

Kahana Sunset

Association Of Apartment Owners

MANAGED RETREAT PLAN



Prepared for The Association of Owners of Kahana Sunset
4909 Lower Honoapiilani Road, Lahaina, Hawaii 96761
Subject Parcel Tax Map Key (TMK): (2) 4-3-003:015.

KE KAI PLANNING LLC
JANUARY 19, 2024

This report can not be copied without the explicit approval from Ke Kai Planning LLC

Design and layout by Cyndi Reese

Cover photos courtesy of Kahana Sunset photo archives and website

INTRODUCTION

*Climate Change effect:
Warm oceans increase sea level rise,
Hotter temperatures increase the frequency of wildfires,
Water scarcity increases drought,
Increase in the wind intensity and rainfall
Affect us all.
There is no escaping Mother Nature.
We are all in this together.*

THE KAHANA SUNSET Managed Retreat Plan (MRPlan) aims to discuss in broad and general terms the concept of what Managed Retreat looks like for the Association of Apartment Owners of Kahana Sunset (AOAO).

Climate Change is a threat to Hawaii's economic well-being, public health, natural resources and the environment. Maui County (Maui, Lanai, Molokai, Kaho'olawe), Hawaii County (Big Island), Kauai (Kauai, Ni'ihau, Lehua and Ka'ula) and the City and County of Honolulu (Oahu) will all be affected. Climate Change and sea level rise will impact fresh water, ecosystems, soil moisture which will lead to drought and increase infectious diseases, storms, temperature, fires, wind events and the density of rain events.

What is managed retreat? What does it look like conceptually? How does managed retreat work? Is it possible to retreat in the face of climate change? Is managed retreat an Option or a Reward? Is managed retreat fair to the neighboring communities? Who are the winners and losers of managed retreat? What is the timeline of a Managed Retreat Plan?

Several things were apparent in writing this report: One, you cannot control nature. Although the marine environment may reclaim valuable land with sea level rise Maui's sandy beaches may not recover. Two, financially, managed retreat will cost taxpayers and landowners. Shoreline property owners will lose land as a financial investment. Three, more time and alternative/multiple solutions for managed retreat are required. Four, community and agency cooperation must occur.

While the MRPlan does not aim to answer the questions asked, the MRPlan tries to provide adaptation strategies for Kahana Sunset to manage retreat for structures threatened by coastal erosion and to address the effects of climate change and sea level rise within the framework of existing Federal, State and County laws.

— Dawn Hegger-Nordblom, Ke Kai Planning

EXECUTIVE SUMMARY

THE STATE OF HAWAII Office of Planning and Sustainable Development defines managed retreat as three main adaptation approaches: retreat, accommodation (adapting existing structures) and protection. Kahana Sunset has a long history of accommodation and hard protection. Much of this document is concerned with the F Building and its seawall, the A Building and its seawall, and the receding shoreline in Keonenui Bay. The F Building has been unoccupied for several years on the advice of Kahana Sunset structural engineers. A permit has been issued by the County to repair the structure of the F Building not for the purpose of occupancy and with the eventual intent of removing the building. Kahana Sunset is not alone — other resorts on West Maui and other islands in Hawaii will face similar problems. Kahana Sunset may be the first resort in Maui to submit a formal managed retreat plan and has diligently prepared a thorough and well documented plan.

The purpose of this document is to examine current issues, discuss managed retreat pathways and to develop a managed retreat plan that will help lead Kahana Sunset into the future. It will include available options, legislative discussion addressing climate change, current laws of condominium property regime, and future retreat pathways with an analysis of tasks to achieve each pathway goal. All this leads to the final stage of the report — the structure for a living strategic plan and the first set of tasks that Kahana Sunset will work on.

Fourteen short-term and long-term pathways are identified in this report. Kahana Sunset has developed its first living strategic plan that can be accomplished in three years, selecting tasks from various pathways. Each year Kahana Sunset will submit an annual report with updates. At the end of the term, a new 3-year living strategic plan will be created identifying new goals and timelines. This will be repeated until the managed retreat plan is no longer a viable program. As this report points out, “Retreat is done over years or a decade. It is not done in a year.” The Kahana Sunset board believes managed retreat could take longer than a decade.

After much discussion with current board members, it was thought that a 3-year strategic plan would target the solutions and phases that were doable; depending on funding from the working budget and owner assessments. It would also create a plan that can be passed on to future board members as elected members of the board change when terms expire.

There will undoubtedly be unforeseen and unanticipated delays and issues. The Kahana Sunset Board understands that goals and pathways will change as time passes, whether it be dictated by events of nature, support via legislative laws or possible funding from the government, emerging technologies and solutions, or new governmental policies. In consideration of unforeseen issues, the managed retreat plan is meant to be flexible and fiscally responsible.

— *Kahana Sunset Board*

TABLE OF CONTENTS

INTRODUCTION.....	i
EXECUTIVE SUMMARY	ii
CHAPTER 1 HISTORY.....	1
CHAPTER 2: PRESENT	5
Beach Access.....	6
Buildings And Amenities.....	6
Environment.....	9
Permits.....	11
Shoreline	11
Building F Repairs	16
Building A Repairs.....	17
State-Owned Land.....	19
Certified Shoreline	20
Neighboring Properties	21
CHAPTER 3 – MANAGED RETREAT	23
Accommodation Adaptation Approach.....	24
Accommodation Discussion.....	27
Protection — Adaptation Approach.....	28
Hard Protection.....	28
Hard Protection Discussion	30
Soft Protection Discussion	31
Managed Retreat Approach	36
Hawaii State Legislature.....	37
Climate Change.....	40
Coastal Hazards.....	41
Tsunamis	42
Coastal Erosion.....	42
Annual Erosion Hazard Rate Map.....	44
Shoreline Setback Area	45
Aerial Photographs.....	46

Sea Level Rise.....	46
PaclOOS State Of Hawaii Sea Level Rise Viewer.....	47
PaclOOS West Maui Wave-Driven Flooding With Sea Level Rise.....	49
PaclOOS Wave Run-Up Forecast.....	51
Public Outreach.....	52
Kauai County.....	54
Hawaii County.....	55
Maui County.....	56
Office Of Planning And Sustainable Development.....	56
Transfer And Purchase Of Development Rights.....	57
Leaseback Property.....	59
Land Exchange.....	59
Artificial Reef Installation.....	61
Biorock Installation.....	63
Federal Funding.....	63
Eminent Domain / Condemnation.....	64
Government Plans.....	64
State And County Laws.....	65
CHAPTER 4: MANAGED RETREAT PATHWAYS.....	71
HRS, Chapter 514B Condominium Property Act.....	72
Hard Protection.....	74
Building F.....	76
Building A.....	78
Beach Nourishment.....	79
Bay Stabilization.....	80
Utilities.....	80
HRS, Chapter 6E Historic Preservation.....	81
Shoreline Certifications.....	82
Archeological Resources.....	82
U.S. Fish And Wildlife Service.....	82
Community Input.....	83
Beach Access.....	83
Community Plan Amendment And Change In Zoning.....	84
Unforeseen And Unanticipated Delays.....	84

CHAPTER 5: KAHANA SUNSET LIVING STRATEGIC MANAGED RETREAT PLAN

2024-2026.....85

HRS Chapter 514B Condominium Property Act 85

Hard Protection..... 86

Building F..... 86

Building A 86

Beach Nourishment 87

Bay Stabilization..... 87

Utilities..... 87

HRS, Chapter 6E Historic Preservation..... 88

Shoreline Certifications 88

Archeological Resources 88

U.S. Fish and Wildlife Service..... 88

Community Input 88

Beach Access..... 88

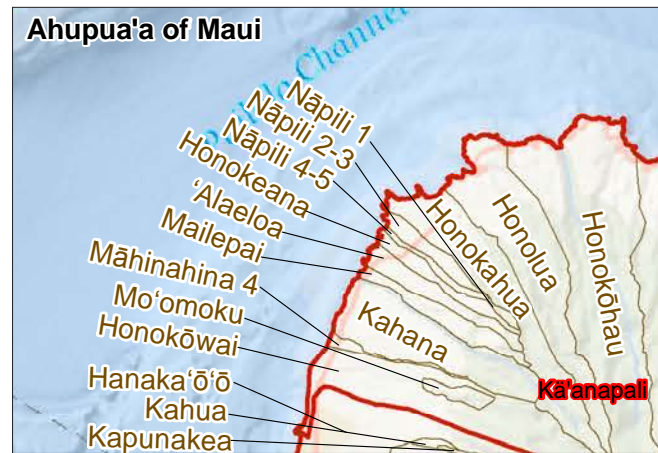
Community Plan Amendment And Change In Zoning 88

APPENDIX A: TOPO MAPS89

REFERENCES91

CHAPTER 1 HISTORY

The 2014 Kahana Sunset Shoreline and Site Improvements Final Environmental Assessment (2014 FEA Kahana Sunset), Cultural Impact Assessment (CIA) report noted the subject parcel and the area that surrounds it is enriched with Native Hawaiian history and culture. The subject parcel is located between 'Alaeloa Point and Haukoe Point and "the white sand beach fronting the subject parcel is called Keonenui or "the big sand" or Yabui Beach."



Twelve Ahupuaa in Maui
Source: Maui Nui Ahupua'a Project

The Civil Code of 1859 indicated "the twelve ancient districts of the island of Maui were reduced to four by combining Kā'anapali with Lāhainā..." Prior to this time, the district of Lāhainā extended to Keka'a, in the area that now is the Kā'anapali Resort. The district of Kā'anapali extended from Keka'a around the north coast of West Maui, past Kahakuloa, to near Hulu Island. Today, the subject property is located within the ahupuaa of 'Alaeloa in the district once known as Kā'anapali, but now known as Lāhainā.

The name 'Alaeloa translates as "distant mudhen" but some contemporary informants related the word "alae" to the area's red dirt. According to the Hawaiian Dictionary, 'alaea is "the water-soluble ah ono lecherous earth used for coloring salt, for medicine, for dye and formerly in the purification ceremony called hi'uwai."

Two Hawaiian proverbs apply to the Kā'anapali district. The first, Kā'anapali wāwae 'ula'ula (red-footed Kā'anapali), is "a term of derision for the people of Kā'anapali. The soil there is red, and so the people are said to be recognizable by the red soles of their feet." The second proverb indicated this was a productive area: Ka ua leina hua o Kā'anapali (the rain of Kā'anapali that leaps and produces fruit).

The area includes the famous Honoapi'ilani six bays of Pi'ilani: Honokōwai, Honokeana, Honokahua, Honolua, Honokōhau, and Hononana. The name for the bays refers to the high chief Pi'ilani who controlled all of Maui Nui in the 15th century. The bays were rich with fish, fed by streams that watered lo'i kalo in their valleys.

Several written songs celebrate the hono bays as a symbol of Maui. Moloka'i Nui A Hina begins with the line Ua nani nā hono a Pi'ilani or "How beautiful are the bays of Pi'ilani." Maui Nani by Johanna Koana Wilcox line Maika'i ah ono a'o Pi'ilani denotes "And the charming bays of Pi'ilani." Lei Lokelani by Charles E. Kingnote, I nā hono a Pi'ilani denotes "For the bays of Pi'ilani."

The area played a part in the great battles of the 1700's at Lāhainā and Kā'anapali. In Fornander's Account of the Polynesian Race:

[Alapa'inui, on his return from Oahu, hears of the uprising of Kauhaimokuakama against his brother Kamehamehanui. Kamehamehanui is defeated in Lāhainā and flees with Alapa'inui to Hawai'i.]

In the following year, say 1738, Alapa'inui returned to Maui with a large fleet, well-equipped, accompanied by Kamehamehanui. With headquarters at Lāhainā, his forces extended from Ukumehame to Honokōwai...

[Kauhi sends to Peleioholani, moi of Oahu, for help] ... which that restless and warlike prince accepted, and landing his fleet at Kekaha, encamped his soldiers about Honolua and Honokahua.

It is said that Alapa'i proceeded with great severity against the adherents of Kauhi in Lāhainā, destroying their taro patches and breaking down the watercourses out of the Kauaula, Kanaha, and Mahoma [Kahoma] valleys.

[Alapa'i reaches Lāhainā before I can get there from Oahu, and Kauhi retreats to the uplands and ravines behind Lāhainā. Pele'ioholani lands and attacks Alapa'inui's forces in the hopes that he can form a junction with Kauhi's forces.]

To this effect Pele'ioholani advanced to Honokōwai where he found a detachment of Alapa'i's army, which he overthrew and drove back with great loss to Keawawa. Here they rallied upon the main body of the Hawaii troops. The next morning Alapa'i had moved up his whole force, and a grand battle was fought between the Oahu and Hawaii armies. The fortune of the battle swayed back-and-forth from Honokōwai to near into Lāhainā.

Kamakau describes the battle in Ruling Chiefs. Alapa'i in addition to drying up the streams in the Lāhainā area also "kept close watch over the brooks of Olowalu, Ukumehame, Wailuku and Honokōwai." The hardest fighting, he says, "even compared with that at Nāpili and at Honokahua in Kā'anapali," took place at Pu'unēnē.

The Kahana settlement pattern in A.D. 1848 consisted of house lot and one (1) fishpond which extended several miles inland along the banks of Kahana Stream; no house lots were claimed beyond a few hundred feet inland. This pattern appeared for the next three ahupua'a to the north of Kahana – Mailepai, 'Alaeloa, and Honokeana. Research indicated for the three ahupua'a north two (2) Land Commission Award (L.C.A.) parcels with lo'i were recorded; both were very small presumably spring fed.

Detailed comprehensive population figures were not available for Hawai'i in the 1800s; there are Honokōwai figures which may include 'Alaeloa. The mission census of 1832 found 490 indi-

viduals living in Honokōwai. An 1878 Kingdom of Hawai'i census of Honokōwai indicated a total of 242 individuals lived in 32 hale visited by the enumerator and were engaged in agriculture — own kuleana or plantation worker.

The subject parcel itself is part of Land Commission Award (L.C.A.) 4807. A claimant named Nika received five apana under the claim number and received the land from his ancestors in the time of Kamehameha I and from "Kekana'i at the time of Hoapili in 1837, no objections." The parcels were in 'Alaeloanui and 'Alaeloai.

Honolua Ranch journals recorded land information indicated Nika and his son Kahopukahi deeded his portion of Nika land in Kahana to Lincoln M. Baldwin (1889), who then deeded these holdings to Henry Perrine Baldwin (1891). In Mailepai, lands identified as "purchased from Nika" ended up in the hands of H. P. Baldwin and became part of Honolua Ranch. H.P. Baldwin acquired most of the company's land (Honolua Ranch) by the end of the 19th century through a series of land grants and purchases.

LCA 4807 was one of the smaller parcels surrounded by the much larger lands controlled by Laura Kanaholo Konia (c. 1807-1857) who held 22 'āina prior to the Māhele, almost all on Maui in the Kā'anapali district. She relinquished half to the king and was left with eleven; eight were on Maui; 'Alaeloa was among them. With neighboring lands of Mahinahina, Nāpili, Mailepai and a portion of Honokeana, it became part of Land Commission Award 5524 and later Royal Patent 1663. When Laura Konia passed in 1857, her daughter Bernice Pauahi inherited her lands. State of Hawaii (State), Department of Land and Natural Resources (DLNR), Bureau of Conveyances (BUC) documents indicated Bernice Pauahi and Charles Bishop deeded the land to 106 owners known as the Hui 'Āina o Mailepai in June 1860.



*Kahana Sunset is located at bottom left of photograph
Source: University of Hawaii at Manoa Library Aerial Photo 1950 – 2000*

Baldwin Packers, the petitioner in the 1931 Mailepai Hui partition, eventually ended the hui as the land was partitioned into separate lots.

Honolua Ranch was renamed Baldwin Packers (1924) which then merged with Maui Pineapple Company (1962); grazing lands were replaced with pineapple and other crops early in the 20th century. The lands south of Honolua – the Mailepai Hui land and subject parcel were developed into residential and resort neighborhoods.

The Yabui home was on the site of Kahana Sunset. Keonenui Beach is also called Yabui Beach as Alan's grandfather Yoshimatsu Yabui, father Yoshihara Yabui, and Alan moved to the subject parcel. There are anecdotal stories from the past regarding the subject parcel mentioned in the report from informants: Alan Yabui, Joan McKelvey, Philomen Sadang, Emma and David Sharpe, Glenn Kamaka, Silla Kaina, Frances Kalua and Gwen Amaral Lutey.

Bikers riding from Honokahua to Kahana mentioned the route took them past the subject parcel owned by the Yabui family. Back then, the water always had the right-of-way to go through property and at this location water flowed through a culvert under the road and down the slope to the ocean. There is mention of an intermittent stream; a dip in the road crossed the stream bed that flowed during heavy rains.

It was possible a Native Hawaiian fishing village was located in the area due to found artifacts. Alan Yabui's grandfather dug up rocks which are now used in the walls around the Kahana Sunset which were weathered and dark-blue basalt, adze-quality stone that might have come from the village. There was also a post-contact dwelling in the area and with steps going down to the beach.

The bay was rich in marine life. Turtles, hukilau, akule and papio could be found in the bay. It was a breeding site for moi. Hukilau- type fishing events occurred near in the bay. People would lay net and share the fish they caught. There was also plenty of the limu known as lipe'e. The shellfish known as pipipi were big and plentiful.

Another shellfish, the kupe'e, lived in the sand and could be found only on starry nights; people went down to the beach to catch sand crabs as well.

Residents would collect red dirt from the 'Alaeloa cliffs which was boiled to make an iron-rich tea. The dirt from this ahupua'a is redder than that in other ahupua'a. The area was rural, traditional cooperative lifestyle; families lived off the land and raised chickens, pigs and duck.

CHAPTER 2: PRESENT



*Current photo of Kahana Sunset and public beach access to the right of Building F
Source: Kahana Sunset website*

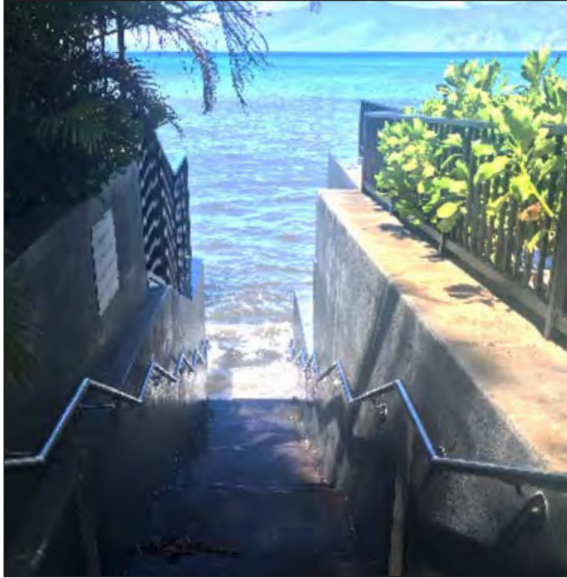
The Association of Apartment Owners of Kahana Sunset (AOAO) will be referenced as Kahana Sunset for the MRPlan report. Kahana Sunset is located on an irregular 4.47 acre shoreline subject parcel located at 4909 Lower Honoapiilani Road, Lahaina, island of Maui on Tax Map Key (TMK): (2) 4-3-003:015. Maui, Lanai, Molokai, and Kahoolawe are known as the Maui Nui Complex.

The subject parcel is located within the ahupuaa of 'Alaeloa (in the district once known as Kāanapali, but now known as Lāhainā). The subject parcel is located on the coastline northwest of the West Maui Volcano also known as the West Maui Mountains or Mauna Kahālāwai. The subject parcel is located between 'Alaeloa Point and Haukoe Point.

To the north of the subject parcel is the Door of Faith Church. To the south of the subject parcel is one single family residence (SFR). To the east of the subject parcel is Lower Honoapiilani Road. To the west of the subject parcel is the shoreline and Keonenui beach. Approximately 0.25 miles away is Maui County's Napili Fire Station and approximately 5.48 miles to the south is the Police Station. Approximately 7.76 miles to the south is Lahaina town. Pedestrian and vehicular access to the subject parcel is via Lower Honoapiilani Road.

BEACH ACCESS

In October 2013, the Maui County (County), Department of Planning (Department) approved a 250 linear foot beach access path and stairs located at the subject parcels southern end pursuant to SM1 2012/0003.



*Kahana Sunset public beach access pathway
Beach access steps leading to the ocean*



*Access path looking upwards to the gated entrance on
Lower Honoapiilani Rd*

Source: Ke Kai Planning Photo January 26, 2023

BUILDINGS and AMENITIES

In 1968, a Variance was requested from Meyer Ueoka to the Maui County Planning Commission (Commission). The request applied for the rezoning of the subject parcel from Residential to H-1. A hearing was held. The Variance was requested to permit the owners and developers to construct an apartment based on the provisions on the proposed A-1 zoning (not yet adopted). The owners and developers were restricted to a two-story modified building with a forty (40) percent density, club facilities, and one parking stall for every two units. Records indicated unanimous action taken by the Commission in approving a Variance requested by Kiyoshi Yabui et al. for the Construction of an Apartment Building with Accessory Uses at Mailepai, Lahaina.

Currently, Kahana Sunset is a multi-unit shorefront condominium complex which consists of six (6) detached wood-framed apartment buildings. Identified as Building A, Building B, Building C, Building D, Building E, and Building F they are cantilevered and elevated on the subject parcel. Each unit contains mountain/garden and/or shoreline ocean views. Units are individually owned by owners and lien holders and used as residences and/or as short-term vacation rentals. Overall, it is comprised of two (2) and three-story structures that encompass 79 units; sixteen (16) one-bedroom units and sixty-three (63) two-bedroom units.

Building A is two-story and contains ten two-bedroom units with 1106 square feet (SF) of living area and 308 SF of lanai. Building B is three-story and contains five one-bedroom units and eleven two-bedroom units. One-bedroom units have 700 SF of living area and 84 SF of Lanai. Two-bedroom units have 1,050 SF of living area and 392 SF of lanai. Building C is three-story and contains three one-bedroom units and eight two-bedroom units. Building D is three-story and contains three one-bedroom units and eleven two-bedroom units. Building E is three-story and contains five one-bedroom units and eleven two-bedroom units. One-bedroom units have 700 SF of living area and 84 SF of Lanai. Two-bedroom units have 1,050 SF of living area and 392 SF of lanai. Building F is two-story and contains twelve two-bedroom units which have 1,050 SF of living area and 392 SF of lanai.



Site plan of building locations

Source: Maui Exclusive Real Estate Websites



Kahana Sunset floorplans of 1 and 2 bedroom units



Source: Kahana Sunset photo archives

Separate from Buildings A through F is the 1,144 SF apartment and 785 SF offices and laundry room. Kahana Sunset’s unit owners and lien holders share in the cost of the common area elements such as the walkways, lanais, and open space lawn area, pool, restroom, outdoor shower, barbecue pavilion, and the Keonenui room (located under Building A).

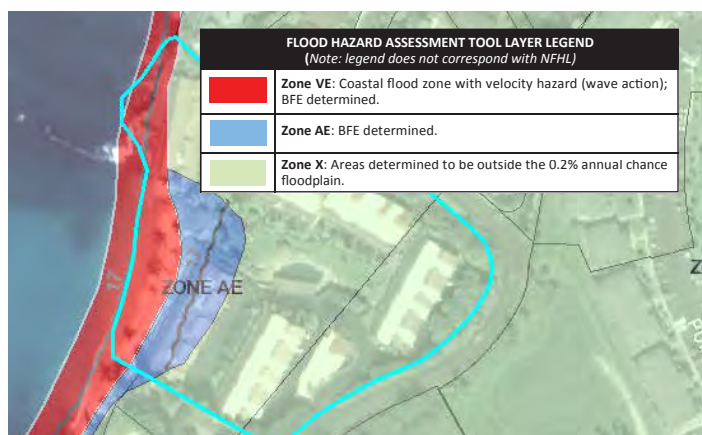
Approximately, forty percent of the total land area has been constructed. The paved areas constitute approximately 25 percent of the subject parcel. There are five parking lots approximately 39,700 square feet (SF). There is no assigned parking for the 103 parking. Two twenty-four-foot-wide driveways and access roadways cover approximately 11,500 SF. Building A and Building B share one parking lot and Buildings C, D, E, and F have parking located beneath the upper second story bedrooms. Parking is available next to Buildings G and L. The subject parcel can be accessed by emergency service vehicles and fire engines.

Topography located at the top of the subject parcel at the highest point is 49 feet above MSL. The subject parcel gently slopes downward with the existing contours of the land which is V- shaped. Parcel elevations are:

- Lowest Point: approximately 8 feet above Mean Sea Level (MSL)
- Highest Point: approximately 49 feet above MSL

The ground is generally sloping approximately 9% downward in a southwesterly direction toward the ocean. Kahana Sunset’s seawalls have an path in the middle which allows a pedestrian user to access the beach located 0 MSL.

The subject parcel is located in the State Land Use (SLU) Urban District, Maui Island Plan within the Urban Growth Boundary and Outside Protected Areas, Community Plan Single Family and Open Space, County Zoning is R-3 Residential District, Special Management Area, Flood Zones: VE, and AE and X with a Base Flood Elevation of 17 feet. The subject parcel is located in the Special Management Area (SMA).



Flood Hazard Assessment Report

www.hawaiiifip.org

KAHANA SUNSET 2.7.2023

Property Information

COUNTY: MALUI
 TMK NO: (2) 4-3-003.015
 WATERSHED: KAHANA
 PARCEL ADDRESS: 4909 LOWER HONOAPILANI RD
 LAHAANA, HI 96761

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 04, 2015
 LETTER OF MAP CHANGE(S): NONE
 FEMA FIRM PANEL: 1500030264F
 PANEL EFFECTIVE DATE: SEPTEMBER 19, 2012

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: YES
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://dlnreg.hawaii.gov/dam/>

Notes:

Flood Hazard Assessment Report for Kahana Sunset
 Source: State of Hawaii, Flood Hazard Assessment Report February 7, 2023

ENVIRONMENT

The MRPlan used information from Final Environmental Assessments (FEAs) from the adjacent Kahana Sunset shoreline landowners: the 2002 Lusardi Residence Seawall Repairs, the 2012 Walter Hester Slope Retaining Wall Project, the 2013 Schweitzer Shoreline Erosion Control and the 2014 Final Environmental Assessment. Proposed Kahana Sunset Shoreline and Site Improvements (2014 Kahana Sunset FEA).

The 2014 Kahana Sunset FEA's Wave Climate Study for Kahana Sunset (2011) noted the subject parcel is subject to north swells and trade wind waves that reach the shallow shelves, headlands and fringing reef. South swells do not affect the region. Kahana Sunset experienced problems with chronic beach erosion and wave over wash of the seawall foundations and other coastal fortifications along the coastline.

Trade wind waves (east and northeast) prevail most of the year. Because of the oblique incident angles to the shore, refraction typically reduces the height of the wind waves to 1 meter (3 feet) or less before reaching the reef (located 1 km seaward). Wind waves do not usually present a coastal hazard.

Past computer simulations conducted in 2011 of two swell events indicated that major swell event(s) from the north can produce waves large enough to inundate the shoreline fronting the property and scour the seawall foundation. The uneven wave height and oblique wave direction at the shore generated a clockwise circulation in the embayment, that together with wave actions eroded the beach fronting the property. A moderate swell (in contrast) might not be an erosion hazard but was sufficient for the surge to reach the seawall foundation and caused over time erosion and undermining of the seawall.

The report further noted "northwest approaching waves and the wave height gradient along the shore, drive a net current to the south creating a clockwise mean flow in the embayment... the net current reaches 0.66 m/s (1.98 ft/s) along the beach fronting Kahana Sunset condominium." This net longshore current is the main mechanism for erosion of the beach during peak swell events. Since the southern portion of the embayment is steep, the sand eroded from Keonenui Beach is transported and deposited in the reef channels in the embayment.

Simulated results for waves from a moderate swell event with smaller wave heights and shorter periods confirmed that these waves followed the channels in the reef system and were refracted to a greater extent closer to the coast and approached the shore normally. A moderate event created a maximum wave set up of 0.12 feet along the shore and caused inundation up to of 42 feet inland. While the events might not present a beach erosion hazard, the surge reaching the seawall could cause erosion and undermine the seawalls footings over time. The moderate swell generated a maximum net current of 1.56 ft/s along the shore; the flow pattern was not

well defined and unlikely to cause a net transport of sand in the offshore direction. Turbidity was higher at the bay's southern end with waters clearing in the central and northern portions.

Keonenui bay consists primarily of sand in the middle with coral, limestone and rock located along the perimeter. A reef system extends 1 kilometer (km or 0.62 miles) offshore. Beach sand was extremely erodible and shifted constantly under tidal action. Isolated basalt outcrops were normally covered with limu (seaweed). The DLNR, Division of Aquatic Resources (DAR) noted the waters around the islands are known habitats for the Hawaiian monk seal and the green and hawksbill turtles.

Land inland of the seawall is underlain with a soil horizon composed of coralline sand assigned to the Jaucas series; these soils have a low expansion potential and a low corrosion potential to uncoated steel and concrete. For land located behind the seawall the erosion hazard due to water is considered slight. Susceptibility to wind erosion is considered severe if vegetation is removed. Test borings taken below the zone of seawall's backfill profiles (at and below the seawall's foundation level) suggested the lower zone of sand reached a maximum depth of about 23 feet; below was a solid basalt rock platform.

Survey results from the area of the sea cliff disclosed superficial soils composed of a gray-brown, moist, medium-stiff to very stiff clayey silt (Unified Soil Classification: MH) to a maximum depth of at approximately five feet. Below the superficial soils, the borings encountered gray-brown, highly weathered and fractured, moderately strong basalt to the maximum depth explored at approximately eight feet. Regarding sea cliff stability the basaltic lava flows are characterized by sets of nearly vertical joints that form irregular prismatic columns. These vertical joints are usually intersected by sets of fractures oriented in horizontal planes; the rock mass is actually composed of multiple blocks of different size(s). Sea wave surges and erosion of the gunite sea cliff face may hydraulically pluck the exposed, weaker blocks. Once quarried, it will remove support from additional overlying blocks. The blocks lack of support may remain in an overhanging position for short periods only until the friction along the columnar joints is released. Sea caves caused by hydraulic churning at the cliff's base may remain stable due to the rocks arching capability. However, the arching support can fail (suddenly) and cause the formation of higher and narrower ceilings.

The wall backfill and foundation soils were exceedingly permeable, therefore transient ground water levels at or above the foundation level can be expected in response to irrigation, rainfall, tidal changes and/or a combination of all the above. No free groundwater was observed in borings drilled along the edge of the sea cliff. Stabilized ground water levels were measured between depths of six and half feet to nine feet below grade.

The northeast trade winds are the predominant winds in the Hawaiian Islands. During the summer months of April through October trade winds occur 80 to 95 percent of the time with average wind speeds of ten to twenty miles per hour (mph). Tradewinds are present during the winter months of November through March although southerly Kona winds or Kona lows, associated with local low-pressure systems, may occur ten percent annually. Kona lows wind can range from light and variable to gale strength and are usually accompanied with unusually heavy rainfall and/or flash flooding.

Tides are semi-diurnal in nature, with pronounced diurnal inequalities (i.e., two tidal cycles per day with the range of water level movement being unequal). The National Oceanic and Atmospheric Administration's (NOAA) tide predictions data (Highest Tide, Mean Higher High Water, Mean High Water, Mean Tide Level, Mean Low Water, Mean Lower Low Water) tide prediction tables compute tides for the state. The values are referenced to the Mean Tide Level datum, which is equal to Mean Sea Level.

The MRPlan looked for critical habitats within the project area under the U.S. Fish and Wildlife Service jurisdiction; there are no critical habitats within the project area (January 30, 2023).

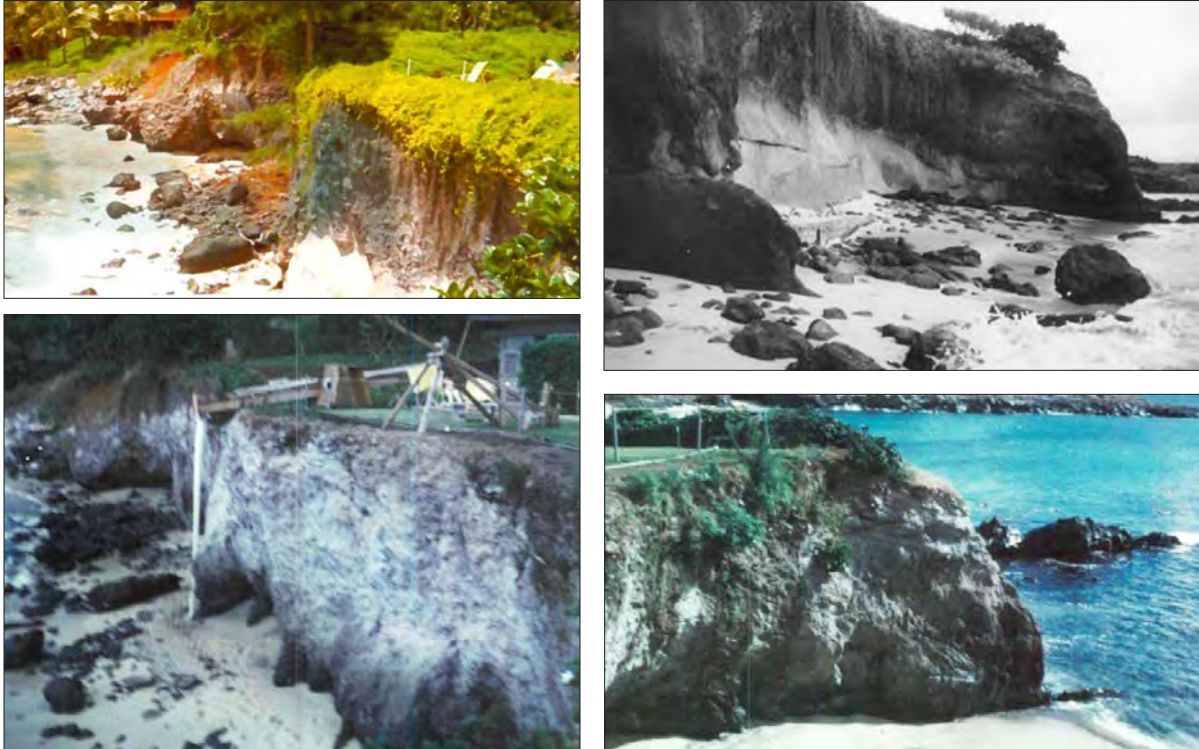
PERMITS

Since Kahana Sunset is and was subjected to coastal hazard erosion and seasonal high surf, permits were required from federal, state and county agencies. Available records were used to create a timeline of permits and approvals issued by the State of Hawaii (State), Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) (formerly Office of Conservation and Environmental Affairs (OCEA) of Conservation District Use Application (CDUA), correspondences and Site Plan Approvals. The DLNR, Land Division issued Right of Entry (ROE), Easement and correspondences. The Department of Accounting and General Services (DAGS), Land Survey issued correspondences and Shoreline Certification Maps. The Department approved the FEA, and issued Shoreline Setback Applications (SSA), Special Management Area Permits (SMA), Shoreline Setback Variances (SSV), and correspondences. The Public Works Department approved an Emergency Coastal Zone Management Determination and Emergency Permit.

SHORELINE

April 1974 — a shoreline erosion protection system was constructed to prevent wave action from undermining the shoreline and various cave formations were filled with concrete. An USACE After-The-Fact (ATF) permit was issued (June 1977). The DLNR requested After-the-Fact (ATF) approval, but no Conservation District Use Application (CDUA) was filed.

April 15, 1975 — the Department approved the construction of the concrete sea/retaining wall pursuant to Shoreline Setback Rules, Section 13(a). The Department noted Kahana Sunset needed measures to stabilize the shoreline by diverting storm runoff from ground surface(s) and (the) adjacent building. A permanent and appropriate solution for the proposed retaining wall was required.



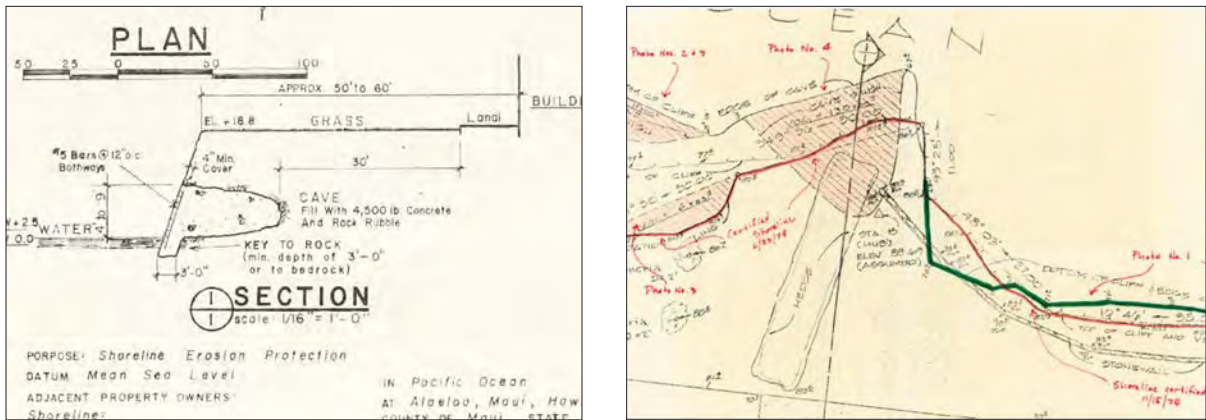
Pictures of cliff fronting the A Building

Source: DAGS Land Survey Certified Shoreline (1974, 1978) and DLNR OCEA CDUA MA-107 Files

August 3, 1978 — the Department and the Public Works Department approved a reinforced concrete erosion protection system pursuant to an Emergency Coastal Zone Management Determination and Emergency Permit pursuant to Section 18 of the Interim Coastal Zone Management (CZM) Rules and Regulations of the County. The cliff face site was undermined due to seasonal high waves; there was imminent substantial harm to the public health, safety, and welfare due to the potential for the structures collapse. Approximately, 147 cubic yards of 4,500 pounds of concrete and rock rubble mixture reinforced with steel bars was utilized. The undermined area had penetrated beneath the lawn and within forty feet of Building A.

August 31, 1978 — the Department approved an erosion control project to place approximately 65 cubic yards of concrete on an eighteen foot high bank face to control undermining pursuant to Section 12A of the Interim Coastal Zone Management Rules and Regulations of the County of Maui.

October 13, 1978 — the State Board of Land and Natural Resources (BLNR) approved CDUA MA-8/2/78-1077 for a shoreline erosion protection system on the subject parcel's northern portion. Approximately, 147 cubic yards of 4,500 pounds of concrete and rock rubble mixture reinforced with steel bars filled three (3) cave formations that had eroded due to tidal and wave actions and threatened Building A's foundation. The report noted no evidence of historical, archaeological, or geographical feature would be significantly affected.



Plans for the Shoreline Erosion Protection and 1978 Shoreline Certification



Shoreline at south end of A Building
Source: DLNR, OCCL CDUA MA-1077

June 30, 1997 — the Department approved the repair to the existing wall pursuant to SM5 960005 and SSA 960002.

January 13, 2003 — the Department approved the repair to the seawall to prevent harm to the public safety and welfare pursuant to SM3 2003/0001 and SM3 2003/0002.

April 26, 2012 — the Department approved to stabilize the bluff and a portion of the seawall pursuant to SM2 2012/0051 and SSA 2012/0029. Overhanging material contributed to the slope/bluff failure and seawall portion fronting Building A. Approximately, 100 cubic yards of soil, clay and basalt material were removed, and the slope was capped with gunite.



Finished A Building bluff and cliff



*Cliff fronting northern end of A Building
Source: DLNR, OCCL CDUA MA-1077*

October 3, 2013 — the Department approved the removal of shoreline encroachments (concrete rock, stair structure) and seawall repairs to Building F pursuant to SM3 2013/0003. A portion of seawall attached to Building F's lanai had undermined and the sand substrate loss created was an approximately 600 foot cavity. Boulders and shotcrete were utilized. The Department approved the beach access project pursuant SM1 2012/0003.

April 25, 2014 — the Department approved the FEA for Kahana Sunset pursuant to SM1 2012/0003, SSV 2012/0002, Community Plan Amendment (CPA) 2012/0003 and Change in Zoning (CIZ) 2012/0007. The existing seawall and stairway were removed, and a 125 linear foot seawall constructed. Landscaping, drainage and two retaining walls were installed. The FEA was submitted as part of the SMA emergency permit for Building F (2009) and Building A (2010) and addressed the Commission's (2009) request for strategic retreat master plan. The CPA request from Multi-Family to Hotel and CIZ request from R-3 Residential to H-M Hotel District is required by HRS, 205A Coastal Zone Management (CZM). Kahana Sunset is classified as Hotel and Resort by the County's Real Property Tax Division and pays the associated tax rate. The requests will bring the entitlements into consistency with the existing and historical use of the property as a resort condominium.

The pictures below show the before/after drainage issues into Keonenui Bay that were addressed by Kahana Sunset in conjunction with the County to fix past drainage issues from the neighboring property. Kahana Sunset ultimately redid the drain system to capture sediment runoff. There is an existing Drainage System that consists of SDMH/Drywell, Intake/Drywell, Drain Inlet, Cobbled Open Channel, (DS) Downspout, and ESD Existing Storm Drain.



*Flowing water from Lower Honoapiilani Rd into the storm drain
Source: Kahana Sunset photo archive (2011)*



*County repairs showing the new drainage system from Lower Honoapiilani Rd to the existing storm drain
Source: Kahana Sunset photo archive (2023)*



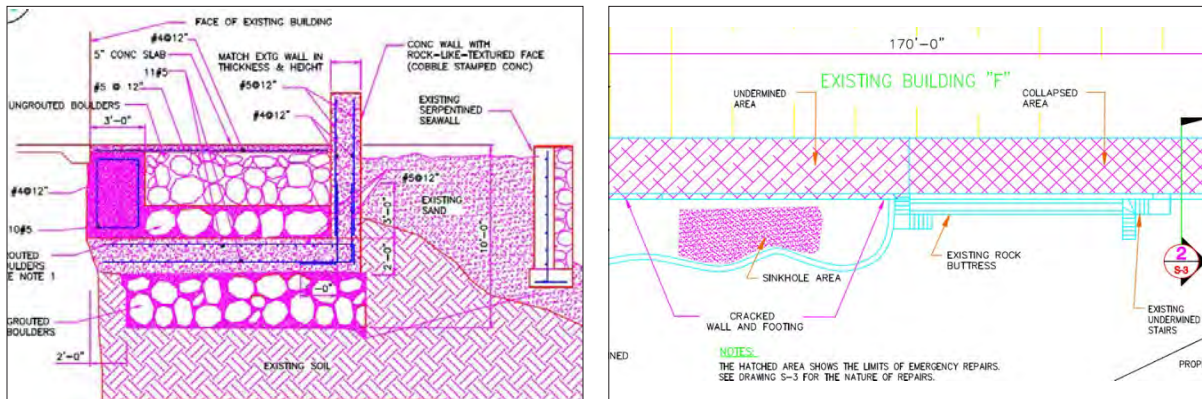
*Storm drain prior to 2015
Source: Kahana Sunset photo archive (2011)*



*Completed storm drain repairs
Source: Kahana Sunset photo archive (2023)*

BUILDING F REPAIRS

December 29, 2009 — the Department approved emergency protective measures to repair Building F's foundation and seawall pursuant to SM3 2009/0005. The foundation was undermined and in danger of collapse due to ongoing severe wave action during December 2009's large wave episode and created a 60 feet long sinkhole. The building was evacuated due to the threat to life and safety and the units vacated until Building F's foundation was stabilized.



Approved emergency plans for F Building seawall and foundation



F Building sinkhole from December 2009



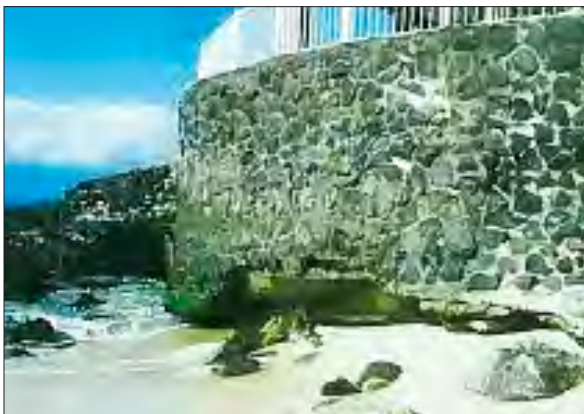
*Workflow process repairing the F Building lanais
Source: AAA Structural Engineering Repairs and Building 2010 File*

June 19, 2023 — the Department approved repairs to Building F's foundation pursuant to SM52023-000114 and SSA 2023-00022. The repairs will maintain the structural integrity and secure the foundation from movement via a support grid of micro piles tied together with a surface lateral concrete structural beam. Building F exhibited signs of potential structural failure; the health and safety of the occupants and beach goers was a concern.

BUILDING A REPAIRS

February 4, 2010 — the Department approved emergency protective measures to repair to Building A's foundation and adjacent seawall pursuant to SM3 2010/0001. The undermined foundation was in danger of collapse due to ongoing severe wave action during December 2009's large wave episodes; an eight-foot cavity formed under the seawall and Building A's support wall. The building's occupants were evacuated due to the threat to life and safety and the units vacated until Building A's foundation was stabilized.

June 15, 2010 — the DLNR, Land Division, Maui Branch granted a ROE to access state-owned lands to conduct emergency protective measures and to repair Building A's foundation and seawall.



A Building seawall below the Keonenui Room



Seawall adjacent to the A Building

Source: Structural Engineering and DLNR, OCCL Files



Kahana Sunset sandbags and removal of sandbags

Source: DLNR, OCCL Emergency Permit MA-17-29 and AAA Structural Engineering Files

July 12, 2018 — the Department approved repairs to Building A's Keonenui Room pursuant to SM5 2018/0139 and SSA 2018/0029. Eight foundation columns were installed as a secondary structural column system near existing CMU foundation columns. The Department asked Kahana Sunset to view the Hawaii Sea Level Rise Viewer and to discuss managed retreat out of the shoreline setback area as the subject parcel will be subjected to predicted SLR.

September 15, 2021 — the Department approved a staging area in the shoreline setback area to remove the sandbags fronting Building A pursuant to SM2 2021/0077 and SSA 2020/0069.

July 13, 2023 — the Department approved repairs to the sinkhole and column repairs to Building A pursuant to SM32023-00006. The column repairs will provide structural integrity to Building A. Approximately, 120 cubic yards of Low Strength Material (CLSM) will be used to fill in the sinkhole. Column work will provide support to Building A.

STATE-OWNED LAND

Kahana Sunset worked with the DLNR, OCCL to remove on state-owned lands the following: the serpentine wall and concrete stairs (Enforcement MA-09-24, MA-10-9), a 609 square foot concrete revetment, CRM retaining wall and concrete footing (Enforcement MA-12-06), and stairs and seawall buttress (footing) (SPA MA-14-9).



F Building serpentine seawall and beach prior to 2009

Source: DLNR, OCCL Field Visit 2010 File



*F Building serpentine seawall and beach prior to 2009 — steps encroached on state property and were removed
Source: DLNR, OCCL Field Visit 2010 File*

Kahana Sunset worked with the DLNR, Land Division Maui Branch to grant a Right-of-Entry Permit to access state-owned land shoreline area seaward of Kahana Sunset for: data collection fronting Building F (2005), emergency repairs to existing seawall and removal of rock and concrete stairways (2013), and the removal of sandbags (2017, 2022). Since 1978, the State BLNR granted Revocable Permit No. S-5117 to the Lokelani Condominium Owners Association for 339.92 square feet of state-owned land.

CERTIFIED SHORELINE

The certified shoreline establishes the jurisdiction between the County's SMA and the States Conservation District. The following Hawaii Administrative Rules (HAR) and Hawaii Revised Statutes (HRS) regulate the shoreline certification process:

- HAR, Section 13-10-222 SHORELINE CERTIFICATIONS,
- HRS, Section 171-53 RECLAMATION AND DISPOSITION OF SUBMERGED OR RECLAIMED LANDS,
- HRS, Section 171-55, PERMITS,
- HAR, Chapter 3-40 RULES GOVERNING PUBLIC USE OF THE LAND SURVEY DIVISION MAPS, DESCRIPTIONS, AND RECORDS, AND SCHEDULE OF FEES FOR SERVICES, MAPS, AND OTHER RECORD DATA.

The State Department of Accounting and General Services (DAGS), Land Survey, Certified Shoreline Maps for the subject parcel indicated two (2) Certified Shoreline Maps dated November 15, 1974 and June 23, 1978. Two Shoreline Surveys were submitted (May 2, 2009 and July 1, 2011). Due to encroachments (CRM walls and stairs, concrete, geotextile sandbags, drainage culvert, concrete revetment) identified on state-owned lands the applications were not processed.

On June 19, 2023, the Department approved SM52023-000114 and SSA 2023-00022 and requested a Certified Shoreline Maps for Kahana Sunset. Per that request Kahana Sunset submitted the Shoreline Certification Application form to be processed by the State DLNR, Land Division (July 2023).

NEIGHBORING PROPERTIES



Aerial view of Kahana Sunset neighboring properties prior to 2020
Source: Google Earth website



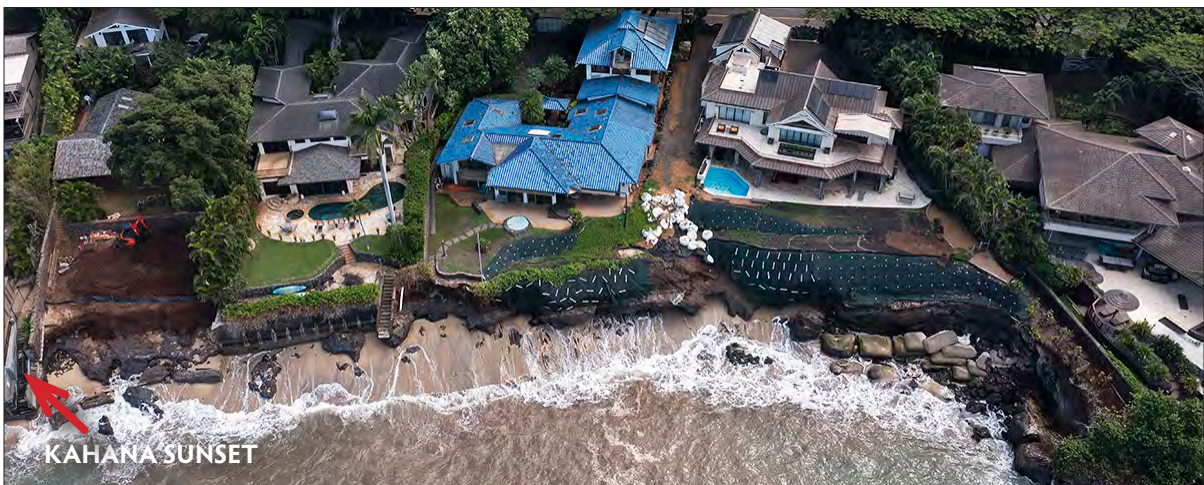
Source: Kahana Sunset website



*Aerial photo of Keoninui Bay
Source: Don McLeish December 2022*



*Seawall repairs made by neighboring properties during high wave surf event
Source: Don McLeish January 2021*



*Aerial view of neighboring properties and attempts to mitigate erosion and stabilize property
Source: Don McLeish December 2022*

CHAPTER 3 – MANAGED RETREAT

In 2009, the Commission requested that Kahana Sunset submit a Strategic Retreat master plan as a condition of SM3 2009/0005 and SM3 2010/0001. In 2022, the Council asked Kahana Sunset for a draft Managed Retreat Plan. In 2022, the Department provided a managed retreat plan for a neighboring resort to Kahana Sunset to use as a template for managed retreat. On June 19, 2023, the Department approved SM52023-000114 and asked that the draft Managed Retreat Plan be forwarded to the Department by October 2023. Delays were encountered due to the Lahaina fire on August 8, 2023 and an extension was submitted to extend the deadline to December 2023. The draft Managed Retreat Plan is a necessary step for Kahana Sunset to complete the CIZ and CPA to meet consistency with the Community Plan, Maui Island Plan and Zoning.

The Department noted “managed retreat” is defined herein as a purposeful action that relocates structures and infrastructure away from vulnerable coastal areas. The National Oceanic and Atmospheric Administration (NOAA) noted,

Managed retreat typically involves establishing thresholds to trigger the demolition or relocation of structures threatened by coastal hazards or sea level rise. This approach is frequently coupled with several other planning and regulatory techniques including: shoreline planning, to identify high-risk areas where this type of policy would be the only cost-effective, long-term solution; regulating the type of structure allowed near the shore to ensure that buildings are small enough and constructed in a way to facilitate relocation when needed; and instituting relocation assistance and/or buy-back programs to help with relocation costs or compensate property owners when their property becomes unusable.

The State’s Office of Planning and Sustainable Development (OPSD), CZM 2019 Final Report Accessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas in Hawaii (2019 OPSD CZM Report) noted,

Managed retreat analysis is a necessary component of climate change adaptation policies. Adaptation, whether through accommodation, such as elevating homes, or protection, such as hardening or beach restoration projects, may not be sufficient and retreat may need to be considered. Managed retreat essentially means shifting development inland from the coast either by the physical movement of structures or changing the restrictions and management of Hawaii’s coastal areas...Retreat is one of three main adaptation approaches to sea level rise and other coastal hazards. The other two are accommodation and protection. Accommodation involves adapting existing structures and systems to allow them to better withstand changing conditions. An example of accommodation is elevating a structure on piles to greater tolerate more extreme wave

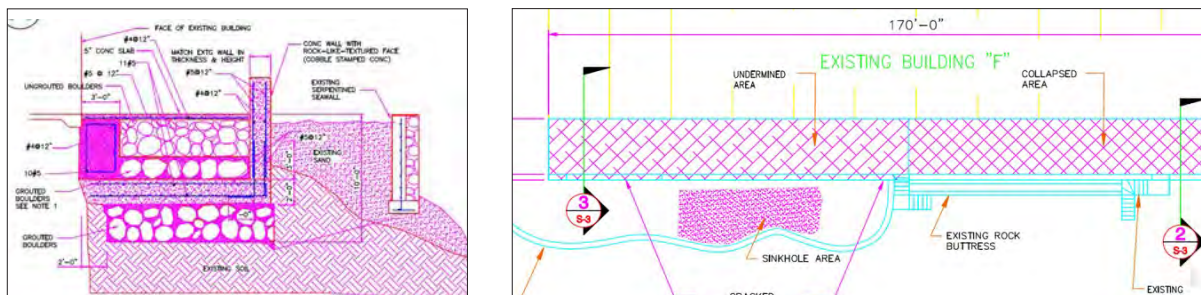
inundation. Protection strategies include both hard and soft solutions. Hard methods of protection safeguard an area or a system in its existing location to withstand impacts from changing conditions. Examples of hard protection include seawalls, rock revetments and other hard structures to hold back the advance of the sea. Beach nourishment is an example of a soft protection solution...both accommodation and protection...require ongoing maintenance and may eventually fail and need to be repaired. As such, they may only be temporary solutions...

The report's goal was to achieve a plan to help implement managed retreat for areas in the state threatened by sea level rise and/or other coastal hazards. However, the report "recognized retreat was not a simple task which may be easily accomplished." The report noted that questions varied from when to utilize managed retreat versus accommodation or protection? What should be retreated versus the rights of private property owners, infrastructure, or coastal resources? What are the financial/monetary costs/tax implications? Who is responsible for shouldering the financial burden of managed retreat? Is managed retreat the responsibility of the landowner, government or it is a public-private partnership? Should government land be utilized to in retreat? What legal issues surround retreat — rebuilding restrictions, structure removal requirements, acquisition and buyout programs, conservation easements, rolling easements, etc.?

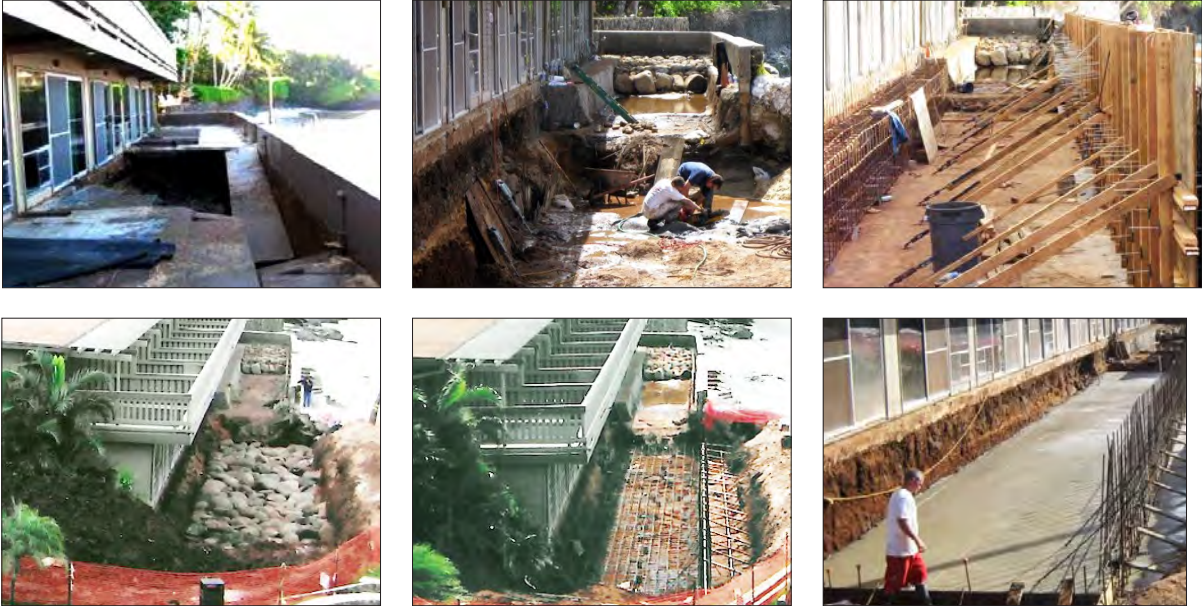
ACCOMMODATION ADAPTATION APPROACH

The 2019 OPSD CZM Report noted, "accommodation involves adapting existing structures and systems to allow them to better withstand changing conditions." The report further noted accommodation requires ongoing maintenance and may fail and require further repairs.

Accommodation as an adaptation approach was utilized for Building A and Building F to allow them to withstand changing conditions. In 2009 and 2010, the Department approved emergency protective measures to repair the buildings foundation and adjacent seawall (SM3 2009/0005) (SM3 2010/0001). Both buildings were in danger of collapse due to ongoing severe wave action of December 2009's large wave episode. The buildings were evacuated and the units vacant until the foundations were stabilized.

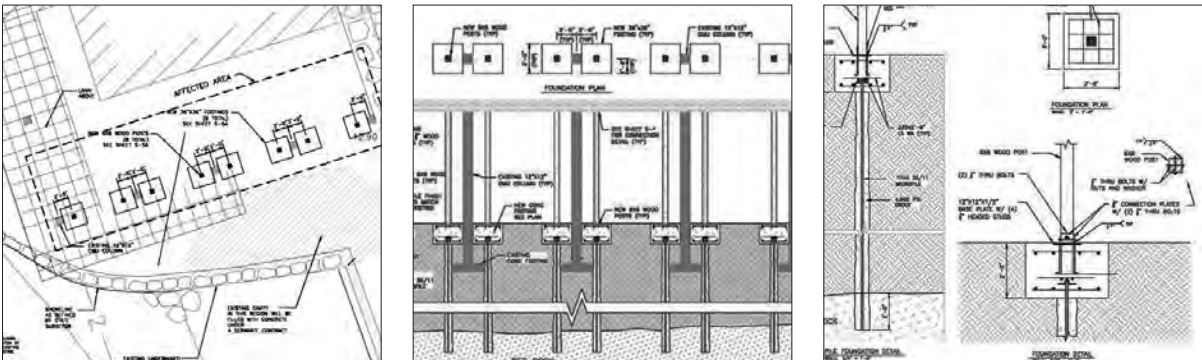


*Approved emergency plans to protect the F Building foundation and adjacent seawall
Source: Kahana Sunset Building F Photos March 2010*



Repairs being made to the F Building and seawall
 Source: Kahana Sunset Building F Photos March 2010

In 2017, the Departments approved SM5 2017/0126 and the DLNR, OCCL approved Emergency Permit MA-17-29 to repair to Building A's foundation and sinkhole with concrete. In 2018, the Departments approved SM5 2018/0139 to repair Building A's Keonenui Room. Eight foundation columns were installed as a secondary structural column system strengthening Building A structure with the actions.

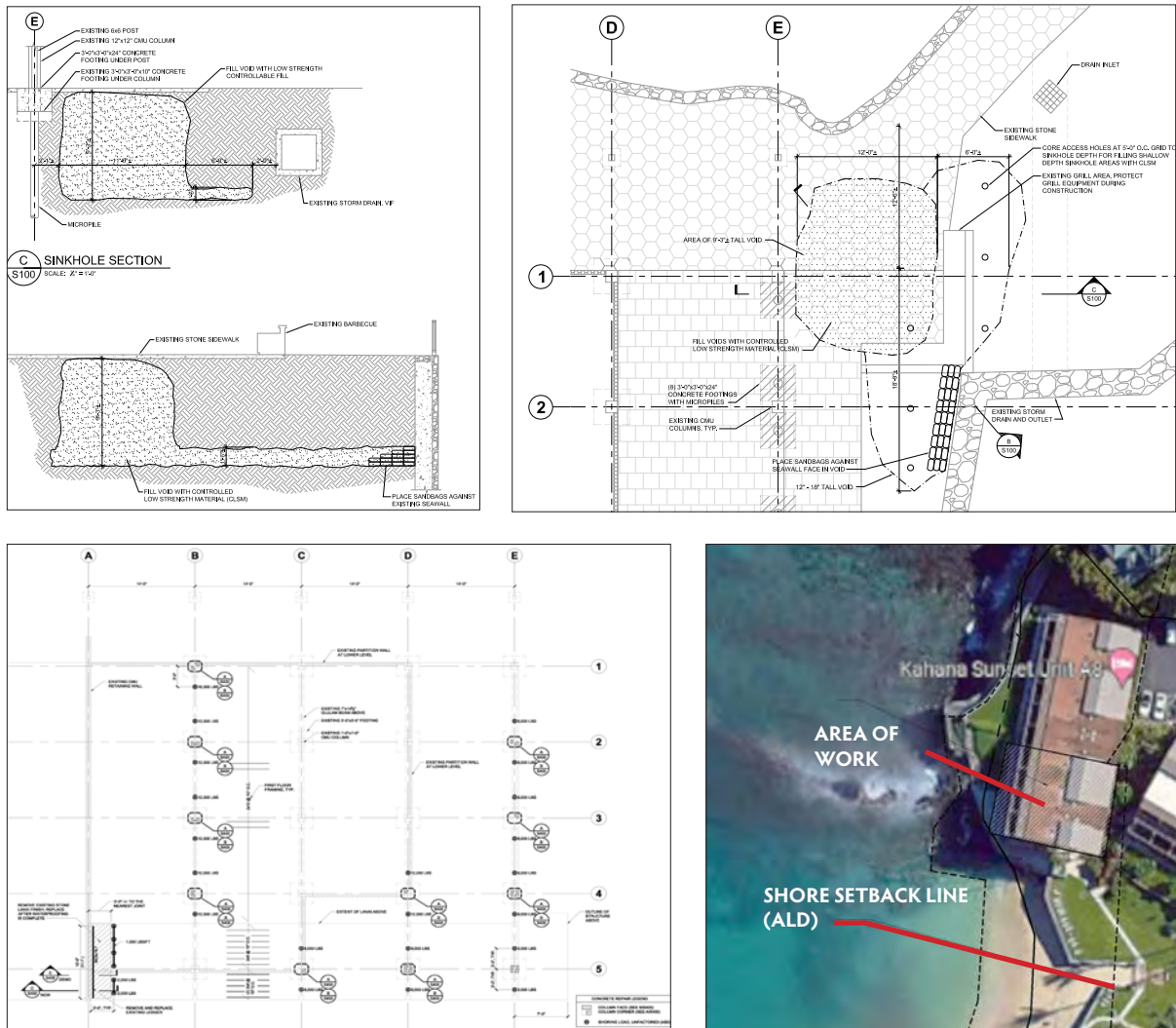


Approved plans to repair the A Building foundation and sinkhole



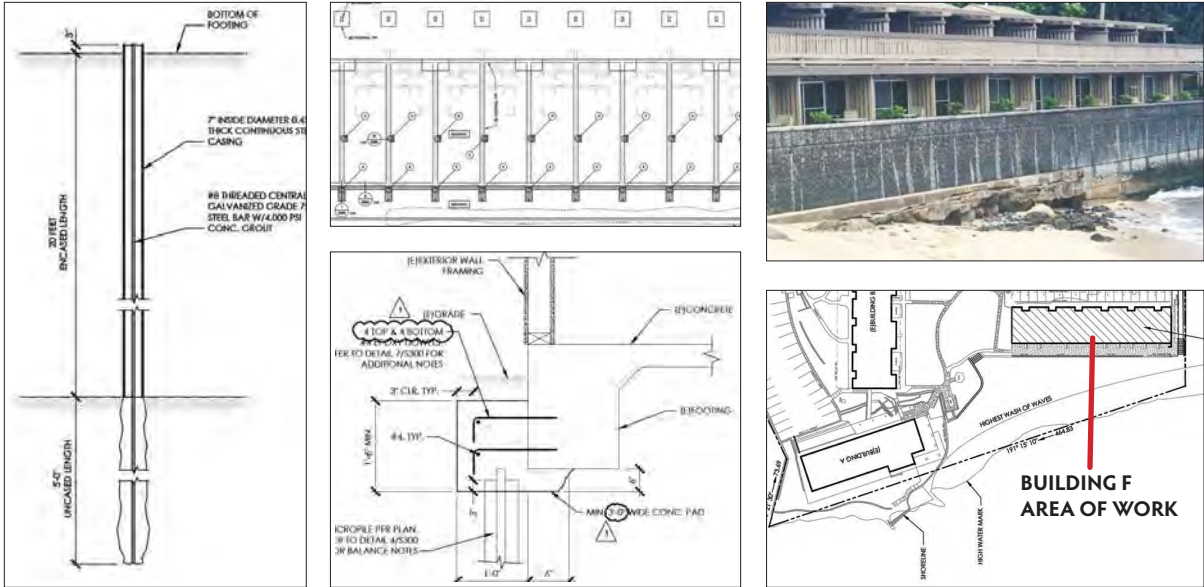
Process of installing micropiles to stabilize the A Building foundation
 Source: Structural Engineering Repair April 2018 File

On July 13, 2023, the Department approved SM32023-00006 for sinkhole and column repairs to Building A to provide structural integrity.



Approved repair plans to fill in the sinkhole adjacent to the A Building and replacement of A Building columns
 Source: K2N 2023 File

June 19, 2023 — the Department approved SM52023-000114 repairs to Building F foundation which are being permitted for moving forward to stabilize Building F foundation with the short-term future objective of removal of Building F that would lead to and result in relocation of the twelve, at-risk townhouse units. The repairs to the foundation are not intended to allow occupancy of Building F...The proposed scope of work does not include the separate repairs and reconstruction of the fronting seawall at Building F. Reconstruction of the seawall structure, in the structural configuration proposed, requires a SMA Major Use Permit and a Shoreline Setback Variance.



Submitted repair plan to stabilize the F Building seawall

Approved repair plans to stabilize the F Building foundation Source: K2N 202 Source: JPB Engineering Foundation Strengthening Plans Permit SM5 2023-000114

ACCOMMODATION DISCUSSION

Kahana Sunset is subject to north swells and trade wind waves which reach the shallow shelves, headlands, and fringing reef. This past winter had several high surf warnings and wave heights forecasted in the 20-25 foot range.



High wave event on the F Building on November 6, 2023 Source: Kahana Sunset Photo Archives

In June 2023, the National Weather Service (NWS) declared the arrival of El Niño which means moderate to strong conditions such as stronger storms, more hurricane activity, high surf, and warm weather expected in the late fall/early winter. It is likely a portion of the subject parcel will be inundated with chronic flooding hazards (passive flooding, annual high wave flooding, and coastal erosion).

The Department approved sinkhole and column repairs to Building A to provide structural integrity to the building. The Department approved repairs to Building F to maintain the structural integrity of the foundation and secure the foundation from movement. Future wave action may continue to undermine the seawall. ACT 16 SLH 2020 amended HRS 205A which prohibits the construction of a new seawall.

How long can Kahana Sunset utilize accommodation as an adaptation approach to sea level rise and coastal erosion? Future repairs both short and long-term need to be assessed. In the meantime, Kahana Sunset has no choice but to utilize accommodation to protect the structure, the public, Keonenui Beach and the offshore marine environment.

PROTECTION — ADAPTATION APPROACH

The 2019 OPSD CZM Report noted protection as an adaptation approach to sea level rise and other coastal hazards include *hard protection* (seawalls, rock revetments and other hard structures) and *soft protection* (beach nourishment) to safeguard an area and/or system in its existing location to withstand impacts from changing conditions. Both hard and soft protection requires ongoing maintenance, may eventually fail, and will need repair.

HARD PROTECTION

Seawalls, rock revetments and other hard structures — shoreline erosion protection systems, gunite and concrete erosion protection system were constructed, and over time repaired to safeguard Kahana Sunset shoreline subject parcel to withstand impacts from changing conditions in 1975, 1978, 1997, 2003, 2009, 2010, 2012, 2013, 2014, and 2017.

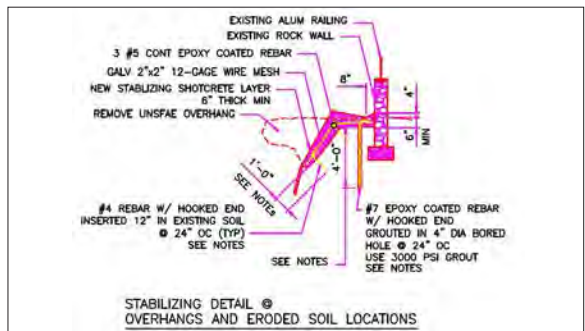
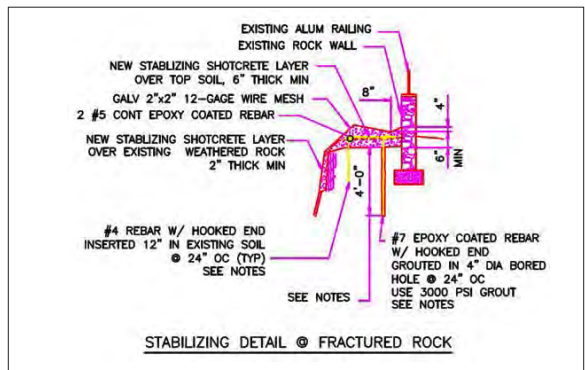
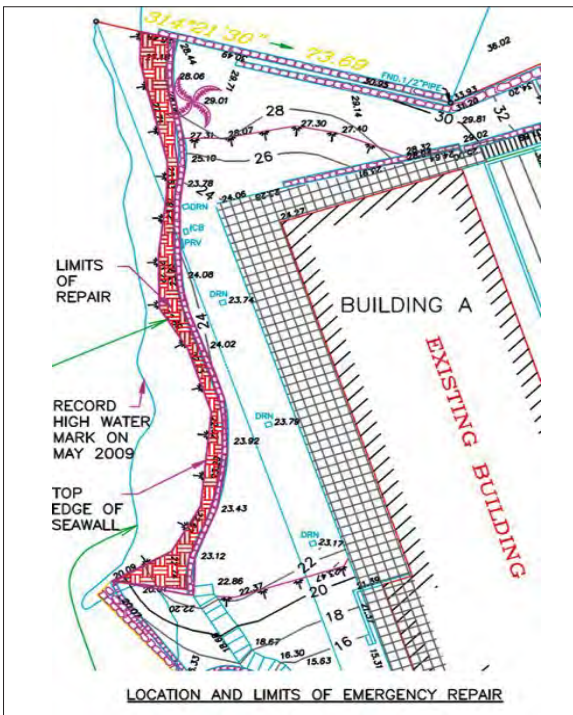


Photo of proposed repair area fronting A Building
Source: AAA September 2009 File

A BUILDING SEAWALL REPAIR

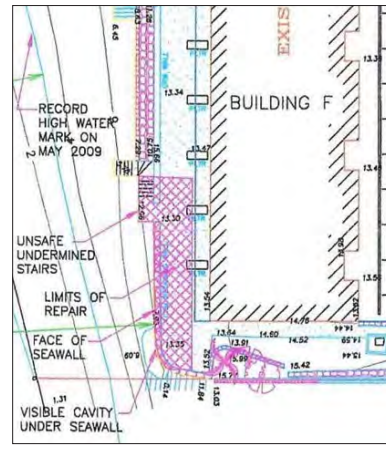
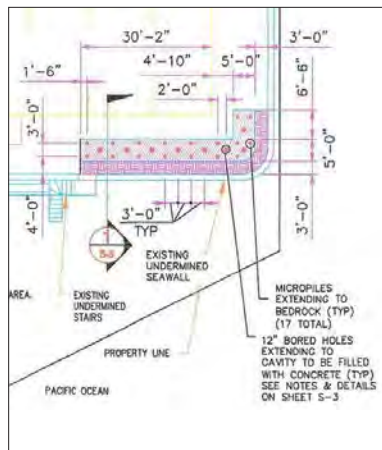
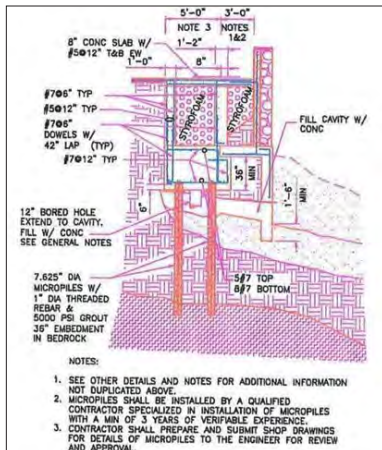
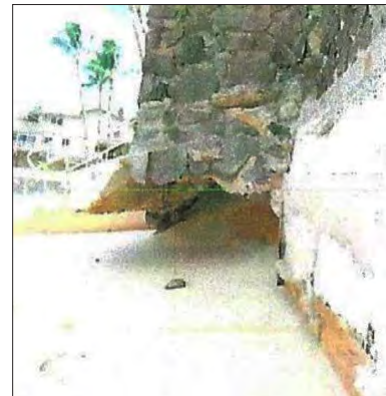
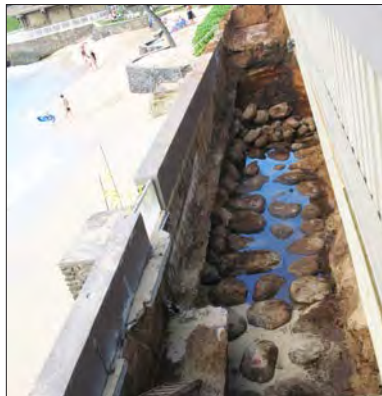


Photos of cliff and bluff repairs at the north side of the property by A Building



Approved A Building seawall repair plans
Source: AAA September 2009 File

F BUILDING SEAWALL REPAIR



For repairs Kahana Sunset will work within the confines of the County and State rules and regulations:

- Land Use Commission:
 - HRS Chapter 205.
- Department of Commerce and Consumer Affairs (DCCA):
 - HRS, Chapter 514B CONDOMINIUM PROPERTY ACT
- Department of Business, Economic Development and Tourism (DBEDT), Office of Planning and Sustainable Development:
 - HRS, 205A COASTAL ZONE MANAGEMENT, and
 - ACT16, SLH 2020,
- Department of Land and Natural Resources:
 - HAR, Chapter 13-5 CONSERVATION DISTRICT RULES,
 - HAR, Section 13-10-222 SHORELINE CERTIFICATIONS,
 - HRS, Section 171-53 RECLAMATION AND DISPOSITION OF SUBMERGED OR RECLAIMED LANDS,
 - HRS, Section 171-55, PERMITS, and
 - HRS CHAPTER 6E.
- Department of Accounting and General Services
 - HAR, Chapter 3-40 RULES GOVERNING PUBLIC USE OF THE LAND SURVEY DIVISION MAPS, DESCRIPTIONS, AND RECORDS, AND SCHEDULE OF FEES FOR SERVICES, MAPS, AND OTHER RECORD DATA.
- Maui County
 - Section 12-203 SHORELINE RULES FOR THE MAUI PLANNING COMMISSION, and
 - Section 12-202 SPECIAL MANAGEMENT AREA RULES.

SOFT PROTECTION DISCUSSION

Keonenui Beach is recognized as a resource for the general public. Kahana Sunset has not in the past applied to the State and/or County for beach nourishment but has started efforts in beach restoration. Kahana Sunset did initiate efforts in beach restoration for both the Kahana Sunset resort and the entire Keonenui Bay.

In 2020, Rising Tide Engineering was hired by Kahana Sunset to conduct engineering work related to efforts to nourish and rehabilitate the Kahana Sunset beach. This included a study of beach erosion mechanisms, resources overview studies including offshore sand confirmation, benthic habitat and confirmation of the best approaches to mitigate the near term and long-

term effects of beach erosion. These studies were intended to support the planning and permitting phase for beach restoration at the Kahana Sunset.

According to Dr. Michael Lindenfeld, Keonenui Bay Foundation President, this sand survey showed an adequate volume of beach quality sand about 1 km offshore. Keonenui Bay Foundation is a 501(c)(3) organization, Inc. (KNBF) approved by the IRS on August 31, 2020, EIN 85-3018802 and is registered in Hawaii. The founder and current president of KNBF is Kahana Sunset owner Michael Lindenfeld, Ph.D., who worked in US Navy classified programs on physical oceanography and optical oceanography.

Due to the onset of COVID-19, the Rising Tide Engineering study has not been finalized. However, one of the Managed Retreat Plan solutions states that the report will be finalized and submitted to the County for review.

Kahana Sunset will also need further input from the Kahana Sunset landowners and lienholders whether they want to continue a beach nourishment project as an adaptation pathway. Future feedback from the adjacent landowners will be sought if they would also participate in a beach nourishment project.

In 2012, the U.S. Geological Survey (USGS) and the University of Hawaii at Manoa's (UH Manoa) School of Ocean and Earth Science and Technology's (SOEST) studied one hundred-fifty miles of coastline and coastal change over the past century. The summary noted seventy percent of the beaches on Kauai, Oahu and Maui were undergoing long-term erosion. Erosion is the dominant trend of coastal change. Maui's beaches have experienced the highest rates and greatest extent of beach erosion (85%), followed by Kauai (71%), and Oahu (60%).

The report noted,

The average rate of coastal change — taking into account beaches that are both eroding and accreting — was 0.4 feet of erosion per year from the early 1900s to 2000s... the inevitable fate of the Hawaiian Islands millions of years into the future is seen to the northwest in the spires of French Frigate Shoals and the remnants of other once mighty islands, ancestors of today's Hawaii, but now sunken beneath the sea through the forces of waves, rivers, and the slow subsidence of the seafloor. Hawaii's beaches are dominated by erosion as a whole, coastal change is highly variable along the shore with "cells" of erosion and accretion typically separated by hundreds of feet on continuous beaches or by rocky headlands that divide the coast into many small embayments. Most of Hawaii beaches are composed of a mix of sediment derived from adjacent reefs and from the volcanic rock of the islands. Sediment availability and transport are important factors in shoreline change, and human interference in natural processes appears to have impacted the measured rates of change.

Researchers noted the “analysis of past and present trends of shoreline movement is designed to allow for future repeatable analyses of shoreline movement, coastal erosion and land loss.” The research results “provide critical coastal change information that can be used to inform a wide variety of coastal management decisions.”

Dr. Chip Fletcher, Interim Dean of UH Manoa SOEST noted,

Over a century of building along the Hawaiian shoreline, without this sort of detailed knowledge about shoreline change, has led to some development that is located too close to the ocean...a better understanding of historical shoreline change and human responses to erosion may improve our ability to avoid erosion hazards in the future.

Researchers note the “analysis of past and present trends of shoreline movement is designed to allow for future repeatable analyses of shoreline movement, coastal erosion and land loss.” In addition, the research results “provide critical coastal change information that can be used to inform a wide variety of coastal management decisions.”

The 2014 Hawaii Shore and Beach Preservation Association (HSBPA) Beach Restoration in Hawaii: Challenges and Opportunities Report and 2014 Hawaii Beach Restoration Workshop noted,

Hawaii’s world-renown beaches are being lost at an alarming rate due to natural and human impacts. Alternatives to hardening our shorelines such as proactive sediment management, beach restoration, innovative erosion control measures, conservation of backshore areas and dunes, and managed retreat are needed in order to conserve and restore Hawaii’s critical beach habitat, which is culturally and economically vital for future generations. Beach conservation will become increasingly urgent in the coming decades with accelerating sea-level rise and continued pressure to develop and utilize valuable beachfront property...Like many mainland U.S. coastal areas, Hawaii is losing beaches at an alarming rate due to natural variability, chronic erosion, human impacts such as sea-wall construction, historical sand mining, and sea level rise. Beach restoration is one of a range of tools for conserving degraded beaches in Hawaii. However, beach restoration is only practiced on a limited basis due to a general lack of beach-quality sand for nourishment projects, limited funding, and environmental and regulatory challenges.

Since 1929, the State has conducted beach nourishment projects. More recent projects include the 2011 Iroquois Point Beach Nourishment and Stabilization (Ewa Beach, Oahu) and 2012 Waikiki Beach Maintenance Project. Maui projects include the 2002

Sugar Cove Berm Maintenance Plan and 2012 Stable Road Beach Restoration Foundation. Kauai projects include the 2019 Kauai Kailani Condominiums (Kapaa) Small Scale Beach Restoration Project.

The neighboring 2012 Hester FEA Coastal Engineering Assessment noted,

Beaches are an effective way of minimizing wave impacts on the shoreline. Wave energy is absorbed by bed shear and resulting turbulence, the transport of sediment by wave swash, and percolation into the beach. Unlike hard structures, beaches will adjust to different incident wave conditions by shifting orientation, changing slope, and by hydraulic sorting of beach sediment. Beach nourishment is not a guaranteed as the beaches will adjust to different incident wave conditions by shifting orientation, changing slope, and by hydraulic sorting of beach sediment so there is no guarantee the beach will remain for a specific amount of time depending on future wave and storm action. Beach nourishment may include fine particles that may be washed from the emplaced sand, increasing nearshore turbidity. Sand may also be washed offshore and could bury portions of the hard substrate that are nearshore.

The report noted for beach nourishment to be effective the project would need to involve Kahana Sunset and the four shoreline SFRs located along Keonenui Beach. Participants will need to commit considerable financial resources to fund Federal, State and County permits, environmental studies, and contractors (barge, hydraulic suction dredge, mechanical sand blower).

In early 2023, Associate Dean for Academic Affairs at the University of Hawaii at Manoa (UH Manoa), School of Ocean and Earth Science and Technology (SOEST) Dr. Fletcher noted about the subject parcel,

There are no simple, cheap, or easy answers. I would look at land swaps, transferable development rights, conservation easements, direct condemnation, etc. all as tools that need further development in this space because they hold promise as solutions. Fundamentally I believe [the] condo buildings should be demolished and the shoreline returned to a natural state. Is the building built on a silt embankment? Are worries about siltation in the water being used to argue against building removal? If we had not locked up sand elsewhere along this shoreline with walls and buildings, I believe nature would have prevented siltation by moving a carbonate sand beach in front of the silt outcrop. Show me a natural location in Hawaii where silt geology is polluting the water in the absence of already existing anthropogenic (or human) impacts to the coast. The silt argument can be solved by restoring the natural sand budget using beach nourishment — after the buildings are removed.

Beach nourishment projects have an uncertain future. In 2023, the BLNR denied the proposed Memorandum of Understanding (MOU) between the Kaanapali Operations Association (KOA) and the DLNR to fund the Kaanapali Beach Restoration and Berm Enhancement Project. The project was considered a short to midterm mitigation effort to slow the impacts of sea level rise

and coastal erosion (including sand loss). The project would have utilized approximately 75,000 total cubic yards of compatible calcium carbonate marine sand found in an 8.5 acre deposit located 150 to 800 feet offshore Puu Kekaa Kekaa (Black Rock). The proposed project would have restored the beach to the former 1988 beach width, enhance the dry beach volume and raise the elevation by 3.5 feet. Total cost was approximately \$11,125,000.00; KOA would have committed approximately \$5 million dollars and the State would pay the balance. The BLNR took a firm stance on the State of Hawaii's Public Trust Doctrine and noted DLNR's mandate was "not to protect private property but rather to protect and preserve the public trust."

Beach nourishment is an expensive and lengthy process and will require further input from Kahana Sunset. If Kahana Sunset proposes to continue the beach nourishment project for Keonenui Bay Beach the following will need to occur:

- Have consolidated support and funding from all parcels in the Keonenui Bay.
- Have the available funds and commit to funding the beach restoration project regardless of BLNR approval;
- Enter into a Memorandum of Understanding with each landowner;
- Apply for a Maui County SMA Permit pursuant to Maui County Code (MCC) Section 12-202 Special Management Area Rules,
- Apply for a Maui County SSV pursuant to MCC Section 12-203 Shoreline Rules for the Maui Planning Commission;
- Receive a DLNR, Land Division ROE for work on State-owned lands pursuant to HAR/HRS;
- Apply for a DLNR, OCCL, CDUA pursuant to HAR, Section 13-5-22, identified land uses in the Protective Subzone, P-16 BEACH RESTORATION¹ or a Small Scale Beach Nourishment (SSBN) Project Category I or Category II Permit²;
- Find a reliable source of compatible sand source offshore (which may be limited).
- Find an appropriate source of government funding, i.e., U.S. Army Corps of Engineers or the DLNR-OCCL Beach Restoration Fund;
- Enter into an MOU with the State DLNR if state funding utilized;
- Complete an Environmental Assessment or Environmental Impact Statement pursuant to Hawaii Administrative Rules (HAR), Chapter 11-200.1 / Hawaii Revised Statutes (HRS),

¹ This permit allows for sand placement not exceeding 10,000 cubic yards per occasion, minor sand retention structures, the extraction of offshore sand from an adequate sand source from submerged lands and includes the transportation/submission of sand from the sand site. The sand being sourced from the immediate area would have to match the consistency of the bay and/or beach environment. Sand restoration projects and the placement of over 10,000 cubic yards in one (1) littoral cell in one (1) calendar year also requires a CDUA and BLNR approval.

² BLNR Chair Gilbert Coloma-Agaran on April 2002 approved the October 27, 2000 the Statewide Conservation District Use Application for Small-Scale Beach Nourishment Projects on Hawaiian Beaches; subject to thirty-two (32) terms and conditions. Category I is for projects under 500 cubic yards and Category II is for projects 500 to 10,000 cubic yards.

Chapter 343 due to proposed triggers — Use of State or County Lands or Funds, Use of Conservation District Lands, and Use of Shoreline Area;

- Utilize Best Management Practices (BMPs);
- Note: the Clean Water Act Section 401 Water Quality Certification (WQC) from the State of Hawaii Department of Health (DOH), Clean Water Branch was NULL pursuant to ACT 162; amended Hawaii Revised Statutes (HRS) Chapter 342D WATER POLLUTION, Chapter 342D-6 Permits; procedures for (i) (July 1, 2021).

Beach nourishment will promote Keonenui beach's value as a coastal and recreation resource.

MANAGED RETREAT APPROACH

The Legislature noted,

Managed retreat is the shifting of development inland from the coast either by the physical movement of structures or changing the restrictions and management of coastal areas... will be an essential tool for relocating development away from areas that are critically impacted by coastal erosion and flooding with sea level rise, particularly in areas with high natural and community resource value.

The 2019 OPSD Report noted accommodation, protection, and retreat are the main adaptation approaches to sea level rise and other coastal hazards. The report also noted,

To rush haphazardly into retreat may waste precious and limited state, county, and public sources of funds and lands and cause undesirable litigation. There has not yet been an agreement/consensus reached of what needs to be retreated, where to retreat to and how much it will cost ... To act on retreat without a clear, deliberate plan may derail retreat in the long-run to the severe and irreversible detriment of the State, its precious natural resources and citizens. Managed retreat will need to be approached through a combination of planning, policy, regulatory and financing tools, with critical underpinnings of political will and community acceptance.

Dr. Fletcher noted managed retreat is still "an idealized hypothesis" for places like Waikiki and Kaanapali since there is a huge investment in these locations and many questions about how it would work: Where will buildings be moved to? Who would pay the costs? Who will tear down the leftover buildings that are falling into the ocean? Ultimately though, Fletcher said, "these are doomed locations." "Unless they figure out how to live with six-feet of sea level rise, they are ultimately doomed," said Fletcher. He said Hawaii had a high probability of experiencing six feet of sea-level rise in the next century. "They're going to have to re-imagine the future, and doing beach nourishment is a stopgap," said Fletcher. "Ultimately, they're going to have to get out of nature's way," Fletcher added. "Obviously, they want to still maintain themselves as a resort

destination, as a visitor destination, and I think they totally can do that. There's an awful lot of land between them and the highway."

H.B. 756 H.D. 2 RELATING TO LAND USE testimony by the UH Manoa SOEST and Sea Grant Program noted,

Historically, coastal retreat has taken the form of mandatory relocation of development or communities through government buyouts or incentives, but future methods of retreat may include broader planning options such as down zoning and rebuilding restrictions, transferable development rights, increased coastal setbacks, and limitation of ownership transfers. Climate change-driven coastal adaptation will require some phased combination of retreat along with protection and adaptation. Disaster management literature reveals an unprecedented number of major natural disaster events around the world, this suggests a modern era of unmanaged or forced retreat (on) us now upon many of the low-elevation coastal communities around the world. Unmanaged retreat is often a default reactive response due to a lack of viable adaptation options, and is fundamentally different than strategic managed retreat as part of a holistic suite of adaptation policy tools.

The Department noted "managed retreat" is defined herein as a purposeful action that relocates structures and infrastructure away from vulnerable coastal areas.

The MRPlan looked at the following subject matter to see how the subject parcel will be affected by climate change and sea level rise retreat: Hawaii State Legislature, Climate Change and Sea Level Rise Coastal Hazards, Tsunamis, Coastal Erosion, Annual Erosion Hazard Rate Map , Shoreline Setback Area, Aerial photos, Sea Level Rise, the University of Hawaii's PacIOOS's State of Hawaii: Sea Level Rise Viewer, PACIOOS Shoreline Impacts, Wave Run-Up Forecast (West Maui), PacIOOS Wave Run- Up Forecast tool, Public Outreach, Kauai County, Hawaii County, Maui County, Office of Planning an Sustainable Development, Managed Retreat Tools, Artificial reef installation, Biorock installation, Federal funding, Eminent domain/condemnation, and State and County laws.

HAWAII STATE LEGISLATURE

In order to address Climate Change the Hawaii State Legislature (Legislature) has focused on reducing the State's greenhouse gas emissions and aided funding (barrel tax, the environmental response, energy, and food security tax (HRS, Section 243-3.5). Other laws passed to address climate change include: ACT 234 SLH 2007, ACT 73 SLH 2010, ACT 286 SLH 2012, ACT 83 SLH 2014, ACT 32 SLH 2017, and ACT 223 SLH 2022.

- ACT 223, SLH 2022, expanded the authority of the counties to regulate the transfer of development rights to protect areas vulnerable to sea level rise, coastal erosion, storm surge and flooding, thereby facilitating the potential movement of development away from at-risk areas to locations more appropriate for development.
- HRS, Chapter 226, Hawaii State Planning Act Chapter 226-108 established Sustainability. HRS, Chapter 226-109 established Climate Change adaptation priority guidelines county and state activities must consider in the impacts of climate change in land use, capital improvement and program decisions. The Hawaii Climate Adaptation Initiative Act formed the Hawaii Climate Change Mitigation and Adaptation Commission (Commission) and charged the OPSD with the coordination the development of statewide climate adaptation plans to address climate change effects through 2050.
- The 2017 Hawaii Sea Level Rise Vulnerability and Adaptation Report addressed climate change threats to the State's public health, natural resources, economy, and environment; summary recommendations directed mitigation and adaptation and using the updated climate science and the United Nations (UN), Intergovernmental Panel on Climate Change (IPCC) numbers for sea level rise.

As of May 2022, pursuant to HRS, Section 508D-15 the State requires real estate transactions taking place within the State must disclose any risk of sea level rise to the property and created a Sea Level Rise Exposure Area Flyer.

Other avenues to address Climate Change impacts to Hawaii include: the State of Hawaii Climate Change Action Plan (1998), Hawaii Clean Energy Initiative (2008), Hawaii 2050 Sustainability Plan (2005), Hawaii committed to the Paris Agreement (Act 32)(2017), the state declared a climate emergency (Act Senate Concurrence Resolution 44)(2021), launch of the Hawaii 2050 Sustainability Plan and Aloha + Challenge (2014), former Governor Neil Abercrombie served on the President's Task Force on Climate Preparedness and Resilience (2013). The State hosted the International Union for the Conservation of Nature at the Hawaii World Conservation Conference (2016).

During the Hawaii State Legislature's 2023 Session the House and Senate Committees heard multiple measures relating to Managed Retreat. The following measures failed to be scheduled, be read, or were deferred by the assigned committees; as of October 2023 these measures have not been advanced:

- H.B. 1092 and S.B. 1390 Relating to Climate Adaptation discussed the North Shore (Oahu) pilot program to utilize managed retreat voluntarily for residential development and infrastructure to move outside of SLR and coastal flooding exposure areas. The measure expanded the authority of the State and counties and provided funding.

- S.B. 1350 S.D. 1 and H.B. 1052 H.D.1 Relating to Climate Changes allocated funds to a Sea Level Rise Voluntary Relocation Fund and for the Hawaii Climate Change Mitigation and Adaptation Commission to address climate change and carbon outputs.
- S.B. 69 and H.B. 770 Relating to Coastal Zone Management noted the CZM Program must have a consistent and balanced framework for developing and implementing sea level rise adaptation strategies. Policies should balance between public and private interests. Shoreline construction was an allowable practice to protect beach(s). The County Planning Commission(s) can allow proposed development within the shoreline area and within the SLR exposure area (under certain circumstances). Addressed SMA Guidelines. County agencies can require that shoreline setback lines be established at greater distances (under certain circumstances).
- H.B. 756 H.D.2 and S.B. 1032 Relating to Land Use discussed the development adaptation plans that include managed retreat as a tool and through mechanism, such as buy outs, relocation, exchange of Public Land for private lands for the transfer of developmental rights, and land exchanges to relocate private development away from high-risk areas. Established a Sea Level Rise Relocation Special Fund. Required the DLNR to complete and maintain a current inventory of all public lands located outside the sea level rise exposure area and special flood hazard area. Expanded the climate change adaptation priority guidelines. Allocated and appropriated funds to the DLNR to prepare and implement sea level rise relocation plans and program. Plan and implement sea level rise relocation project(s) for voluntary relocation of critically threatened beach(s) from development on Oahu's North Shore.
- S.B. 1521 S.D. 2 H.D.1 Relating to Sustainable Land Use required the OPSD to develop an integrated land use study, and incorporate the following plans (Hawaii 2050 Sustainability Plan, the Hawaii Sea Level Rise Vulnerability and Adaptation Report, the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas Report) to serve as a guide for planning and decision making for land located in the State Land Use (SLU) Agricultural District, addressed the state's climate, sustainability, and housing targets. The study shall review the 2022 State Land Use System Review of Districts, Hawaii State Plan, and Soil Classification Study.

The MRPlan notes the Sea Level Rise Relocation Special Fund and the Sea Level Rise Voluntary Relocation Fund will help address climate change. H.B. 756 H.D.2 and S.B. 1032 Relating to Land Use it shows future promise to exchange Public Land for private lands, transfer of developmental rights and/or land exchanges to relocate private development away from high-risk areas. However, none of these measures will help Kahana Sunset as action is required now.

CLIMATE CHANGE

In 2023, the UH Manoa Sea Grant College Program (Hawaii Sea Grant) and the Climate Resilience Collaborative (CRC) provided testimony on H.B. 756 H.D. 2. which noted, “data suggests Hawaii will experience sea level rise that is 1% to 30% higher than the global average; sea level around Hawaii is projected to rise about one foot by 2050 and about four feet by 2100.”

The Hawaii Climate Change Mitigation and Adaptation Commission updated the Hawai'i Sea Level Rise Vulnerability and Adaptation Report pursuant to Act 32, SLH 2017. The report noted,

The latest science suggests the Sea Level Rise Exposure Area (SLR-XA) for 3.2 feet of sea level remains valid as a planning overlay for the mid-century at this time...the State should set a revised planning and policy benchmark of four (4) feet as the minimum scenario for all planning and design based on the report's Intermediate (mid- range) scenario for Hawaii of 3.9 feet of sea level rise by 2100, apply a six (6) foot benchmark for planning and design of public infrastructure projects and other projects with low tolerance for risk based on the report's Intermediate High scenario for Hawaii of 5.9 feet of SLR by 2100.

The United Nations (UN), IPCC Sixth Assessment Report (2022) stated,

Sea level is committed to rise for centuries to millennia due to continuing deep-ocean warming and ice-sheet melt and will remain elevated for thousands of years. Hawaii's coastal communities grow increasingly vulnerable to the dangers of wave impacts, coastal erosion, high tide flooding, and storm surge, all of which are exacerbated by sea level rise... there is nothing we can do to stop sea level rise and exit strategies for coastal communities must be developed. Sea level rise is an unstoppable reality and without major adjustments to coastal laws and policies, flooding, erosion, and storm dangers will increase — slowly at first, as at present, but by the 2030's sea level rise impacts related to extreme tidal flooding will increase exponentially.

Maui County's, Office of Climate Change, Resiliency and Sustainability's Maui County Climate Action & Resiliency Plan 2022 Status Report noted climate change is apparent on Maui, Molokai, and Lanai with drought, sea level rise, storms, erosion, coral bleaching, and habitat and species loss. The report focused on managing the county's contributions to climate change, preparing for unavoidable impacts, the reduction in greenhouse gases and an increase in resiliency for the community. The report noted,

The 2018 Hawaiian Island Climate Vulnerability and Adaptation Synthesis found that most vulnerable natural systems in all three islands in the county are moderately to highly vulnerable to climate change. Vulnerable habitats include coastal beaches (erosion, inundation), dry forests (precipitation, soil moisture), culture and heritage loss (loss of

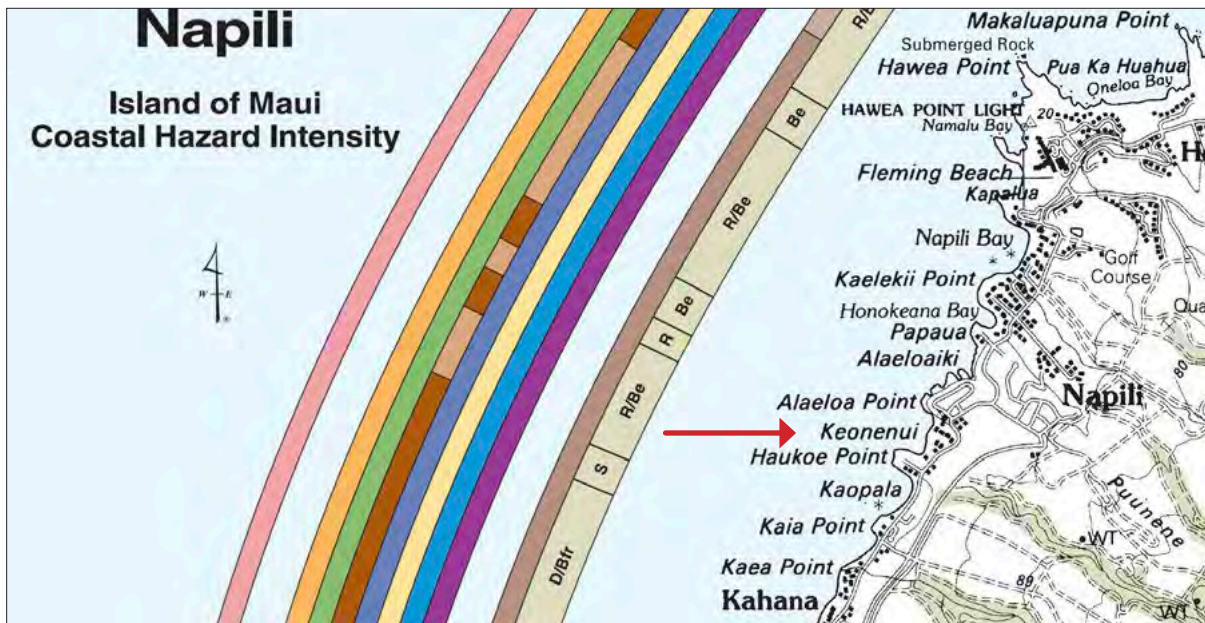
native ecosystems, species, and cultural sites), wetland and coastal dunes, flood mitigation, and inundated freshwater supply.

COASTAL HAZARDS

The MRPlan used the 2012 Hester FEA coastal hazards data for Keonenui Bay. The subject parcel is located at the northern end of the bay and Hester's subject parcel is located at the southern end of the bay.

The Sea Engineering's Coastal Engineering Assessment Report noted,

The comprehensive report by the UH Coastal Geology Group and the U. S. Geological Survey gave a regional Overall Hazard Assessment for the project area as moderate to high. The high tsunami hazard is due to the 1946 tsunami inundation of 15 ft (reported as 24 ft by Loomis, 1976). The Flood Insurance Rate Map (FIRM) designation for the project site is V24 with a base elevation of 17 feet. This designation corresponds to areas of 100-year coastal flood with velocity (wave action). Other hazards include flash flooding caused by the steep terrain of the West Maui Mountains and the potential for heavy precipitation, as well as the chronic erosion conditions that are prevalent along the coast. Exposure to storms (in particular Kona storms), and moderately high wave conditions is intensified by projected global sea level rise. Undermining of the cliff face and potential collapse are hazards specific to the project site. The region is also seismically active and is classified as a seismic hazard zone 2.



Overall Hazard Assessment for Napili
Source: 2012 Hester FEA Sea Engineering Coastal Engineering Assessment

TSUNAMIS

The earliest tsunami on record was reported in the early 1800s. Data shows eight-five tsunami have hit the islands and the notable ones were in: 1946, 1952, 1957, 1960, 1975, 2010, 2011, 2012, and 2015. For Maui the 2011 tsunami pushed water affected the following areas: Maui's central valley, Kahului Waste Water Treatment Plant, Kahului Harbor, Maalaea Harbor, Kihei Boat Ramp, Lahaina Harbor, Puunene Avenue, South Kihei Road, Kalama Park, Launipoko Beach Park, Honoapiilani Highway, and Front Street.

COASTAL EROSION

The 2018, Sea Engineering's Coastal Engineering Report for Lower Honoapiilani Road Erosion at Kaopala Bay for the County's Department of Public Works (DPW) noted,

The coastline of West Maui has been severely degraded over the last few years by a combination of oceanographic factors. The winter wave season is usually tempered by the presence of the island of Molokai, which blocks much of the wave activity from the northwest. The Pailolo channel is open to the north, and waves from the north-northwest through north-northeast directions can approach the West Maui coastline unimpeded." In 2015 and 2017, there were two highly energetic winters with persistent wave activity from the north over the winters and during 2018 contributed to the severe degradation of the West Maui shoreline.

The MRPlan used the 2002 Lusardi FEA for historical aerial photographic analysis for Keonenui Beach. The subject parcel is located at the northern end of the bay and the Lusardi subject parcel is located in the bay. It states,

Vertical aerial photographs observed were taken in November 1949, March 1975, July 1987, March 1988 and May 1997 and then were digitized. The photographs were registered to the Hawaii State Plane Coordinate System, and common reference points were selected in each photo to correct for scale and rotation distortion. The vegetation line and beach toe position were digitized to assess shoreline changes over the years.



1949 Aerial Photograph Keonenui Beach Sea Engineering 2012 Hester Coastal Engineering Assessment



1987 Aerial Photograph Keonenui Beach Sea Engineering 2012 Hester Coastal Engineering Assessment

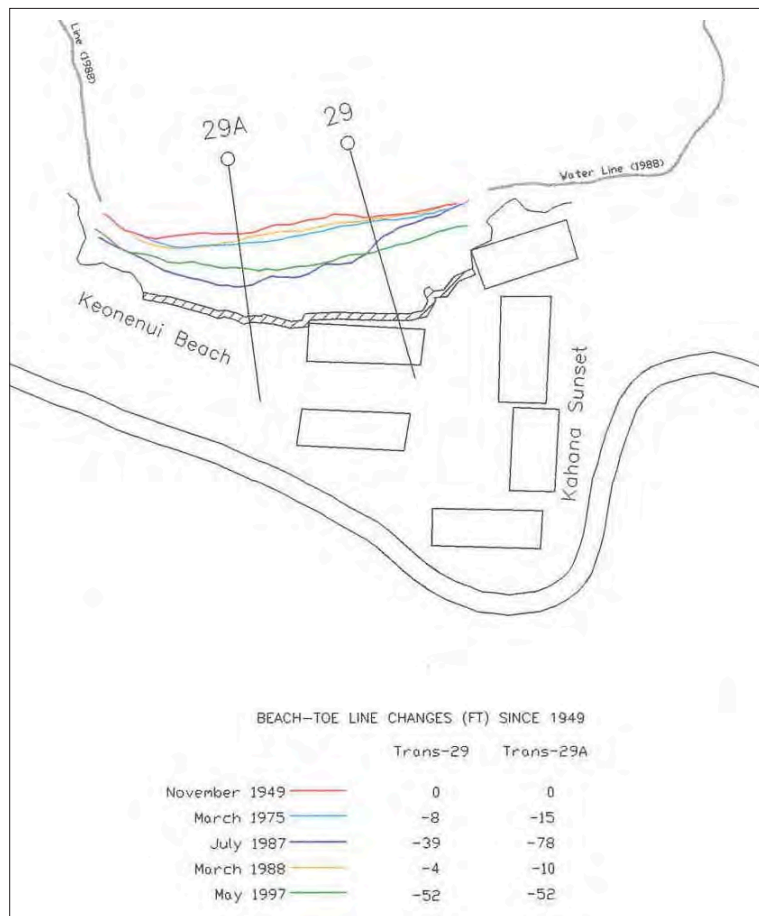
The report noted, “the University of Hawaii Coastal Geology Group conducted an island-wide study of coastal erosion as determined from aerial photographs. The results for Keonenui Beach...show approximately 1 ft average yearly erosion.” Aerial photographs from 1949 and 1987 show a dramatic change in the sand beach shoreline and beach width.

The MRPlan also looked at the 2012 Hester FEA Coastal Engineering Assessment Erosion Analysis of Keonenui Beach. The report noted,

Keonenui Beach’s vegetation line is not a good indicator of beach processes because it has been stabilized artificially by the construction of seawalls along the beach. The beach toe is defined as the change in slope at the transition between the nearshore and foreshore regions of the beach. It appears as a change in color or tone in vertical aerial photographs. The beach toe is a good indicator of shoreline position; however, it can also vary with seasonal or short-term erosion or accretion, or changes in beach slope and width, and thus may also indicate the dynamic nature of a beach, rather than long term erosion or accretion trends.

Each colored line represents the location of the beach toe for the particular year. A beach toe position that is further seaward indicates a wider, accreted beach, while a beach toe position closer to the buildings and walls indicates a narrow, eroded beach.

To quantitatively assess the shoreline movement, the specific locations of the beach toe relative to the position in 1949 were measured along two transects: 29A in front of the Lusardi property, and 29 in front of the Kahana Sunset. The numerical values of the beach toe positions at these two transects are listed. The results show that the beach is dynamic with periods of erosion and accretion.



Erosion Analysis of Keonenui Beach

Source: Sea Engineering 2012 Hester Coastal Engineering Assessment

Along transect 29A, the beach toe eroded 78 feet between 1949 and 1987, then accreted 68 feet in the following year, and eroded 42 feet between 1988 and 1997. Similarly, at transect 29, the beach toe eroded 39 feet between 1949 and 1987, then accreted 35 feet in the following year, then eroded 48 feet between 1988 and 1997. Net erosion between 1949 and 1997 has been 52 feet at both transects. The beach toe movements may in part be attributable to seasonal changes in surf and current conditions. The beach toe was in an accreted position during photos taken in November and March, which may indicate response to winter conditions. Conversely, the beach toe was in an eroded (landward) position in the photos taken in May and July, which may indicate response to summer surf conditions.

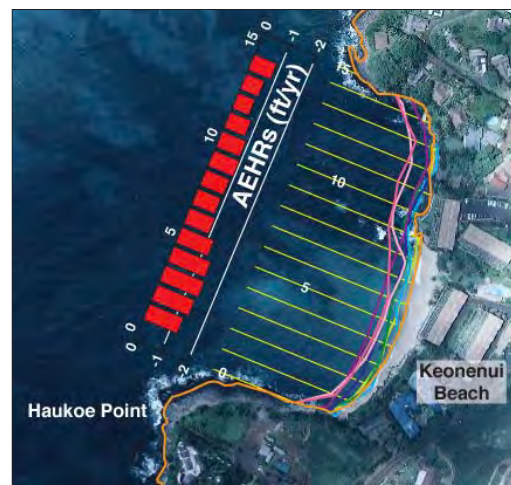
The 2012 Hester FEA noted,

Keonenui Beach is dynamic in nature, with periods of both beach erosion and accretion. It is a pocket beach bound by prominent headlands, and beach sand is essentially trapped between these headlands during periods with moderate wave conditions. Extreme conditions may result in sand moving offshore. In that event the headlands may slow the beach recovery by inhibiting sand movement back into the bay. On a dynamic beach such as Keonenui Beach, the computed erosion rate depends largely on whether the beginning and end points of the analysis are during seasonally accreted or eroded states. It further noted that the analysis of the effects of seawalls on the Keonenui shoreline was not conclusive. During the eight months between the 1987 and 1988 photos, with walls already lining the shoreline, there was accretion of 35 feet and 68 feet along the beach. Yet between 1988 and 1997, the beach appeared to erode.

ANNUAL EROSION HAZARD RATE MAP

According to the Shoreline Rules for the Maui County Planning Commission, Section 12- 203-4 the “annual erosion hazard rate” means the annual rate of coastal erosion calculated according to the methodology developed by the university of Hawaii along transects placed at regular intervals of approximately sixty-six feet and as indicated on maps on file with the department.

Maui County’s Shoreline Erosion Atlas, Annual Erosion Hazard Rate (AEHR) Map for West Maui, Alaeloa includes Keonenui Beach (and Haukoe Point), Alaeloa Beach, Honokeana Beach, Napili Bay, Kapa-



Maui Shoreline Erosion Atlas - Alaeloa
Source: Maui County

lua Bay, and Namalu Bay. The Smoothed Erosion Rates are taken from 1912 to 1997. Kahana Sunset fronts Transect #3, Transect #4, Transect #5, Transect #6, Transect #7, Transect #8, Transect #9, Transect #10, and Transect #11 on the AEHR map.

The AEHR map data indicates,

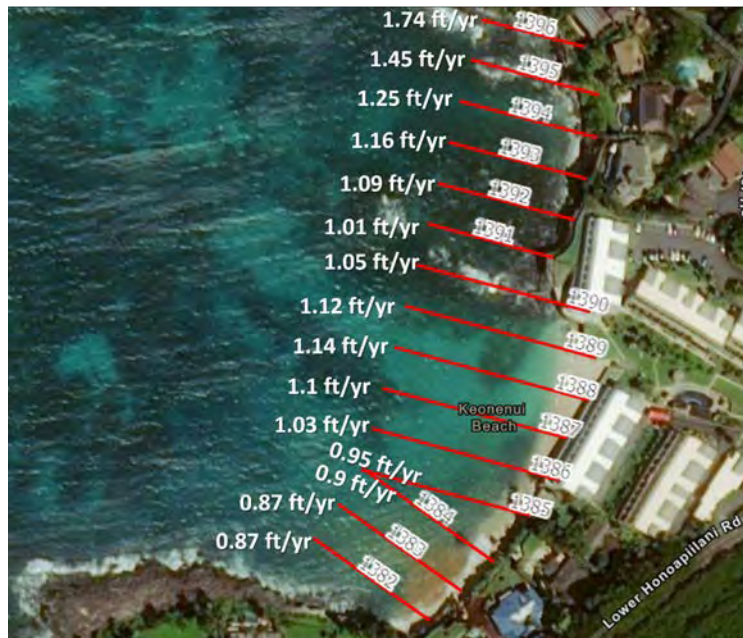
As a whole, the area has experienced moderate to high erosion since 1912 with average AEHR of -0.9 foot/year (ft/yr). Keonenui Beach (transects 1–14) is partially backed by a revetment constructed prior to 1960 to protect private property. The beach has experienced moderate erosion over time with an average AEHR of -1.0 ft/yr...Trends identified in the study generally agree with those found by Sea Engineering (1991). Average beach width is the average horizontal distance from the vegetation line to the low water mark...at Keonenui Beach, average beach width has decreased 43% between 1949 and 1997.

AEHRs for the Alaaloa area were calculated using data (1912 and 1997); shorelines during these years show a reasonably consistent trend. Historical Shorelines were calculated with same year data. The low water mark is used as the historical shoreline or shoreline change reference feature (SCRF).

SHORELINE SETBACK AREA

Annual Erosion Hazard

For Building F, the University of Hawaii determined that the shoreline position at the property is moving inland at an average rate of about 1.1 ft per year (shown to the right). The shoreline setback, according to Chapter 203, is twenty-five feet plus a distance of fifty times the annual erosion hazard rate (1.1 ft/yr) from the shoreline, or 80 feet. This illustration shows a historical shoreline change rate at the project site. Reference: Coastal Geology Group in the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawai'i. 2021.



Hawai'i Shoreline Study
<https://www.soest.hawaii.edu/crc/index.php/hawaii-shoreline-study-web-map>



Kahana Sunset average lot depth

Calculated here is one interpretation of shoreline setback provided by Mike Foley at Oceanit. The County will make the final determination that is consistent with their rules and methods.

Average Lot Depth

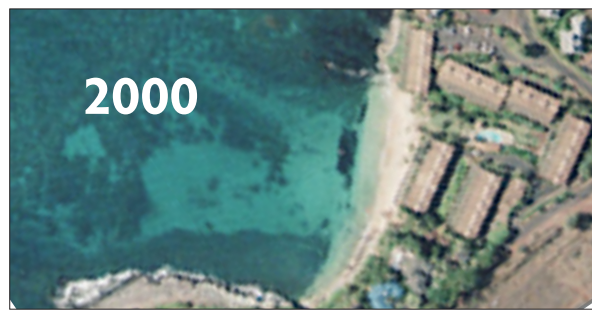
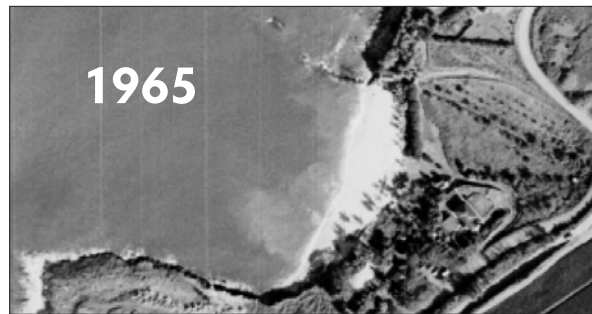
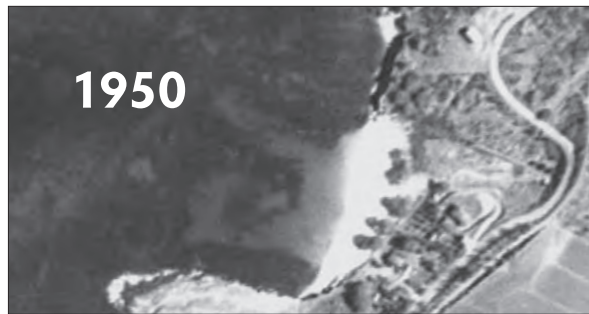
Assuming the County calculates the lot depth from the shoreline to the mauka boundary, the calculation is approximately:

$$(254 \text{ ft} + 432 \text{ ft} + 230 \text{ ft}) / 3 = \mathbf{305 \text{ feet average lot depth}}$$

$$305 * (.25) = \mathbf{76 \text{ feet}}$$

AERIAL PHOTOGRAPHS

The MRPlan looked at aerial photograph data from the University of Hawaii at Manoa’s Library Aerial Photos Archive. The photos show a loss of beach from 1950, 1965, 1976 and 2000.



Keonenui Bay aerial photos

Source: University of Hawaii at Manoa Library Aerial Photos Archive

SEA LEVEL RISE

By 2100, current climate science and projections indicate there will be three to four foot of sea level rise. This is a mid-range rather than high-end scenario for the state. As Greenhouse gases (GHG) continue to increase Greenland and West Antarctica will continue to lose ice mass loss to

the oceans. With projections to 2100 sea level will continue to “rise for centuries to millennia according to the 2021 IPCC Sixth Assessment Report.

The 2022 National Oceanic and Atmospheric Administration (NOAA), National Ocean Service, 2022 Sea Level Rise Technical Report summarized sea level rise projections by 2050 with coastal flooding coastal infrastructure, communities, and ecosystems. Long- term observational data from local tide gauge stations showed sea level rose around the state.

Models indicate that Hawaii and other tropical Pacific sites will experience sea level rise that is 16% to 20% higher than the global average. The 2022 Sea Level Rise Technical Report provided a range of regionalized sea level rise scenarios based on differing GHG emissions pathways and associated global warming and ice sheet melt (all projections relative to sea level in the year 2000):

- Sea level will rise around Hawaii between 0.7 and 1.5 feet by 2050.
- The Intermediate (mid-range) estimate is for a rise of 1.0 feet by 2050.
- Sea level will rise between 1.3 and 8.0 feet by 2100.
- The Intermediate (mid-range) estimate is for a rise of 3.9 feet by 2100.

The UH Sea Grant and CRC noted the data suggests Hawaii will experience SLR that is 1% to 30% higher than the global average; sea level around Hawaii is projected to rise about one foot by 2050 and about four feet by 2100. The Hawaii Climate Change Mitigation and Adaptation Commission noted the most recent science suggested the SLR-XA for 3.2 feet of sea level remains valid as a planning overlay. However, the State should set a revised planning and policy benchmark of four feet as the minimum scenario for SLR for Hawaii by 2100 and apply a six-foot benchmark for public infrastructure projects by 2100.

PacIOOS STATE OF HAWAII SEA LEVEL RISE VIEWER

To view sea level rise impacts to the subject parcel the draft MRPlan turned to the UH PacIOOS’s State of Hawaii: Sea Level Rise Viewer (Viewer) mapping tool. The tool shows the Sea Level Rise Exposure Area (SLR-XA) which is the result of three modeled chronic flooding hazards: passive flooding, annual high wave flooding, and coastal erosion.

The UH PacIOOS’s Sea Level Rise: State of Hawaii Sea Level Rise Viewer (Viewer) is based on an upper-end projection in the 2013 IPCC Fifth Assessment Report of 3.2 feet of global mean sea level rise by 2100. Since 2017, the viewer was being used in land management decisions on shoreline properties which will be affected by sea level rise.

The Viewer supports the Hawaii Sea Level Rise Vulnerability and Adaptation Report mandated by Act 83, Session Laws of Hawaii (SLH) 2014 and Act 32 SLH 2017³. The report was updated in

³ Act 83, Session Laws of Hawaii (SLH) 2014 under H.B. 1714 H.D. 1 S.D. 2 C.D 1 and Act 32 SLH 2017 under S.B. 559 S.D. 1 H.D. 2 C.D 1.

2022 with a summary the latest data regarding sea level rise science and 2017 accomplishments updated recommendations.

The Viewer shows the SLR-XA at the following measurements for four future sea level rise scenarios: 0.5 feet, 1.1 feet, 2.0 feet, and 3.2 feet. At the 0.5 foot exposure SLR-XA Kahana Sunset's Building A and Building F are located within the hazard line, at the 1.1 foot exposure SLR-XA Kahana Sunset's Building A and Building F are located within the hazard line, at the 2.0 foot exposure SLR-XA Kahana Sunset's Building A and Building F, Building B and Building E and



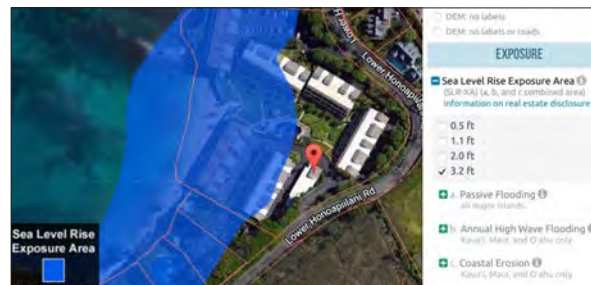
*0.5 feet exposure SLR-XA line
Kahana Sunset's Building A and Building F
are located within the hazard line*



*1.1 feet exposure SLR-XA line
Kahana Sunset's Building A and Building F
are located within the hazard line*



*2.0 feet exposure SLR-XA line
Kahana Sunset's Building A and Building F,
and a portion of Building B and Building E and common
area are located within the hazard line*



*3.2 feet exposure SLR-XA line
Kahana Sunset's Building A, B, E and F and 1/2 of the com-
mon area are located within the hazard line*

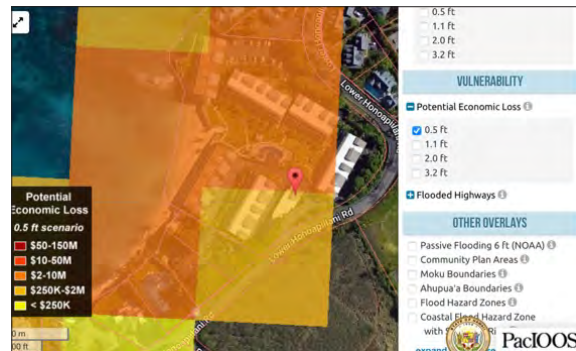
common area are located within the hazard line, and at the 3.2 foot exposure SLR-XA Kahana Sunset's Buildings A, B, E and F and 1/2 of the common area are located within the hazard line.

Vulnerability

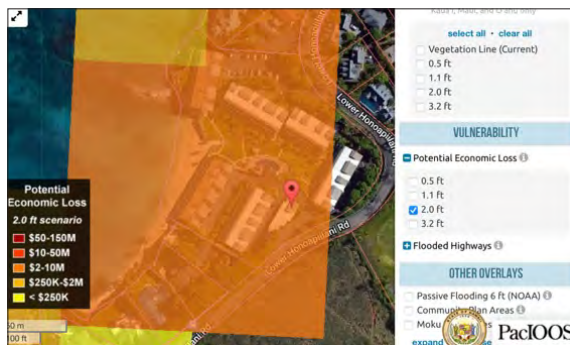
The Viewer also indicated the potential for Kahana Sunset and the surrounding area's economic loss or vulnerability. Vulnerability was based on the value of the land and structures based on the Maui County tax parcel database which were permanently lost in the SLR-XA for each projected sea level rise height. The three illustrations display potential economic loss for the area.

The MRPlan notes for subject parcel and the surrounding subject parcels at: the 0.5 feet and 1.1 feet the potential economic loss ranges from \$250K to \$10 million dollars, at the 2.0 feet line

the potential economic loss ranges from \$2 million to \$10 million dollars, at the 3.2 foot line the line the potential economic loss ranges from \$2 million to \$50 million dollars.



0.5 foot and 1.1 foot potential economic loss ranges from \$250K to \$10 million dollars



2.0 foot potential economic loss ranges from \$2 million to \$10 million dollars



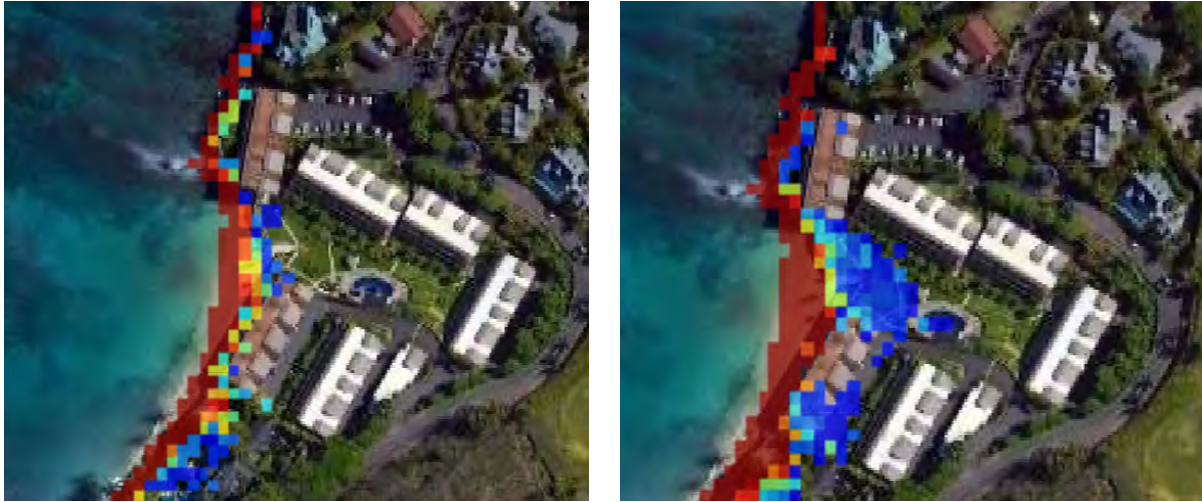
3.2 foot potential economic loss ranges from \$2 million to \$50 million dollars

Source: PacIOOS Website Vulnerability

PacIOOS WEST MAUI WAVE-DRIVEN FLOODING WITH SEA LEVEL RISE

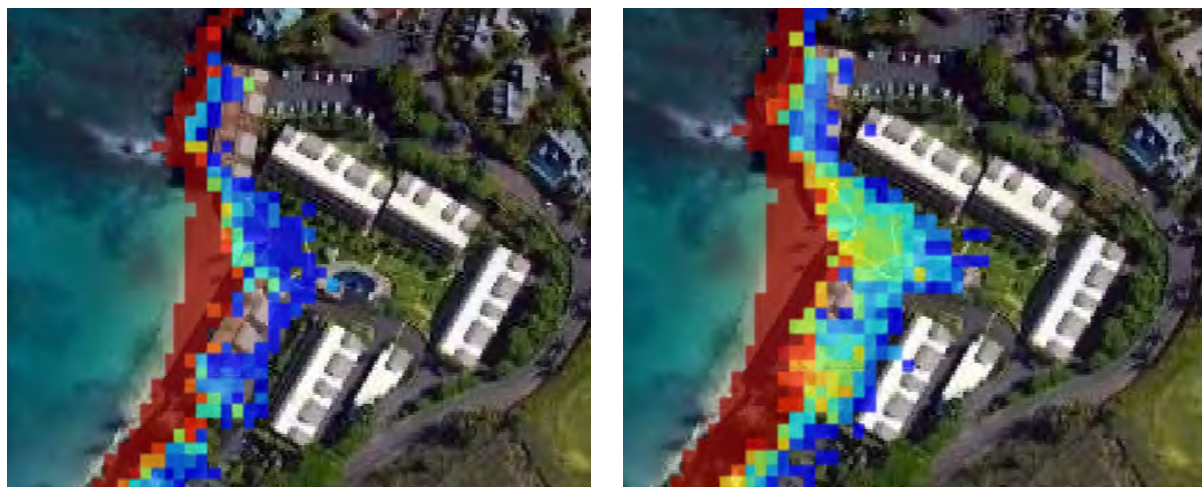
The PacIOOS forecast of coastal flooding was developed by the UH Oceanography's Coastal Hazards Group which was funded through a National Oceanic and Atmospheric Administration (NOAA) grant award. The PACIOOS Sea Level Rise West Maui Wave- Driven Flooding with Sea Level Rise tool looked at the Napili Region which extends ½ from Hawea point (north of Nana-lu Bay) to ½ from Haukoe Point (south). Kahana Sunset is located near Haukoe Point. The tool simulates Wave Flooding through Wave Height - Minimum Wave Flooding (minimal swell and high background WL), Annual High Wave Flooding (large swell and high background WL), and Maximum Wave Flooding (largest swell and highest background WL). Sea Level Rise view options include: 0.0, 1.0, 2.0, 3.3 and 6.6 feet. Wave Exposure options include combined directions or specific directions N, NNW, SSW and S.

The West Maui Wave-Driven Flooding with Sea Level Rise MINIMUM Wave Height at 3.3 and 6.6. Feet Sea Level Rise + combined wave exposure indicates under both scenarios indicate the potential for wave flooding for Kahana Sunset's Building A and Building F, the common area and parking for Building F.



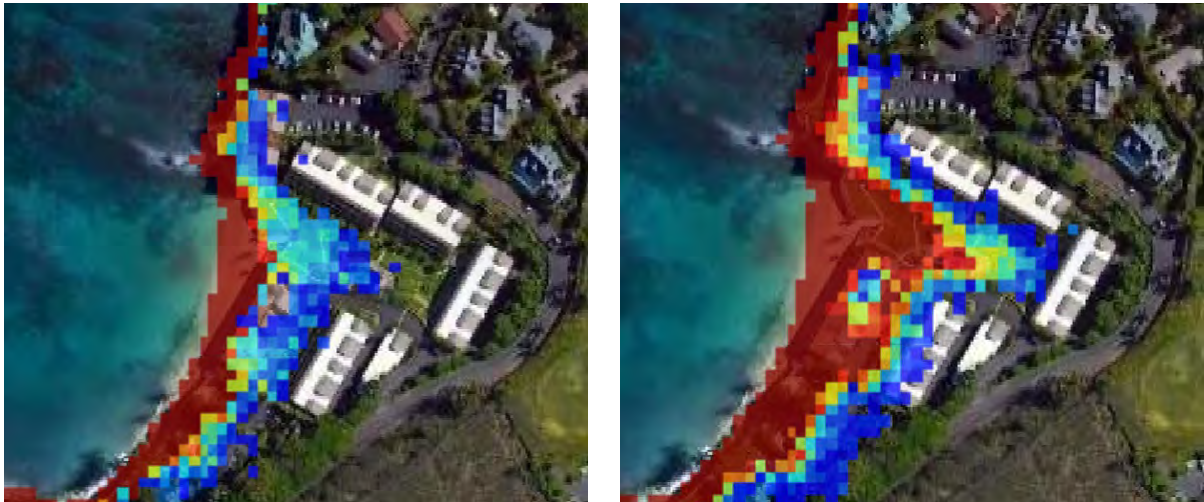
Sea Level Rise Viewer: West Maui Wave-Driven Flooding with Sea Level Rise MINIMUM Wave Height of 3.3 and 6.6 Feet Sea Level Rise and combined wave exposure

The ANNUAL Wave Height at 3.3 and 6.6. Feet Sea Level Rise + combined wave exposure indicates under both scenarios indicate the potential for wave flooding for Kahana Sunset's Building A and Building F, Building B and Building E, common area and parking for Building F.



Sea Level Rise Viewer: West Maui Wave-Driven Flooding with Sea Level Rise ANNUAL Wave Height of 3.3 and 6.6 Feet Sea Level Rise and combined wave exposure

The West Maui Wave-Driven Flooding with Sea Level Rise MAXIMUM Wave Height at 3.3 and 6.6 Feet Sea Level Rise + combined wave exposure indicates under both scenarios indicate the potential for wave flooding for all of Kahana Sunset’s Buildings and common area and parking for Building F. Most impacted by wave flooding are Building A, Building F, and Building B.



Sea Level Rise Viewer: West Maui Wave-Driven Flooding with Sea Level Rise MAXIMUM Wave Height of 3.3 and 6.6 Feet Sea Level Rise and combined wave exposure

PacIOOS WAVE RUN-UP FORECAST

The PacIOOS Wave Run-Up Forecast tool was utilized to predict the potential occurrence of high sea levels and wave inundation impacting the shoreline for the future events for the West Maui community. Kahana Sunset is located in the West Maui; Nāpili Region is located from Hāwea point (north of Namalu Bay) to Keonenui Bay (south). According to the viewer, the shoreline is characterized by steep, volcanic headlands that contain pocket beaches composed of sand and/or cobble. There are various forms of shoreline hardening. There is an irregular fringing reef concentrated at headlands with sand channels fronting the sandy beaches which protect the shoreline from waves intermittently. High waves and erosion threaten buildings and infrastructure.

Critical Impact Events

In 2009 and 2016, Keonenui Bay experienced Run-up Threshold Critical Impact Events identified as “strong wave battering of vegetation, dunes or bluffs; strong battering and frequent overtopping of shoreline hardening backing some beaches; likely flooding of adjacent land behind sand dunes and/or significant erosion of exposed volcanic sediment.”

The PacIOOS Wave Run-up Forecasts provides guidance to increase community capacity to prepare for, and recover from, wave-driven impacts such as coastal flooding and erosion. The website noted that the run-up height will always exceed or equal the tide plus background sea level described above as the waves are riding on top of that sea level. The Dark Blue Curve is a

history of the last forecast run-up height determined for each particular time of the past three days; the curve provides context to show how the forecast run-up for the next six days differs. If the forecast run-up extends into the red shaded region which indicates light impacts, hazardous impacts, critical impacts on the plot; the waves may be a disruption for beach activities. The higher the forecast the more severe the expected effects.



*F Building lanais and sinkhole
2009 Critical Impact Event Keonenui Bay*



*Exposed shoreline fronting the F Building and red clay
2016 Critical Impact Event Keonenui Bay*

Source: PaclOOS PaclOOS Run-up Example Critical Impact Event 2009 and 2016

PUBLIC OUTREACH

To address the concern that Native Hawaiians and local community members were not thoroughly included in discussing the MRPlan public comments were solicited through the Lahaina News and the Maui News.

On July 24, 2023, the below paragraph was submitted to the Lahaina News on May 5, 2023 under the Community News section, and as a Letter to the Editor on July 20, 2023. On July 29, 2023, The Maui News published the paragraph as a Letter to the Editor. The following was published in the seeking comments from west side residents:

Maui residents have seen how Climate Change and Sea Level Rise have and are affecting Maui's valuable shorelines. To those who call the shoreline home and/or have experienced accelerated changes to our valued beaches your perspective and input matters. One of the many plans to deal with climate change impacts along the coast is referred to as a Managed Retreat. The term might oversimplify a much more complex situation. Can we move out of the way of Mother Nature? and if not how can Maui County adapt to the changes? Community input is being sought regarding Managed Retreat as part of the Kahana Sunset Managed Retreat Plan. Ke Kai Planning invites the community to comment on what and how they feel Managed Retreat can be accomplished.

To date the following comments were received:

- July 19, 2023 Robert Cartright: To deal with our changing climate beach nourishment project, then work to restore (the) reefs, and finally install artificial reefs to provide environments that support coral growth and other sea life. These are the best long terms solution to our problem with beach erosion. Managed retreat is the most important issue facing Hawaii. The DLNR (did) not to move forward with the project to nourish the beach at Kaanapali after Governor Green approved it was a terrible mistake. To not allow for the nourishment of Kaanapali beach is an act of total surrender and not one of managed retreat. To lose this valuable resource without making the effort to save it would not only take away everyone's ability to enjoy the beach and ocean but it will eventually take away jobs for our local residents. In addition, the County of Maui and State of Hawaii will lose all the revenue generated from the Real Property Taxes, General Excise Tax and Transient Accommodation taxes that go toward funding their work and social programs. I live on Kaanapali Beach and have lived and worked in Kaanapali for over 40 years. I see local residents enjoying the beach every day, either surfing, body boarding, fishing, diving or just to swim.
- August 1, 2023 Ralph Lowman: I believe the only way to slow the seashore erosion is to build a breakwall 10 feet above sea level that is 10 foot wide minimum at the top. I wish "they" would put sandbags in front of the trees at Honokowai Beach Park, I doubt the remaining trees will make it through the December swell. No sandbags north of S Turns is allowing the road to be undermined. It's amazing nothing has been started yet. No one wants to look at or pay for a breakwall. I heard the county will no longer issue seawall permits. Everything is too expensive. Building a tunnel through Olowalu to lao & using the lava or rock for a seawall is a way out of line of thought.
- August 4, 2023 Scott Werden: Aloha, I saw an article in the paper inviting mana'o from the public regarding managed retreat.

I am very much against maintaining properties that are close to the shore and are being threatened by erosion. The reason for my view is that erosion is a natural part of ocean dynamics, particularly here in Hawai'i. It is normal for us to get battered by storms and it is normal for some amount of sea level rise, after all, 10,00 years ago it was possible to walk from Maui to Lana'i. Of course global warming is accelerating sea level rise but even without warming, it would rise on its own. So property owners who built where they should not have built should only fight erosion if doing so is 100% harmless. But it isn't; to stop natural erosion means stopping what nature does all the time and the ecosystems that have evolved expect this behavior.

There are other good reasons to not be building close to the shore and to be moving existing buildings away from the shore. Those buildings by and large cut off access by the public to beaches, which are considered part of the public trust that the Hawai'i constitution protects.

Since I am not in favor of harming our shores to maintain threatened buildings, and I question whether they should be there at all, I am in favor of managed retreat.

KAUAI COUNTY

On February 23, 2023, the Kauai County Planning Department was contacted to discuss managed retreat and what that meant conceptually for the island of Kauai. On Zoom were staff planner Ms. Summers and Director Mr. Hull. Kauai County is addressing climate change and seeking public input on climate adaptation strategies through the Kauai Climate Adaptation Plan and Portal website.⁴ The Climate Adaptation Plan is being developed with the goal to “present a framework of actions to ensure people, places and natural and built systems are able to adapt to and mitigate climate change.”

An example is the Waimea 400 Conceptual Master Plan which allows for the advancement of sea level rise, groundwater intrusion, and climate change. The county- owned 417 acre subject parcel is located between Waimea and KeKaha and subject to flooding. Critical infrastructure is located in places based on sea level rise and flooding. Housing and agriculture uses are based upland.

Another concept discussed was the possibility of a Transfer Development Rights (TDR) program with development located not on prime rated agricultural lands to increase housing supply to meet demand. Research is being conducted to address landowner rights, land use laws, entitlements, and sea level rise that includes passive flooding, annual high wave flooding, and coastal erosion. Director Hull noted that the report looked at the movement of people and/or communities to agriculture land.

The general consensus is structures need to move away from the shoreline. Does this mean downsizing, no managed retreat, or relocate mauka? Does the community approve the use of public property? There is no funding in place. Will the landowner get the same entitlements and fair market value for relocating inward?

Kauai County does not have the present issues as Maui faces but will have to face the challenge within the next 15 to 20 years. Kauai has more sand than Maui. The sea level rise exposure area

⁴ The Climate and Vulnerability and Equity Interactive Map identifies Climate Vulnerability by five (5) Planning Area; a synopsis of climate change hazards — drought and heat, wildfire, sea level rise, flooding, landslides, and their impacts on homes, infrastructure and affordable housing units, cultural resources, cesspools, critical infrastructure such as boat harbor, fire and police stations, neighborhood centers, transportation infrastructure/assets and towns, agricultural land and traditional cultivation areas, the beach, and reservoirs are summarized.

(SLR-XA) line for Maui island is consistent with CZM program but not for Kauai County. The SLR-XA is inside the SMA area.



Source: OPSD GIS Program and PaOLOOS website

HAWAII COUNTY

On February 27, 2023, the Hawaii County Planning Department was contacted to discuss managed retreat. Staff planner Mr. Sullivan noted an example of managed retreat was the (Amended) Urban Renewal Plan for the Kaikoo Project discussed areas affected by the May 1960 tsunami (1965). The Land Use Plan noted the “general purpose and objective of this Renewal Plan is to designate lands within the project area for such reuse as will minimize the danger of loss of life or damage to property in areas subject to possible inundation and flooding from future seismic waves;” the plan identified elevated areas and open areas and acceptable land use(s). The county identified Hilo’s northeast section affected by the 1960 tsunami which constrained development.

A follow up report was issued eleven years later titled Project: Kaiko (rough seas). Hawaii County’s Hawaii Redevelopment Agency played a significant role in the renewal of Hilo. More so, “it is, fundamentally, a story of people helping people.” Key to the plan was the Legislature enacting legislation to make public lands available to rebuild and relocate families and light industry. The disaster area was cleared and the residents and business were moved, the area was rebuilt and renewed. The design was to minimize the destruction from the next wave. Tsunami victims moved to the state-owned light industrial land tract located by airport.

The report noted, “families whose home had been leveled the wave did not object to relocation...as negotiations turned to less damaged and still-populated areas, resistance stiffened, project momentum slowed.” Condemnation proceedings occurred. Several factors that helped reconvert the area were the proposed construction and occupation of the Hilo Mall and new state and county offices, direct flights from the mainland to Hilo, multi-use development, a developed green belt seaside zone, and the Small Business Administration lease guarantee program.

Residents were moved into homes located away from tsunami threat. The report noted that the before and after property tax levy increased as the result of more efficient land use.

MAUI COUNTY

The lead for climate change and sea level rise is the Department and its staff of Ms. Thackerson, Mr. Buika, and SOEST staff Ms. Owens and Mr. Crile who have been working with Kahana Sunset on the MRPlan.

Other sources include the County's Office of Climate Change, Resiliency and Sustainability that produced the Maui County Climate Action & Resiliency Plan 2022 Status Report which noted that climate change is apparent in Maui, Molokai, and Lanai with drought, sea level rise, storms, erosion, coral bleaching, and habitat and species loss. The report focuses on managing the county's contributions to climate change, preparing for the unavoidable impacts, reduction in greenhouse gases and an increase in resiliency for the community.

OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT

The OPSD, Coastal Zone Management (CZM) Program purpose is to "provide for the effective management, beneficial use, protection, and development of the coastal zone." The OPSD is mandated by HRS, Chapter 205A to coordinate and implement the ORMP and its the Management Priorities. The OPSD was tasked by the Legislature with a step- by-step plan to help implement managed retreat for areas in Hawaii threatened by SLR and/or other coastal hazards.

The 2019 OPSD Report recognized retreat was not a simple task which may be easily accomplished. The report and one-day workshop highlighted various questions:

- Managed retreat versus accommodation or protection?
- What should be retreated versus the rights of private property owners, infrastructure, or coastal resources?
- What are the financial/monetary costs/tax implications?
- Who is responsible for shouldering the financial burden of managed retreat?
- Is managed retreat the responsibility of the landowner, government or it is a public-private partnership?
- Should government land be utilized in retreat?
- What legal issues surround retreat — rebuilding restrictions, structure removal requirements, acquisition and buyout programs, conservation easements, rolling easements, etc.?

These were the many questions that came out of the meeting for the report. The CZM continues to work with State and County agencies to explore Managed Retreat in Hawaii to develop a balanced approach to competing uses.

TRANSFER AND PURCHASE OF DEVELOPMENT RIGHTS

Local Housing Solutions noted TDR programs have been around for twenty years. TDR evolved out of a concept known as PDR. TDR programs were designed to encourage a shift in growth away from agricultural land, environmentally sensitive areas, open space, and/or other significant regions and concentrate growth in more appropriate areas. TDR programs are voluntary programs. TDR programs require careful planning and design.

In 2007, Chris Hart and Partners prepared for the Department's Long-Range Planning Division the General Plan 2030 Maui Island Plan, Directed Growth Strategy – Transfer and Purchase of Development Rights Program Implementation Study for TDR and PDR programs for Maui County.

The plan noted, "a primary objective of the update is to develop a directed growth strategy to accommodate population growth in a manner that is fiscally prudent, safeguards the island's natural and cultural resources, enhances the built environment, and preserves land use opportunities for future generations. An important element of the directed growth strategy will be to establish TDR and PDR programs. TDR's and PDR's have been in use for many years nationally to preserve agricultural lands, open space, and sensitive environmental resources. These tools provide landowners the option of being compensated for giving up development rights to lands that serve an important public purpose in their current use, or undeveloped condition.

With PDR programs the landowner is compensated by a land trust or local government agency that buys development rights from the landowner so that the property can be preserved in its current condition. With TDR programs the landowner can sell development rights to a developer who then uses those rights to develop at a higher density than what would otherwise be permitted. TDR and PDR programs usually contain a set of incentives to facilitate the desired landowner behavior.

The intent of a TDR program is to provide a market-based process for permanently preserving lands or landmark structures that provide a public benefit. With TDR, landowners in sending areas sell their development rights, and purchasers may then use those rights to build in a designated receiving area at higher density than is normally allowed by existing zoning. A conservation easement is then put in place on the sending area property and the property is permanently protected from development. Landowners who sell development rights receive cash while retaining ownership and private use of their land. Land from which development rights are sold can never be developed, but may still be used for agriculture, hunting, timber and recreation. The landowner can continue to live on the property and may sell the property in the future. The restriction is on new development.

An internet search for Maui County and TDR search words yielded the preliminary draft ordinance regarding Transfer Development Rights which was undated and not in effect. However the Maui County General Plan 2030 Chapter 7: Land Use does discuss TDR programs.

Examples of PDR programs include the Maui Coastal Lands Trust, Hawaii Land Trust, Trust for Public Land which have bought land and placed a permanent deed restriction on the subject parcels which limit the land use(s) in perpetuity. The deed restriction is known as a conservation easement.

H.B. 756 H.D.2 Relating to Land Use (and companion bill S.B. 1032) addressed TDR and the PDR; the latest version of H.B. 756 H.D.2 failed to be heard. The DLNR would have developed plans and programs to facilitate the voluntary relocation of residential development away from areas at risk of sea level rise. It allowed for the exchange of public land for private lands for the transfer of development rights or land exchanges to relocate private development away from high-risk areas.

The DLNR was tasked with the voluntary relocation of development from locations that are or will be critically threatened by impacts related to climate change and sea level rise and have high natural resource value, including acquisitions, leasebacks, transfers of development rights, land exchanges, and restoration of coastal lands from sending areas to receiving areas in state-owned lands, subject to all applicable laws, so long as the public interest is served.

In the March 28, 2023 Civil Beat Article, Hawaii Lawmakers Grappling with Sea Level Rise Say 'It's Not the Right Time' for Managed Retreat, Dr. Fletcher noted "Coastal residents could all be given a "bank" of development rights — for instance, put an extra floor or two on a building to break through a height restriction," explained Fletcher, which developers could then purchase from each property owner to use where they see fit. These transferable rights could be worth hundreds of thousands of dollars or more, said Fletcher. After selling their allotted rights to a developer, property owners could then be required to vacate. As coastal residents move in search of new homes, the system would ensure a more direct correlation between the number of these buyers and the amount of development available to accommodate them...This is one very powerful tool, but there are going to have to be other powerful tools as well... Not to mention the task of figuring out how to equitably distribute these transferable development rights in the first place.

The MRPlan notes Kahana Sunset does not meet the qualifications and criteria set out in the Transfer and Purchase of Development Rights Program Implementation Study (2007). It does not meet the three (3) criteria appropriate sending sites: Designated Prime or Other Agricultural Resource Lands; Located within close proximity to existing urban areas; and Has value as

an open space resource by creating a separation or buffer between existing communities and protecting scenic views. Kahana Sunset is not in a sending area that consists of Prime Agricultural Resource Lands that are or are not located within the Urban Fringe Prime Agricultural Preservation Area, nor are they located in Shoreline Lands Preservation Area.

If a future TDR bill is passed Kahana Sunset may benefit in the future. Realistic questions that need to be asked are just and fair compensation, land and/or development rights and/or real estate equity.

LEASEBACK PROPERTY

As part of House Bill 756 H.D.2 and S.B. 1032 RELATING TO LAND USE the leaseback of property was raised as well as the funding mechanism.

The definition of "Leaseback" was "a transaction in which a property owner willingly sells the real property to the State or third party and leases the property back from that new owner until such time as the State deems the land is unsafe for the leased use due to increasing erosion or flood hazard." HRS, Section 171-B, General powers, language would have been amended and authority given to the DLNR Board:

In carrying out its functions under this part, the board may do all things necessary, useful, and convenient in connection with voluntary relocation of development from locations that are or will be critically threatened by impacts related to climate change and sea level rise and have high natural resource value, including...leasebacks...from sending areas to receiving areas in state-owned lands, subject to all applicable laws, so long as the public interest is served." Pursuant to HRS, Chapter 171-D Sea level rise relocation special fund (4) "there is established in the state treasury the sea level rise relocation special fund, into which shall be deposited: (4) proceeds from...leasebacks

The MRPlan notes that since the measure was not heard, this is not an option. However, future Legislative measures and actions should be watched for opportunities.

LAND EXCHANGE

According to the World Bank, a land swap, "is a tool that empowers a city to trade a municipally owned site with a privately owned site. Governments can resort to land swaps to enable development and urban regeneration on land that faces other restrictions (for instance, endowment land or land with restrictions such as areas controlled by the military)."

Land exchange or land swap can be used as a managed retreat tool. House Bill 756 HD 2 noted, The legislature further finds that transferring development rights and land exchanges are useful techniques to achieve managed retreat strategies by voluntarily shifting develop-

ment away from areas that are critically threatened by sea level rise, including areas with particularly high natural and community resource value. The measure would allow the exchange of “public land for private lands or land exchanges to relocate private development away from high-risk areas.” “Land exchange” means mechanisms to secure lands while compensating property owners in-kind, including partial or full replacement to financial compensation, through providing land or development rights....Land exchanges are a valuable regulatory tool that can enable coastal residents to retain some real estate equity in cases where the state decides it is best to relocate them before the ocean takes their property.

Land exchange proposals raise critical debate over the possible, perceived and/or potential outcome(s) for the landowner(s), the receiver(s), the environment and/or Native Hawaiians. Land exchange may take years to complete and are not short-term solutions. There is need for due diligence, ownership of land titles, appropriate valuation price and community input. Is the valuation based on the land swap date year/date or as an unimproved and/or developed parcel? What does one need to clear title? Are the steps moving forward a fair and equitable transaction?

Past proposals for state-owned land exchanges have raised critical debate over the use of (specific) state funds, due diligence, acquisition of non-state lands, release of state-owned lands, and the state’s interpretation of property of equal value, the state’s expectation and its process of acquiring private lands, and the fairness of using Special Funds used for revenues designated for particular purposes. This was true for Senate Bill 1374 as detailed in 2015 Civil Beat’s article No Prison-for-Pineapples After Land Swap Bill Stalls in House.

In 2014, the DLNR and Haleakalā Ranch agreed on a land exchange to ensure hiking public access and to avoid costly litigation. However, the dispute ranged for ten years. The DLNR relinquished title to the Haleakalā Bridle Trail but maintained a binding perpetual agreement for hiking trail public access and a perpetual easement for a new access route to the 1928 Kahikinui Forest Reserve and 2011 Nakula Natural Area Reserve (NAR); the NAR protects a koa-’ohi’a forest and alpine shrublands and is potential habitat for endangered forest birds at risk of imminent extinction.

Hawaii’s Thousand Friends discussed the Hawaii’s public trust doctrine and noted the Hawaii Supreme Court described the public trust doctrine as

The right of the people to have the waters protected for their use [which] demands adequate provision for traditional and customary Hawaiian rights, wildlife, maintenance of ecological balance and scenic beauty, and the preservation and enhancement of the waters...For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii’s natural beauty and all natural resources,

including land, water, air, minerals and energy sources, and shall promote the development and utilization of these resources in a manner consistent with their conservation and in furtherance of the self-sufficiency of the State. All public natural resources are held in trust by the State for the benefit of the people.

In 2023, the Council's Housing and Land Use Committee did not approve the affordable housing project Hale Mahaolu Ke Kahua due to lack of sufficient infrastructure (sidewalks, bus stops) and Native Hawaiian concerns regarding the protection of iwi kupuna. East Maui Council member Mr. Sinenci proposed the project scale down or move to another location (under a county land swap). The MEO rejected the idea,

The project was tailored for the 11-acre parcel. [Hale Mahaolu and Highridge Costa] spent significant money with the site plans, with the environmental impact, with cultural studies, with traffic studies...to move the project to someplace else, none of that will be applicable. You would have to start completely over.

The MEO noted, "if a land swap were to occur it would take MEO and its partners between five to ten years to have the development completed." MEO noted if it doesn't get approved, it's likely the building won't happen.

There is no mechanism for Kahana Sunset to conduct a land swap or land exchange. If the future allowed such a mechanism to occur any land swap will need to include all Kahana Sunset owner's approval.

ARTIFICIAL REEF INSTALLATION

The MRPlan looks at the construction and installation of artificial reef installation(s) as a way to dissipate wave energy reaching Keonenui Bay. The DLNR, Division of Aquatic Resources (DAR) was contacted about the potential to construct an artificial reef offshore. DAR noted that artificial reefs and coral reef restoration definitions have been conjoined together, however actual uses are quite specific. Artificial reefs merely provide a hard surface for invertebrates (corals, oysters, barnacles) to attach. Coral restoration is the act of growing corals and then planting them in the wild.

Since 1960, the DAR installed artificial reefs to increase and enhance fishing opportunities where natural habitat was sparse to enhanced reef habitat, increased fish biomass and increased species diversity. In 1961, the state installed the first artificial reef in Oahu, the 74-acre Mauanalua Bay artificial reef. In 1963, two more artificial reefs followed, the 54-acre artificial reef off Keawakapu, Maui and the 141-acre artificial reef off of Waianae, Oahu. In 1972, the 1,727-acre artificial reef off of Kualoa, Oahu was created. In 1986, the 31-acre Ewa Deepwater artificial reef was created for bottom fish habitat.

All artificial reefs except the latter were deployed at depths from 50 to 100 feet of water; the latter was deployed at 300-420 feet of water. Materials consisted of car bodies, concrete pipes, barge and minesweeper, concrete and tire modules, concrete material, truck tires and more recently concrete “z-modules” and small vessels. DAR noted the objectives were to expand existing artificial reef sites and add more sites around the Main Hawaiian Islands. The limiting factor for the artificial reef program is the lack of funding.

Sea level rise and wave-induced flooding has the potential to threaten approximately 1,700 Department of Defense (DoD) managed military installations in coastal areas. In 2022, the DoD’s Defense Advanced Research Projects Agency (DARPA) Reefense Project awarded approximately \$25 million to the UH to develop an engineered coral reef ecosystem to protect coastlines from flooding, erosion and storm damage through an engineered structure which dissipates wave energy and provided habitat for corals and other reef life. The Rapid Resilient Reefs for Coastal Defense (R3D) project takes an integrated, ecosystem-level approach to design and build a living coastal-protection system versus using current coastal protection measures (bulkhead, coastal seawalls).

The MRPlan notes an artificial reef installation may act as a fish aggregating device (FAD), create coral habitat, and dissipate wave energy reaching shoreline. If Kahana Sunset proceeded with an artificial reef installation the following steps would occur at minimum:

- Have available funds and commit to funding regardless of federal, state or county approval;
- Apply for a Maui County Special Management Area Permit pursuant to Maui County Code (MCC) Section 12-202 Special Management Area Rules,
- Apply for a Maui County Shoreline Setback Variance pursuant to MCC Section 12- 203 Shoreline Rules for the Maui Planning Commission;
- Receive a DLNR, Land Division Lease for State-owned submerged lands pursuant to HAR/HRS;
- Apply for a DLNR, Office of Conservation and Coastal Lands - Conservation District Use Permit (CDUP) pursuant to Hawaii Administrative Rules (HAR), Section 13-5-24, identified land uses in the Resource Subzone, R-2 ARTIFICIAL REEFS and/or Section 13-5-24 R-5 MARINE CONSTRUCTION;
- Apply for a Clean Water Act Section 401 Water Quality Certification (WQC) from the State of Hawaii Department of Health (DOH), Clean Water Branch;
- Get prior approval from the DLNR Division of Boating and Ocean Recreation (DOBOR) and Division of Aquatic Resources (DAR);
- Complete a Environmental Assessment or Environmental Impact Statement pursuant to Hawaii Administrative Rules (HAR), Chapter 11-200.1 / Hawaii Revised Statutes (HRS), Chapter 343 due to proposed triggers – Use of State or County Lands or Funds, Use of Conservation District Lands, and Use of Shoreline Area;
- Utilize Best Management Practices (BMPs).

The project could go through the appropriate regulatory processes; however nothing is guaranteed on the Federal, State and or Maui County jurisdictions.

BIOROCK INSTALLATION

The MRPlan looked at Biorock Installation(s) as a potential solution which was the concept from the nonprofit 501(c)(3) Keonenui Bay Foundation.

The Global Coral Reef Alliance have been constructing Biorock reefs for decades in forty countries. For Keonenui Bay, the proposed project proposes the placement of Biorock Installation(s) in Keonenui Bay with several options to protect Building A and Building F and the seawall plus an optional layout to protect neighbors to the South. The proposed project would encourage coral growth through an electrical current to encourage the growth of coral. Materials would consist of a steel mesh frame structure protected by the Biorock mineral accretion technique. The structure would be fifty feet wide with a steep leading edge facing wave swells to dissipate wave energy.

The DLNR, DAR noted there has not been an approved Biorock reef installation project in the state; it is an unproven project. The division notes in order to assess the proposed project a formal permit application will need to be submitted. DAR noted any public or private entity trying to establish an artificial reef in U.S waters must get a permit from the U.S. Army Corps of Engineers (USACE) which is the lead Federal agency responsible for permitting artificial reef development pursuant to the 1984 National Fishing Enhancement Act.

The MRPlan notes the proposed Biorock Installation project could go through the appropriate regulatory processes; however nothing is guaranteed on the Federal, State and or Maui County jurisdictions. The Keonenui Bay Foundation has submitted two proposals for Biorock permit preparation to the National Fish and Wildlife Fund, one each for the Coastal Resilience Fund and the Coral Reef Conservation Fund. Both were rejected.

FEDERAL FUNDING

The OPSD notes there is no federal funding program that allocate federal funds to the State of Hawaii. The 2019 OPSD Report noted, "coastal erosion, which is a chronic condition and a coastal hazard, is different from in-land flood prone areas. Coastal erosion may lead to flooding — but flooding due to coastal erosion may not be eligible for FEMA funding."

The Background Research and Scenario Profiles identified insurance as a central point of confusion for the analysis of the feasibility of managed retreat. The FEMA is charged with administering federal programs for flood insurance and the National Flood Insurance Program (NFIP) provides coverage for properties subject to flooding. Funds are used to reduce or eliminate the

long-term risks of flood damage to structures insured under the NFIP. The Flood Insurance Rate Maps (FIRM) identify flood hazard areas that provide the basis for the subsidies issued by NFIP. The FIRMs' hazard areas are based on historical flooding patterns and do not consider projections of SLR and other climate change related impacts.

Without the ability to secure flood insurance via NFIP, it would be difficult or impossible to secure a mortgage and owners would need to purchase insurance that reflects the costs of coastal living. Owners can risk living along the shore without insurance or not purchase a shoreline property.

EMINENT DOMAIN / CONDEMNATION

In August 2017, Maui County's Department of the Corporation Counsel covered the eminent domain process for the Front Street Apartment Facility, and the process for initiating condemnation proceedings by the Council.

HRS statutes relevant to eminent domain were covered: HRS, Section 46-1.5 (6) General powers and limitation of the counties, HRS, Section 46-61 Eminent domain; purpose for taking property, HRS, Section 101-13 Exercise of power by county, HRS, Section 101-14 Plaintiff, HRS, Section 46-62 Eminent domain; proceedings according to Chapter 101 (which discusses condemnation process). The Maui County Code Section 3.44.015 (E) and Revised Chapter of the County of Maui (1983) Section 4-2 (7) were discussed. The memo summary noted for eminent domain the County should own the land and the structures to effectuate the purpose of the condemnation.

Council actions include passing a Resolution to authorize the proceedings in eminent domain for the acquisition of real property for Public Purposes. One example is Resolution No. 07-90 (2007) that authorized the proceedings in eminent domain for the acquisition of real property for Public Purposes — Unit 2 of the Montana Beach Condominium. The Council approved Resolution No. 06-41 (2006) that authorized proceedings in eminent domain for the acquisition of real property for the North-South Collector Road.

The MRPlan notes that in order for Maui County to enact eminent domain there has to be a compelling public purpose.

GOVERNMENT PLANS

Kahana Sunset will continue to work within the framework of the County of Maui 2030 General Plan, Maui Island Plan, and West Maui Community Plan.

STATE AND COUNTY LAWS

Kahana Sunset will continue to work within the confines of the law, pursuant to:

- Land Use Commission:
 - HRS, Chapter 205 Land Use Commission.
- Department of Business, Economic Development and Tourism:
 - HRS, Section 205A COASTAL ZONE MANAGEMENT.
 - ACT 16, Session Laws of Hawaii 2020.
 - HRS, Chapter 343 ENVIRONMENTAL IMPACT STATEMENTS.
- Department of Commerce and Consumer Affairs:
 - HRS, Chapter 514B CONDOMINIUM PROPERTY ACT.
- Department of Land and Natural Resources:
 - HAR, Chapter 13-5 CONSERVATION DISTRICT RULES and HRS, Chapter 183C Conservation District.
 - HAR, Section 13-10-222 SHORELINE CERTIFICATIONS,
 - HRS, Section 171-53 RECLAMATION AND DISPOSITION OF SUBMERGED OR RECLAIMED LANDS.
 - HRS, Section 171-55, PERMITS.
 - HRS Chapter 6E.
- Department of Accounting and General Services
 - HAR, Chapter 3-40 RULES GOVERNING PUBLIC USE OF THE LAND SURVEY DIVISION MAPS, DESCRIPTIONS, AND RECORDS, AND SCHEDULE OF FEES FOR SERVICES, MAPS, AND OTHER RECORD DATA.
- Maui County:
 - Planning Department's Section 12-203 SHORELINE RULES FOR THE MAUI PLANNING COMMISSION.
 - Section 12-202 SPECIAL MANAGEMENT AREA RULES.
 - Department of Public Works Title 16 – BUILDINGS AND CONSTRUCTION, Chapter 16.26 BUILDING CODE.

HRS, Section 205A COASTAL ZONE MANAGEMENT

The state of Hawaii is located in the Coastal Zone Management area. The Department of Business, Economic Development and Tourism (DBEDT), OPSD, CZM Program manages the 1977 program. Kahana Sunset will need to work within the confines of HRS, Chapter 205A's purpose to "provide for the effective management, beneficial use, protection, and development of the Coastal Zone."

Kahana Sunset will need to work within the confines ACT16, SLH 2020. The act updated HRS, Chapter 205A. It strengthened “protections for beach and other coastal environments by specifically prohibiting private shoreline hardening structures and minimizing public shoreline hardening structures, including seawalls and revetments, at sandy beaches where they would interfere with existing recreational and waterline activities.”

Kahana Sunset’s sea walls and other hard structures - shoreline erosion protection systems, gunite and concrete erosion protection system were constructed, and over time repaired to safeguard the shoreline subject parcel to withstand impacts from changing conditions in 1975, 1978, 1997, 2003, 2009, 2010, 2012, 2013, 2014, and 2017.

Kahana Sunset will require future repairs however the repairs will need to fall within the definition of repair. The Frequently Asked Questions for amendments to HRS, Chapter 205A enacted by ACT 16, SLH 2020 (FAQ ACT 16 SLH 2020) noted, “Repair means an action of fixing, improving, or rebuilding any part of an existing legally constructed structure, but not the entire structure, for example, less than 50% of its replacement value, solely for the purpose of its maintenance.”

Kahana Sunset may not construct a new seawall. The FAQ ACT 16 SLH 2020 noted, “seawalls, revetments, and other shoreline hardening structures are no longer allowed at the sites with beaches as defined in HRS, Section 205A-1 unless it is in the interest of the public.” On January 14, 2021, the Department noted,

Under the changes enacted by ACT 16, the Department cannot approve shoreline or Special Management Area (SMA) permits as proposed for the fronting seawall structural plans, which would, in essence, build a new seawall...the Shoreline Rules for the Maui Planning Commission, under 12-203-12, permitted structures and activities within the shoreline area strictly limit the massing and types of structures to minor structures in the shoreline setback area.

HRS, Chapter 343 ENVIRONMENTAL IMPACT STATEMENTS

HRS, Chapter 343 the Hawaii Environmental Policy Act known as HEPA was enacted in the early 1970s and provided for environmental assessments and/or environmental impact statements when an action may affect the environment. Hawaii Administrative Rules (HAR), Chapter 11-200.1 Environmental Impact Statement Rules.

Kahana Sunset may need to provide an environmental assessment pursuant to HRS, Section 343-5 Applicability and requirements and HAR, Section 11-200.1-8 Applicability of Chapter 343, HRS.

HRS, Chapter 514B CONDOMINIUM PROPERTY ACT

The Association of Apartment Owners of Kahana Sunset is a condominium regime governed by HRS Chapter 514B. The Kahana Sunset AOA is comprised of 80 unit owners. The owners pay maintenance fees and reserves for the maintenance and operation of the common elements, which include landscaping, the swimming pool, BBQ area, gazebo, seawalls, parking, lanais, walkways, drainage, and roofs. Maintenance fees are also paid for the common expenses of the condominium project, such as professional services, utilities (sewage, water, security, cable, electricity, internet), and insurance. The seawall and building envelope of Building F are common elements.

Pursuant to the Declaration of Horizontal Property Regime of Kahana Sunset ("Declaration"), the Bylaws of the Association of Kahana Sunset and HRS Section 514B-137, the Association, through its Board of Directors, has a mandatory duty to maintain, repair and replace, the common elements. To eliminate or demolish units, thus depriving owners of their common percentage interest in the common elements and property rights, it requires the owner's approval and the lienholders' approval. No common interest percentage may be changed without the approval of the owner and lienholder per HRS Section 514B-137: "a unit's common interest shall be permanent and remain undivided, and may not be altered or partitioned without the consent of the owner of the unit and the owner's mortgagee, expressed in a duly executed and recorded declaration amendment." In addition, to remove a portion of the property from the condominium property regime, the Condominium Property Act requires a vote of 80% of the owners plus all lienholders of the units being removed, and then a partition action brought in the Second Circuit Court under HRS Section 514B-47. Further, to make any material alterations or additions at the condominium project requires 67% owner approval pursuant to HRS Section 514B-140.

These legal requirements make demolishing or removing a building and units extremely difficult. The Kahana Sunset AOA owners will need to decide on a variety of topics through a vote with the individual unit owners and lienholders: consent to change the Declaration to remove a building(s) from the condominium project, change the remaining owners' common percentage interest, and file a partition action with the Second Circuit Court..

HAR, Chapter 13-5 CONSERVATION DISTRICT RULES and HRS,

Chapter 183C Conservation District

The Conservation District is regulated by HRS, Chapter 183C Conservation District and HAR, Chapter 13-5 CONSERVATION DISTRICT RULES.

ACT 16 SLH 2020 addresses seawalls, beach nourishment, groins and sandbags. Seawalls and revetments are prohibited from sites with beaches unless a seawall is clearly in the interest

of the public. FAQACT 16 SLH 2020 noted, “the interest of the public means a benefit from a proposed action for public safety and/or public health, for the protection of public infrastructure in response to risk of coastal hazards, or for beach protection/sand retention for public use and recreation or coastal ecosystems.” Soft mitigation measures are preferred. Beach nourishments with installation of groins/breakwaters may be an effective way to restore and maintain beaches. Proposed installation of sandbags is a temporary and emergency measure to buy time to protect property from the shoreline erosion; sandbags will be removed after the permit expires.

Future Kahana Sunset projects located in the Conservation District must be an identified land use pursuant to HAR Chapter 13-5 as well as identified land uses the Protective Subzone (Section 13-5-22) and Resource Subzone (Section 13-5-24). In cases of an emergency Kahana Sunset can apply for an Emergency Permit pursuant to HAR, Chapter 13-5, Section 13-5-35 EMERGENCY PERMITS.

HRS Chapter 6E HISTORIC PRESERVATION

Kahana Sunset was constructed more than fifty-years ago. Because of state law Kahana Sunset will need to comply with the DLNR, Historic Preservation Division (HPD) laws.

Under HRS Chapter 6E, a historic property is an object, district, structure, site or building that is 50 years or older. Historic properties that meet the significance criteria and retain historic integrity may be eligible for, or listed to, the Hawaii or National Register of Historic Places.

The HPD will determine whether a Historic American Buildings Survey (HABS) report is required prior to action removal. Begun in 1933, the HABS was the nation’s first documentation program of America’s architectural heritage. The initial legislation stated that, “A comprehensive and continuous national survey is the logical concern of the Federal Government.” As a national survey, the HABS collection is intended to represent “a complete resume of the builder’s art.” Thus, the building selection ranges in type and style from the monumental and architect- designed to the utilitarian and vernacular, including a sampling of a vast array of regionally and ethnically derived building traditions.

Kahana Sunset will seek a determination from the DLNR, HPD regarding reporting methods.

HAR, Section 13-10-222 SHORELINE CERTIFICATIONS

The DLNR, OCCL website notes, “the certified shoreline is defined as the upper reaches of the wash of the waves, other than storm or seismic waves, at high tide during the season of the year in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth, or the upper limit of debris left by the wash of the waves” pursuant to HAR, Section 13-222. The certified shoreline is a valuable tool as it provides the baseline for measuring shoreline setbacks, establishes the jurisdictional boundary between the state Conservation District and the County’s SMA

areas, can be used to preserve access to Hawaii's shorelines, and used to identify encroachments, violations, unauthorized land uses, and unauthorized shoreline structures. The Certified Shoreline is valid for 12 months from the date of the certification, pursuant to HAR Section 13-222-10.

Kahana Sunset is required to obtain a Certified Shoreline Map as part of the Department's SM52023-000114 and SSAD2023-00022 terms and conditions (June 19, 2023). In July 2023, Kahana Sunset submitted the Shoreline Certification Application forms. Kahana Sunset will need a new Certified Shoreline Map for future projects as well.

HAR, Chapter 3-40 RULES GOVERNING PUBLIC USE OF THE LAND SURVEY DIVISION MAPS, DESCRIPTIONS, AND RECORDS, AND SCHEDULE OF FEES FOR SERVICES, MAPS, AND OTHER RECORD DATA

Shoreline Certification Application forms are processed by the State DLNR, Land Division. However, the Land Division works in conjunction with the Department of Accounting and General Services, Land Survey and the OCCL.

HRS, Section 171-53 RECLAMATION AND DISPOSITION OF SUBMERGED OR RECLAIMED LANDS and HRS, Section 171-55, PERMITS regulate reclaimed lands and submerged lands or lands beneath tidal waters by authority of law.

If Kahana Sunset has encroachments, violations, unauthorized land uses, and unauthorized shoreline structures on state-owned lands they will need to be resolve the issue with the DLNR and BLNR. Prior approval to lease state submerged lands is required from the Governor of Hawaii and prior authorization from the Hawaii State Legislature.

Section 12-203 SHORELINE RULES FOR THE MAUI PLANNING COMMISSION

Pursuant to Section 12-203 SHORELINE RULES FOR THE MAUI PLANNING COMMISSION

The purpose of this chapter is to establish shoreline rules which regulate the use and activities of land within the shoreline environment in order to protect the health, safety, and welfare of the public by providing minimum protection from known coastal natural hazards; and to ensure that the public use and enjoyment of our shoreline resources are preserved and protected for future generations in accordance with the Hawaii coastal zone management law, HRS chapter 205A.

Kahana Sunset will work within the confines of Section 12-203 and ACT 16 SLH 2020 which strengthened HRS, Section 205A.

Section 12-202 SPECIAL MANAGEMENT AREA RULES

The purpose of Section 12-202 SPECIAL MANAGEMENT AREA RULES is to implement HRS Chapter 205A. Maui County's Special Management Area (SMA) permitting system is part of the CZM Program.

Kahana Sunset will work within the confines of Section 12-202.

TITLE 16 – BUILDINGS AND CONSTRUCTION Chapter 16.26 BUILDING CODE

If Kahana Sunset wishes to pursue demolition, a Building Permit is required for any building or structure within Maui County. The Public Works, Development Services Administration, Building Plans Review will review the Permit for demolition; a Site Plan according to the International Building Code will be required for submittal.

Kahana Sunset will work within TITLE 16 — BUILDINGS AND CONSTRUCTION Chapter 16.26 BUILDING CODE.



Site map of Kahana Sunset
Source: K2NCrest October 10, 2022

CHAPTER 4: MANAGED RETREAT PATHWAYS

The 2019 OPSD Report noted while accommodation, protection and retreat are the main adaptation approaches to sea level rise and coastal hazards there are unanswered questions relating to separate and conjoined issues: regulatory, legal, social, cultural, economic, land use, planning and environmental issues:

Recognized retreat is not a simple task which may be easily accomplished. To rush haphazardly into retreat may waste precious and limited state, county, and public sources of funds and lands and cause undesirable litigation. There has not yet been an agreement/consensus reached of what needs to be retreated, where to retreat to and how much it will cost . . . To act on retreat without a clear, deliberate plan may derail retreat in the long-run to the severe and irreversible detriment of the State, its precious natural resources and citizens. Managed retreat will need to be approached through a combination of planning, policy, regulatory and financing tools, with critical underpinnings of political will and community acceptance.

The 2018 article, “Pathways to resilience: adapting to sea level rise on Los Angeles” summarized the potential effects of sea level rise to the coast of Los Angeles County; it described adaptation pathways and estimates associated costs in order to cope with sea level rise. The adaptation pathway was defined as measures (beach nourishment, dune restoration, flood-proofing buildings, levees) required to lower flood risk to people, ports, and harbors and to mitigate social, economic, and physical damage due to an increase in flood risk due to climate change and sea level rise...The aim of using different adaptation pathways was

To enable a transition from one methodology to another over time...These pathways address uncertainty in future projections, allowing for flexibility among policies and potentially spreading the costs over time...The research suggests three adaptation pathways, anticipating a +1 ft (0.3 m) to +7 ft (+2 m) sea level rise by year 2100. Total adaptation costs vary between \$4.3 and \$6.4 billion, depending on measures included in the adaptation pathway.

The MRPlan gives Kahana Sunset the available science and data available regarding climate change and sea level rise and the potential effects on the subject parcel. However, Kahana Sunset requires time and the approval of the unit owners and lien holders to move forward. The ability to use Managed Retreat Pathways gives Kahana Sunset the ability to use all the available tools, laws, and data to conduct retreat.

Retreat is done over years or a decade. It is not done in a year. With the following Managed Retreat Pathways, Kahana Sunset is not locked into one solution but can utilize a wide array of paths to achieve multiple outcomes to address sea level rise and climate change.

Kahana Sunset will continue to work within the confines of the law, pursuant to:

- Land Use Commission:
 - HRS, Chapter 205 Land Use Commission.
- Department of Business, Economic Development and Tourism:
 - HRS, Section 205A COASTAL ZONE MANAGEMENT.
 - ACT 16, Session Laws of Hawaii 2020.
 - HRS, Chapter 343 ENVIRONMENTAL IMPACT STATEMENTS.
- Department of Commerce and Consumer Affairs:
 - HRS, Chapter 514B CONDOMINIUM PROPERTY ACT.
- Department of Land and Natural Resources:
 - HAR, Chapter 13-5 CONSERVATION DISTRICT RULES and HRS, Chapter 183C Conservation District.
 - HAR, Section 13-10-222 SHORELINE CERTIFICATIONS,
 - HRS, Section 171-53 RECLAMATION AND DISPOSITION OF SUBMERGED OR RECLAIMED LANDS.
 - HRS, Section 171-55, PERMITS.
 - HRS, Chapter 6E.
- Department of Accounting and General Services
 - HAR, Chapter 3-40 RULES GOVERNING PUBLIC USE OF THE LAND SURVEY DIVISION MAPS, DESCRIPTIONS, AND RECORDS, AND SCHEDULE OF FEES FOR SERVICES, MAPS, AND OTHER RECORD DATA.
- Maui County:
 - Planning Department's Section 12-203 SHORELINE RULES FOR THE MAUI PLANNING COMMISSION.
 - Section 12-202 SPECIAL MANAGEMENT AREA RULES.
 - Department of Public Works Title 16 – BUILDINGS AND CONSTRUCTION, Chapter 16.26 BUILDING CODE.

HRS, Chapter 514B CONDOMINIUM PROPERTY ACT

Kahana Sunset is governed by HRS, Chapter 514B CONDOMINIUM PROPERTY ACT. Kahana Sunset's Counsel for the Association advised "since all of the damaged areas are common elements as defined by the Association's Declaration of Horizontal Property Regime ('Declaration'), the Association, through its Board of Directors, has a mandatory duty to repair the damaged areas consistent with the Association's Bylaws."

Kahana Sunset AOA is comprised of individual unit owners and lien holders. Kahana Sunset Homeowners Associations (HOA) fees maintain the community's common areas, maintenance, and insurances fees (flood, fire, and hurricane).

Kahana Sunset does not have current declarations and bylaws to demolish a building and/or structure. Legally, in the absence of a condemnation order, there is no provision in the Association's Declaration or Bylaws that give the Association the authority to demolish an Association owner's unit without approval of each affected unit owner. To change the bylaws requires a presentation of the issue(s) to the individual unit owners and lien holders, 100% of the individual unit owners and lien holders need to vote, with seventy-five (75) percent approval from all individual unit owners and lien holders concerning units at the building(s).

One such vote may require the purchase of adjacent land to move infrastructure. In 2022 and 2023, Kahana Sunset looked at acquiring the adjacent 9.999 acre subject parcel located across Lower Honoapiilani Road from Kahana Sunset – Tax Map Key (TMK): (2) 4-3-001:039. However, the County planned for a Lower Honoapiilani Road detour. Other detractions were that the subject parcel was a flood hazard designated area (Zones AE, AEF), and Zone AEF — Floodway areas, with zoning and land entitlements concerns.

Kahana Sunset will need more time to address issues and concerns from the individual unit owners and lien holders to help them understand and gain support for retreat. Agreement and/or consensus must be reached with a majority of the Kahana Sunset AOA on retreat, what needs to retreat, where to retreat to and the funds to retreat.

As a managed retreat strategy Kahana Sunset will:

Phase 1

Amendments, Bylaws, Declarations:

- Kahana Sunset will start the process to redefine “common elements” that are considered damaged areas consistent with the Kahana Sunset's Association's Amendments, Bylaws, and Declarations.

Poll:

Kahana Sunset AOA will seek owners and lienholders' votes regarding demolishing, removing and/or relocating Building A and/or Building F, potentially eliminating owners' interests and readjusting common percentage interests.

Kahana Sunset will obtain cost estimates for the following scenarios:

- Demolish and remove Building F.
- Relocate Building F.
- Look to construct on another subject parcel.
- Demolish and remove Building A. Demolish and remove Building A partially.
Relocate Building A.
- Build an underground parking garage underneath Building A to replace Buildings A and B parking lot.

Phase 2

- Kahana Sunset will file new Amendments, Bylaws, Declarations with the DLNR, Bureau of Conveyances.
- Kahana Sunset will update the Council on the results of the poll and cost estimates as discuss the feasibility of retreat options.

HARD PROTECTION

Seawalls, rock revetments and other hard structures such as shoreline erosion protection systems, gunite and concrete erosion protection system were constructed, and over time repaired to safeguard Kahana Sunset shoreline subject parcel to withstand impacts from changing conditions in 1975, 1978, 1997, 2003, 2009, 2010, 2012, 2013, 2014, and 2017. The improvements will eventually fail due to coastal wave erosion, storm events, and high tides and repair and maintenance will be required.

Kahana Sunset's Counsel for the Association noted to the Department that

[they have been] advised since all of the damaged areas are common elements as defined by the Association's Declaration of Horizontal Property Regime ('Declaration'), the Association, through its Board of Directors, has a mandatory duty to repair the damaged areas consistent with the Association's Bylaws.

In 2021 the Department noted,

Due to repetitive repairs to the original seawall fronting Building F since 2007, the seawall structure has substantially changed and is no longer a seawall but rather a seawall-bulwark complex of boulders and mortar in a monolithic concrete structure possessing excessive weight that has become suspended in the air, due to repeated ocean undermining of the structure. The result of this suspended-in-the-air seawall-bulwark structure is that it is tilting en masse and moving away from Building F's slab-on-grade foundation as observed by continuous cracks indicating surface separation of the lanai and seawall from Building F's foundation. These cracks, indicating separation, are apparent from one end of the structure to the other. Subsurface conditions under the seawall-bulwark are unknown. Thus, both the seawall-bulwark and Building F have become unstable and unsafe for occupation. Furthermore, the extent of instability and undermining of Building F at this time is still unknown.

In 2022, the Department noted, "...since 2009, due to undermining by ocean waves, the seawall fronting Building F has been subjected to multiple, limited, emergency repairs as well a major rehabilitation in a managed retreat action under a Shoreline Setback.

The Department noted Kahana Sunset can apply for the proposed seawall action, and to submit applications for a Variance (SSV) and a SMA Permit. The proposed shoreline action is a trigger for an Environmental Assessment (EA) under Hawaii Revised Statutes Chapter 343; however, the action may qualify for an Environmental Assessment Exemption (EAE). The Department will work with [Kahana Sunset] to process both an SSV and a SMA Permit, as well as an EAE, for the seawall action. ACT 16 SLH 2020 as amended HRS prohibits the construction of a new seawall.

As a managed retreat strategy Kahana Sunset will:

Phase 1

- Arrange to meet with the County to understand what proposed repairs and maintenance efforts can be done by Kahana Sunset regarding the seawall fronting Building F and Building A within 45 days of the acceptance of the MRPlan.
- Kahana Sunset will conduct an updated Geoanalytical Investigation on the soils located under both seawalls, the rock revetments and other hard structures including shoreline erosion protection systems, gunite and concrete erosion protection system that were constructed.
 - The report will identify what repairs are required with a timeline of proposed repairs pursuant to state and county laws.
- Kahana Sunset will hire a Coastal Engineering Firm to provide a coastal assessment on the seawall, the rock revetments, and other hard structures — shoreline erosion protection systems, gunite and concrete erosion protection system that were constructed.
 - The report will identify what repairs are required with a timeline of proposed repairs pursuant to state and county laws.
 - The report will investigate slope stabilization methods if the hard protection is removed and will potentially include use of Native Hawaiian beach plants to help stabilize the shoreline once one or both seawalls are removed and demolished. This approach is likely only feasible if done in combination with a beach and bay restoration project that includes significant beach nourishment and bay stabilization efforts.

Phase 2

- Kahana Sunset will report to Maui County on the following: the summary findings of the Coastal Engineering report on whether Kahana Sunset hard protection is suitable and a timeline of proposed repairs pursuant to state and county laws.
- Report the summary findings of the Geoanalytical Investigation report on the soils located under both seawalls, the rock revetments and other hard structures: shoreline erosion protection systems, gunite and concrete erosion protection system that were

constructed and what repairs are required with a timeline of proposed repairs pursuant to state and county laws.

Phase 3

- Kahana Sunset will remove the seawall fronting Building F.
- Slope stabilization will occur.

BUILDING F

Kahana Sunset's Counsel for the Association noted to the Department they have been:

advised since all of the damaged areas are common elements as defined by the Association's Declaration of Horizontal Property Regime ('Declaration'), the Association, through its Board of Directors, has a mandatory duty to repair the damaged areas consistent with the Association's Bylaws.

The Cost of Managed Retreat, as Suggested by the Department, is Prohibitively Expensive...the relocation, or demolition and reconstruction, of Building F would be exorbitantly expensive, requiring funds that Kahana Sunset does not have. Building F contains twelve two-story units and is slab-on-grade construction. It cannot be lifted and moved. Building F would have to be demolished and the units entirely rebuilt in other locations. Any new location for Building F may likely occupy the area of currently existing parking areas, which are used by other owners of Kahana Sunset units.

The relocation of the Building F units would not only require the demolition and reconstruction of the currently existing Building F, but also further expenditures for the design and construction of an underground parking area to replace those parking areas which would be occupied by the relocated Building F units. Furthermore, the demolition of the Seawall, as recommended by the Department, is a tremendous undertaking that would require the removal of hundreds of cubic yards of rock and cement and would likely cause flanking erosion from the property just south of the Kahana Sunset property. Even if Kahana Sunset were able to obtain the consent of all affected unit owners to such a plan, it does not have the necessary funds to finance such a project, making the relocation of the Building F units impossible.

On November 2021, the Department noted

Building F is being flanked by the ocean on its south side from recent coastal erosion on the neighboring property at 4885 Lower Honoapiilani Road. The large concrete staircase structure and the adjoining seawall structure both have failed, collapsed, and have been totally undermined with the ocean incursion at least 20 feet inland, no longer providing any flank protection for Building F into the future. The Department suggests that

Kahana Sunset re-evaluate the structural engineering solution in light of ongoing ocean conditions and cumulative impacts from coastal erosion at Keonenui Bay, especially due to recent potential flanking on its south side by the failed shoreline structures as noted above. The impacts of sea level rise will continue to increase the vulnerability and instability of Building F.

Based on the poll results Kahana Sunset will seek actions to either: demolish and remove Building F, relocate Building F, and look to construct on another subject parcel Kahana Sunset.

The managed retreat pathway for Building F will be:

Phase 1

- Arrange to meet with the County to understand what proposed repairs and maintenance efforts can be done by Kahana Sunset regarding Building F within 45 days of the acceptance of the MRPlan.
- Kahana Sunset will hire a structural engineering and coastal engineer to report on the Building F's current structural integrity and whether it can be retreated.
 - The reports will evaluate structural engineering solutions in light of ongoing ocean conditions and cumulative impacts from coastal erosion at Keonenui Bay.
 - The reports will identify what repairs are required with a timeline of proposed repairs pursuant to state and county laws.
- Confirm if Kahana Sunset buildings contain asbestos in the walls and ceilings. If the building is removed the method of disposal would then require the only available disposal site in Oahu and must be transported via barge.
- Kahana Sunset will get cost estimates, a contractor's plan and possible timeline of removal for buildings that contain asbestos in the walls and ceilings.
- Identify potential areas for Building F relocation.

Phase 2

- Kahana Sunset will submit structural engineering plans to continue stabilizing the structural integrity of Building F.

Phase 3

- Kahana Sunset will submit structural engineering plans to demolish Building F.

Phase 4

- Kahana Sunset will remove Building F.
- Slope stabilization will occur.

BUILDING A

Past history indicates work was conducted on the shoreline face of the cliff / bluff with approvals from the Department in 1974, twice in 1978, and 2012. Building A may be benched on a lava and/or rock promontory.

In 2018, the Department noted that Building A and other areas of the subject parcel will be subjected to predicted SLR; Building A is in a vulnerable coastal area. The Department requested up-to-three location alternatives with relocated footprints for Building A, more mauka (inland), away from the shoreline setback area. "Managed retreat" was defined herein as a purposeful action that relocates structures and infrastructure away from vulnerable coastal areas. Kahana Sunset noted retreat for Building A may be relocated on present day Buildings A and B parking lot. However, Kahana Sunset faced insurmountable obstacles in terms of cost, relocation costs, and placement next to Building's B and C and the Door of Faith Kahana Church. The cost would be in the millions of dollars and was prohibitive.

Based on the poll results Kahana Sunset will demolish and remove Building A, demolish and remove Building A partially, relocate Building A, and/or build an underground parking garage underneath Building A.

The managed retreat pathway for Building A will be:

Phase 1

- Kahana Sunset will discuss with the Door of Faith Kahana Church the proposed location of Building A and any other building.
- Kahana Sunset will discuss with the Door of Faith Kahana Church and other adjacent subject parcels how the proposed location of Building A and any other building will affect their coastal and scenic view planes.
- Kahana Sunset will hire engineers to report and analyze Building A's foundational strength.
 - The reports will indicate whether Kahana Sunset Building A foundation is suitable for the current location or whether a portion and/or whole will need to be retreated.
 - The reports will identify what repairs are required with a timeline of proposed repairs pursuant to state and county laws.
- Kahana Sunset will conduct a Geoanalytical Investigation with test borings of the soils and sea cliff surrounding and located under Building A. There is a March 13, 2006 Weidig Geoanalysts Report however only three test borings were taken.
 - The reports will document the site conditions, explaining the physical processes that drive erosion at the site.

- The reports will summarize whether Building A's placement is benched on a lava and/or rock promontory.
- The reports will indicate whether Kahana Sunset Building A foundation is suitable for the current location or whether a portion and/or whole will need to be retreated.
- The reports will identify what repairs are required with a timeline of proposed repairs pursuant to state and county laws.
- The reports will identify slope stabilization methods if the structure is removed.

Phase 2

Kahana Sunset will report to Maui County on

- The Door of Faith Kahana Church response.
- The Door of Faith Kahana Church and other adjacent subject parcels response regarding coastal and scenic view planes.
- The summary findings of engineer reports on whether Kahana Sunset Building A foundation is suitable and a timeline of proposed repairs pursuant to state and county laws.
- The summary findings of the Geoanalytical Investigation and test borings of the soils and sea cliff, erosion process and suitability of location, and a timeline of proposed repairs pursuant to state and county laws.

BEACH NOURISHMENT

The MRPLan notes there has been no finalized study and/or conversation on the potential negative and/or positive effect(s) of beach nourishment for Keonenui Beach with the State of Hawaii and/or the County of Maui.

Keonenui Beach is recognized as a resource for the general public. Kahana Sunset has not in the past applied to the State and/or County for beach nourishment but has started efforts in beach restoration. Kahana Sunset did initiate efforts in beach restoration for both the Kahana Sunset resort and the entire Keonenui Bay.

Kahana Sunset will need further input from the Kahana Sunset landowners and lienholders whether they want to continue a beach nourishment project as a managed retreat pathway. Future feedback from the adjacent landowners will be sought if they would also participate in a beach nourishment project.

As a managed retreat strategy Kahana Sunset will:

Phase 1

- Kahana Sunset will discuss and poll the proposed beach nourishment project with the individual unit owners and lien holders for approval. Discussion will center on shared funding for the Environmental Assessment, required studies and permits.

- Finalize the started 2020 Rising Tide Engineering report regarding beach nourishment.
- Kahana Sunset will work with the Keonenui Bay Foundation to get more shoreline owners into the foundation and for approval for the beach nourishment project.

Phase 2

- Kahana Sunset will continue to reach out the adjacent landowners and community for discussion and approval.
- Kahana Sunset will discuss with the DLNR and Maui County the feasibility of beach nourishment for Keonenui Beach.
- Kahana Sunset will hire Coastal Engineers to provide an assessment on the feasibility of beach nourishment for Keonenui Beach.

Phase 3

- Kahana Sunset will hire a consultant to write the Environmental Assessment. Kahana Sunset will engage in the process of federal, state and county permits.

Phase 4

- Kahana Sunset will initiate beach nourishment.

BAY STABILIZATION

There has been no study and/or conversation on the potential negative and/or positive effect(s) of the placement of bay stabilization structures (e.g. groins, breakwaters, etc) for Keonenui Beach. The project needs to be further studied for its full potential in an effort to stem sand loss and the shoreline’s recession.

As a managed retreat strategy Kahana Sunset will:

Phase 1

- Kahana Sunset will discuss a proposed bay stabilization with the individual unit owners and lien holders for approval. Discussion will center on shared funding for the Environmental Assessment, required studies and permits.

Phase 2

- If approved, Kahana Sunset will reach out to the adjacent landowners and community.
- Kahana Sunset will discuss the DLNR and Maui County the feasibility of groins for Keonenui Beach.
- Kahana Sunset will hire Coastal Engineers to provide an assessment on the feasibility of groins for Keonenui Beach.

UTILITIES

Kahana Sunset will need to look at the relocation of utilities such as potable water, waste water and drainage, electric power, telephone cable TV services supplied to Kahana Sunset.

In the CIA report, Mr. Alan Yabui and Mr. Glenn Kamaka “recalled an intermittent stream that ran during Kona storms.” While drainage has been improved over time more studies may be required to ensure flooding from upland sources is adequately disposed of within Kahana Sunset’s drainage infrastructure.

As a managed retreat strategy Kahana Sunset will:

Phase 1

- Kahana Sunset hire a consultant to identify utilities that need to be relocated in the face of sea level rise and climate change.
- Kahana Sunset will hire a consultant to conduct hydrostatic testing as well as non-staining water-soluble dye test(s) during rainfall to ensure adequate capture of water.

Phase 2

- Kahana Sunset will fix any deficiency in the drainage infrastructure.

Phase 3

- Kahana Sunset will start the process to move utilities with the required permits.

HRS, Chapter 6E HISTORIC PRESERVATION

Kahana Sunset was constructed between 1968 and 1971, more than 50 years ago. Mandated by the National Historic Preservation Act (NHPA) and HRS, Chapter 6E HISTORIC PRESERVATION all buildings over 50 years old must be reviewed by the HPD. Pursuant to HRS Chapter 6E a “historic property” is an object, district, structure, site or building that is 50 years or older. Historic properties that meet the significance criteria and retain historic integrity may be eligible for, or listed to, the Hawaii or National Register of Historic Places.

A Historic American Buildings Survey (HABS) report and other report may be required if Kahana Sunset meets the significance criteria pursuant to HRS Chapter 6E.

As a managed retreat strategy Kahana Sunset will:

Phase 1

- Kahana Sunset will seek determination from the HPD whether a Historic American Buildings Survey (HABS) report and/or other required reports.

Phase 2

- Kahana Sunset will hire the appropriate consultant (Architect, etc.) to prepare the HABS report and/or other required reports.

Phase 3

- Kahana Sunset will submit the required report(s) to the DLNR HPD.

SHORELINE CERTIFICATIONS

The certified shoreline establishes the jurisdiction between the County's Special Management Area and the State's Conservation District. Specific HAR and HRS regulate the shoreline certification process. With climate change and sea level rise the shoreline will move and new/updated certified shorelines will be required with the removal of seawall(s) and infrastructure, pursuant to HAR Section, 13-222 SHORELINE CERTIFICATIONS.

As a managed retreat strategy:

Kahana Sunset will continue to work with the State DAGS, Land Survey and DLNR regarding the submittal of the Shoreline Certification Application form.

ARCHEOLOGICAL RESOURCES

The 2014 Kahana Sunset FEA's Archeological Monitoring Plan for the repair and Replacement of Sea Walls and Demolition of Concrete Stairway noted,

The subject area is improved with condominium structures, pool, ancillary buildings, landscaping and underground utilities. Additionally, two Land Commission Awards, LCA, (LCA 4807 Ap. 3 and LCA 4807:4) are present within the project area boundaries and likely represent former habitation and agricultural activities. No known inventory survey has been conducted of the subject parcel...Based on the above information, and most importantly, that recent re-developments along the shoreline have documented numerous significant subsurface historic properties; it is possible that subsurface pre-Contact burials, remnant traditional cultural layers, historic refuse deposits, and buried architecture from both the pre-Contact and historic periods may be extant.

If Kahana Sunset moves inland and upward to address sea level rise and coastal hazards the possibility that subsurface pre-Contact burials, remnant traditional cultural layers, historic refuse deposits, and buried architecture from both the pre-Contact and historic periods may be extant.

As a managed retreat strategy

Kahana Sunset will consult with the State Department of Land and Natural Resources (DLNR), Historic Preservation Division (HPD) regarding future projects that involve ground-disturbing activities to address the potential possibility until retreat has been concluded.

U.S. FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service Project Code: 2023-0039599 noted there is no critical habitats within the project area under the office's jurisdiction. The endangered Hawaiian petrel (*Pterodro-*

ma sandwichensis), threatened Newell's shearwater (*Puffinus auricularis newelli*) and endangered band-rumped storm-petrel (*Oceanodroma castro*) utilize terrestrial habitat on Maui but are not localized to a specific area. Migratory seabirds such as White terns and Wedge-tail shearwaters may transit over the area. In addition to USFWS, other agencies such as NOAA office and DLNR may have concerns over the impacts of retreat. There will probably also be concerns from the community.

Climate change and sea level rise will affect shoreline areas with existing critical habits moving species to areas otherwise unknown. It is unclear how terrestrial and marine wildlife will be impacted in the future.

As a managed retreat strategy

Kahana Sunset will consult with the U.S. Fish and Wildlife Service regarding future projects that involve construction and/or demolition and the potential for negative impact(s) on the environment and the potential for critical habitats until retreat has been concluded. It will also consider organizing all concerns into the HRS Chapter 343 process and developing a draft EA to provide the framework to explore options and assess potential impacts.

COMMUNITY INPUT

Kahana Sunset welcomes community input as a managed retreat strategy for retreat and may seek community input regarding future projects.

As a managed retreat strategy

Kahana Sunset will form a working group called the Kahana Sunset Community Group. The Group will identify visual resources and identify the cultural and traditional resources of the area. The Group will continue to provide input retreat until retreat has been concluded.

BEACH ACCESS

The 2019 OPSD Report noted,

A potential benefit of managed retreat is to provide enhanced public access to the shoreline. The State of Hawai'i has laws protecting the right of the public to access the shoreline. As the Hawai'i Supreme Court has stated, "[o]ur examination of the relevant legal developments in Hawaiian history leads us to the conclusion that the western concept of exclusivity is not universally applicable in Hawaii" (PASH, 1995). Public shoreline access is under threat with rising sea levels and in combination with other coastal hazards. Shoreline hardening and armoring, such as seawalls, also threaten to further exacerbate beach loss. The Surfrider Foundation noted "If there's no beach, there's no beach access." Retreat has the potential for increasing shoreline access...to enhance shoreline

access for recreation, cultural practices, subsistence, and coastal safety. Managed retreat provides the opportunity to create public open space(s) along coastal areas and can restoring coastal ecosystems and as well as a natural buffer to coastal hazards.

On October 2013, the Department approved a 250 linear foot beach access path and stairs located at the subject parcel's south end pursuant to SMA SM1 2012/0003. As feasible, Kahana Sunset will need to continue to repair and maintain the 250 linear foot beach access pathway and stairs. Kahana Sunset can only provide improvements within reason as the liability lies with Kahana Sunset.

As a managed retreat strategy

Kahana Sunset will work with the community to provide public access to the shoreline of Keonenui Beach until retreat has been concluded. Parking stalls are not assigned perhaps Kahana Sunset may be able to assign some parking and access stalls with parking and traffic controls enacted by Kahana Sunset.

COMMUNITY PLAN AMENDMENT AND CHANGE IN ZONING

The CIZ and CPA requests were heard twice by Maui County Council and was deferred until a draft managed retreat plan is submitted. After the draft MRPlan is submitted Kahana Sunset will apply for a CIZ and CPA. If the CPA and CIZ requests are granted, the 1968 variance would no longer need to be in effect.

The request for the CIZ from R-3 Residential to H-M Hotel District and request for a CPA from Single-Family to Hotel is to have the land use entitlements and designations consistent with the existing and historical use of the property as a resort condominium; Kahana Sunset is classified as "Hotel and Resort" by the Maui County Real Property Tax Division and has been paying the associated tax rate.

The MRPlan notes in 2012 from single family to hotel, the code was one stall for every two units for hotel zoning according to Maui County Code (MCC) Chapter 19.36A. In 2018, the code now states one stall for each unit (MCC Chapter 19.36B). Kahana Sunset has 1.2 stalls for each unit and meets current hotel zoning requirements.

As a managed retreat strategy

Kahana Sunset will continue to work towards the CIZ and CPA until retreat has been concluded.

UNFORESEEN AND UNANTICIPATED DELAYS

Kahana Sunset is bound to run into unforeseen and unanticipated delays until the managed retreat plan is completed.

CHAPTER 5: KAHANA SUNSET LIVING STRATEGIC MANAGED RETREAT PLAN 2024-2026

The following tasks are included in Kahana Sunset's first 3-year Living Strategic Managed Retreat Plan. At the end of the term, a new 3-year plan will be submitted to the County based on the outcomes of the managed retreat pathways described in this document.

After much discussion with the current board members, it was thought that a 3-year strategic plan would target the solutions and phases that were doable; depending on funding from the working budget and owner assessments.

If the County approves the MRPlan, Kahana Sunset will submit an annual summary report with updates on the proposed Managed Retreat Pathways every August until the MRPlan is no longer a viable program. Within the MRPlan will be a strategic plan identifying new goals and timelines every three years.

At the beginning of August Year 2026 a second Managed Retreat Plan will be submitted to the County for approval for Years 2026 to 2029 to address the concerns of the current board members and depending on funding from the working budget and owner assessment. There might also be changes and more available solutions to managed retreat in the State, federal aid, the Legislature and County to help implement managed retreat solutions.

Creating a series of strategic plans every three years will allow this MRPlan to be a document that can be used by Kahana Sunset boards into the future, to allow flexibility to change as needed and to be fiscally responsible.

There will undoubtedly be unforeseen and unanticipated delays and issues. The board understands that goals and pathways will change as time passes, whether it be dictated by events of nature, support via legislative laws or via possible funding from the government, emerging technologies and solutions, or new governmental policies.

HRS Chapter 514B CONDOMINIUM PROPERTY ACT

Kahana Sunset AOA will seek owners and lienholders' votes regarding demolishing, removing and/or relocating Building F, potentially eliminating owners' interests and readjusting common percentage interests.

Kahana Sunset will obtain cost estimates for the following scenarios:

- Demolish and remove Building F.
- Relocate Building F.
- Look to construct on another subject parcel.

HARD PROTECTION

- Arrange to meet with the County to understand what proposed repairs and maintenance efforts can be done by Kahana Sunset regarding the seawall fronting Building F and Building A within 45 days of the acceptance of the MRPlan.
- Kahana Sunset will conduct an updated Geoanalytical Investigation on the soils located under both seawalls, the rock revetments and other hard structures including shoreline erosion protection systems, gunite and concrete erosion protection system that were constructed.
- The report will identify what repairs are required with a timeline of proposed repairs pursuant to state and county laws.
- Kahana Sunset will hire a Coastal Engineering Firm to provide a coastal assessment on the seawall, the rock revetments and other hard structures — shoreline erosion protection systems, gunite and concrete erosion protection system that were constructed.

BUILDING F

- Arrange to meet with the County to understand what proposed repairs and maintenance efforts can be done by Kahana Sunset regarding Building F within 45 days of the acceptance of the MRPlan.
- Kahana Sunset will hire a structural engineering and coastal engineer to report on the current structural integrity of Building F.
- The reports will evaluate structural engineering solutions in light of ongoing ocean conditions and cumulative impacts from coastal erosion at Keonenui Bay.
- The reports will identify what repairs are required with a timeline of proposed repairs pursuant to state and county laws.
- Kahana Sunset will submit structural engineering plans to continue stabilize the structural integrity of Building F.
- Identify potential areas for Building F relocation.

BUILDING A

- Kahana Sunset will hire engineers to report and analyze Building A's foundational strength.
 - The reports will indicate whether Kahana Sunset Building A foundation is suitable for the current location or whether a portion and/or whole will need to be retreated.
 - The reports will identify what repairs are required with a timeline of proposed repairs pursuant to state and county laws.

- Kahana Sunset will conduct a Geoanalytical Investigation with test borings of the soils and sea cliff surrounding and located under Building A. There is a March 13, 2006 Weidig Geoanalysts Report however only three test borings were taken.
 - The reports will document the site conditions, explaining the physical processes that drive erosion at the site.
 - The reports will summarize whether Building A's placement is benched on a lava and/or rock promontory.
 - The reports will indicate whether Kahana Sunset Building A foundation is suitable for the current location or whether a portion and/or whole will need to be retreated.
 - The reports will identify what repairs are required with a timeline of proposed repairs pursuant to state and county laws.
 - The reports will identify slope stabilization methods if the structure is removed.

BEACH NOURISHMENT

- Kahana Sunset will discuss and poll the proposed beach nourishment project with the individual unit owners and lien holders for approval. Discussion will center on shared funding for the Environmental Assessment, required studies and permits.
- Finalize the 2020 Rising Tide Engineering report regarding beach nourishment.
- Kahana Sunset will work with the Keonenui Bay Foundation to get more shoreline owners into the foundation and for approval for the beach nourishment project.
- Kahana Sunset will continue to reach out the adjacent landowners and community for discussion and approval.
- Kahana Sunset will discuss with the DLNR and Maui County the feasibility of beach nourishment for Keonenui Beach.
- Kahana Sunset will hire Coastal Engineers to provide an assessment on the feasibility of beach nourishment for Keonenui Beach.

BAY STABILIZATION

Kahana Sunset will discuss a proposed bay stabilization with the individual unit owners and lien holders for approval. Discussion will center on shared funding for the Environmental Assessment, required studies and permits.

UTILITIES

Relocation of utilities will be addressed in a future 3-year Living Strategic Managed Retreat Plan.

HRS, Chapter 6E HISTORIC PRESERVATION

Kahana Sunset will seek determination from the HPD whether a Historic American Buildings Survey (HABS) report and/or other required reports.

SHORELINE CERTIFICATIONS

As a managed retreat strategy Kahana Sunset will continue to work with the State DAGS, Land Survey and DLNR regarding the submittal of the Shoreline Certification Application form.

ARCHEOLOGICAL RESOURCES

Consulting with the State Department of Land and Natural Resources (DLNR) about archeological resources will be addressed in a future 3-year Living Strategic Managed Retreat Plan.

U.S. FISH AND WILDLIFE SERVICE

Kahana Sunset will consult with the U.S. Fish and Wildlife Service regarding future projects in a future 3-year Living Strategic Managed Retreat Plan.

COMMUNITY INPUT

Kahana Sunset will form a working group called the Kahana Sunset Community Group.

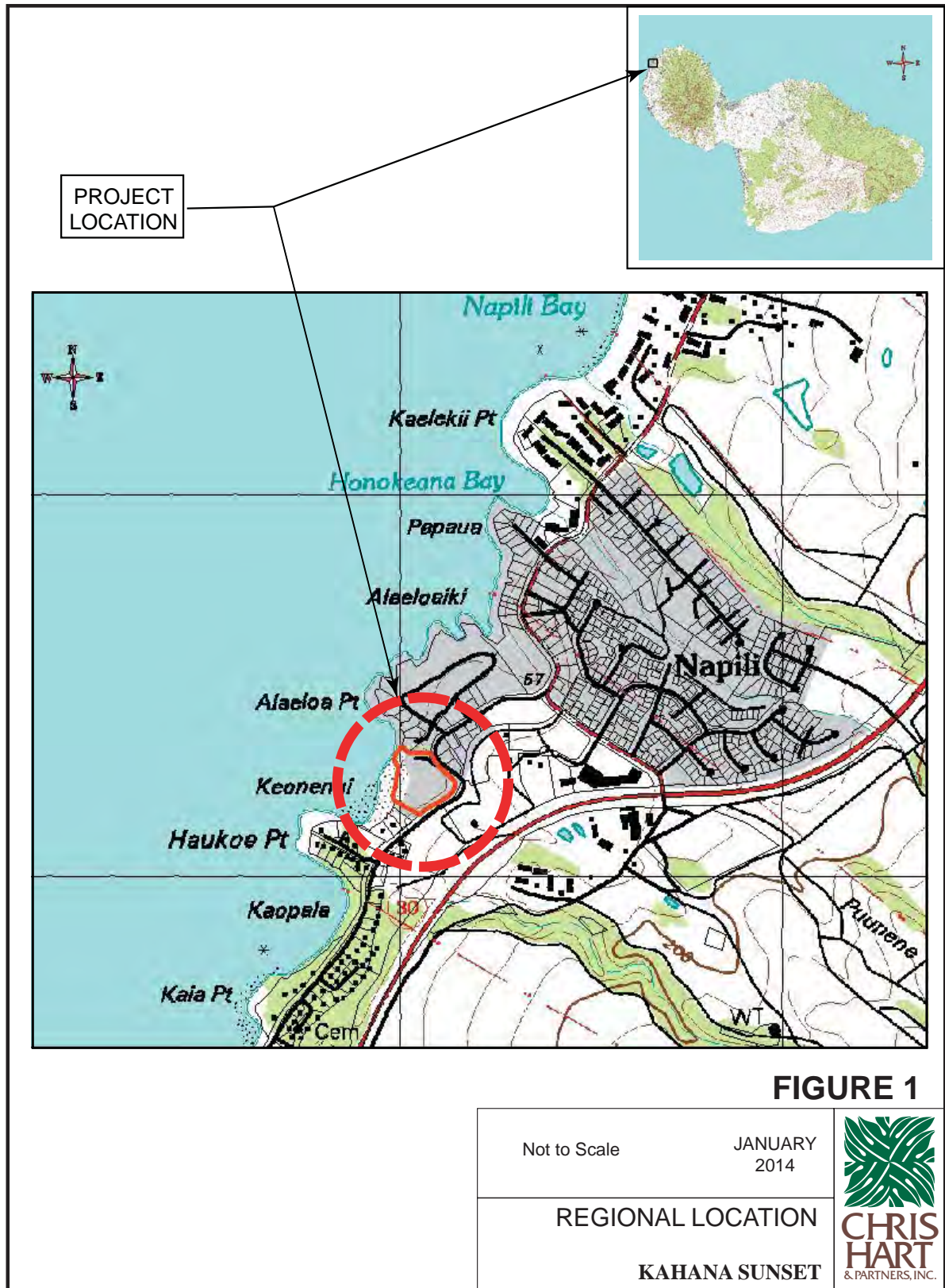
BEACH ACCESS

As a managed retreat strategy Kahana Sunset will work with the community to provide enhanced public access to the shoreline of Keonenui Beach until retreat has been concluded

COMMUNITY PLAN AMENDMENT AND CHANGE IN ZONING

As a managed retreat strategy Kahana Sunset will continue to work towards the CIZ and CPA until retreat has been concluded.

APPENDIX A : TOPO MAPS



Source: Chris Hart & Partners



Figure 1. Location of Project Area on USGS Quadrangle

Source: Environmental Assessment Page 290

REFERENCES

- ACT 32. July 1, 2022. Accessed: May 22, 2023. Internet source:
<https://www.capitol.hawaii.gov/slh/Years/SLH2017/SLH2017_Act32.pdf>
- ACT 73, Session Laws of Hawaii 2010. Accessed February 1, 2023. Internet Source:
<<https://files.hawaii.gov/tax/news/announce/ann10-07.pdf>>
- ACT 83, Session Laws of Hawaii 2014. . Accessed February 1, 2023. Internet Source:
<The Hawaii Climate Adaptation Initiative Act, ACT 83, Session Laws of Hawaii 2014>
- ACT 223, Session Laws of Hawaii 2022 - H.B. 1436 H.D. 1 S.D. 2 C.D. 1
Accessed February 1, 2023. Internet Source: <https://www.capitol.hawaii.gov/session/archives/measure_indiv_Archives.aspx?billtype=HB&billnumber=1436&year=2022>
- ACT 234, Session Laws of Hawaii 2007. Accessed February 1, 2023. Internet Source:
<https://health.hawaii.gov/cab/files/2014/07/GM1005_.pdf>
- Aloha + Challenge. Date unknown. Accessed: May 22, 2023. Internet source:
<<https://alohachallenge.hawaii.gov/>>
- Civil Beat. A History of Tsunamis in Hawaii. March 11, 2011. December 2021. Accessed: March 1, 2023. Internet source:
<<https://www.civilbeat.org/2011/03/9558-a-history-of-tsunamis-in-hawaii/>>
- Civil Beat. Six feet above: Where to Draw the Line on Sea Level Rise. February 18, 2020. December 2021. Accessed: March 1, 2023. Internet source: <<https://www.civilbeat.org/2020/02/six-feet-above-where-to-draw-the-line-on-sea-level-rise/#:~:text=lf%20global%20warming%20is%20left,about%201%20meter%2C%20by%202100>>
- Civil Beat. March 28, 2023. Hawaii Lawmakers Grappling With Sea Level Rise Say It's 'Not The Right Time' For Managed Retreat. Accessed June 2023. Internet Source:
<<https://www.civilbeat.org/2023/03/hawaii-lawmakers-grappling-with-sea-level-rise-say-its-not-the-right-time-for-managed-retreat/>>
- Coastal Plants of Hawaii. Hawaii Endemic/Hawaii Indigenous. Date unknown. Accessed: May 22, 2023. Internet source:
<<https://www.marinelifephotography.com/marine/plants/plants.htm>>
- County of Kauai, Waimea 400 Conceptual Master Plan. Date unknown. Accessed: July 18, 2023. Internet source:
<<https://pbrhawaii.com/projects/waimea-400-conceptual-master-plan/>>
- County of Kauai, Planning Department Phone Call February 27, 2023.

Draft Environmental Assessment (EA) for the Proposed Construction of a sea wall at the Walter Hester Residence located at Napili, Maui, Hawaii, TMK: (2) 4-3-015:003. Accessed Date: March 29, 2023. Internet Source: <https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2012-07-08-MA-DEA-Seawall-Construction-at-Walter-Residence-Napili-Maui.pdf>

Environment Hawaii. Volume 32, Number 6. Draft EIS Describes Plan to Address Coastal Erosion in Kahana Bay, Maui. December 2021. Accessed: March 1, 2023. Internet source: <<https://www.environment-hawaii.org/?p=14111>>

Environmental Science and Policy. Adaption pathways: A review of approaches and a learning framework. Volume 116. February 2021. Pages 266-275. Accessed: July 26, 2023. Internet source: <<https://www.sciencedirect.com/science/article/pii/S1462901120313836>>

Final Environmental Assessment for the Lusardi Residence Seawall Repairs at Napili, Maui, Hawaii TMK 2nd 4-3-15:02. Accessed: February 1, 2023. Internet source: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2002-12-08-MA-FEA-Lusardi-Residence-Seawall.pdf

Final Environmental Assessment (FEA-FONSI). Schweitzer Shoreline Erosion Control Lahaina, Island of Maui, TMK: (2) 4-3-003:015:001. September 24, 2013. Accessed: February 1, 2023. Internet Source: <https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-10-08-MA-FEA-Schweitzer-Shoreline-Erosion-Control-in-Lahaina.pdf>

General Plan 2030. Maui Island Plan. Directed Growth Strategy – Transfer and Purchase of Development Rights Program Implementation Study. 2007. Accessed April 21, 2023. Internet Source: <https://www.mauicounty.gov/DocumentCenter/View/10491/Preliminary-Draft-TDR-PDR-Report?bidId=>>

Global Reef Alliance. The Biorock Process. Picturing reef building with electricity. April 2010. Accessed April 21, 2023. Internet Source: <https://globalcoral.org/_oldgkra/Biorock%20booklet%20online%20version%201.4.pdf>

Hawaii Administrative Rules (HAR). Title 11, Chapter 200 – unofficial. Accessed April 21, 2023. Internet Source: < https://files.hawaii.gov/luc/docs/har_11_200.pdf>

Hawaii County. Hawaii Redevelopment Agency. Urban Renewal Plan Kaikoo Project No. Hawaii R-4. June 25, 1965.

Hawaii County. Hawaii Redevelopment Agency. Project: Kaikoo. 1976. Hawaii County. Planning Department. Kaikoo. Kevin Sullivan. Emails.

Historic Hawaii Foundation. About the Historic American Buildings Survey (HABS). Date unknown. Accessed: April 6, 2023. Internet source: <https://historichawaii.org/2021/07/01/the-historic-american-buildings-survey/>

Hawaii News Now. Hawaii land exchange to aid Honolulu rail, raises questions. September 9, 2019. Accessed: March 1, 2023. Internet source: <<https://www.hawaiiinewsnow.com/2019/09/09/hawaii-land-exchange-aid-honolulu-rail-raises-questions/>>

Hawaii Public Radio. March 27, 2023. Maui councilmembers vote against exemptions for Waiehu. Accessed: March 1, 2023. Internet source: <<https://www.hawaiipublicradio.org/local-news/2023-03-27/council-members-vote-against-exemptions-for-waiehu-affordable-housing-project>>

Hawaii Senate Bill 386. May 3, 2018. Accessed: March 1, 2023. Internet source: <<https://www.billtrack50.com/BillDetail/907127?>>

Hawaii's Thousand Friends. Public Trust Doctrine. Accessed April 24, 2023. Internet Source: <<http://www.hawaiis1000friends.org/public-trust-doctrine.html#:~:text=In%20strong%20language%2C%20the%20Hawaii,scenic%20beauty%2C%20and%20the%20preservation>>

Hawaii Revised Statutes (HRS). Chapter 225P. Hawaii Climate Change Mitigation and Adaptation Initiative. Accessed: May 22, 2023. Internet source: <https://www.capitol.hawaii.gov/hrscurrent/vol04_ch0201-0257/HRS0225P/HRS_0225P-.htm>

HRS Section - 46-61 Eminent domain; purpose for taking property. Date unknown. Accessed date; May 24, 2023. Internet Source: <<https://casetext.com/statute/hawaii-revised-statutes/division-1-government/title-6-county-organization-and-administration/subtitle-1-provisions-common-to-all-counties/chapter-46-general-provisions/part-iv-real-and-personal-property/section-46-61-eminent-domain-purposes-for-taking-property>>

HRS Section 46-163 Conditions for the transfer of development rights. Accessed February 1, 2023. Internet Source: <https://www.capitol.hawaii.gov/hrscurrent/Vol02_Ch0046-0115/HRS0046/HRS_0046-0163.htm>

HRS Section 101-13 Exercise of power by county. Date unknown. Accessed date; May 24, 2023. Internet Source: <<https://casetext.com/statute/hawaii-revised-statutes/division-1-government/title-9-public-property-purchasing-and-contracting/chapter-101-eminent-domain/part-i-condemnation-of-private-property/section-101-13-exercise-of-power-by-county>>

HRS Section 171-53 RECLAMATION AND DISPOSITION OF SUBMERGED OR RECLAIMED LANDS and HRS, Section 171-55, PERMITS. Accessed: February 1, 2023. Internet Source: <https://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0171/HRS_0171-0053.htm>

HRS 205A Coastal Zone Management Program; objectives and policies. Accessed April 24, 2023. Internet Source: <https://www.capitol.hawaii.gov/hrscurrent/Vol04_Ch0201-0257/HRS0205A/HRS_0205A-0002.htm>

HRS Section 226-109, Climate change adaptation priority guidelines of the Hawaii State Planning Act. Accessed: February 15, 2023. Internet Source: <https://www.capitol.hawaii.gov/hrscurrent/Vol04_Ch0201-0257/HRS0226/HRS_0226-0109.htm>

Hawaii Shore and Beach Preservation Association. Beach Restoration in Hawaii: Challenges and Opportunities. Outcomes from the Hawaii Shore and Beach Preservation Association (HSBPA) 2014 Hawaii Beach Restoration Workshop. Accessed April 24, 2023. Internet Source: <<https://asbpa.org/wp-content/uploads/2016/09/HSBPA-2014-Beach-Restoration-White-Paper.pdf>>

Honolulu Civil Beat. No Prison-for-Pineapples After Land Swap Bill Stalls in House. March 20, 2015. Accessed: March 1, 2023. Internet source; <<https://www.civilbeat.org/2015/03/no-prison-for-pineapples-after-land-swap-bill-stalls-in-house/>>

Huapala.org. Lei Lokelani. Charles. E. King. Accessed: April 1, 2023. Internet source: <https://www.huapala.org/Mau/Maui_Nani.html>

Huapala.org. Maui Nani. Johanna Koana Wilcox. Accessed: April 1, 2023. Internet source: <https://www.huapala.org/Mau/Maui_Nani.html>

Intergovernmental Panel on Climate Change (IPCC). Data. Date unknown. Accessed February 1, 2023. Internet Source: <<https://www.ipcc.ch/>>

Kahana Sunset Shoreline and Site Improvements Final Environmental Assessment (FEA) (FONSI), Lahaina, Island of Maui, TMK: (2) 4-3-003:015. 2014. Accessed: February 1, 2023. Internet source: <http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Maui/2010s/2014-05-23-MA-DEA-DLNR-Administration-Building.pdf>

Kahana Sunset Website. February 17, 2023. Accessed: February 15, 2023. Internet source: <<https://www.kahanasunset.com/about-us/floor-plans/>>

Kauai Climate Adaptation Plan. Unknown Date. Accessed: July 18, 2023. Internet source: <<https://kauaiadaptation.com/impacts/>>

Kauai County Planning Department. Ms. Alisha Summers and Director Mr. Kaaina Hull February 23, 2023. Zoom meeting.

Keonenui Bay Foundation. Coastal Erosion and Viable Solutions. The Vision. Unknown date. Accessed February 1, 2023. Internet Source: <<https://knbf.org/coastal-erosion-and-viable-solutions/>>

Khon2. Kona Low rolls in Hawaii, Maui see storm impacts. February 17, 2023. Accessed: February 15, 2023. Internet Source: <<https://www.khon2.com/video/kona-low-rolls-in-as-hawaii-maui-see-storm-impacts/8403190/>>

Khon2. Feds to oversee valuation of DHHL land where the city built rail hub. October 14, 2019. Accessed April 21, 2023. Internet Source: <https://www.khon2.com/top-stories/feds-to-oversee-valuation-of-dhhl-land-where-city-built-rail-hub/>

Khon2. Still unknown if El Niño conditions will take over by the Fall. March 14, 2023. Accessed April 21, 2023. Internet Source: <https://www.khon2.com/local-news/still-unknown-if-el-ni-no-conditions-will-take-over-by-fall/>

Lahaina News. Biorock Coral Reef Proposed for Keonenui Bay in Kahana. May 6, 2022. Accessed date: April 26, 2023. Internet Source: <https://www.lahainanews.com/news/local-news/2022/05/06/biorock-coral-reef-proposed-for-keonenui-bay-in-kahana/>

Local Housing Solutions. Transfers of Development Rights. Date Unknown. Accessed date: April 26, 2023. Internet Source: [https://localhousingsolutions.org/housing-policy-library/transfers-of-development-rights/#:~:text=Transfers%20of%20development%20rights%20\(TDR,the%20%20receiving%20site\)](https://localhousingsolutions.org/housing-policy-library/transfers-of-development-rights/#:~:text=Transfers%20of%20development%20rights%20(TDR,the%20%20receiving%20site))

MAGIS at the University of Hawaii at Mānoa Library. MAGIS. Hawaii Aerial Photos 1950-2000 - Maui 1950 USGS GSMFO (oblique) Reference No: 036-3975 1950 USGS, Maui 1950-1951 USGS GSMF Reference No: 036-3523 1950, Maui 1965-1966 USDA EKN Reference No. 051-4822 1965, Maui 1976- 1978 USGC VEED. Reference No. 035-3410 1976. Maui 2000 NOAA Reference No: 085-7389 2000. Accessed: March 15, 2023. Internet source: <https://uhmagis.maps.arcgis.com/apps/webappviewer/index.html?id=f6672e31727d49468a37b7b-b3ab77d77>

Maui County. 2010. Maui Countywide Policy Plan, 2010. Accessed date: June 2, 2023. Internet Source: <https://www.mauicounty.gov/DocumentCenter/View/11132/Final--Countywide-Policy-Plan---Complete?bidId=>>

Maui County. 2012. Maui County Island Plan. Accessed date: April 30, 2023. Internet Source: <https://www.mauicounty.gov/1503/Maui-Island-Plan>

Maui County. Development Services Administration. Phone conversation demolition permit. July 24, 2023.

Maui County. Disaster, Resilience, International Affairs, and Planning Committee. Date unknown. Accessed February 1, 2023. Internet Source: <https://www.mauicounty.us/drip/>

Maui County. Eminent Domain of Front Street Apartment Facility. 2017. Accessed April 4, 2023. Internet Source: <https://www.mauicounty.gov/ArchiveCenter/ViewFile/Item/23161>

Maui County. Office of Climate Change, Resiliency and Sustainability. Date Accessed: July 18, 2023. Internet Source: <https://www.resilientmauinui.org/>

Maui County. Office of the Mayor, Office of Climate Change, Resiliency and Sustainability. Maui County Climate Action & Resiliency Plan 2022 Status Report Date Accessed: July 18, 2023. Internet Source: <<https://www.resilientmauinui.org/>>

Maui County Councilmember Tamara Paltin. Zoom meeting March 2, 2020.

Maui County. Maui Shoreline Access. Unknown. Accessed February 1, 2023. Internet Source: <<https://www.mauishorelineaccess.net>>

Maui County. Maui Shoreline Erosion Atlas AEHR. Alaeloa. Unknown date. Accessed February 1, 2023. Internet Source: <<https://www.mauicounty.gov/DocumentCenter/View/6255/Alaeloa?bidId=>>

Maui County. Molokai Ranch Questions. Date unknown. Accessed April 4, 2023. Internet Source: <<https://www.mauicounty.gov/faq.aspx?QID=189>>

Maui County. Planning Commission Summary Minutes March 28, 2023. Accessed April 4, 2023. Internet Source: <<https://www.mauicounty.gov/ArchiveCenter/ViewFile/Item/29935>>

Maui County. Planning Department. Proposed Updates to the Maui Planning Commission Special Management Area and Shoreline Rules Responses to Frequent Comments and Questions April 2022 Update. 2022. Accessed February 1, 2023. Internet Source: <<https://www.mauicounty.gov/DocumentCenter/View/133253/Frequently-Asked-Questions---updated-04222022#:~:text=%2412%2D203%2D12%2C,allow%20for%20repairs%20to%20structures>>

Maui County. Planning Department. Kahana Sunset Permit File: April 15, 1975 permit — Shoreline Setback Rules, Section 13 (a), August 3, 1978 Department and Public Works Department Emergency Coastal Zone Management Determination and Emergency Permit, August 31, 1978 permit Section 12A of the Interim Coastal Zone Management Rules and Regulations, June 30, 1997 - SM5 960005 and SSA 960002, January 13, 2003 - SM3 2003/0001 and SM3 2003/0002, April 26, 2012 - SM2 2012/0051 and SSA 2012/002, October 3, 2013 –SM3 2013/0003 and SMA SM1 2012/0003, April 25, 2014 –SM1 2012/0003, December 29, 2009 –SM3 2009/0005 and SM3 2003/0001, June 19, 2023 - SM52023-000114, February 4, 2010 –to SM3 2010/0001, July 13, 2017 –SM5 2017/0126, July 12, 2018 –SM5 2018/0139, September 15, 2021 –SM2 2021/0077, July 13, 2023 –SM32023-00006 File.

Maui County. Planning Department. Date unknown. Accessed February 1, 2023. Internet Source: <<https://www.mauicounty.gov/121/Planning-Department>>

Maui County. Planning Department. West Maui Community Plan Update 2022. 2022. Accessed: March 29, 2023. Internet Access: <<https://www.mauicounty.gov/2476/West-Maui-Community-Plan-Update-2022>>

Maui County. Planning Department. Long Range Planning. Community Plan Amendment Process. April 2023.

Maui County. Public Works. Title 16 – BUILDINGS AND CONSTRUCTION Chapter 16.26 BUILDING CODE. Date unknown. Accessed April 4, 2023. Internet Source: <http://mauico-hi.elaws.us/code/coord_title16_ch16.26b>

Maui County. Shoreline Access. Date unknown. Accessed February 1, 2023. Internet Source: <<https://www.mauishorelineaccess.net>>

Maui County. Title 6. County Organization and Administration. Subtitle 1. Provisions Common to All Counties. Accessed February 1, 2023. Internet Source: <<https://legiscan.com/HI/text/HB1436/2022>>

Maui County. Transfer of Development Rights, Maui County. Preliminary Draft Ordinance. Accessed April 4, 2023. Internet Source: <<https://www.mauicounty.gov/DocumentCenter/View/10481/Draft-TDR-Ordinance-2?bidId=>>

Maui County Resolution No. 07-90 August 2, 2007. Authorizing proceedings in eminent domain for the acquisition of real property situated at Paia, Maui, Hawaii, Known as Unit 2 of the Montana Beach Condominium, for Public Purposes. August 2, 2017. Accessed: March 1, 2023. Internet Source: <https://www.mauicounty.gov/DocumentCenter/View/7684/Reso-07-090?bidId=>

Maui County Resolution No. 06-41. May 26, 2006. Authorizing proceedings in eminent domain for the acquisition of real property situated at Kihei, Maui, Hawaii for North-South Collector Road. August 2, 2017. Accessed: March 1, 2023. Internet source: <<https://www.mauicounty.gov/DocumentCenter/View/7473/Reso-06-041>>

Maui News. State declines to fund half of \$10 M beach restoration. March 15, 2023. Accessed April 4, 2023. Internet Source: <<https://www.mauinews.com/news/local-news/2023/03/state-declines-to-fund-half-of-10m-beach-restoration/>>

Maui News. Warning issues: swell to bring surf of 40-50 feet to north shores. January 10, 2023. Accessed April 6, 2023. Internet Source: <<https://mauinow.com/2023/01/10/warning-issued-swell-to-bring-surf-of-40-50-feet-to-north-shores/>>

Maui News. Article: The question isn't if the sea level is rising but how quickly. 2017. Accessed date: June 1, 2021. Internet Source: <<https://www.mauinews.com/news/local-news/2017/03/the-question-isnt-if-the-sea-level-is-rising-but-how-quickly/>>

Maui News. Letters to the Editor. Community Input Sought on Managed Retreat. Accessed July 29, 2023. Internet Source: <<https://www.mauinews.com/opinion/>>

Maui Now Article: Haleakala Land Exchange Proposed to Ensure Trail Access. January 9, 2014. Accessed April 6, 2023. Internet source: <https://mauiNOW.com/2014/01/09/haleakala-land-exchange-proposed-to-ensure-trail-access/>

Maui Now Article: Board Authorizes Review of Proposed Maui Land Exchange. January 13, 2014. Accessed April 6, 2023. Internet source: <https://mauiNOW.com/2014/01/13/board-authorizes-review-of-proposed-maui-land-exchange/>

Maui Now Article: Stable Road Beach Protection Proposed. October 10, 2012. August 4, 2017. Accessed April 4, 2023. Internet Source: <https://mauiNOW.com/2012/10/10/stable-road-beach-protection-proposed/>

Maui Now Article: Maui Tsunami Damage March 11, 2011. April 4, 2023. Internet source: <https://www.mauihawaii.org/sights/tsunami-maui-2011/>

Maui Nui Ahupuaa Project. Date Unknown. Accessed April 4, 2023. Internet source: <https://www.mauiNuiAhupuaaProject.com/>

Maui Nui Marine Resource Council. Managing Maui's Dynamic Shorelines. August 4, 2017. Accessed April 4, 2023. Internet Source: https://www.mauireefs.org/wp-content/uploads/2018/02/maui_shoreline_erosion_status_and_trends.pdf

Maui Tomorrow website. Directed Growth Strategy. March 2008. Accessed April 4, 2023. Internet source: https://maui-tomorrow.org/draftplan/10_DirectedGrowthStrategy.pdf

National Weather Service. Kona Lows Produce Two Rounds of Flooding — February 2023. Date unknown. Accessed April 6, 2023. Internet Source: <https://www.weather.gov/hfo/KonaLowFeb2023>

National Library of Medicine. Pathways to resilience: adapting to sea level rise on Los Angeles (LA). September 2018. Accessed date: June 1, 2023. Internet source: <https://pubmed.ncbi.nlm.nih.gov/30230554/#:~:text=An%20adaptation%20pathway%20in%20this,methodology%20to%20another%20over%20time>

Oceanit. Kahana Sunset Coastal Assessment Report. July 6, 2023.

Oceanit. M. Foley correspondence on Annual Erosion Hazard, and Average Lot Depth. October 5, 2023.

Preliminary Draft Ordinance. Transfer of Development Rights. Maui County Ordinance No. Date unknown. Accessed April 4, 2023. Internet Source: [https://www.mauicounty.gov/DocumentCenter/View/10481/Draft-TDR-Ordinance-2?bidId=Relating to Development Rights H.B. 1436 H.D. 1 S.D. 2 C.D. 1. 2022](https://www.mauicounty.gov/DocumentCenter/View/10481/Draft-TDR-Ordinance-2?bidId=Relating%20to%20Development%20Rights%20H.B.%201436%20H.D.%201%20S.D.%202%20C.D.%201.%202022) Date. Accessed: May 22, 2023. Internet Source: https://www.capitol.hawaii.gov/session/archives/measure_indiv_Archives.aspx?billtype=HB&billnumber=1436&year=2022

Regional Sediment Management (RSM) Program. Hawaii Regional Sediment Management (RSM): Regional Sediment Budget for the West Maui Region. July 2015. Accessed: March 15, 2023. Internet source: <https://www.researchgate.net/publication/290995875_Hawaii_Regional_Sediment_Management_RSM_for_West_Maui_region_CHL-TR-15-xx_DRAFT/download>

Sea Engineering, Inc. County of Maui, Department of Public Works, Engineering Division. Job. No. 25619. Coastal Engineering Report for Lower Honoapiilani Road Erosion at Kaopala Bay. September 2018. Accessed: March 29, 2023. Internet Access: <<https://www.google.com/search?client=safari&rls=en&q=Coastal+Engineering+Report+for+Lower+Honoapiilani+Road+Erosion+at+Kaopala+Bay&ie=UTF-8&oe=UTF-8>>

Spectrum News. Maui residents and Native Hawaiians say they will fight a controversial beach restoration project. January 3, 2022. Accessed: April 4, 2023. Internet Source: <<https://spectrumlocalnews.com/hi/hawaii/environment/2021/12/29/controversial-beach-restoration-in-west-maui>>

State of Hawaii (State). Climate Change Portal. State Sea Level Rise Resources. Accessed: February 1, 2023. Internet Source: <<https://climate.hawaii.gov/hi-adaptation/state-sea-level-rise-resources/>>

State Climate Change Portal. HI Commission. Accessed: February 1, 2023. Internet source: <<https://climate.hawaii.gov/hi-commission/>>

State Climate Change Portal. Accessed: February 1, 2023. Internet Source: <<https://climate.hawaii.gov/hi-commission/>>

State Climate Change Portal. Hawaii Climate Change Report. Accessed: February 1, 2023. Internet Source: <<https://climate.hawaii.gov/wp-content/uploads/2023/01/OCCL23-Hawaii-Climate-Change-Report-FY22.pdf>>

State Hawaii Climate Commission. DISCLOSURE REQUIREMENT. No date. Accessed: February 1, 2023. Internet Source: <<https://climate.hawaii.gov/wp-content/uploads/2022/03/SLR-XA-Flyer-Final.pdf>>

State of Hawaii. Department of Accounting and General Services (DAGS), Land Survey. Certified Shoreline Maps. Accessed: February 1, 2023. Internet Source: <<https://ags.hawaii.gov/survey/certified-shoreline-maps/>>

State of Hawaii. DAGS. Land Survey Letter dated December 5, 2011. MA-296 (11) and MA-491 File. Accessed June 2023.

State of Hawaii. DAGS. Land Survey. Accessed: February 1, 2023. Internet Source: <<https://ags.hawaii.gov/survey/>>

State Department of Business, Economic Development and Tourism (DBEDT), Office of Planning and Sustainable Development (OPSD), Coastal Zone Management (CZM) Program, Final Report Accessing the Feasibility and Implications of Managed Retreat Strategies for Vulnerable Coastal Areas in Hawaii. February 2019. Accessed: February 1, 2023. Internet source: <https://files.hawaii.gov/dbedt/op/czm/ormp/assessing_the_feasibility_and_implications_of_managed_retr_eat_strategies_for_vulnerable_coastal_areas_in_hawaii.pdf>

State OPSD. National Coastal Zone Management Act, Section 307. Accessed April 25, 2023. Internet Source: <<https://planning.hawaii.gov/czm/federal-consistency/>>

State OPSD, CZM. Accessed April 25, 2023. Internet Source: <<https://planning.hawaii.gov/czm/about-czm/>>

State OPSD GIS. Accessed October 2, 2023. Internet Source: <<https://geoportal.hawaii.gov>>

State Department of Commerce and Consumer Affairs. Real Estate Branch. HRS Chapter 514B Condominiums. Date unknown. Accessed: February 1, 2023. Internet Source: <<https://cca.hawaii.gov/reb/reb-hawaii-revised-statutes/>>

State Department of Commerce and Consumer Affairs. Real Estate Branch. Homeowners Association and Cooperatives. Date unknown. Accessed: February 1, 2023. Internet source: <https://cca.hawaii.gov/reb/faqs/condo_faqs/homeowners-associations-and-cooperatives/#:~:text=The%20Hawaii%20Real%20Estate%20Commission,governed%20by%20HRS%2C%20chapter%20514B.>>

State Department of Defense. 2018 Hazard Mitigation Plan. 2018. Accessed: February 1, 2023. Internet Source: <<https://dod.hawaii.gov/hiema/files/2020/06/2018-State-HI-HMP-Update-100218.pdf>>

State Department of Health (DOH). Chapter 342D WATER POLLUTION. Unknown date. Accessed: February 1, 2023. Internet Source: <https://www.capitol.hawaii.gov/hrscurrent/vol06_ch0321-0344/HRS0342D/HRS_0342D-.htm>

State DOH, Office of Environmental Quality Control. Final Environmental Assessment and Finding of No Significant Impact (FONSI) for the Iroquois Point Beach Nourishment and Stabilization, Ewa Beach, Oahu, Hawaii. Accessed: April 25, 2023. Internet source: <https://files.hawaii.gov/dbedt/erp/Other_TEN_Publications/2012-01-08-OA-NEPA-FEA-Iroquois-Point-Beach.pdf>

State Department of Land and Natural Resources (DLNR) Hawaii Administrative Rules (HAR) Chapter 13-222. Accessed: April 25, 2023. Internet Source: <<https://dlnr.hawaii.gov/ld/files/2013/07/Ch13-222-Amend-Compil-Stand-Rev1.pdf>>

State DLNR, Division of Aquatic Resources (DAR). April 26, 2023. Phone Conversation Ryan O'Connell – Ecosystem Project Manager.

State DLNR DAR. Hawaii Coral Reef Program. Accessed: February 1, 2023. Internet Source: <https://dlnr.hawaii.gov/coralreefs/>

State DLNR, DAR. Artificial Reefs and FADS. April 26, 2023. Internet Source: < <https://dlnr.hawaii.gov/dar/fishing/artificial-reefs-and-fads/> >

State DLNR Engineering Division, National Flood Insurance Program. Flood Hazard Assessment Tool (FHAT). Date Unknown. Accessed: March 1, 2023. Internet Source: < <http://gis.hawaiiinfip.org/fhat/> >

State DLNR Engineering Division, National Flood Insurance Program. Sea Level Rise and Coastal Flood Web Tool Comparison Matrix — Hawaii. Date Unknown. Accessed: March 1, 2023. Internet source: <<https://sealevel.climatecentral.org/matrix/HI.html?v=1>>

State DLNR, Historic Preservation Division. HRS, Chapter 6E HISTORIC PRESERVATION. Accessed: April 25, 2023. Internet Source: < https://www.capitol.hawaii.gov/hrscurrent/vol01_ch0001-0042f/hrs0006e/hrs_0006e-.htm >

State DLNR, Office of Conservation and Coastal Lands (OCCL). HRS, Chapter 183C. Accessed: April 25, 2023. Internet Source: <https://www.capitol.hawaii.gov/hrscurrent/vol03_ch0121-0200d/hrs0183c/HRS_0183C-.htm>

State DLNR, OCCL Conservation District Use Application 1978 - DLNR – OCEA - MA-8/2/78-1077 for Shoreline Erosion Protection System File.

State DLNR, OCCL Site Plan Approval MA-14-9 File.

State DLNR, OCCL. HAR, Chapter 13-5. Accessed: April 25, 2023. Internet source: <<https://dlnr.hawaii.gov/occl/files/2013/08/HAR-13-5-2021.pdf>>

State DLNR, OCCL. Hawaii Sea Level Rise Vulnerability and Adaptation Report. December 2022. Accessed: February 1, 2023. Internet Source: <https://climateadaptation.hawaii.gov/wp-content/uploads/2017/12/SLR-Report_Dec2017.pdf>

State DLNR, OCCL Notice of Site Plan Approval (MA-14-9) File Removal of Encroaching Portions of Seawall at Kahana Sunset Condominium, 4909 Lower Honoapiilani Highway, Lahaina, Maui, Hawaii: TMK (2) 4-3- 003:015.

State DLNR, OCCL. Small Scale Beach Restoration Project Kauai Kailani Condominiums in Kapaa, Kauai. Accessed: April 25, 2023. Internet Source: <https://dlnr.hawaii.gov/occl/files/2019/02/Kauai-Kailani-CatII-SSBN_Application_compiled.pdf>

State DLNR, OCCL. Small Scale Beach Nourishment. Date Unknown. Accessed: April 4, 2023. Internet Source: < <https://dlnr.hawaii.gov/occl/beach-restoration/> >

State DLNR, OCCL. Report to the Thirty-Second Legislature 2023 Regular Session. Sea Level Rise Vulnerability and Adaptation Report. December 2022. Accessed: February 1, 2023. Internet source: <<https://climate.hawaii.gov/wp-content/uploads/2023/01/OCCL23-Sea-Level-Rise-Report-FY22-1.pdf>>

State DLNR, OCCL 2012 Waikiki Beach Maintenance, Waikiki, Oahu, Hawaii. Accessed: April 25, 2023. Internet source:<<https://dlnr.hawaii.gov/occl/files/2013/08/2012-Waikiki-Beach-Maintenance-Final-Report.pdf>>

State DLNR, Land Division, Maui Branch Right-of-Entry (ROE) records: June 15, 2010, 2017, and May 17, 2022.

State Department of Transportation (HDOT). Asset and Hazard Assessment. Accessed: February 1, 2023. Internet source: <<https://histategis.maps.arcgis.com/apps/MapSeries/index.html?appid=fb60bffa652c453d96b89d9f4aa9f756>>

State HDOT. Date Unknown. Accessed: March 1, 2023. Internet source: <<https://hidot.hawaii.gov/highways/home/maui/maui-state-roads-and-highways/>>

State of Hawaii. Public Trust Doctrine. 2000. Accessed: February 1, 2023. Internet source: <<http://www.hawaiis1000friends.org/public-trust-doctrine.html>>

State of Hawaii 2050 Sustainability Task Force. Hawaii 2050 Sustainability Plan. 2008. Accessed Date: March 29, 2023. Internet Source: <https://files.hawaii.gov/dbedt/op/sustainability/hawaii_2050_plan_final.pdf>

State of Hawaii. The Senate Thirty-First Legislature 2022. Keyword: Managed Retreat. Accessed March 14, 2023. Internet Source: <<https://www.capitol.hawaii.gov/search/isysquery/5f6296b3-8630-435b-89be-d9863dd9e753/21-30/list/>>

State of Hawaii. The Senate Thirty-First Legislature 2017. ACT 32 A Bill for an Act Relating to Climate Change. Accessed February 1, 2023. Internet Source: <https://www.capitol.hawaii.gov/slh/Years/SLH2017/SLH2017_Act32.pdf>

State of Hawaii. Twenty-Ninth Legislature, 2017. S.B. 386. Relating to Highways. Accessed: March 1, 2023. Internet source: <https://www.capitol.hawaii.gov/sessions/session2017/bills/SB386_.HTM>

State of Hawaii. Twenty-Ninth Legislature, 2017. ACT 32, Session Laws of Hawaii 2017. S.B. No. 559 S.D 1 H.D 2 C.D 1. Accessed: March 1, 2023. Internet source: <https://www.capitol.hawaii.gov/slh/Years/SLH2017/SLH2017_Act32.pdf>

State of Hawaii. The Senate Thirty-First Legislature 2022. State of Hawaii. ACT 223. Accessed February 1, 2023. Internet Source: <https://www.capitol.hawaii.gov/slh/Years/SLH2022/SLH2022_Act223.pdf>

State of Hawaii. Thirty-First Legislature 2022. Hawaii State Legislature - 2022 Regular Session. ACT 223, Session Laws of Hawaii 2022. H.B. No. 1436 H.D. 1 S.D. 2 C.D 1. Accessed: March 1, 2023. Internet Source:
<https://www.capitol.hawaii.gov/sessions/session2022/bills/HB1436_CD1_.htm>

State of Hawaii. Thirty-Second Hawaii State Legislature - 2023 Regular Session. S.B. 1032. Accessed: March 1, 2023. Internet source:
<https://www.capitol.hawaii.gov/sessions/session2023/bills/SB1032_.pdf>

State of Hawaii. Thirty-Second Hawaii State Legislature - 2023 Regular Session. H.B. No. 756. Accessed: March 1, 2023. Internet source:
<https://www.capitol.hawaii.gov/sessions/session2023/bills/HB756_.HTM>

State of Hawaii. Thirty-Second Hawaii State Legislature - 2023 Regular Session. H.B. No. 756 H.D.1. Accessed: March 1, 2023. Internet source:
<https://www.capitol.hawaii.gov/sessions/session2023/bills/HB756_HD1_.HTM>

State of Hawaii. Thirty-Second Hawaii State Legislature - 2023 Regular Session. H.B. No. 756 H.D. 2. Accessed: March 1, 2023. Internet source:
<https://www.capitol.hawaii.gov/sessions/session2023/bills/HB756_HD2_.pdf>

State of Hawaii. Thirty-Second Hawaii State Legislature - 2023 Regular Session. Testimony H.B. No. 756. Accessed: March 1, 2023. Internet source:
<https://www.capitol.hawaii.gov/sessions/session2023/Testimony/HB756_TESTIMONY_WAL_02-02-23_.PDF>

State of Hawaii. Thirty-Second Hawaii State Legislature - 2023 Regular Session. Testimony H.B. No. 756 H.D.1. Accessed: March 1, 2023. Internet Source: https://www.capitol.hawaii.gov/sessions/session2023/Testimony/HB756_HD1_TESTIMONY_EEP_02-16-23_.PDF

State of Hawaii. Thirty-Second Hawaii State Legislature - 2023 Regular Session. Testimony H.B. 756 H.D. 2. Accessed: March 1, 2023. Internet source: <https://www.capitol.hawaii.gov/sessions/session2023/Testimony/HB756_HD2_TESTIMONY_FIN_02-28-23_.PDF>

State of Hawaii. Thirty-Second Hawaii State Legislature - 2023 Regular Session. Committee on Water and Land – Stand Com Rep No. 181 H.B. No. 756 H.D.1. Accessed: March 1, 2023. Internet source: <https://www.capitol.hawaii.gov/sessions/session2023/CommReports/HB756_HD1_HSCR181_.htm>

State of Hawaii. Thirty-Second Hawaii State Legislature - 2023 Regular Session. Committee on Energy and Environmental Protection – Stand Com Rep No. 665 – H.B. No. 756 H.D. 2. Accessed: March 1, 2023. Internet source: <https://www.capitol.hawaii.gov/sessions/session2023/CommReports/HB756_HD2_HSCR665_.htm>

Strategies for Vulnerable Coastal Areas in Hawaii Final Report February 2019. Accessed: February 1, 2023. Internet source: <https://files.hawaii.gov/dbedt/op/czm/ormp/assessing_the_feasibility_and_implications_of_managed_retr eat_strategies_for_vulnerable_coastal_areas_in_hawaii.pdf>

Spectrum April 25, 2023. Maui Condo Owners are Funding Beach Restoration in Front of Their Homes. 2023. Accessed: April 25, 2023. Internet source: <<https://spectrumlocalnews.com/hi/hawaii/environment/2022/03/26/maui-condo-owners-are-funding-beach-restoration-in-front-of-their-homes>>

University of Hawaii (UH) Article "Exploring Our Fluid Earth Tide Paterns and Currents." Accessed: April 6, 2023. Internet Source: <https://manoa.hawaii.edu/exploringourfluidearth/physical/tides/tide-patterns-and-currents>

UH, Department of Geology and Geophysics. Journal of Coastal Research SI 38 106-124. Fall 2003. Mapping Shoreline Change Using Digital Orthophotogrammetry on Maui, Hawaii. Accessed Date: March 29, 2023. Internet Source: <<https://www.jstor.org/stable/25736602>>

UH Library Aerial Photos Archive. Email.

UH, Pacific Islands Ocean Observing System (PacIOOS). PacIOOS: The Sea Level Rise: West Maui Wave- Driven Flooding with Sea Level Rise tool. Unknown Date. Accessed: October 2, 2023. Internet Source: <https://www.pacioos.hawaii.edu/shoreline/slr-westmaui/#scenarios>

UH, PacIOOS. Wave Run-Up Forecast. West Maui: Napili Region. Unknown Date. Accessed: May 22, 2023. Internet Source:

<http://www.pacioos.hawaii.edu/shoreline/runup-westmaui-napili/#examples>

Accessed October 2, 2023. Internet Source:

<<http://www.pacioos.hawaii.edu/shoreline/runup-westmaui-napili/#examples>>

UH, PacIOOS. Wave Run-Up Forecast: West Maui. Run-Up Thresholds. Unknown date. Accessed: March 15, 2023. Internet source: <<http://www.pacioos.hawaii.edu/shoreline-category/runup-westmaui/?>> Accessed October 2, 2023. Internet Source:

< <http://www.pacioos.hawaii.edu/shoreline/runup-westmaui-kahana/#examples>>

UH, PacIOOS. West Maui : Napili Region, Maui. Unknown date. Accessed February 1, 2023. Internet Source: <<https://www.pacioos.hawaii.edu/shoreline/runup-westmaui-napili/>>.

Accessed October 2, 2023. Internet Source:

<<https://www.pacioos.hawaii.edu/shoreline/runup-westmaui-napili/#examples>>

UH, PacIOOS. Sea Level Rise: State of Hawaii Sea Level Rise Viewer. Sea Level Rise Exposure Area (SLR-XA). Accessed October 2, 2023. Internet Source:

<https://www.pacioos.hawaii.edu/shoreline/slr-westmaui/#scenarios>

UH, PacIOOS Wave Run-Up Forecast: West Maui. Regions. Unknown date. Accessed: March 15, 2023. Internet Source:

<<http://www.pacioos.hawaii.edu/shoreline-category/runup-westmaui/>>

UH, Sea Grant. Common Law and Statutes. Unknown date. Accessed: February 15, 2023. Internet Source: <https://seagrant.soest.hawaii.edu/common-law-and-statutes/>

UH. Coastal Geology Group in the School of Ocean and Earth Science and Technology (SOEST) Historical shoreline change rate at the project site. 2021. Hawai'i Shoreline Study. Accessed October 5, 2023. Internet Source:

<<https://www.soest.hawaii.edu/crc/index.php/hawaii-shoreline-study-web-map>>

UH, Sea Grant College with the Hawaii Department of Land and Natural Resources, Office of Conservation and Coastal Lands for the Hawaii Climate Change Mitigation and Adaptation Commission - Climate Ready Hawaii Initiative. Guidance for Using the Sea Level Rise Exposure Area in Local Planning and Permitting Decisions. 2020. Accessed: February 1, 2023.

Internet source: <<https://climate.hawaii.gov/wp-content/uploads/2020/12/Guidance-for-Using-the-Sea-Level-Rise-Exposure-Area.pdf>>