


Spring 5-17-2016

Colonization to Construction: Bridging the Gap Between Ancient Chamorro, Spanish Colonial & Modern Architecture on Guam

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Colonization to Construction

Bridging the Gap Between Ancient Chamorro,
Spanish Colonial & Modern Architecture on Guam



Dominic J. Lizama

Colonization to Construction:
Bridging the Gap Between Ancient Chamorro,
Spanish Colonial & Modern Architecture on Guam

By

Dominic J. Lizama

A thesis submitted in partial satisfaction of the
requirements for the Honors in
Architecture and Community Design
in the
Department of Art + Architecture
in the
College of Arts & Sciences
of the
University of San Francisco

Approved by:



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10 May 2016

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Thesis Statement

The architectural style that exists on Guam today is one that divides itself into four distinct categories with each as a response to external forces that affected and continue to affect the island. By bridging the gap between the four styles, we can fully represent each sphere of influence that contributes to Guam's rich cultural history and acts as a link between the past and present.



Facts

- Organized, Unincorporated Territory of the United States
- Geographic Location: 13°26'31"N / 144°46'35"E
- Area of 210 sq miles at 30 miles long and 9 miles wide
- Capital: Hagatna. Population of 161,785
- Tropical Marine Climate. Average Temperature: 86°
- Average Annual Rainfall: 96 inches



Introduction

Since the arrival of the original inhabitants of Guam, the Austronesian people originating from South Asia as early as 2,000 BC, this unincorporated territory of the United States as well as the largest island in the Marianas, has seen an intricate history that highlights colonialism, warfare, natural phenomena and an influx of people, culture and customs. The island has succumbed to patterns of restructuring from external forces for thousands of years that has left the people with a convoluted identity that pushes and pulls at each defining influence. In an article by Thomas Misco and Lena Lee, Diaz refers to Guam as an "important crossroads for an assortment of multinational and multiethnic interests' and is a complex, creolized culture



brought on by centuries of 'intercultural mixing as the principal form of indigenous social and cultural articulation.'" (Misco and Lee)

The people and the culture that they identify with is a constant tug of war between each culturally defining element in Guam's history, and given the amount of influence that has been made on the island throughout time, one could question which of these elements should take precedence. Still, I argue that no singular culture exists that encompasses the entire strain of cultural influence for Guam.

Here, the interaction of cultures on Guam is seen through the lens of architecture and building construction in hopes of de-cluttering

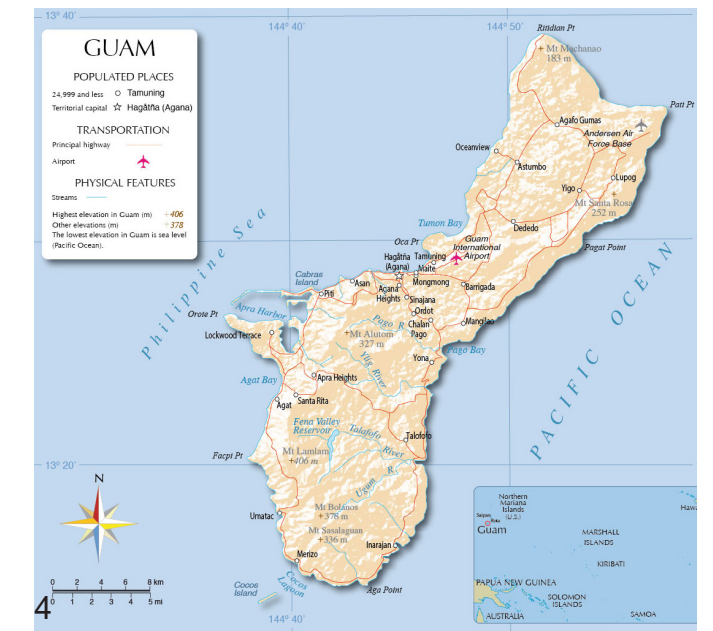
"[Guam is an] important crossroads for an assortment of multinational and multiethnic interests' and is a complex, creolized culture brought on by centuries of 'intercultural mixing as the principal form of indigenous social and cultural articulation."

-Thomas Misco & Lena Lee

the murkiness of Guam's cultural history and ordering it to see a clear and natural progression that can lead to a cohesive and all-encompassing cultural model. The spheres of influence include: Ancient Chamorro architecture and practices primarily during the Latte Period (2000 BC to 1521 AD), Spanish Colonial architecture and the introduction of new materials and building methods (1521 AD to 1898 AD), the emergence of U.S. power on Guam in the World War II Era (1898 AD to 1950 AD) and architecture as a response to the natural phenomena within the region and the introduction of new materials in the Contemporary Guam Era (1950 AD to Present). At present all four are divided with remnants of each still remaining on Guam as links to

the past. The objective would be to bridge the gap that exists between the four "styles" in hopes of providing a holistic realization that embodies the characteristics of each influence. I, therefore, divided the project in two phases beginning with the Research Phase where I studied Guam architecture throughout history and later began designing a Cultural Center where each style would be represented during the Design Phase.

Figure 1: Aerial View of Adelupé in Hagatna
 Figure 2: Map of Guam with World Context
 Figure 3: Panorama of Agat, Santa Rita and Apra Harbor
 Figure 4: Map of Guam with Village Boundaries





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Figure 5: Aerial View of Tumon Bay

Research Phase

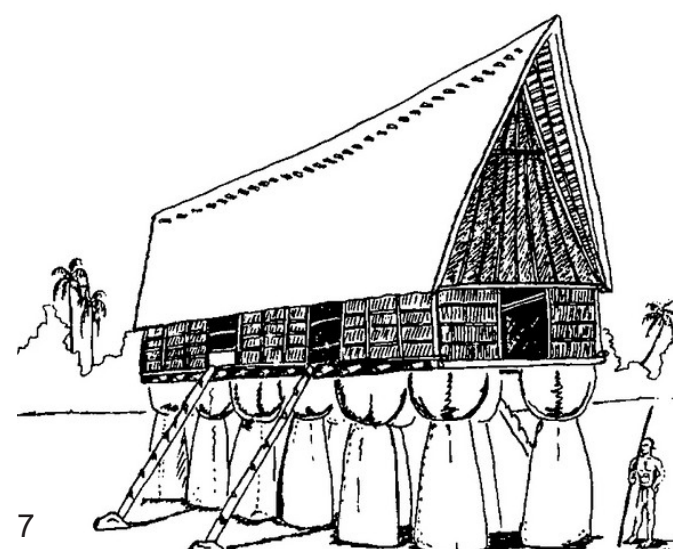
POLITICAL EVENT	1200 BP Chamorros first build with Latte Stones	1521 Ferdinand Magellan arrives on Guam	1565 Miguel Lopez de Legazpi claims Guam for Spain	1668 Diego Luis de San Vitores establishes first Catholic Church in Hagatna	1740 Chamorros of the Northern Mariana Islands move to Guam	1815 Galleon Era ends following Mexican Independence	1898 Spain ceded Guam to the United States through the Treaty of Paris	1898 United States captures Guam in the Spanish-American War	1941 Japanese forces invaded Guam in World War II	1944 Japanese forces officially surrender	1944 United States converts Guam to an operations base by the Navy and Air Force	1950 Guam established as an unincorporated organized U.S. territory through the Organic Act											
	TYPHOON																						
	1961 Typhoon Nancy	1962 Typhoon Karen	1976 Typhoon Pamela	1979 Typhoon Tip	1988 Typhoon Roy	1991 Typhoon Yuki	1992 Typhoon Gay	1992 Typhoon Omar	1997 Typhoon Ivan	1997 Typhoon Paka	1997 Typhoon Joana	1997 Typhoon Keith	2002 Typhoon Halong	2002 Typhoon Chataan	2004 Typhoon Chaba	2007 Typhoon Kong-Rey	2008 Typhoon Dolphin	2013 Typhoon Francisco	2014 Typhoon Rammasun	2015 Typhoon Goni	2015 Typhoon Nangka	2015 Typhoon Dolphin	2015 Typhoon Chanhom

ARCHITECTURE EVENT	2000 BC Original Inhabitants of Guam first arrive	1669 Dulce Nombre de Maria Cathedral Basilica formally opens in Hagatna	1695 Chamorros settle in Hagatna, Fena, Pagat, Sumay and Umatac	1944 Military built over 1,000 wood and tin homes to house displaced Chamorros	1944 The villages of Sumay and Hagatna were virtually destroyed	1963 Congress passes the Guam Rehabilitation Act of 1963	1965 Fred Reinmann, PhD, completes the first archaeological documentation on latte stones	2001 Lujan House first completed	2002 Typhoon Chataan	2005 Hagatna Master Plan adopted	2010 Latte of Freedom opens in Hagatna	2013 Groundbreaking on the Guam & Chamorro Educational Facility	2016 Pago Bay Housing Development Project proposed
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Ancient Chamorro

roots planted, stones erected



7 | Colonization to Construction

In 1565, Miguel Lopez de Legazpi, a Spanish navigator and the first Governor-General of the East Indies landed on the southern village of Umatac and described the houses of the Chamorros as “high, neatly made and better constructed than those of any aboriginal race he thereto discovered in the indies” (Cunningham 47). The homes Legazpi was referring to are the latte structures that existed on Guam since the arrival of the Austronesian people in 2000 BC up to the arrival of the Spanish in the 1500’s. This time-frame is known as the Latte Period.

The structures during the Latte Period feature one defining element: the latte stone. Dating back to 845 AD, the latte stone, a two-part rock structure found only on Guam and the Marianas, was heavily constructed and used as a key element in structural systems. A latte stone is comprised of two elements: the cap or tasa and the base pillar or haligi. The tasa was made from inverted brain coral head taken from the reef as well as limestone and basalt that required only minimal shaping. The haligi was often made from beach rock slabs that were chipped and sized using basalt tools. The parts would then be transported to the site where they would be joined together (Cunningham 49).

Many debates exist on how the indigenous people were able to construct and erect these monumental stone pillars prior to the arrival of the Spanish and their tools. In his book

“Ancient Chamorro Society”, Lawrence J. Cunningham suggests the use of a wooden “keel” system using supporting rocks. Here, the shaped slabs would be hoisted into the air by several men then strategically placed on the site. This process would be repeated until the lattes formed a column grid with traditional latte structures having the dimensions of 11 feet by 33 feet or 12 feet by 48 feet with 3 to 7 as the building footprint (Cunningham 50). Another popular belief in Chamorro culture is that the stones were created and erected by ancestral spirits called taotaomo’na that are believed to possess supernatural strength. The Chamorros, at that time practiced a form of animism where every object contained a spirit such as the ocean, mountains, and jungles. Chamorro people believe that these spirits reside within and around latte stones. This notion came about through the disbelief that these isolated individuals were able to conceive plausible ways to construct these monumental stones using just basic tools and manpower.

Typically, the latte stones would provide structural support for an A-framed building suspended by the pillars. The rest of the building would be made using a pole and thatch method commonly comprised of ifit (an indigenous tropical hardwood) or bamboo as poles with coconut palms and sword-grass as the thatch component. Though the exact design of these latte structures is unclear, Archeologist Alejandro Lizama presents

“A huge latte structure could have been viewed as tangible evidence the cooperative or harmonious (inafa’maolek) spirit within a social group. It could have been a testament of strength and a warning to potential enemies.”
Lawrence Cunningham.

his interpretation of the structure as an A-frame house that sits atop latte stones in Cunningham’s “Ancient Chamorro Society” Here, the bamboo or ifit would be carved into beam-like structures with a steep roof able to withstand typhoon winds. Smaller pieces would then run across the beams behaving as rafters to hold the thatch. Coconut palms or sword grass would be layered as a waterproofing roof material. Given the size, these structures were typically reserved for the highest caste in Chamorro society, the Chamorri. Cunningham and other historians also conclude that the latte structures may also have been used for men’s houses or uritaos, or even as boat houses (Cunningham 51). Robert F. Rogers wrote about latte stones in his book, “Destiny’s Landfall” saying, “Members of the Legazpi expedition in 1565 were the first Europeans to describe Chamorro Latte structures. The large communal canoe house built on latte at Umatac impressed the Spaniards as a ‘beautiful structure with four transept naves’, so spacious it could accommodate 200 people along with large canoes. Thirty-seven years later, Juan Pobre corroborated that description of latte for Rota: ‘these are the best natives’ houses I have ever seen because they are all built on stone pillars, which others do not have” (Rogers 32).

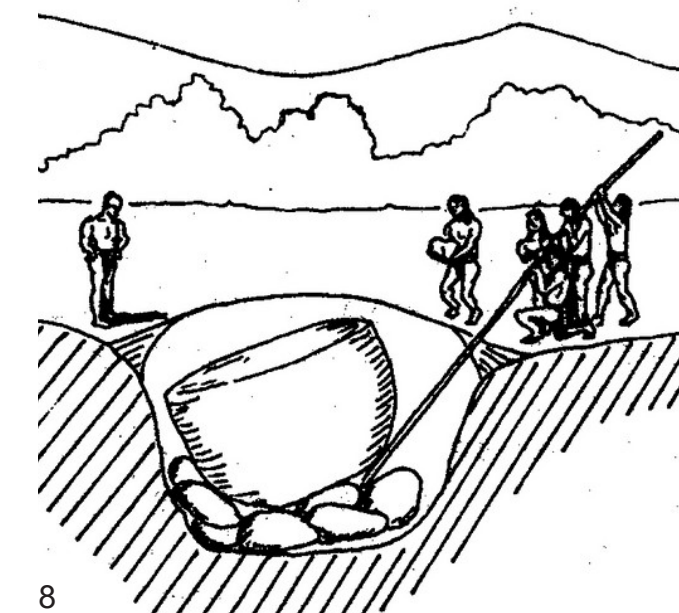
One common question about the mystery of the latte stones is why the Chamorro people chose to construct their buildings using such substantial two-part pillars. Archaeologists

discovered several possibilities. The first deals with the practical nature of stone as a building material: it does not rot nor could it be affected by termites or other insects like that of wood and other natural materials. Additionally, the raised nature of the floors allow for better ventilation, air circulation, protection from flooding and animals and also creates a covered workspace underneath the dwelling. Large objects such as boats and other seafaring vessels were commonly stored underneath the homes. Lastly, the connection between the tasa and haligi works as a shock absorber that protects the structure during high seismic activity. Still, the question remains as to why the structures needed to be so monumental. Some latte stones prior to Magellan’s arrival in 1521 are recorded at over 16 feet high. Historians believe that the size of the lattes is in part due to a deep connection to the culture of the time. Cunningham writes: “In the hierarchical Chamorro society, perhaps inter- and intra-village competitiveness lead to larger and larger latte structures. A large latte structure would be visual evidence of the success of an extended family or village. A huge latte structure could have been viewed as tangible evidence the cooperative or harmonious (inafa’maolek) spirit within a social group. It could have been a statement of strength and a warning to potential enemies.” (Cunningham).

Today, the latte stones exist both physically and symbolically in Chamorro culture. Fred M. Reinman, Ph.D. became the first to complete extensive archaeological research on the latte in 1965 and 1966. He and his team discovered nearly 140 archaeological sites where many of which had multiple latte sets. They’re found extensively throughout the Marianas archipelago: Guam, Rota, Tinian, and Saipan. The largest standing latte is the House of Taga in Tinian, where capstones measure between

2.7 – 2.48 meters in diameter and shafts are 3.87 – 4.23 meters long. On Guam, many latte sites continue to be discovered and studied, hoping to find more about the people and their way of life. These sites are open to the public where the stones themselves are protected by local and federal and local laws such as the Archaeological Resources Protection Act of 1979 that “provides for both civil and criminal penalties for excavation or removal of protected resources from federal or Indian lands without a required permit, establishes a program for regularly reporting suspected violations, and requires response to cultural resources discovered with projects in progress”. The local Title 21 Guam Code Annotated “establishes public policy to engage in a comprehensive program of historic preservation, undertaken at all levels of government, to promote the use and conservation of historic, archaeological, architectural, and cultural heritage property for education, inspiration, pleasure, and enrichment of Guam residents and visitors.” (Belt Collins Guam Ltd., B-3). The latte stone has also become a cultural icon that continues to be represented on new buildings. Latte stones are commonly used as decorative objects that seemingly support new buildings that aspire to have the Guam aesthetic. The Latte of Freedom, for example, stands as a modern take on the latte aesthetic that currently exists in Guam’s urban fabric. The latte stone was represented not just in the overall form of the building, but through the strength and construction with the building made of reinforced concrete with structural steel and 14 inch walls able to withstand typhoons up to 150 miles per hour.

Figure 6: Latte Stone
Figure 7: Alejandro Lizama’s rendition of a latte house
Figure 8: Artist rendition of how the tasa was retrieved
Figure 9: 3D Model of a latte house
Figure 10: Latte Stone Park in Hagatna



Spanish Colonial

a society no longer untouched

In 1521, the indigenous Chamorro people experienced their first encounter with the outside world through Ferdinand Magellan, a Portuguese explorer sailing under the Holy Roman Emperor King Charles I of Spain. However, it wasn't until 1595 that the Spanish formally claimed Guam as a colony through Miguel Lopez de Legazpi and thus would begin the first in a series of colonization for the island. From 1565 to 1815, Guam and the rest of the Marianas became an important resting stop for the Manila Galleons as they sailed to and from Manila in the Philippines and Acapulco in Mexico. This key role as a re-provisioning station meant heavy port and trade activity on Guam by the Spanish. This led to an influx of goods brought to Guam that the Chamorro

people had never seen before. Thus, Guam was now exposed to new materials, tools and even building technologies that proved critical as the Spanish settlers began to shape Guam into a Spanish colony through colonization and conversion (Hezel).

One critical element to the change in building typology on Guam in the 1600's is the conversion of the Chamorro people to Catholicism by efforts of Jesuit Missionaries like Padre Diego Luis de San Vitores and Pedro Calungsod who established the first Catholic Church on Guam. Dozens of churches built with Spanish architectural styles in mind would arise during this time period with many still standing today as remnants of this colonial

Architecture is but one aspect of culture that was either altered or removed all-together. Other aspects of Chamorro culture like language, religion, societal structure, community values and cuisine were forced, leaving locals left to either adapt to Spanish customs completely as to reject Chamorro customs, or to incorporate both customs simultaneously.

era on Guam such as the San Dionisio Church in Umatac and the Dulce Nombre de Maria Cathedral Basilica in Hagatna. The Plaza de Espana, once the hub for government activity in Hagatna still stands as remnants of the architecture of that era standing among the urban context of Hagatna that pushes and pulls towards modernity and the past.

The arrival of Spanish Architecture meant the decline of Chamorro or Latte architecture that was commonly used up until the 1500's. The two-part latte stone was soon replaced with dressed limestones cut using Spanish methods. These stones would become the literal building block of Spanish architecture on Guam and would work to provide another

independent, yet still culturally relevant aspect of construction in this time. The first type of building method introduced on Guam is a stone and mortar construction called mamposteria. Cunningham wrote about this new method in a Guampedia article, saying: "In its simplest form, mampostería ordinaria, masons mortared together stone rubble walls, stone by stone, upon bedrock or a compacted sand, earth, or stone foundation. In the rarer, mampostería cantería, cut stones with one flat outer face were mortared to the interior and exterior walls of a structure. In between these flat faced outer stones, rubble and mortar were used for filling the thick walls..." Chamorros referred to the mamposteria structures as bodega, with bodega referring to the to the mamposteria

storage or cellar that formed the foundation. Some of these bodega spaces can still be seen in older homes in Guam's southern region in villages like Inarajan and Merizo.

Chamorros would start construction of new homes by building the entire house frame and the roof before filling in the space between the support posts with thick walls of unshaped rocks bound together using mortar. Ifit posts were then buried into the wall and left exposed due to ifit's natural resistance to moisture and rotting. These posts would repeat to form rows through the center of the bodega, supporting the floor framing. The masonry bodega was only used as a core structural support on the ground level from which ifit-framed construction or wet-wall construction (tabique) was used on the upper levels for living quarters. The combination of ifit and tabique construction proved safer than masonry for seismic conditions. The roofing material was left to two options. The first is a more local Chamorro method using thatch made of coconut palms or sword-grass that mimicked that of the rooves in the Latte Period

commonly used for residential homes. The other option used teha, a Spanish introduced material imported to the Marianas, which is a barrel-tile or terra cotta earthenware commonly used in Spanish architecture predominantly used in government and official buildings. People in Guam built mampostería homes, fortifications, churches, schools, and other government buildings.

Though commonly used for houses and other buildings, this bodega building method was only one type of mamposteria that existed at the time. The Spanish also had a rare version referred to as de Silleria which used hard-cut stones. During Spanish rule, the best buildings and bridges meant to evoke power and authority were built using large rectangular hard-cut stones rather than the smaller stone and mortar combination used in bodega. These larger stones were precisely cut and left without a layer of plaster, leaving a greater sense of structural integrity and grandeur. The earliest de Silleria building on Guam was the Dulce Nombre de Maria Church (now elevated

to the status of Cathedral-Basilica) in Hagatna finished in 1709. The church was built using the de Silleria method with ifit as the other primary building material. This structure would exist until World War II as a casualty of war before being rebuilt to the current structure seen today. Additionally, many bridges on Guam at the time were built using this method, namely the Taleyfac and Taeyalang bridges in the southern village of Agat, the Spanish Bridge at Sella Bay connecting Agat and Umatac, and the San Antonio Bridge in Hagatna.

We can see the subtle changes in architectural style and materials that would slowly reject traditional practices in favor of Spanish-introduced methods. The core pillar-system consisting of a column grid of latte stones was replaced with a Spanish-style bodega masonry core. Above that, the ifit timber construction would remain in combination with the tabique wall system. Finally, the once natural thatch roof made of local palms and grasses would eventually be traded out for mass produced terra cotta tiles with some residential home

continuing to be built out of thatch. Architecture is but one aspect of culture that was either altered or removed all-together. Other aspects of Chamorro culture like language, religion, societal structure, community values and cuisine were forced, leaving locals left to either adapt to Spanish customs completely as to reject Chamorro customs, or to incorporate both customs simultaneously. This incorporation of both cultures formed a hybrid culture making it possible to assimilate into Spanish society while still holding onto the Chamorro roots. The assimilation by the Chamorro people towards Spanish Culture ultimately led to the decline of Chamorro culture as other nations would soon play a part in the overall adaptation of Guam into a more global entity.

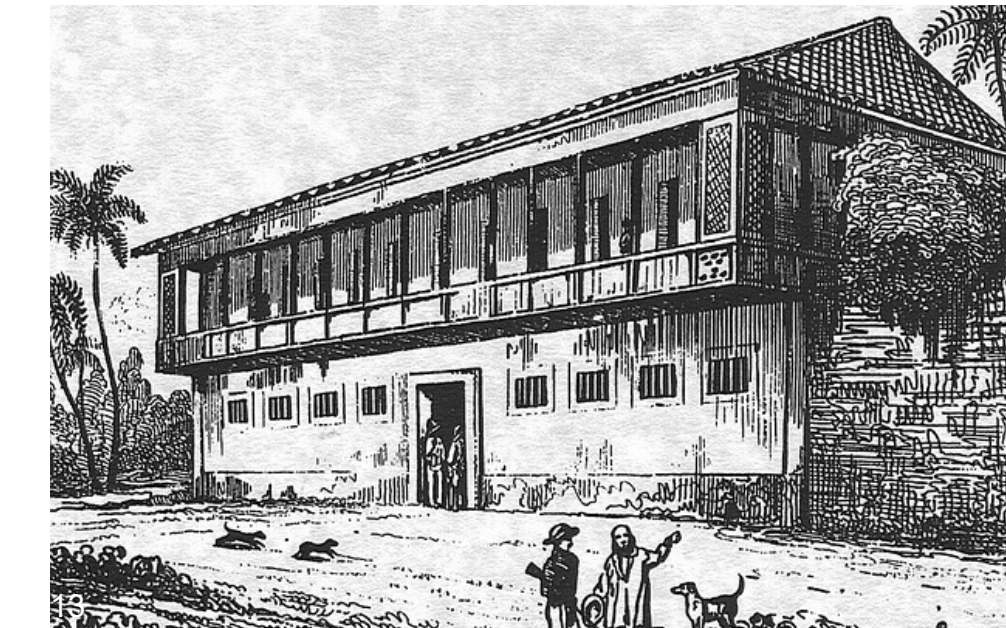


Figure 11: Main Pavilion at the Plaza De Espana in Hagatna
Figure 12: Spanish Gate at the Plaza De Espana in Hagatna
Figure 13: Artist rendition of a Bodega home
Figure 14: Taleyfac Bridge in Agat made of mamposteria
Figure 15: Bodega basement structure in Inarajan

United States / World War II

an island caught in the crosshairs of a world war

“Architectural materials and designs changed with the availability of imported materials, to meet the needs of the US military as well as to help the people of Guam withstand the destructive forces of nature and the destruction of a world war...”

Tanya Champaco Mendiola



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The advent of modern architecture on Guam came as a result of the U.S. taking control of the island in the 1898 Spanish-American War as part of the Treaty of Paris. With this, Guam became a station for the ships in the U.S. Navy as they traveled to and from the Philippines. The influx of people and materials, combined with the aftermath of war lead to a drastic change in architecture on the island. In the Guampedia article entitled “Changes in Construction Styles”, Tanya M. Champaco Mendiola writes: “From pole and thatched homes to those made of concrete and reinforced steel, Guam has seen an evolution in building styles since the arrival of Americans in 1898. Architectural materials and designs changed with the availability of imported materials, to meet the needs of the US military as well as to help the people of Guam withstand the destructive forces of nature and the destruction of a world war...” But the Spanish-American War wouldn’t be the last conflict the island would face. In 1941 shortly after the attack on Pearl Harbor, Japanese forces would invade the island and control it for thirty-one months until the U.S. would reclaim it in 1944. Throughout this time period, the rise and fall of buildings due to warfare would lead to several new building typologies being introduced to the island.

The first most prominent building typology to arise was that of wood and tin houses. The arrival of the U.S. military made metal (specifically tin) available for construction use

that would replace the thatch and Spanish terra cotta altogether. The tin would be combined with the locally favored ifit wood to create the structures with 1,000 wood and tin structures erected just after World War II in 1944 to house displaced Chamorros. Given the urgency of displacement and the aftermath of World War II, the primary objective was to build homes as quickly and efficiently as possible in order to provide for the thousands of displaced Chamorros as well as the servicemen that found themselves on the island as a result of the war. Wood and tin became the most prevalent building materials used on Guam until the 1960’s. Excessive use of wood would eventually lead to ifit shortages. This paired with increased military construction would bring wood imports from the United States and the Philippines, using a Redwood resin to acclimate the imported wood to the tropical environment.

Destruction of wood and thatched dwellings occurred in 1944 when the United States military strategy in liberating the island from the Japanese lead to the bombing of any structure that might house potential threats. After securing the island, demolition and construction was conducted by the Navy to provide facilities for the 200,000 servicemen expected to be on Guam to fight on the Asian front toward the end of World War II. By the end of this period, an estimated eighty percent of the 3,286 homes on Guam were destroyed. This paved the way for another building



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a semicircular cross section. These were favored by the Navy because of they were of low-cost, easy to build and easily transported. With an average size of sixteen feet by thirty-six feet and an eight-foot radius, the temporary structures eventually came to be used for non-military functions as homes, schools, and hospitals. However, the structures proved to be high maintenance and would eventually decline in popularity. The structures became highly corrosive during times of inclement rain in typhoons. Conversely, the structures were known for being unbearably hot due to the high use of metal. Quonset huts have had about a fifty-year lifespan on Guam with only a few still standing today. (Quinata)

Super Typhoon Karen in 1962 brought about a drastic shift in architecture and construction with over ninety percent of homes on Guam destroyed by the 176 mile per hour winds. With federal rehabilitation funds invested through the Guam Rehabilitation Act of 1963, Architects needed to find new ways to make Guam typhoon-resistant. This meant a complete abandonment of the once popular wood and

tin houses and in favor of a new, more durable material. Private developers began to adopt a pillbox style Kaiser Pre-Fab house using a perfected method of pre-casting concrete allowing uniform homes to be mass produced. Soon subdivisions within populated villages like Dededo would dominate the island and bring the suburbia of the U.S. to Guam. These homes consist of pre-cast concrete walls, floor slabs and roofs reinforced with rebar to protect the structure from typhoons and earthquakes. Although these dwellings brought Guam into modern times, they had many faults due to Guam’s tropical location. One main issue with the concrete structure deals with heat gain and re-radiation especially given Guam’s average temperature of 82 degrees year round. This paired with a low flat ceiling of only eight feet of clearance would leave the interiors of the houses warmer than outside. Other issues with the Kaiser Pre-Fab homes deal more with the aesthetic nature of these concrete structures. These early structures had cold facades that, paired with a lack of landscaping, lead to rather plain and minimalist exteriors. This cold structure would eventually be mass produced



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throughout the island with none having defining or individual characteristics (Quinata). Guam would then become a victim to cookie-cutter development in terms of housing.

Through this era, we see how the persistent need for architecture as a means of housing displaced individuals ultimately led to temporary solutions that became permanent. The structures meant to only house these individuals ended up revolutionizing the way people built and lived, leaving a lasting mark on the island that can still be seen today. Many homes still exist in these styles and remain untouched by the modern influence of architecture. Still, these structures serve as a reminder of the hardship dealt during this period of warfare that still plagues the island today.

Figure 16: United States Soldiers during the Battle of Guam
 Figure 17: Damage seen in Hagatna during the War
 Figure 18: Quonset Huts
 Figure 19: Exterior view of a Quonset Hut showing metal siding
 Figure 20: Wood and Tin structure
 Figure 21: Kaiser Pre-fab home



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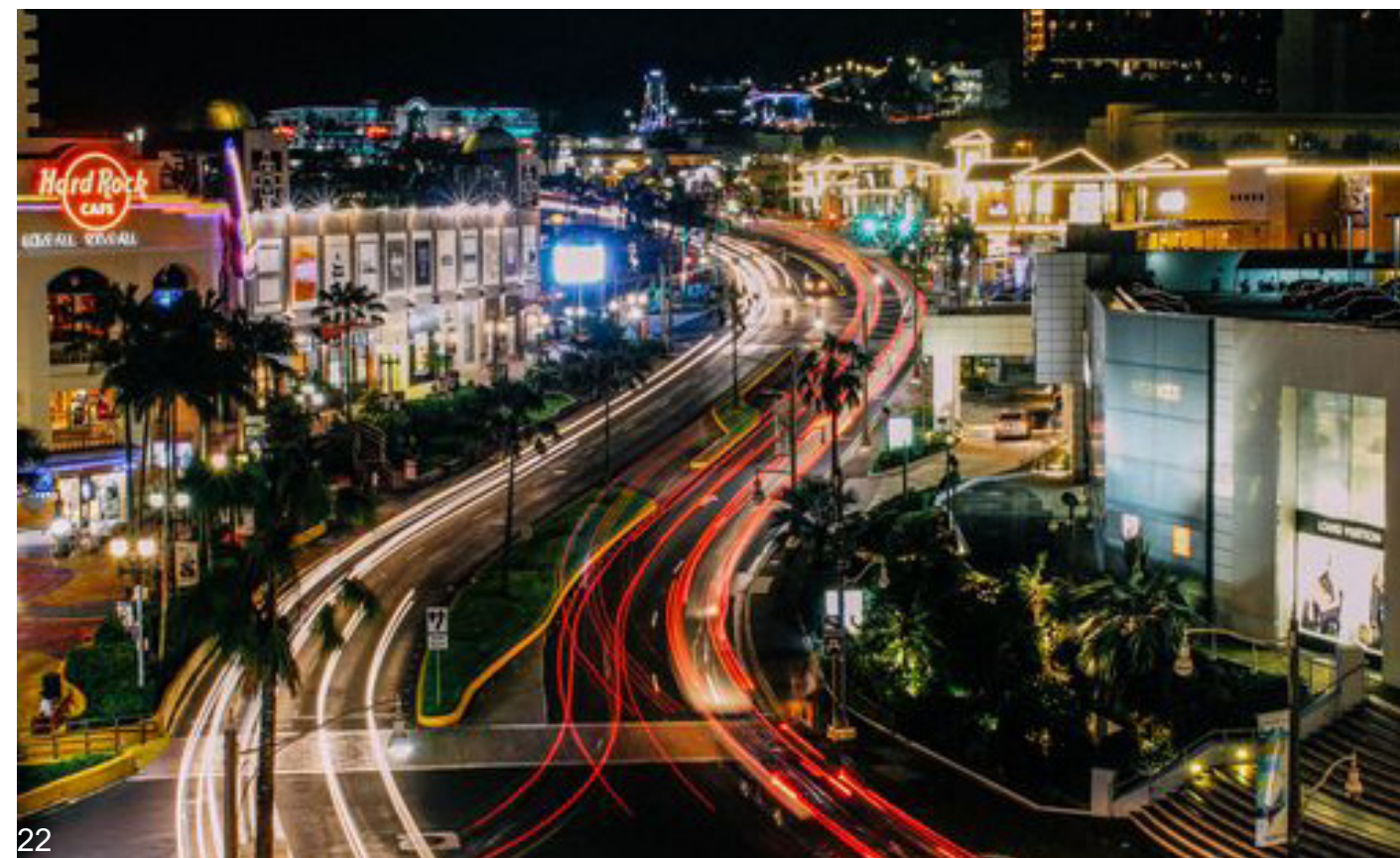
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Contemporary Guam

a push towards urbanization



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The last building material introduced to Guam during this era would prove to be the most successful as many of the structures built at this time still stand today. Hollow block concrete masonry units or CMU block as they are referred to within the construction industry, was introduced to Guam in the 1980's as a correction to the shortcomings of its precast predecessor. In this method, standard 8x8x16 inch blocks would stack on top of each other with rebar and mortar used in and between the bricks to reinforce the walls and make them resistant to earthquakes and typhoons. One major correction that CMU block allowed was the introduction of sloped roofs. This allowed heat to be dispersed less directly, dramatically reducing the interior temperature of the house. Quinata writes how functionality, innovation and aesthetics took priority over the speed and cost essential to the last generation of housing allowing new methods to be experimented with. CMU block still proves to be the most common building method on Guam since the 1980's with many of the structures erected at the time still standing and in use.

The arrival of CMU and poured in place concrete construction has led to a drastic urbanization of the island with more and more structures arising. Additionally, the implementation of the Guam Military Build Up, a comprehensive plan to relocate thousands of Marines from Okinawa, Japan to Guam, pushes the urgency of urbanism and urban renewal with many new buildings being constructed and much of the

"Therefore, just as the development of the island in social, political and economic issues affect the architectural nature of Guam, so too does the architecture of the island play a role in its overall development and advancement in today's modern society."

infrastructure being repaired in anticipation. Through this process of urbanization, Guam is seeing a revival within its architecture with many different building typologies and styles being incorporated for a vast amount of uses. Comprehensive plans such as the Hagatna Master Plan are working towards creating a more cohesive urban fabric within Hagatna while the rise of the tourism industry has led to an increase in the development of hotels and tourist attractions throughout the island. These factors are leading to a new architectural aesthetic of the island that combines each style together with a push towards modernism. Projects like the Coast 360 Federal Credit Union Headquarters, Guam Regional Medical City, the Guam and Chamorro Educational Facility, and the construction of high-rise hotels like the Dusit Thani have led to an advancement in architecture that the island hasn't seen before. The impending need to build in order to provide for the visitors and residents of Guam only highlight the importance that architecture plays in the overall development of the island. However, the increase of Guam's architectural presence in recent years hasn't come without it's issues. The Military Build Up, for example, has sparked controversy with locals who fear the threat that urbanism has on Guam's natural environment. Projects like shooting ranges and military buildings are perceived to threaten Guam's ecosystem based on their location near fragile coral reefs and jungles. The Pago Bay Marina Resort, a multi-residential housing complex has also sparked public opposition

with some calling it a "monstrosity". This is just one example of large scale architecture projects being dismissed by the general public through arguments over land use, environmental impact and overall effects to the people and Guam's culture.

Still, the fact remains that because of this critical time in Guam's developing history, the issues are finally being addressed in ways that they may not have before. The focus on environmentalism also ushered in a new way of sustainability into the island with greener movements occurring within the architecture community. Newer buildings have taken green initiatives. The new Coast 360 Headquarters built in 2010, for example, pioneered the sustainable movement on Guam through receiving LEED Gold certification, becoming Guam's first LEED certified building. CEO of Coast 360 Federal Credit Union, John Arroyo remarked, "We're happy to hear that other Government of Guam agencies are following our footsteps, and they are designing green buildings as well with the idea of getting LEED certification. This is what our intention was to set an example and show it can be done; all you need is the commitment and to make it happen." Therefore, just as the development of the island in social, political and economic issues affect the architectural nature of Guam, so too does the architecture of the island play a role in its overall development and advancement in today's modern society.

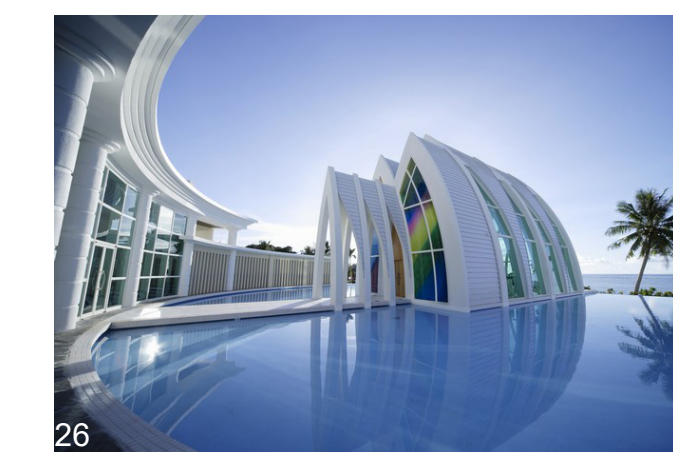
The push towards sustainability and architecture with lower environmental impacts has led to heavy research placed on alternative materials in favor of their high carbon counterparts. In a research paper entitled, "Recycled Plastic Aggregate in Concrete: An Ecological Solution to Plastic Waste on the Pacific Island of Guam", author Morgan Campbell, an alumna from the

University of San Francisco researched the possibility of replacing traditional aggregate within concrete construction to that of plastic aggregate. The idea was to place emphasis on Guam's high usage of concrete in conjunction with its shortcomings in terms of landfill and recycling. Campell, addresses the high volume of concrete being produced on the island as well as Guam's inefficient ways of disposing of plastic.

In summary, the way Guam's architecture and construction industries are progressing follows the same trajectory to that of the world at large. These fields are taking responsibility for the way design and construction has made negative impacts towards our environment and are finally taking stands and initiatives to remedy the situation. The arrival of LEED Certification to Guam's architectural fields sparks only the beginning of environmentalism on the island. Additionally, the further incorporation of new materials with low carbon footprints can help remedy the issue that Guam is currently having with concrete. Although the material has done wonders for the island in providing a necessary solution to the way our buildings are being constructed, problems still arise leaving much to be desired. Still, Guam is undoubtedly progressing from the way its buildings looked and were constructed with the movements of Westernization at the root of this cause. Given this fact, the need to create architecture that is culturally connected to the area is impending.



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Figure 22: Pale San Vitores Road in Tumon
 Figure 23: Latta of Freedom in Hagatna
 Figure 24: Pago Bay Marina Resort Renderings
 Figure 25: CMU construction home
 Figure 26: St. Laguna Chapel in Tumon
 Figure 27: Coast 360 Headquarters, LEED certified Gold
 Figure 28: Coast 360 Headquarters interior lobby
 Figure 29: Coast 360 Headquarters Green Roof

Natural Disasters

foundations built on shaky ground

Typhoon Name	Year	Highest Winds (1 min sustained)	Regional Damages	Direct Fatalities
Nancy	1961	345 km/h	\$ 500 Million	172-191
Karen	1962	295 km/h	\$ 250 Million	11
Pamela	1976	240 km/h	\$ 500 Million	11
Tip	1979	305 km/h	n/a	99
Roy	1988	215 km/h	\$ 28.5 Million	2
Yuki	1991	280 km/h	\$ 36 Million	0
Gay	1992	295 km/h	n/a	1
Omar	1992	240 km/h	\$ 561.2 Million	15
Ivan	1997	295 km/h	\$ 9.6 Million	14
Isa	1997	270 km/h	\$ 1 Million	0
Paka	1997	295 km/h	\$ 580 Million	0
Keith	1997	285 km/h	\$ 15 Million	0
Joan	1997	295 km/h	\$ 200 Thousand	1
Chataan	2002	204 km/h	\$ 600 Million	54
Pongsona	2002	240 km/h	\$ 730 Million	1
Halong	2002	250 km/h	\$ 89 Million	10
Chaba	2004	205 km/h	\$ 977 Million	20
Kong-Rey	2007	185 km/h	\$ 10 Thousand	0
Dolphin	2008	155 km/h	\$ 9 Thousand	47
Francisco	2013	260 km/h	\$ 150 Thousand	0
Rammasun	2014	260 km/h	\$ 7 Billion	175
Chanhom	2015	220 km/h	\$ 1 Billion	6
Dolphin	2015	260 km/h	\$ 10 Million	0
Goni	2015	215 km/h	\$ 293 Million	34
Nangka	2015	250 km/h	\$ 150 Million	2

Guam has the highest risk of being hit by a typhoon (aka hurricane) of any state or territory in the United States. It also has one of the highest risks for being hit by the world's largest and most intense tropical cyclones."

Typhoon Vulnerability Study on Guam

The advent of warfare on Guam, though destructive, proved to be positive in terms of the outcome in architecture. The arrival of the U.S. translated to a departure from Spanish materials and methods through total shift from the masonry stonework since the 1500's and 1600's to the introduction of new building typologies, namely: wood and tin houses, Quonset huts, Kaiser Pre-Fab homes and eventually hollow concrete masonry unit blocks. This shift mirrors that of the Spanish Era where we see a change from the latte structures into the mamposteria structures through a more gradual change. The difference between the two alterations is that of the natural phenomena that exists on Guam as it is located within the Ring of Fire. The Ring of Fire is an area in the Pacific Ocean where the movement of the earth's plates causes frequent earthquakes and volcanic activity. In fact, earthquakes occur every day on Guam, but the majority of them are imperceptible without a seismograph. Occasional destructive force earthquakes occur every few years, as evidenced in the landscape and geological record, as well as in historic accounts. Tolentino writes: "the Mariana Islands lie on the edge of the zone where the Pacific Plate sinks beneath the Philippine Plate, forming the Marianas Trench, the lowest elevation on the earth's surface. Around 43 million years ago, the release of magma from volcanic activity in this area resulted in the formation of Guam, the oldest of the Mariana Islands chain." But these occurrences are neither few nor weak. "At least

four earthquakes of magnitude 7.0 or greater on the Richter scale occurred between 1849 and 1911. Unconfirmed reports of earthquakes in the late 1700s include events in 1767, 1769, 1779 or 1799. Major earthquakes have been reported, in 1809, 1810, 1822, 1825, 1834, 1837, 1849, 1892, 1901 and 1909" (Tolentino)

Earthquakes are but one type of natural disaster that plagues the island; the threat of tsunamis continues to rise due to an increase in seismic activity in recent times. A tsunami or seismic sea wave is a series of waves in a water body caused by the displacement of a large body of water commonly caused by earthquakes. Guam has had 3 tsunamis large enough to cause damage. In the Guampedia article entitled "Tsunami and Earthquake History and Potential for Guam" Dominica Tolentino writes: "Because of the recent devastating earthquakes and tsunamis in Japan, Samoa and Indonesia, the question of Guam's risk of tsunamis has been raised. The notion that Guam is largely protected by the deep waters of the Marianas Trench and the reefs surrounding the islands is commonly accepted, although this idea has been refuted by some geophysicists for a number of reasons.

Still, another type of natural disaster continues to affect the island in a large way. Authors of the Typhoon Vulnerability Study for Guam write that: "Guam has the highest risk of being hit by a typhoon (aka hurricane) of any state or territory in the United States. It also



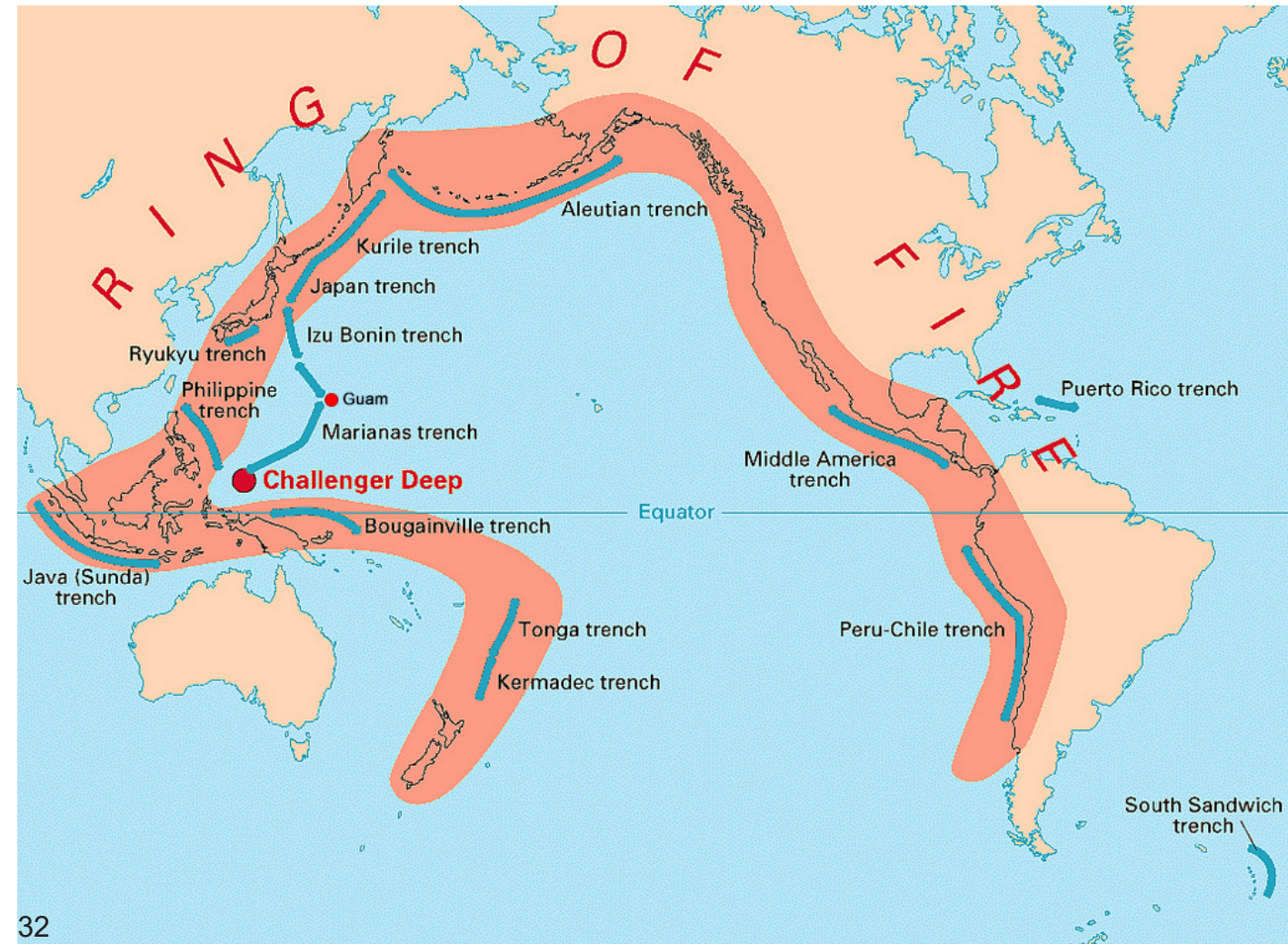
has one of the highest risks for being hit by the world's largest and most intense tropical cyclones." in terms of infrastructure to the island. Based on the table, there have been a total of 25 typhoons to hit Guam since 1961 with most of them causing millions of dollars worth of damages totaled in all affected areas. The graph is meant to show how susceptible Guam is to these storms that bring high winds, torrential rain and the probability of flooding. This paired with the likelihood of earthquakes and the increasing awareness towards tsunamis makes for a fatal combination of natural disasters that the island has only in recent decades become prepared for.

Thus, preparation is widely seen throughout the island. In an article by the Stars and Stripes, Dave Omauer writes about complacency in these typhoon stricken areas. Omauer urges residents to be cautious and prepared when faced with these disasters saying that "complacency is a risk in Typhoon Alley". Local Guam residents have experienced these disasters enough to know how to be better prepared with their architecture as a prime example of this. Guam currently has an average recorded wind speed of 10 mph. In an article



discussing the severity of Supertyphoon Karen in 1962, Tom Skilling writes: "Supertyphoon Karen, a Category 5 storm, was one of the most powerful and destructive typhoons to ever hit Guam. It struck the western Pacific island on Nov. 11, 1962, with top sustained winds of 175-185 mph, with gusts estimated in excess of 200 mph. The storm destroyed or damaged nearly all the island's structures, left nearly 50,000 homeless, and caused 11 fatalities. In the wake of the storm, damage on the island was so severe that thousands of residents had to be evacuated to Wake Island, California and Hawaii. All records at the island's heavily damaged Andersen Air Force Base were destroyed. As a testament to the storm's severity and impact, the name Karen was retired from the list of typhoon names" Island leaders and residents alike have learned about the destruction of these storms and constantly work to prepare themselves for these impending disasters and their after effects.

Figure 30: Royal Orchid Hotel damage in an earthquake
Figure 31: Damage seen during Typhoon Pongsona
Figure 32: Map of the Ring of Fire
Figure 33: Devastation done by Typhoon Pongsona



Hagatña Master Plan

a revival of guam's capitol

In 2005, the Hagatna Restoration and Redevelopment Authority (HARRA) adapted what is known as the "Hagatna Master Plan", a comprehensive vision of the future of Hagatna over the next 20 years. The plan itself contains projected renovations of existing Hagatna landmarks, proposals for connections between major areas that lack safe pedestrian cross-ways and even proposals for new features the Capital lacks. One major aspect of the Hagatna Master Plan currently in progress is the construction of the Guam and Chamorro Educational Facility, a museum located at Skinner's Plaza, a central feature of the village. The museum is intended to house many Chamorro and Guam related artifacts kept off-island due to Guam's lack of a proper containment facility. The museum will also include a presentation theater, shops, archives and major landscaping. The master plan works in combination with the Hagatna Heritage Walking Trail, an existing pathway that connects major landmarks from the Spanish Colonial period as a way of promoting tourism within the Capital. The Hagatna Heritage Trail as well as the Guam and Chamorro Educational facility (in cooperation with the overall Hagatna Master Plan) work to envision a vibrant Capital village and provide Hagatna with key essentials that they currently lack.

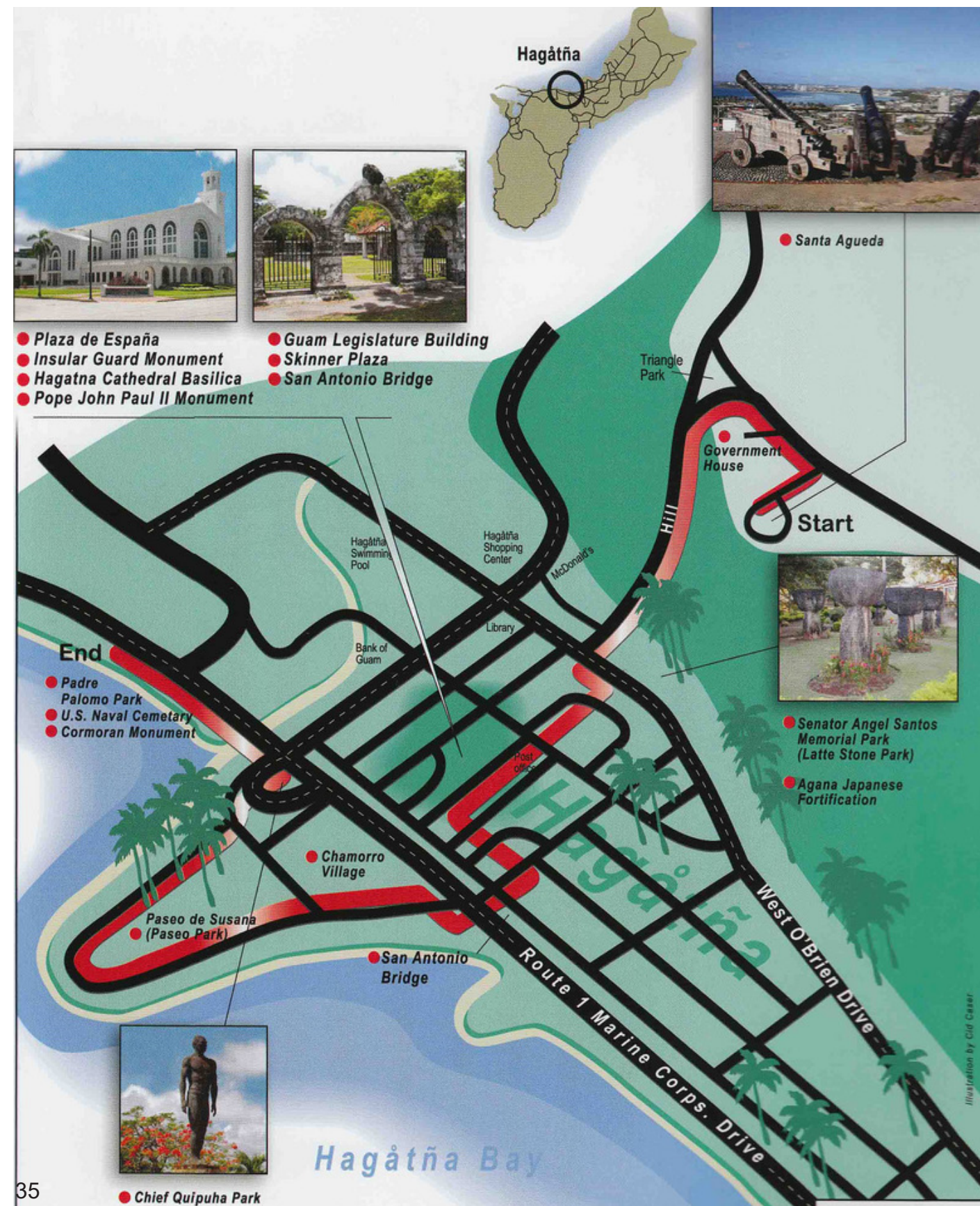
Thus, in choosing a site for the Cultural Center, I felt that Hagatna would be an ideal location in that the Cultural Center could address key needs of the village as well as be

incorporated into the existing Hagatna Master Plan. Some proposed potential projects within the Master Plan include a "Community theatre to promote cultural and entertainment options", a "Museum to promote Hagatna as the cultural and historic center of Guam" and, other projects to promote economic activity, open pedestrian space and nightlife. The Cultural Center can work to address these needs of the village by providing a space for each of these necessary activities under one roof. The goal of the Cultural Center is not to detract from current features of the village such as the Chamorro Village, Latte Stone Park or even the Guam and Chamorro Educational Facility, rather it is intended to supplement these features by providing spaces for other activities to happen.

Figure 34: Lujan House restored using merbau
Figure 35: Hagatna Heritage Walking Trail



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Ifit Wood

the giving tree



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Colloquially known as Ifit to locals, this species of tropical hardwood (*Intsia Bijua*) became a primary construction material in ancient times and even became a symbol for the people. Known for its natural strength and resistance, the Chamorro people prized the tree, using it for timber construction pieces such as pillars, rafters and floorboards. This was the main building material of choice until the introduction of modern concrete, steel and masonry from the Spanish and later, the United States. Today, due to the standardization of modern elements and the endangerment of the tree, Ifit wood is only used for decorative wood-working purposes such as furniture and souvenirs. Though nothing physically remains of these ancient structures today, the importance of the Ifit tree and its wood is left through history, oral tradition and the Chamorro people who have made Ifit the National Tree of Guam. The results of the comparison show Ifit's numbers at the peak of every test for various characteristics. To note, Ifit has extremely high compressive strength, Modulus of Rupture (or bending strength) as well as high Modulus of Elasticity (or stiffness). This combination of strengths make ifit a viable candidate for many applications that require high compression and tension such as columns and beams. Additionally, given ifit's high density, it is naturally repellent to insects and rotting. It also is less susceptible to shrinkage which can make it quite favored over other wood species in which the shrinkage needs to be accounted

The engineering strengths and deep cultural connection ifit has with the Chamorro culture as well as its prevalent use throughout Guam's history makes it the prime candidate in terms of wood choice when constructing new structures on Guam

for. Lastly, Ifit displays high Janka Hardness: a test that measures the force it takes to embed a steel ball into the wood, calculating it's resistance to dents, dings and wear. In summary, all of these characteristics make for ifit's more prevalent integration into construction more enticing. The engineering strengths and deep cultural connection ifit has with the Chamorro culture as well as its prevalent use throughout Guam's history makes it the prime candidate in terms of wood choice when constructing new structures on Guam. Though the availability of local ifit on Guam has dwindled to that of an endangered status, the fact remains that wood for all construction products has to be imported to Guam from either the U.S. or parts of Asia and therefore, it makes sense to choose ifit (merbau as it is commonly known elsewhere) in place of other wood imports.

The introduction of concrete to Guam has made unquestionable positive impacts to the lives of the people as well as the architecture that is produced. Its strengths during wind and seismic activity makes it the most viable option for construction given the materials that is made available on Guam. Still, the use of cement in concrete which leads to a higher carbon footprint and energy use leaves much to be desired. Studies have been done in researching potential substitutes for cement in concrete using an ash alternative that is derived from local plant by-products like

sugarcane bagasse and coconut. These studies have not made any clear conclusions to likelihood of this alternative being made available in the near future nor have any research been done to test the strength of concrete and its resistance to forces.

For place with such as rich history of using a type of wood like Ifit, a better effort should be made in order to reclaim this resource for the people of Guam. It's long-stead use throughout history paired with its current status as near endangered speaks about the ways that external forces have plagued the island.

Figure 36: Ifit tree
Figure 37: Merbau decking



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Design Phase

Design Concept

latching on to the hook

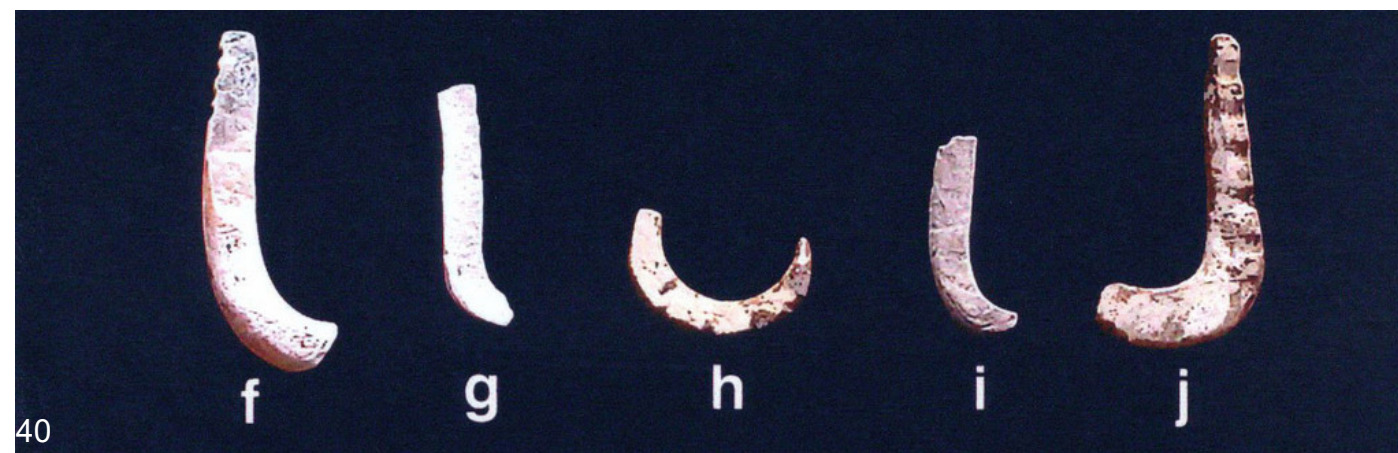
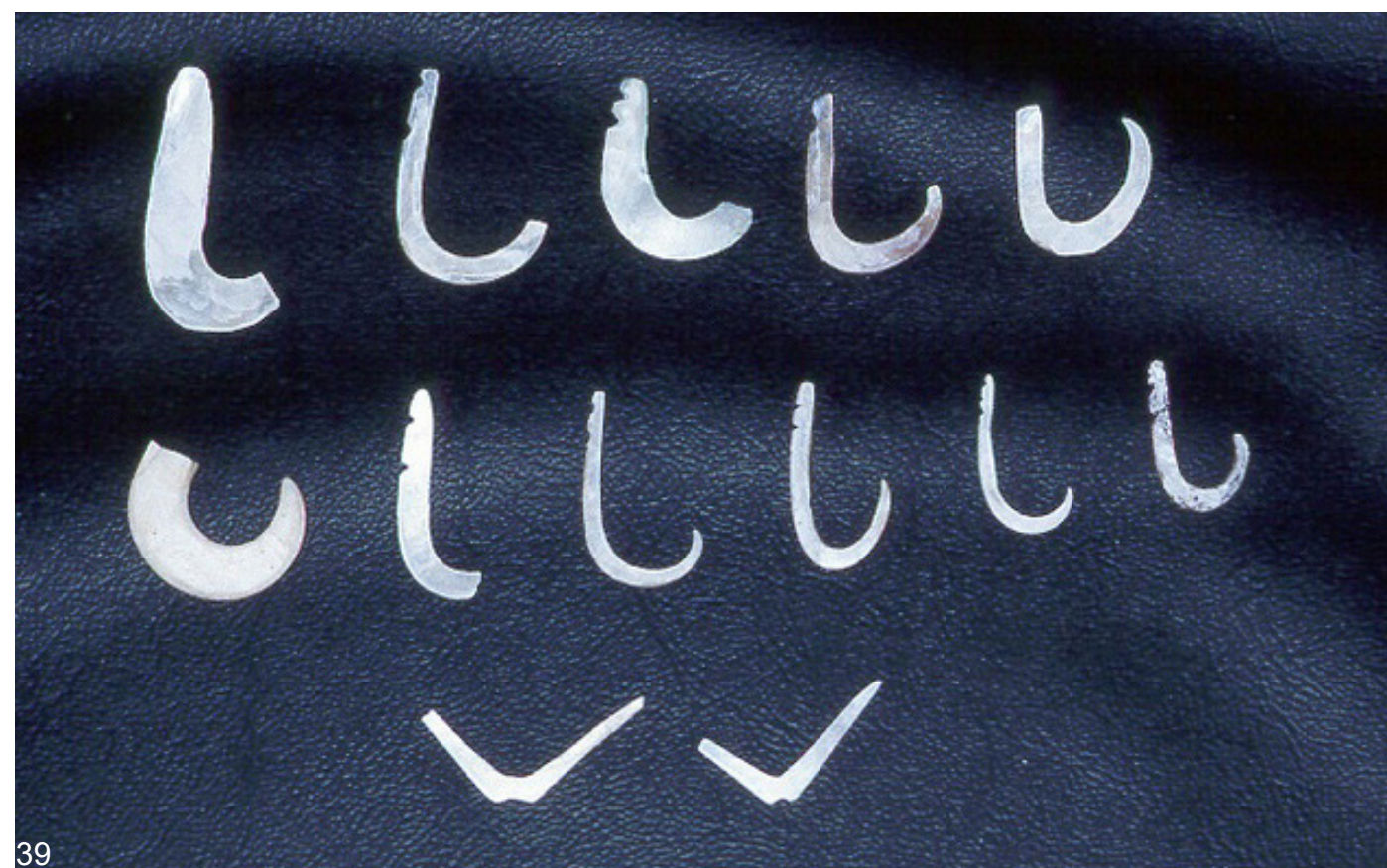
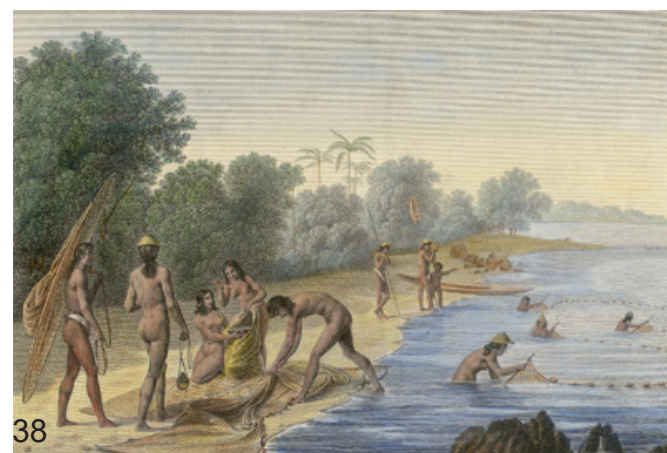
In creating the design for the Cultural Center, I looked closely at symbols of Guam and Chamorro culture given the nature of the building. I felt that merely recreating the traditional latte house, or replicating that of the Spanish bodega structures, would only pay tribute to one style, leaving the other three unrecognized. I eventually came across the shape of a hook—a thin neck to allow attachment to rope that curved and pointed at the tip meant to pierce through fish. I felt the design was ideal because it allowed me to showcase an aspect of Chamorro culture, fishing, through architecture and that the design would allow the visitors to see the building materials in new ways. The concrete structures that arose in the World War II era were that of concrete boxes that were created for their efficient nature and simplicity in design, but concrete as a material has evolved past many preconceived limitations. The curves of the proposed design allow the material to be showcased in a way that is rarely seen on the island.

I also felt that the hook concept could highlight the importance of fishing within Guam history. For generations, many groups of people relied on fishing as a source of life—providing food and tools. Fishing also holds high notion in Chamorro folklore. One legend tells of how young maidens of Guam saved the island from being completely eaten by a giant fish. Fishing is still held in high regard with many master carvers passing their knowledge down to a younger generation in hopes that the

knowledge attributed to fishing and the making of fishing tools can be passed down.

I latched on to the idea of a fish hook as a building form by relating the process of carving a fish hook to that of designing this building. A hook starts off as a large oyster shell, turtle shell or fish bone and is carved down to become intricate hooks. So too was this process of taking all of the information I had researched and filtering it by determining which aspects of history I want to include within this building. The shape of the building as a carved hook is a metaphor for the design process that resulted in the creation of this building.

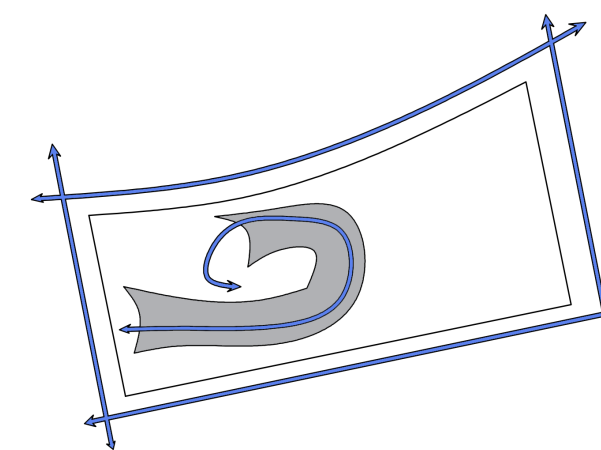
Figure 38: Artist rendition of ancient fishing on Guam
 Figure 39: Hook artifacts
 Figure 40: Other hook artifacts



Design Diagrams

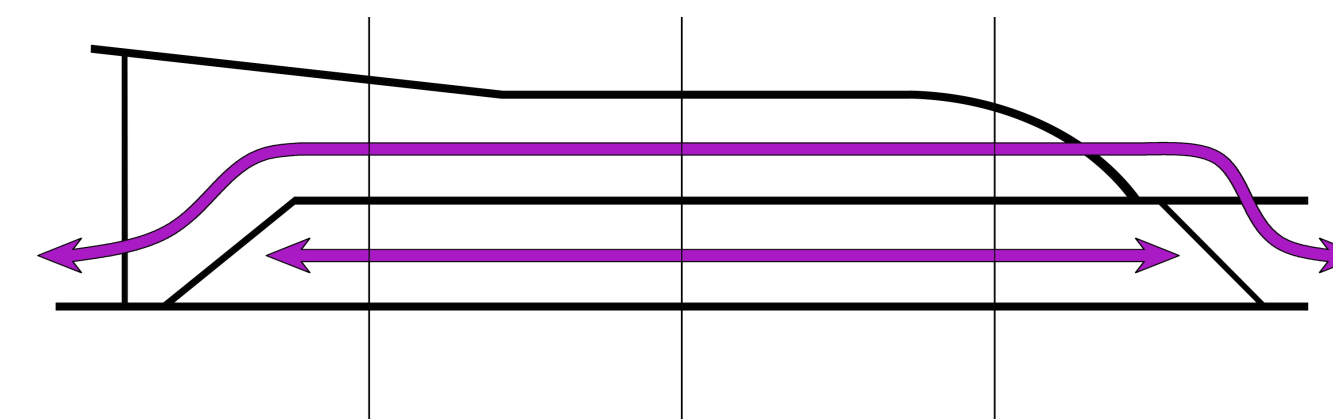
three design ideas

In creating the overall design of the Cultural Center, I focused on three main design moves to help push through the process and result in a building that reflects my main parti—the hook.



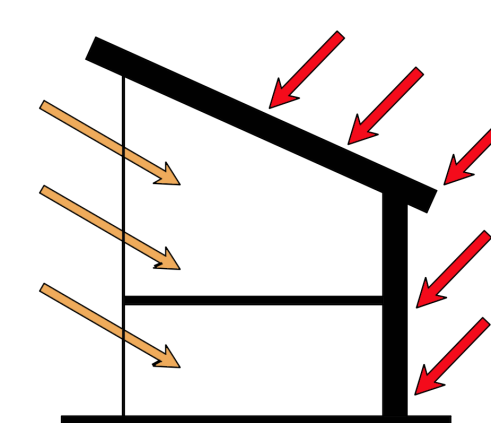
The first design idea was that of the hook's shape in both building form and circulation. I wanted to mold each of the program spaces into the form of a hook as well as circulate people through the shape. The idea is that the hook's circulation would break the orthogonal nature of the circulation around the site. Upon entering the building, guests circulate through the hook, moving along the exterior courtyard before spiraling into the market and flooding the open space. The idea was to break the traditional circulation of rectilinear buildings and accentuate the curved form. I wanted to create a strong emphasis on the central courtyard, allowing it to act as an

anchor. The second design idea focused on the roof shape. The United States / WWII Era consisted of buildings with predominantly flat roofs resulting in the idea of “concrete boxes”. Homeowners criticized these forms, saying that they provided poor indoor air quality due to their low ceilings as well as provided a drab facade at the exterior. This was partially corrected by the emergence of pitched roofs during the Contemporary Guam Era allowing better circulation and improved aesthetics. Here, I wanted to employ a shed roof with a steep angle to allow good air flow as well as provide a unique roof shape not common to the island. These sheds alternate within different spaces with angles facing key areas with optimal sunlight. The roof reaches its peak at the entrance of the Cultural Center and seemingly curves down into the Balcony. The roof is meant to mimic the tapering effect



that is usually carved into a hook. In creating the roof shapes, in section, you can see how the roof slopes with the back facing towards West O'Brien Drive. I angled the roof in such a way that would be ideal for solar panels to catch the intense sun in that direction. The other side, however, is filled with large curtain walls meant to let in natural light without added heat gain. Here, the roof peaks around 15 feet high and angles down to about 9 feet high at the opposite end.

The last design idea I wanted to incorporate was horizontal circulation as a way of representing the different architectural styles of Guam. The idea was that as one walks through the building, they experience each of the architectural styles as living exhibits. From the Lobby, guests walk through the Ancient Chamorro Style represented in the Sky Bridge.

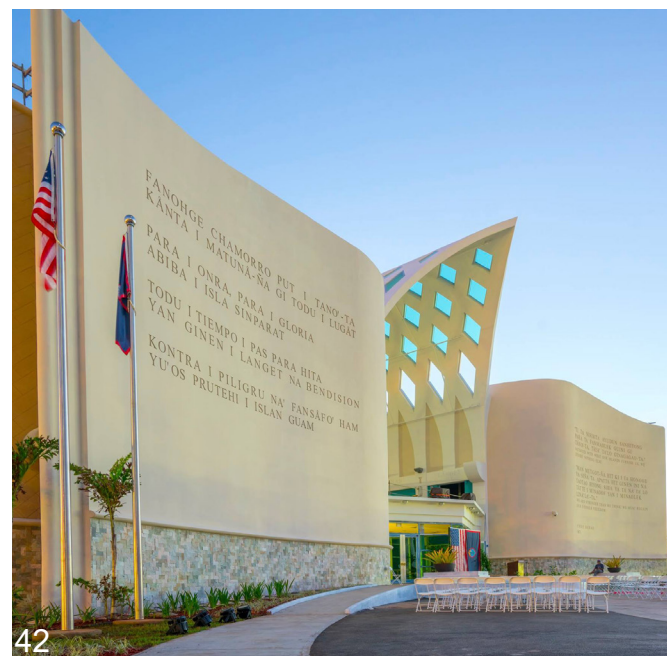


The Sky Bridge leads into the Spanish Gallery space representing the Spanish Colonial Style. Just below that is the Classroom area that imitates the aesthetic of the United States / WWII Style. Lastly, the Contemporary Guam Style, is represented within the Balcony Level at the end of the Cultural Center. The changes within the buildings interior and open spaces reflect the subtle changes seen throughout Guam's architectural history with each adaptation as a connection to the spheres of influence that have affected the island. As one moves through the spaces within the Cultural Center, they move through Guam's cultural and historical time-line.

During the programming and schematic design phases of this project, I wanted to periodically reflect and assess whether the overall design was following each of these three moves in some way and, if it was not the case, I wanted to ensure that my overall parti was followed in every design decision I made.

The Site

390 west o'brien drive, hagatna, guam



After determining the program of the building as well as its functions, I wanted to choose a site that would both be suitable for the Cultural Center and would also benefit from its integration into the existing urban fabric. The nature of the Cultural Center is to act as a hub for various aspects of Chamorro culture including art, crafts, dance, literature and music with each of these distinctions coexisting under one roof. This consolidation of culture affected the process of choosing the site in that I wanted to locate the Cultural Center in close proximity to other nearby buildings with similar functions.

The emergence of the Guam and Chamorro Educational facility, a new Museum intended to house Guam artifacts, inclined me to examine the Capitol village of Hagatna as a suitable site for the Cultural Center. Currently existing as the mecca for Guam's governmental affairs as a center for culture, Hagatna has a long standing history of being an ideal place for various activities. Declared Capitol in 1686, Hagatna currently houses the three branches of Guam's government, the location of the Archdiocese of Agana belonging to the Catholic Church as well as many commercial attractions. Hagatna seamlessly integrates social, economic, legislative and spiritual elements into one area.

The village of Hagatna sits at a strategic location with many natural features and thoroughfares running through it. North of the village lies Guam's coastline that stretches

towards Asan and the southern portion of Guam on the east with the west linking up to Tumon Bay, an epicenter for Guam's tourism. The name was changed to "Agana" by the Spanish before officially being recognized as "Hagatna" in 1998 in order to reflect the original Chamorro pronunciation. South of Hagatna lies the smaller villages of Agana Heights and Sinajana that offer grand views of Agana Bay and downtown Hagatna. One main feature of the village is Marine Corps Drive, a major highway that runs through the village connecting Andersen Air Force Base in Yigo with Naval Base Guam in Apra Harbor. The village sees a high density of traffic activity with Guam residents using Marine Corps Drive to connect the Northern and Southern portions of Guam.

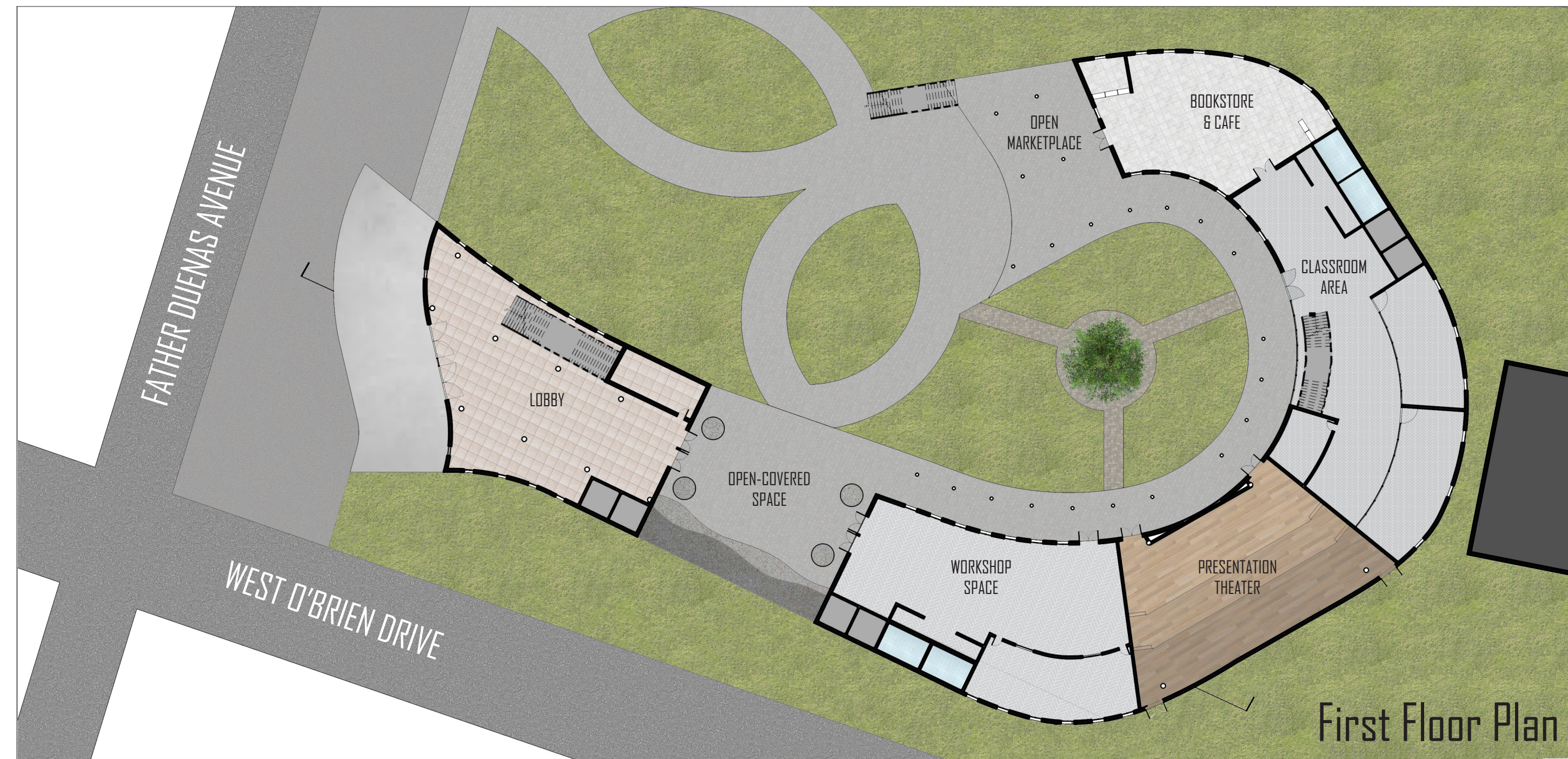
The Cultural Center aspires to be integrated into Hagatna's existing context. Such adjacencies include the Chamorro Village, the Dulce Nombre de Maria Cathedral Basilica, the Plaza de Espana and the Julale Shopping Center with each just a few blocks from the proposed site. Currently, the site is a large plot of empty land with commercial and residential areas nearby. The site also sits along West O'Brien Drive, a smaller roadway that connects much of Hagatna's Judicial activity.

Figure 41: Dulce Nombre de Maria Cathedral Basilica
 Figure 42: Guam and Chamorro Educational Facility
 Figure 43: Marine Corps Drive in East Agana
 Figure 44: Chamorro Village Night Market
 Figure 45: Aerial View of Hagatna zoomed in



Floor Plans

a cultural center for art and architecture



1/32" = 1'

In creating the floor plans of the Cultural Center, I wanted to emphasize the curved nature of the building. by contrasting the concrete boxes that were widespread in the 1900's with the curved form of the Cultural Center to highlight the progression of concrete on Guam as a revolutionary building material.

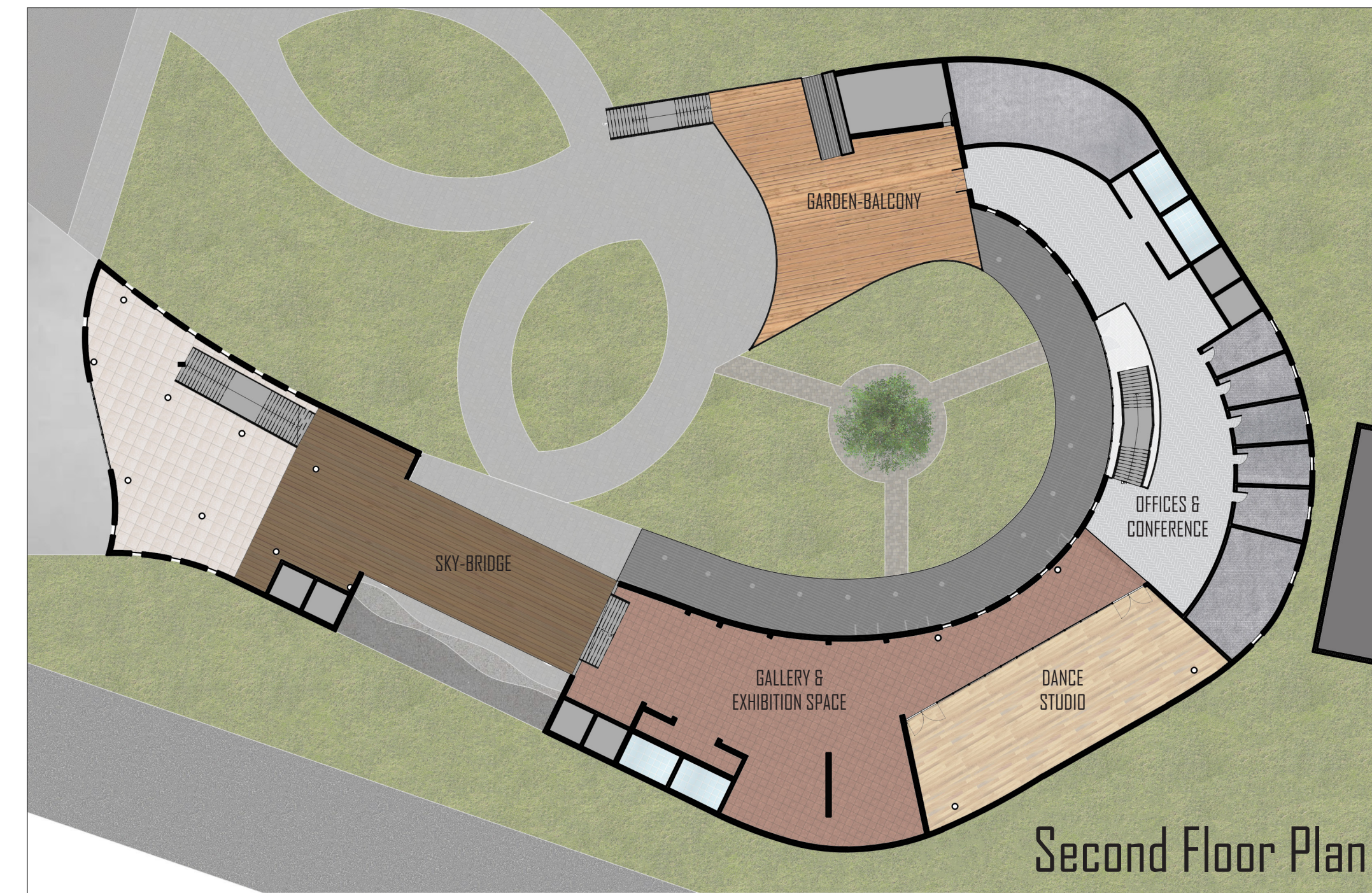
In terms of the building's circulation, I placed the entrance of the Cultural Center, a double-height lobby and information center along Father Duenas Avenue. From there, guests circulate throughout the building, following the curve before exiting and spilling into the shaded courtyard. The building is shaped in

such a way that draws guests towards the courtyard with large windows and curtain walls facing the inner core. From the Lobby, guests enter a shaded gathering space underneath the Sky-Bridge supported by latte stones. This space is followed by a workshop and classroom areas where local craftsmen can

hold interactive classes. A presentation theatre able to hold up to 200 guests is beside the workshop where viewers can watch films and performances on culture. The First Floor also includes a bookstore and open market where local vendors and craftsmen can sell their products. The space is intended to be filled with craftsmen, artisans and buyers looking to own pieces of Guam's history through these products. .

From the First Floor, guests can trickle out to the open courtyard of the Cultural Center, a shaded area with a large amount of open space suitable for local plants and shrubs. The courtyard's focal point is a large shade tree acting as the anchor of the Cultural Center. Guests can walk across the courtyard or along the colonnade. The pathways also take the shape of slingstones: a type of weapon that has since been adopted, like the latte as a symbol of Chamorro history integrated into contemporary pop culture. The symbol also exists on the Guam Flag and is incorporated into other architectural designs.

The Second Floor of the Cultural Center starts as guests walk up the grand staircase at the lobby. There, on the Mezzanine Level, they flow into the Sky-Bridge that provides great views of Hagatna and the courtyard spaces underneath. Guests then descend into the main Gallery and Exhibition space where local art and artifacts are showcased. The Gallery spaces then spill out past a large dance studio where cultural dance groups can rehearse. Along the right are conference spaces and administrative offices for the in-house staff. The main circulation hall runs past a music room, ideal for recording or rehearsal. The Second Floor ends with the outdoor terrace, a garden space where guests are immersed with nature as well as views of Hagatna.



1/32" = 1'

Longitudinal Section

This section shows the major elevation changes within the Cultural Center by highlighting the large double height Lobby at the entrance of the building with heights that extend past 25 feet. From there, a large staircase leads guests up to the Sky-Bridge at the Mezzanine Level. From the Sky-Bridge, guests descend down into the Gallery Space and onto the rest of the Second Floor before they exit down the staircase at the Balcony. Each of the spaces are set with high ceilings around 12 feet tall for air circulation and ventilation with the each of the spaces varying in overall height and size.

The section also works to highlight the changes made to the roof as the guests move through the building. The roof reaches its peak at the Lobby entrance and slopes down at the Sky Bridge before pushing up, providing a clerestory to flood the Sky Bridge with sunlight. From there, the Roof slopes towards West O'Brien before pushing back down, creating another clerestory at the Gallery Space. This angle is intended to hold solar panels to catch the intense sunlight from the south. The angle rotates around the inner courtyard with the tallest heights around the center exterior with the roof sloping down towards the exterior.



Renderings



These renderings aim to show several design features. The first is the curved nature of the building with the view towards the central courtyard marked by the large shade tree. From this angle, you see the Cultural Center cave in into itself, accentuating the curve of the hook. Predominantly shown are the narrow slits of glass used on both sides of the lobby to allow for natural light without heat gain. The top rendering also shows the way in which the roof changes with the highest portion at the Lobby as if to enter guests in. The roof pushes at certain areas providing opportunities for clerestories. Also shown is the colonnade

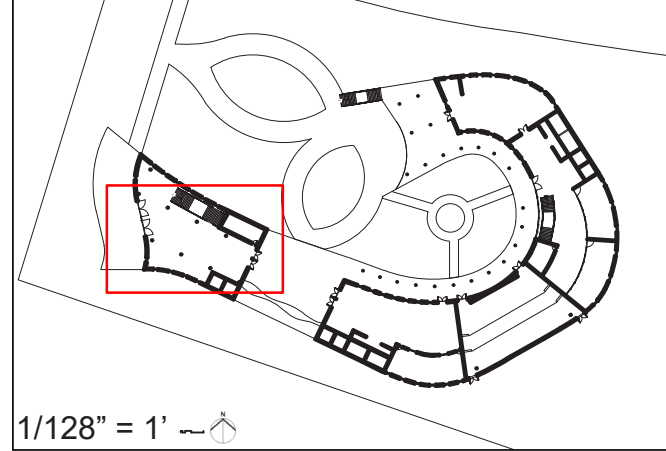
that lines the inner courtyard. The building sits along the site with the hills of Agana Heights and Sinajana in the back. From this view, you see how guests can enter through the main entrance at the Lobby or through the courtyard as they follow the pathways shaped like ancient Chamorro slingstones. This view also shows the balance between covered and open spaces as well as open and closed spaces. The building is meant to break the form and function of a concrete box and play with the concept of inside meets outside with the building providing balance between the natural and built environments.

This space is intended to provide an open, yet shaded space in order to combat Guam's high heat and humidity. The focal point of the view is the large shade tree that acts as an anchor for every element along the courtyard. Towards the left, you can see the Open Marketplace that sits just below the Balcony space adorned with pergolas, benches and great views of the surrounding neighborhood. Following the colonnade, guests walk towards the entrance into the main classroom spaces. Marked by the large curtain walls, these spaces highlight the materiality of the WWII Era. The glazing in this space was meant to contrast the concrete

nature of the Cultural Center as to provide a balance between transparent and opaque. Facing away from the sun path, these curtain walls flood the classroom area with natural diffused light. The view also highlights the hook with the fine tip of the building piercing through the courtyard along the balcony. The arc made by the two points is also highlighted. Overall, the space is meant as a large gathering area intended to activate the open spaces that normally go unused in Guam's climate. The building also acts as a point of interest to draw guests from both Marine Corps Drive and West O'Brien Drive.

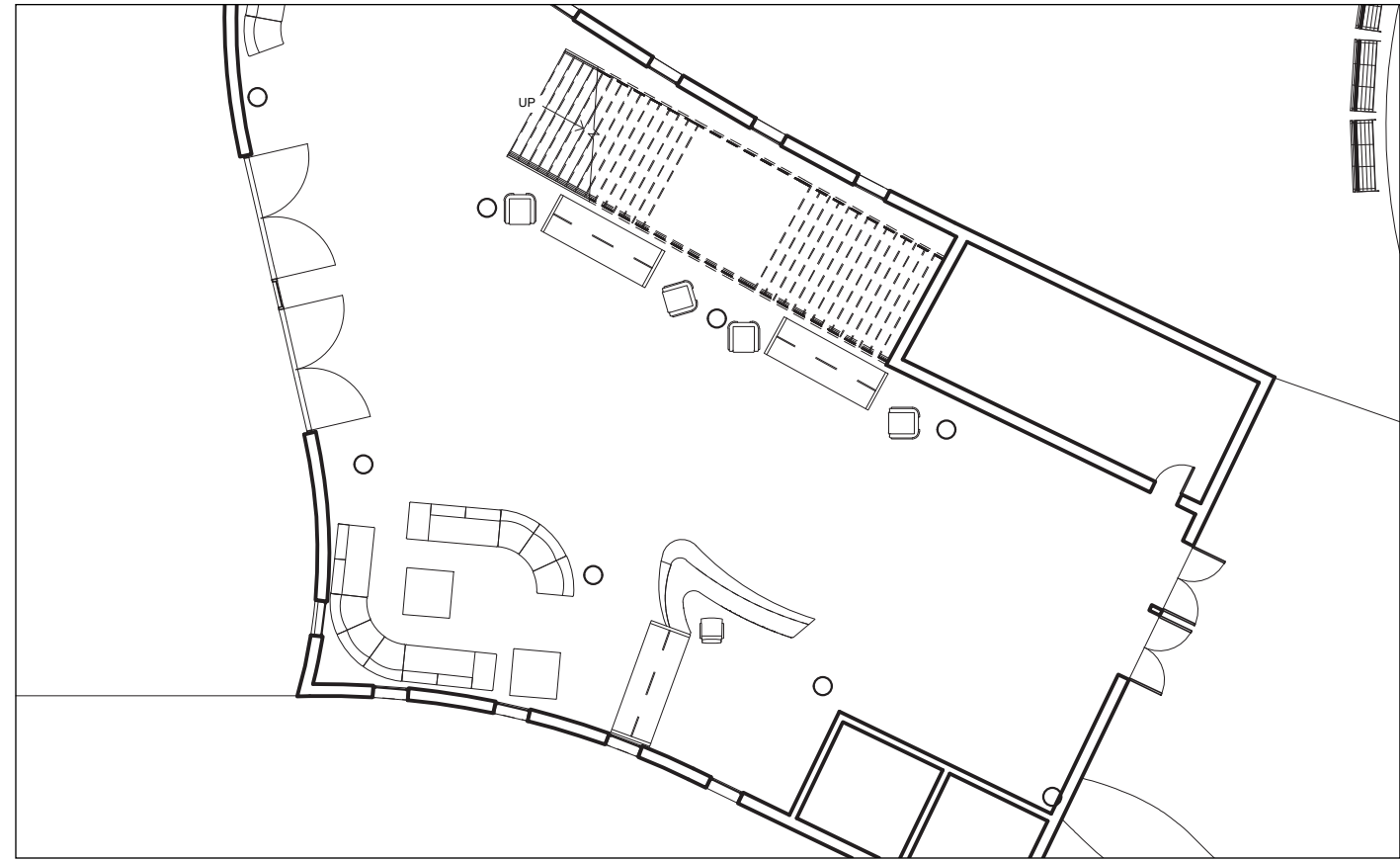


Lobby & Information Center



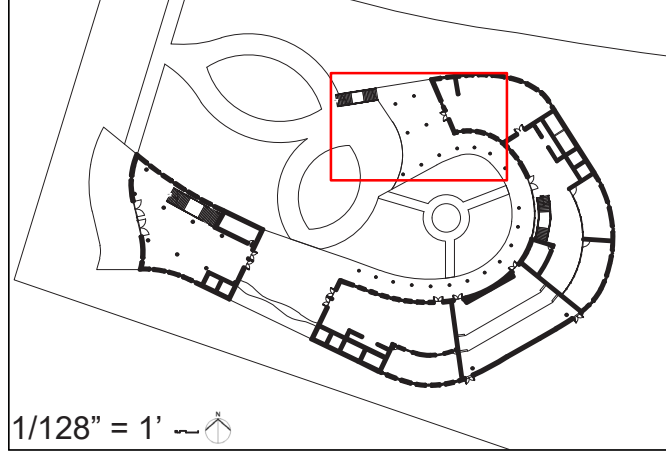
1/128" = 1' ~

Guests are welcomed into the Cultural Center through the main entrance facing Father Duenas Drive. Upon entering, they experience the large double-heighted space that serves as a Lobby and Information Center. The space is furnished with lounge seating, large tables and a curved reception desk. Concrete columns line the Lobby and extend to the angled roof. Along the north and south walls are narrow slits of glass windows that flood the space with natural light yet assist in preventing added heat gain. A wide grand staircase links the Lobby with the Mezzanine Level.



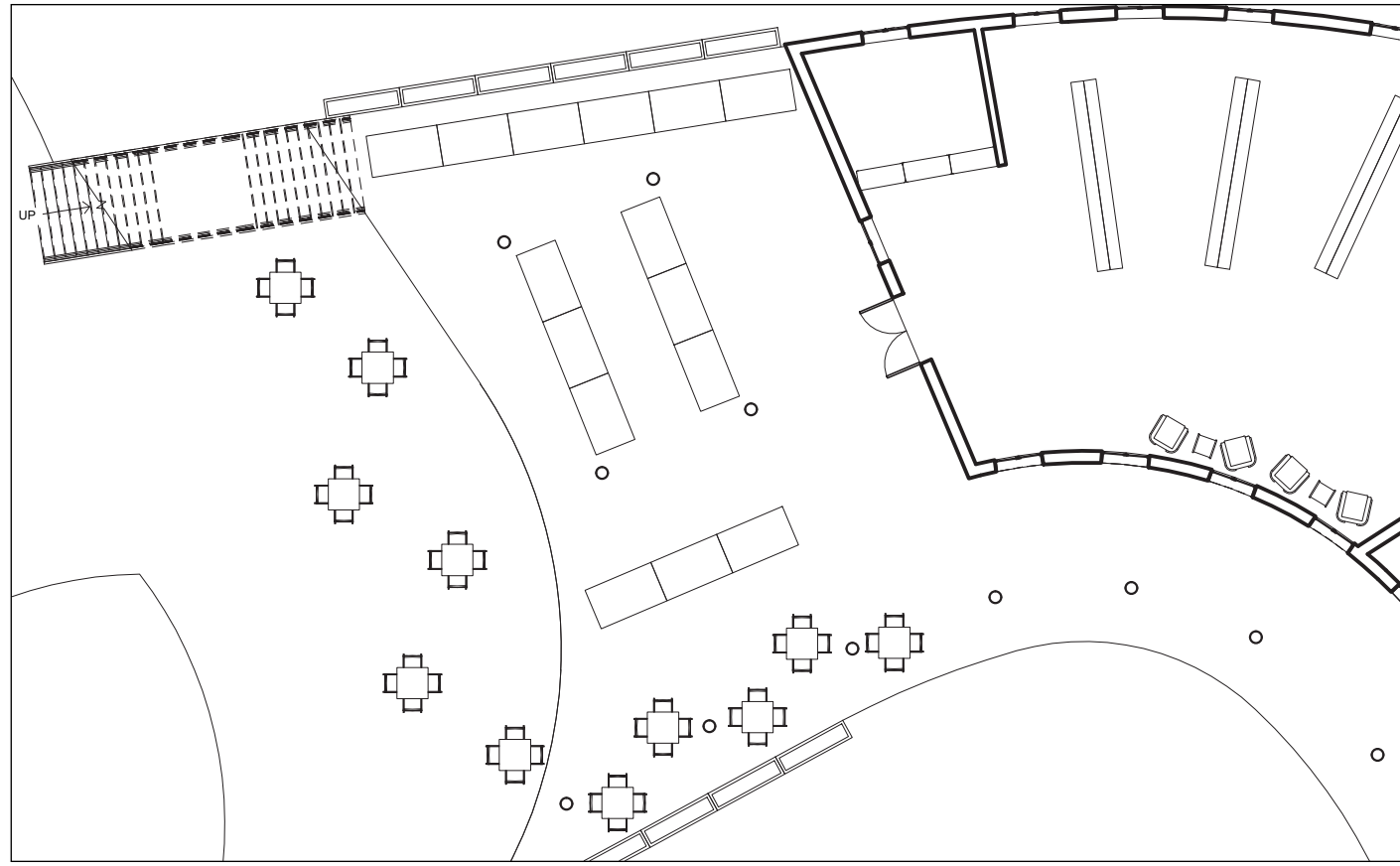
1/16" = 1' ~

Open Marketplace



1/128" = 1' ~

Underneath the Balcony lies another covered open space that extends into the courtyard. Here, local vendors form an open marketplace where they can sell their products to guests. The idea was that, at the Cultural Center, guests can learn about different aspects of Chamorro culture through the gallery and theater spaces, engage in these aspects through the workshop and classrooms and finally purchase these products through the bookstore and marketplace. The space is defined by vendor tables and seating along the courtyard. The space is classified by the apparent hook form from above as well as the inside-outside nature of the market.

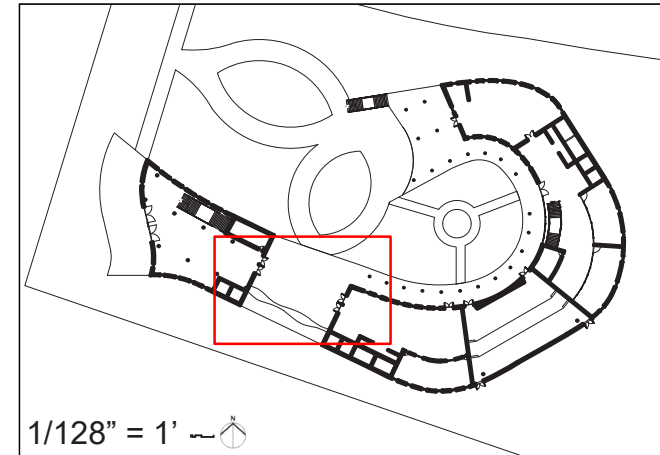


1/16" = 1' ~

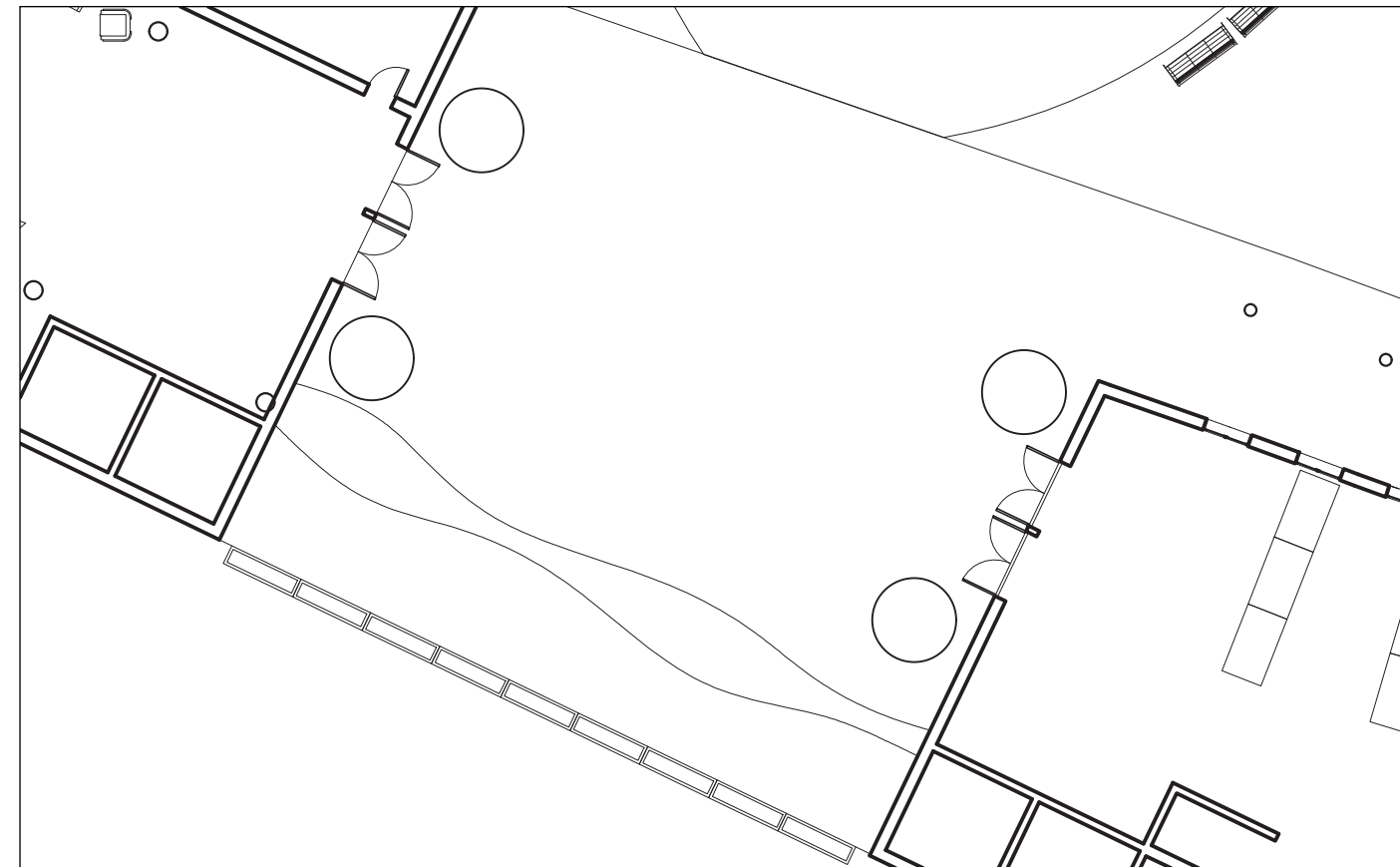


Sky-Bridge & Covered Space

ancient chamorro inspired

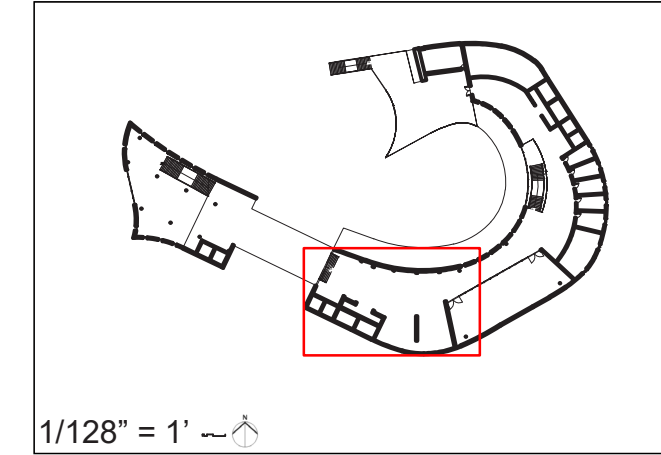


After exiting the Lobby guests find themselves in a covered open space underneath the Sky Bridge on the second floor. The idea is to create a space that mimics the latte houses of the Ancient Chamorro Era by replicating the height of the space underneath. The actual dimensions of latte stones are with heights at 16 feet and diameters that measure 7 feet at the Haligi and 9 feet at the Tasa, providing a modern take on this ancient structural system. Here, guests are provided great views of the hillside and courtyard with smaller displays along the middle. The floor is intended to be made out of Ifit/Merbau decking to show a connection to the materiality of that Era.

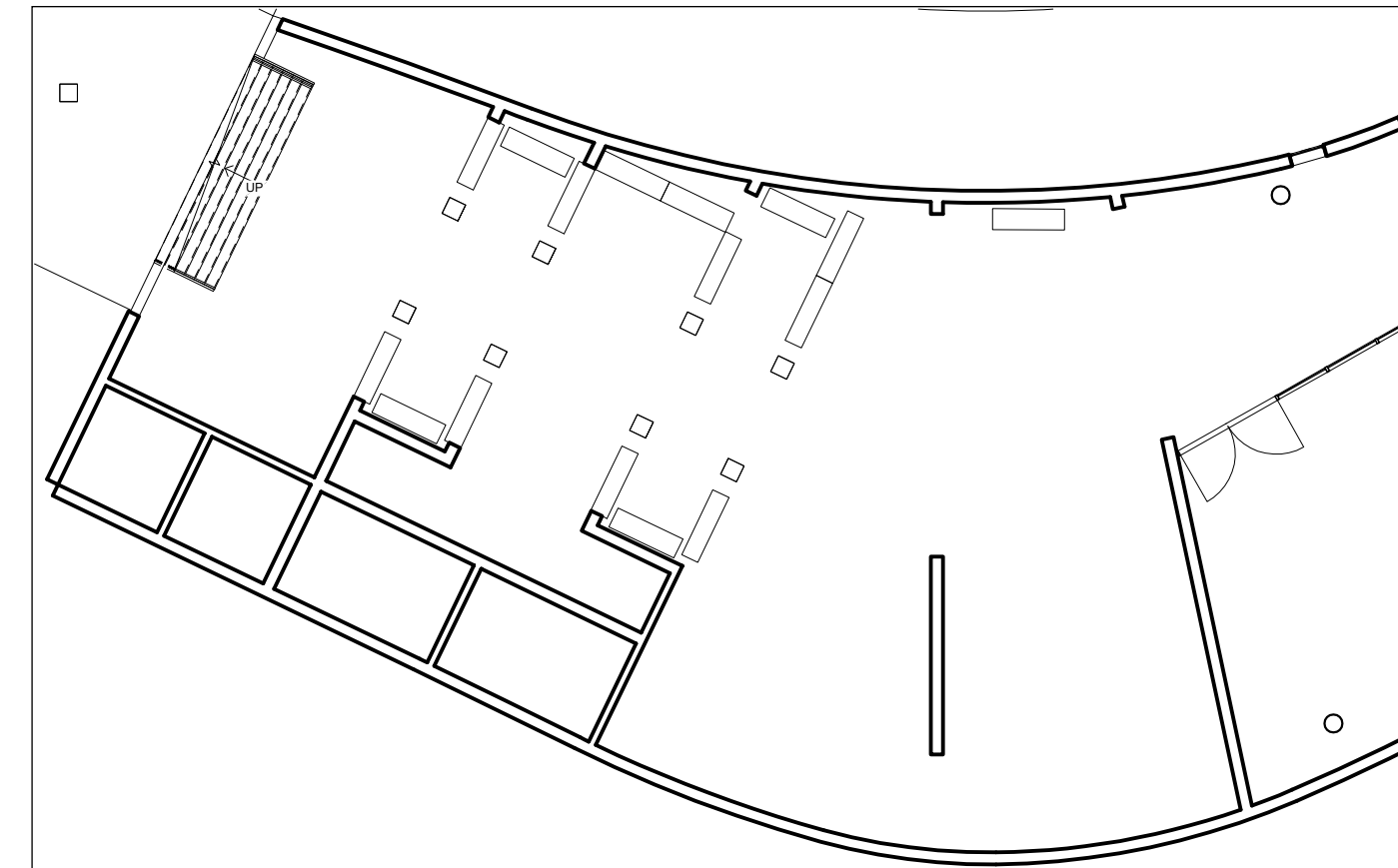


Gallery & Exhibition Space

spanish colonial inspired

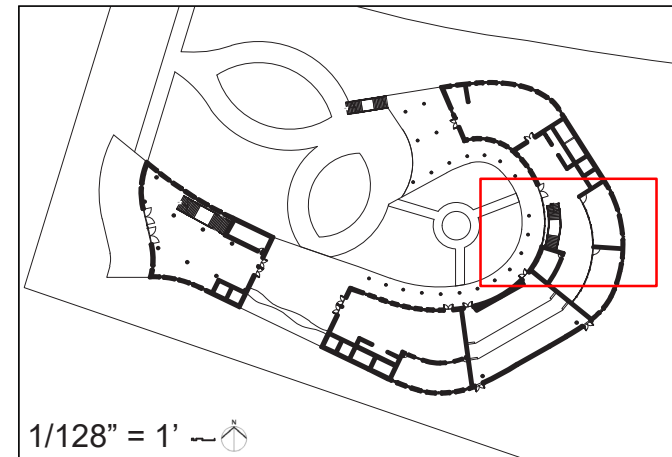


From the Sky-Bridge at the Mezzanine Level, guests descend down to the Gallery Space. Here, the décor imitates that of Spanish Churches during the Colonial Era. The space is defined by tan-stained walls, a dark wooden ceiling and a patterned floor. The space is divided into segments using archways that mimic the architecture of that time. Here, the display cases are arranged like church pews with a walkway down the middle to enforce the symmetrical nature of spaces at that time. The gallery is kept dimly lit in order to protect the paintings and sculptures on display. The space intends to slow the guests and allow them to enjoy the exhibition area.

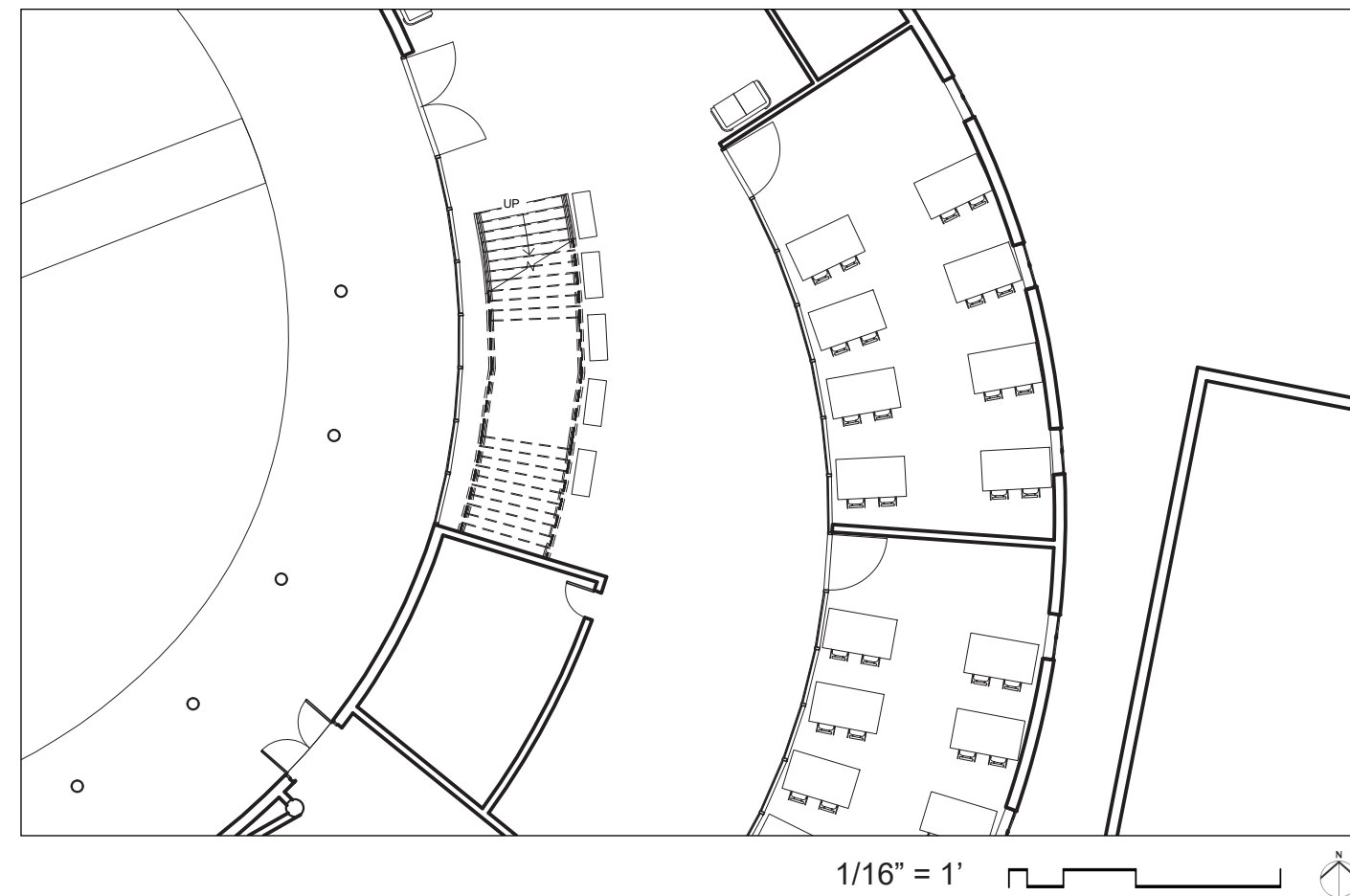


Classroom Area

united states / wwII inspired

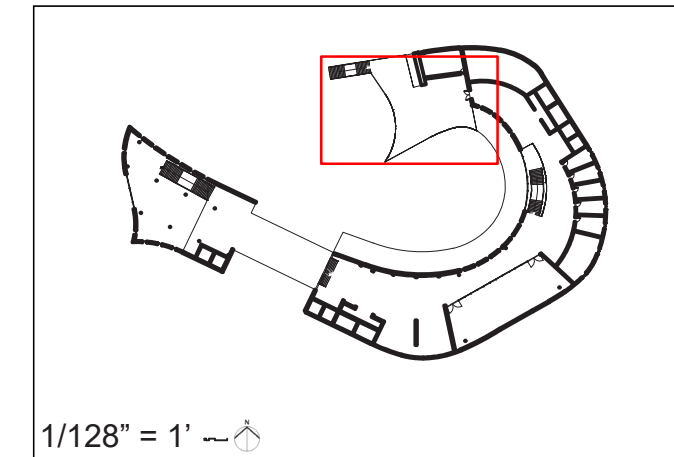


The Classroom Area is lined with curtain walls along the curve, providing tons of natural light that wash off the gray surfaces. The area is accessible either through the courtyard entrance, the bookstore or even from the Second Floor. The interior is defined by white-tiled floors, concrete walls and metal finishes to reference the pre-fab concrete homes and Quonset huts during the United States / WWII Era. The curved nature of the space is highlighted by the curtain wall and stair opening, mimicking the arched form of the Quonset hut. Here, guests can take classes on aspects of Chamorro culture like history and language.

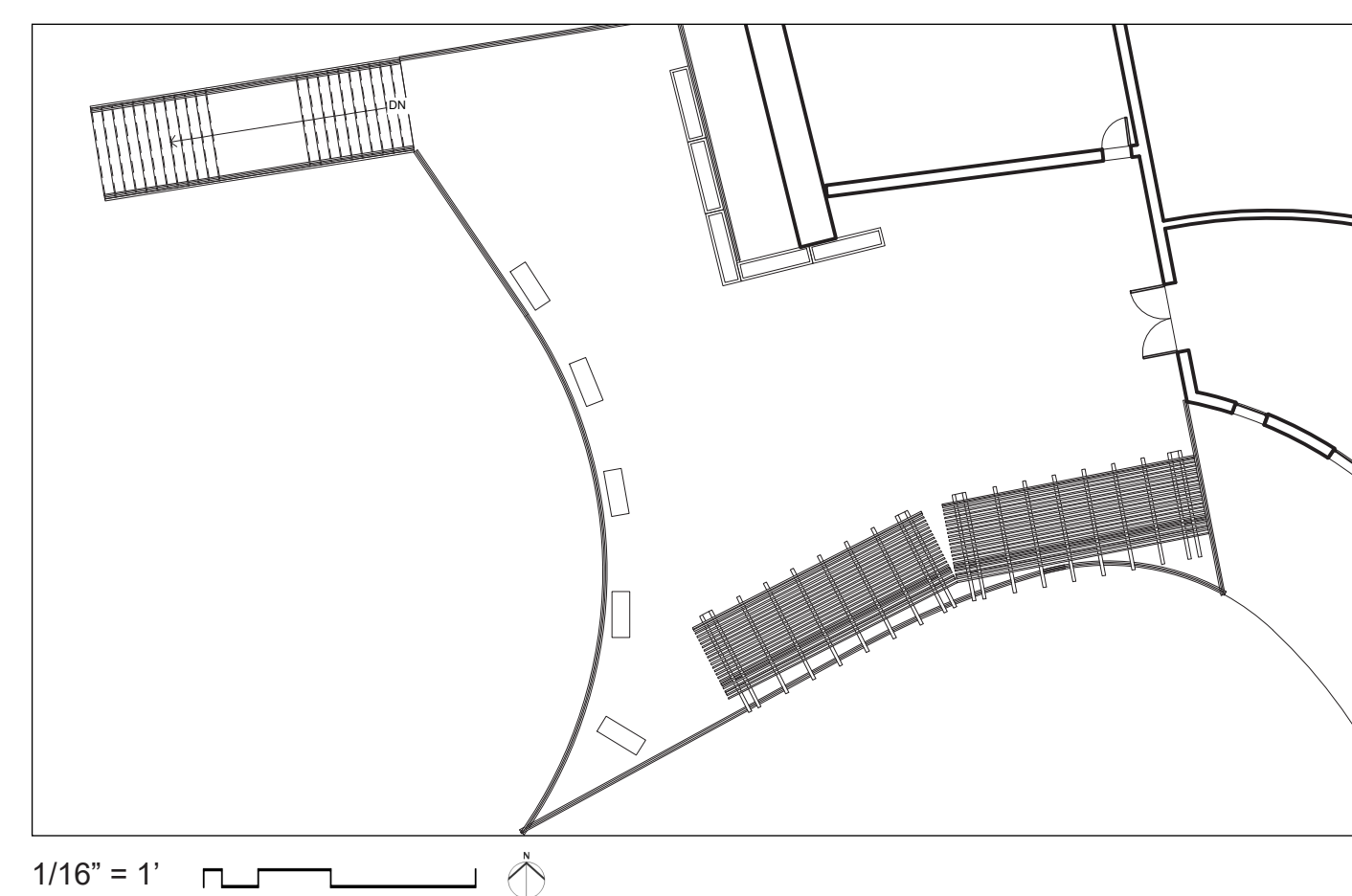


Outdoor Garden-Balcony

contemporary guam inspired



The Second floor of the Cultural Center concludes with the Balcony space, an open deck that provides views of downtown Hagatna and the exterior of the Cultural Center. Here, large pergolas and planter boxes fill the space, intended to house different local plants and vegetation. A wooden deck and benches warm the space with guests able to sit in the sun. The guests are surrounded by vegetation and the changing cityscape of Hagatna's urban fabric. The idea is to represent the shift of focus that is happening during the Contemporary Guam Era with more attention towards sustainability and urbanization.



Conclusion

Guam, the once isolated island virtually untouched from the outside world has withstood the test of time. Slowly, the world began to cave in with nations flocking to the island bringing their own people, ideologies and culture. The Chamorro people began a process of assimilation as a way of dealing with these external forces and adapting to their now changing world. This influence and adaptation is most clearly seen through the architecture of the island. Every building that stands represents a rich urban fabric that tells the story of how the island has progressed throughout time.

Each of these styles represents a period of Guam's history that tells a story of the social context of the island at that moment with something to be learned from each. The latte stone structures of the Ancient Chamorro Era

represent the indigenous people's relationship with nature, an interaction that promoted resourcefulness and ingenuity. The latte stones that come out of that era represent the knowledge of the Chamorro people and their ideals that they represent.

The mamposteria structures of the Spanish Colonial Era reflect the adaptability by the Chamorro people to their changing world. These people were now faced with new building types, new materials and a new form of architecture they had never seen before. Though these structures could not withstand Guam's traumatic climate, their existence represents the ways that Guam has managed to assimilate in a time of heavy cultural upheaval. Still, there is much to learn from these forms especially given their continued significance in Guam's history.

The temporary structures of the United States / WWII Era talk about how the island was able to quickly address pressing issues. The Quonset Huts and Kaiser Pre-fab homes represent an architecture out of necessity. Their construction efficiency, low cost and low maintenance speak to how the island was able to recover and rebuild during a time of extreme war and displacement.

Lastly, the introduction of concrete in the Contemporary Guam Era marked the beginning of a new shift of focus for the island. With most of the primary building and construction issues solved by the incorporation of concrete into Guam's main building material repertoire, the island now has the opportunity to pay closer attention to other worldwide issues such as sustainability, urbanization and westernization. The architecture that continues to come out

of this Era talks about the changing nature of the island as it plays a balance between the traditional and the innovative.

The Cultural Center aspires to represent each of these architectural styles and the rich spheres of influence that have shaped these Eras. My desire to design a Cultural Center with a strong link to the architecture of Guam's past is reflective of how the island's architecture is moving towards the future. Guam architecture has a story that needs to be told. By producing buildings that have ties to history, we can continue to tell this story and represent Guam architecture not just as a period of history but as an ever-evolving movement that continues to shape our lives and the way we build. It is my hope that the buildings to come will be designed in a way that speaks to the past with anticipation of the future.



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Figure 46 View of Hagatna from Fort Apugan

Glossary

Budega (Chamorro) – refers to the mamposteria storage area or cellar that formed the foundation.

de Silleria (Spanish) – a type of mamposteria that uses large, 4 rectangular hard-cut stones

Haligi (Chamorro) – a post used to support a building, or a fence

Ifit (Chamorro) – a type of tropical hardwood. Scientific Name: *Intsia Bijuga*. Commonly known as merbau in other parts of the world

Inafa' maolek (Chamorro) – Phrase that describes the Chamorro concept of restoring harmony or order. The literal translation is 'to make' (inafa) 'good' (maolek).

Latte (Chamorro) – two-part stone supports for important ancient Chamorro buildings.

Mamposteria (Spanish) – a stone and mortar construction, adapted from the Spanish building method

Tasa (Chamorro) – cup; the cap of a latte stone

Tabique (Spanish) – partition or wall composed of thin strips of wood or bamboo laths plastered over with mud, clay, or mortar.

Taotaomo'na (Chamorro) – the people of before; refers to ancestral spirits that inhabited the earth along with the living.

Teha (Spanish) – terra cotta; a barrel tile or curved roof tile.

Uritao (Chamorro) – Bachelor's House; houses for young Chamorro men in the Mariana Islands from ancient times until the late 1600's

Map of Guam



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Figure 47 Pacific Ocean at sunset
Figure 48: Village Map of Guam

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