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A Heart for Kapālama
Transforming Kapālama Canal into an Urban Catalyst Through Renaturation and Remediation

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Over the last two centuries, Kapālama has undergone dramatic transformations. It was once a floodplain adorned with loʻi (Taro) and fish ponds (DTL). Today, Kapālama is an industrial center, home to the working class. Originally, the canal was conceived and built in 1939 as a flood prevention measure; the stream's periodic flooding became increasingly problematic as the population in the area grew denser (WCIT). Initially, the water quality was relatively clean as residents would regularly access the water to swim and fish (DTL). As industrial use became more prominent, water quality began to plummet, and the canal became a hazard and gave rise to a negative perception in the community. Though the canal has enabled industrial, commercial, and residential development in the Kapālama area, water has been an afterthought, entirely neglected throughout the years. The canal was designed, primarily to move water as quickly as possible without attention to environment and aesthetics. Over the years, the canal has fallen into neglect, leading to stream bank erosion and, in turn, poor water quality. The water quality was exacerbated when sewage was diverted into the canal to alleviate infrastructure overloads. In “A Heart for Kapālama,” I propose a beautification and revitalization of the canal and the area surrounding it, making for a more welcoming, uplifting and livable neighborhood. I see the canal as an urban catalyst that is capable of uniting the community. Thus far, most parks on the island are underutilized, not provocative, nor environmentally responsible. Most cases appear as a shallow and generic patch of grass occasionally shaded by just a few trees. The goal of my proposal was to create a vision which establishes a precedent of a true “green” gathering place in O‘ahu by honoring the responsibility to land and water, and using natural elements and resources in tandem to grow and transform the community.

I graduated from UH Mānoa with a Bachelor of Environmental Design in 2017, and I am currently a candidate for the Doctor of Architecture degree at the UH School of Architecture focusing on ecological design. “A Heart for Kapālama” was a conceptual design project for Architecture 341: Intermediate Design Studio taught by Assistant Professor Simon M. Bussiere. In the studio, through site-analysis and process-based design, we sought to transform Kapālama Canal into an urban park and ecological catalyst. The design in this proposal seeks to elevate the Kapālama community by merging landscape and architecture to clean water, restore ecosystems, and grow food for communities. This piece signifies the reemergence of land and water in an industrial core of Honolulu, creating an everlasting sense of place for its people by incorporating the old with the new to create a self-sustaining future.
Kapālama canal is an approximately one-mile long water channel located in the midst of the Kalihi-Palama neighborhood (WCIT) (Figure 1). Within the next few years, the neighborhood will experience a significant re-development that brings a rail transit hub and new range of mixed-use buildings and high-rise residential units into the Kalihi-Palama district. Currently, the Kapālama canal is in a deteriorating state and divides the community. The canal and its water has fallen victim to erosion, pollution, litter, and neglect—far from the Hawaiian tradition of Mālama ‘Āina which means to care for the land. At one point in time, the area was capable of agricultural and recreational uses, but today, it is a site that is fenced-off, deemed unsafe and hazardous. My design proposal of "A Heart for Kapālama" sees the canal and its body of water as an urban catalyst capable of elevating the quality of life and promoting congregation, growth, and play within the Kalihi-Palama community. The basis of my re-imagination of Kapālama Canal is motivated by three design principles:

**Weaving together a divided community:** The canal must motivate and facilitate social life within the communities that encompass it. The canal and its inherent resources should not only improve the quality of life but also educate upcoming generations on the significance of agriculture and respect for our lands and waterways.

**As above, so below:** Not only should human needs be fulfilled, but integrating natural and environmental systems will restore integrity, creating value and identity for the Kapālama district. Manipulating the land and water systems appropriately can alleviate our need for artificial water infrastructure. Implementing green infrastructure will play a vital role in improving the water quality within the canal naturally.

**Rejuvenation of Ahupua‘a through Mālama ‘Āina:** Caring for land, using it optimally and respectfully as the Native Hawaiians did will set a precedent for a true “sense of place” in Hawai‘i—creating a place that is self-sustaining, capable of providing its own sustenance and goods by using land and water resourcefully.

Our land and its waterways were once incredibly dynamic media that had the potential to grow food and influence the citizens that inhabit them—and they can still do that in this day and age. Native Hawaiians pioneered the Ahupua‘a, a system of organizing mountainous watersheds through the subdivision of land to cultivate crops and different species of lo‘i. The “Heart for Kapālama” vision proposes to restore the canal to a natural stream—reminiscent of the original Kalihi ahupua‘a. Originally, the canal was designed as a concrete channel, a flood preventative measure to divert water outflow as quickly as possible, whereas a natural stream possesses elemental nuances such as rocks, vegetation, obstructions, and gravity that influence the flow of water, thus aiding in the optimal distribution of deposition and sediment. A stream will allow the water to naturally flow and meander, creating new opportunities for the water to become cleaner on its own as minerals and nutrients are optimally dispersed and filtrated. To incorporate dynamic water flows in this new stream, certain meander belts of the stream will be more open and others tighter and more constrained. Furthermore, man-made “islands” will punctuate the river—dividing the water way, allowing the water to flow in two directions instead of one. The “islands” will serve as the points of connectivity through pedestrian bridging. At the core of the stream, four bridges will symbolically “stitch” the community together, seeking to mend the urban “wound” that has divided Kapālama for so long (Figure 2).

The new Kapālama stream will feature stabilized embankments that will prevent soil erosion. Applying vegetated stepped-terraces will remove the concern of erosion because the soil will be more compacted within a stricter and more constrained geometry. Furthermore, adding a layer of vegetation on top of the stepped-terrace will assist in naturally holding the soil together. The vegetated stepped-terraces also serve as a park recreational feature as visitors can use them for water access, seating and reclining elements in their personal experience of the park. The design of the stream and park aims to induce a myriad of sensory experiences ranging from calm, quiet and intimate feelings to loud, tactile and adventurous (Figure 2).
Visitors would find that they can climb down and sit close to the water, even touch it, or skip across to the other side of the stream. Others, from above on the pedestrian foot bridges, would be able to observe the scene of water, seeing people and nature gracefully melding together, working to evoke people’s playful nature. Or other visitors who are more conservative would sit atop the green hills, enjoy a picnic and survey all the activities that go on at the park: seeing people interacting with the water, moving through the swooping bridges, and using the gardens integrated within the stream.

In the stream, there are three core regional experiences (Figure 4). The first is a Wetlands Region, consisting of local vegetation and fauna planted in the water body and along the stream embankments. The assortment of plants would aid in cleaning the stream water through a process called phyto-remediation, where impurities and toxins are absorbed as food sources for the plants. The wetlands region of the park catalyzes biodiversity by generating a healthier living environment, habitat and ecosystem capable of fostering aquatic and wildlife. This portion of the stream and park is dedicated to the act of conserving, observing and surveying nature (Figure 5). Located at the lowest part of the park, the wetlands observatory induces a quieter and calmer experience as visitors watch dragonflies and butterflies enjoying the fauna, birds and ducks gliding along the water, and schools of fish swimming within the water (Figure 6).

The next core experience is the Agricultural Region, located at the center of the stream. A fusion of pedestrian movement and an agricultural farm, the aim of the design of this area was to unify multiple elements: walkability, increased urban connectivity, ecosystem restoration, renaturation, and urban agriculture (Figure 7). To do this, the urban park and stream is a combination of hard (paved) and soft (vegetated) surfaces. The stream bed is a sequence of elevating and declining ramps which guide and push the water through sequences of reliefs, spearheading the dilution of water by increasing the circulation in the water. Though the ramps work to move water dynamically throughout the channel, they also subdivide the stream to separate freshwater from saltwater (Figure 8), allowing plants and crops to grow. The freshwater that comes from the watershed in the mountain ranges is an invaluable resource to revitalize and catalyze the presence of agriculture within Kapālama. In between the incline and decline ramps are a series of agriculture ponds which collect the descending freshwater to initiate the growing of crops, especially lo‘i. The agriculture ponds within the stream serve as opportunities to incorporate education into the programmatic use of the park, and, in turn, generate more awareness of the importance of agriculture by educating the neighboring middle schools, high schools, and community college.
The man-made islands within the stream establish points of connectivity for bridging, but also create junction points in the flow of water (Figure 9). Instead of moving in one direction, water is now forced to divide and flow around the island (Figure 10). Thus, the islands work as obstacles that enable different velocities of water flow within the channel (Figure 11). Visitors in this area of the park will hear the sounds of water rushing in, falling, and trickling in contrast to the calm and quiet flow of the wetlands region of the park. As visitors stroll or bike through this area, they would witness local farmers and kids accessing the agriculture ponds and engaging in the act of planting, maintaining, and harvesting—passing down the knowledge of agriculture to new generations.

The last core experience is the Event Region, which is designed to promote public recreation, congregation and adventurousness. Located after the agricultural ponds, this region occurs at the north peak of the stream, where water from the mountain watersheds converges and begins to enter the stream (Figure 3). The water cleansing process begins at this point by focusing on slowing down the flow of water before it touches the agriculture and wetland amenities located further down the stream. Cylindrical concrete pillars are placed in an
Man-made islands serve as points of connectivity on which the pedestrian footbridges rest. They are also obstacles within the stream that divide the flow of water, forcing it to flow in multiple directions instead of one.

Figure 11  Water circulation diagram, depicting how obstacles influence the flow of the new Kapālama stream. The cylindrical concrete pillars located at the north peak of the stream slow down the water flow. As water moves down the stream, it then meets the man-made islands and divides flow within the stream, creating primary and secondary streams.

Array to create a lining of obstacles which slows down the water flow by “confusing” it, forcing the water to flow in different directions instead of one (Figure 11). As water pushes and grazes through these pillars, sediment and impurities are dispersed more actively as the circulation of water is greatly increased. In tandem with the bed of the new stream, which is composed of reliefs through incline and decline, ramping creates a cascading water movement, allowing water to fall and trickle along faceted surfaces as it moves down the stream. Water becomes cleaner throughout its journey in the stream as it is pushed through obstructions, forced to circulate between obstacles, and then cascades down a diversified bed (Figure 12). These seemingly disparate elements work together to make the water
become more touchable, useful, and engaging in the coming months and years.

From the visitor’s point of view, these surface geometries are not just barricades that slow down the water flow, they appear as “stepping stones” that emerge out of the water like boulders and rocks in a natural stream. In addition to these “stepping stones” lining the edges of the stream, ensembles of lush vegetation which absorb contaminants in the water, and double alley rows of trees which shade and stabilize the stream embankments, immerse the visitor in the recreation of nature (Figure 13). These elements trigger people’s sense of adventure by allowing them to get close to the water or even traverse the stream by skipping across the stones. Visitors in this event region will find that they are met with different ways to approach their experience of the park. They could either choose to go on the bridge or step down from the main promenade to experience the park more intimately by getting closer to the water and, if water level permits, even sitting on the edge of the embankment and dipping their feet in the water. If the “stepping stones” within the stream are not submerged, then one may choose to either walk on them, kneel down to touch the water, or skip on them to get to the other side of the park. The intention of this region is to create opportunities for visitors to immerse themselves within the park in different ways, ranging from visual to tactile stimuli. Visitors would share quiet and contemplative moments as a sense of temporality can be experienced here in which certain elements may be submerged and left inaccessible throughout the year—giving the individual a sense of impermanence and reemergence.

The ultimate goal of proposing these playful yet effective approaches to cleaning water is to not only create engaging sensory experiences, but to one day get the water quality to a level where urban agriculture can be possible. We live in a time where food production and availability are challenges with an ever-increasing global population. Hawai‘i heavily relies on imports to supply food for the state. Hence, the design proposal within “A Heart for Kapālama,” seeks to establish a precedent for a true “green” gathering space for Hawai‘i—capable of cleaning water and utilizing it to locally grow food to self-provide sustenance for its community (Figure 8).

In the coming years, Kapālama will experience incredible changes as it is slated to be redeveloped with the new rail transit system that runs through the neighborhood. In the city’s proposal for the future of Kapālama, high-rise residential development will replace all of the industrial shops that...
reside along the corridors of the existing canal (WCIT). These corridors are largely underutilized, unengaging, and ignored, either used privately for industrial purposes or private parking spaces. Hence in my redesign, these corridors are no longer vehicle accessible, but become pedestrian promenades that circulate around the stream, and give rise to stronger access points and connectivity for the community (Figure 14). As people step off the rail transit hub and work their way down to the street level, they will be met with a lush promenade wrapped around green mounds, in turn provoking them to explore the moments that lie ahead and within the park (Figure 15). Not only do the pedestrian bridges symbolically “stitch” together the multi-ethnic community at the core of the park, this gesture of urban healing echoes throughout the design as the park sprawls, “branching” into the Kapālama community with its increased access points. The bridges will align and connect with key corridors within the district for optimized connectivity, and secondary corridors will lead into the park’s pedestrian promenade (Figure 16).

The new pedestrian promenades will accentuate the waterfront as future residential buildings and businesses will directly meet with the urban park, farm and communal space. The goal of this project was to create a true “green” open-recreational space that elevates the quality of living while promoting exchange between a wide spectrum of people in the Kapālama community. The park is an escape from urban traffic and stress, immersing the user in recreation in nature through the sculpting of land and water. As an ecological and phenomenological catalyst, the park creates a destination where new memories and sensations can be made and felt. This idea is strengthened by incorporating a sense of temporality, or a play on time. To do this, natural patterns and processes actively participate in the designing of the park and stream, letting nature take its course and design itself. Throughout the year, the water levels may change, certain areas may be submerged,
plants will change color, wither and regrow; seeing these transitions creates the feeling of impermanence. It is intended for the users and visitors to be reminded of the transformable and regenerative force that is nature, constantly changing and persistently adapting.

“A Heart of Kapālama,” is a vision of ecological placemaking for the Kalihi-Pālama district of O‘ahu that combines architecture, landscape, and ecological principles to induce an elevated quality of living, where growth, exchange, and play are possible (Figure 17). Slowly the canal will evolve from a canal, to a stream, to a garden, and eventually into a cultural evolution. Ultimately, dedicating efforts to rejuvenate and re-develop the canal will weave meaning, optimism and hope back into the Kapālama community. With the mountains of O‘ahu lingering in the background, the cool and calm breezes gracing the area, and a large body of water to interact with, the canal already has the pieces to initiate change and regrowth in the Kapālama community. Kapālama canal is the engine that will rejuvenate the spirit of Kapālama—creating the foundation for its identity and sense of place (Figure 18).

Figure 17 Site analysis diagrams aid in the designing decision-making process leading into the final design intervention; side-by-side comparison illustrating the before and after transformation of the Kapālama Canal.

Figure 18 The new Kapālama stream park as an urban and ecological catalyst. Residential buildings meet with the park’s promenade, leading into the pedestrian bridges, then to the gardens and farms within the stream. The stream weaves meaning, optimism and hope back into the Kapālama community—creating a new “sense of place.”

Bibliography: