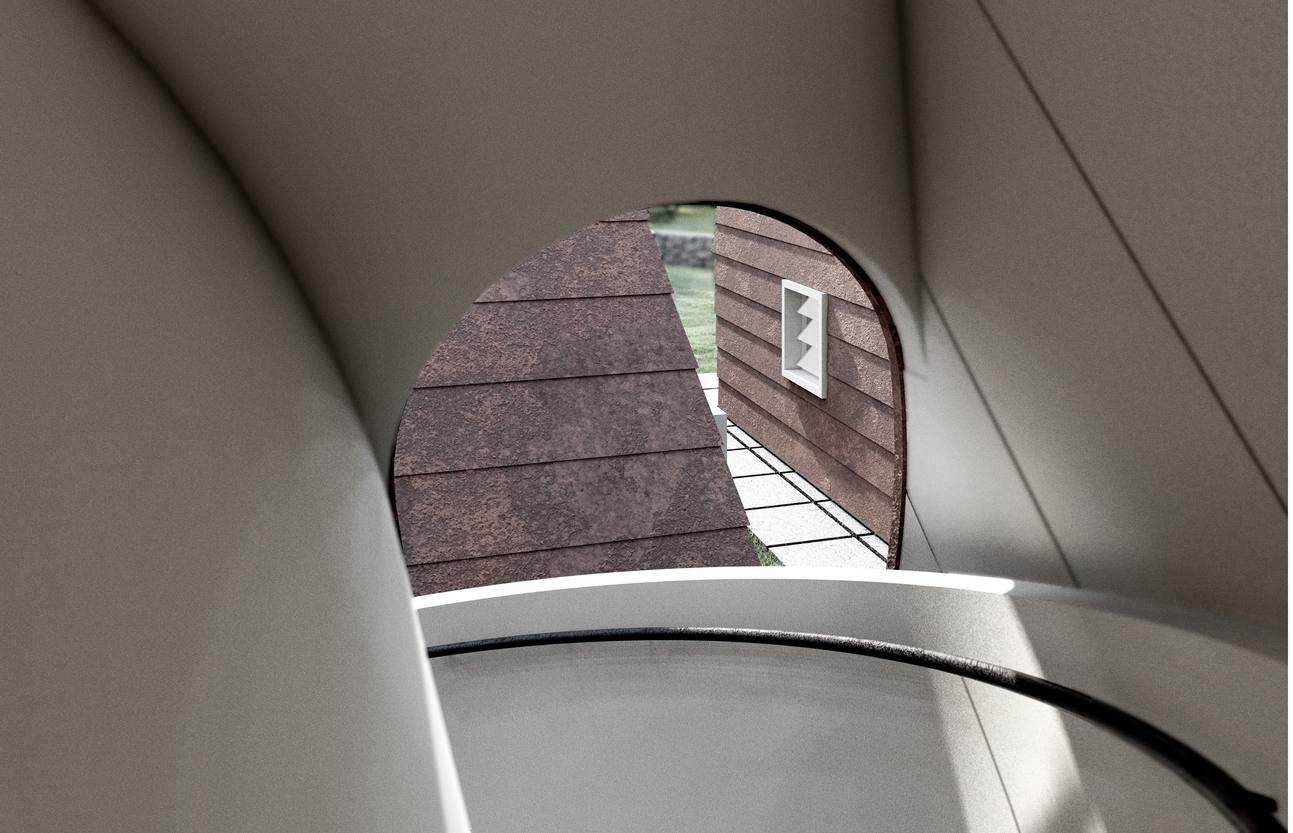
Wyatt is a writer, as a night owl, He wakes up after the sun. His impending deadline requires that he rearrange todays schedule over breakfast.

Form and Material:

The dining space and kitchen of hale elua (house 2) is simultaneously exposed and sheltered. A conical void points toward the center of the suns southern path. Direct sunlight is masked to create a daily sequence of lighting conditions that can be associated with moments of the day, month, and year. Before the shelter absorbs the day's heat the resident can say their pule no ka lā (prayer for the day/sun) with direct morning light.

Interior paneling references the cones ruled lines and primary structural frame. Fenestration, circulation and form all work together to enforce the reverence of the suns path. Exposed concrete flooring stops short of the dining room walls so pebbles and plants can punctute the threshold between interior and exterior space. Beyond the dining space, a sleeping house masks the southern view to create intended dialectics of shape to void and shape to landscape.

Do not duplicate without authors permission.



While wyatt eats breakfast, Koa returns from the beach. After washing up and changing his clothes he grabs a bite to eat as well.

Form and Material:

In the hale ekahi a cropped view from the second floor bedroom forces the resident to manouver around the embedded conical form and the exterior walls.

An arched header over this passage reinforces the fluidity of the surface material and the perception of the overall form of the hale.

Do not duplicate without authors permission.



The sun is now reaching deep into The kitchen. When the room is fully saturated with sun light, he knows he should be at work. It motivates him to start the days labor.

Form and Material:

The conical dining space and kitchen of hale ekahi (house 1) is similarly shaped, situated and oriented as the hale elua. The embedded cone points toward the center of the suns southern path. Direct sunlight is masked to create a daily sequence of lighting conditions that can be associated with moments of the day, month, and year. Before the shelter absorbs the days heat the resident can say their pule no ka lā (prayer for the day/sun) with direct morning light.

Interior paneling references the cones ruled lines and primary structural frame. Fenestration, circulation and form all work together to enforce the reverence of the suns path. Exposed concrete flooring stops short of the dining room walls so pebbles and plants can punctute the threshold between interior and exterior space. Beyond the dining space, a sleeping house masks the southern view to create intended dialectics of shape to void and shape to landscape.

Do not duplicate without authors permission.



As Koa heads out he sees Wyatt taking the dog for its morning walk.

Form and Material:

Unlike the hale elua, this form brings the stair into the space rather than pushing it to the exterior. This formal decision creates a strong pressence of geometry in the hale. The stair's galvanized steel stringer traces the perpedicular curve of the cones inherent geometry and tangentiallly peels off of the level ceiling before it passes through the plumb wall and plugs into the finish grade at the stair's landing.

The exterior sheathing on the houses is a rapidly weathering red metal. A606-4 weathering steel provides a monolithic visual aesthetic. The homogenous siding material forces the surface of the form to perform as both roof and wall with fluid yet developable transitions.

Do not duplicate without authors permission.



The two share some aloha as they head to their duties. Wyatt heads to the Hale Hana and sets up for day of writing.

Form and Material:

The hale hana (work house) brings work closer to home but maintains a separation between business and recreation. The only form in the complex that does not utilize a cone to achieve a desired manipulation of space. Rather than embed the use and circulation logic into the geometry of the form the design intent behind this space is much more existential.

Do not duplicate without authors permission.



The space is introspective and the rhythm of the structure always provides enough complexity to inspire but not enough to distract.

Form and Material:

The rhythmic steel structure is emphasized by an intermittent fabric backlight panel. A ridge line sky-lite ensures an evenly dispersed gradient of light through the entire space. By limiting the glass fenestration to the short facade, the office provides an introspective yet productive environment.

Do not duplicate without authors permission.



In a day dream, The roof seems to be splitting under the pressure of a piercing sun. A tension ring at the apex of the structure is begging to burst at Any moment while the walls could spring out like a jacking the box.

Form and Material:

In the hale hana the two family's finally converge to share void space. While the office is only accessed at one point the void is split by a new and foreign shape. The rectangular service space housing a restroom, storage and watering space provides the immediate needs of both office spaces without dominating or fully partitioning the overall void. The partition is seen as an independent form or even as a peace of furniture as its position is clearly distinct from the overall shape.

Do not duplicate without authors permission.



On a break, Wyatt pays Koa a visit. While out clearing some land for a new lo'i kalo they both get caught in the rain. The Ka'ua (rain) of Waimanalo is temperamental and invites herself to any and all occasions without warning.

Form and Material:

Nested amongst the thick unmanicured vegetation these structures take on a zoomorphic quality. Much like wild creatures they appear both natural and unfamiliar.

Do not duplicate without authors permission.



As swift as Ka'ua showed up and sent them into their houses she's gone and the sun burns off the proof of her presence within minutes. Koa takes the opportunity to make some lunch.

Form and Material:

A conical surface allows for the flat strips of metal siding to wrap the building without requiring unique manipulation or distortion.

Do not duplicate without authors permission.



As a traditional musician, W'yatt's partner has spent the morning developing a new oli. The chant is developed out of the mo'okuauhau - its a chant about how the ancestors that came before and are represented by the shadows of the endlessly circulating sun. The up stairs has recently been converted into a music room. On most days the easterly ko'olau trade winds are captured by this louvered wall. On days like this one the light wind creates a warm environment in the heat of the day, but the passing showers and cool air from the shaded first floor keep it tolerable.

Form and Material:

The hale elua has an upstairs nook that provides a flexible space for reading, stretching, studying etc. As it does on the first floor, interior paneling reveals the cones ruled surface geometry and points to noon sun on the winter solstice. By clipping this cone it also reveals a culturally significant feature of the night sky. Ke Kā o Makali'i (the bailer of makali'i) is a well known constellation in Hawai'i that includes the Greek Orion's Belt.

Do not duplicate without authors permission.



Still though, she heads to the lanai. On the way she is reminded of her Tutu Wahine (grandmother) and Kupuna (great grandparent) and the stories that they shared with her as a child.

Form and Material:

A borrowed scenery is dramatized by both framing quoting and cropping to achieve the desired effect. The compound's structures continue the formal language of the natural landscape to both honor it and humbly reinforce its importance on daily life in Hawai'i.

The resident is forced to contend with their existence in relationship to the landmarks that have shaped Hawaiian culture through mythology, genealogy and historical context.

Do not duplicate without authors permission.



The lanai is always temperate and it has the added benefit of a guaranteed conversation with anakala Ben her chatty neighbor.

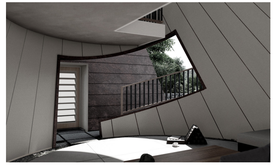
Form and Material:

The lanai structure is made for comfort. The form is simple yet dramatic. A continuous band of open air wraps the space to capture a breeze from any direction. A small attic space is substantially vented both naturally and mechanically to ensure vertical air circulation. The tall well insulated roof is slow to absorb radiative heat and quickly expels it when shaded or out of direct sun exposure.

This space serves the favorite pass time of Hawai'i's locals. A good hosting space is essential for each family. Although the Lanai is enclosed to focus the inhabitants on each other, an adjacency to it's twin and the lane ensures unintended social interaction.

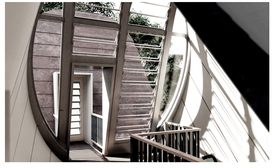
Do not duplicate without authors permission.








Although this experience was inherent to the place and is inextricably linked to the climate, geography and culture of the community this duplex it is actually not anonymous in Hawai'i. The actual vernacular architecture of Hawai'i today does not effectively serve or represent the lifestyle of the people.

In much of Hawai'i's past and present the people put the hearth and thus their comfort outside, but the architecture that they inhabit today is derived out of a culture that puts the hearth on the interior. Buildings in Hawai'i used to Create a three-dimensional perception of space that was linked to the culture that it served.

Form and Material:

A pervasive use of material and form create continuity amongst varying forms. A specific pairing of use and void shape helps to create consistency without resulting in homogeneity.

Materials like timber beams, glue-lam beams, galvanized steel beams, steel roofing, exterior plaster, interior gypsum, wood tongue and grove paneling, fabric partitioning, and scored and polished concrete floors are all common materials throughout the islands. By keeping in line with common material and construction techniques the project will demand creative thinking only in the mediums in witch craftsman are already experts.

Do not duplicate without authors permission.



Picture of Ahu'ena Heiau[4]

In my research to find a vocabulary that could define the contemporary Hawaiian (island) sense of place, I found an architecture in crisis. I found enough evidence to believe that the genealogy of the original vernacular architecture of Hawai'i had been cut short of it's evolutionary potential. I also found that it has little to no representation in the built environment today[5]. The following work is attempting to focus on some of the architectural traumas that lead to the erasure of the Hawaiian architectural style due to western colonization and aggressive Americanization.

Do not duplicate without authors permission.



Map of Hawai'i's global context[6]

After centuries of Pacific trade and geographic independence the Hawaiian people developed unique governmental, religious and aesthetic opinions. By the mid nineteenth century, decades of influence from colonial merchants disguised as enterprising missionaries had permeated the royal family[7]. In this era, extreme changes came to the people from the top down.

Do not duplicate without authors permission.

Historic Context



Queen Liliuokalani[8]
Last reigning monarch
1890s



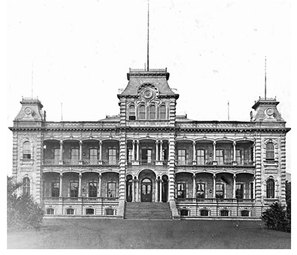
Prince Jonah Kuhio Kalaniana'ole[9]
Congressional delegate from Hawaii Territory.
1920s

Eventually the true intentions of Christian advisors lead to the coup of the Hawaiian Kingdom. Due to military interests the United States' congress and senate passed the Newlands Resolution and declared the annexation of the coup government.[10]

Do not duplicate without authors permission.

‘Iolani Palace[11]

Built in 1879



‘Iolani Palace[13]

Coup of the Hawaiian monarchy, January 1893



American Generals[12]

War with Spain, 1896



‘Iolani Palace[14]

Illegal Annexation, August, 1898

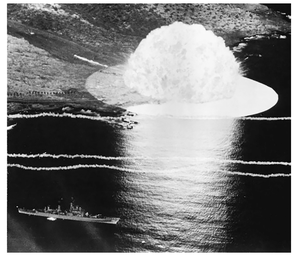


This constitutionally illegitimate and illigal annexation is well known today as a militaristic occupation. The American occupation that still exists has established animosity in the hearts and minds of native and foreign families loyal to the crown[15].

Do not duplicate without authors permission.

American war games[16]

Kaho'olawe
April 16, 1965



Hawaiian Sovereignty[17]

Displacement in Hawai'i Kai
August, 1970



Hawaiian Sovereignty[18]

Development on Sacred land
August, 1979



Hokule'a[19]



For most of the last century, songs, chants, and folklore ached for the days when the Kingdom prioritized the Hawaiian way of life by perpetuating the arts, sciences and spirituality that is native to the land. Fortunately, during the last 30 years an extensive grassroots movement has revived much of the suppressed Hawaiian culture.

Today, Hawaiian language, sport, craft, music, religion, medical care and performance art can all be seen and heard throughout the islands. As many traditional principals have seen a strong reestablishment in contemporary Hawai'i, the values on spatial aesthetics are unfortunately seeing a much slower return[20].

Do not duplicate without authors permission.

Timeline of the Hawaiian Vernacular in 2 Acts[21]

ACT 1
WITH ‘AI KAPU

DUALITY IN ARCHITECTURE

ACT 2
WITHOUT ‘AI KAPU

SINGULARITY

- Caves and natural earth formations used as dwellings.
- Over time housing types develop with increasing population.
- Two preistly men named Pa’ao and Makua-kaumana introduce new rules to religion.
- Kauhale planning guided by ‘ai kapu separating program and houses.
- **1778 CAPTAIN COOK ARRIVES TO HAWAI'I BRINGING NEW DEVASTATING DISEASES AND WEAPONRY.**
- 1778 Webber sketches Kaua'i, documenting the abundant use of Kapi'o form.
- **1790 TWO BRITISH SAILORS BUILD THE FIRST FOREIGN STYLE BUILDING.**
- 1790 Sandalwood export trade starts
- 1794 The first vessel of foreign design named Britannia is built by english carpenters.
- 1800 Construction of Kamehameha's residence, the first Hawaiian palace built of brick.
- 1804 Japanese laborers arrive.
- 1809 John Palmer Parker starts The Parker Ranch.
- 1810-1825 Height of sandalwood trade.

- 1819 King Kamehameha II and Queen Ka’ahumanu abolish ‘Ai Kapu.

- 1820 Missionaries build Kawaiaha`o church founded with Rev. Hiram Bingham as pastor.
- **1820 SEPARATION OF PROGRAM AND HOUSE ENDS.**
- **1822 THE FIRST MISSION HOUSE WAS BUILT FROM BOSTON LUMBER.**
- **1825 MERCHANTS IMPORT BUILDING MATERIALS FROM OTHER NATIONS.**
- 1826 Night-biting mosquitoes introduced to the Islands. Church at Kailua, Kona, finished and dedicated.
- 1827 William Ellis visits Hawaii records"however near the houses may be, they are alyways distinct buildings.
- 1825 Wainee church the first stone church built in Hawai`i.
- **1837 ORIGINAL VERNACULAR IS DENSE AND NEAR UNIVERSAL IN HONOLULU.**
- 1831 Chamberlain House - built of local coral rock, local mortar and lumber salvaged from shipwrecks.
- **1834 DAVID MALO BEGINS WRITING ABOUT TRADITIONAL HOUSES IN NEWS PAPERS.**
- 1842 Kawaiaha`o Church, designed by Rev. Hiram Bingham and Dr. Gerritt Judd. .
- 1846 A record 736 whaling ships visit the Islands

The arrival of captain James Cook in 1778 has undoubtedly had the most devastating impact on Hawaiian life and culture in all of its history. The consequences of Cook introducing western diseases and weapons to Hawai'i are innumerable, and eventually led to the horrendous lose of over a million lives and the end of many kānaka maoli (native Hawaiian) ancestral lineages. The emotional trauma that this and subsequent events inflicted on kānaka maoli have had many manifestations over the last 240 years and is still present today[22].

A respectful use of historical referances is imperitive in this study and if siding on caution results in teped statments and moderate conclusions I am happy with that result. I find my confidence in the words of the last reigning monarch Queen Lili'uokalani when she said,

“I could not turn back the time for political change, but there is still time to save our heritage. You must remember never to cease to act because you fear you may fail.”[23]

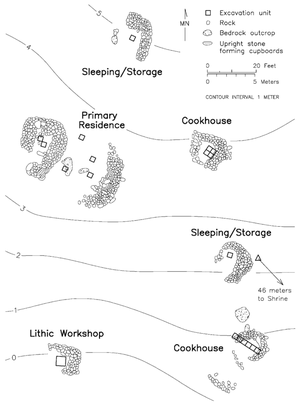
Much more qualified experts have recounted and dissected the impact of the west on Hawaiian arts, sciences and crafts. As a student of architecture I believe domestic space has an important role in culture and identity. Identifying noncolonial methods of shaping space can benefit all members of society in contemporary Hawai'i.

I see the erasure of traditional architectural aesthetics as a result of 5 significant moments spanning two major acts.

The two Act's divide Hawaiian cultural history into before and after the monarchy converted to Christianity and abolished the ‘ai kapu regulatory system. One of the foundational components of Hawaiian ‘ai kapu society was restricting men and women from eating together.

Do not duplicate without authors permission.

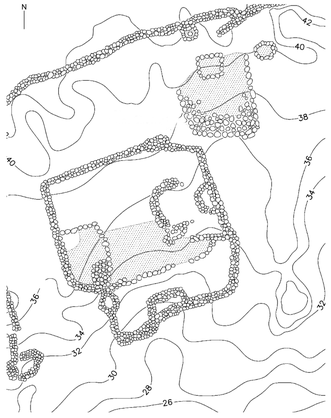
Archaeological Map of Pre-Contact Household



Note the inferred functions and separation of the architectural features. Archaeological map of a single pre-contact Hawaiian kauhale (household) on the island of Moloka'i.[25]

(Adapted from Weisler and Kirch 1985:145, Fig. 9)

Archaeological Map of Post-Contact Household



Note the tightened perimeter around distinct rooms. Archaeological map of three post-contact Hawaiian household sites on the island of Hawai'i.[24] (Adapted from Ladefoged 1991:63, Fig.5)

The monarch's dismissal of traditional practices brought the demise of an architectural duality between male space and female space. In the 1830s Hawai'i historian David Malo described the domestic structures of a traditional household.

Malo says,

"Every self-respecting Hawaiian who desired to live up to the system of kapu was obliged to build for himself and family a number of houses, the chief motive being to separate the sexes entirely from each other while eating, as well as to provide suitable places for carrying on the various occupations."[26]

Do not duplicate without authors permission.

5 moments to ensure the erasure of the Hawaiian Vernacular

1: The brick palace.

2: The Kuleana Act.

3: American Civil War.

4: Matson shipping.

5: Teaching western building trades.

The Brick Palace

First foreign style building built by english sailers in 1790.[27]



Image of Brick Palace.[32]

Kuleana Act

72% were left landless due to Kuleana land maps like this one of Waimanalo.[2829]



Image of Kuleana map.[33]

Sugarcane Economy

American Civil War created massive demand for Sugar.[30]



Image of sugarcane plantation.[34]

Merchant Shiping

The Falls of Clyde shiping in the pacific 1882.[31]

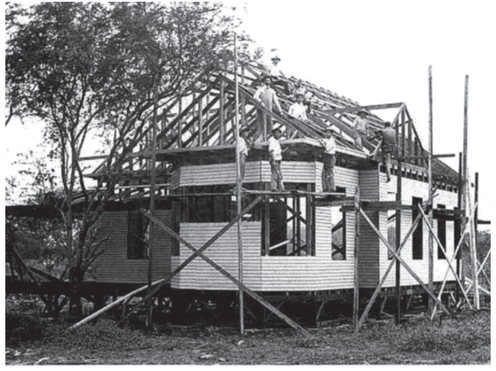


Image of The Falls of Clyde.[35]

Do not duplicate without authors permission.

Privileged Technology

Kamehameha Schools teaching western building trades to build this post and pier Craftsman house in 1902.



Carpentry shop students building a school cottage 1902—1903, Kamehameha School for Boys, (left to right, first row) Charles Brickwood Lyman (1904), Kaumu Hanchett (1904); (second row) Mr. Ira Eskew, Instructor, David Desha (1905), Arthur Arnold (1905); (third row) Stephen Desha (1903).[36]

The 5 significant moments that resulted in the complete erasure of the traditional architectural aesthetic are:

1: The brick palace in 1790, the first western-style structure built in Hawaii to serve as the first Royal Palace.[37]

2: The Kuleana Act of 1850 granted land to 11,000 Native Hawaiians and 72% were left landless. With 72% unable to build housing in their preferred technique Hawaiians experienced a massive decrease in the design agency of their environment.[3839]

3: In 1861 the American Civil War drives up the price of sugar and creates a booming industry for Hawai'i grown sugar. The industry requires the prolific development of plantation homesteads.[40]

4: In 1882 Matson began bringing modern building supplies in large quantities and much more affordable prices.[41]

5: And In 1887 The Kamehameha School for Hawaiian Boys began teaching western building trades to young Hawaiians to prepare them for industry. This institutional prioritization of western over traditional building techniques led to the direct erasure of the traditional vernacular style.[4243]

Do not duplicate without authors permission.

Original Vernacular Aesthetic



Image of original vernacular.[44]

Common Vernacular Aesthetic



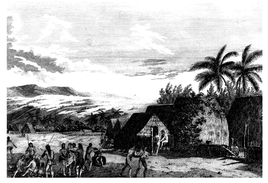
To better communicate the basic principles of the various domestic building styles in Hawai'i I have identified two categories of Vernacular Hawaiian Architecture. Within these two categories are various types and expressions.

The Original Vernacular refers to the domestic style that Hawaiians built in before foreign material, technique and form completely replaced it.

The Common Vernacular refers to the style of architecture that was built in Hawai'i and became anonymous in the islands after industrialization and Americanization erased the traditional architectural aesthetic.

Do not duplicate without authors permission.

Timeline of Vernacular Representation[6]



1770s



1870s



1890s



1910s

The images on this timeline are a small segment of a much larger collection I have gathered to compare the various depictions of the Original vernacular. Here we see depictions of how space was inhabited as western building components began to integrate into the Hawaiian vernacular.

Do not duplicate without authors permission.

Timeline of Vernacular Representation

"Our own highly complicated way of life has produced architectural standards based on different values than those of preindustrial times. These standards are concerned less and less with design and more and more with technology."[46]

- Sibyl Moholy-Nagy



1930s



1960s



1990s

We now see the gradual disappearance of the unique Hawaiian form as new technology and American influence began to replace it.

Do not duplicate without authors permission.

Original Vernacular

Lahaina;

"the number of inhabitants is about two thousand five hundred" p.182

Honolulu;

"The houses for the chiefs are generally large... from forty to sixty feet in length, twenty or twenty-five in breadth ." p.137

- Stewart[47]



Street view image of Honolulu with Kinau in the foreground, by Louis Jules Masselot (1837); Hawaii State archive.[48]

Although this research is primarily focused on the domestic vernacular before western contact, it is it important to acknowledge that this architecture did not exist in a vacuum. This illustration provides evidence of the various scales and uses of the Hawaiian vernacular form. Images of the late 19th century show us that while the program and plan had adjusted to new foreign use, the Hawaiian form is clearly distinct from the western form that it coexisted with. Here, the colonial is foreign, and the thatched house is still anonymous. Before long, European building styles transformed the Hawaiian vernacular into what we see today, and the original vernacular form has become foreign.

Do not duplicate without authors permission.

Bungalow Style

Suburb





Renaissance Styles

Downtown



Plantation Cottage

Rural elite





Homestead Cottage

Rural Makaʻainana





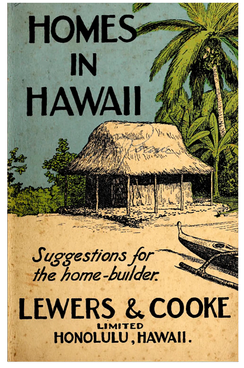
All images here are original productions.

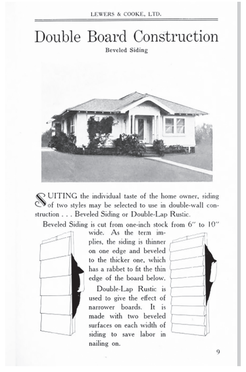
Under the influence of the missionary aesthetic the suburbs of Honolulu saw a rapid replacement of the original vernacular style with the New England colonial. In the early 20th century American pop culture grew to have a tremendous impact in islands. With it, the American bungalow and craftsman took hold and thrived.

Do not duplicate without authors permission.

Developers Theater

Adjustments to the foreign Vernacular to fit in urban Hawaiian context.




LEWERS & COOKE, LTD.

Double Board Construction

Beveled Siding

SUITING the individual taste of the home owner, siding of two styles may be selected to use in double-wall construction . . . Beveled Siding or Double-Lap Rustic.

Beveled Siding is cut from one-inch stock from 6" to 10" wide. As the term implies, the siding is thinner on one edge and beveled to the thickey one, which has a rabbet to fit the thin edge of the board below.

Double-Lap Rustic is used to give the effect of narrower boards. It is made with two beveled surfaces on each width of siding to save labor in nailing on.

9

From Homes in Hawaii : suggestions for the home builder 1926.[49]

A closer look at these adaptions were found in this 1925 housing brochure put out by one of the largest land developers in the Islands.

Do not duplicate without authors permission.

Bungalow Style

Suburb





Renaissance Styles

Downtown



Plantation Cottage

Rural elite





Homestead Cottage

Rural Makaʻainana





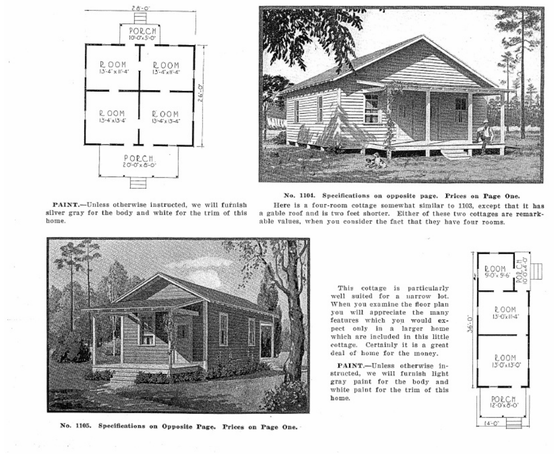
All images here are original productions.

While Downtown Honolulu developed in the Hawaiian renaissance styles and its suburbs adopted the bungalow and colonial styles, a modest architecture was evolving out of unique circumstances, aesthetics and cultures. This evolution was taking place across the rural districts on sugar plantations and their homesteads.

Do not duplicate without authors permission.

Southern Cottage

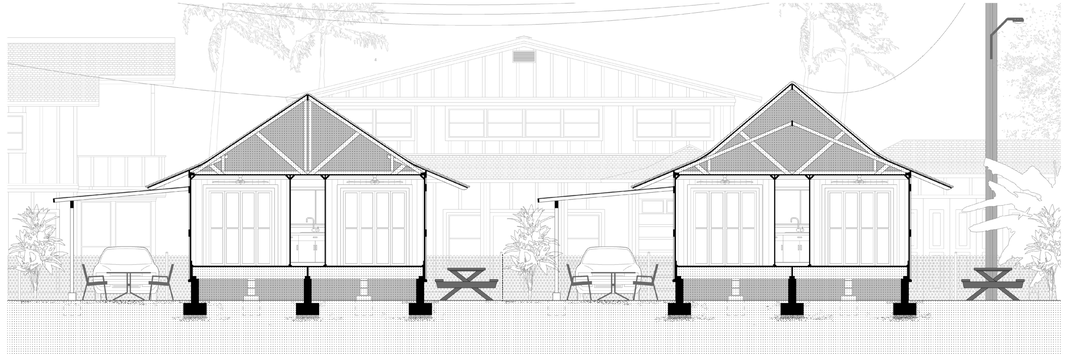
Shotgun house of the South.

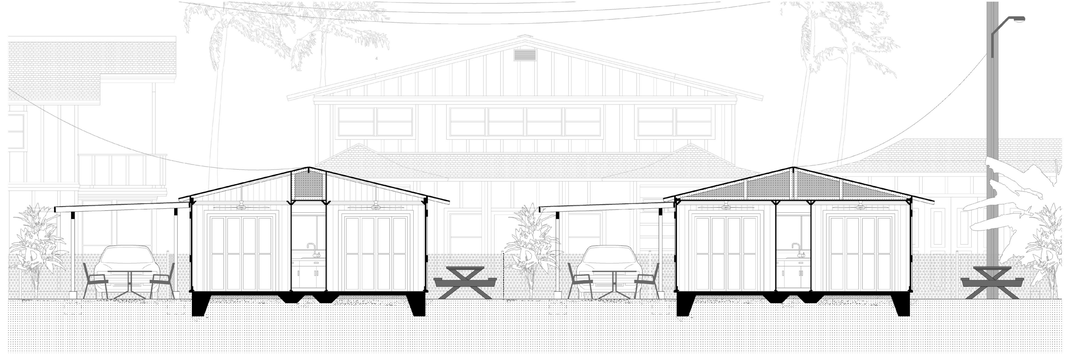


From Hattiesburg's Gordon Van-Tine's housing brochure in 1920.[50]

In rural communities the original vernacular was being replaced with cheap homesteads that had a striking resemblance to the southern cottage.

Do not duplicate without authors permission.

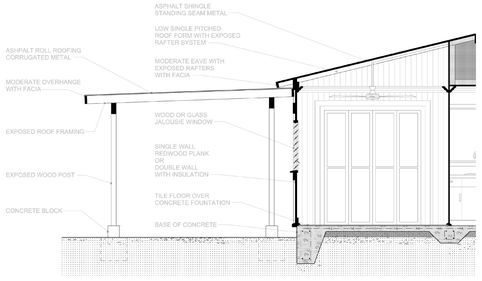


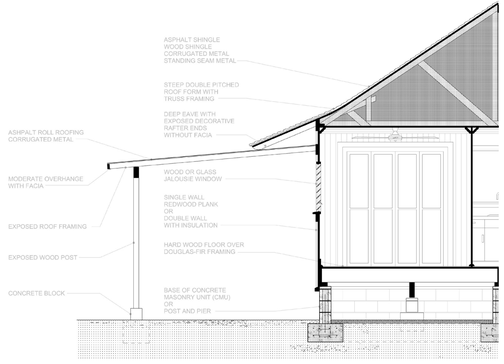


The Hawaiian plantation style featured a low-profile wood roof, wood frames, single wall plank siding, large porticos and locally sourced finish materials.

Do not duplicate without authors permission.

Common Vernacular
Typical Conditions





Roofs were the most distinguishable parts of Hawaiian plantation structures, and were often; Wide-hipped, Double pitched or bellcast with Deep eaves and Revealed rafter tails. The Hawaiian plantation house is slight in its context and takes a backseat to the beauty of the surrounding geography. The modesty of these houses contributed greatly to its prolific use.

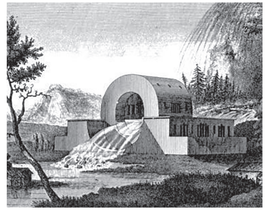
Do not duplicate without authors permission.

The Modernist Culprit

A simplified timeline could suggest that in the span of the 19th century modernisms theoretical lineage went from arguing for less ornament and more form to less form and more technology.

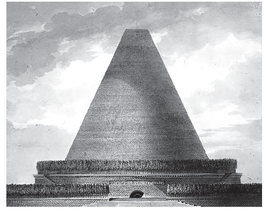
Do not duplicate without authors permission.

The Modernist Culprit



Claude Nicolas Ledoux

1770's



Étienne-Louis Boullée

1780's



Henri Labrouste

1850's



Otto Wagner

1904

less ornament and more form

less form and more structure

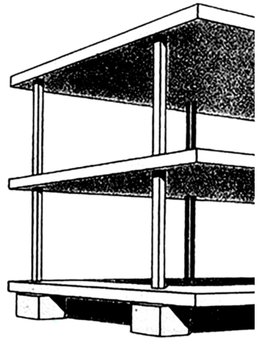
At the dawn of modernism, a select group of white men framed the various western perspectives on pure form. While interested in the origins of architecture, their work reinforced the essentialist perspective. According to them, at the origin of all building form was an original form. A pure representation of that form could be made with simple platonic geometry. This geometry would then be shaped by proportions that were perfect for the Vitruvian man[51, 52, 53, 54]

Do not duplicate without authors permission.

Form deviated from classical

Reductive classical form





less ornament and more form

less form and more structure

Horner House
Adolf Loos - 1912[55]

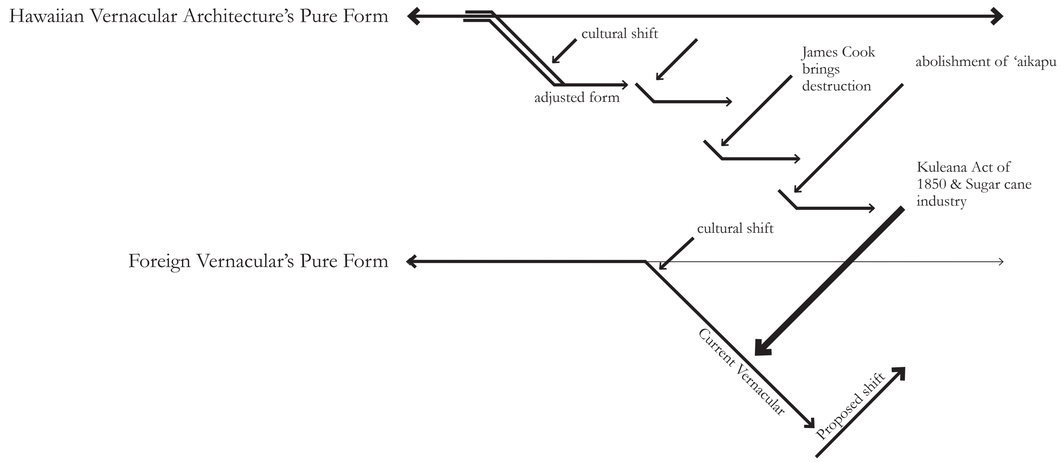
Dom-Ino House
Le Corbusier in 1914[56]

This philosophical environment incubated designers looking for a logic to rationalize their aesthetic fatigue of Eclecticism. Although architects like Otto Wagner and Adolf Loos would design with form that deviated from the classical, modernist form would eventually become more reductive than ever before.

As architectural pedagogy turned toward a modernism of reductive platonic form and its inherent structural logic[57]; it lacked the spatial vocabulary of the pacific.

Do not duplicate without authors permission.

Evolution of Pure Form in the Original Vernacular



Unfortunately, the original vernacular of Hawai'i had been dramatically erased by 1850. Without a critical mass of representation, the vernacular form of Hawai'i was cut off from its evolutionary potential suggested by this original diagram based on the ideas of Adolf Goller in 1888[58].

Do not duplicate without authors permission.

So called, 'Primitive Hut'

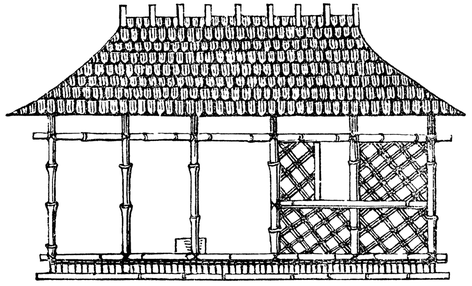


Image of the Caraib Hut.[59]

Although semper argued that the origin of architectural forms could be found in the historical context in which it was derived, tropical modernist often cite Semper's hut to rationalize their international modernist agenda[60].

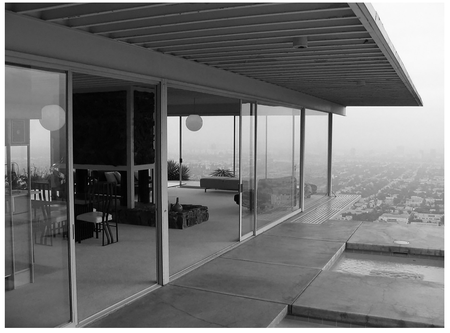
Do not duplicate without authors permission.

Healy House



Ralph Twitchell & Paul Rudolph design in tropical modernism Florida 1948.[62]

The Stahl House



Pierre Koenig designs in Mid Modernism LA, 1957.[61]

Tropical modernist pedagogy looks at the Original Hawaiian Vernacular as a simple ancient hut that confirms the dogma of the Domino or Healy house.

Do not duplicate without authors permission.

Common Vernacular 4
Tract House





Tropical Modernist
McMansion



Image of contemporary tropical modernist house.[63]



Fortunately Le Corbusier turned his back on the simplistic 5 points in his later years, but unfortunately tract house developer found its full economic potential in the housing boom of the 1960s. Just like post war Japan, Hawai'i saw an invasion of industrialized housing rationalized in western theory. By appropriating traditional architectural terms to justify their international and tropical modernist styles, architects created unfounded comfort in calling their work vernacular.

Do not duplicate without authors permission.

This has been done

When non-local architects are commissioned to work on the continent, they will inevitably come to a moment in the process when they choose to engage with or reject the style of the region. Architects that choose to design intuitively without reference to local styles or vernacular building technique, may bring benefits to neighborhoods that are securely connected or contingent to their architectural heritage. In Hawai'i, this is not the case, and a respectful use of formal signs that reference tradition will bring benefits to a society that is not securely connected to its architecture. Unsurprisingly, the words of Shinohara Kazuo in 1967 still ring true for Hawaii today,

"…material prosperity does not mean prosperity of the spirit. As the fissure between the two deepens, human heart's insecurity deepens. The arts have their values stabilized and are thrown into a space in which they have nothing to lean on. Residential planning must be deeply connected with the way people today live."[1]

The connection between Hawaiian art and the Kingdom that prospered prior to the illegal overthrow is inextricable. This deep connection to a suppressed religious and secular society has created the condition of insecurity that Shinohara writes about for Japan.

Just as Shinohara observed the modernists mis reading the vernacular styles of Japan, non-local architects are usually unaware of Hawai'i's architectural heritage and meaning beyond the kitsch. When these architects are commissioned to work in Hawai'i, the pressures to accept or decline style does not inevitably affect their process. Altruistic architects with anti-colonial sentiments often become culprits to the insensitive principals of the Sarasota or Googie pedagogy when trying to create a Hawaiian sense of place. However, there are living remnants of Hawaiian vernacular architecture and its various forms have powerful meanings embedded within them.

Utilizing semiotics found in vernacular architecture requires designers to have a strong understanding of how an audience will interpret a signifier. Gaining enough fluency to communicate effectively through physical form requires quotational referencing and symbolic abstracting. The collection of reference material helps to understand the organization, classification, and concept of the work in the region. If they knew what they were looking at, architects and designers that visit Hawai'i would be able recognize the diversity and semiotic potential of residential form throughout the islands. For example, in Hawai'i, the effect on meaning when making the subtle shift of placing the structural support of the roof from deep under the eave, to flush with the roof facia can be dramatic. For someone in Hawaii, the former subliminally references the common residential vernacular house while the latter an original vernacular house found in the traditional Hawaiian context. To perform effectively, a designer dedicated to the built environment in Hawai'i should make a serious inquiry into to the historic and current building form of the islands.

Under the pressure of the industrial machine, Shinohara wanted to create a natively sourced modern Japan divorced from western dogma. By referencing traditional concepts of space and domestic form, Shinohara successfully created a personal, unique, and artistic design approach without rejecting Japan's history or culture.

[1] Quoted from, Shinohara, Kazuo. "A Theory of Residential Architecture." Japan Architect, no. 10, 67AD. Where Shinohara discusses the Varied Aspects of Space, Insecure Expanse.

Do not duplicate without authors permission.

Japan's Precedent



Sky House, 1958
Kiyonori Kikutake
Public domain img.[64]

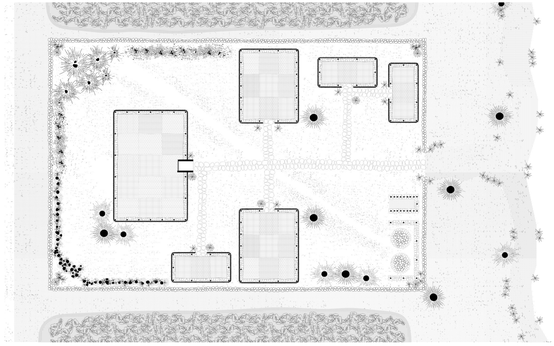


Umbrella House, 1961
Kazuo Shinohara
JA93 Spring 2014[65]

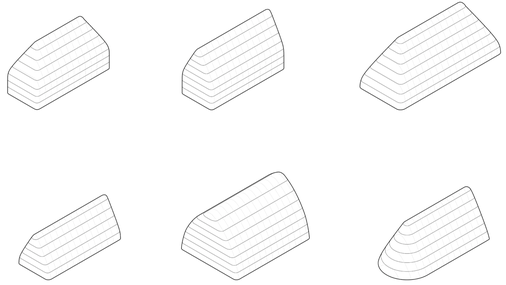
The vernacular Minka houses of the middle class, played a significant role in bridging the gap between Japanese tradition and Shinohara's architecture.

Do not duplicate without authors permission.

Plan
Hawaiian Vernacular



Form
Hawaiian Vernacular



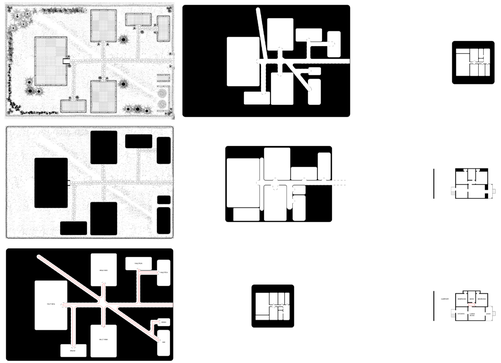
The following analysis of the traditional hale (house) and Kauhale (homestead) is an attempt to use a Shinohara like process to find precedent examples for formal quotation and symbolic referencing in Hawai'i.

These speculative representations focus on the lesser known vernacular forms that were designed and planned for domestic space.

Do not duplicate without authors permission.

Conceptual Transition

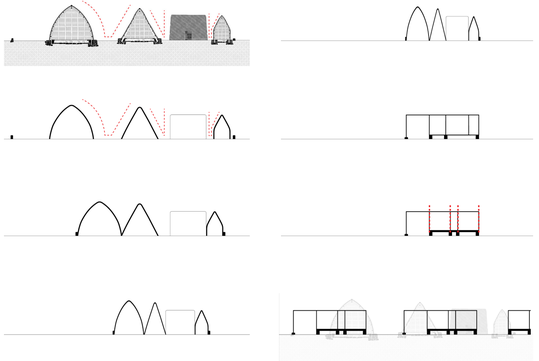
Original Vernacular to Common Vernacular plan.



Original animation available at https://www.vernacularhawaii.com

Conceptual Transition

Original Vernacular to Common Vernacular section.



Original animation available at https://www.vernacularhawaii.com

The transition from the Kauhale plan to the Homestead and tract home plan was dramatic for scale, circulation, and experience. The Kauhale's perimeter wall that served as the division between public and private space tightened around the individual house forms like a belt.

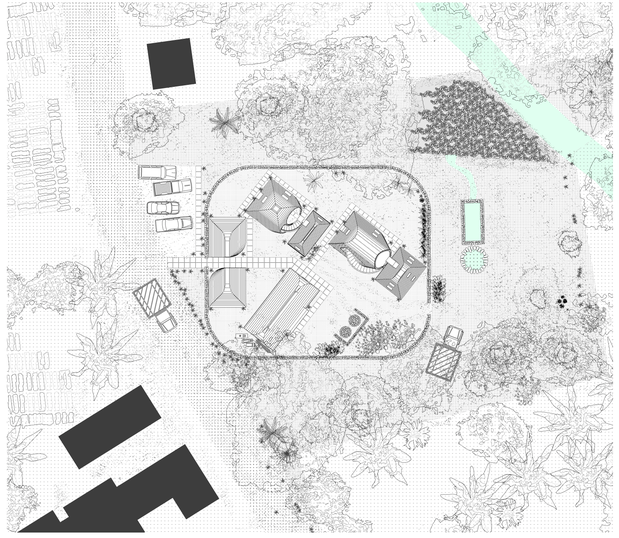
Programs once separated by two walls, substantial distance and an intermittent circulation experience became packed into one economical and minimal interior partition.

Do not duplicate without authors permission.

Plan

Any attempt to explain a Hawaiian's deeply spiritual and emotional perception of space is both impossible and inappropriate for this brief academic analysis. However, considering the compositional character of this plan type is enough to identify several significant formal and organizational attributes of the Original Vernacular.[66]

Do not duplicate without authors permission.

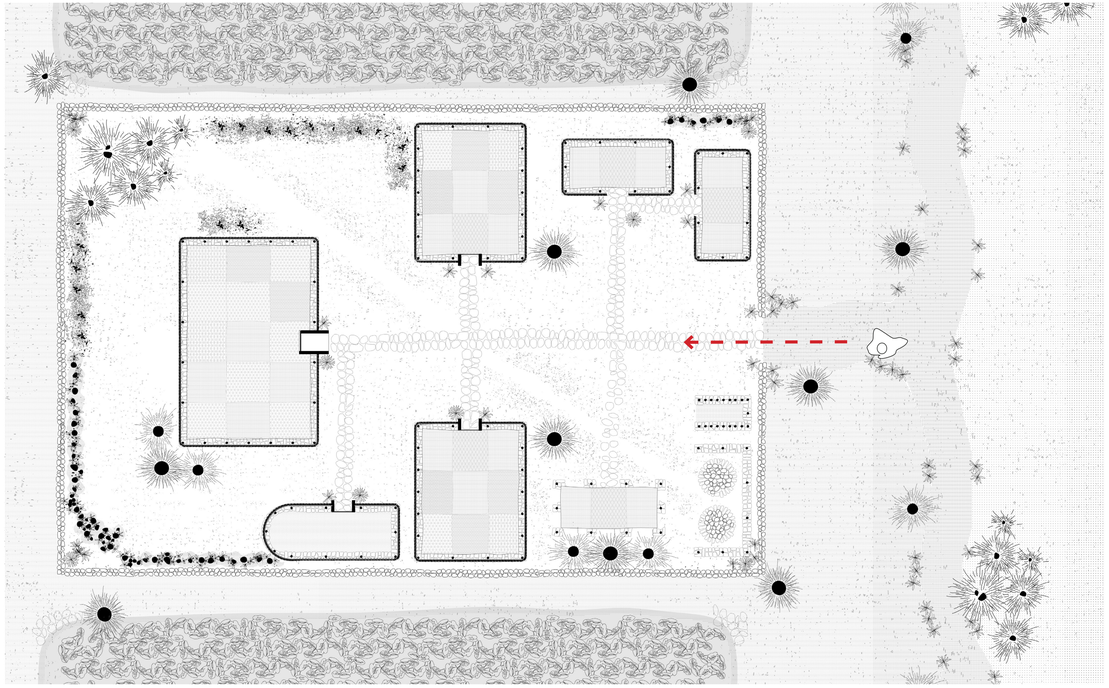


"it is by the solids that surround us that we aquire our three dimensional perception."[67]

- Sibyl Moholy-Nagy

The drawing seen here is an interpretation of a kauhale single-family dwelling planned as described by Hawaiian historians and archeological surveys.[68]

Do not duplicate without authors permission.

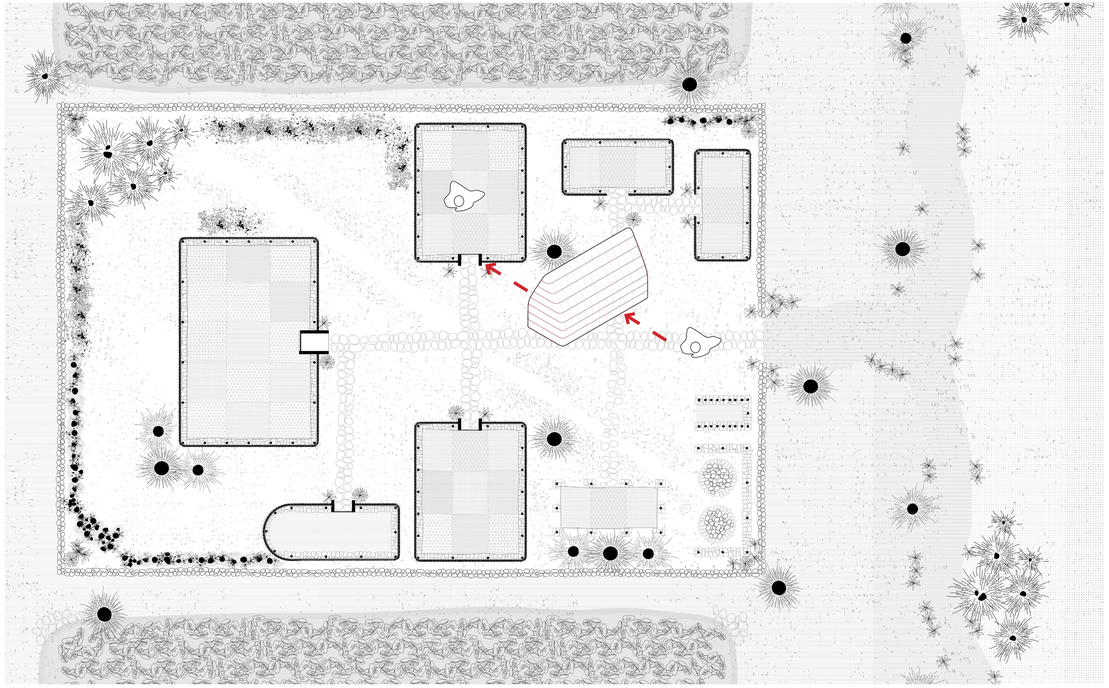


Speculative representation of a Kauhale plan.

In a Kauhale plan:

A border of vegetation or stone clustered the homes and provided order to circulation and entry.

Do not duplicate without authors permission.

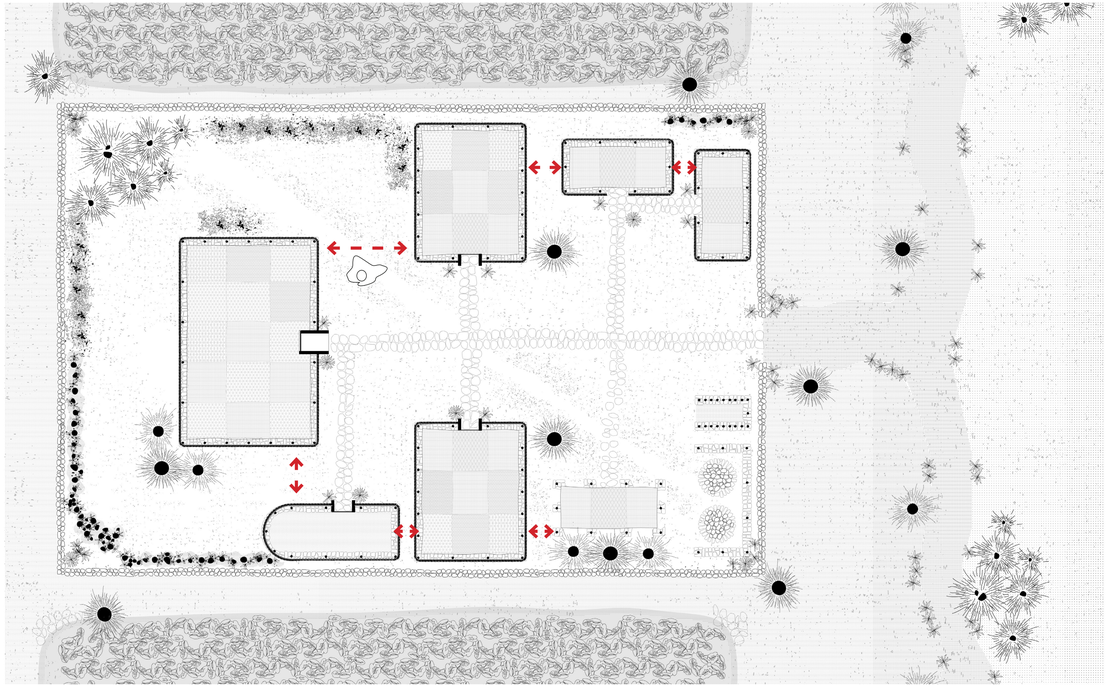


Speculative representation of a Kauhale plan.

In a Kauhale plan:

Every room was seen as a volume before you entered it.

Do not duplicate without authors permission.

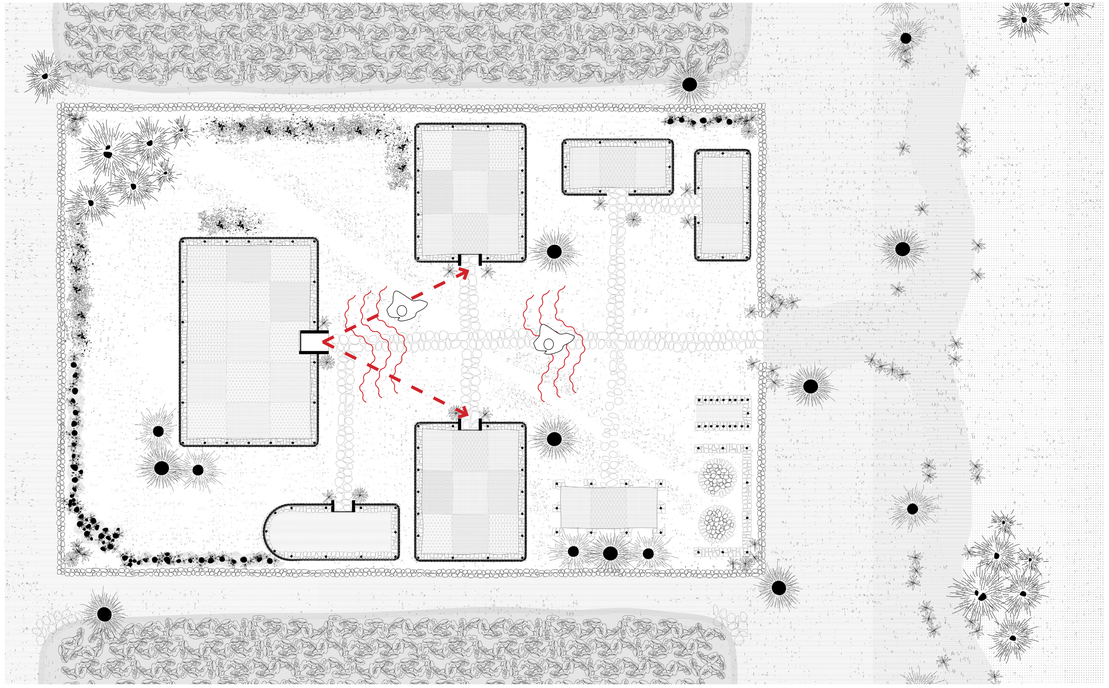


Speculative representation of a Kauhale plan.

In a Kauhale plan:

There were no doors connecting two volumes.

Do not duplicate without authors permission.

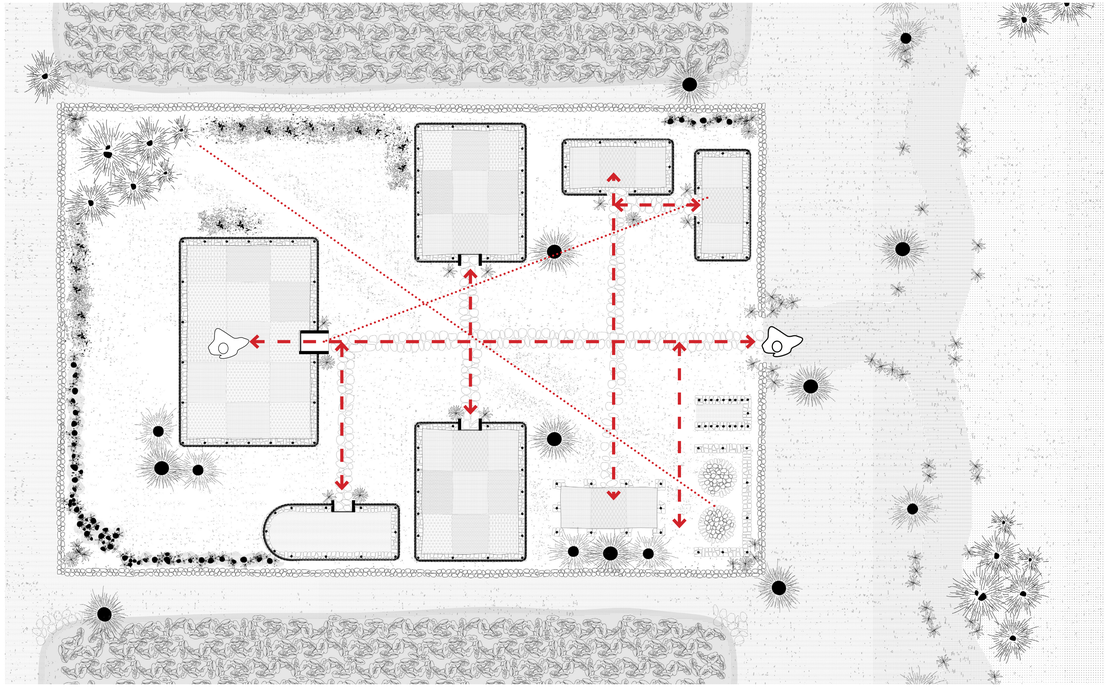


Speculative representation of a Kauhale plan.

In a Kauhale plan:

Each programed space was separated by an experience with the natural climate.

Do not duplicate without authors permission.

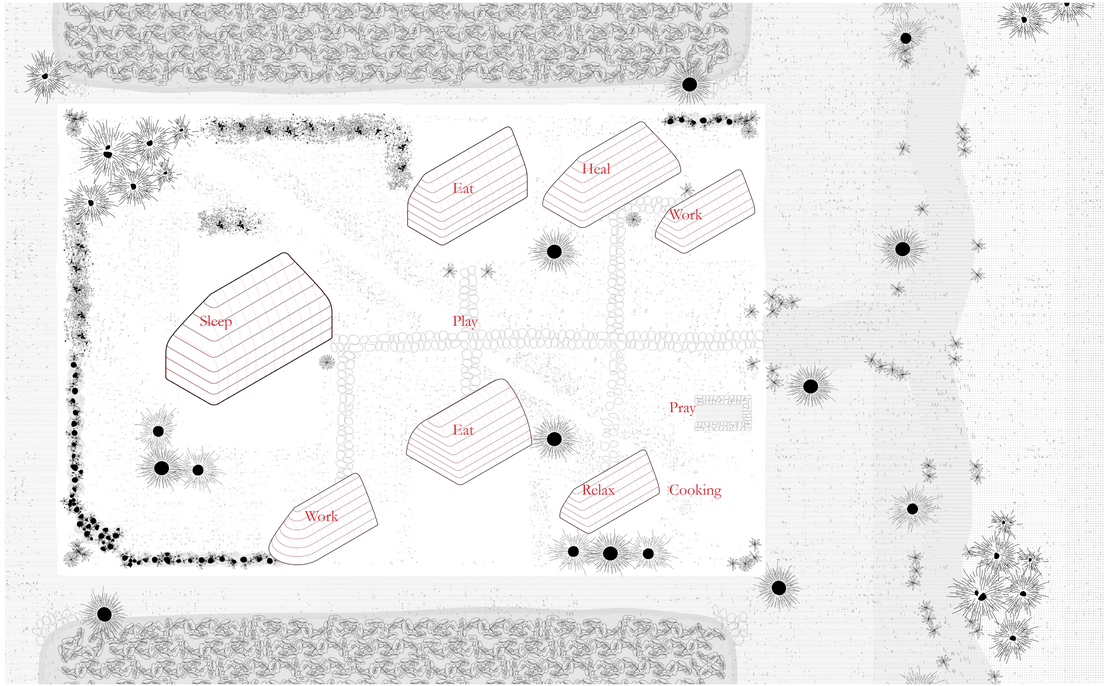


Speculative representation of a Kauhale plan.

In a Kauhale plan:

Circulation demanded that one must deviate from their initial alignment to enter another room.

Do not duplicate without authors permission.

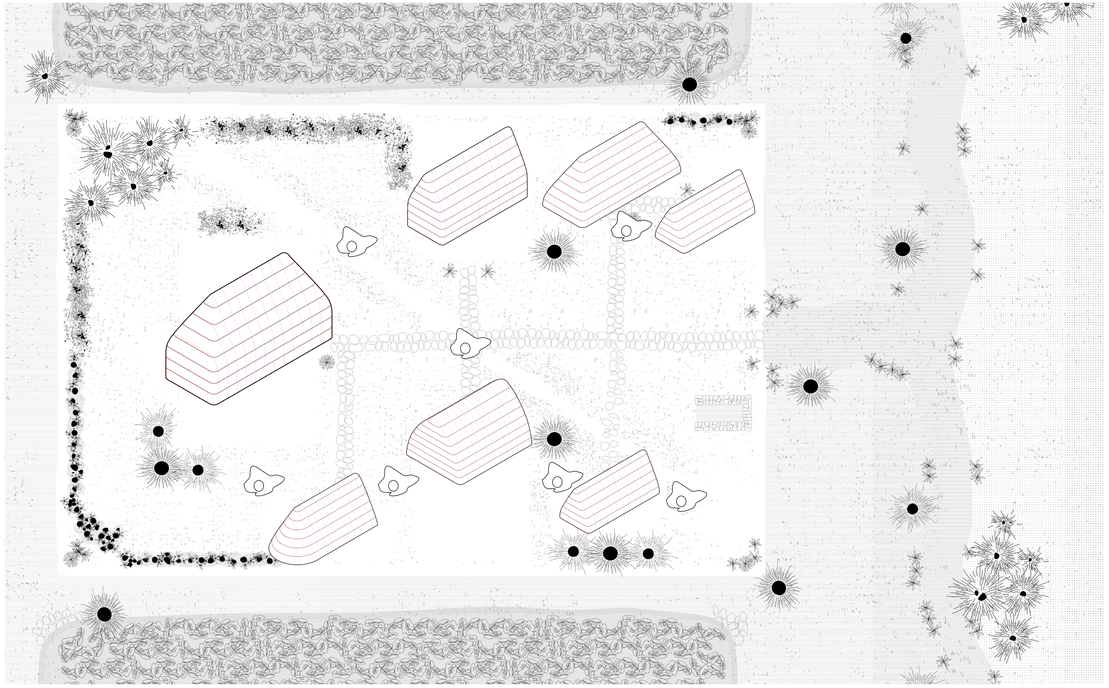


Speculative representation of a Kauhale plan.

In a Kauhale plan:

Program was explicitly connected to a volume and its shape.

Do not duplicate without authors permission.

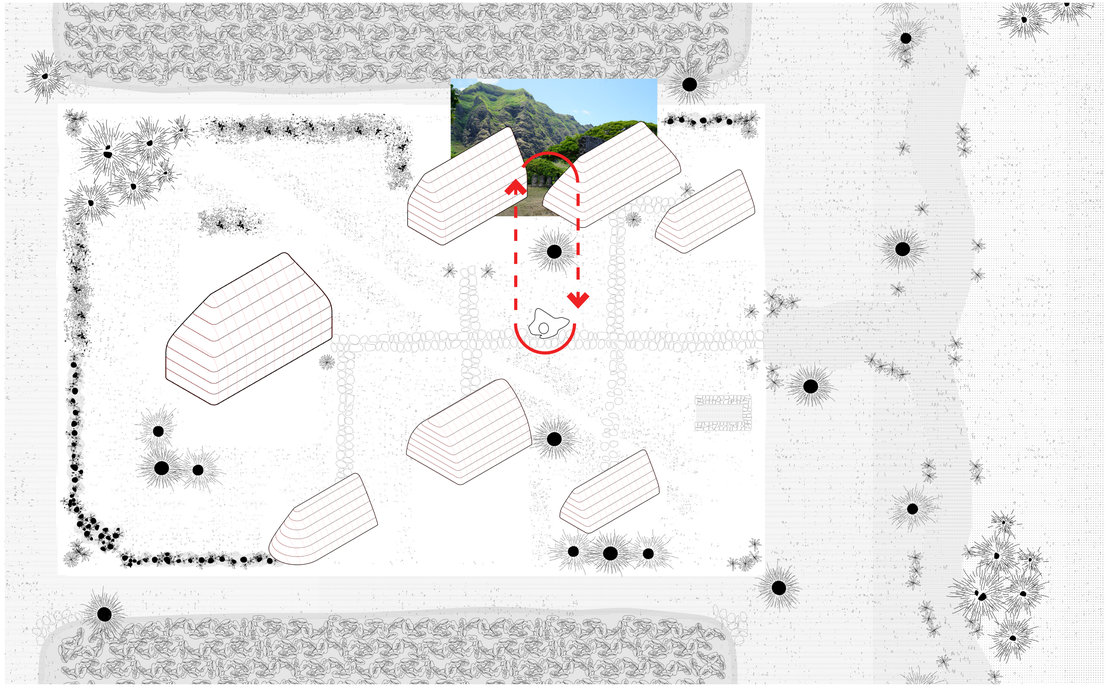


Speculative representation of a Kauhale plan.

In a Kauhale plan:

A variety of exterior geometries and materials were encountered throughout the day.

Do not duplicate without authors permission.



Speculative representation of a Kauhale plan.

In a Kauhale plan:

The landscape beyond the dwelling boundary was frame by the form of your home.

One brief introduction into the Hawaiian sense of space can be further emphasized by the language. In Hawaiian, one has two methods of expressing the possessive. Ka'u and Ko'u. The o-class includes one's birthright: God, parents, siblings, name, body parts, clothes, emotion, and house. The a-class includes objects that one acquires in life. As stated, the House is in the Ko'u class. Under this classification this perspective sees the house as an extension of their ancestry. In this plan type a resident is constantly seeing a representation and an extension themselves amongst their environment.[69]

Do not duplicate without authors permission.

Erased Experience

1 Hale Kua - Work.

2 Hale Pe'a - Women house.

3 Hale Noa - The one place where the family mingled on familiar terms during the day and where they slept at night.

4 Halau - Shed for tools.

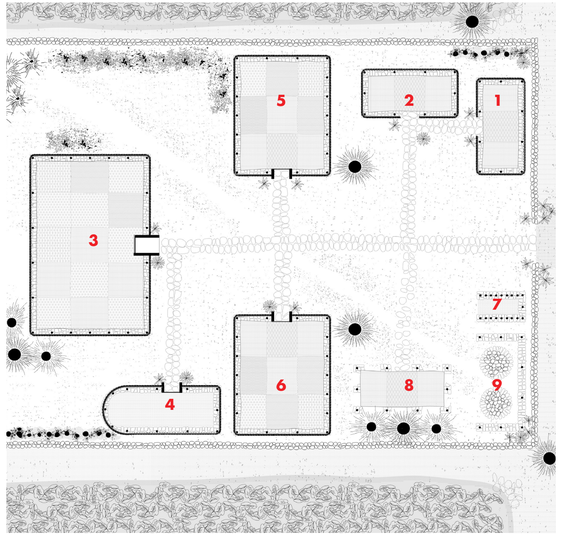
5 Hale 'Aina - The women's eating house which was tabu to the men.

6 Hale Mua - The men's eating house which was tabu to females.

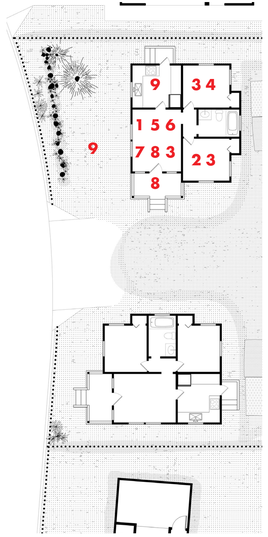
7 Heiau - A family chapel.

8 Lanai or Kahua - Open visible space intermitant space, informal public lounging and greeting.

9 Imu - Earthen oven for men. & Oven for women.



Act 1
One Dwelling with 'ai kapu

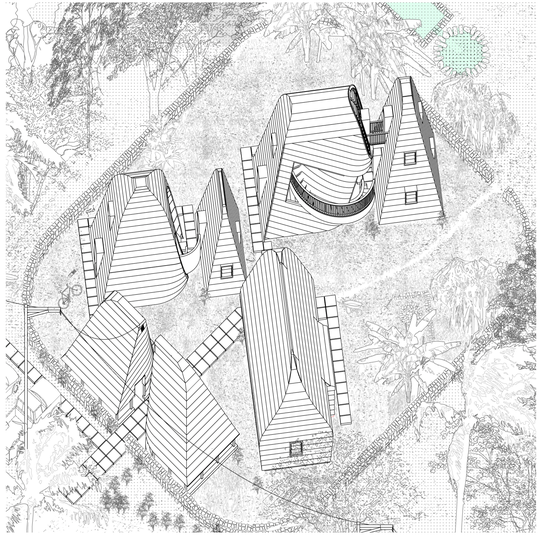


Act 2
One dwelling without 'ai kapu

Speculative representation of a Kauhale plan.

The importance of the solids that surround us as describe by Syble Moholy-Nagy and how they shape our perception of space is an extremely significant concept when comparing the Kauhale plan of the Original vernacular to the foreign plan of colonial introduction.

Do not duplicate without authors permission.



"Architecture is a form-giving art. Its impact on man comes from the interrelationship of enclosing walls and shaped interior void."[20]

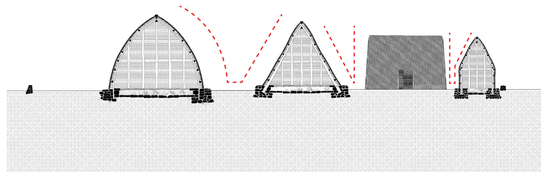
- Sibyl Moholy-Nagy

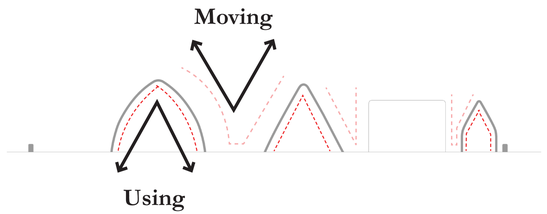
Form

Shaped Voids

"however, near the houses may be, they are always distinct buildings"

- William Ellis (p.79)[71]

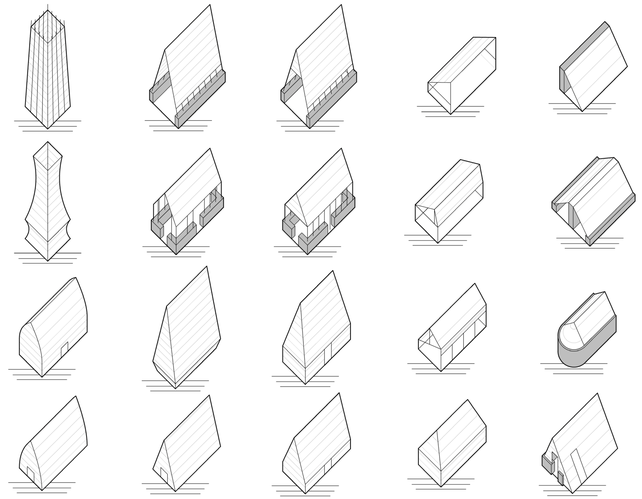




Living in the Kauhale under the 'Ai kapu system, meant constantly interacting with the exterior surface and shape of house volumes. It meant the resident would occupy and experience a complete volume when they entered a hale. With minimal fenestration and no partitions, light would be filtered through the surface of that volume and reinforce the perception of the inhabited shape.

Do not duplicate without authors permission.

Some Identified Building Forms



As seen here, including religious and public structures Hawaiian buildings take on many formal qualities. From my research, domestic houses are represented in six verifiable forms. Each of these various forms could have been assigned to one or all the discrete programs found in the traditional Kauhale plan. These speculative and liberal representations are based on the drawings available and as described by historical narrative.

"Samuel M. Kamakau's The Works of the People of Old (1869)

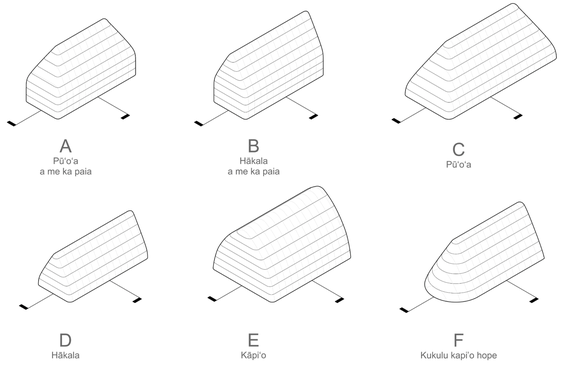
Davide Malo's Hawaiian Antiquities (1898)
William Brigham's The Ancient Hawaiian House (1908)

Kelsy M. Y. Jorgensen E Ho'i Ka U'i (2019)
The many ongoing efforts of Francis Sinenci and Earl Kawa'a.

Maui county code at,
https://www.citationmachine.net/chicago/cite-a-website/search?q=https%3A%2F%2Fwww.mauicounty.gov%2FDocumentCenter%2FView%2F4434%2FIndigenous-Hawaiian-Architecture

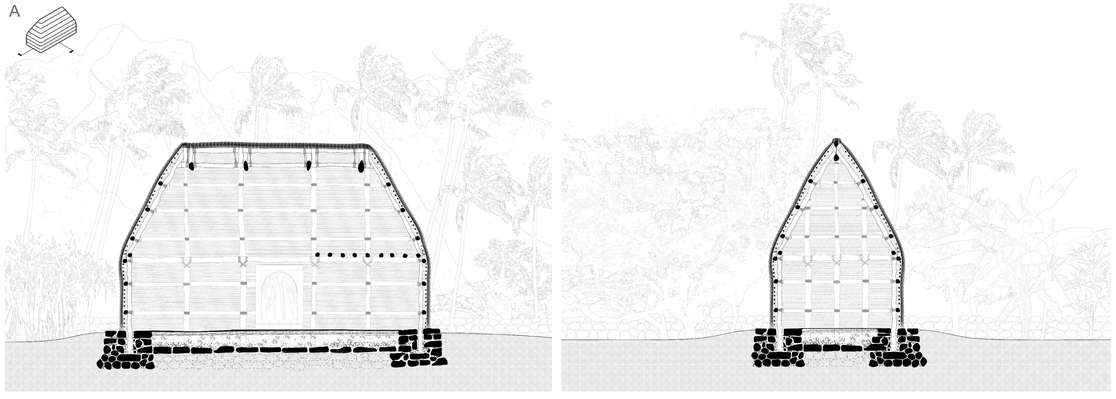
Conversation with Dwight Kauahikaua on form.

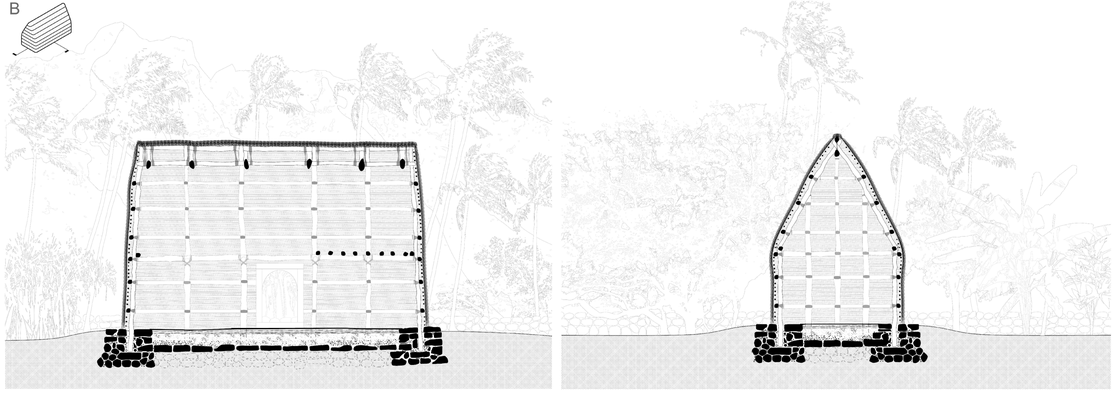
Do not duplicate without authors permission.



These form types are derivatives of the form Samuel Kamakau describes in the following historical account. "As the population increased people began to make Hale Kapi'o 'ili la'au and hale kapi'o 'uki kamala" (arch houses) … Later, they set up a post in front and arched the back.

Do not duplicate without authors permission.

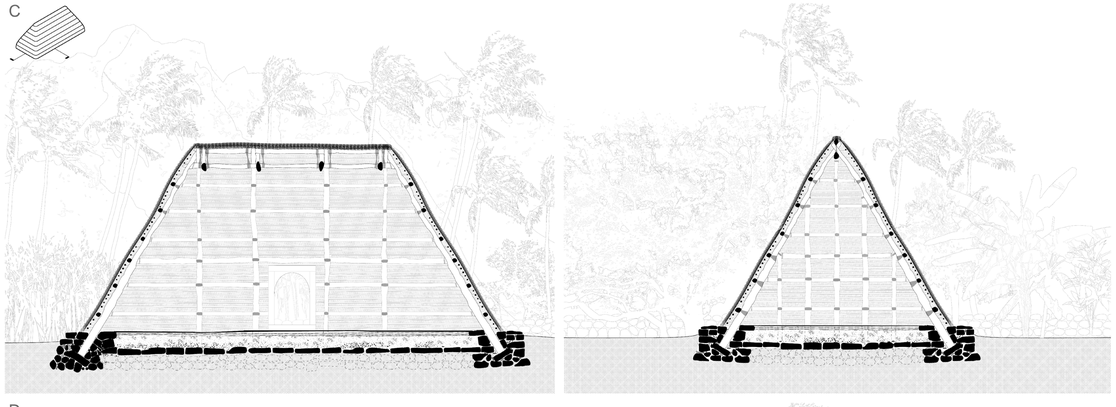


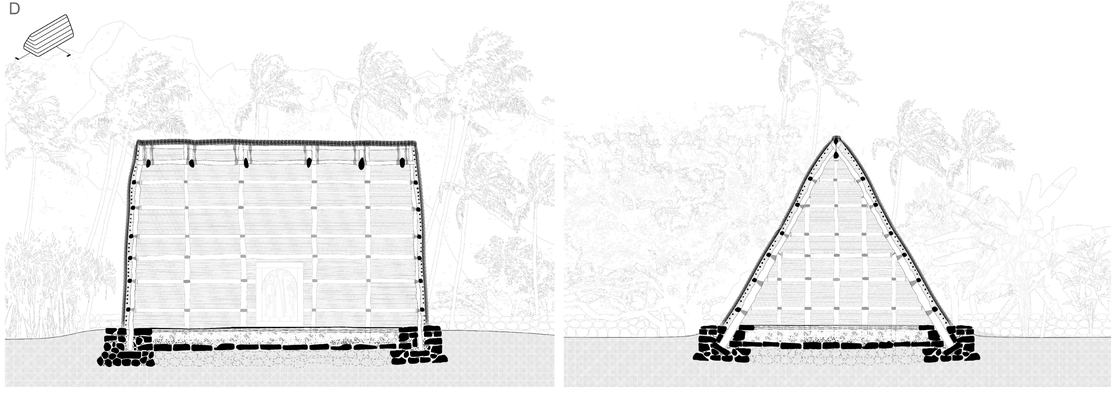


A. Pu'o'a a me ka paia - a steep hip that flushes with walls slightly out of plumb.

B. Hakala a me ka paia - a steep gable that flushes with walls slightly out of plumb.

Do not duplicate without authors permission.

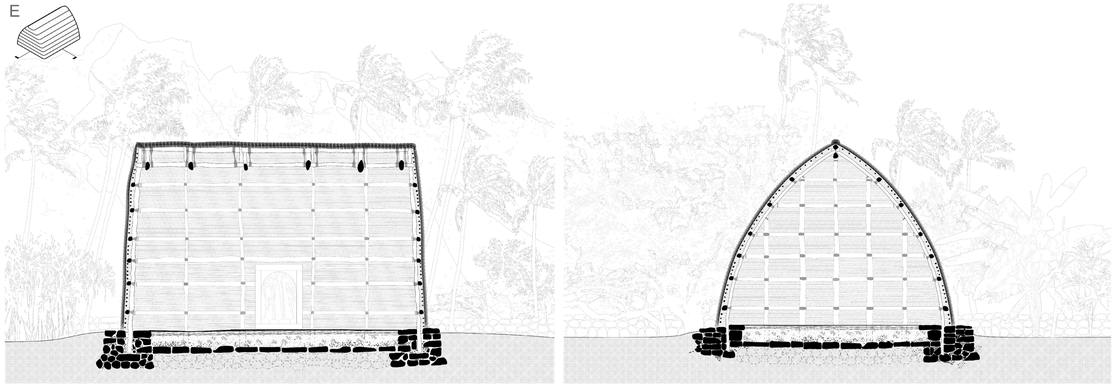


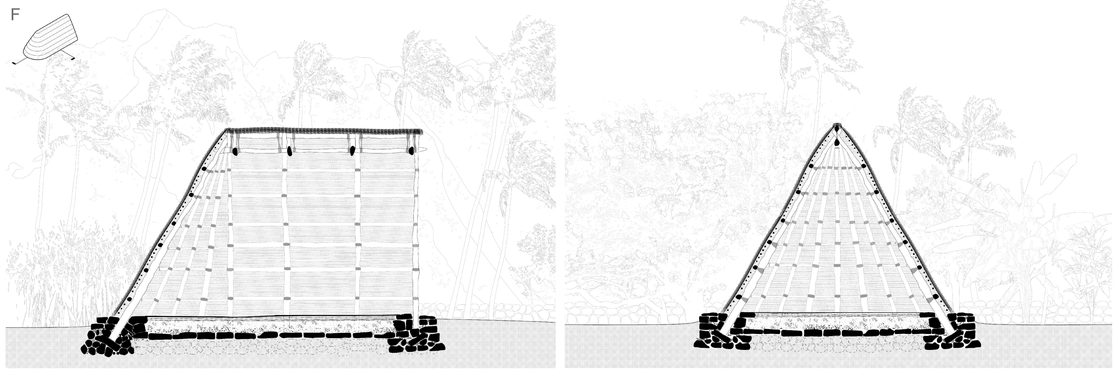


C. Pu'o'a - a steep hip that sits directly on grade.

D. Hakala - a steep gable that sits directly on grade.

Do not duplicate without authors permission.





E. Kapi'o – an extruded arch with parabolic tendencies.

F. Kukulu kapi'o hope – an asymmetrical form with and arched end and an open end.

Speculative Hale Kukulu kapi'o hope (form F)

This is a speculative form based on the surveyors findings at archeological sites indicating a horse shoe foundation and Kamakau's description of hale Kapi'o hope (Posterior) with, "a post in front and arched the back." (p. 95)[72] These description paired with the building methods explained by experts suggest a conical result.



Archaeological sketch of a survey findings. Found at: "Cultural History of Three Traditional Hawaiian Sites (Chapter 1)." National Parks Service. Accessed October 30, 2020. https://www.nps.gov/parkhistory/online_books/kona/history1d.htm.

Do not duplicate without authors permission.

Form Giving Methods

Malleable surface material

Parabolic or similar frame arch

Loose fit surface over frame

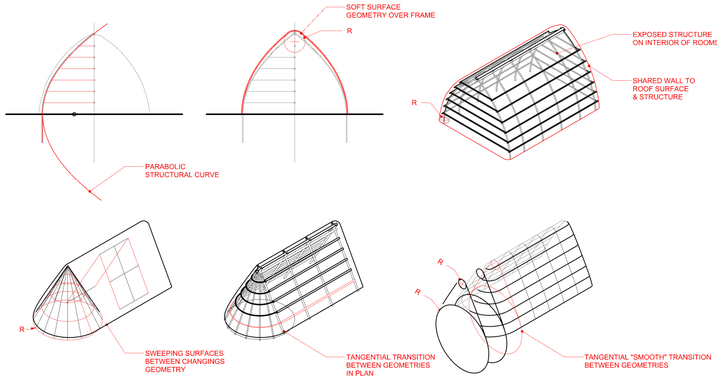
Rhythmic order on interior

Shared surface between roof and wall

Soft sweeping surface Geometry

Tangential transitions between surfaces

Softened edges



The modernists would like us to believe that these forms are merely the products of convenience. But the hale kapi'o seen here has disrupted many linear concepts of Traditional architectural form and its prolific use and was unique to Hawaii.

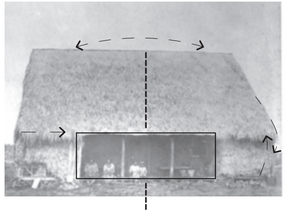
In the 1920's anthropologist Sir Peter Henry Buck describes its construction: "by fixing the lower ends of the rafters in the vertical position and then bending them in a curve to cross over the ridge pole, the lower ends of the rafters are further fixed in the vertical position by vertical steaks driven into the ground on the inner side of the rafter. The curve is maintained by the lashing of the upper ends to the ridge pole and to the propping of the graduated gable posts against the inner side of the rafters..." (p. 79)[73]

This construction process suggests that designer had complete control over their environment and that the form of the house was carefully calibrated by graduated gable posts and did not simply bend according to its inherent and found moment capacity. This form requires a predetermined manipulation of material and choosing it over the roof and wall construction systems available shows us that its designer had an aesthetic opinion that valued the marriage of form and efficiency.

Do not duplicate without authors permission.

Character





"If erecting had been done well, the ridge pole will arch has proudly as the crest of a helmet."

- Kamakau (p. 101)[74]

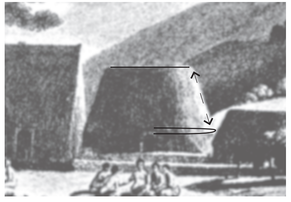




"the best houses were built on a kahua or platform of stone"

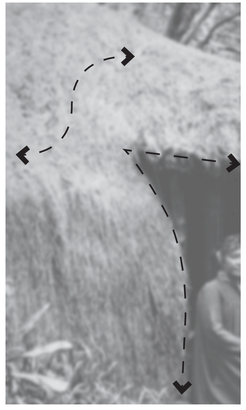
- William Tufts Brigham (p.90)[76]





"Pili grass was very much liked for the thatching because of its reddish color and it's pleasant odor on a new house… And because of the smoothness."

- Kamakau (p.101)[75]



Through a close reading of historical and contemporary[77] text, this traditional aesthetic opinion was elaborated on in prose. The following quotes provide insight on some of the preferred Hawaiian aesthetic.

Do not duplicate without authors permission.

Character of Precedent
Form

Characteristics of the
Original Vernacular form:

Smoothness through changing plans or shapes.

Soft edges.

Dark minimal fenestration in facade.

Volume on grade.

Minimal or no separation between roof and wall transition.

Material continuity between roof and wall.

Steep roof pitch.

Arching and sweeping gestures.

Rhythmic structure.

Fluid transition between grade and volume.

Separated and complete forms

Convex experience in circulation.

Concave experience in programed space

Inhabitance of entire complete shape on interior.

Controlled light related to program.

Character of Precedent
Plan

Characteristics of the
Original Vernacular Plan:

Perimeter wall around enclosed volumes.

Open court between houses.

Exterior experience when connecting programs.

Circulation demands that one sees a shape representing a program before they inhabit the space.

Programs are explicitly connected to a particular volume and shape.

Inhabiting a space means encountering the interior void of a complete volume.

Variety of exterior geometries and materials are encountered throughout the day.

Buildings align with culturally practical and spiritual values.

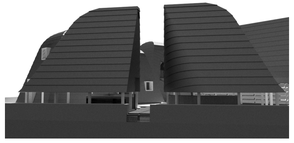
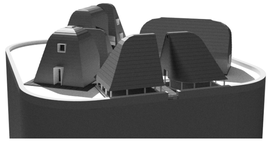
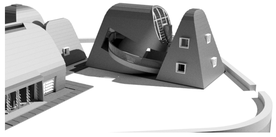
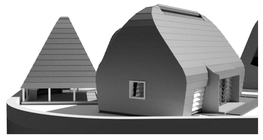
Buildings mask the environment around significant views.

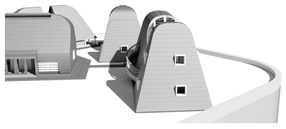
Houses can be very close but remain separate.

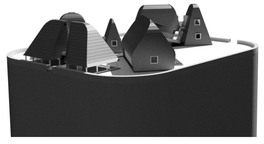
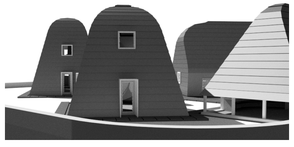
Do not duplicate without authors permission.

Abstracted Model

Proposal for reconstructing the erased domestic experience.



Original animation available at https://www.vernacularhawaii.com

With this set of methods in which to measure the success oa a design proposal I would like to reintroduce the houses where we met Wyatt and Koa.

Do not duplicate without authors permission.

1884 Government of Hawai'i survey of Waimanalo, Oahu

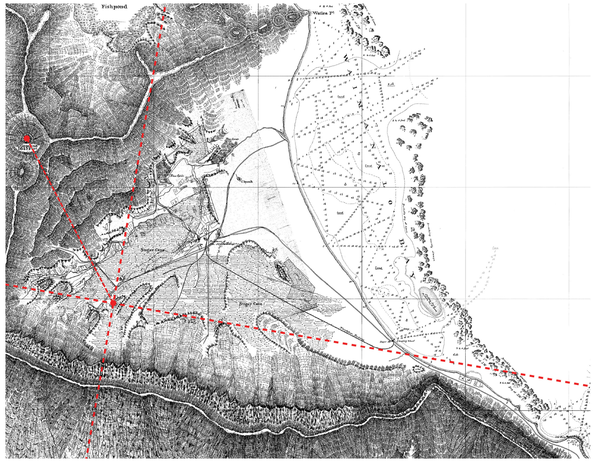


Image of site selection and context map.[78]

On Oahu island situated between the Ko'olau cliffs and the moody North Pacific is the district of Waimanalo. I choose this location to site my project because it's played a vital role in the revival of the Hawaiian lifestyle and culture.

Do not duplicate without authors permission.



Here, the erased form of Hawai'i is familiar to the landscape. The following representations of the site and location express the significant interests of the Waimanalo community and culture.

Do not duplicate without authors permission.

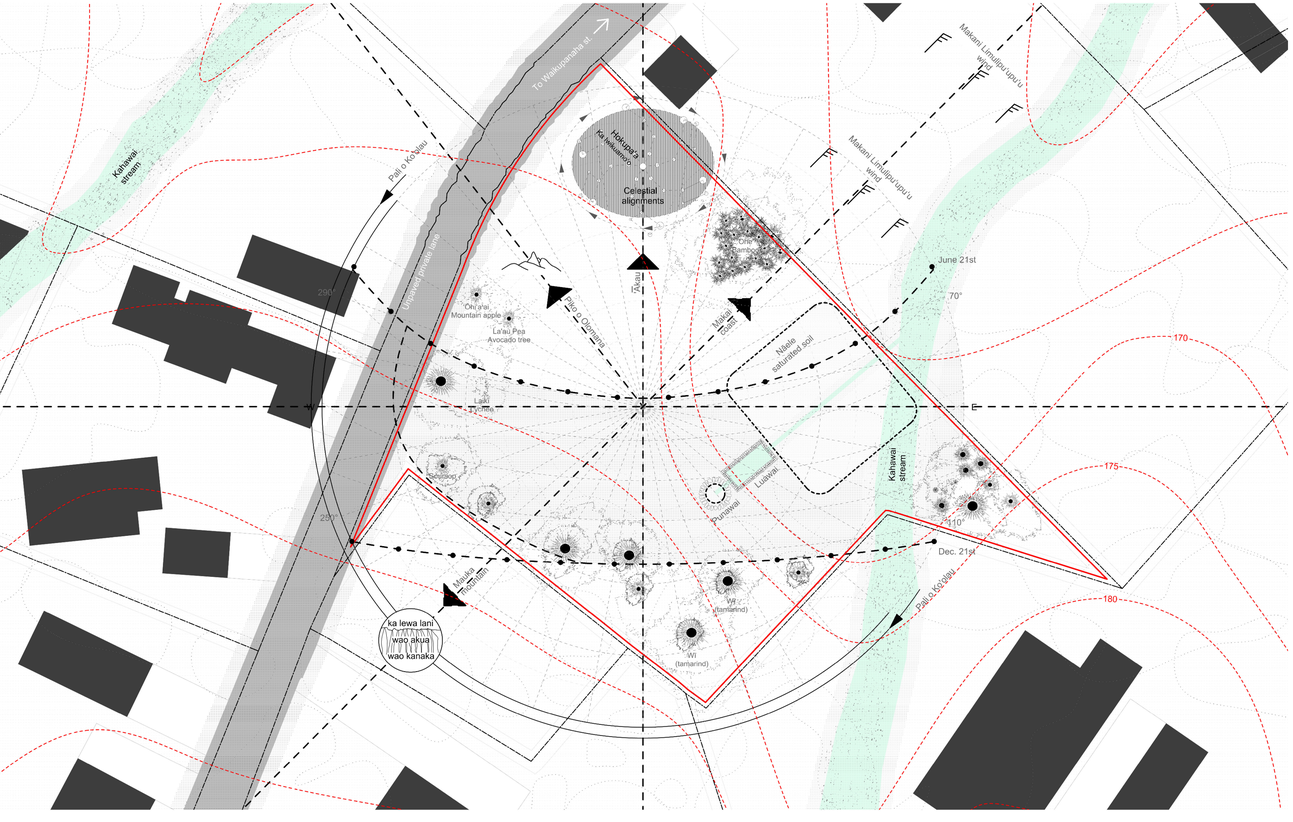
Significant Markers to Consider

Native Hawaiian Access Rights Project

- ▶ Constellations of interest
- ▶ Solstice
- ▶ Equinox
- ▶ Streams
- ▶ Ponds
- ▶ ʻAuwai (taro irrigation ditches)
- ▶ Loʻi kalo (taro pond fields)
- ▶ Springs
- Caves
- ▶ Trails
- ▶ Wahi pana (named places)
- ▶ Sacred places
- Dunes
- ▶ Landings
- Surfing sites
- Sandy beach
- Fishing area
- Fishpond
- Fish house
- ▶ Hunting areas
- Kilo iʻa (fish sighting spot)
- Muliwai (brackish pond)
- Anchialine pond
- Salt ponds
- ▶ Wells
- ▶ Historic walls
- Basalt veins for tools
- Shrines
- Koʻa (fishing shrines)
- Heiau (temples)
- ▶ Historic sites
- ▶ Cultural use areas
- ▶ Hoʻailona (natural signs)
- ▶ Sighting place
- Lele (cliff jumping spots)
- ▶ Native plants
- ▶ Puʻuhonua (places of refuge)
- Holua slides (slides for sleds)
- ▶ Cultivation area
- Leina (jumping off point
- Archaeological sites for souls to cross into the next world)
- Burials
- ▶ Oʻopu
- Hihiwai/wi
- Steam bath areas
- ▶ Bathing pools
- Lava tubes
- Subterranean water course
- Petroglyph
- Artifacts
- ▶ View plane
- ▶ Seasonal residential sites
- Burial markers
- Water caves
- Birthing stones
- Phallic stones
- Pohaku Kane
- ▶ House sites
- Dams
- ▶ ʻaumakua (ancestral deities) domain
- ▶ Po kane routes (night marcher routes)

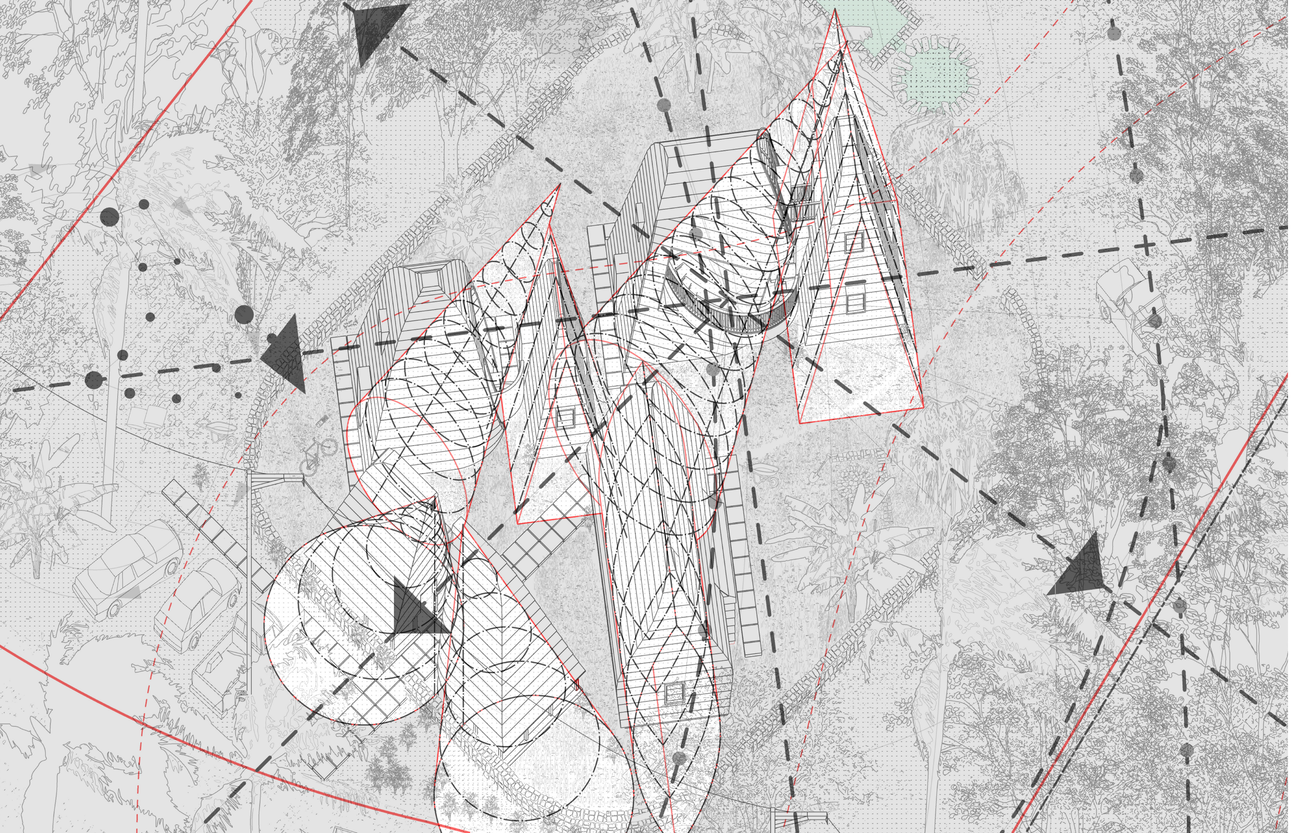
The colonial design process relies on methods that lack the acknowledgement of cultural resources. Furthermore, their forms represent the history of Americanization and cultural suppression. Therefore, Hawaiian cultural resources have no significant impact on the form or alignment of the Common Vernacular. This list of Significant Markers comes from the Native Hawaiian Access Rights Project.[79]

Do not duplicate without authors permission.



Alignments to celestial patterns, geographic features, and culturally significant characteristics are identified and located in relationship to the sites hard and soft boundaries.

Do not duplicate without authors permission.



In contrast to the colonial model, this project identifies Waimanalo's culturally significant resources and introduces non-colonial methods of manipulating the Par-T form as found in the Original vernacular. The structures attempt to frame, align, divide and mask these resources, and create a connection between a contemporary dwelling and the planning significance of Original Vernacular.

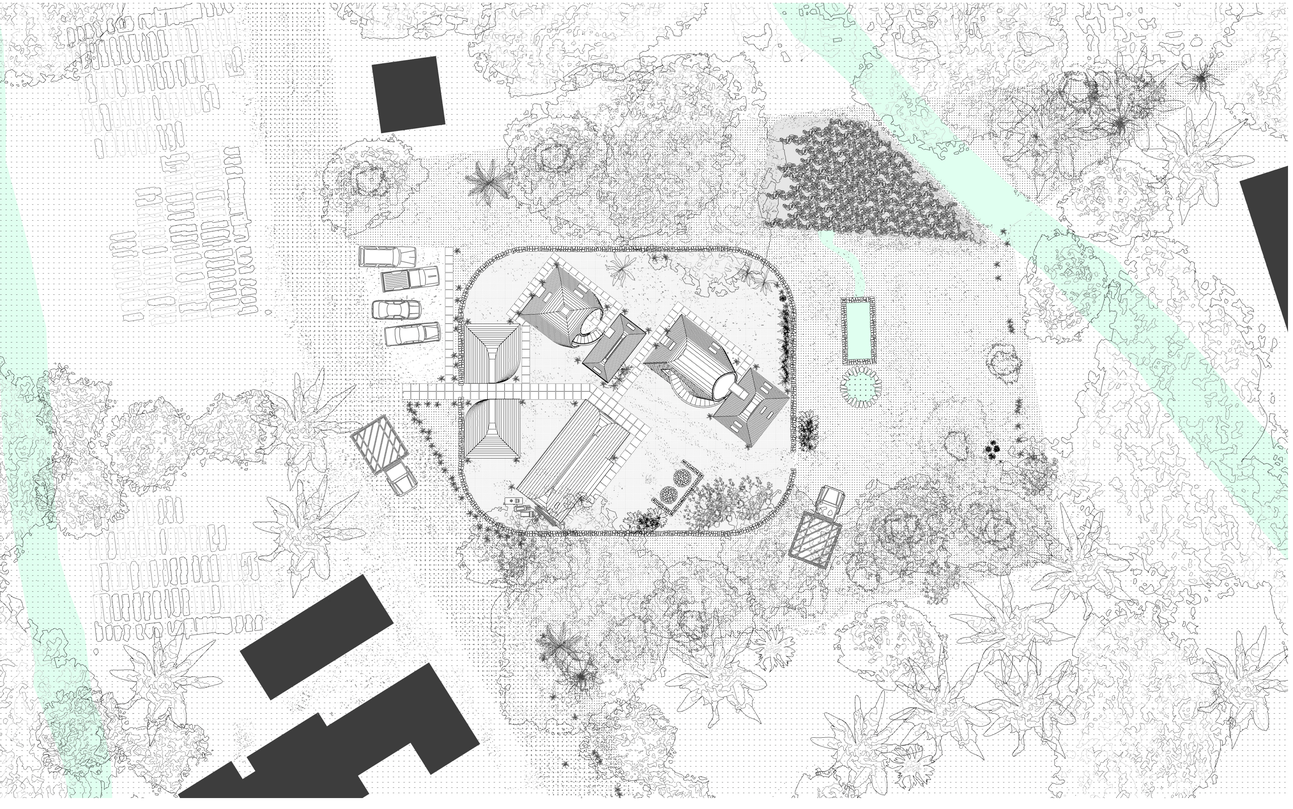
Do not duplicate without authors permission.





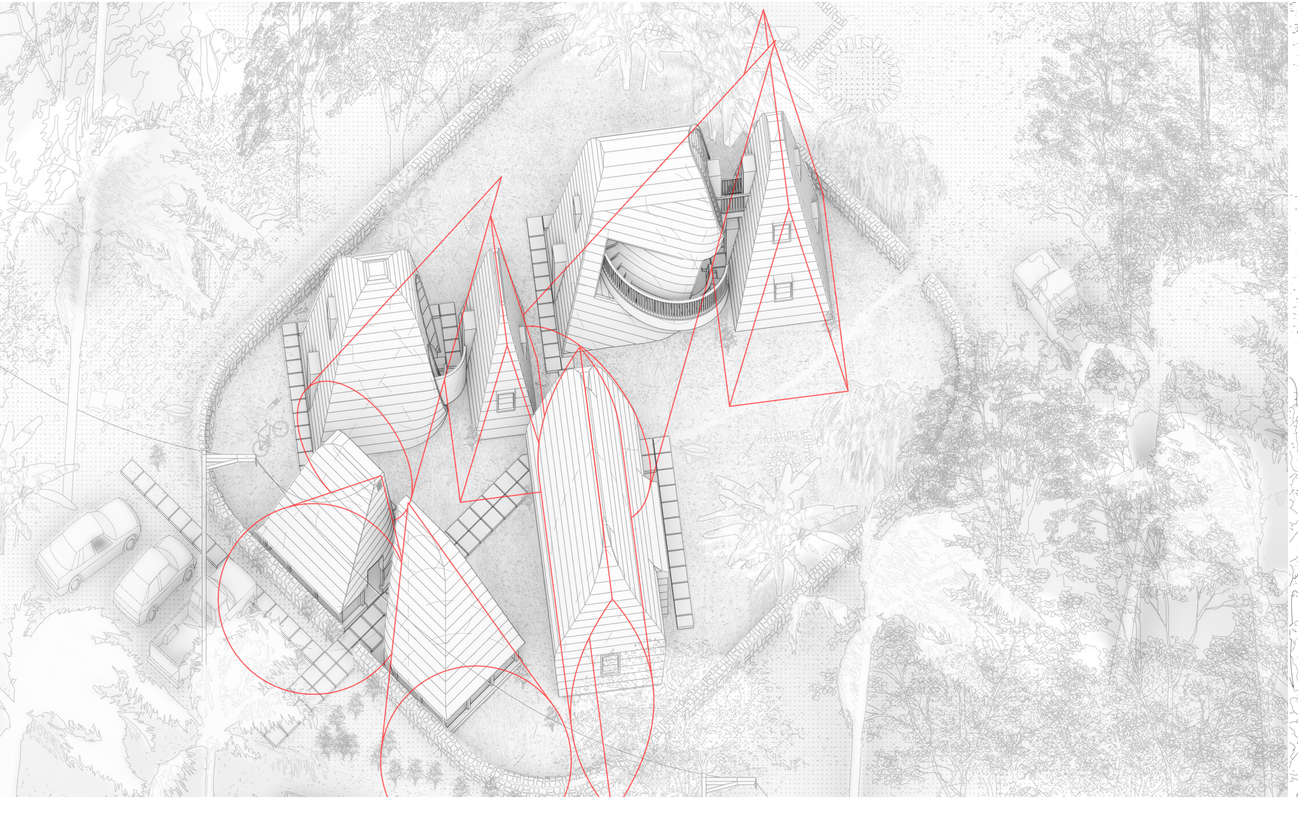
As it has since time immemorial, the site and now the houses provide unobstructed views to the historic peak of mount Olomana to the north-west and masks the kua (wall) of the Ko'olau mountain range from the west to the southeast. For cultural practitioners that maintain traditional beliefs, natural landscapes and geological characteristic serve as a visual representation of their religious structures and their spatial history. Many landforms are understood as the creations of their aumakua (ancestors) and nā akua (the gods).

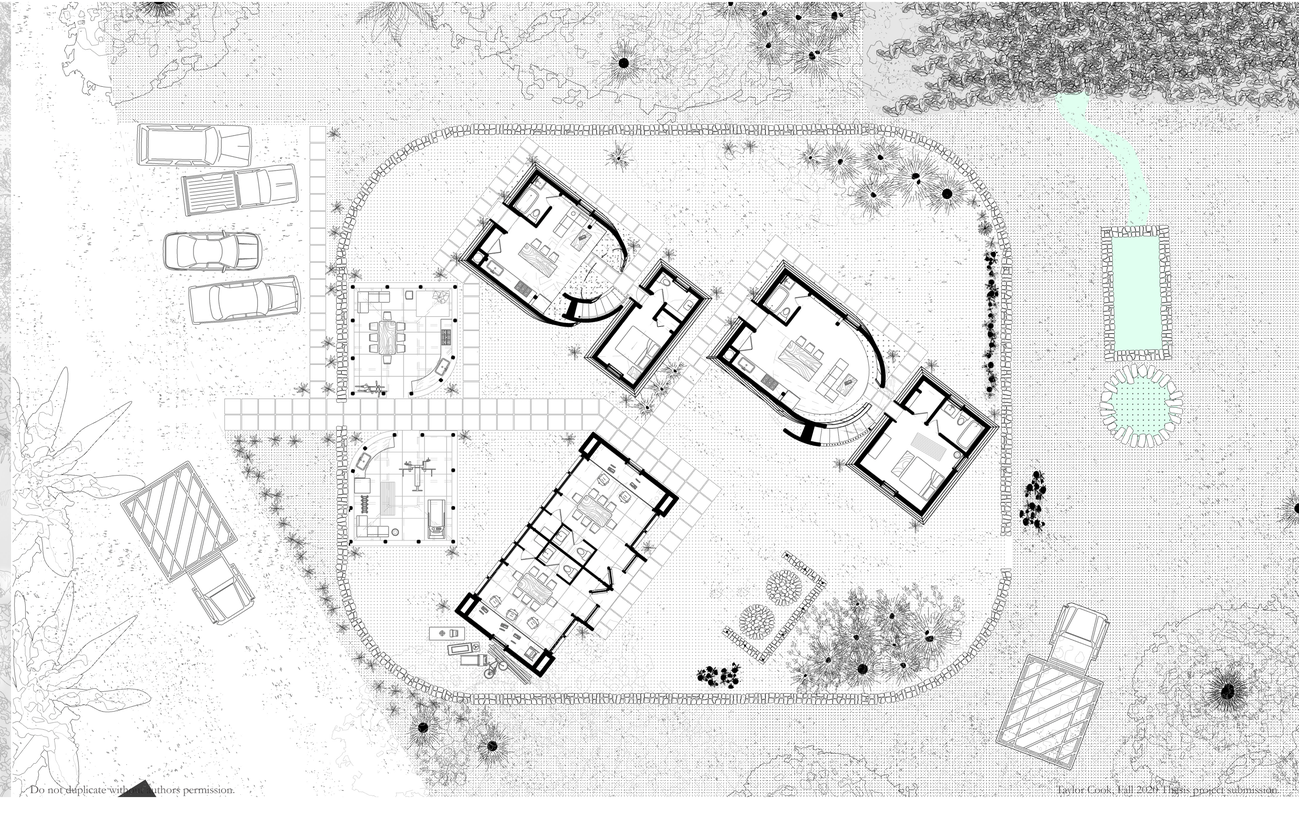
Do not duplicate without authors permission.



Both houses point to and frame the
zones of the wao akua or region of the gods.

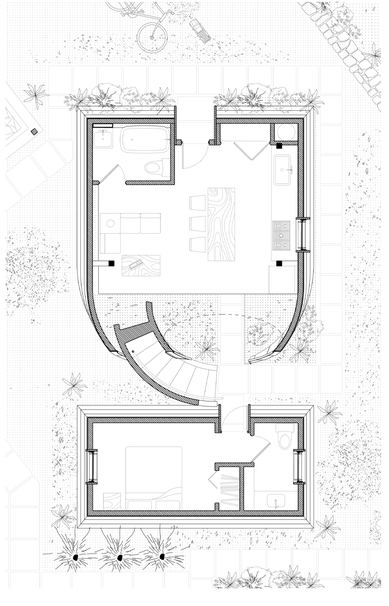
Do not duplicate without authors permission.

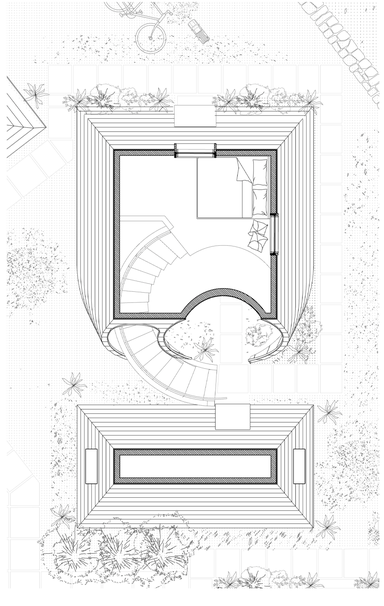




Do not duplicate without authors permission.

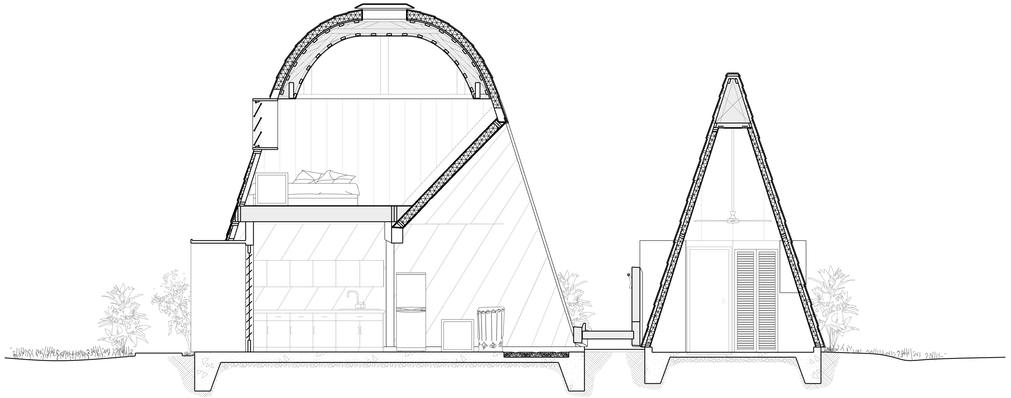




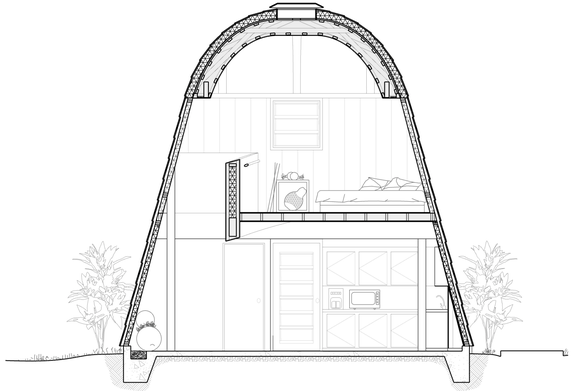


Koa's Hale
Floor Plan 1 & 2

Do not duplicate without authors permission.



Koa's Hale
Long Section

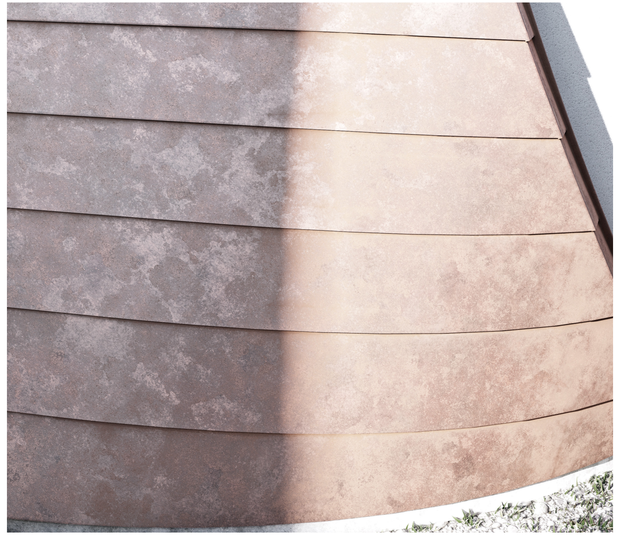


Koa's Hale
Cross Section

Do not duplicate without authors permission.

Taylor Cook, Fall 2020 Thesis project submission.



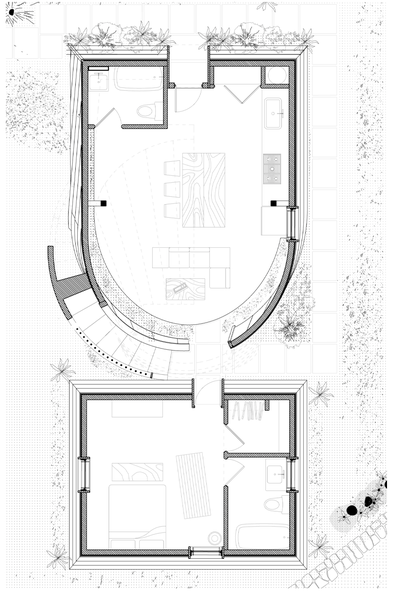


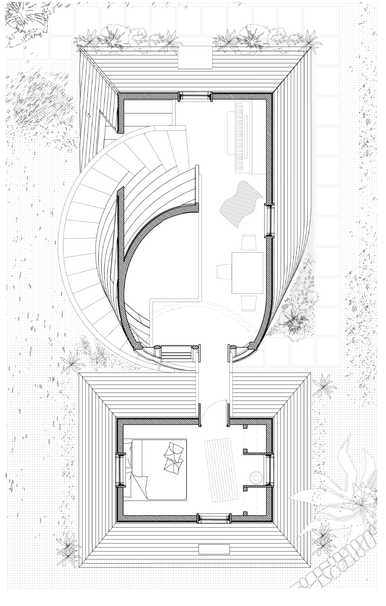
Character:

Corten steel panels and conical forms allow for Smooth transitions through changing plans or shapes. The inherent character of wrapping a cone with develop-able bands result in lineament vectors pointing toward the earth. This slight bend into and out of grade give an ever-present ruin-like appearance. The roof and wall transitions perform as supporting attributes of a smooth and fluid concept reinforced by a gradient of shadow always chasing the circulating sun.

Do not duplicate without authors permission.

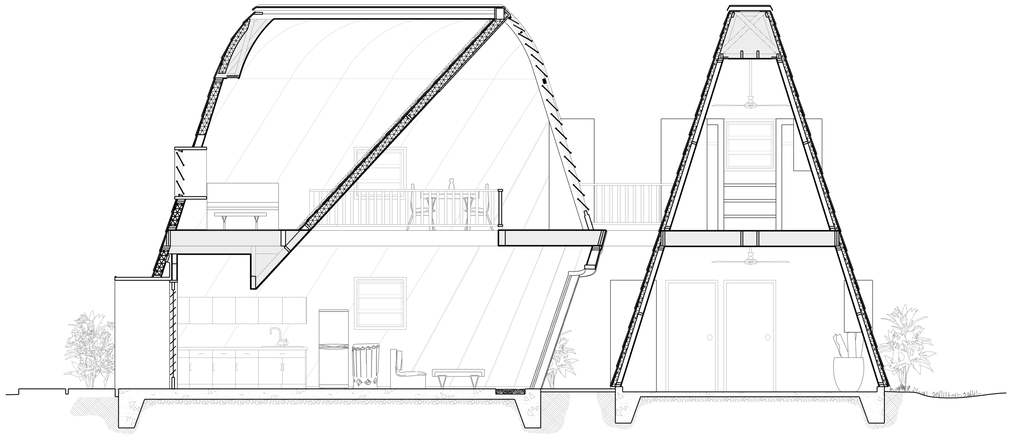




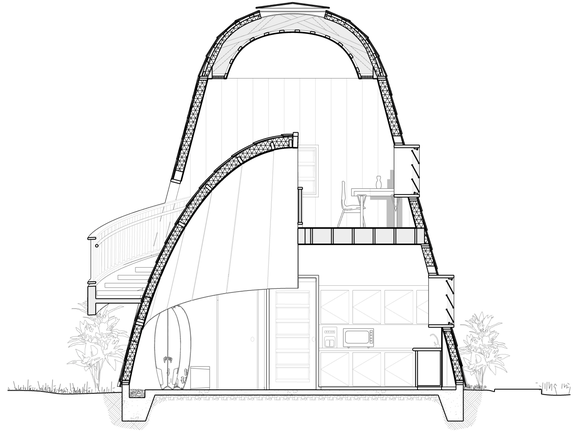


Wyatt's Hale
Floor Plan 1& 2

Do not duplicate without authors permission.



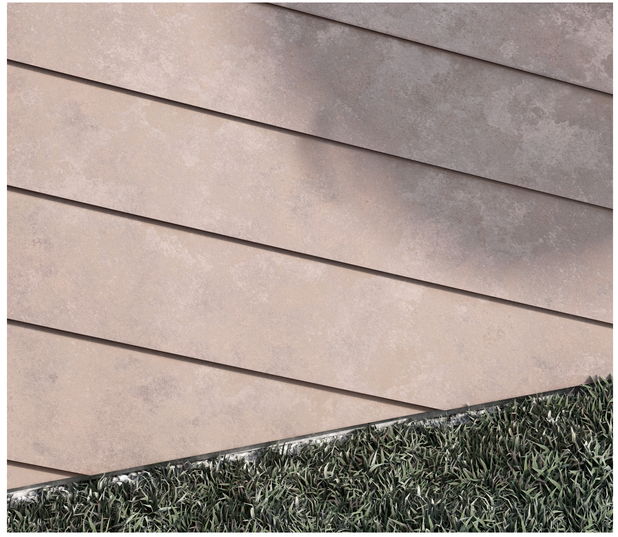
Wyatt's Hale
Long Section



Wyatt's Hale
Cross Section

Do not duplicate without authors permission.

Taylor Cook, Fall 2020 Thesis project submission.



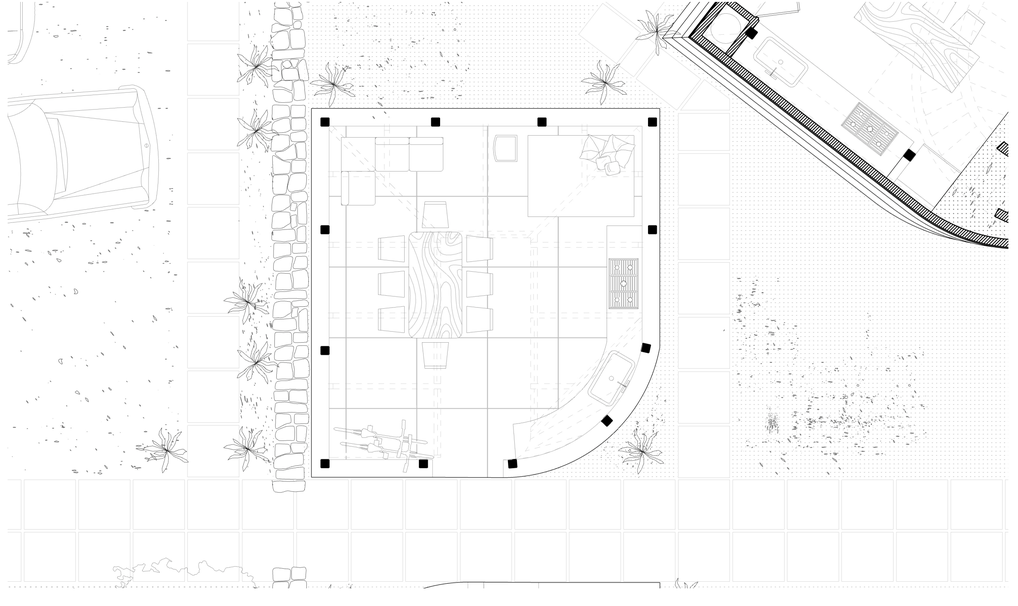


Character:

Corten steel panels and conical forms allow for Smooth transitions through changing plans or shapes. The inherent character of wrapping a cone with develop-able bands result in lineament vectors pointing toward the earth. This slight bend into and out of grade give an ever-present ruin-like appearance. The roof and wall transitions perform as supporting attributes of a smooth and fluid concept reinforced by a gradient of shadow always chasing the circulating sun.

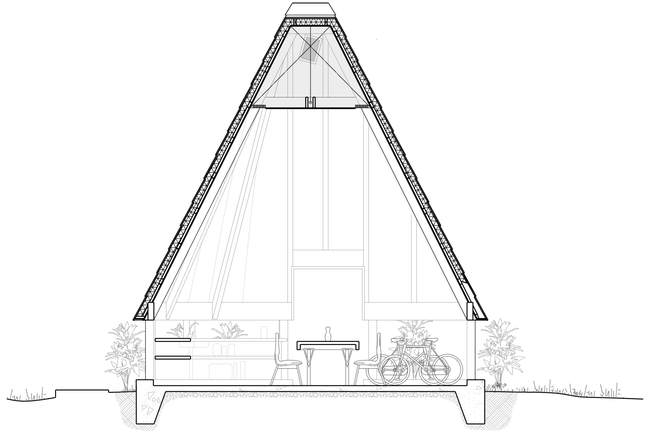
Do not duplicate without authors permission.



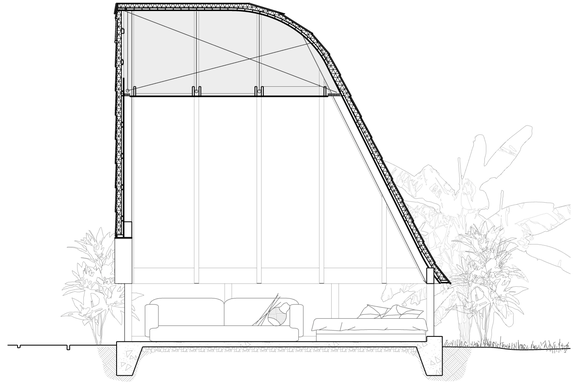


Lanai
Floor Plan

Do not duplicate without authors permission.



Lanai
Cross Section



Lanai
Long Section

Do not duplicate without authors permission.

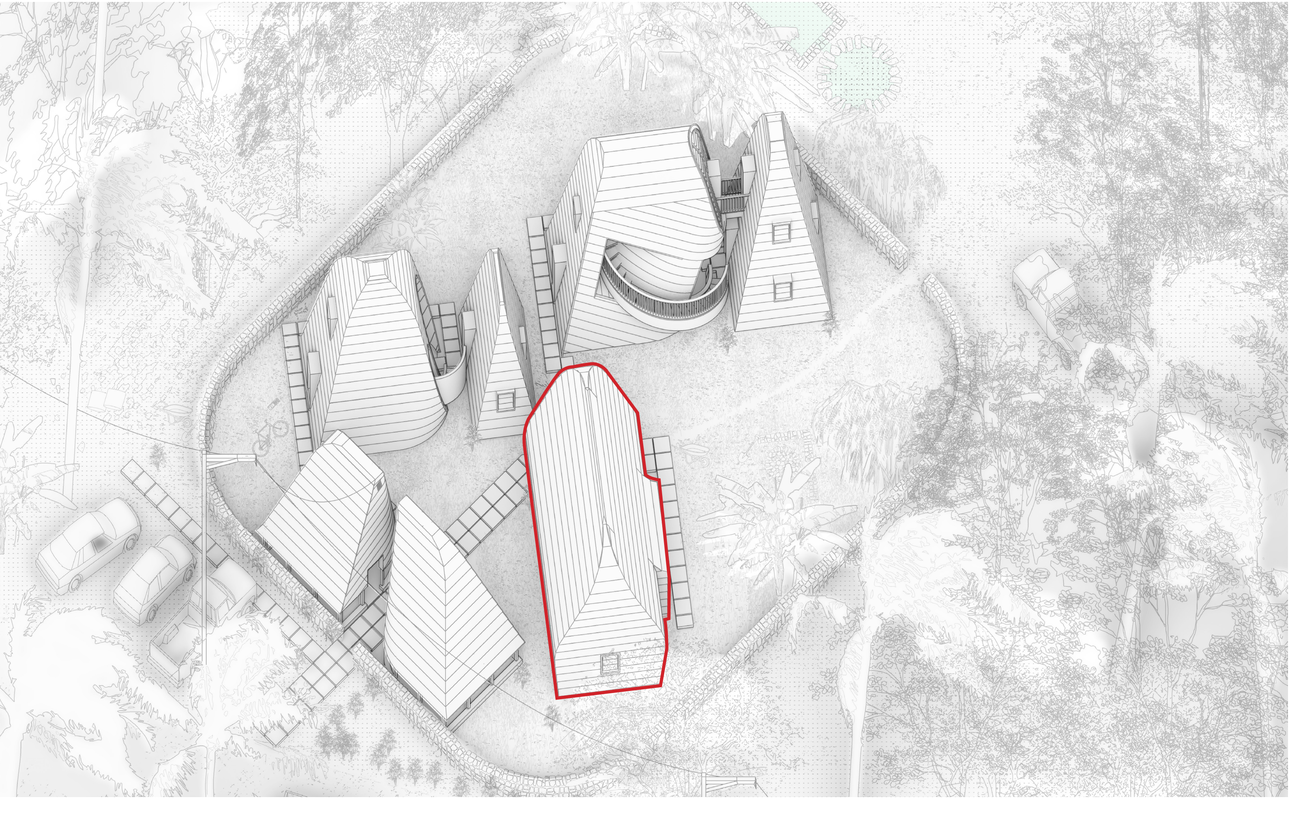


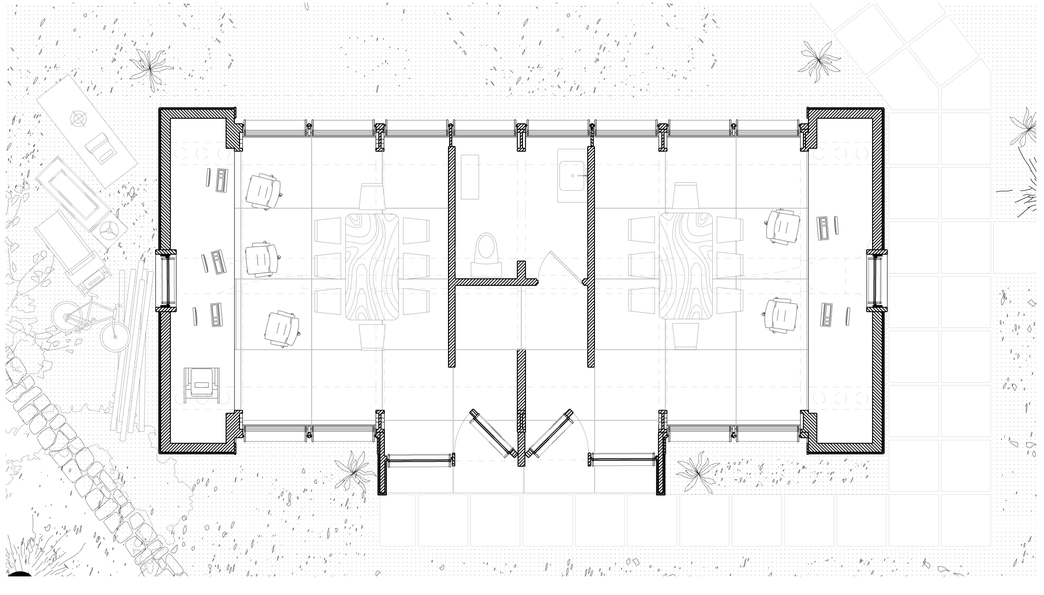


Character:

Corten steel panels and conical forms allow for Smooth transitions through changing plans or shapes. The inherent character of wrapping a cone with develop-able bands result in lineament vectors pointing toward the earth. This slight bend into and out of grade give an ever-present ruin-like appearance. The roof and wall transitions perform as supporting attributes of a smooth and fluid concept reinforced by a gradient of shadow always chasing the circulating sun.

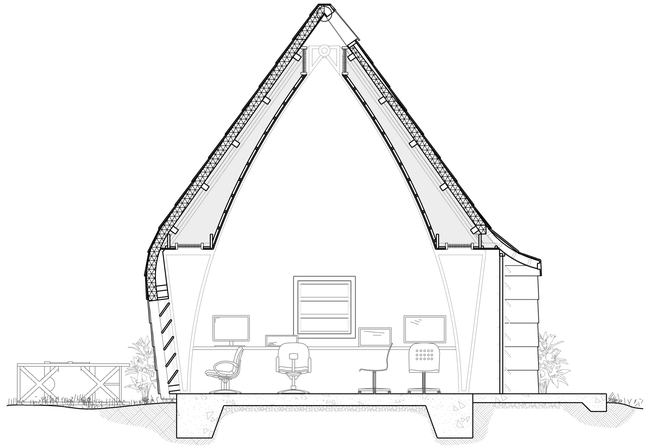
Do not duplicate without authors permission.



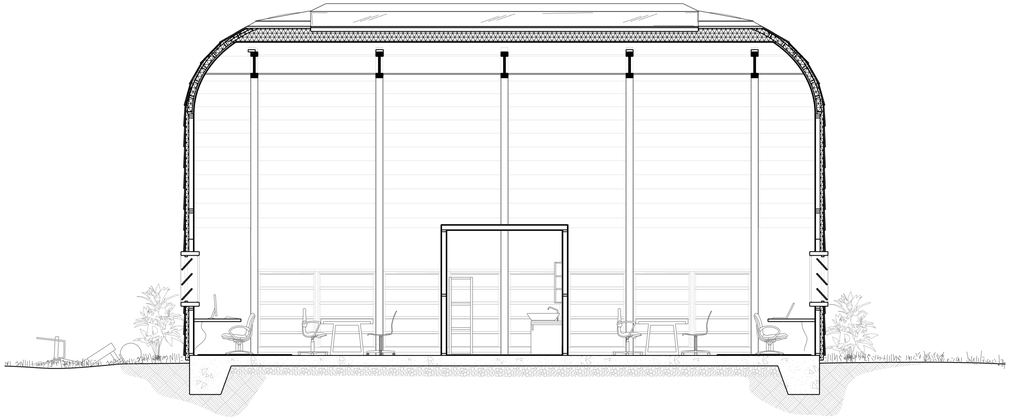


Hale Hana
Floor Plan

Do not duplicate without authors permission.

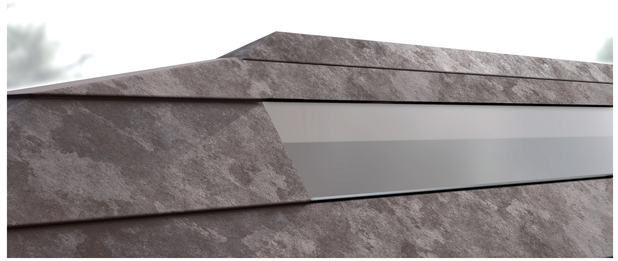


Hale Hana
Cross Section



Hale Hana
Long Section

Do not duplicate without authors permission.







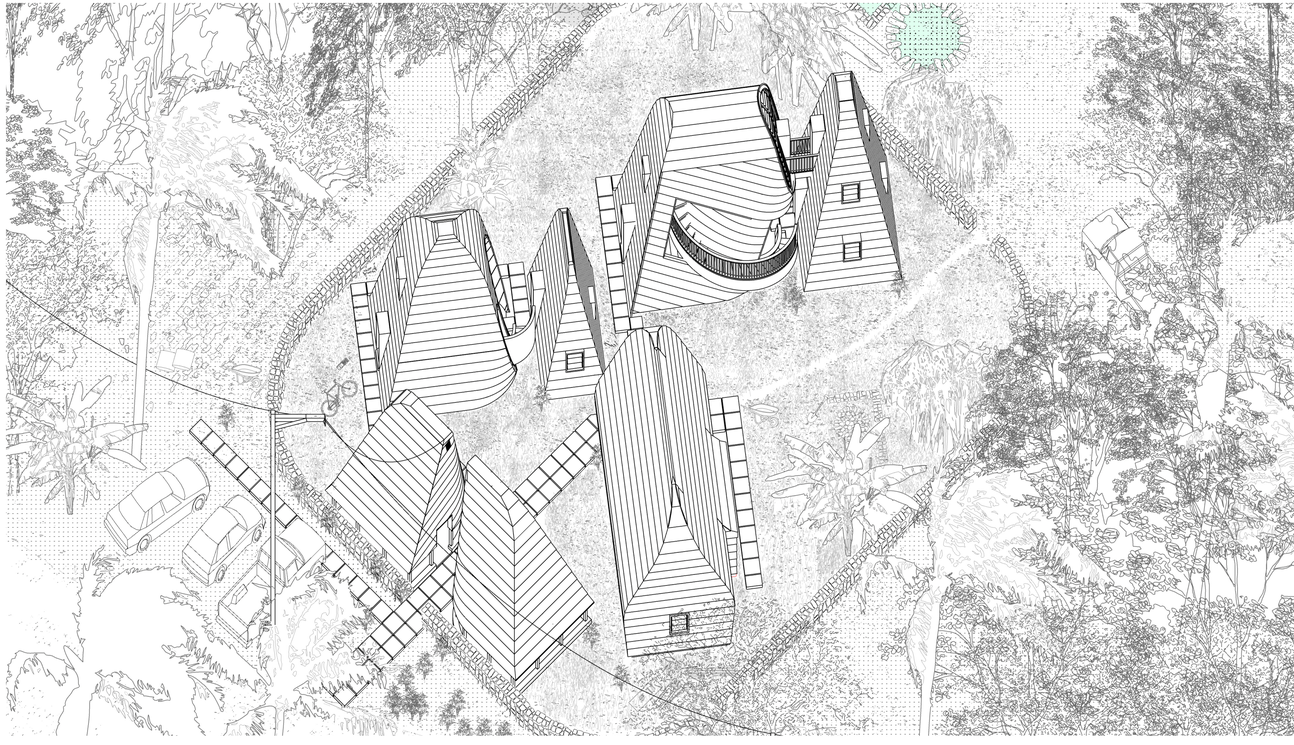
Character:

Removing the solids and voids of the duplex out of thier context forces the now eclectic feild of follies to lean upon the compositional logic and aesthetic atributes of the architecture. In this reading the historical context is also forgotten and the intuitive design choices come to the forground.

Do not duplicate without authors permission.



Kauhale
Long Section



Kauhale
Axonometric

Do not duplicate without authors permission.





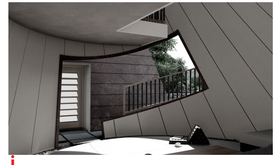
a



d



g



i



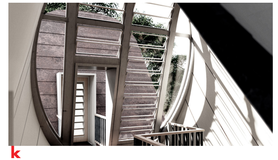
b



e



h



k



c



f

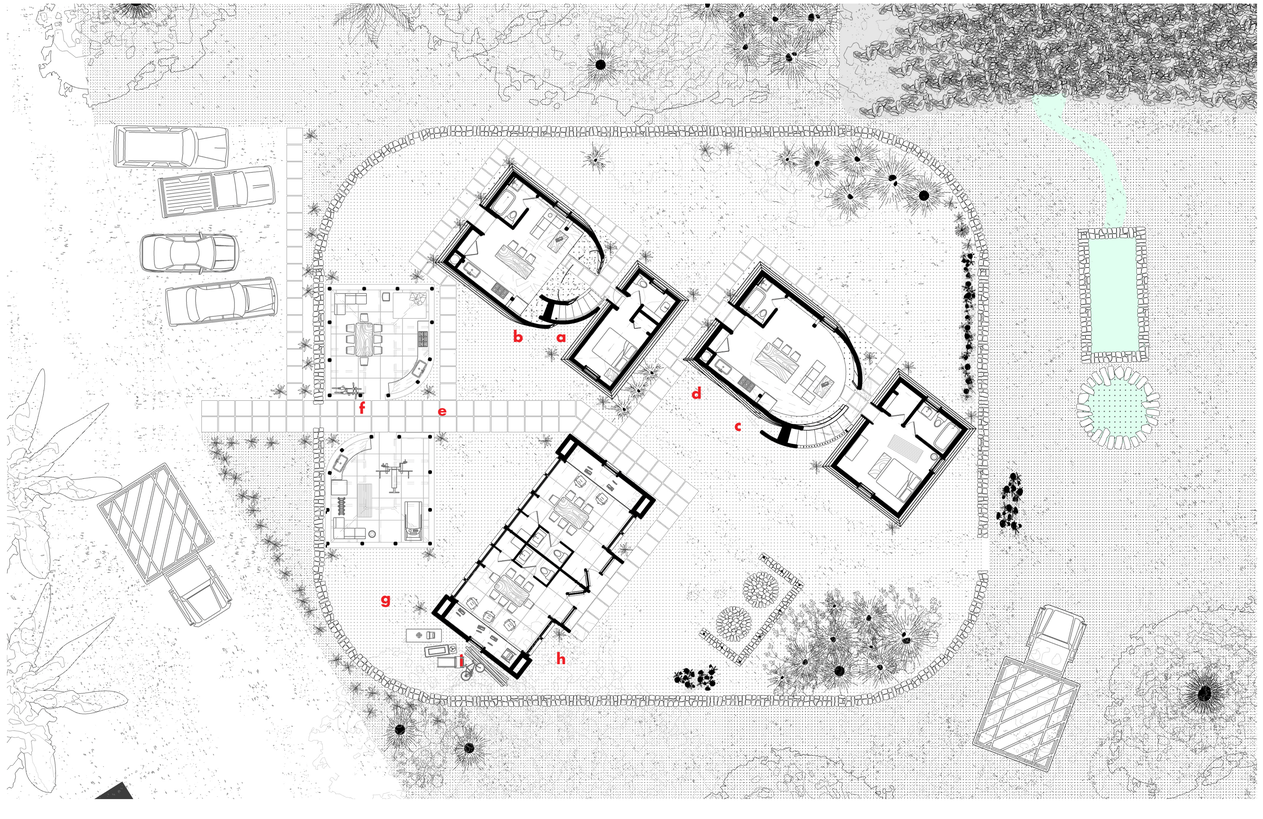


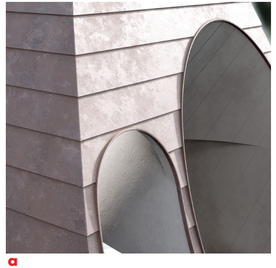
i



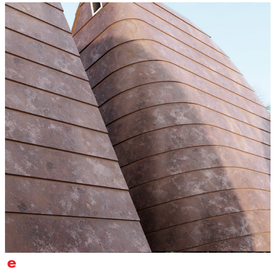
l

Do not duplicate without authors permission.




a


c


e

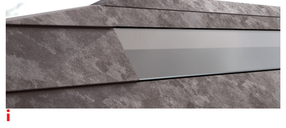

g


b


d


f


h


i

Do not duplicate without authors permission.



Young people in Hawaii learn about geography and history by memorizing the mo'olelo (history) of landmarks. Olomana for example holds the history of a warrior that lived on Kaua'i island named Palila. The warrior was extremely good at leaping and once jumped from his home on Kaua'i all the way to the shoulders of a famous warrior giant named Olomana. After Olomana asked Palila what his name was and where he was from, Palila suddenly surprised Olomana with a smacked and cut him in half. The lower half of his body stayed in place and froze into the mountain these structures are framing.[80]

Do not duplicate without authors permission.

"I could not turn back the time for political change, but there is still time to save our heritage. You must remember never to cease to act because you fear you may fail."

Queen Liliuokalani

Last reigning monarch

In a message to her daughter, January 1917.[81]

Me ke Mahalo a me ka Ha'aha'a.

Do not duplicate without authors permission.

Endnotes

Images in the presentation without endnotes are original productions or extremely altered from the original source material.

1 Paglinawan , Lynette K., Richard Likeke Paglinawan , Dennis Kauahi, and Valli Kalei Kanuha . Nana I Ke Kumu. Three. Vol. Three. Honolulu, HAWAII: Lili'uokalani Trust , 2020.
2 Kamakau, Samuel Manaiakalani. The Works of the People of Old = Na Hana a Ka Po'e Kahiko. Bishop Museum Press, 1976.
3 Buck, Peter Henry, and Bernice Pauahi Bishop Museum. Arts and Crafts of Hawaii. Reprint of bound volume. ed., Bishop Museum Press, 2003.
4 unknown. Ahuena Heiau . Photograph. Https://Commons.wikimedia.org Hawaii: wikimedia.org, December 30, 2005. https://commons.wikimedia.org. https://commons.wikimedia.org/wiki/File:Ahuena_Heiau.jpg .
5 Paglinawan , Lynette K., Richard Likeke Paglinawan , Dennis Kauahi, and Valli Kalei Kanuha . Nana I Ke Kumu. Three. Vol. Three. Honolulu, HAWAII: Lili'uokalani Trust , 2020.
6 Newton, H. E. " The Hawaiian Islands." Map. The Hawaiian Islands. Hawaiian Islands. Honolulu, HI: Hawaii Territory, 1919. http://hdl.handle.net/10524/59569.
7 Moore, Susanna. Paradise of the Pacific : Approaching Hawai'i. First ed. New York: Farrar, Straus and Giroux, 2015.
8 Queen Liliuokalani image avaiable at Hawaii State Archive: URI: https://ags.hawaii.gov/archives/about-us/photograph-collection/
9 Prince Jonah Kuhio Kalaniana'ole image available at Hawaii State Archive: URI: https://ags.hawaii.gov/archives/about-us/photograph-collection/
10 "History." History - Queen Liliuokalani Trust, 2021. https://onipaa.org/pages/her-history.
11 Iolani palace image in public domain, available at: "'Iolani Palace." Wikipedia. Wikimedia Foundation, December 17, 2020. https://en.wikipedia.org/wiki/%CA%BBIolani_Palace.
12 Image of coup in public domain, available at: "Hawaiian Rebellions (1887–1895)." Wikipedia. Wikimedia Foundation, August 14, 2020. https://en.wikipedia.org/wiki/Hawaiian_rebellions_(1887%E2%80%931895).
13 Image of generals in public domain, available at Hawaii state archive online resources: https://ags.hawaii.gov/archives/
14 Image of annexation celebration in public domain, available at Hawaii state archive online resources: https://ags.hawaii.gov/archives/
15 Ph.D., Keanu Sai. "The Illegal Overthrow of the Hawaiian Kingdom Government." NEA, February 4, 2018. https://www.nea.org/advocating-for-change/new-from-nea/illegal-overthrow-hawaiian-kingdom-government.
16 Kahoolawe bomb image, available at Hawaii state archive online resources: Hawai'i State Archives. Accessed January 8, 2021. https://ags.hawaii.gov/archives/.
17 Kalama valley protest image available at; Ed Greevy via http://archives.starbulletin.com/2003/07/10/features/story1.html
18 Maunakea protest image available at; KHON2. "No Arrests on First Day of Construction atop Mauna Kea." KHON2. KHON2, July 16, 2019. https://www.khon2.com/local-news/hundreds-of-protesters-blocking-mauna-kea-access-road-in-efforts-to-stop-tmt/.
19 Hokulea image in the public domain and available at; Uhl , Phil. "Search Results." https://commons.wikimedia.org/. Wikimedia Commons, August 26, 1976. https://commons.wikimedia.org/w/index.php?title=Special%3ASearch&limit=20&offset=40&profile=default&search=hokulea&advancedSearchcurrent=%7B%7D&ns0=1&ns6=1&ns12=1&ns14=1&ns100=1&ns106=1#/media/File:Hokule'a.jpg.
20 Paglinawan , Lynette K., Richard Likeke Paglinawan , Dennis Kauahi, and Valli Kalei Kanuha . Nana I Ke Kumu. Three. Vol. Three. Honolulu, HAWAII: Lili'uokalani Trust , 2020.
21 Schmitt, Robert. "Hawai'i Timeline." HawaiiHistory.org - Hawaii History - Home. Hukilau Network , 2021. http://www.hawaiihistory.org/index.cfm?fuseaction=ig.page.
22 Paglinawan , Lynette K., Richard Likeke Paglinawan , Dennis Kauahi, and Valli Kalei Kanuha . Nana I Ke Kumu. Three. Vol. Three. Honolulu, HAWAII: Lili'uokalani Trust , 2020.
23 Steib, Paula. "." Women in World History: A Biographical Encyclopedia. . Encyclopedia.com. 21 Dec. 2020 ." Encyclopedia.com. Encyclopedia.com, January 7, 2021. https://www.encyclopedia.com/women/encyclopedias-almanacs-transcripts-and-maps/liliuokalani-1838-1917.
24 Bayman, James M. "Technological Change and the Archaeology of Emergent Colonialism in the Kingdom of Hawai'i." International Journal of Historical Archaeology 13, no. 2 (2009): 127–57. https://doi.org/10.1007/s10761-009-0076-z.
25 Bayman, James M. "Technological Change and the Archaeology of Emergent Colonialism in the Kingdom of Hawai'i." International Journal of Historical Archaeology 13, no. 2 (2009): 127–57. https://doi.org/10.1007/s10761-009-0076-z.
26 Malo, David, and Nathaniel Bright Emerson. Hawaiian Antiquities (Moolelo Hawaii). Hawaiian Gazette Co., Ltd., 1903.
27 Ring, Trudy, Robert M. Salkin, Noelle Watson, and Paul E. Schellinger. International Dictionary of Historic Places. Americas. Edited by Trudy Ring and Robert M. Salkin. Chicago, IL: Fitzroy Dearborn Publishers, 1995.
28 Levy, Neil M. "Native Hawaiian Land Rights." California Law Review 63, no. 4 (1975): 848-85.
29 Kamehameha Schools. "Kamehameha III: Kauikeaouli." Ulukau, 1995. http://www.ulukau.org/elib/cgi-bin/library?e=d-0ks9-000Sec--11en-50-20-frameset-book--1-010escapewin&a=d&d=D0.22&toc=0.
30 Schmitt, Robert. "Hawai'i Timeline." HawaiiHistory.org - Hawaii History - Home. Hukilau Network , 2021. http://www.hawaiihistory.org/index.cfm?fuseaction=ig.page.
31 "History." The Friends of Falls of Clyde. Accessed January 7, 2021. http://www.friendsoffallsofclyde.org/history.html.
32 Image of brick palace by Lahaina Restoration Foundation/unknown artist, available at: Lahaina Restoration Foundation. "Brick Palace." Wikipedia. Wikimedia Foundation, August 12, 2020. https://en.wikipedia.org/wiki/Brick_Palace.
33 Edited government survey found at university of Hawaii online resources: https://evols.library.manoa.hawaii.edu/handle/10524/49267
34 Sugar cane Economy image available at: http://imagesofoldhawaii.com/waimanalo-sugar-plantation/
35 Image of falls of clyde in public domain, available at Hawaii state archive online resources: https://ags.hawaii.gov/archives/
36 Image of Kamehameha School teaching students, available at Hawaii state archive online resources: https://ags.hawaii.gov/archives/
37 Ring, Trudy, Robert M. Salkin, Noelle Watson, and Paul E. Schellinger. International Dictionary of Historic Places. Americas. Edited by Trudy Ring and Robert M. Salkin. Chicago, IL: Fitzroy Dearborn Publishers, 1995.
38 Levy, Neil M. "Native Hawaiian Land Rights." California Law Review 63, no. 4 (1975): 848-85.
39 Kamehameha Schools. "Kamehameha III: Kauikeaouli." Ulukau, 1995. http://www.ulukau.org/elib/cgi-bin/library?e=d-0ks9-000Sec--11en-50-20-frameset-book--1-010escapewin&a=d&d=D0.22&toc=0.
40 Schmitt, Robert. "Hawai'i Timeline." HawaiiHistory.org - Hawaii History - Home. Hukilau Network , 2021. http://www.hawaiihistory.org/index.cfm?fuseaction=ig.page.
41 "History." The Friends of Falls of Clyde. Accessed January 7, 2021. http://www.friendsoffallsofclyde.org/history.html.
42 Beyer, Carl K. "Manual and Industrial Education For Hawaiians During the 19th Century ." The Hawaiian Journal of History 38 (2004).
43 Image of Kamehameha School teaching students available at Hawaii state archive online resources: https://ags.hawaii.gov/archives/
44 Image number pp-32-2-012 of original vernacular house available at Hawaii state archive online resources: https://ags.hawaii.gov/archives/
45 Images of 1770s taken from The ancient Hawaiian house published in 1908 and therefore in the public domain. All other images in the public domain, available at https://commons.wikimedia.org/wiki/Main_Page or at Hawaii state archive online resources: https://ags.hawaii.gov/archives/
46 Moholy-Nagy, Sibyl. Native Genius in Anonymous Architecture. Schocken Books, 1976.
47 Brigham, William Tufts. The Ancient Hawaiian House. Whitefish, MT: Kessinger Pub., 2010. & Stewart, C. S. Journal of a Residence in the Sandwich Islands, during the Years, 1823, 1824, and 1825: Including Remarks on the Manners and Customs of the Inhabitants .. University of Hawaii Press for Friends of the Library of Hawaii, 1970.
48 Brigham, William Tufts. The Ancient Hawaiian House. Whitefish, MT: Kessinger Pub., 2010.
49 Lewers & Cooke. "Homes in Hawaii : Suggestions for the Home Builder. : Lewers & Cooke, Limited : Free Download, Borrow, and Streaming." Internet Archive. Honolulu, Hawaii : Lewers & Cooke, January 1, 1970. https://archive.org/details/homesinhawaiisug00lewe/page/14/mode/2up?q=foundation.
50 EI.Malvaney. "Masterbilt Shotgun Houses." Preservation in Mississippi, December 14, 2016. https://misspreservation.com/2016/12/14/masterbilt-shotgun-houses/.
51 Wagner, Otto. Modern Architecture. 1902nd ed. TEXTS & DOCUMENTS. Santa Monica, CA: THE GETTY CENTER PUBLICATION PROGRAMS, 1988.
52 Hvattum, Mari. Gottfried Semper and the Problem of Historicism. Cambridge NY: Cambridge University Press, 2004.
53 Schwarzer, Mitchell. "Visual Historicism in the Aesthetics of Adolf Göller." Art History, vol. 18, no. 4, 1995, pp. 568–583.
54 Guyer, Paul. "Formalism around 1800: A Grudging Concession to Aesthetic Sensibility." Filozofija i drustvo 30, no. 2 (2019): 241–56. https://doi.org/10.2298/fid1902241g.
55 Horner House image available at, Munari, Nicola-Matteo. Designculture. http://www.designculture.it/, 2013. http://www.designculture.it/profile/adolf-loos.html.
56 Domino house image available at: Jeanneret, Charles-Édouard. "File:Charles-Édouard Jeanneret (Le Corbusier), 1914-15, Maison Dom-Ino.jpg." Wikipedia. Wikimedia Foundation, May 21, 2017. https://en.wikipedia.org/wiki/Dom-Ino_House#/media/File:Charles-%C3%89douard_Jeanneret_(Le_Corbusier)_1914-15,_Maison_Dom-Ino.jpg.
57 Wagner, Otto. Modern Architecture. 1902nd ed. TEXTS & DOCUMENTS. Santa Monica, CA: THE GETTY CENTER PUBLICATION PROGRAMS, 1988.
58 Schwarzer, Mitchell. "Visual Historicism in the Aesthetics of Adolf Göller." Art History 18, no. 4 (1995): 568-83.
59 "The Caraib Hut". Gottfried Semper, Der Stil (2nd ed. 1878), vol. 2, p.263. Francis Loeb Library, Harvard University.
60 Hvattum, Mari. Gottfried Semper and the Problem of Historicism. Cambridge NY: Cambridge University Press, 2004.
61 The Stahl House image taken by Keith Daly at flicker as dalylab, available at: Andrew Kroll. "AD Classics: Stahl House / Pierre Koenig" 22 Oct 2010. ArchDaily. Accessed 7 Jan 2021. <https://www.archdaily.com/83038/ad-classics-stahl-house-pierre-koenig> ISSN 0719-8884
62 Healy House image available at: Architecttype. Cocoon House . Https://Commons.wikimedia.org/. Wikimedia Commons, December 18, 2018. https://commons.wikimedia.org/wiki/File:Cocoon_House_(Paul_Rudolph_and_Ralph_Twitchell,_Architects).jpg.
63 Tropical Modernist image of McMansion available at: 6, One Kindesign May. "Sumptuous Vacation Retreat in a Tropical Rainforest," October 8, 2014. https://onekindesign.com/2012/05/06/sumptous-vacation-retreat-in-a-tropical-rainforest/.
64 Sky house image available at: Camile, Veronica. "Kiyonori Kikutake Sky House in Tokyo, Japan." ArchEyes. Timeless Architecture, October 21, 2020. https://archeyes.com/sky-house-kiyonori-kikutake/.
65 Umbrella house image available at: Graham McKay, "Kazuo Shinohara's Houses," misfits' architecture, published on July 20, 2014, accessed on January 8, 2021, permalink: https://misfitsarchitecture.com/2014/07/20/kazuo-shinoharas-houses/.
66 Jorgensen, Kelsy M.Y. E Hoi Ka Ui: Perspectives on Placemaking in Hawaii. School of Architecture, University of Hawaii at Mānoa, 2019.
67 Moholy-Nagy, Sibyl. Native Genius in Anonymous Architecture. Schocken Books, 1976.
68 Bayman, James M. "Technological Change and the Archaeology of Emergent Colonialism in the Kingdom of Hawai'i." International Journal of Historical Archaeology 13, no. 2 (2009): 127–57. https://doi.org/10.1007/s10761-009-0076-z
69 Kamehameha Schools. "Spoken Hawaiian." Ulukau, 1995. http://www.ulukau.org/elib/cgi-bin/library?e=d-0spoken-000Sec--11haw-50-20-contact-book--1-010escapewin&a=d&d=D0.18&toc=0.
70 Moholy-Nagy, Sibyl. Native Genius in Anonymous Architecture. Schocken Books, 1976.
71 Brigham, William Tufts. The Ancient Hawaiian House. Whitefish, MT: Kessinger Pub., 2010.
72 Kamakau, Samuel Manaiakalani. The Works of the People of Old = Na Hana a Ka Po'e Kahiko. Bishop Museum Press, 1976
73 Buck, Peter Henry, and Bernice Pauahi Bishop Museum. Arts and Crafts of Hawaii. Reprint of bound volume. ed., Bishop Museum Press, 2003.
74 Kamakau, Samuel Manaiakalani. The Works of the People of Old = Na Hana a Ka Po'e Kahiko. Bishop Museum Press, 1976.
75 Kamakau, Samuel Manaiakalani. The Works of the People of Old = Na Hana a Ka Po'e Kahiko. Bishop Museum Press, 1976
76 Brigham, William Tufts. The Ancient Hawaiian House. Whitefish, MT: Kessinger Pub., 2010.
77 Jorgensen, Kelsy M.Y. E Hoi Ka Ui: Perspectives on Placemaking in Hawaii. School of Architecture, University of Hawaii at Mānoa, 2019.
78 Edited government survey found at university of Hawaii online resources: https://evols.library.manoa.hawaii.edu/handle/10524/49267
79 McGregor, Davianna P. Jon Matsuoka, Luciano Minerbi, and Panaewa Kelley. Rep. Phase III. Native Hawaiian Access Rights Project Recommendations for SMA Rules and Process. Honolulu, HI: State of Hawai'i, 2002.
80 Kamehameha Schools. "Hawaiian Mythology." Ulukau, 1995. http://ulukau.org/elib/cgi-bin/library?e=d-0beckwit1-000Sec--11en-50-20-contact-book--1-010escapewin%3Dd&a=d&d=D0.31.15&toc=0.
81 "History." History - Queen Liliuokalani Trust, 2021. https://onipaa.org/pages/her-history.