

TAI-O / A MODERN VILLAGE

Tejido Group / University of Arizona / Capla / 2013



INTRODUCTION

In the summer of 2013, the Tejido Group from the University of Arizona / CAPLA assembled a group of volunteer students from both Schools of Architecture and Landscape Architecture to develop a revitalization master plan for one of the last remaining fishing villages in the Hong Kong territories – TAI-O on Lantau Island.

The project illustrated a collaborative and interdisciplinary effort among our faculty and students from the University of Arizona. Our design team was graciously hosted by the Chinese University of Hong Kong throughout the four week duration of the project. CUHK faculty and students assisted us greatly in adapting to, and in better understanding the many complex social, economic and environmental issues confronting us in this fascinating project. With strong support from CUHK and their School of Architecture, the students, professors, and all others involved experienced unique design challenges resulting in experiences which fostered both academic and personal growth. This revitalization project of TAI-O has evolved into an attempt to develop a multipronged approach to the revitalization and conservation of the wonderfully complex social and environmental context which is TAI-O. We sincerely hope that this “sustainable rural development prototype” may assist TAI-O in revitalizing a threatened, yet truly unique and relevant lifestyle. With very special thanks to CUHK and our gracious host Patrick Hwang we offer the following as a brief summary of the design and planning outcomes resulting from this summer’s odyssey in Hong Kong.

TAI-O DESIGN TEAM:

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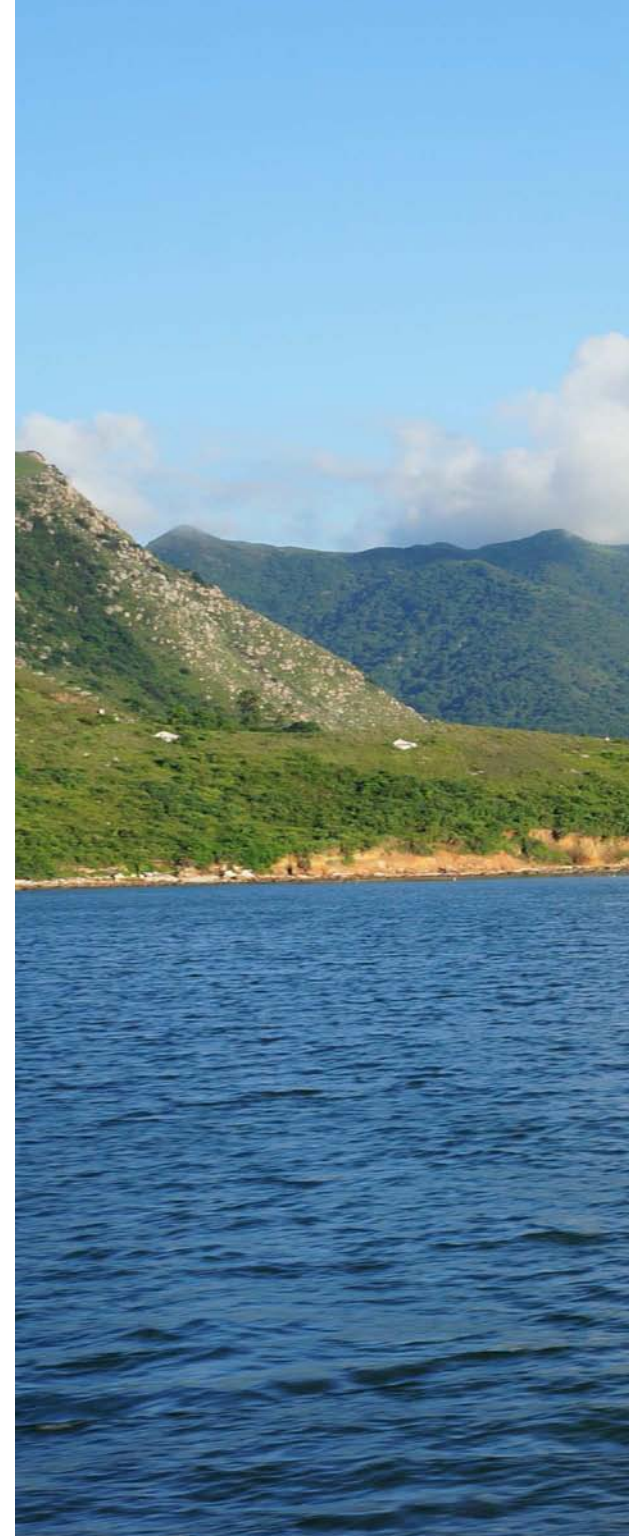




Tai O is a remembrance of the past and a vision of the future. Once home to the Tanka people, Tai O has been an important trading and fishing port to China for the last 100 years. It was originally colonized in the 10th century CE as it occupies a strategic position in the Pearl River Delta, situated equally between Hong Kong, Macau, and Guangzhou. The waters in this area have been traveled for at least the last 6000 years, traveled by pirates and traders, armies and smugglers. Historically the major exports have been salt and fish, and the village is renown for its famous shrimp paste. Evidence of this commercial activity can be seen throughout the village today, from fish drying racks and shrimp paste drying in the open air to the remains of the salt pans that are now host to mangrove wetlands. Temples to Hung Shing, the patron saint of fisherfolk, can still be found throughout the village, a testament to the strong history and tradition of the village. An analysis of the Feng Shui of the village attests that it is strategically placed for social and economic success. Whatever you believe, it is important to preserve the history of the village, while providing a path for its future that will ensure its continued sustainability.

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This is a view of the general Pearl River delta region. Lantau Island is connected to Hong Kong mainland by bridge, ferry and subway links. Currently a new bridge connecton is under construction to Macau.

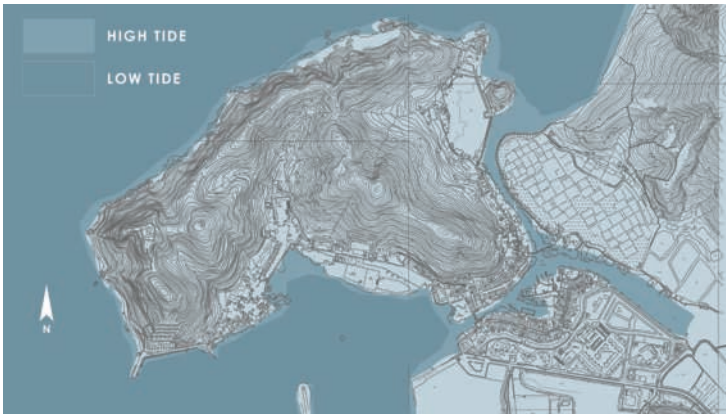


Other than Tai-O village, Lantau island is largely undeveloped, yet there are new dense nodal developments in the form of a new international airport on the northern coast, and a Disneyland resort located along the northeast coast.



ESTUARIES

Estuaries present an opportunity in terms of revegetation efforts in an attempt to reestablish natural ecologic functions. Natural vegetation, such as mangroves, prevent the detrimental functions of tidal actions. They also create a microenvironment in which fish, molluscs and other plants and animals thrive.



HIGH AND LOW TIDES

High and low tides are very significant in this region, with the high tide line moving throughout the village and up Tai O Creek, and the low tide moving far enough away from the land to create significant mud flats around the island.



INTERTIDAL ZONE

The intertidal zone supports a variety of life that is adapted to extreme environments. Because of the variability of this environment, many species of life are supported because of the high volume of nutrients presented by these different inputs. Habitats such as those created by mangroves can ameliorate the more dramatic affects in these areas.

EXISTING LAND USE

Much of the land surrounding the village of Tai O is already protected and not slated for development. Any future development within the historic village is also strictly limited, often times not allowing houses that have been destroyed to be rebuilt.



CIRCULATION

Circulation within the village is good, if not somewhat limited by the shape of the development and the water that surrounds most of it. Circulation is most limited in the access to the village from the outside, with the only main circulation paths being one road from the rest of Lantau and one ferry entrance at the port.



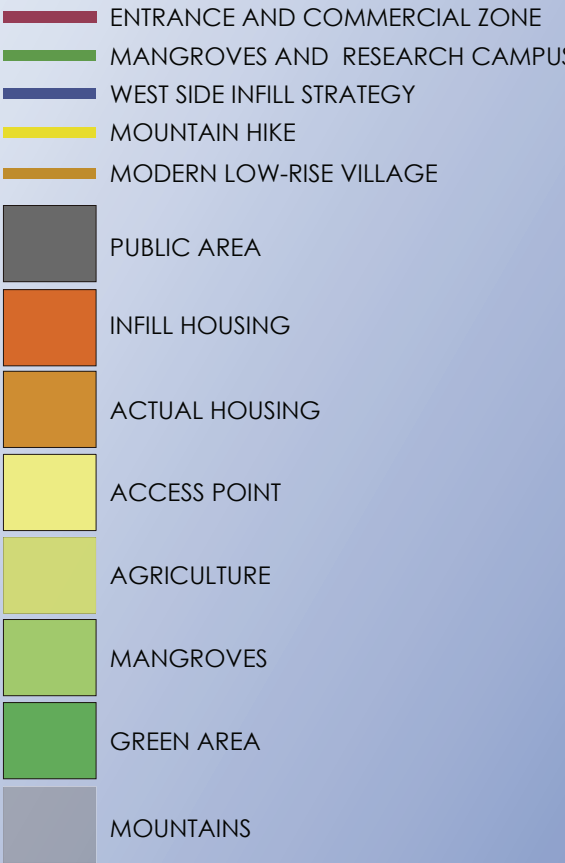
AMENITIES

There are amenities for the residents of the village, but they are often not placed with regard to the limited mobility of the mostly aging population of the village. Amenities tend to be concentrated in the newer developments, presumably because they are more easily located than in the existing village fabric.



ZONED MASTER PLAN

Much consideration was taken in developing a new master plan for Tai O. Much emphasis was placed on the preservation and redevelopment of existing infrastructure, as it was important to keep the fabric and social cohesion of the village intact, and preserve the historic elements which make the village such an important part of the history of Hong Kong. Areas that were unused or underutilized were targeted for redevelopment plans than emphasized the overall cohesion of the area, while attempting to address some of the issues that had developed in recent years. Amenities were placed closer to the areas in which they would be utilized, and development strategies emphasize the creation of more infrastructure for visitors, while attempting to improve the quality of life for the residents of the village.





ENTRANCE AND COMMERCIAL ZONE

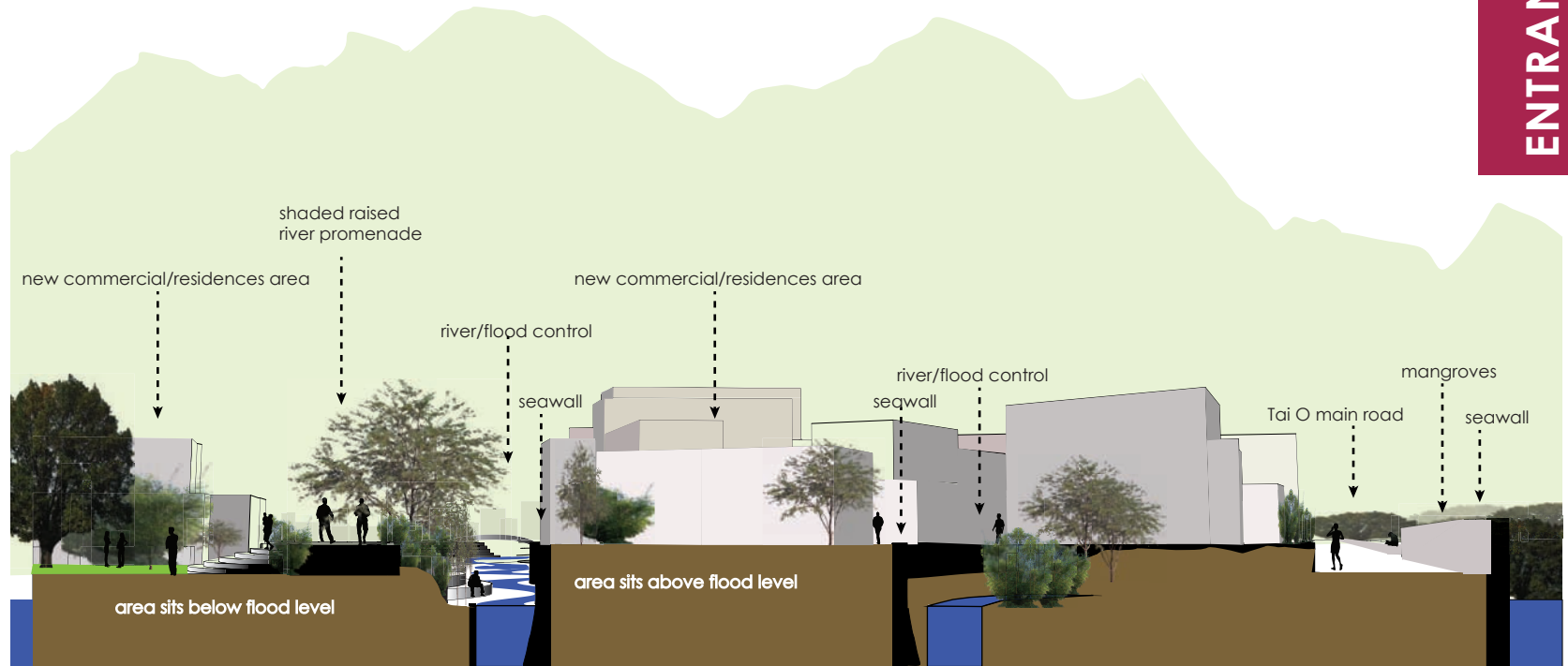
Tai O is a picturesque fishing village that is facing several challenges. Its fishing industry has been trailing off as the young people are turning away from a low paying, physically demanding career to new career opportunities in urban Hong Kong. The village is also gaining attention as a possible ecotourism destination. With this in mind, the design team determined that maintaining the fishing industry was importance for integrity and relevance, but ecotourism should also be a target.

One crucial design issue was the purely functional but uninteresting entry sequence for visitors to Tai O. The bus depot dominated the entry plaza and there was no inviting sense of arrival. Also the seawall and drainage river between the old village and new high rise housing creates a barrier, both physically and visibly. The wall is so close to the old village buildings that it inhibits expansion and personal gardens and communal open space.



ENTERING TAI O

ENTRANCE



existing entry





proposed dropoff and assembly plaza

Entry design strategies suggested are:

- Move the bus depot and open up the pier, entry plaza for events and play.
- Create shaded walkways and places to eat and sit which do not exist at the moment
- Move the seawall and drainage river so that the old village commercial buildings and residences can have personal gardens or open up the space for commerce. This large space is landscaped to be a shady tree laden courtyard with places to sit and eat. At night, when the day tourists leave, it becomes a place for the locals to congregate and socialize.
- The seawall was moved over to new commercial/mixed use area. To continue to protect the old village, a stepped down wall was created so that people can sit on the large steps and there is more relationship with the river. The steps also function as flood protection.
- A new commercial section was added where the high rises have been removed. These form a link to the new bus drop off and provide a shaded entry sequence with a sense of arrival.
- Exposure to the sea was added with steps down to a safer and more convenient place to moor boats for tourist scenic trips.



proposed entry plaza






MODERN LOW-RISE VILLAGE

Replacing the outdated and under-utilized high rise apartment buildings was the number one priority for this development area. Instead of concrete block housing, modern prototypes inspired by the design of the traditional stilt houses are arranged in an organic yet organized manner, echoing the development patterns of the neighboring old Tai O village. Minor spaces are created for gathering and rest, while green corridors create passageways throughout the village and connect to other areas of Tai O. Community amenities are concentrated in the center shared areas where they can be easily accessed by all. Each individual home is provided with green space which can be utilized as an economic development

opportunity or for garden plots to support individual families. A terraced walkway separates yet connects old Tai O with this new development, replacing the old seawall with something that is more functional and aesthetically appealing. It also provides privacy for those houses that are overlooking the terraced walk. A second green corridor connects residents from both sides of the bay while providing a visual screen and an entry sequence for visitors arriving via the main roadway.

RESIDENTIAL





By pushing the canal wall further towards the canal it opened up a wide space for different activities. The spaces start with the existing housing in place followed by a large open private backyard for each house. This backyard could be used for different activities as per the wish of the user. These backyards are screened from the public by bamboo which also provides a shaded walkway and bike path. This space extends further at different level and is visually connected to the stream. The thought was that the people living in that space could eventually open up small scale commercial activity extending from their private backyards or use them for their personal purposes. The space provides an environment which can be altered as per the wishes of the people living there.







evenings along the canal



The existing canal is widened, water flow is increased, the walls are relocated in different forms and land is terraced in an irregular step like formation which allows for the space to liberate while still maintaining the indigenous nature of Tai-O. The river that runs along the terraced land is imagined to be a peaceful place during the day where the chirping of birds and faint voices from the village can be heard. Reading a book, fishing or just relaxing are some of the activities imagined to occur there.

Commercial activities at Tai-O end by evening hence this provides an opportunity for the locals to open small scale commercial activity along the river during the night. This well lighted quiet environment could prove to be economically viable for the locals to offer a scene rarely experienced by the citizens of urban Hong Kong. The new prototype stilt houses are located on the other side of the stream.





neighborhood open space & park

Island Park

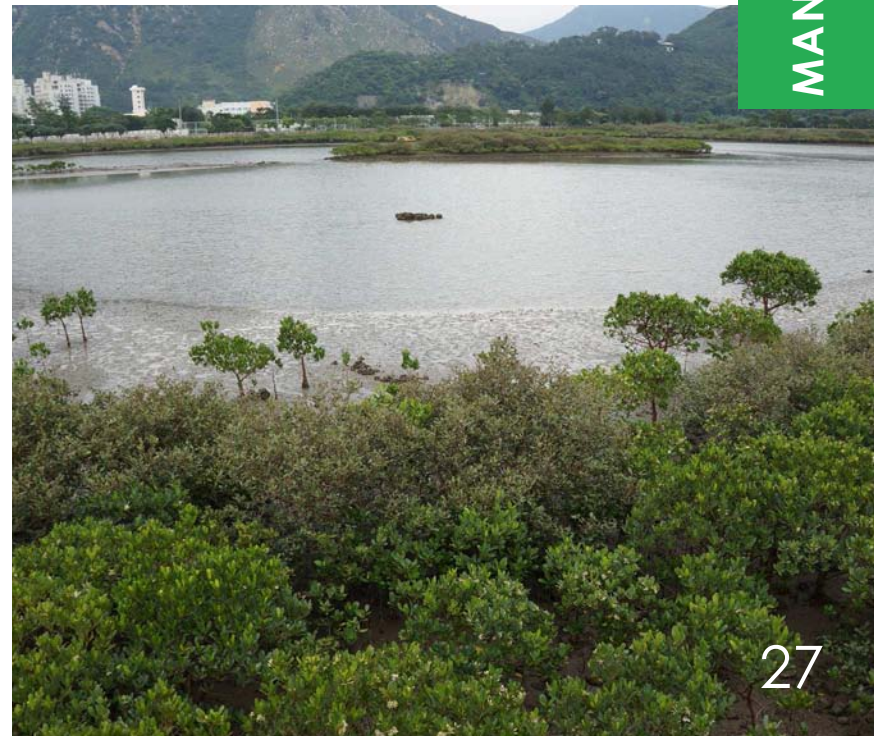
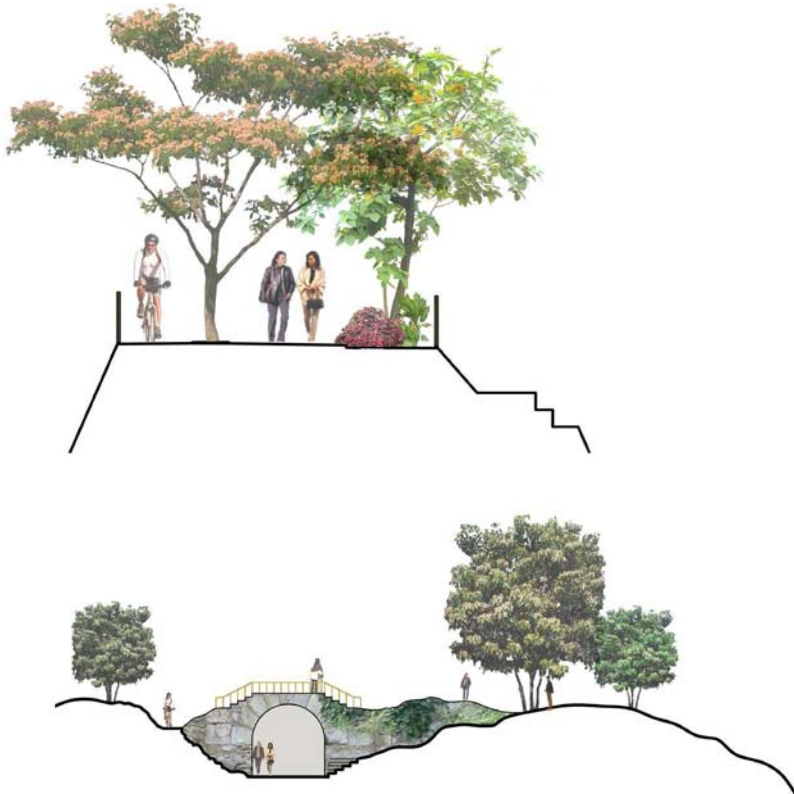
Aquarium Entrance

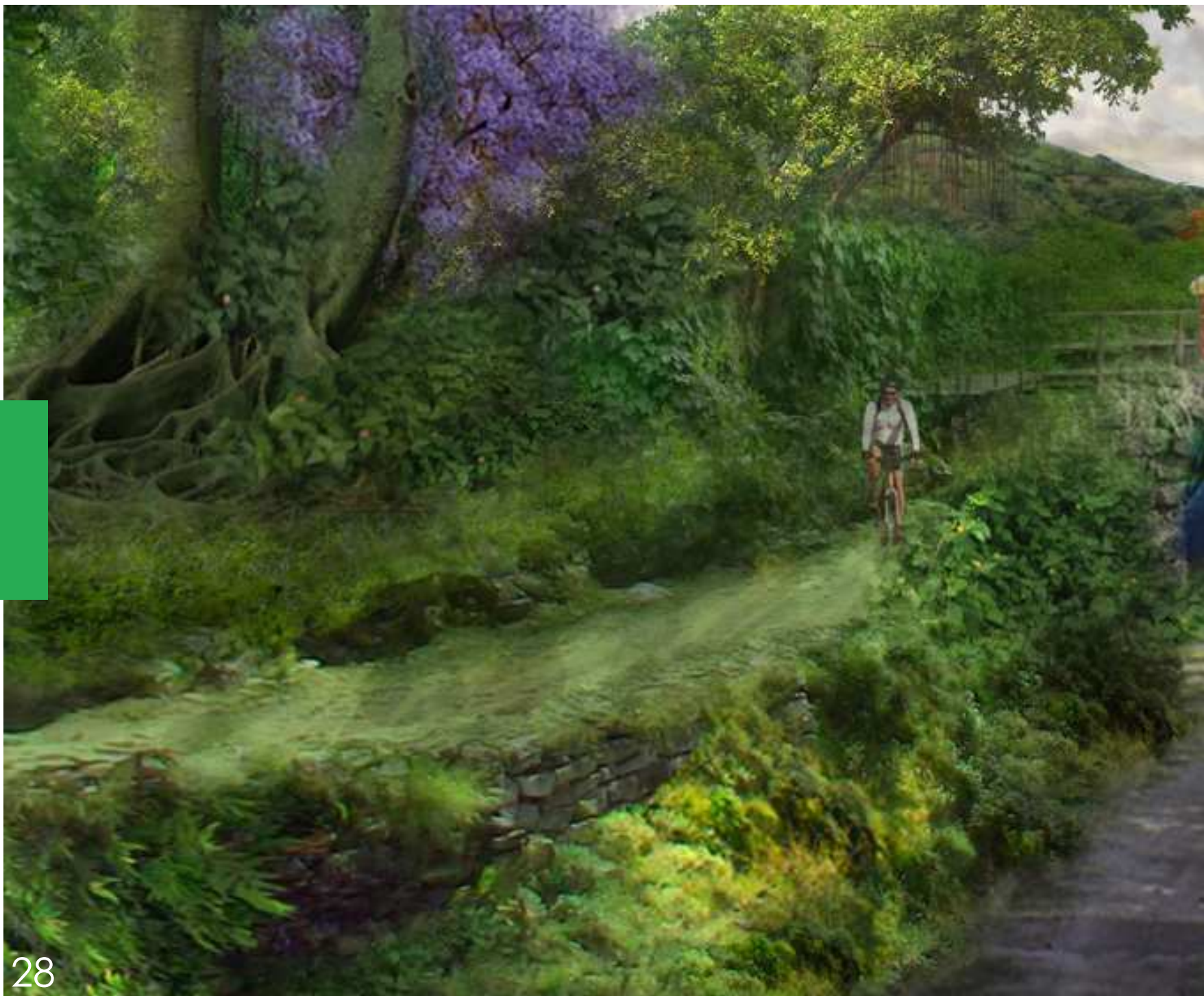
Mangrove Preservation Park

MANGROVES AND RESEARCH CAMPUS

Using existing topography, ecology, and major circulation routes, a mangrove restoration park will be used to tie Tai O with its surroundings, as well as increase the economics and ecological habitats of the area and support the local people and their current way of life. Building upon the existing mangrove habitat, a mangrove preservation park was established to increase the environmental awareness of this gorgeous place. Adjacent to the mangrove restoration park is a new fishery. This fishery will be supported by the estuaries created within the mangroves, supplying the locals

with fresh fish as well as the surrounding ocean with more aquatic life for future sustainability in a rich fishing culture. Circulation paths create a functional and aesthetically pleasing way for locals and tourists to explore the mangroves, as well as a new subterranean aquarium. This aquarium provides underwater views of the abundance of life in the mangroves on one side, and of the ocean on the other.







WEST SIDE INFILL STRATEGIES

As you venture through the busy commercial corridor the historic stilt house community that is centrally located in the heart of Tai-o has a charming quality that is rich with authenticity, but can seem very congested, disorganized and lacks a direct connection to the waterfront. By breaking up the historic fabric to create thresholds and corridors, this concept proposes a green network that allows for both visitors as well as locals of Tai-O to maintain an easier connection to and through the old historic town.

The pocket park is also connected to the tourist boardwalk, which gives opportunities for social interaction.

CULTURAL

Provides community spaces that are comfortable for locals and visitors year-round.

Green space that provides an unobstructed view to the ocean which also creates a direct connection with visitors being transported via boat.

Instead of having a large central park, small pocket parks were provided to recreate the natural habits of the people of Tai O, such as gathering in small groups and enjoying a game of mahjong. These pocket parks allow for small groups to get together and experience a moment of quiet interaction.

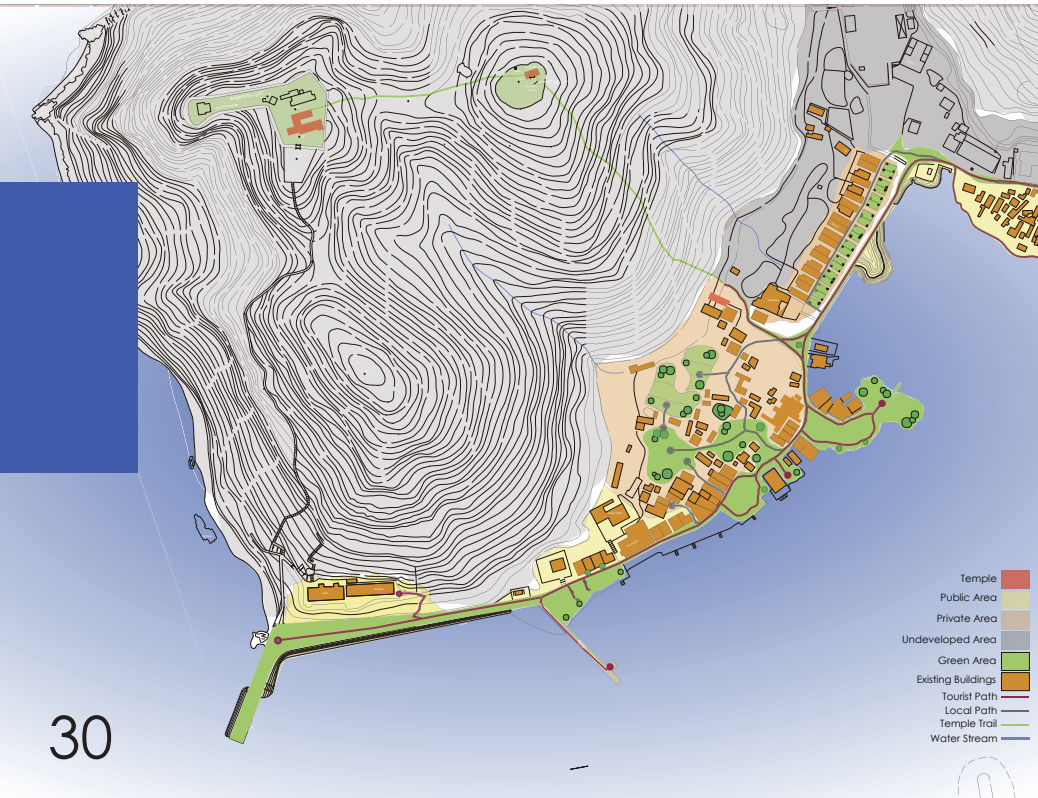
FUNCTIONAL

Open space to be shared mostly by local people that live attached to or near the pocket park for recreational activities.

The pocket park is also connected to the tourist boardwalk, which also offers opportunities for social interaction.

ENVIRONMENTAL

Improve park life for the residents of Tai O, who do not have much in the way of private green spaces or yards.





ECONOMIC

Attempts to locate employment and commercial opportunities near private housing by proposing an active relationship between visitors and locals.

By placing the restaurant in front of the fish markets it provides an opportunity to create

business that includes the fish market working in collaboration with the restaurant.

CULTURAL

Improve social interactions by creating a connection between the fish market, the restaurant, and the public eating area.



FUNCTIONAL

There are three major nodes that were created on the west side of Tai O. The last node which connects the local pathway with the tourist board walk is the restaurant. This provides opportunities for interaction between tourists and locals.

The restaurant is placed near the pier, allowing tourists to enjoy a meal and take a ride back in a boat from the pier to the main plaza, enjoying a view of Tai O from the sea.



urban trail & waterfront restaurant

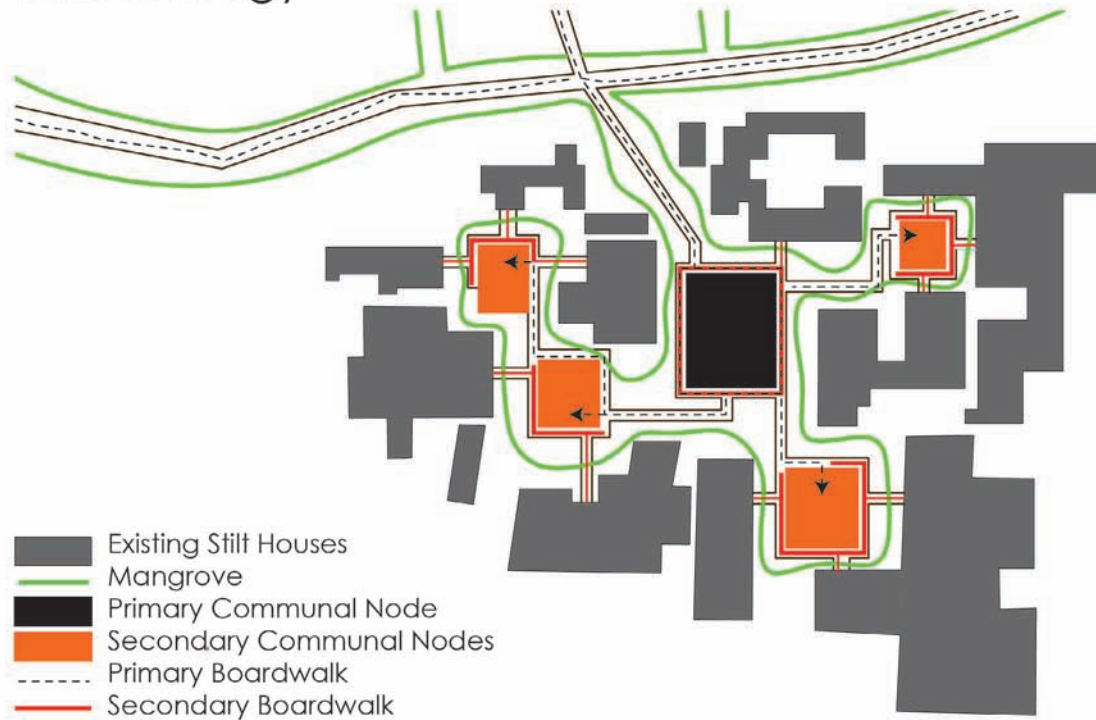


ENVIRONMENTAL

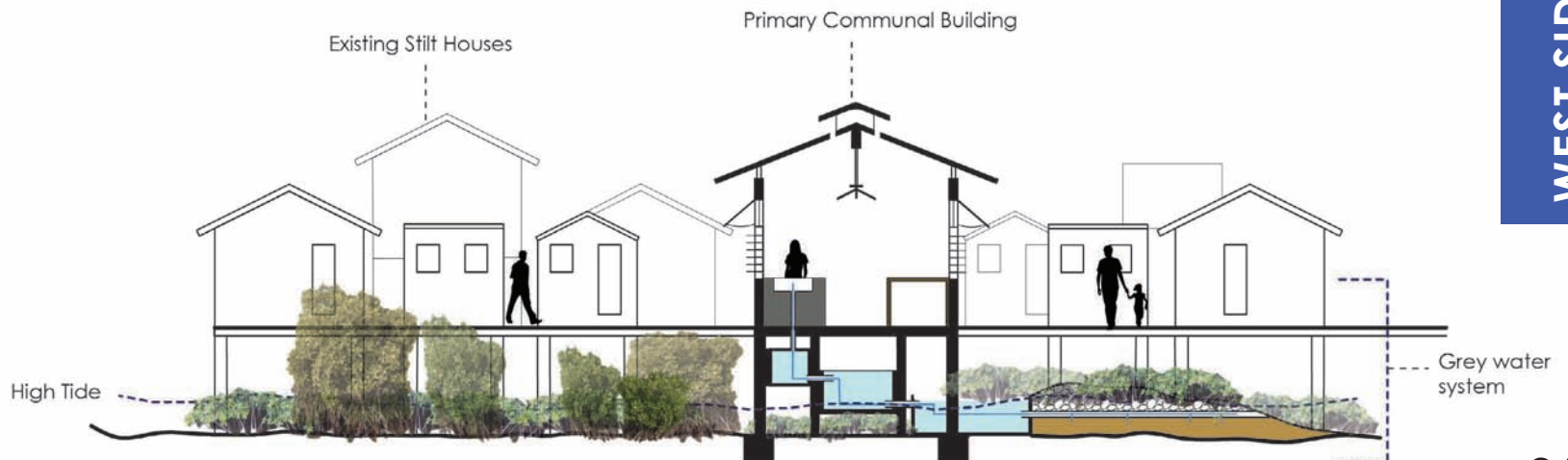
In section you can see that a sustainable and efficient prototype placed within the node will also serve as an opportunity for the structure to respond to the environment. By creating a

grey water system that filters runoff through a series of biotic events that in turn provides a clean source of water for the adjacent mangrove habitat.

Infill Strategy



Within the stilt house community there are several vacant areas that can become opportunity nodes for locals to gather and use as flexible live and work areas. This infill strategy shows an example of how these vacant nodes nestled within the historic stilt house fabric can be developed in an array of different manners.





AESTHETIC AND ECONOMIC

The intention of the prototype is to maintain the Tai-O historic archetype, yet introduce new thermal performance techniques (screen and operable fenestrations) that allow for more natural light and ventilation to come through. The materials have an aesthetic quality to them in hopes of lending these prototypes authenticity as well as functional efficiency.

ENVIRONMENTAL

lower costs and carbon footprint through the use of natural light and ventilation.

SOCIOCULTURAL

The structure provides a gathering space for locals to come and work together on their daily routines.

FUNCTIONAL

The structure is surrounded by boardwalks that allow for easy access to building for the locals from their home.





ENVIRONMENTAL ISSUES

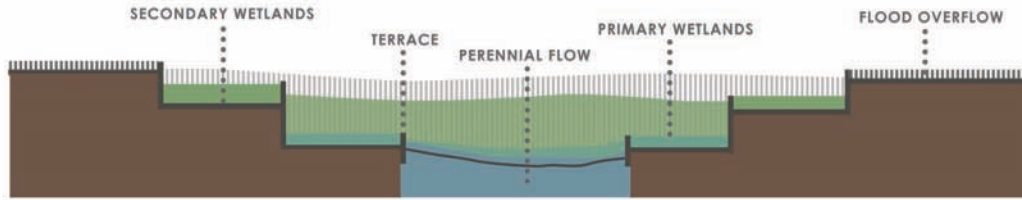
Environmental issues are of utmost importance to the village of Tai O. Without access to modern sanitation, and with the river flow increasingly dwindling, conditions are ripe for an outbreak of disease within the historic part of the village. Wastewater is currently being dumped directly from the houses into the bed of the river, with little regard for the tides or any other cleaning methods. This not only affects the village but the waters that spread beyond it into the main body of the Pearl River Delta. One of the main tourist attractions in the village, the Chinese White Dolphin (*Sousa chinensis*), is directly affected by the quality of the water that runs off from Tai O, with their numbers dwindling every year. Without a sustainable population of these mammals, one very important source

of tourism revenue is taken from the village. The other major source of revenue for Tai O comes from the fishing industry, which is also greatly affected by the quality of the water immediately surrounding the area. Without an environment conducive to life, fish populations will move elsewhere and this central tenant of the economy will disappear.

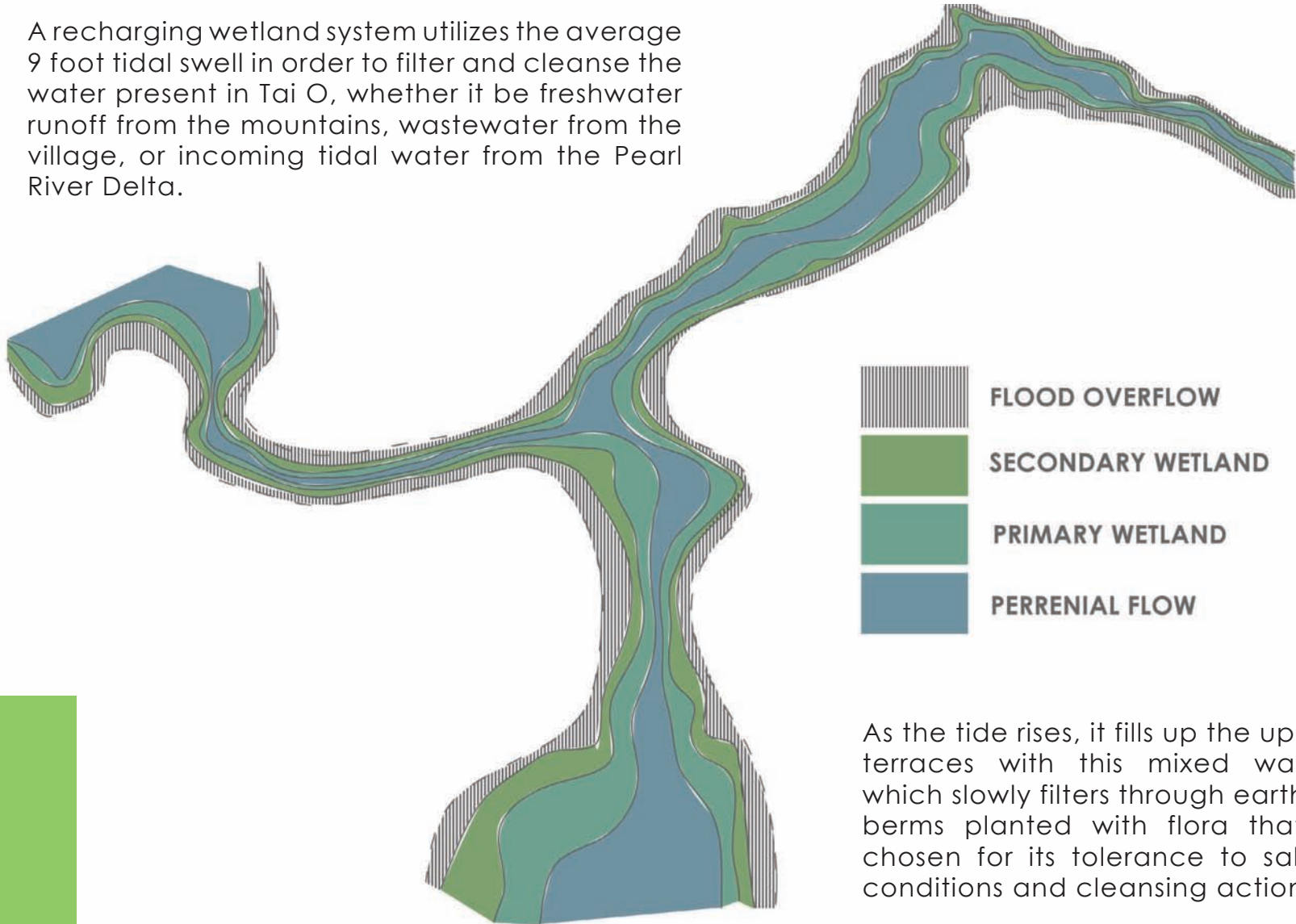
The poor sanitation of the old town area itself also affects environmental quality and tourism. Lack of proper waste disposal methods may be part of the problem, as litter can be found throughout the village, but Tai O's position downstream from a group of major population centers (Hong Kong, Macau and Guangzhou) means that it could be a collection point for litter that has floated from these locales.



WETLAND MANAGEMENT



A recharging wetland system utilizes the average 9 foot tidal swell in order to filter and cleanse the water present in Tai O, whether it be freshwater runoff from the mountains, wastewater from the village, or incoming tidal water from the Pearl River Delta.



As the tide rises, it fills up the upper terraces with this mixed water, which slowly filters through earthen berms planted with flora that is chosen for its tolerance to saline conditions and cleansing actions.



revitalized canal & mangrove habitat

HOUSING

Currently, the only housing options that are available in the village of Tai O are either the stilt houses on the water or high-density apartment buildings that sit away from the town center. Whereas the stilt houses in the old part of the village seem to be the most desired housing, there are limits to growth imposed by both governing bodies and natural limitations. These stilt houses are not easily built and require time, money and planning to execute. The high-rise buildings have their benefits, including modern plumbing and more comfortable living space. However, these buildings are only operating at 50% of capacity. This fact bears more research, but it is our understanding that the inhabitants of Tai-o prefer living in the stilt houses with direct access to the sea. A few prototypes have been developed for a new housing area that incorporates the community feeling and the density of the old Tai O village with updated and modern plumbing and other amenities. The goal is to provide a new example for living comfortably in Tai O without having to sacrifice the character and charm of the village lifestyle.



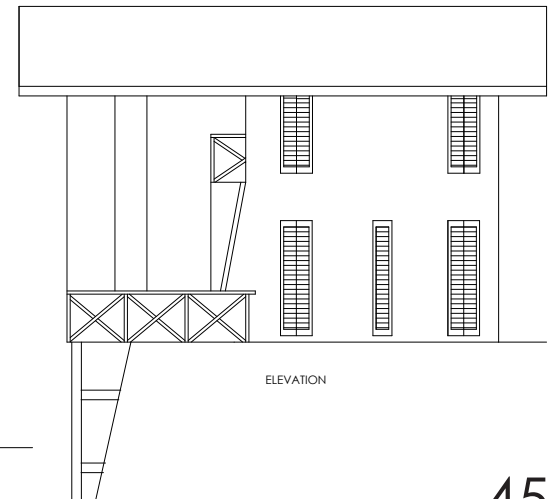
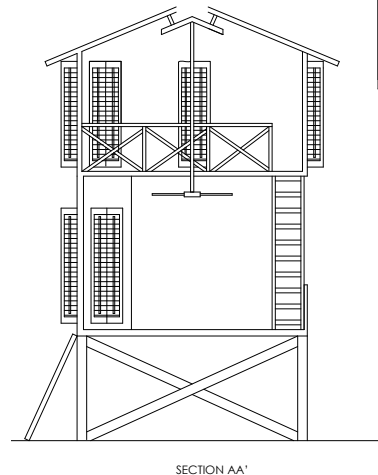
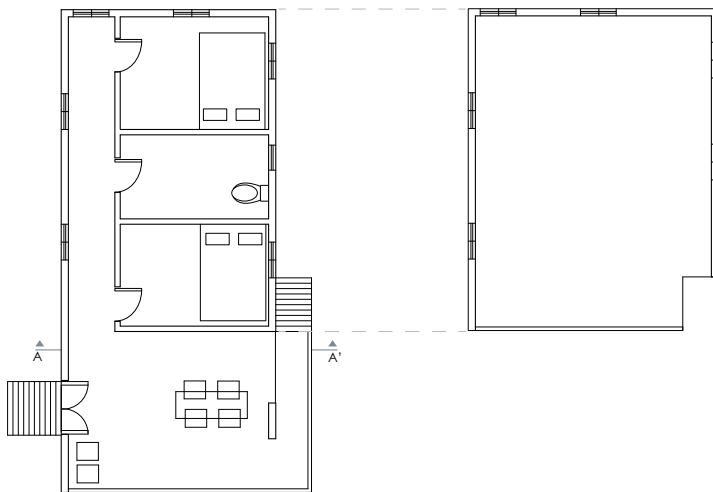




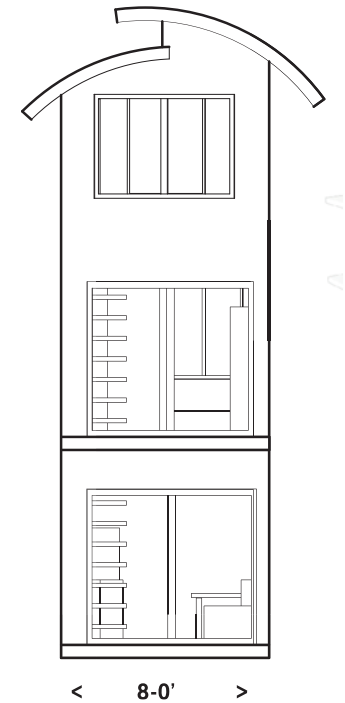
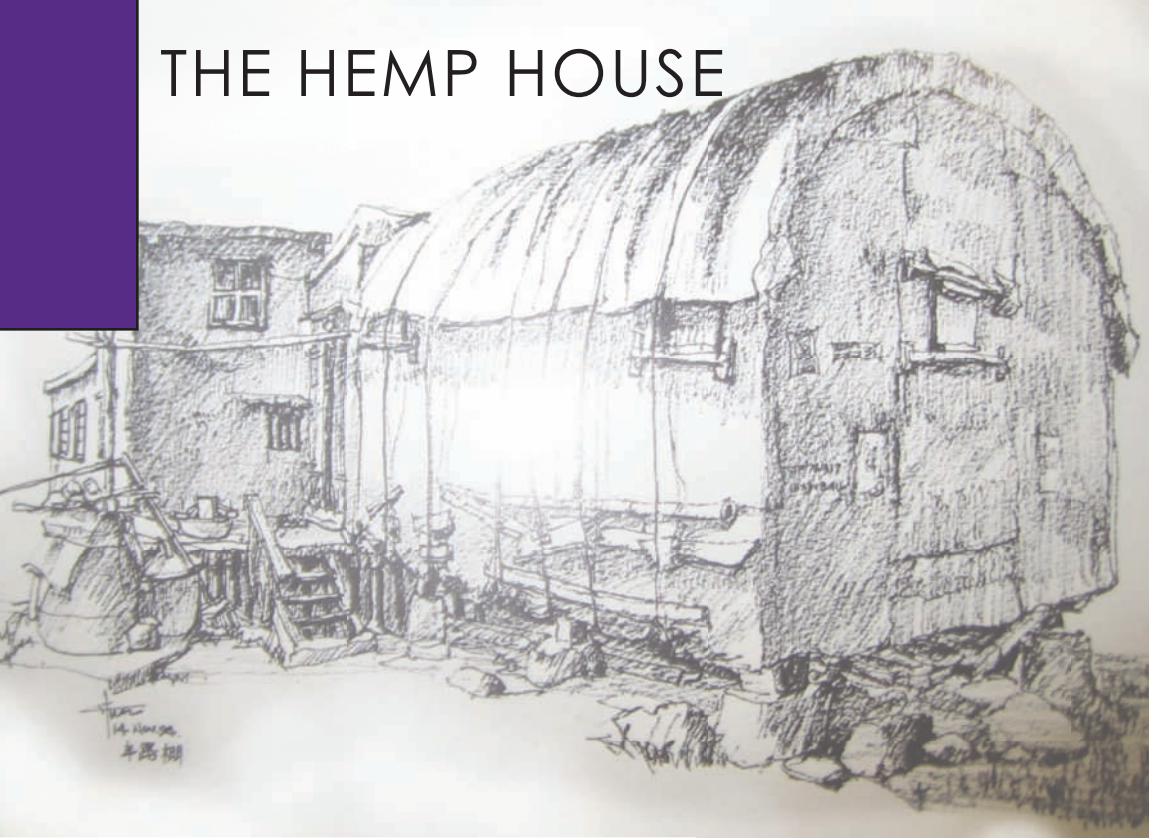


The lifestyle of the people within the village of Tai-O embraces aspects such as a close knit community, keeping private spaces open to public and flexibility of use. The housing prototype design allows the dweller flexibility in use and an abundance of ventilation. The outside is visually open and the amount of light, view and exposure can be easily controlled by the individual living within.

The upper floor is a mezzanine floor which could be used for storage or as future living space for the extended family as it is equal to the living space on the ground floor. The fan could be used to move air within the dwelling or to exhaust air out of it through an operable pening in the roof. The shuttered/louvered windows allow the viewer to control the amount of airflow, light and view on a diurnal basis.



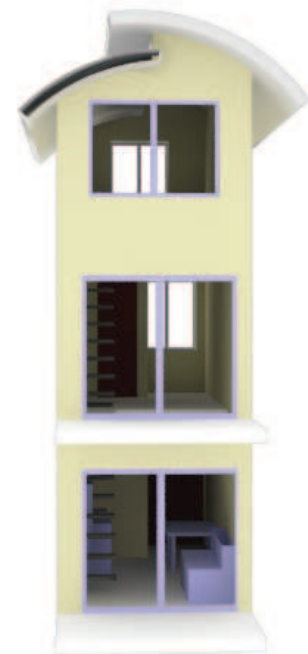
THE HEMP HOUSE

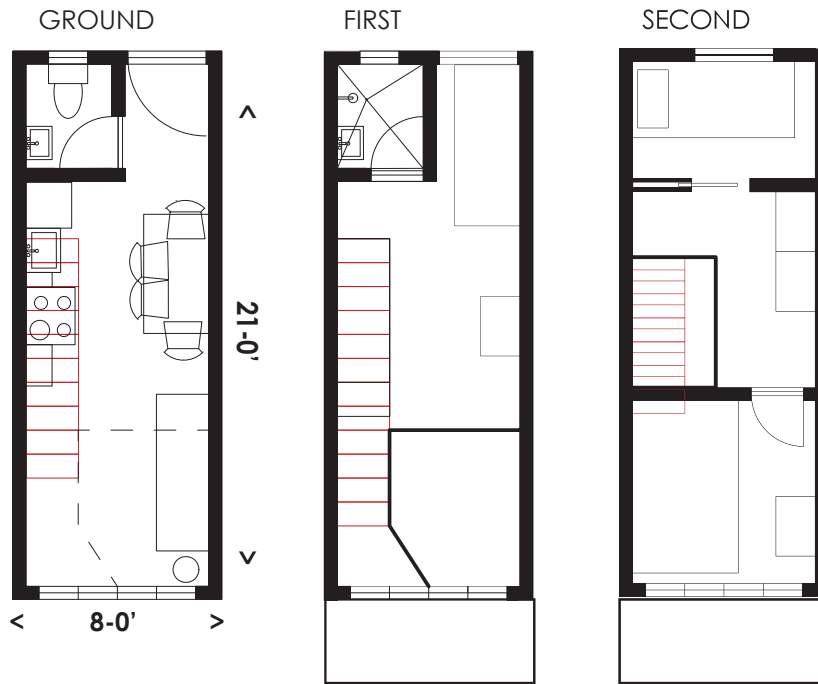


The Government has strict regulations for housing in Tai O. Only houses that have existed and are registered can be replaced or rebuilt. However, the Government will not allow a house to be built larger than the original square footage, and a registry has been created. Every house is marked with its dimensions clearly displayed. This has created a dilemma for many residents with growing needs; some houses are very small.

This design suggests only

one idea, of many possible solutions, for creating a house that can adapt to changing needs and differs from the present trend of using aluminum as the main building material. A more sustainable building material would be hempcrete, made from hemp. The material is cast like concrete and hardens to a concrete type of material. Furthermore, hempcrete is very durable, easy to build with by unskilled workers and uses one of the most sustainable products existing.



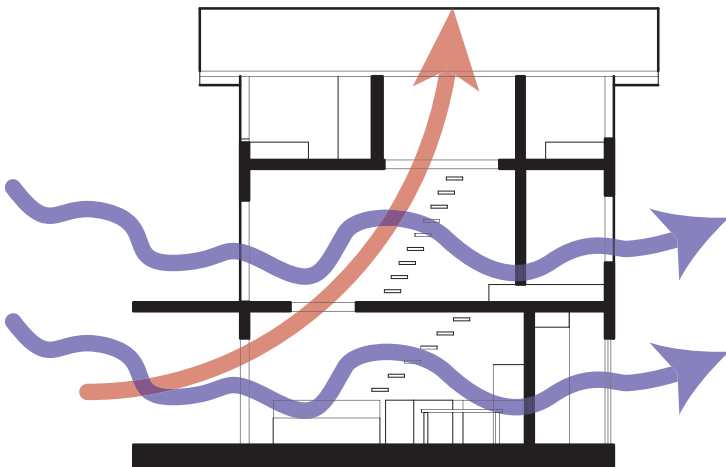


This house is used today. The dimensions and registry number are shown on the front. There is little light or ventilation inside. The house is only 8 feet wide and the replacement cannot have a larger footprint.

The footprint limit for this house is only 8 feet by 21 feet but the Government allows vertical expansion.



MOVING BACK TO NATURAL VENTILATION



Most houses in Tai O rely on air conditioning for comfort. This is particularly the case with the metal fabricated houses, new and old.

This design uses cross winds to cool and ventilate the house in Hong Kong's humid climate. Hemp naturally wicks humidity out of the interior and has high insulation factors to prevent over heating inside. Hemp is waterproof yet flexible enough to handle the slight movement of the houses.

Due to space most houses build up against each other so there are no windows on these walls. Light and air come in through the roof skylight and open core.





Currently the recreational and tourism opportunities in Tai O are limited. If there are more options that are developed in a way that is environmentally responsible and culturally sensitive, this could be a major resource in developing a renewable and sustainable tourism industry. Currently there is a tram that operates between Hong Kong and Ngong Ping, where the Po Lin Monastery hosts the world's largest outdoor brass Buddha, the Tian Tan Buddha. From there, tourists must take a bus to get to Tai O. If a significant tourist presence develops, it will be because of the development of a more efficient mode of transportation between

Ngong Ping and Tai O. A trail is proposed that will connect existing temples and lookout points on Tai O Island, which will serve as an outdoor opportunity for those who are so inclined and also a religious journey of sorts that could potentially tie in with the existing infrastructure development at Ngong Ping.

In addition to the tourism opportunities, low-impact development in the form of a hiking trail will bring additional value to the land for both residents and visitors, and provide incentive for preservation and conservation for years to come.

CONCLUSION

Tai O occupies a unique place in the history of Hong Kong. To visit Tai O is to feel a part of the village, an emotional attachment of sorts... something that is not easy to create, but important to preserve.

We certainly believe that Tai O is worthy of preservation, but also is in dire need of unique solutions that address some very unique problems. Conservation of its culture and natural heritage is paramount, and is inextricably tied to an array of sustainable solutions that effectively engage its economic viability, environmental health, and cultural sensibility.

We sincerely hope that we were able to offer fledgling concepts that may assist the benign development of this very special place and people.

