



Revised
May, 2005

SSBN Cat II
General Application

Category II General Application Small-Scale Beach Nourishment Projects (SSBN)

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809



PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR - LAND

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ACTING DEPUTY DIRECTOR - WATER

**Before completing this form, read the Guidelines
and Instructions for SSBN application.**

Start date of proposed work: March 2019

PROJECT NAME: Kauai Kailani Beach Restoration

Proposed Volume: up to 1,140 cubic yards

For Category II beach nourishment projects less than 10,000 yd³ total volume.
Attach additional sheets as necessary.

DLNR USE ONLY

Permit No.: _____ Planner: _____

Date Received: _____

1) **Property Owner(s) Information** (see Guidelines for SSBN Application - Note 1)

Is this a community association or partnership project? Yes X No _____
Attach additional owner's information as needed.

Legal Name: Association of Unit Owners (AOUO) of Kauai Kailani Condominiums

Street Address: 4-856 Kuhio Highway

City, State and Zip+4 Code: Kapa'a, HI 96746

Mailing Address: 4-856 Kuhio Highway

City, State and Zip+4 Code: Kapa'a, HI 96746

Contact Person & Title: Brian Mose, AOOU of Kauai Kailani Condominiums,
Erosion Committee Chair

Phone No.: (250) 248 0969 Fax No.: N/A

Legal Name: _____

Street Address: _____

City, State and Zip+4 Code: _____

Mailing Address: _____

City, State and Zip+4 Code: _____

Contact Person & Title: _____

2) Primary Contractor Information (see Guidelines - Note 2)

Name: Will be provided by AOOU of Kauai Kailani at least 30 days before project begins.

Scope of Work: Provide long-term shoreline protection by placing up to 1,140 cubic yards of beach quality sand on the eroded beach and reconstructing a temporary groin to stabilize the beach.

Street Address: To be provided

Contact Person & Position Title: To be provided

Phone No.: () To be provided Fax No.: () To be provided

Name: Oceanit Laboratories, Inc.

Scope of Work: Post Design Services and Construction Management

Street Address: 828 Fort Street Mall, Suite 600, Honolulu, HI 96813

Contact Person & Position Title: Michael Foley, Ph.D., P.E., Coastal Engineer

Phone No.: (808) 954 4184 Fax No.: (808) 531 3177

Name: _____

Scope of Work: _____

Street Address: _____

Contact Person & Position Title: _____

Phone No.: () _____ Fax No.: () _____

Name: _____

Scope of Work: _____

Street Address: _____

City, State and Zip+4 Code: _____

Phone No.: () _____ Fax No.: () _____

3) Emergency Contact Information (see Guidelines - Note 3)

Company/Organization Name: Kauai Kailani AOOU

Contact Person & Title: Brian Mose, Erosion Committee Chair

Phone No.: (250) 248 0969 Cell Phone No.: N/A

Company/Organization Name: Kauai Kailani AOOU

Contact Person & Title: Jay Bornstein

Phone No.: (808) 815 4492 Cell Phone No.: N/A

4) Project Site Information (see Guidelines - Note 4)

Project or community association name: Association of Unit Owners (AOUO) Kauai Kailani Condominiums

State/County Zoning. (as applicable): State Land Use: Urban, County Zoning: Open

Street Address: 4-856 Kuhio Highway, Kaua'i; TMK: (4) 4-3-009:050

City, State and Zip+4 Code: Kapa'a, HI, 96746

Contact Person & Title: Brian Mose, Erosion Committee Chair

Phone No.: (250) 248 0969 Fax No.: ()

Tax Map Key Number(s)							
Zone	Section	Plat	Parcel(s)	Ownership	Total Area (sq. ft)	Eroded Area (sq. ft)	Zoning
4	3	09	050	AOUO of Kaua'i Kailani Condominiums	74,461	1,850	Open

5) Location Map and Shoreline Survey (see Guidelines - Note 5)

Provide and attach a regional, vicinity and parcel map of project area and include recent photograph(s) of relevant coast and shoreline:

a. Maps submitted: Figure 1 – Project Site Map

b. Photos submitted: Appendix C Site Photos

c. Shoreline Survey: (Date & Contractor)

Shoreline Delineation: A shoreline survey waiver will be requested. A topographic map is included as Figure 3.

State Certification Map (If Applicable): See Figure 3: Topographic Survey

d. Other surveys (Specify): _____

6) Receiving State Water Information (see Guidelines - Note 6)

a. Regional Name: Pacific Ocean

b. Classification: (check and explain appropriately)

1. Marine Waters: Class A X Type: Open Coastal

2. Marine Bottom Ecosystem: Class II X Type: sand

3. Water-Quality-Limited Segment: Yes _____ No X

c. Explain any "other" classifications:

7) Project Description (see Guidelines - Note 7)

Project Classification (Category I or II)

Note: Category II projects may require a seal from a certified civil engineer.

(Attach separate sheets as needed):

Primary Contractor and Type: To be provided by the AOUO of Kauai Kailani to the Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) before project begins.

Attached Documents (If Applicable): _____

a. Project Category (I or II): Category II

b. Extraction Site Street Address: Waipouli Drainage Canal. The canal mouth is currently blocked by a sand bar. Sand will be extracted from the fill within the canal.

City, State and Zip+4 Code: 4-820 Kuhio Highway, Kapa'a, Hawai'i, 96746

Tax Map Key (TMK): (4) 4-3-008:017

Terrestrial extraction site is a permitted commercial quarry N/A

Offshore Coordinates: Lat: _____ ° ' " Long: _____ ° ' "

UTM: North: _____ East: _____

c. *Nourishment* Site Street Address: 4-856 Kuhio Highway

City, State and Zip+4 Code: Kapa'a, Hawai'i, 96746

Tax Map Key (TMK): (4) 4-3-009:050

d. Describe the overall project scope and purpose and evidence of need for proposed activities.
(Attach separate sheets as needed)

The overall project scope is to construct a temporary sand bag groin to have the same function as the groin removed in 2012 and to replenish the beach with up to 1,140 cubic yards of compatible beach material from the Waipouli Drainage Canal.

The erosion at the Kauai Kailani Association premises is located at 4-856 Kuhio Highway in Kapa'a, on the east side of the island of Kaua'i (herein referred to as the site) (Figure 1). Formerly, a 70-foot (ft) long concrete groin was located at the northern boundary of the site but was removed in 2012. The groin removal caused severe erosion to the shoreline (Appendix E). An emergency erosion protection repair structure was installed in 2017 with the approval of the DLNR after erosion was deemed a threat to public health, safety, and welfare. Since its installment, the emergency structure has required maintenance repairs. The emergency structure is permitted to remain in place for three (3) years while a long-term solution is developed. The long-term solution proposed is a beach nourishment event stabilized by a temporary sand bag groin.

This SSBN proposal covers a preliminary beach nourishment and temporary sand bag groin construction event, as well as maintenance to nourish the beach over a ten (10)-year period. The preliminary beach nourishment event includes obtaining approximately 540 cubic yards (cy) of beach quality sand from the Waipouli Drainage Canal. Approximately 100 cy of the 540 total cy of lower quality sand located between 200-400 ft upstream of the Waipouli Canal mouth will be used to fill the Elcorock® sand bags that will comprise the temporary groin. Subsequent beach nourishment events are anticipated after three (3) to four (4) years following the preliminary nourishment event, or when 60% of the nourished sand is lost, whichever occurs first. Approximately 100-200 cubic yards of sand will be used for each nourishment event; totaling approximately 940-1,140 cubic yards of total sand nourishment. Sand in the Waipouli Drainage Canal will be the preferred sand source for subsequent beach nourishment events; however, if the sand source in the canal is not sufficient, an additional sand source will be submitted to OCCL for approval. The time for the proposed initial sand placement and temporary groin construction, including mobilization and demobilization, will take approximately three months, and nourishment events will span over the course of ten (10) years.

The requested re-nourishment interval rates were predicted based on past erosion observations as well as future project erosion conditions. Following the removal of the previous groin, the beach along the Kauai Kailani shoreline was lost in approximately three years.

Removal of the temporary revetment during the second sand nourishment, approximately three to four years following the temporary groin construction, is also proposed in the project scope.

If the proposed groin is not approved, coastal erosion will continue to damage the temporary revetment until it fails, at which time coastal erosion will continue to advance *mauka*, putting people and property in jeopardy. If only beach fill is approved, erosion will continue, and nourishment efforts will be more frequent. Since quality sand is in short supply, the groin is recommended.

- e. Provide a brief assessment of the primary causes of beach erosion or sand loss for the project site and describe the ability of the proposed project to correct or mitigate the problem. Provide an estimate of the designed residence time of the nourishment project and any anticipated follow up nourishment(s).

The primary cause of the beach erosion at the site was the removal of an upstream groin north of the site in 2012, which had protected the beach from the natural longshore littoral drift.

During high tide at the site, waves break on the nearshore beachrock that runs parallel to the shoreline and pumps water into the depressed channel between the beachrock and the shoreline. This creates a strong longshore current that moves water and sand south until they encounter a gap in the hard reef structure and return back out to sea. This strong southerly current carries large amounts of sand away from the beach. The removal of the groin in 2012 allowed the longshore current to flow closer to the property shoreline. Prior to its removal, the groin diverted the southward flowing littoral current seaward, which limited the strength of the current south of the structure and protected the sand on the beach. Over a two-year period following the groin removal, erosion removed approximately 500 cubic yards of sand, reducing the beach width. An emergency temporary sand bag revetment was installed in 2017 to protect the approximately seven-foot high erosion escarpment along the property.

The proposed groin is designed to occupy the same footprint and perform the same function of a groin removed in 2012. The proposed groin construction and beach nourishment are designed to return the Kauai Kailani beach to pre-existing 2012 conditions when the former groin and sandy beach were present.

Subsequent beach nourishment events are anticipated after three to four years following the preliminary nourishment event, or when 60 of the nourished sand is lost. Approximately 100-200 cubic yards of sand will be used for each nourishment event; totaling approximately 940-1,140 cubic yards of total sand nourishment over a ten (10)-year period.

- f. Describe the method of sediment extraction and delivery, type of equipment to be utilized and construction methods.

The sand source for the planned beach nourishment is sand that has been pushed into the Waipouli Drainage canal by wave action, creating a sand bar is accreted as far as 600 ft into the canal. Grain size analyses have shown that the sand in the canal is very similar to the sand at the nourishment site and in accordance with SSBN standards; thus the Waipouli Canal is considered a favorable sand source for the SSBN. Sand cores at the canal mouth, 100, 200, 400, and 600 ft upstream were taken from the surface down to three ft below ground surface (bgs) to analyze sand quality (Appendix E). It was determined that there was quality sand down to 3 ft bgs from the river mouth to 200 ft upstream, and that the upper sand layer between 200-400 ft upstream is acceptable, although the number of organics and darker color increase as the depth and distance upstream increases in this area. The material between 400-600 ft includes some organic material that may be unsuitable for beach fill. If the material this far up the canal is used for this project, the quality will first be confirmed by qualified personnel in the field.

The beach fill from the canal will be completed in stages. The first phase will consist of removal of approximately 540 cubic yards of sand from the drainage canal using a long arm excavator and stockpiling the sand to allow it to dry (Figure 2). Dredging from the canal mouth to 200 ft upstream will take place to three ft bgs. Between 200-400 ft upstream, sand removal will be removed in one-ft depth increments with qualified personnel onsite to ensure that the dredge sand are acceptable to be used as beach fill. The lowest quality sand (i.e., darker sand that varies from the native sand color scheme) will be placed in a separate stockpile and will be used to fill Elcorock ® sand bags that will be used to construct the temporary groin. The beach fill will be transported to the stockpile location in a dump truck to be dried. Elcorock ® sand bags will be filled mechanically at the stockpile location.

The second phase will transport the stockpiled sand and sand bags to the erosion escarpment. The proposed groin footprint area will be cleared of loose debris and a foundation layer of Tensar Triton Filter Mattress will be placed on the beachrock. The sand bags will be arranged on top of the filter mattress into the temporary groin using a backhoe or similar equipment. A front end loader or similar heavy equipment will push the sand on to the beach and grade it to the designed shape (Figures 6,8).

- g. Provide scale drawings or photographs (with scale bar) of area to be excavated and filled. Include an estimate of the area (ft²) to be nourished. Delineate property boundaries, certified shoreline (if available), location and cross-section of beach profiles, existing and proposed temporary structures with cross-sectional views of any proposed temporary structures. Provide an estimate of the elevations and dimensions of the project area and a range of water depths of proposed activities.

Figures 5-8: Conceptual Plans

Areas to be excavated: ~3,300 ft² in the canal, Area to be nourished: 6,274 ft²

The repaired shoreline covers a length of about 140 ft.

- h. Provide photographs of area to be excavated and filled before, during and after the nourishment project.

Appendix C: Photos

Site photographs of post-nourishment activities will be provided immediately after completion.

- i. Provide a description and engineering design of any proposed temporary structures including all retention or offshore structures. Include a design analysis of any offshore sand extraction.

The design of the groin is to accommodate site-specific currents at the Kauai Kailani site. The currents that remove sand from the site are not due to the common phenomena of long wave littoral drift. Instead, there is beachrock that sits parallel to the shoreline, on which waves break over and pump water into a channel in between the hard reef and the shore. This creates a strong southerly current that moves rapidly along the shoreline, scouring the shoreline until it can exit through a break in the hard reef structure back out to sea. This strong southerly current carries large amounts of sand away from the beach (see nearshore current figure in attached Appendix F Field Report). The proposed groin is designed to occupy the same footprint and perform the same function of a groin removed in 2012, which had diverted the longshore current seaward instead of letting it continue south and eroding the beach fronting Kauai Kailani. After the groin was removed, severe erosion occurred and the majority of the sand fronting the beach was lost over a period of about three years. The proposed groin construction and beach nourishment are designed to return the Kauai Kailani beach to pre-existing 2012 conditions when the former groin and sandy beach were present (Figures 5-8).

No offshore sand excavation is included in the proposed activities.

- j. Provide a temporary construction plan. If temporary retention structures are proposed provide the following:

1. Describe the potential effects to the marine substrate and local littoral processes.

The temporary retention structure to be used is a fiber roll barrier mauka of the project site to prevent any construction runoff from entering terrestrial drainageways (See Figure 9 and BMP Plan included as Appendix A).

2. Location, type and dimensions of proposed structure(s) (noted on drawings in section 7g).

The location of the groin structure is at the location of the original groin, at the north boundary of the property line. A foundation layer of Tensar Triton Filter Mattresses will be placed beneath approximately 29 Elcorock sand bags stacked to create a groin. The groin will be perpendicular to the shoreline berm and extend 80 ft seaward over the beachrock. The footprint of the groin is 12 ft wide at the bottom and tapered to 6 ft wide at the top. The top elevation will be +6.5 ft MLLW.

The temporary fiber roll barrier will be placed along the top bank (approximately 170 linear ft) and will be a minimum of 8 inches in diameter and will be anchored with 2 in x 2 in wood or metal stakes spaced 4 ft apart. The temporary fiber roll barrier will be removed after the beach fill is complete.

3. Length of time retention structures will remain in place including a timeline of installation and removal efforts.

The temporary groin structure will serve to retain the nourished sand for approximately three years until a permanent concrete or rock groin is constructed. The length of time will depend on the time it takes to obtain regulatory permits. When the permanent groin is ready for installation, the temporary sand bag structure will be removed.

The temporary fiber roll barrier will be removed after completion of the preliminary beach nourishment event and groin construction.

4. Proof of general liability insurance (\$1,000,000 minimum).

Proof of general liability insurance is attached (Appendix F).

- k. Describe existing physical, chemical and biological environment of project site and any other pertinent characteristics of site. Include a description of major topographic/hydrographic features such as slope, ledges, holes, reefs. Provide a relevant hydrographic chart with site highlighted.

Soils specific to the project site are *Beaches* (BS) and *Mokulē`ia Fine Sandy Loam* (Mr). BS soils consist of coarse sand derived from coral and seashells and are excessively drained with very low runoff. Mr soils consist of well-drained soils found along the coastal plains and are well drained with very low runoff. Ongoing erosion has created a vertical and/or undermining ledge along the vegetation line, exposing roots for the turf and adjacent trees and shrubs and causing vegetation to fall in the ocean. This escarpment was covered by an emergency erosion control structure in 2017 and has needed multiple repairs since its installment.

A botanical survey of the site was conducted in July 2002 for the bike/pedestrian path project by Kaua'i County in the adjacent area. The survey did not find any state or federally listed threatened or endangered plant species in the area. Most plant species were non-natives with few indigenous plants in the area.

The nearshore area is dominated by a beachrock reef. The shore fronting the property and nearshore area consists of reef flats with a thin layer of sand on top. The surface of the shoreline reef has minimal marine vegetation and does not provide significant habitat. Waves primarily break on the outer reef and finally at the nearshore reef, producing a strong littoral drift southwards. Surface current measurements were taken during high tide in the area to determine the surface current patterns (Figure 11). The local littoral drift across the reef flat zone is from north to south. The dominant force driving the littoral drift is water from waves that overtop the reef edge. The overtopping water is pumped into a depressed channel that runs between the reef and the shoreline, flowing south along the reef until it exits in a break in the beach rock south of the property. The strong littoral current produced by waves at high tide causes the erosion of the AOQU property.

The top elevation varies from MLLW to 3 ft above MLLW. Currently there is no beach seaward of the erosion escarpment and only an emergency temporary erosion protection at the property. The shoreline north of the AOUE property has vertical seawalls constructed on the beachrock reef.

Water quality measurements at the site were taken in 2017. The temperature of the water at the reef was about 25 degrees Celsius, with a mean pH of 8.6 and salinity of 36.2 ppt. Laboratory analysis of collected water samples showed total suspended solids in the surface water of 3.2 mg/L and 6.1 mg/L at a depth of three feet.

- l. Describe the existing bottom type of the extraction and nourishment site. Include percent coverage and type.

Sand accreted in the Waipouli Drainage Canal will be extracted for the project. The top three feet of sand within the canal consist of acceptable sand from the mouth of canal up to approximately 400 ft upstream. The bottom of the extraction canal to the proposed excavation level is currently 100% sand. The sand likely originated from the beach and is suitable for nourishment at the project site. The nourishment fill site is comprised of approximately 40% carbonate sand, 25% coral rubble, 30% beachrock, and 5% large rocks and boulders across the reef flat zone (Appendix E). The elevation of the hard stratum varies from mean lower low water (MLLW) at the lowest point to +three (3) ft MLLW at the bottom edge of the erosion escarpment. Prior to the groin removal in 2012, the nourishment site was a sandy beach.

- m. Describe potential adverse environmental effects of proposed activity.

Construction activities to erect the proposed structure may result in temporary turbidity in the nearshore waters; however, no long-term degradation of physical chemical environments are expected. Strict adherence to construction BMPs and established sand quality will be important mitigation policies. Work will be conducted in low tide and low wave conditions.

Biological effects on marine benthos may occur within the footprint of the sandbag groin and the in-water fill area. The footprint of the groin is 80 ft L x 12 ft W, and the sand backfill area is 6,274 ft². A field visit to characterize the bottom type and biological resources present was performed on October 31, 2018 (Appendix E). There are no live corals across the bottom of the fill area and sparse live coral heads outside of the area. Motile organisms such as sea cucumbers and fish visit the area during low tide. Thus, biological environmental effects are not expected to be significant.

The groin will permanently change the local littoral drift across the reef flat zone by diverting water energy away from the shoreline to prevent scouring, although this is not expected to be an adverse environmental effect to the area. This change will recreate the local littoral drift that existed before the groin was removed in 2012.

- n. Describe the current recreational use of the project site and describe the potential impacts the proposed project might have. (i.e. Impacts on swimming, surfing, canoe clubs, diving, fishing, tourism, etc.) Briefly identify the development style and land use of the project area, (undeveloped, urban, residential, condominium, agricultural, commercial, etc.)

The site currently consists of hard strata and has limited recreational use, consisting mainly of walking at low tide. No surfing sites are nearby, and thus limited short term disturbances to in-water recreational activities are expected. During high tide, waves and currents produce unsafe conditions for walking and swimming. Restoring the beach will provide additional sandy beach that will provide a broader opportunity for beach use and recreation and create safer conditions for beach activities. The surrounding land use urban and consists of residential areas of condominiums and private houses.

- o. Identify and describe any known historic properties within or near the proposed project area and any mitigation commitments made to protect, restore, or data recover any of the identified properties. This could include properties such as stone features, fishponds, burial sites, cultural deposits, and traditional places.

Both the extraction site and the nourishment site are areas disturbed by earlier development activities. No known historic properties exist within the area.

p. Check Yes or No for the following items. Provide a detailed explanation for any "yes" answers. (see Instructional Guidelines)	<u>Yes</u>	<u>No</u>	<u>Contacted?</u>
Is any proposed work within the shoreline setback area? ¹	<u>X</u>	<u> </u>	<u>Planning</u>
Is any portion of this project within a Special Management Area? ¹	<u>X</u>	<u> </u>	<u>Planning</u>
Is any portion of this project within an endangered species habitat? ^{2,3}	<u>X</u>	<u> </u>	<u> </u>
Is any portion of this project within a wetlands or estuary? ^{2,3}	<u>X</u>	<u> </u>	<u> </u>
Is any portion of this project within a Marine Life Conservation District? ⁴	<u> </u>	<u>X</u>	<u> </u>
Is any portion of this project within a historical or cultural site? ⁵	<u> </u>	<u>X</u>	<u> </u>
Letter of Public Notice of Proposed Action submitted to the Office of Environmental Quality Control (OEQC)? ⁶	<u> </u>	<u>X</u>	<u> </u>
Date OEQC Contacted:	<u> </u>	<u>X</u>	<u> </u>

The project site is located in a critical habitat for the United States Fish and Wildlife (USFWS) Service Rare, Threatened and Endangered (RTE) Species for the Hawaiian monk seal (known to frequent any sandy beach along the coast). If endangered Hawaiian monk seals, green sea turtles, or any other RTE species are within the project site or vicinity, construction will be stopped immediately. Construction may continue when the RTE animal(s) leaves the site on its own accord. There will be no attempt to remove or force the animal to leave the site. The long-term impact of the proposed action will restore and enhance this critical habitat by restoring the sandy beach area.

The project site is located within an Estuarine and Marine Wetland Area (M2USN) according to the USFWS National Wetlands Mapper. The USFWS will be contacted in the event that additional permits are needed.

Description of the Existing Sedimentary Environment and Compatibility of Proposed Nourishment Sediment. (see Guidelines - Note 8)

- a. Describe the **existing** sediment type including size, composition and quality. Include grain size distribution, percent fines and color.

Existing sediment at the Kauai Kailani beach site consists mainly of calcareous materials from coral and shell detritus, with a small fraction of basalt. Grain size varies from 0.1 millimeters (mm) to 4.0 mm (Appendix D). Less than half a percent of the sand passed through the 0.1 mm sieve. The sand is yellowish brown in color and is shows a texture of typical beach material. Full grain size distribution results for the existing sand at Kauai Kailani is included as Appendix D.

- b. Describe the **proposed fill** sediment type including size, composition and quality. Include grain size distribution, percent fines and color.

The proposed fill sand currently located in the Wapouli Drainage Canal has accreted from the beach to approximately 600 ft upstream. For the preliminary nourishment event, sand up to 400 ft in the canal will be used. The sand seems to be built up of layers and consist of calcareous detritus and a fraction of basalt. The sand from the canal mouth to 200 ft upstream and down to 3 ft is similar in color to the sand at the nourishment site. Sand between 200 ft and 400 ft gets grayish and darker in depth bgs as well as depth inland, and thus qualified personnel will be onsite to determine to which depth acceptable sand can be obtained from this area. The grain size varies from 0.1 mm to 2.0 mm. The fraction passing through the 0.1 mm sieve is less than one percent. Grain size distribution shows that the proposed fill sand is consistently coarser than the native Kauai Kailani Beach sand, making it more difficult to move by wave action. This is favorable because no over nourishment is expected. Grain size distribution results for Waipouli Drainage Canal fill are included in Appendix D and photos of sand cores taken are included in Appendix E.

- c. Give an estimate of compatibility to fill site and evidence that proposed fill sediment meets the requirements for grain size ranges as specified in the Guidelines Section 8c. Indicate an overfill ratio and method of calculation (if applicable).

The proposed fill sand in the Waipouli Drainage Canal meets applicable DLNR grain size requirements; no more than 50 percent of this sand is less than 0.125 mm, as measured by the #120 standard mesh sieve. In addition, the percentage of fine sediment is also less than 2 percent.

- d. Provide one separate, bagged and labeled (~0.5 lb) sediment sample of both the extraction site and nourishment site to the DLNR Lands Division. (see Guidelines Note 8)

Sample sent or delivered (Date):

One bagged composite sand sample from the extraction site and one bagged composite sand sample from the nourishment (fill) site were delivered to OCCL on 9/14/18. Additional sand samples collected from the Waipouli Canal mouth, 100, 200 ft, 400, and 600 ft upstream at the surface and from approximately two (2) to three (3)-ft depth at each location will be submitted with the revised SSBN permit.

- e. List name and contact numbers for laboratory to be used for sediment analysis:

Lab name, contact name and phone number.

AECOS Inc., Snookie Mello, (808) 234-7770.

8) Project Schedule (see Guidelines - Note 9)

- a. Provide the estimated date or dates on which the activity will begin and end:¹

¹ See Article V.22 TERMS of the Guidelines

Total project construction will span approximately three months. The commencement of the construction will depend on the concurrence from regulatory agencies. Nourishment events are expected every three to four years up to ten years.

- b. Provide the date or dates that the excavation and or nourishment(s) will take place:

Dates of excavation and nourishment activities will be dependent on permit approvals and installation of BMPs.

10) **Site-Specific Best Management Practices (BMP) Plan** (see Guidelines - Note 10)
See Appendix A

- a. Separate maps are attached Yes (Figure 9) Using existing map_____ (Indicate which)
- b. Project monitoring and oversight responsibility (If different than Section 3 Emergency Contact).

Contact Person: Same as Section 3 Emergency Contact

Title:

Contact number(s):

- c. Construction sequence and duration.

Excavation from the Waipouli Canal and stockpiling at the temporary storage area to allow the beach material to dewater (one week), installation of applicable BMPs at the project site, and construction of the sand bag groin structure is expected to take approximately two weeks. Transportation of the stockpiled beach material and grading at the nourishment site will take approximately one week. The total duration of the project will take approximately three months. For more details, see Section C of the attached BMP Plan (Appendix A).

- d. Construction or nourishment materials and equipment to be used and the anticipated dates of installation/mobilization and removal.

Anticipated construction equipment includes a long arm excavator to extract sand from the Waipouli Canal and dump trucks to move sand from the source site to the temporary storage site. A front-end loader and dump trucks will be used to move the beach material from temporary storage stockpile site to the nourishment site, and the same equipment will be used to grade and contour the beach material to the desired configuration. Dates will be set according to need caused by erosional stressors and with respect to low tide and mild surf conditions to minimize construction-caused turbidity. See Attached BMP Plan for further details (Attachment A).

- e. Characteristics of potential pollutants associated with the proposed nourishment or construction activity.

Source	Composition	Potential Pollutant	Quantity	Duration
Trucks, Excavator, and Loader		Diesel fuel leak (Not into state waters)	Limited	3 weeks
Trucks, Excavator, and Loader		Hydraulic fuel leak (Not into state waters)	Limited	3 weeks
Trucks, Excavator, and Loader		Oil Leak (Not into state waters)	Limited	3 weeks

Source	Composition	Potential Pollutant	Quantity	Duration
Land erosion and fill transport		Sediment and water turbidity	Limited	3 weeks

f. Proposed pollution control measures and/or treatment(s).

A temporary fiber roll will be installed as a pollution control measure. In water pollution control measures are not anticipated to be needed because the installation of the Tensar Triton Filter Mattresses and Elcorock sand bags are not expected to produce any sediment or plumes. Placement of sand fill will be initiated above the MHHW on the Kauai Kailani property and grading will be performed so that no heavy equipment enters the water in the nearshore area.

All equipment will be checked to ensure that there are no leaks of any pollutants (i.e., fuels or oils). A preconstruction meeting will be conducted with the trucking and bulldozer operators to review BMPs, construction sequence, and safety measures. In order to mitigate the potential for toxic or chemical spills into the coastal environment, all fueling and servicing of heavy machinery and equipment will be completed offsite at the farthest *mauka* area of the ingress/egress lot (at least 100 ft away from the ocean).

In addition, BMPs will be utilized during construction activities in order to mitigate the potential for adverse effects to air quality and noise levels. Such BMPs include the use of emission control devices and noise attenuating devices. In addition, machinery will not be allowed to idle and will be prohibited from entering coastal waters below the MHHW mark.

g. Describe the onsite public safety measures (i.e. Warning signs, barriers, cordon off area, safety personnel, etc.)
Every effort will be made to notify residents and neighbors of the date and scope of work. Notification signs will be posted during construction activities, and lateral beach access will be maintained. Areas where heavy equipment will be operated will be cordoned off, and appropriate warning signs will be posted by the Contractor. The project manager or applicant's agent will be onsite during all construction activities.

The project shall be completed in accordance with all applicable State and County health and safety regulations. Please see Appendix A BMP Plan for more details.

11) Monitoring and Assessment Plan (see Guidelines - Note 11)

See Appendix B

The Monitoring and Assessment Plan shall, at a minimum, include the following:

a) Description of the methods and means being used or proposed to monitor the quality of the surrounding near shore waters. (Describe the planned monitoring program frequency)

Water Quality Monitoring will take place pre-, during, and post- construction activities. There will be three DUs where water quality monitoring will be conducted. These are selected to represent baseline water quality in the vicinity of the project site (i.e., Baseline DU), water quality condition at the worksite within the area protected by the BMPs (i.e., Work DU), and the area immediately outside the BMPs where the most severe impacts are expected (i.e., Impact DU). Each of the locations for the suggested DUs are shown in Figure 4.

Parameters at each monitoring site will be measured in the field using a MULTI-INCREMENT ® sampling approach with appropriate field instruments for pH, turbidity, salinity, DO, and temperature using a calibrated water quality meter. Total suspended solids (TSS) samples will be collected and analyzed by a local certified analytical laboratory (e.g., AECOS).

Monitoring personnel will also perform visual inspections during monitoring and document the date, time, weather conditions, construction activities, location, condition of the BMPs and any other activities related or unrelated to construction that may impact water quality. These observations will be submitted as a part of the monitoring report. All monitoring activities shall also include photographic documentation of site conditions. All photographs related to this monitoring effort will be date and time stamped. The locations for photo documentation points will marked with Geographic Positioning System (GPS) coordinates.

See Appendix B Applicable Monitoring and Assessment Plan (AMAP) for further details.

Summary of Supporting Documents (see Guidelines - Note 12)

List and submit applicable maps, photos, plans, specifications, copies of associated permits or licenses, federal applications, Environmental Assessments or Environmental Impact Statements, as applicable, etc.

<u>Document Title</u>	<u>Page Referenced</u>	<u>Document Date</u>
a) <u>Figure 1 Project Site Map</u>	<u>3</u>	<u>Aug 2018</u>
b) <u>Figure 2 Proposed Action</u>	<u>6</u>	<u>Dec 2018</u>
c) <u>Figure 3 Topographic Survey</u>	<u>3</u>	<u>Dec 2017</u>
d) <u>Figure 4 Sampling Decision Unit Map</u>	<u>13</u>	<u>Dec 2018</u>
e) <u>Figures 5-8 Conceptual Figures</u>	<u>6</u>	<u>Dec 2018</u>
f) <u>Figure 9 Temporary Erosion Control and BMP Plan</u>	<u>7</u>	<u>Dec 2018</u>
g) <u>Figure 10 Major Benthic Biological Cover</u>	<u>8</u>	<u>Oct 2018</u>
h) <u>Figure 11 Surface Current Map</u>	<u>9</u>	<u>Oct 2018</u>
i) <u>Appendix A: Best Management Practices Plan</u>	<u>7</u>	<u>Dec 2018</u>
j) <u>Appendix B: Applicable Monitoring and Assessment Plan</u>	<u>13</u>	<u>Dec 2018</u>
k) <u>Appendix C: Site Photos</u>	<u>3</u>	<u>Aug 2018</u>
l) <u>Appendix D: Grain Size Analysis Results</u>	<u>10</u>	<u>June 2018</u>
m) <u>Appendix E: Report of 10/31/18 Field Activities</u>	<u>5</u>	<u>Nov 2018</u>
n) <u>Appendix F: Proof of General Liability Insurance</u>	<u>8</u>	<u>June 2018</u>

[illegible]

13) Authorization of Representative (see Guidelines - Note 14)

Check one and complete the appropriate space(s). Alteration of this item will result in the invalidation of the authorization statement(s).

- a. This statement authorizes the named individual (s) or any individual occupying the named position of the company/organization listed below to act as our representative to process the following General Application for Small-Scale Beach Nourishment for the subject project. The Owner hereby agrees to comply with and be responsible for all permit terms and conditions.

Said representative is further authorized to fulfill all terms and conditions of this application:

Yes ☒ No ☐

1. Company/Organization Name: Kaua'i Kailani Condominiums

Street Address: 4-856 Kuhio Highway

City, State and Zip Code+4: Kapa'a, Kaua'i, Hawai'i, 96746

Authorized Person & Title: Garry Weber, Secretary

Phone No.: (541) 517-3333 Fax No.: N/A

Effective date(s): (12/1/18)

- b. A separate statement is attached. Yes ☐ No ☒

14) Certification (see Guidelines - Note 15)

Alteration of this item will result in the invalidation of this application.

☐ I certify that for a municipal agency, I am a principal executive officer or ranking elected official.

☐ I certify that for a state agency, I am a principal executive officer or ranking elected official.

☐ I certify that for a federal or other non-federal public agency, I am a principal executive officer or ranking elected official.

☐ I certify that for a federal agency, I am the chief executive officer of the agency, or I am the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

☐ I certify that I am a general partner for a partnership or association.

☐ I certify that I am the proprietor for a sole proprietorship.

☐ I certify that I am the legal owner of a private residence or property.


☒ I certify that for a corporation or association, I am the President, Vice President, Secretary, or Treasurer of the corporation or association and in charge of a principal business function, or I perform similar policy or decision-making functions for the corporation or association:

☐ I certify that for a corporation, I am the Manager of one or more operating facilities and have the authority to sign documents has been assigned or delegated to me in accordance with corporate procedures.

✓ I certify that for a trust, I am a trustee.

In accordance with all applicable State of Hawaii and federal statutes there is reasonable assurance that the proposed activity will be conducted in such a manner which will not violate basic water quality criteria applicable to all waters and in a manner consistent with the DLNR, COE, DOH and CZM programs where the proposed nourishment would take place.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature:  Date: 12-27-2018

Printed Name & Title: Garry Weber

Company/Organization Name: Kaua'i Kailani Condominiums

Phone No.: (541) 517-3333

Fax No.: (--)

16). **Filing Fee** (see Guidelines - Note 18)

Check one and complete the appropriate space(s). Non-refundable filing fee.

Check # 56727

 Category I Project (\$50)
 X Category II Project (\$250)
 Attached to application

Payable to: *State of Hawaii*

Inquiries and Submittals:

Contact Information

SSBN inquiries and submittals shall be directed to the street or mailing address listed below:

(1) Street Address

State of Hawaii
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
1151 Punchbowl Street
Honolulu, Hawaii 96809
(808) 587-0377
(808) 587-0322 Fax
<http://www.hawaii.gov/dlnr/occl/index.php>

(2) Mailing Address


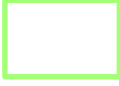

State of Hawaii
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, Hawaii 96809

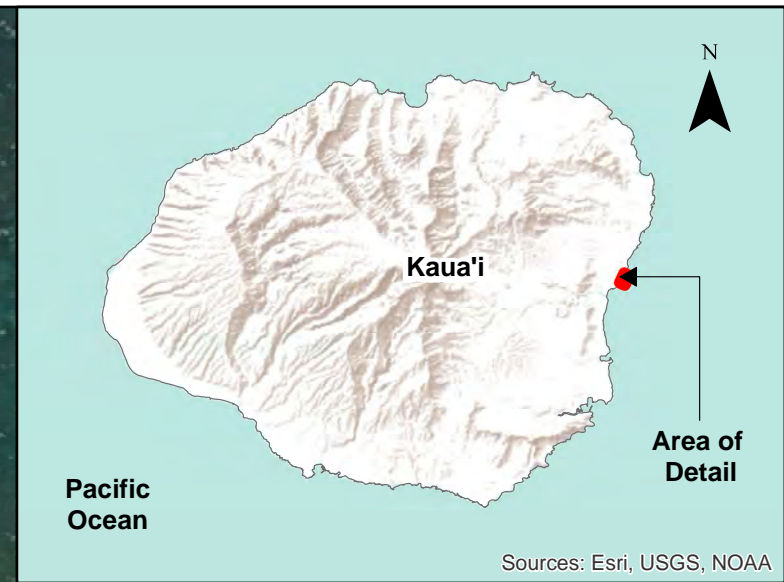
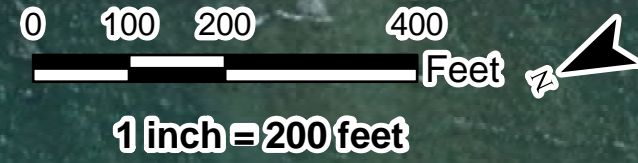
Questions should be directed to the DLNR OCCL.

Note: The length of time required to process this permit will be directly related to the complexity of the project and the adequacy and completeness of the information submitted by the applicant (see Section V.4 of the Guidelines manual).

SSBN Application Checklist		
<p>If any item is listed as "no," attach a sheet with the reason for its exclusion from the application. Sections 10g, 12, 14 and 15 may be omitted (with a "N/A" answer) if applicable.</p>		
Item Number	Description	Item addressed? (yes/no)
1.	Owner Information	<u>yes</u>
2.	General Contractor Information	<u>to be provided</u>
3.	Emergency Contact Information	<u>to be provided</u>
4.	Project Site Information	<u>yes</u>
5.	Location Map and Survey Information	<u>yes</u>
6.	Receiving State Water Information.....	<u>yes</u>
7.	Project Description.....	<u>yes, Contractor info to be provided</u>
	Proof of \$1,000,000 Liability Insurance (attached)	<u>N/A</u>
8.	Description of the Existing Sedimentary Environment and Compatibility of Proposed Nourishment Sediment.....	<u>yes</u>
9.	Project Schedule.....	<u>yes</u>
10.	Site-Specific BMP Plan.....	<u>yes</u>
	10.g Letter to Environmental Notice (Draft attached)	<u>N/A</u>
11.	Monitoring and Assessment Plan	<u>yes</u>
12.	Supporting Documents	<u>yes</u>
13.	Additional Information	<u>N/A</u>
14.	Authorization of Representative.....	<u>yes</u>
15.	Certification.....	<u>yes</u>
16.	Filing Fee (\$50 Category I; \$250 Category II) is attached	<u>yes</u>
17.	Number of copies with supporting documents submitted	
	b) One (1) copy for projects on Oahu with owner's original signature	<u> </u>
	c) Two (2) copies for projects on islands other than Oahu (one with owner's original signature)	<u>yes</u>

Legend

-  Project Area
-  Temporary Sand Storage Area
-  Tax Map Key



Kaua'i Kailani Beach Restoration

Project Site Map

Kaua'i Kailani Association Premises, Kapa'a, Kaua'i

Figure 1

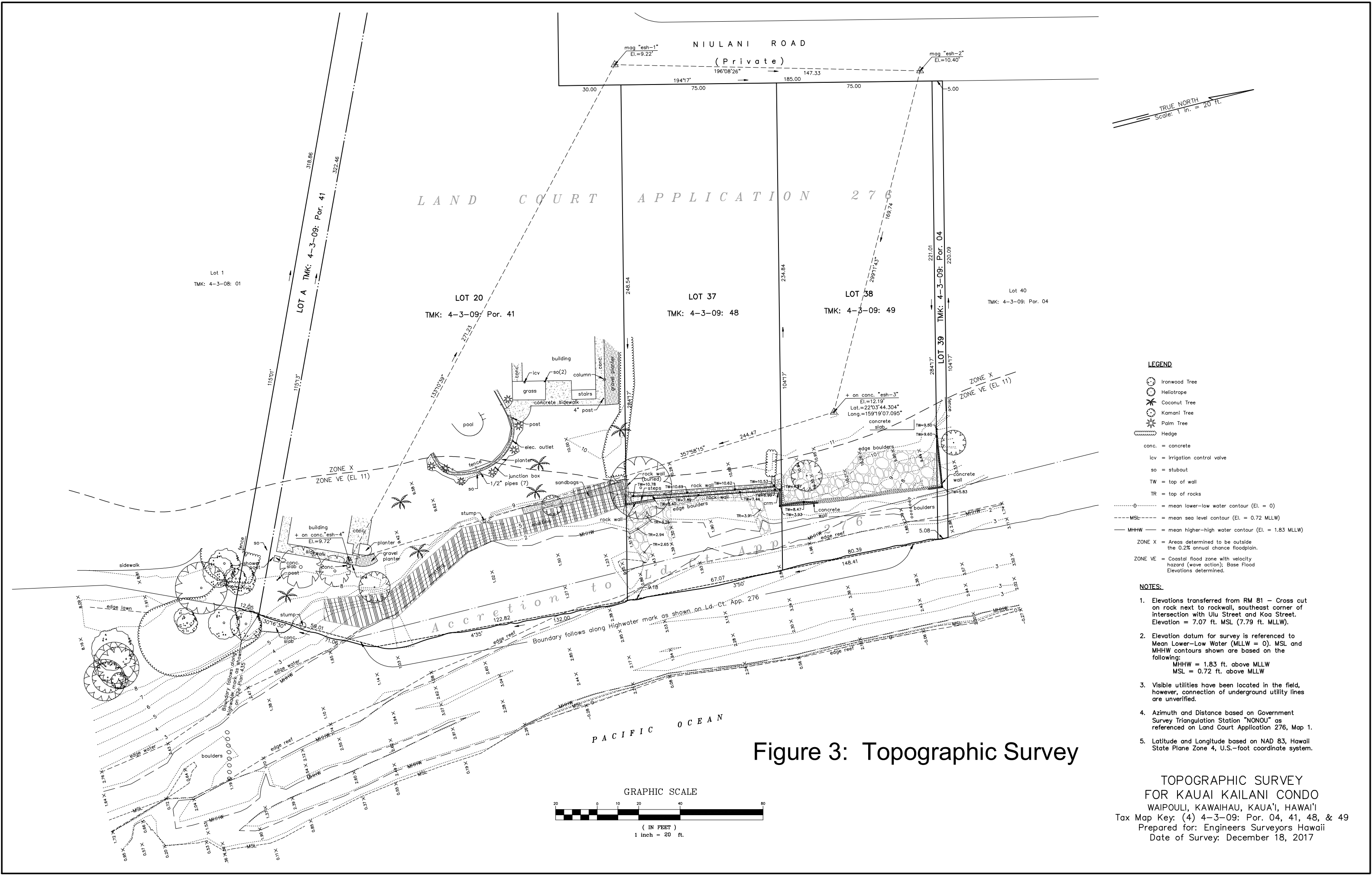


Kaua'i Kailani Beach Restoration

Proposed Action

Kaua'i Kailani Association of Apartment Owners

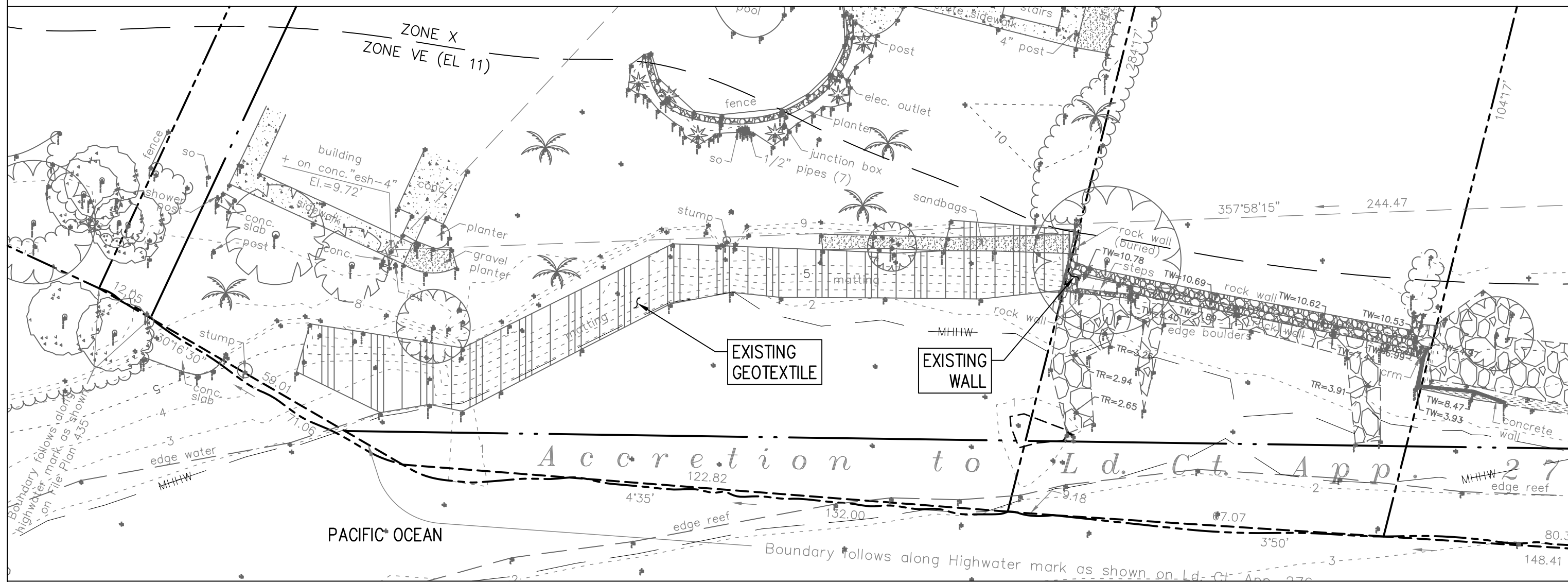
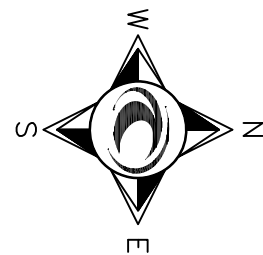
Figure 2



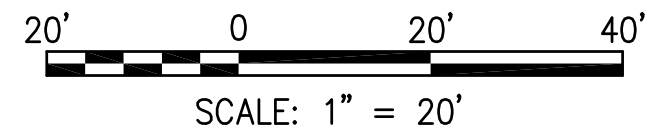


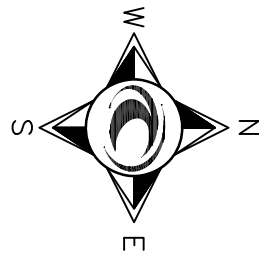
	Small Scale Beach Nourishment Application	Figure 4
	Sampling Decision Unit Map Kaua'i Kailani Association Premises, Kapa'a, Kaua'i	

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SITE PLAN KAUAI KAILANI CONDOS

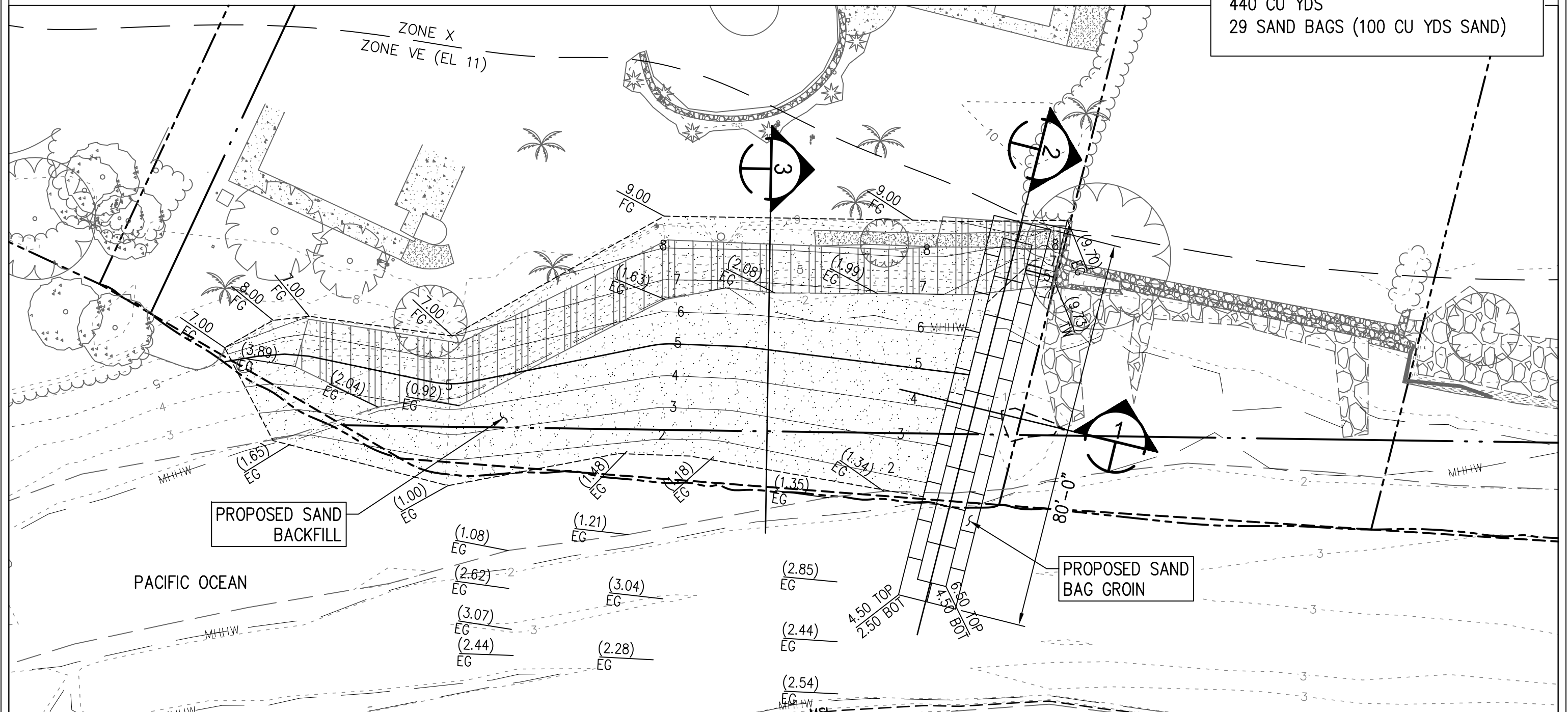




PROJECT SUMMARY

(FOR DISCUSSION PURPOSES ONLY)

SHORELINE PROTECTION CONCEPT:
APPROXIMATE VOLUME OF SAND FILL:
440 CU YDS
29 SAND BAGS (100 CU YDS SAND)

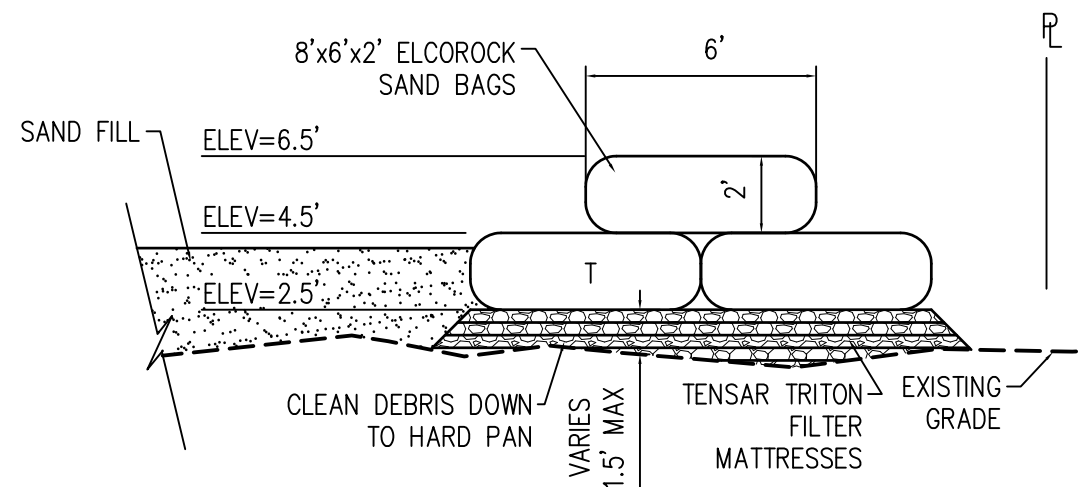
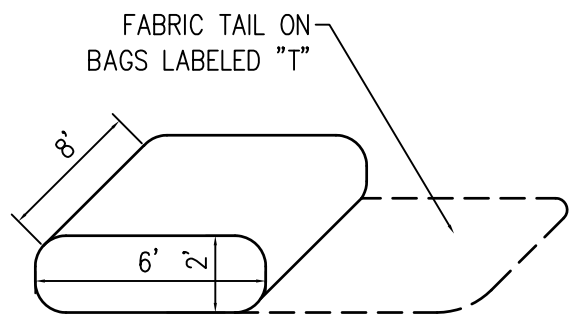


CONCEPTUAL PLAN KAUAI KAILANI CONDOS

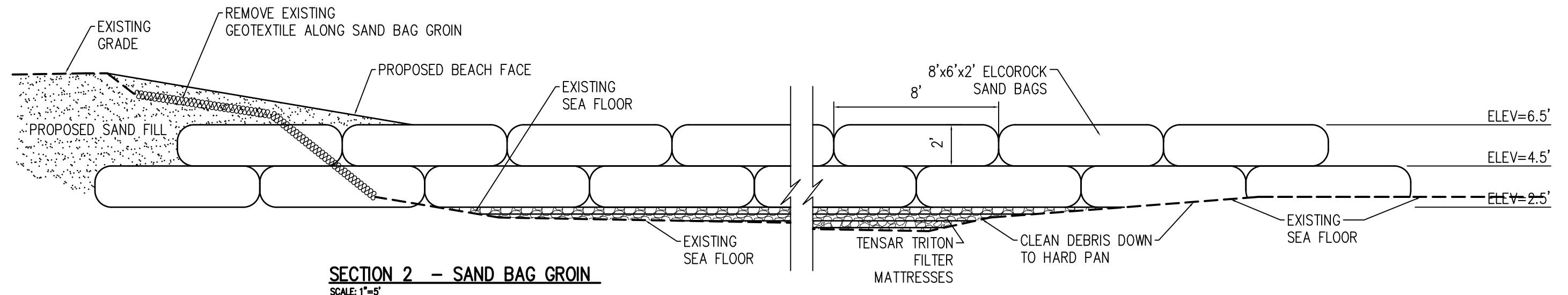
20' 0 20' 40'
SCALE: 1" = 20'

oceanit
FIGURE 6

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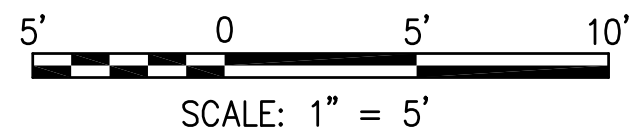


SECTION 1 - SAND BAG GROIN
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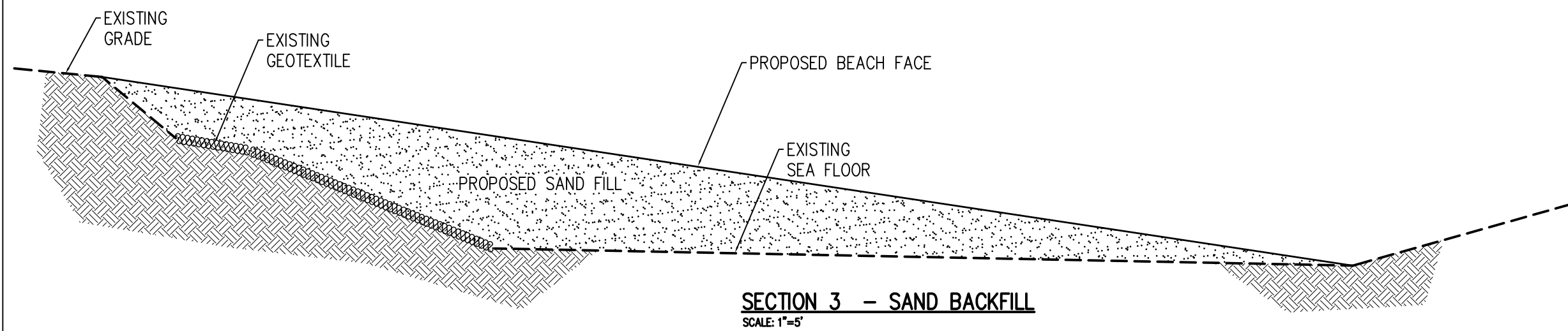


SECTION 2 - SAND BAG GROIN
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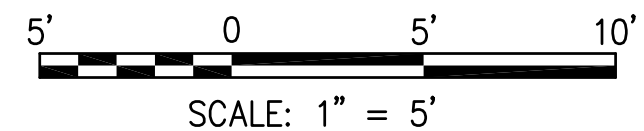
SECTIONS KAUAI KAILANI CONDOS



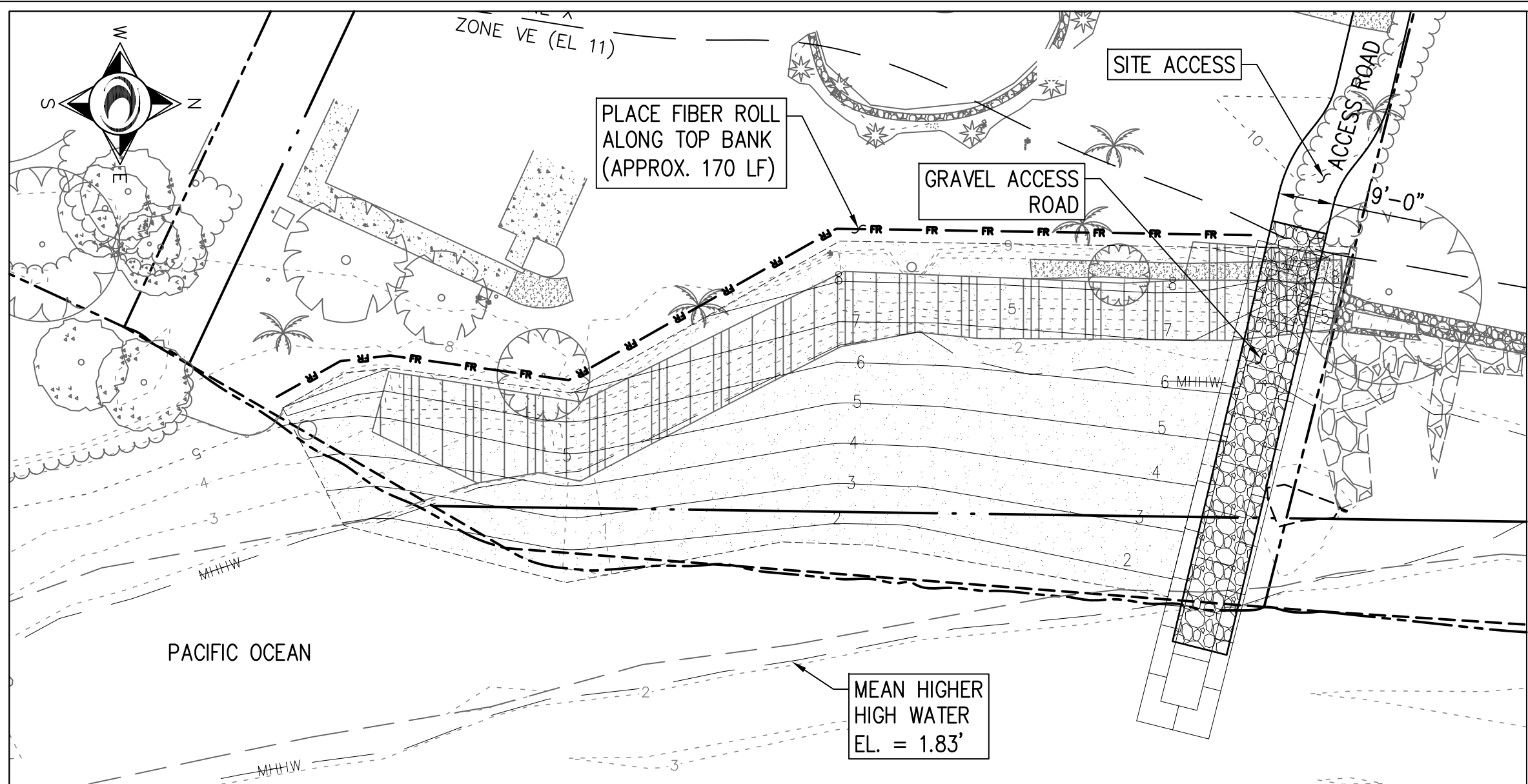
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SECTIONS KAUAI KAILANI CONDOS



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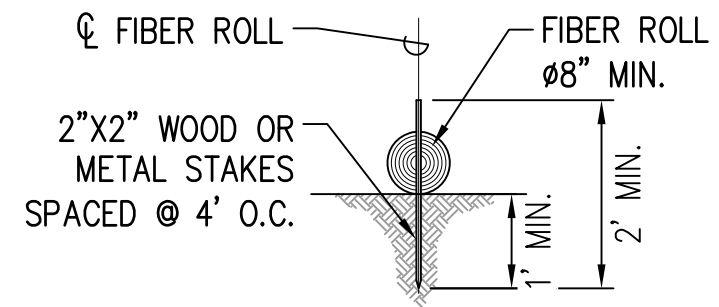


LEGEND

— FR — FR — FR — FR — FIBER ROLL

— MHHW — MEAN HIGHER HIGH WATER

- NOTES:**
1. WORK ALONG THE SHORELINE SHALL BE DURING PERIODS OF EXPECTED LOW TIDE AND SMALL OR FAVORABLE WAVE CONDITIONS.
 2. ANY LOOSE SOIL, DEBRIS, OR OTHER FOREIGN MATERIAL THAT FALLS ONTO THE BEACH DURING CONSTRUCTION MUST BE IMMEDIATELY CONTAINED AND REMOVED.
 3. ENDANGERED GREEN SEA TURTLES AND ENDANGERED HAWAIIAN MONK SEALS ARE KNOWN TO VISIT THE NEARBY OCEAN AND BEACHES. CONSTRUCTION WILL BE STOPPED IMMEDIATELY IF SEA TURTLES, MONK SEALS, OR INDIVIDUALS OF ANY OTHER RARE, THREATENED, OR ENDANGERED (RTE) SPECIES ENTER THE CONSTRUCTION SITE OR NEARBY VICINITY. CONSTRUCTION MAY CONTINUE WHEN THE RTE ANIMAL(S) LEAVES THE SITE ON ITS OWN ACCORD. THERE WILL BE NO ATTEMPT TO REMOVE OR FORCE THE ANIMAL TO LEAVE THE SITE.



FIBER ROLL DETAIL
NOT TO SCALE

ACCESS / BMP PLAN KAUAI KAILANI CONDOS

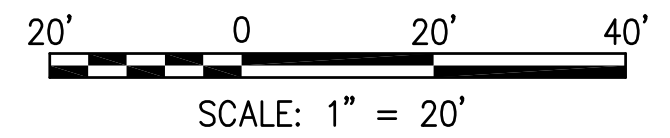


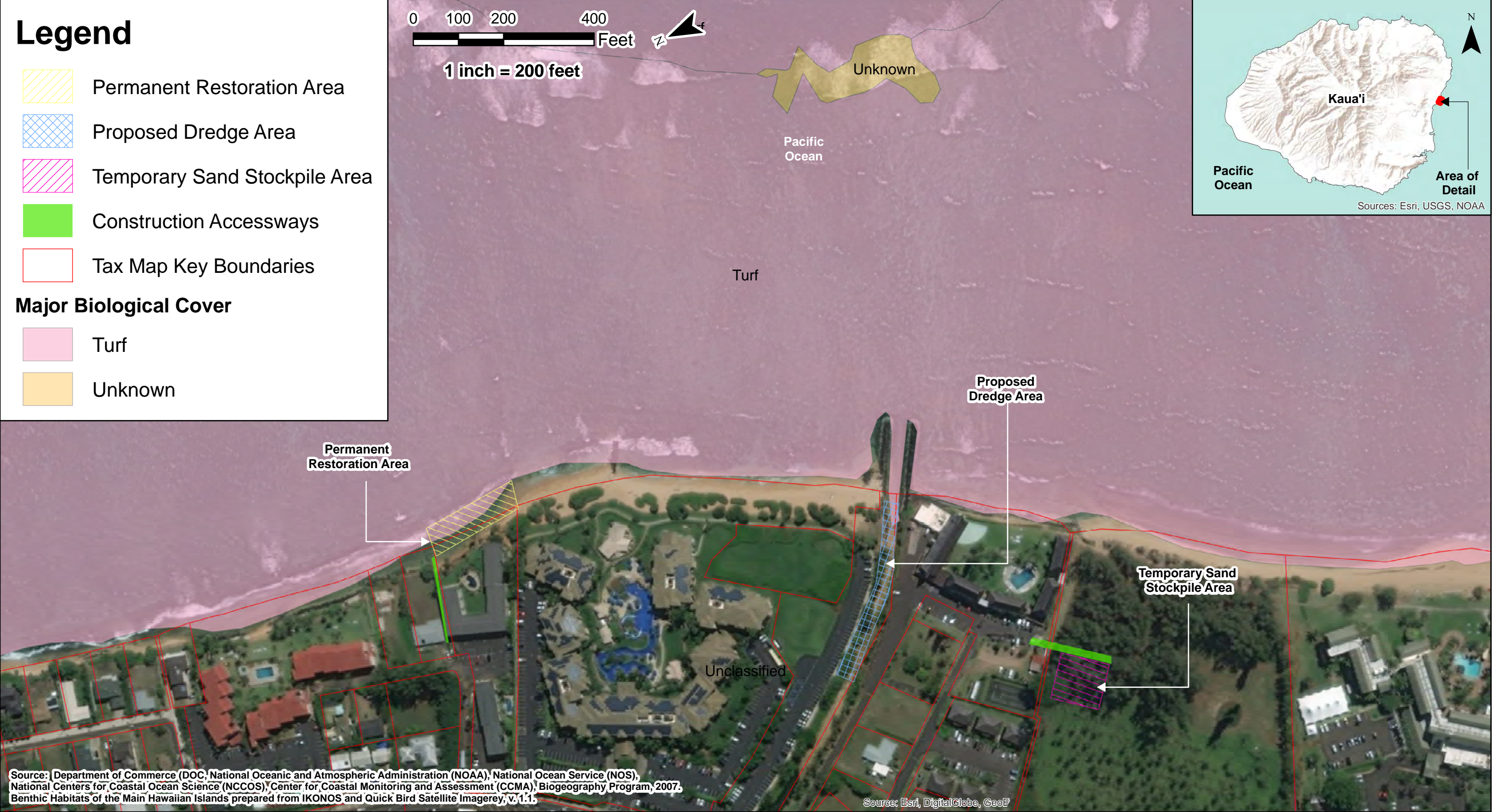
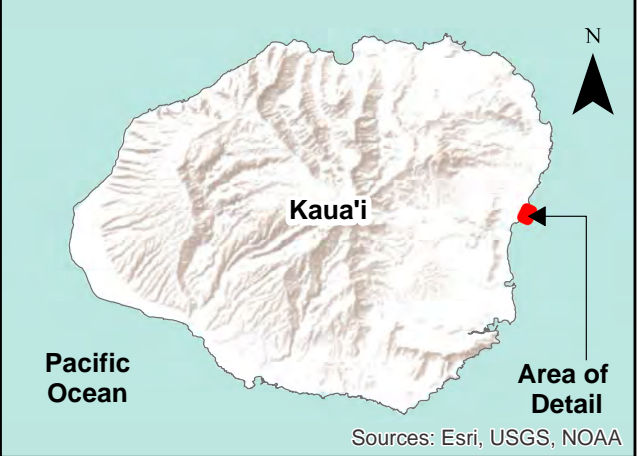
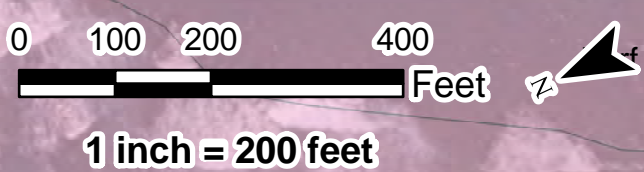

FIGURE 9

Legend

- Permanent Restoration Area
- Proposed Dredge Area
- Temporary Sand Stockpile Area
- Construction Accessways
- Tax Map Key Boundaries

Major Biological Cover

- Turf
- Unknown







Kaua'i Kailani Beach Restoration

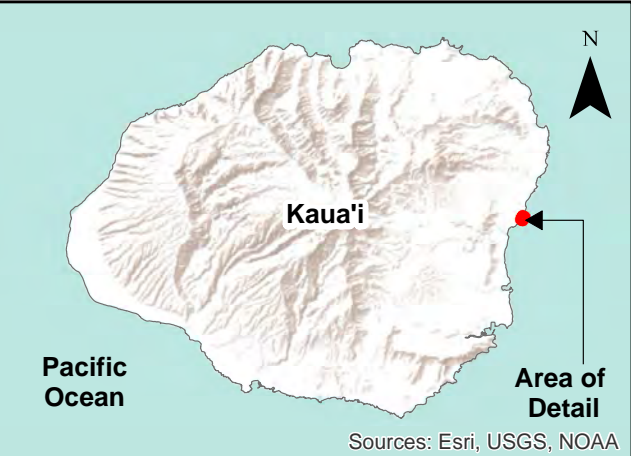
Major Benthic Biological Cover

Kaua'i Kailani Association of Apartment Owners

Figure 10

Legend

-  Sand Sampling Locations
-  Temporary Sand Stockpile Area
-  Tax Map Key Boundaries
-  Streets



Additional Waipouli Canal Sand Sampling Locations

Small Scale Beach Nourishment Application
Kaua'i Kailani Association of Apartment Owners

Figure
11



Figure 12: Modern shoreline delineation around project area

Image adapted from the UH SOEST Coastal Geology Group (www.pacioos.hawaii.edu/shoreline/slr-hawaii/).

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Appendix A:
Best Management Practices (BMP) Plan

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APPENDIX A

Best Management Practices Plan Small Scale Beach Nourishment Application Kauai Kailani Beach Restoration Kapa‘a, Kaua‘i, Hawai‘i

Prepared for:



State of Hawai‘i Department of Land and Natural Resources
Office of Conservation and Coastal Lands

P.O. Box 621
Honolulu, HI 96809

Prepared by:
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, HI 96813

December 2018

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BEST MANAGEMENT PRACTICES (BMP) PLAN

a. Maps and Figures

Site maps and figures are shown in Figures 1-3 at the end of this plan.

b. Site Characterization

The erosion at the Kauai Kailani Association premises is located at 4–856 Kuhio Highway in Kapa‘a, on the east side of the island of Kaua‘i (herein referred to as the site) (Figure 1). Formerly, a 70-foot (ft) long concrete groin was located at the northern boundary of the site but was removed in 2012. The groin removal caused severe erosion to the shoreline (Appendix E). Over a two year period following the removal of the rock groin, erosion removed approximately 500 cubic yards of sand. An emergency erosion protection repair structure was installed in 2017 with the approval of the DLNR after erosion was deemed a threat to public health, safety, and welfare. Since its installment, the emergency structure has been damaged twice by wave action and has needed to be repaired. The emergency structure is permitted to remain in place for three (3) years while a long-term solution is developed. The long-term solution proposed is a beach nourishment event stabilized by a temporary sand bag groin.

c. Construction Sequence

The duration of construction activities will be approximately three weeks including mobilization and construction. The sequence of construction activities is described below:

- Mobilization to the sand source (i.e., Waipouli Drainage Canal) and stockpile sites;
- Create a construction accessways from the stockpile footprint to the Courtyard by the Marriott Kauai at Coconut Beach (TMK: 4-3-007:011) parking lot;
- A long boom excavator will be used to extract approximately 540 cubic yards of compatible beach material will be dredged from the Waipouli Canal. The excavator will move along the south bank of the canal and will not enter the canal itself.
- Between the canal mouth and 200 ft upstream, sand will be dredge from the surface down to 3 ft below ground surface (bgs);
- Between 200-400 ft upstream, sand will be excavated in 1 ft depth increments down to 3 ft bgs. Qualified personnel will be on site during the excavation to determine beach quality sand vs. non-beach quality sand. Approximately 100 cubic yards of lower quality sand will be stockpiled separately from the beach quality sand and will be used to fill the Elcorock sand bags that will comprise the temporary structure.
- The beach material will be loaded into a dump truck, where it will be hauled to the sand stockpile location (Figure 1);
- Fill approximately 29 Elcorock sand bags by hand at the stockpile site;

- Mobilize necessary equipment and construction materials to the nourishment site staging area. All equipment will be pre-fueled prior to staging at the site;
- Install temporary best management practices (BMPs): fiber rolls and safety barriers necessary to restrict access of all non-authorized personnel (Figure 2) around the project and staging areas;
- Remove all obstacles and obstructions necessary for the proper access, construction, execution and completion of the work;
- Transport sand and sandbags from the stockpile site to the nourishment site using a backhoe, excavator, and dump truck;
- Install diversion for storm water culvert for duration of construction;
- Clean debris from the groin footprint;
- Place a foundation layer of Tensar Triton Filter Mattresses on hardpan;
- Use Elcorock sand bags to create temporary sandbag groin by using a backhoe to arrange sandbags. Sand bags will be placed from the shoreline going outward;
- Fill and grade approximately 440 cubic yards of beach material at the nourishment site using front end loader to grade the beach material. Nourishment will begin from the Kauai Kailani backyard and will extend seaward;
- Remove all temporary BMP controls and fully restore site to pre-construction conditions; and
- Remove all temporary barriers and restore site access.

The contractor or the will notify the State of Hawai'i Department of Health (HDOH) at least 7 days before starting work and within 14 days after project completion. The contractor will place construction warning signs at the work site.

The temporary revetment will be removed after a permanent groin is installed (following validation of the temporary groin efficacy) by cutting the fabric and removing the fabric, braces, zipties, and other man-made materials. The beach sand inside the revetment will be left in place on the beach. An excavator or backhoe may be used to assist in removal or grade the remaining sand as needed.

d. Construction Methods

The groin construction and beach nourishment will be performed by a qualified professional as required by the contract documents. The contractor will demonstrate that they are capable of performing the intended work by submitting proof of past experience of successfully completed in-water demolition and construction of coastal pre-cast concrete structure projects.

Fiber rolls shall be installed around the staging area on land. All heavy equipment shall be kept on land above mean higher high (MHHW) line. Protection of private property and plating to protect the equipment loads shall be installed prior to bringing in heavy equipment.

Approximately 540 cubic yards of beach quality material will be taken from the Waipouli Canal using a long arm excavator. The fill will be transferred to the temporary stockpile storage location and will

be allowed to dewater prior to being placed in its final nourishment site (Figure 1). The reef hardpan will be cleared of debris in the groin footprint, and a Tensar Triton Filter Mattress will be placed on the reef hardpan. Elcorock sand bags will be filled with sand and will be stacked to create a temporary groin on top of the filter mattress. The Elcorock sandbags for the temporary groin shall be filled and sealed on land before being placed in the water. Sand material shall be clean and free of polychlorinated biphenyls (PCBs). The sand bag groin will be constructed from the shoreline and extending seaward. Each sandbag shall be placed tightly abutting with each other so there are no gaps. Once the temporary groin is in place, beach material backfill and nourishment will take place from the shoreline and extending seaward. Dewatered beach material stockpiled at the temporary location will be transported to the nourishment site and graded to the appropriate contours. The groin construction and beach nourishment activities will take place during low tide and low wave conditions.

e. Characteristics of the discharge and potential pollutants associated with the proposed construction activity

Potential pollutants associated with the proposed project activity include sand sediment disturbance by the construction of the temporary groin, which may potentially increase turbidity. Sand samples were taken at the site and analyzed with grain size analysis. The sand at the beach is coarse with minimal fines, and thus will settle quickly and not have a significant impact on turbidity or water quality.

The Elcorock sand bags will be readily observed. If a breach is observed, the contractor will immediately patch the breakage, and remove the sandbag and any sand material that may have been spilled.

f. Characteristics of the Dredged/Excavated Material

Excavation will occur in the Waipouli Canal to excavate beach quality material. Excavated material from the Waipouli Canal is beach quality sand that has been analyzed with grain-size analysis. This beach material will be used as backfill for the beach nourishment.

g. Proposed Control Measures and/or Treatment

Other applicable BMPs that will be enforced during construction activities include:

- Work shall be conducted at low tide and during small or favorable wave conditions to the most practical extent possible. No work shall occur during high surf or ocean conditions that will create unsafe work or ocean conditions;
- Measures to control runoff and other pollutants shall be in place prior to the initiation of any work. These measures shall be properly constructed and maintained throughout the construction period until the permanent ground cover is fully established;
- Any loose soil, debris, or other foreign material that falls onto the beach during construction will be immediately contained and removed;
- Endangered green sea turtles and Hawaiian monk seals are known to visit the nearby ocean and beaches. Construction will be stopped immediately if sea turtles, monk seals, or individuals of any other rare, threatened, or endangered (RTE) species enter the construction

site or nearby vicinity. Construction may continue when the RTE animal(s) leave the site on its own accord. There will be no attempt to remove or force the animal to leave the site;

- The contractor shall construct and maintain a temporary fiber roll barrier as indicated in Figure 2. The actual location of the barrier will be adjusted to retain the silt on-site;
- Temporary stockpiling of cleared site debris material shall not be permitted at the project site. All debris material shall be removed from the site daily;
- Good housekeeping shall be utilized to ensure protection of roadways and walkways from mud, dirt, and debris;
- The contractor shall ensure that all tires of vehicles are sufficiently cleaned so that dirt or debris are not tracked into the construction site. Washing off tires will not be acceptable unless the runoff is contained and does not enter the storm drain system, paved roadways, or the ocean. All sediment on paved roadways shall be removed within 24 hours;
- Storm water flowing toward the contractor's staging area shall be diverted using appropriate control measures;
- The beach area in the vicinity of the project site shall be kept clear of trash, debris, and other unnecessary materials related to construction;
- Since heavy construction equipment will be used, the Contractor is required to have available materials used to contain and clean up accidental spills of fuel or lubricants. Equipment operators will inspect their machines daily to make sure there are no problems that could result in contamination from fuels, lubricants, hydraulic fluid, or other pollutants. Any required maintenance will be done off-site using methods that will not result in pollution of the water or land area. Any waste oils or lubricants will be removed from the site and disposed of according to applicable federal or state regulations;
- The contractor is required to ensure all materials placed or to be placed in State waters are free of waste material, heavy metals, organic materials, debris and any water pollutants of potential hazardous concentrations to aquatic life;
- Oil absorbent pads and a spills kit will be on site to immediately clean up any small petroleum product spillage that may occur. In the unlikely event of a bigger spill, oil absorbent pads will be used to contain the spill while an environmental emergency response crew is called in. Pacific Environmental Corporation (PENCO) can be called (808-545-5195). PENCO is a highly trained environmental emergency response company available 24 hours a day;
- BMPs will be monitored constantly during construction related activities. At a minimum, BMPs will be checked daily prior to the start of work and after a high wave or heavy rainfall event. Should any release of pollutants including fuel, fluids, sand, concrete etc. into State waters occur or water quality monitoring indicates a non-compliance with water quality standards, the work at the site will be immediately halted. The Contractor shall promptly isolate and cleanup all spills and/or floating debris. The Contractor will evaluate the failed procedures leading to the release and take corrective measures to fix any deficiencies in order to prevent further release. Work shall not resume until water quality monitoring demonstrates that the non-compliance has ceased. The Contractor shall notify the National Response Center (800-424-8802), as required by 40 CFR 302.6, if the quantity of the released substance exceeds

the reportable quantities. The Contractor shall also be responsible for notifying the State Emergency Response Commission (808-586-4249) if the release has the potential to migrate off-site and affect adjacent communities as required by the Emergency Planning and Community Right-to-Know Act (EPCRA) Section 304. The Contractor shall brief all personnel working on the site on BMPs and pollution control and provide a list of personnel briefed to City and County (CCH) Department of Design and Construction (DDC);

- See the following CCH Department of DDC flow chart detailing actions to be taken during storm events (Figure 3).;
- Adequate dust control measures that comply with the provisions of the Hawai‘i Administrative Rules (HAR), Chapter 11-60.1 “Air Pollution Control” Section 11-60.1-33, Fugitive Dust, shall be implemented during all phases of construction;
- Any dirt or grassy area disturbed shall be restored regressing the area or by seeded hydromulch. The grass shall be fully established at the completion of the project. Any disturbed or damaged landscaping areas shall be restored to original or better condition by the satisfaction of the owner;
- At the completion of the project, the contractor shall inspect all catch basin, drain inlet, and drain manholes surrounding the project site. Any accumulated sediment and debris found in the storm drain structures will be removed. Flushing the drain structure is prohibited; and
- BMPs provided here are minimum requirements; during bidding and construction, the contractor shall retain a certified professional in erosion and sediment control (CPESC) to establish the BMPs necessary to meet federal and local laws and regulations regarding water quality and water pollution control.

BEST MANAGEMENT PRACTICES

The National Marine Fisheries Service, Pacific Islands Regional Office recommends that the following measures, as appropriate and germane to specific projects, be incorporated into projects to minimize impacts on protected resources. These supplement but do not supersede the BMPs above.

1. Turbidity and siltation from project-related work should be minimized and contained to within the vicinity of the site through the appropriate use of effective silt containment devices and curtailment of work during adverse tidal and weather conditions;
2. Any construction-related debris that may pose an entanglement hazard to marine protected species must be removed from the project site if not actively being used and/or at the conclusion of the construction work;
3. All project-related materials and equipment placed in the water should be free of pollutants;
4. No project-related materials (removed loose material, debris, sharp objects, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, etc.);
5. No contamination (trash or debris disposal, alien species introductions, etc.) of marine (reef flats, lagoons, open ocean, etc.) environments adjacent to the project site should result from project-related activities;
6. Fueling of project-related vehicles and equipment should take place away from the water. A contingency plan to control the accidental spills of petroleum products at the construction site should be developed. Absorbent pads, containment booms and skimmers will be stored on-site to facilitate the cleanup of petroleum spills;
7. Underlayer fills will be protected from erosion with core-loc units (or stones) as soon after placement as practical;
8. Attempts must be made to prevent discharge of excavated material into the marine environment during transporting and off-loading of dredged material; and
9. Excavated material may not be stored on site, but be contained and removed. No inland dewatering shall take place at the site.

MITIGATION MEASURES TO REDUCE IMPACTS TO PROTECTED SPECIES

A visual survey must be performed by the Contractor of the project area just prior to commencement or resumption of construction activity to ensure that no protected species are in the project area. If protected species are detected, construction activities must be postponed until the animal(s) voluntarily leave the area.

If any listed species enters the area during the conduct of construction activities, all activities must cease until the animal(s) voluntarily depart the area.

All on-site project personnel must be apprised of the status of any listed species potentially present in the project area and the protections afforded to those species under federal laws. A brochure explaining the laws and guidelines for listed species in Hawai‘i, American Samoa, and Guam may be downloaded from http://www.nmfs.noaa.gov/prot_res/mmwatch/hawaii.htm

Any incidental take of marine mammals must be reported immediately to the National Oceanic and Atmospheric Administration (NOAA) Fisheries’ 24-hour hotline at 1-888-256-9840. Hawai‘i only: any injuries to sea turtles must be reported immediately to NOAA Fisheries at 1-808-983-5370. Information reported must include the name and phone number of a point of contact, location of the incident, and nature of the take and/or injury.

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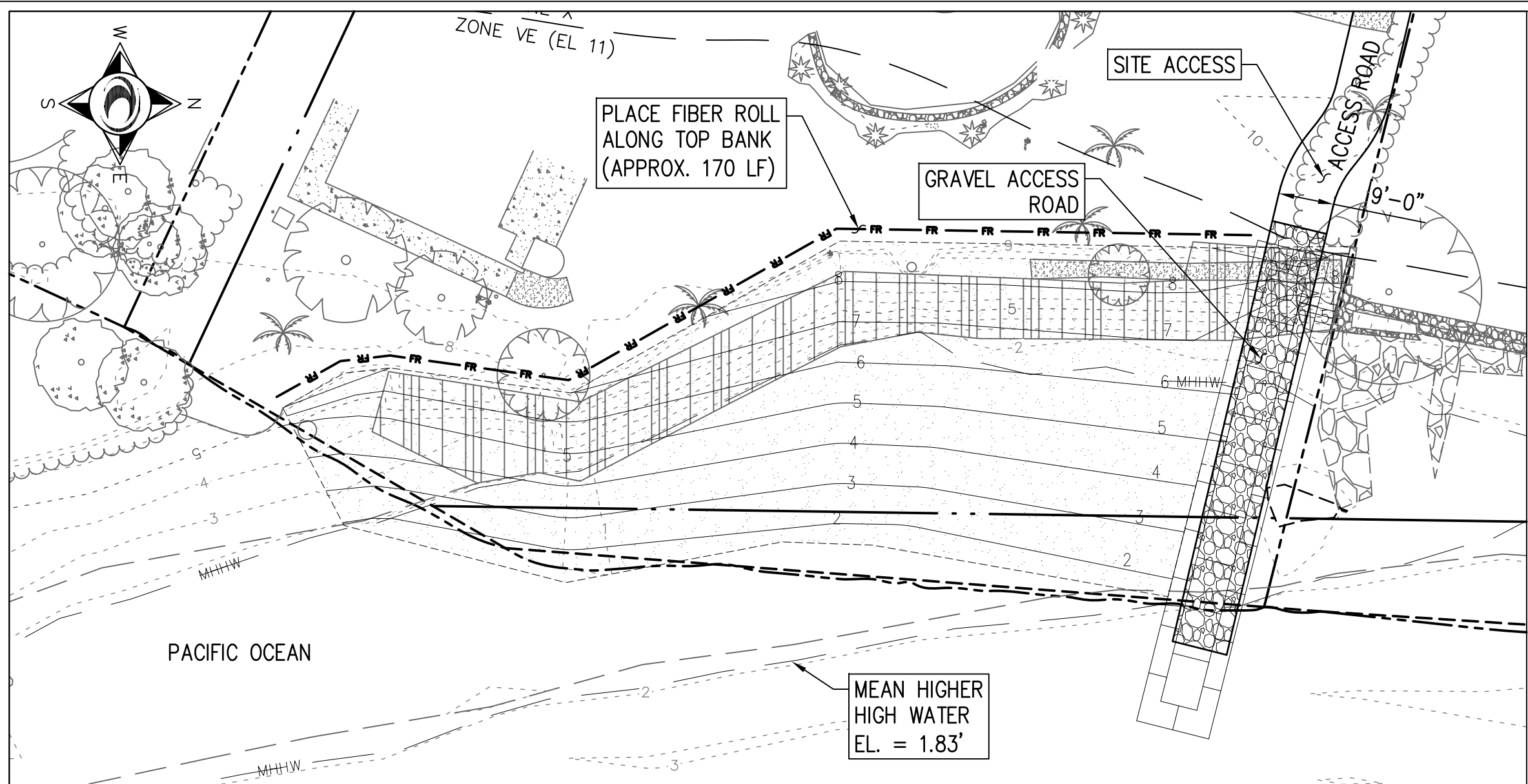
Kaua'i Kailani Beach Restoration

Proposed Action

Kaua'i Kailani Association of Apartment Owners

Figure 1

I:\201752-Kauai_Kailani_Beach_Restoration\Drawings\Contract Documents\02-Final\05-BMPAccess.dwg

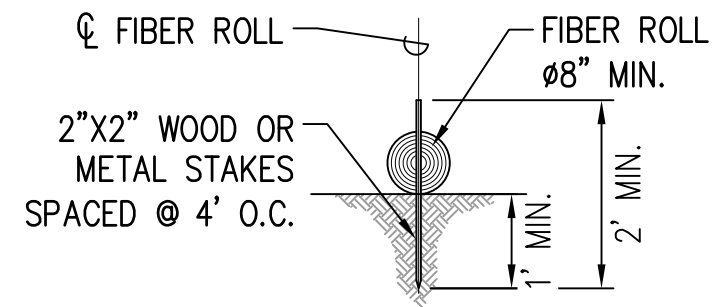


LEGEND

- FR — FR — FR — FR — FIBER ROLL
- MHHW — MEAN HIGHER HIGH WATER

NOTES:

1. WORK ALONG THE SHORELINE SHALL BE DURING PERIODS OF EXPECTED LOW TIDE AND SMALL OR FAVORABLE WAVE CONDITIONS.
2. ANY LOOSE SOIL, DEBRIS, OR OTHER FOREIGN MATERIAL THAT FALLS ONTO THE BEACH DURING CONSTRUCTION MUST BE IMMEDIATELY CONTAINED AND REMOVED.
3. ENDANGERED GREEN SEA TURTLES AND ENDANGERED HAWAIIAN MONK SEALS ARE KNOWN TO VISIT THE NEARBY OCEAN AND BEACHES. CONSTRUCTION WILL BE STOPPED IMMEDIATELY IF SEA TURTLES, MONK SEALS, OR INDIVIDUALS OF ANY OTHER RARE, THREATENED, OR ENDANGERED (RTE) SPECIES ENTER THE CONSTRUCTION SITE OR NEARBY VICINITY. CONSTRUCTION MAY CONTINUE WHEN THE RTE ANIMAL(S) LEAVES THE SITE ON ITS OWN ACCORD. THERE WILL BE NO ATTEMPT TO REMOVE OR FORCE THE ANIMAL TO LEAVE THE SITE.



FIBER ROLL DETAIL
NOT TO SCALE

ACCESS / BMP PLAN
KAUAI KAILANI CONDOS

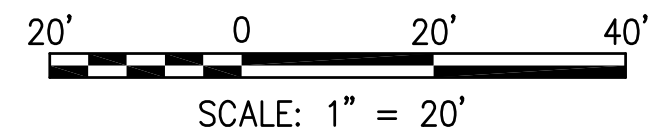
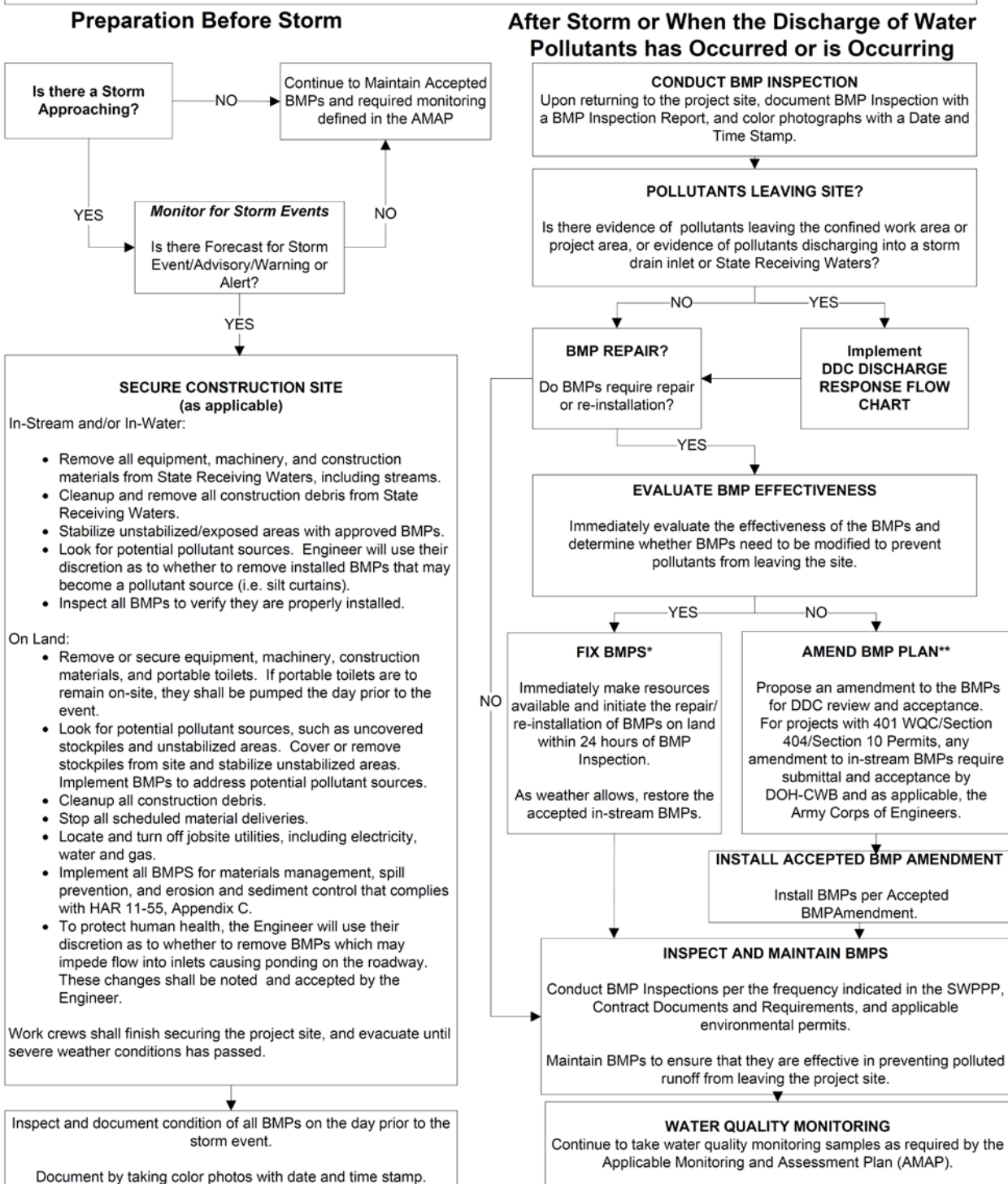



FIGURE 2

Figure 3: CCH DDC Action Plan Flow Chart for Storm Events

The City DDC Civil Division Contingency Plan will be implemented by DDC and the General Contractor to prevent and respond to any discharge resulting from a severe storm or natural disaster or from improperly designed or implemented BMP measures. A severe storm is any event that exceeds a 2-year, 24 hour event. It is the General Contractor's responsibility to abide by the following plan as well as any other binding plan, agreement, regulation, rule, law or ordinance applicable. The Contingency Plan defines actions that are required in Preparation for a Storm Event, Following a Storm Event, and when a discharge of pollutants has occurred or is occurring.



***FIX BMPs**

The Contractor shall contract a BMP supplier prior to the initiation of in-water work to have contingency BMP materials readily available and to have the ability to supply them within 24 hours of a severe storm event. The Contractor shall mobilize manpower and equipment to the site immediately upon returning to the site. BMP repair and re-installation shall be initiated immediately.

****AMEND BMP PLAN**

Upon returning to the project site after the storm, the Contractor shall immediately assess and document which portions of the BMP Plan need to be modified and require an amendment.

In the event that the in-stream BMPs, or a portion of them, requires an amendment, the BMPs will need to be re-designed. The Contractor shall submit the proposed amended BMPs to DDC and DDC will request acceptance from DOH-CWB/ACOE to implement the BMPs. The Contractor shall immediately implement the accepted BMPs to prevent pollutant discharge and discharge of materials from leaving the project site.

DDC will have the contracted design consultant (as applicable) re-design the BMPs and HDOT will submit to DOH-CWB/ACOE (as applicable) for review and acceptance.

Appendix B:

Applicable Monitoring and Assessment Plan (AMAP)

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APPENDIX B

Monitoring and Assessment Plan for Small Scale Beach Nourishment Application Kauai Kailani Beach Restoration Kapa‘a, Kaua‘i, Hawai‘i

Prepared for:



State of Hawai‘i Department of Land and Natural Resources
Office of Conservation and Coastal Lands

P.O. Box 621
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Prepared by:
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December 2018

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APPENDICES

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1. Introduction

This applicable monitoring and assessment plan (AMAP) is part of the Small-Scale Beach Nourishment (SSBN) Application for the groin construction and beach nourishment at the Kaua'i Kailani Shoreline. The intent of the AMAP is to identify and prevent potential impacts to water quality from construction activities. Data collected as part of the AMAP will be used to determine the adequacy of the Best Management Practices (BMPs) applied during construction and help assess impacts of the project on the nearshore waters. If monitoring data show water quality impacts from construction, BMPs will be modified to protect water quality.

1.1 Project Background

The erosion at the Kauai Kailani Association premises is located at 4–856 Kuhio Highway in Kapa'a, on the east side of the island of Kaua'i (herein referred to as the site) (Figure 1). Formerly, a 70-foot (ft) long concrete groin was located at the northern boundary of the site but was removed in 2012. The groin removal caused severe erosion to the shoreline (Appendix E). Over a two year period following the removal of the rock groin, erosion removed approximately 500 cubic yards of sand. An emergency erosion protection repair structure was installed in 2017 with the approval of the DLNR after erosion was deemed a threat to public health, safety, and welfare. Since its installment, the emergency structure has been damaged twice by wave action and has needed to be repaired. The emergency structure is permitted to remain in place for three (3) years while a long-term solution is developed. The long-term solution proposed to implement a small-scale beach nourishment (SSBN) at the site to restore the beach area and construct a temporary sand bag groin to stabilize the sand nourishment.

1.2 Project Description

Severe erosion to the Kauai Kailani shoreline has occurred as a result of the removal of the preexisting rock groin in 2012 and the natural conditions at the site. Temporary erosion measures have been implemented; however, a more permanent solution is needed. The proposed solution includes a preliminary beach nourishment and temporary groin construction event, as well as maintenance to renourish the beach over a 9 to 10-year period.

This SSBN proposal covers a preliminary beach nourishment and temporary sand bag groin construction event, as well as maintenance to nourish the beach over a ten (10)-year period. The preliminary beach nourishment event includes obtaining approximately 540 cubic yards (cy) of beach quality sand from the Waipouli Drainage Canal. Approximately 100 cy of the 540 total cy of lower quality sand between 200-400 ft upstream of the Waipouli Canal mouth will be used to fill the Elcorock® sand bags that will comprise the temporary groin. Subsequent beach nourishment events are anticipated after three (3) to four (4) years following the preliminary nourishment event, or when 60% of the nourished sand is lost, whichever occurs first. Approximately 100-200 cubic yards of sand will be used for each nourishment event; totaling approximately 940-1,140 cubic yards of total sand nourishment. Sand in the Waipouli Drainage Canal will be the preferred sand source for subsequent beach nourishment events; however, if the sand source in the canal is not sufficient, an additional sand source will be submitted to OCCL for approval. The time for the proposed initial sand placement and temporary groin construction,

including mobilization and demobilization, will take approximately three months, and nourishment events will span over the course of ten (10) years.

A sketch of the conceptual construction plan is shown in Figure 1.

1.3 Water Quality BMPs




Water quality BMPs will be performed to ensure no leakages of pollutants are released into open ocean waters. Water quality BMPs will consist of temporary sand bag barriers and fiber roll containment structures that will prevent any sediment from entering the surrounding waters. See applicable BMP Plan for more details.

1.4 Discharge Characteristics

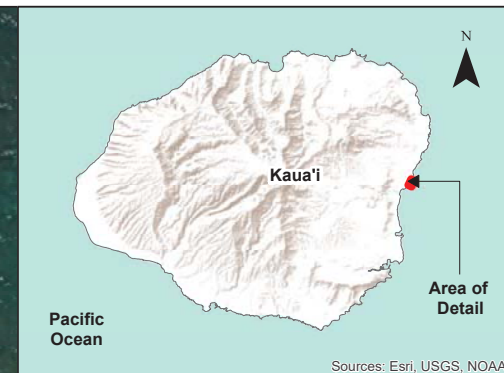
Permanent discharge materials will consist of beach material transferred from the Waipouli Canal that will be added to the nourishment site.

Temporary discharge will consist of Tensar Triton Filter Mattresses and Elcorock bags filled with sand that will comprise the temporary groin. The temporary groin is expected to last approximately three years while a permanent groin is designed and approved, at which time it will be removed. No equipment will be allowed to drive in the water; all construction will be carried out with shore-based equipment.

Legend

-  Project Area
-  Temporary Sand Storage Area
-  Tax Map Key

0 100 200 400 Feet
1 inch = 200 feet



Kaua'i Kailani Beach Restoration

Project Site Map

Kaua'i Kailani Association Premises, Kapa'a, Kaua'i

Figure
1



Kaua'i Kailani Beach Restoration

Proposed Action

Kaua'i Kailani Association of Apartment Owners

**Figure
2**

1.5 Environmental Description

The project site is located in Kapa‘a on the island of Kaua‘i, the oldest of the Hawaiian Islands. The climate in Kapa‘a has an average annual temperature is about 74.3 degrees Fahrenheit (°F), and ranges between about 78°F in the summer and 71°F in the winter (Giambelluca et al., 2014). The annual mean average rainfall of Kapa‘a is approximately 40.6 inches per year, with the majority of the precipitation occurring between the months of October through December (Giambelluca et al., 2013). Elevation at the site ranges from sea level to approximately 5 ft above mean sea level (MSL). Land use around the project site is residential and used for recreation.

The Kauai Kailani Beach is located on the east side of the island of Kaua‘i, in the town of Kapa‘a. The beach fronts the Castle Kauai Kailani and is located north of Waipouli Beach. The bottom type of the project site is comprised of approximately 40% carbonate sand, 25% coral rubble, 30% beachrock, and 5% large rocks and boulders across the reef flat zone. The elevation of the hard stratum varies from mean lower low water (MLLW) at the lowest point to +3 feet MLLW at the bottom edge of the erosion escarpment. The waters of Kapa‘a, Kaua‘i are designated Class A by the State of Hawai‘i Chapter 11-54 Water Quality Standards for open coastal waters.

Soils specific to the project site are *Beaches* (BS) and *Mokulē‘ia Fine Sandy Loam* (Mr). BS soils consist of coarse sand derived from coral and seashells and are excessively drained with very low runoff. Mr soils consist of well-drained soils found along the coastal plains with very low runoff (NRCS, 2017).

2. Monitoring Program

The monitoring program follows the General Monitoring Guidelines for Section 401 Water Quality Certification Projects (HDOH, 2009). In-water work will take approximately two weeks and construction will be timed for low tide, low wave conditions. Photo documentation of the site during construction will be conducted. A qualified field technician will be present during in-water construction to visually monitor and photodocument for permit violations.

2.1 Organization and Responsibilities

Table 1 provides the names, responsibilities and qualifications of the personnel involved with this AMAP. *In situ* measurements will be performed by Oceanit field technicians. Oceanit will provide a qualified technician to perform the visual observations for the entire duration of in-water work to ensure that the activities do not result in adverse impacts to nearshore waters.

Oceanit field technicians will conduct *in situ* water quality monitoring for pre-construction, during construction and post-construction monitoring. Site conditions will be noted and photographs will be taken during the each field monitoring event. Photographs will be made at each sampling site and in the work area during construction and will be accompanied by detailed descriptions and time and date stamps. Geographic Position System (GPS) coordinates of the monitoring sites will be made during monitoring.

Field technicians will document at a minimum, the name of technician, date, time, tidal stage, wave conditions, current, weather conditions, location and condition of BMPs, and construction activity.

2.2 Project Personnel

The roles and responsibilities of key project personnel will be further defined at the beginning of the project and implemented by the monitoring contractor. The organizational structure will ensure that all project personnel will receive proper and accurate information and instructions on quality assurance and quality control procedures to be followed throughout the monitoring process.

Table 1: Project Personnel Responsibilities and Qualifications

Personnel	Responsibilities relating to water quality	Qualifications
Contractor's Construction Site Manager To be determined*	Responsible for overall management of construction site, daily inspection of site and BMPs, taking photographs from predetermined positions and entering observations in site log.	Designated by the Contractor
Monitoring Personnel Oceanit	Conducts field visits, obtaining photographs, work descriptions, and obtains samples for water quality analysis	Trained and experienced in site safety, water sampling methodology, and application of BMPs on construction sites
Design Consultant Oceanit	Assists DDC with design and construction issues for the seawall repair	College degree in Coastal/Civil Engineering. Licensed Professional Engineer.

**Information will be provided within 30 days after contract award.*

2.3 Project Schedule

Total project construction will span approximately six months. Commencement of the construction will depend on concurrence from regulatory agencies.

3. Sampling and Analysis Plan

3.1 Introduction

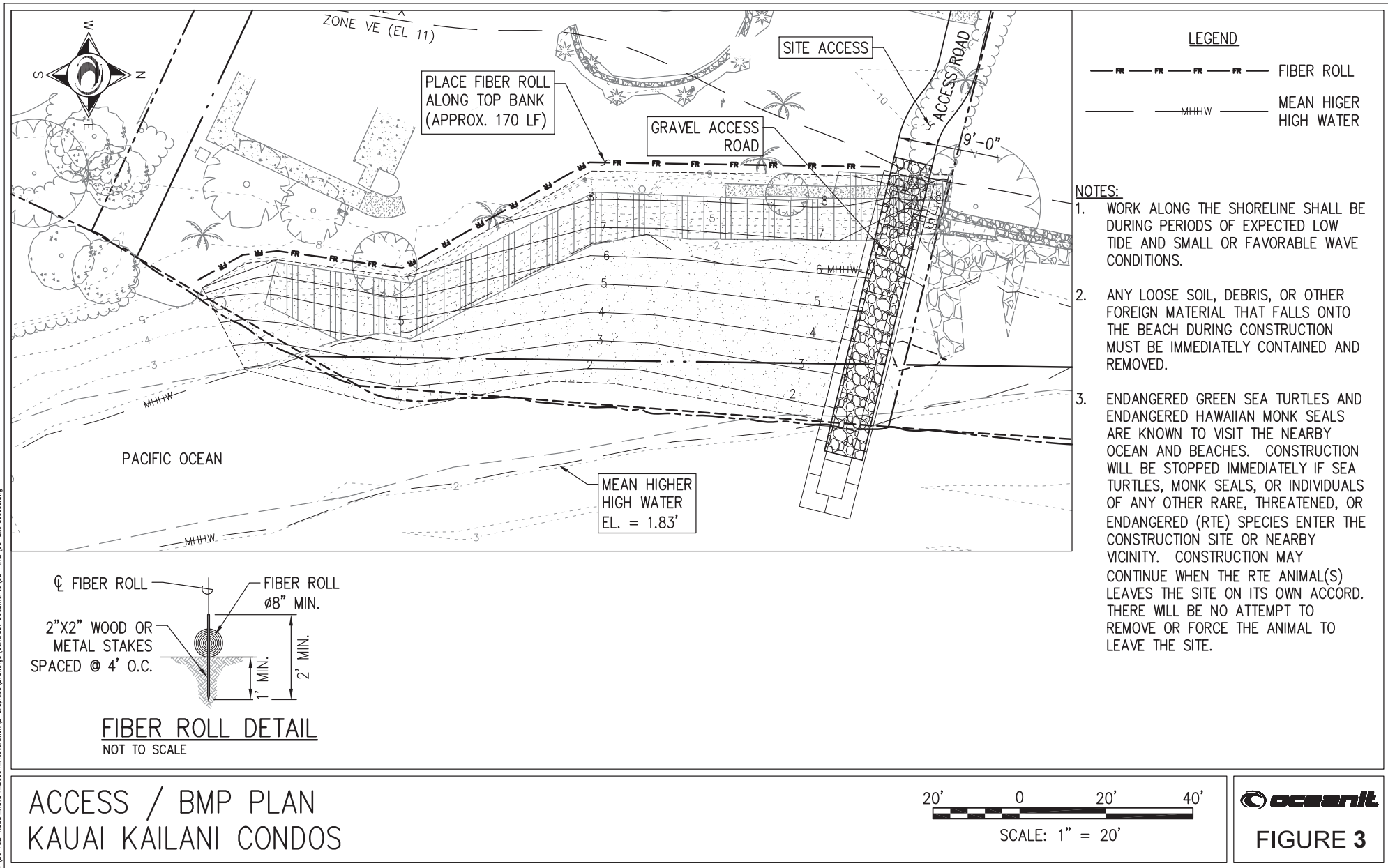
This section presents a plan for the implementation of the sampling and analysis activities for the project before, during, and after the construction phase. The applicable requirements are given below.

The procedures described in this section are developed to provide sufficiently detailed instructions to consistently conduct water quality monitoring and assessment activities and ensure a high level of quality assurance independent of the sampling personnel.

3.2 Objectives and Scope

The objectives of this AMAP will abide with those of the Clean Water Act (CWA), one of which is to minimize pollution of waters of the United States from construction activities. Section 401 of the CWA (33 USC 1341) provides a process for states to ensure that federally permitted activities comply with State Water Quality Standards. The permit holder is responsible for developing and implementing BMPs to avoid or minimize discharge of pollutants from the permitted activity. The purpose of this AMAP is to create an environmental awareness by photo documentation and to describe a water sampling and analysis process that will determine the effectiveness of the BMPs proposed for the project. The plan is developed to verify whether average concentrations of contaminants/parameters of potential concern measured in waters adjacent to the project site during construction activities indicate the adequacy and effectiveness of the BMP installed and modify them if necessary. Comparing the results of monitoring during construction with respective preconstruction monitoring data will show impacts on water quality direct correction of any problems with the BMPs or to adjust construction activities. The proposed monitoring will be done pre-, during, and post-construction.

A temporary fiber roll will be installed as a pollution control measure (Figure 3). In water pollution control measures are not anticipated to be needed the installation of the Tensar Triton Filter Mattresses and Elcorock sand bags are not expected to produce any sediment or plumes. Placement of sand fill will be initiated above the MHHW on the Kauai Kailani property and grading will be performed so that no heavy equipment enters the water in the nearshore area. See the site-specific BMP Plan for further details.



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Permanent materials used for the beach nourishment are:

- Beach material that is part of the beach nourishment.

Temporary fill will consist of the BMP materials including geotextile sand bags that will be used to create a temporary groin structure.

Any water contamination event shall be reported by telephone, e-mail, or facsimile to the State of Hawai'i Department of Health Clean Water Branch (DOH-CWB) within 24 hours or by the end of the next business day.

In addition to the above precautions, a comprehensive water quality monitoring program will be implemented to avoid, minimize, and mitigate any potential water pollution, and modify BMPs or work procedures if contamination from work activities is detected.

3.3 Monitoring Approach

The following process serves as the framework for this AMAP. The monitoring will cover a period before, during, and after construction ends. Monitoring parameters are decided by the type of construction and the possible contaminants the activity may release into coastal waters. For the proposed project, pH, turbidity, TSS, salinity, dissolved oxygen (DO), and temperature will be monitored to establish background conditions, conditions during construction, and conditions after construction is completed. *In situ* monitoring and measurements will be conducted by personnel who are trained and experienced in performing all operations, maintenance, calibration and secondary checking activities in accordance with manufacturer guidelines.

Parameters at each monitoring site will be measured in the field with appropriate field instruments for pH, turbidity, TSS, salinity, DO, and temperature. Monitoring personnel will also perform visual inspections during monitoring and document the date, time, weather conditions, construction activities, location, condition of the BMPs and any other activities related or unrelated to construction that may impact water quality. These observations will be submitted as a part of the monitoring report. All monitoring activities shall also include photographic documentation of site conditions. All photographs related to this monitoring effort will be date and time stamped. The locations for photo documentation points will be marked with GPS coordinates.

The construction contractor will designate a representative to perform daily visual inspections of the construction site including the condition of any BMPs to ensure no adverse impacts occur to coastal waters. The information recorded by the contractor's representative will also include all information provided by the monitoring personnel. A written monitoring report will be submitted to DOH-CWB within 24 hours or by the end of the next business day.

A copy of the contractor's daily observations will be used to prepare the final monitoring report. Since variability is associated with sample collection methodology and equipment and variability within each of the Decision Units (DUs), the monitoring consultant use a *MULTI-INCREMENT*® sampling approach for each of the DUs. *MULTI-INCREMENT*® is a registered trademark of EnviroStat, Inc. and all *MULTI-INCREMENT*® samples must be collected in accordance with the trademark requirements (EnviroStat).

3.4 Sampling Decision Units

There will be three DUs where water quality monitoring will be conducted. These are selected to represent baseline water quality in the vicinity of the project site (i.e., Baseline DU), water quality condition at the worksite within the area protected by the BMPs (i.e., Work DU), and the area immediately outside the BMPs where the most severe impacts are expected (i.e., Impact DU). Each of the locations for the suggested DUs are shown in Figure 4.

Baseline DU will be located in the nearshore area that will be similar in character to the project site and exposed to similar environmental changes. This site should be located outside the potential area of impacts from construction activities.

Work DU will be located between the sand bag barrier (BMP) and the proposed construction area.

Impact DU will be located immediately outside the sand bag barrier. The monitoring area will be the most probable area contaminated if the BMP does not function as expected. The area within the Impact DU will be visually inspected.

Other areas will include any area located within the project area, but outside the DUs, where the water quality is obviously being impacted by construction activities. The monitoring consultant shall inspect the impacted area and determine the sampling locations.

3.5 Monitoring Procedures

Monitored parameters are shown in Table 2. All water samples will be collected using a *MULTI INCREMENT*® sampling approach (EnviroStat) with an appropriate water quality probe that can measure turbidity, salinity, pH, DO, and temperature. Measurements will be made before, during, and after construction for evaluation of any changes in water quality as a result of construction.

3.5.1 Pre-Construction Monitoring

Prior to construction, average background water quality characteristics in the three DUs shall be monitored before construction begins to determine existing water quality conditions. At least ten samples will be collected over a two-week period prior to the start of construction. Pre-construction samples shall be collected to represent the entire Impact DU so that meaningful decisions can be made on actionable events during construction.



Small Scale Beach Nourishment Application

Sampling Decision Unit Map

Kaua'i Kailani Association Premises, Kapa'a, Kaua'i

Figure 4

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3.5.2 During Construction Monitoring

During in water work, average values of the water quality parameters within the project area isolated from the nearshore waters by BMPs (Work DU), the Baseline DU and Impact DU will be monitored daily. A qualified observer will also be present during construction to ensure that areas outside the BMP are not impacted by turbidity. If a plume is observed, the size and location of the plume will be described in an accompanying narrative and documented photographically. If a turbidity plume is observed outside the area isolated by the BMP, the work should stop immediately. Monitoring, including photo-documentation, will be conducted daily during the entire construction period. All photographs related to this sampling effort will be date and time stamped.

3.5.3 Post-Construction Monitoring

Following construction, water quality will be measured 24 hours after construction is completed and the BMPs are removed from the Baseline and Impact DUs. The monitoring will also include photo documentation and is aimed at establishing whether nearshore water quality has been impacted permanently by construction activities.

3.6 Decision Statement

The objectives of sampling, as defined by the decision statement, are (1) to determine whether concentrations of potential pollutants detected in the Impact DU during construction indicate conditions that require changes to installed BMPs to minimize further pollution discharge into the ocean and (2) to document and report site conditions to the DOH-CWB. To achieve these objectives, the quality and spatial spread of the water quality data should provide adequate and reliable information on the average concentrations of the identified pollutants.

Pre-construction sampling data will be analyzed to establish the range, geometric mean and standard deviations of the parameters measured. This will provide a baseline for average and the natural spread of water quality parameters in the area. Decision values (values indicating an actionable event) are defined as the value for each parameter obtained from all data collected during pre-construction and Baseline DU sampling events. The pH should be within the range measured during pre-construction. The other parameters should not exceed the pre-construction mean plus one standard deviation. An actionable event occurs when the measured value of any of the parameters of concern exceeds the above defined value.

The following sections provide guidance to develop a field sampling plan for this project. The sampling consultant will follow the guidelines as close as possible and document any deviations due to specific site conditions.

3.7 Sampling Parameters

Rationale for developing sampling parameters was discussed in Section 3.6. Monitoring parameters and the relevant criteria are summarized in Table 2.

A 6-Series, model 6600 V2 Multiparameter Water Quality Sone made by YSI or equivalent is the recommended instrument for all parameters except TSS, which is analyzed in a laboratory.

Table 2: Water Quality Parameters

Parameter	Units	Accuracy	Min. Detectable Level	Sensi- tivity	Container Type	Holding Time	Min. Vol., mL
Turbidity	NTU	0.5 NTU	0 NTU	0.1 NTU	P,G	ASAP	100
pH	pH units	±0.2 units	0	0.01 units	P,G	ASAP	100
Temp	Deg. C	±0.15° C	-5 °C	0.01 °C	P,G	ASAP	
Salinity	ppt	±1.0% or 0.1 ppt	0 ppt	0.01 ppt	P,G	7 days	500
DO	mg/L	0.01 mg/L or 0.1%	0 mg/L	0 mg/L	P,G	ASAP	100
TSS	mg/L				P,G	7 days	1,000

°C = Degrees Celsius

ASAP = as soon as possible

DO = dissolved oxygen

G = glass

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Units

P = plastic

ppt = parts per thousand

TSS = total suspended solids

3.8 Field Methods

This section provides general field methods that may be employed by the monitoring consultant to conduct water quality monitoring. The sampling operations shall comply with established sampling protocols to ensure quality assurance and monitoring goals. All samples shall be collected using a *MULTI INCREMENT*® approach.

Water Sampling and Analysis - New or pre-cleaned sampling equipment and/or containers shall be used to receive the water samples collected from each DU (Table 2). The sample containers shall be appropriately labeled with the project name, sample identification information, and the date/time of sample collection. A new pair of disposable gloves for collecting each sample.

Parameters with a holding time of ‘ASAP’ shall be collected in the specified container type and measured in the field using portable instruments such as YSI Sondes or equivalent. Salinity will also be measured with a portable instrument. TSS samples shall be delivered to an analytical laboratory in accordance with sample storage and holding time requirements. The Chain-of-Custody (COC) procedures shall be used to ensure possession and handling of samples to be traced from collection to the final destination. A sample COC form is shown in Appendix B. The laboratory shall be instructed to analyze the samples on a 48-hour turnaround time basis.

Sample Control – Sample control includes the methods used to identify, label, transport, and maintain the integrity of samples: sample identification, sample labeling, COC procedures and

sample transport. The industry standard criteria for sample control are described in Section 4. Sample Quality Assurance and Quality Control of this AMAP.

Sample Handling - After sample collection, proper sample handling will ensure that changes in the constituents of interest are minimized and will guard against errors when shipping and analyzing samples. Samples for field measurement will be transferred to a glass or plastic container (such as a beaker) where parameters will be measured with field equipment. Samples for TSS to be delivered to the analytical laboratory shall be kept in insulated coolers packed with frozen gel packs or wet ice. Sample containers will be capped, placed into re-sealable plastic bags, and then placed on ice in a cooler for transport to a laboratory. Samples will be delivered to the laboratory immediately after collection. COC forms shall be placed inside sealable plastic storage bags and placed inside the sample cooler and kept below 4°C. COC copies shall be maintained on-site. The monitoring consultant shall alert the laboratory personnel early to be available to receive the samples to avoid misunderstandings that might compromise the samples.

Investigation-Derived Waste – Investigation-derived waste includes disposable personal protective equipment (PPE) (gloves), disposable sampling equipment, and any other material generated that came in contact with potentially contaminated materials.

Record Keeping and Reporting – Date and time stamped photographs, documents, and field logs shall be maintained as necessary for implementing and recording the above-described procedures. The logbook shall contain pertinent information including location, time on site, personnel and equipment present, downtime, materials used, samples collected, measurement(s) taken, unusual incidents, and any other observations or information necessary to reconstruct field activities at that time. A Field Sample Log Sheet is shown in Appendix A.

4. Sampling Quality Assurance and Quality Control (QA/QC)

4.1 Introduction

The procedures outlined in this QA/QC section are to ensure that:

- Samples are collected, processed, stored, shipped, and analyzed using acceptable standardized procedures;
- Quality of generated data is documented adequately;
- Results are reported completely and accurately; and
- Security and integrity of samples and data are maintained at all times.

4.2 Applicable Requirements

The applicable requirements for this project shall be the current State of Hawai'i Water Quality Standards for discharge into Class A Waters. The "wet" water quality criterion for coastal waters at the project area will be used for determining water quality standards. Monitoring parameters and the relevant criteria to be followed are summarized in Table 2.

Procedures covered in this AMAP are specific to this individual project site. This section addresses the QA/QC plan elements described in "Guidance for Preparation of Combined Work/Quality Assurance Project Plans for Environmental Monitoring" (U.S. EPA 1996). Elements of QA/QC related to environmental sampling are identified below and discussed in Sections 4.3 and 4.4.

- Decision units;
- Sampling methods;
- Sampling frequency;
- Sampling preparation;
- Sample size;
- Sample containers;
- Sample preservation;
- Sample holding times;
- Sample handling;
- Sample labeling;
- Field instrumentation;
- General maintenance and calibration;
- Log keeping;
- COC record; and
- Sample shipping.

4.2.1 Sampling Preparation

Sampling activities in this AMAP will be discussed and/or reviewed by all personnel involved in the sampling activity. Deviation from this AMAP due to any unforeseen site conditions or changes in construction methods must be discussed with and accepted by DOH before implementation. Preparation for sampling includes the following activities:

- The contractor will be responsible for contracting and coordinating with a third party water quality monitoring consultant to execute this AMAP. The consultant will create a Field Sampling Plan to incorporate the information included in this section;
- Obtain written approval for this AMAP from DOH;
- Calibrate field measurement instruments according to Standard Operating Procedures (SOPs);
- Obtain properly cleaned containers of appropriate sample size;
- Prepare sample bottles with labels, coolers, ice, and other necessary materials;
- Set up field documenting forms, COC etc.;
- Prepare instruments and safety gear specific to the job site;
- If necessary, make arrangements for a boat for sampling at the baseline and impact decision units;
- Review of all pertinent QA/QC procedures; and
- Inform laboratory of possible TSS sample delivery.

Planning should ensure that study objectives and their relative importance and priority are understood by all field personnel. This planning will ensure adequate evaluation of impacts of any field deviation from the plan on overall project goals. An equipment checklist should be prepared to ensure availability of all tools and supplies. All equipment should be cleaned and stored in working condition after each sampling episode.

4.2.2 Field Instruments

Parameters frequently measured with field instruments are turbidity, pH, temperature, DO, and salinity. All field measurements will be made with portable measurement devices such as those produced by Yellow Springs Instruments (YSI) or their equivalents. These instruments should be operated by trained personnel in accordance with their respective SOPs. The following precautions should be taken when transporting and using the equipment in the field:

- Ensure that cables are sufficiently long for operation at sites;
- Electrical cables should not be excessively strained;
- Electrical connectors should be waterproof;
- Ensure that the instrument operating range and accuracy are within acceptable limits for the project;

- Instruments should be allowed to warm up before calibration or field use;
- Sensors should be calibrated before use;
- Instruments should be field checked at the beginning of each day's measurements and before and after monitoring;
- Sensors should be rinsed with distilled water after each measurement;
- Optical surfaces should be cleaned with alcohol and lens tissue between measurements;
- Instruments should be transported in boxes designed for this purpose;
- Instruments should be protected from heating and direct sunlight; and
- External sensors should be covered and adequately protected whenever the instrument is not being used.

4.2.3 General Maintenance and Calibration

Routine maintenance inspection of field instruments should follow the manufacturer's recommendations. General procedures include:

- All rubber parts that may get immersed should be coated with silicone grease;
- Connectors should be inspected for bent or broken pins, which may cause faulty connections and flooded cables;
- Cables should be inspected for nicks, cuts, abrasions, or other signs of physical damage;
- Seals should be inspected and periodically cleaned and greased to ensure a waterproof fit;
- Desiccant should be inspected and replaced with fresh or reactivated desiccant when necessary; and
- Replace batteries regularly and also whenever low power is indicated.

Factory servicing and calibration should be made annually or when instrument malfunctions cannot be corrected by following the operations manual. Factory calibrations may also be required when certain major components of the system are replaced. Calibration log sheets shall accompany a report that uses data from the instrument. All field check results should be entered in the field log sheet. Appendix A shows a Field sample log sheet.

4.2.4 Log Keeping

A field sample log sheet (Appendix A) will be used each time the site is visited. This log sheet can be combined with the COC form where convenient. However, all the following information should be entered:

- Project title;
- Date and time;
- Contractor's Work in Progress;

- Sampling location/DU;
- Sample number;
- Replicate number if applicable;
- Weather conditions;
- Comments on sample condition;
- Comments on sample quality;
- Names of members of the sampling crew;
- General site conditions; and
- Photo log.

4.3 Sampling and Analysis

4.3.1 Sample Container Preparation

Sample containers will be cleaned and prepared using industry accepted cleaning and preservation procedures. The recommended sample sizes, type of containers, preservation, and holding times for samples are listed in Table 2.

Sample labels must be waterproof and must be securely fastened to the outside of each sample container to prevent misidentification of samples. Labels must contain at least the project name, sample number, preservation technique, date and time of collection, sample location, and name of sample collector. Labels should be marked with indelible ink.

4.3.2 Sample Handling

Containers for TSS samples will be capped, placed into re-sealable plastic bags, and then placed on ice in a cooler for transport to a laboratory. After sample collection, proper sample handling will ensure that changes in the constituents of interest are minimized and will guard against errors when shipping and analyzing samples. Recommended sample sizes, type of containers, sample preservation, and storage requirements for each variable will be followed (see Table 2).

4.3.3 Field Documentation

It is important throughout a sampling and analysis program to maintain the integrity of the sample from time of collection to the point of data reporting. This integrity should be achieved by using COC procedures that ensure sampling, storing and handling of samples to be traced from collection to the final destination. Proper sampling procedure documentation includes:

- Field data logbook;
- Sample labels;
- COC records;
- Field conducted measurements; and
- Sample shipment method.

4.4 Reporting

The pre-construction monitoring will assess the baseline conditions and compare them with the State Water Quality Standards. These values will be used to make a preliminary assessment of a water quality violation. Statistical methods will be used to analyze measurements and trends.

During construction, data (date and time stamped photographs, monitored data and field observations) will be forwarded to DOH-CWB by e-mail to: cleanwaterbranch@doh.hawaii.gov by the close of the business day following the day of sampling if possible. The report will include field notes and site photographs.

A final report will include field notes and site photographs and will be prepared upon completion of the monitoring program. The final report will describe descriptions of construction and nourishment activities, discussion of any deviations from the proposed project design and the cause of these deviations, results from any additional environmental monitoring including sediment analyses, water quality parameters, and discussion of any necessary corrective action(s), and photographs. This report will be submitted to the DLNR within two months of completion of post construction monitoring.

5. References

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- NRCS, 2017. Web Soil Survey. United States Department of Agriculture. Accessed 1 June 2017. <<http://websoilsurvey.nrcs.usda.gov/>.
- State of Hawaii. 2012 Hawaii Administrative Rules. Department of Health Water Quality Standards, Title 11 Chapter 54.
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Appendix A Field Sample Log Sheet

Field Sample Log Sheet

Date: _____

Collected by: _____

Project Title:

Pre	During	Post	Construction Monitoring
-----	--------	------	-------------------------

Project No./File No.: _____

WQC File No.: _____

Contractor's Work in Progress: _____

Rainfall Present: _____ Past 24 Hrs: _____ %Clouds: _____ Wind mph: _____

In situ Meter Calibration Date Last

Standard

Reading

Reading

pH / /20

Field Calibrated?--->pH=7

pH=10

Turbidity / /20

NTU=0

NTU=100

Sample No. Time Location Type Size Description

Samples held in: Ice Refrigerator AirOther:_____

Samples to Laboratory (name): _____ On (da/time) ____ / ____ / 20 @ : Hr

Lab Chain of Custody # _____

Notes:_____

Appendix B Sample Chain of Custody

Appendix C:
Site Photos

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Shoreline prior to groin removal and goal
of the proposed beach nourishment
Photo taken prior to 2012



Erosion exposing root vegetation and threatening property prior to the 2017 temporary erosion control revetment



Site of pre-existing groin and location of proposed
groin
Photo taken Aug 2017



Current view of the property with temporary erosion control measures in place

Photo taken Dec 2017



Temporary Sand Bag Revetment Installed in 2017
Photo Taken Dec 2017



Temporary Sand Bag Revetment Installed in 2017
Photo Taken Dec 2017



Project Site Conditions and Temporary Sand Bag Revetment
Photo Taken Dec 2017



Temporary Sand Bag Revetment
Photo Taken Jan 2018



Sand Nourishment Site
Photo Taken May 2018

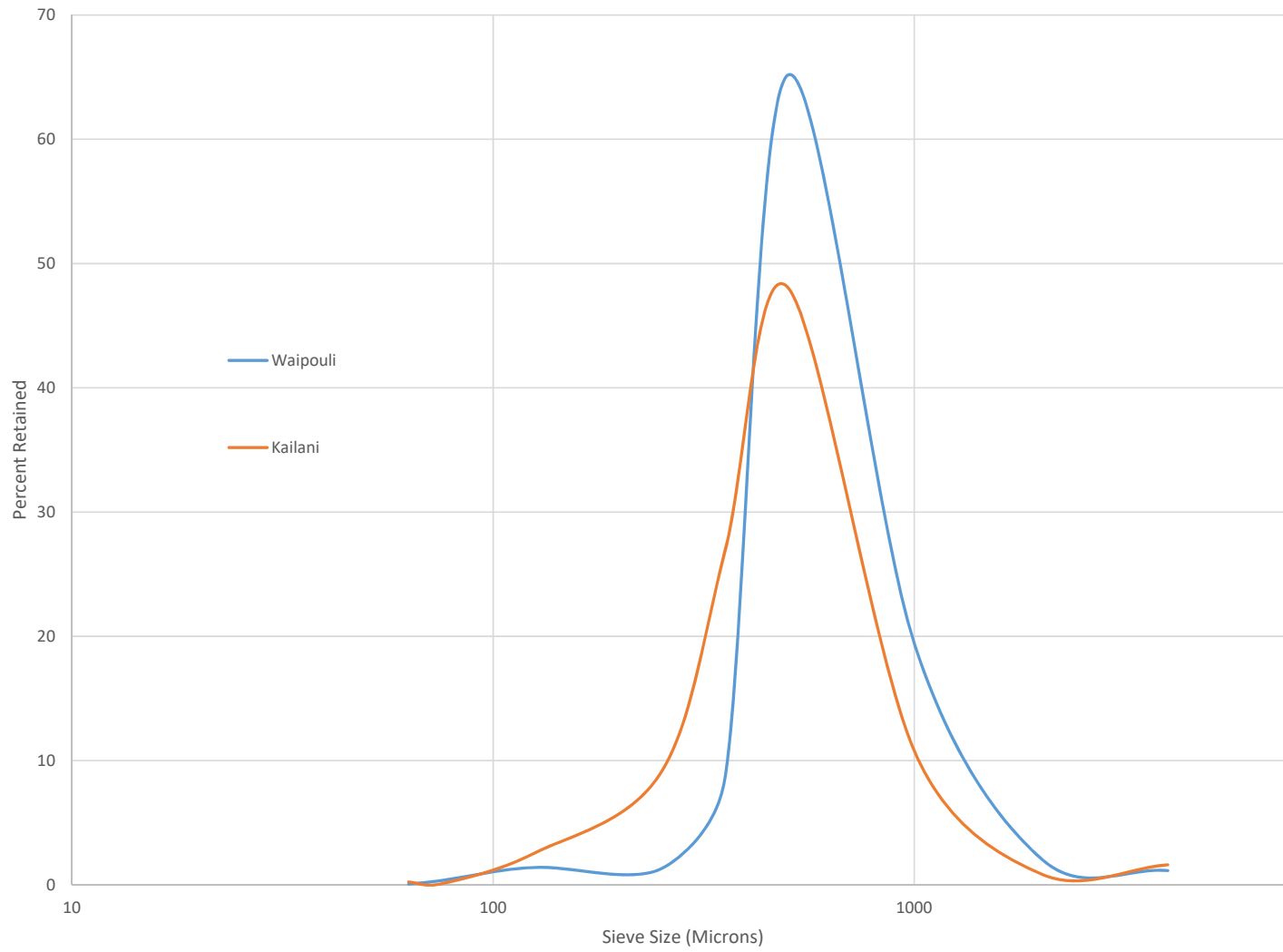


Waipouli Canal – Sand Source Site
Photo Taken May 2018

Appendix D:
Grain Size Analysis Results

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Sand Grain Size Comparison



Cumulative Percentage Greater Than

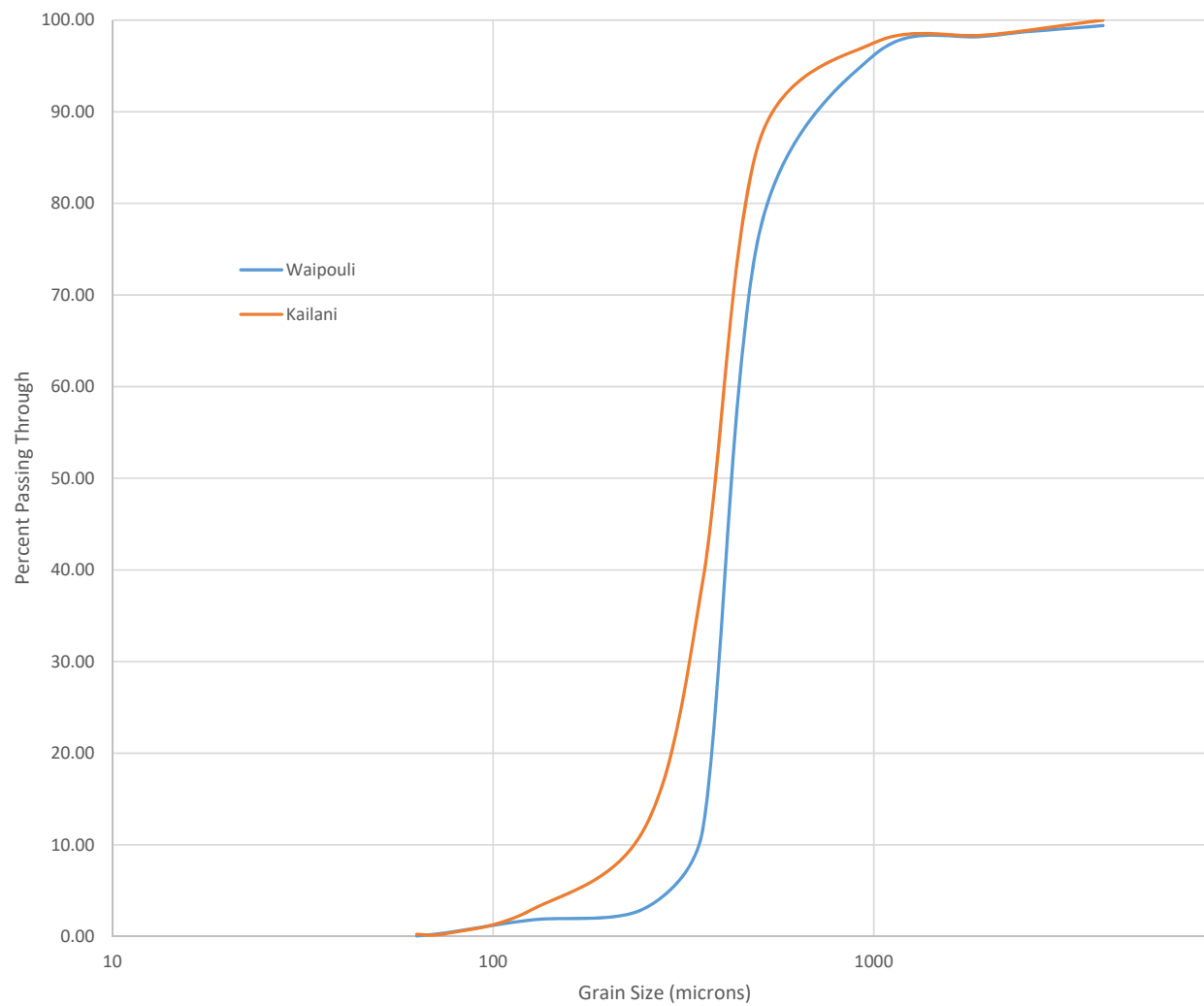
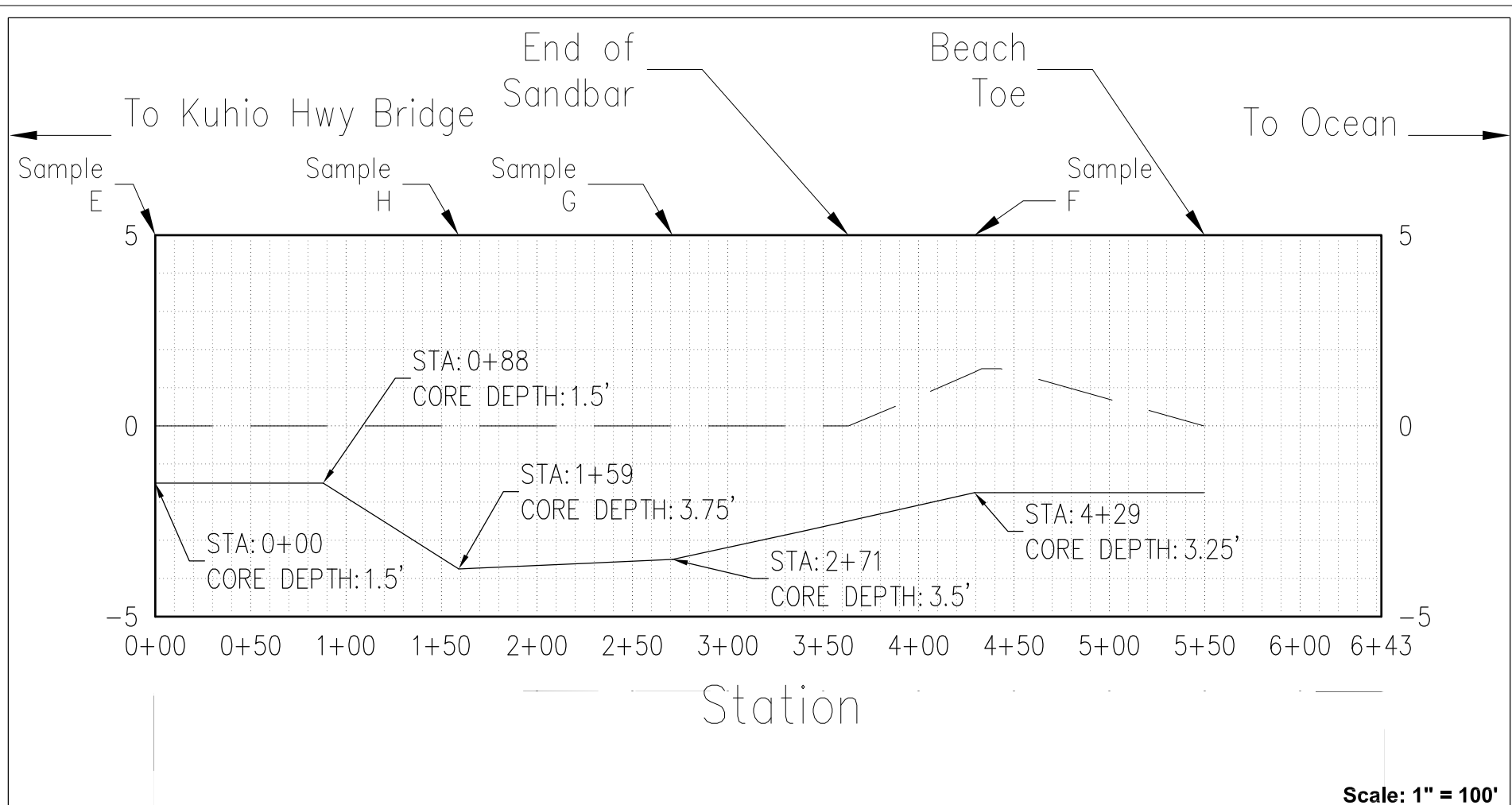




Figure 1: Waipouli Drainage Canal Sediment Sampling
Plan View

Kauai Kailani AOA

oceanit



Legend:

----- EXISTING GROUND

———— CORE DEPTH

CUT VOLUME

1,252 CY

Figure 2: Waipouli Drainage Canal Sediment Sampling
Profile View

Kauai Kailani AOA





Figure 3: Kauai Kailani Beach Sediment Sampling
Plan View

Kauai Kailani AOA



Kauai Kailani Beach Restoration

Sediment Sampling Results, June 2018

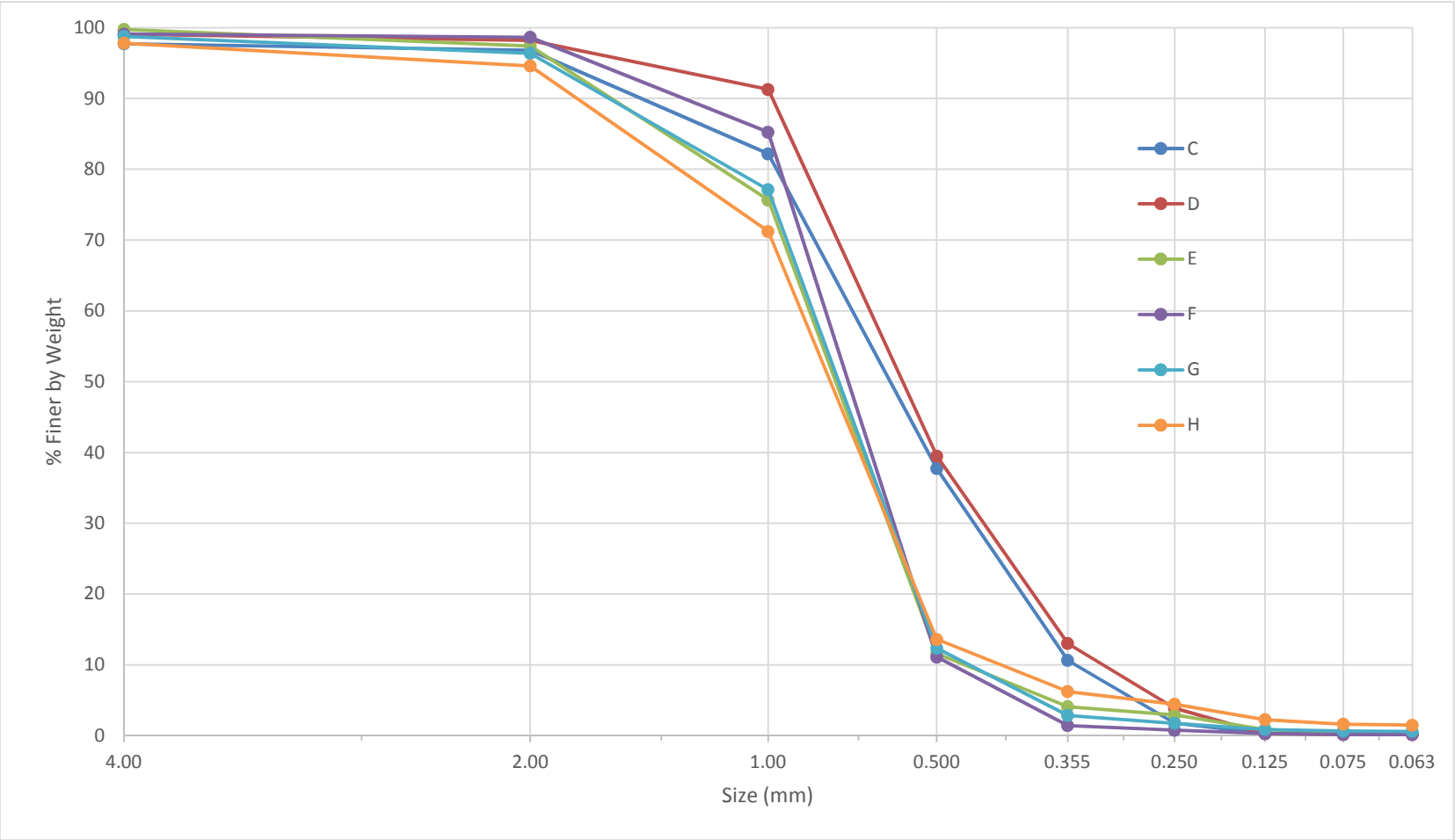
ASTM D-1140-92 & D-22-17-93

		Fraction dry weight (g)										
		size (mm)										
Description	Sample ID	>4.00	4.00 - 2.00	2.00 - 1.00	1.00 - 0.500	0.500 - 0.355	0.355 - 0.250	0.250 - 0.125	0.125 - 0.075	0.075 - 0.063	<0.063	TOTAL
Kauai Kailani Beach #1	C	1.59	0.64	10.24	31.10	18.96	6.19	1.03	0.03	0.00	0.20	69.98
Kauai Kailani Beach #2	D	0.55	0.49	4.04	30.18	15.43	5.33	2.09	0.06	0.01	0.10	58.28
Waipouli Canal STA 0+00	E	0.13	1.30	11.94	35.20	4.12	0.63	1.14	0.24	0.04	0.20	54.94
Waipouli Canal STA 4+29	F	0.54	0.28	8.07	44.67	5.82	0.40	0.29	0.08	0.00	0.10	60.25
Waipouli Canal STA 2+71	G	0.64	1.23	9.94	33.45	4.90	0.58	0.45	0.11	0.03	0.31	51.64
Waipouli Canal STA 1+59	H	1.24	1.83	13.26	32.70	4.18	1.02	1.24	0.36	0.07	0.85	56.75

		Fraction Percent (%) - calculated										
	Sample	size (mm)										
Description	ID	>4.00	4.00 - 2.00	2.00 - 1.00	1.00 - 0.500	0.500 - 0.355	0.355 - 0.250	0.250 - 0.125	0.125 - 0.075	0.075 - 0.063	<0.063	TOTAL
Kauai Kailani Beach #1	C	2.27	0.91	14.63	44.44	27.09	8.85	1.47	0.04	0.00	0.29	100.0
Kauai Kailani Beach #2	D	0.94	0.84	6.93	51.78	26.48	9.15	3.59	0.10	0.02	0.17	100.0
Waipouli Canal STA 0+00	E	0.24	2.37	21.73	64.07	7.50	1.15	2.07	0.44	0.07	0.36	100.0
Waipouli Canal STA 4+29	F	0.90	0.46	13.39	74.14	9.66	0.66	0.48	0.13	0.00	0.17	100.0
Waipouli Canal STA 2+71	G	1.24	2.38	19.25	64.78	9.49	1.12	0.87	0.21	0.06	0.60	100.0
Waipouli Canal STA 1+59	H	2.19	3.22	23.37	57.62	7.37	1.80	2.19	0.63	0.12	1.50	100.0

Description	Sample ID	Percent Finer by Weight (%)								
		size (mm)								
		4.00	2.00	1.00	0.500	0.355	0.250	0.125	0.075	0.063
Kauai Kailani Beach #1	C	97.73	96.81	82.18	37.74	10.65	1.80	0.33	0.29	0.29
Kauai Kailani Beach #2	D	99.06	98.22	91.28	39.50	13.02	3.88	0.29	0.19	0.17
Waipouli Canal STA 0+00	E	99.76	97.40	75.66	11.59	4.10	2.95	0.87	0.44	0.36
Waipouli Canal STA 4+29	F	99.10	98.64	85.24	11.10	1.44	0.78	0.30	0.17	0.17
Waipouli Canal STA 2+71	G	98.76	96.38	77.13	12.35	2.87	1.74	0.87	0.66	0.60
Waipouli Canal STA 1+59	H	97.81	94.59	71.22	13.60	6.24	4.44	2.26	1.62	1.50

Sample ID	Calcium Carbonate	Sample Description
A	86%	Composite sample of samples C and D
B	92%	Composite sample of samples F and G



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Appendix E:

Proof of General Liability Insurance

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**Dongbu Insurance**1440 Kapiolani Blvd. Suite 950
Honolulu, HI 96814**GENERAL LIABILITY COVERAGE PART
DECLARATIONS**

0000017637

Policy Number DGL 1600082 02
Renewal of DGL 1600082**Policy Period** From 04/01/2018 To 04/01/2019
12:01 A.M. Standard Time at the Named Insured's Address**Transaction** RENEWAL DECLARATION
Pay Plan: DIRECT BILL**Named Insured and Address**
KAUAI KAILANI AOA
C/O CASTLE RESORTS & HOTELS, I
590 C PAIEA STREET
HONOLULU HI 96819**Agent**
ATLAS INSURANCE AGENCY INC

GERALD TAKEUCHI
1132 BISHOP STREET, SUITE 1600
HONOLULU HI 96813**Telephone:** 808-533-3222**Business Description**
AOUO CONDOMINIUM**Type of Business**
ASSOCIATION**Audit Period**
NONE

Your acceptance of this policy terminates, effective with the inception of this policy, any prior policy of the same number issued to you by us.

IN RETURN FOR THE PAYMENT OF THE PREMIUM, AND SUBJECT TO ALL THE TERMS OF THIS POLICY, WE AGREE WITH YOU TO PROVIDE THE INSURANCE AS STATED IN THIS POLICY.

LIMITS OF INSURANCE

General Aggregate Limit (Other than Products-Completed Operations)	\$	2,000,000
Products - Completed Operations Aggregate Limit	\$	Not Applicable
Each Occurrence Limit	\$	1,000,000
Personal and Advertising Injury Limit	\$	1,000,000
Medical Expense Limit, any one person	\$	5,000
Damage to Premises Rented to You Limit, any one premises	\$	100,000

AMENDED LIMITS OF LIABILITY

Refer to attached schedule, if any.

LOCATIONS OF ALL PREMISES YOU OWN, RENT OR OCCUPY

Refer to attached schedule.

CLASSIFICATIONS

Refer to attached schedule.

FORMS AND ENDORSEMENTS

Refer to attached schedule.

These Declarations together with the common policy conditions, coverage part declarations, coverage part coverage form(s) and form(s) and endorsements, if any, issued, complete the above numbered policy.

TOTAL PREMIUM FOR THIS COVERAGE PART \$ 5,641.00

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Appendix F:

Report on October 31, 2018 Field Tasks

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Report on October 31, 2018 Field Tasks

Kauai Kailani Beach Restoration

TMK: (4) 4-3-009:050



Prepared for:

Kauai Kailani Association of Unit Owners
4-856 Kuhio Highway
Kapa'a, HI 96746

Prepared by:

Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, HI 96813

December 2018

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1. INTRODUCTION

This report describes field activities that were conducted by Oceanit personnel on October 31, 2018 to provide supplemental information in support of a small-scale beach nourishment (SSBN) application to the State of Hawai'i Department of Land and Natural Resources (DLNR). Following the removal of a groin structure in 2012, the Kauai Kailani Association of Unit Owners (AOUO) has observed severe and rapid shoreline erosion along the property (Figure 1-1). An emergency temporary repair structure was installed with the approval of the DLNR after the erosion was deemed a threat to public health, safety, and welfare. The emergency erosion protection structure is permitted to remain in place for a period of three (3) years while a long-term solution is developed. The proposed long-term solution includes a groin reconstruction to replace the former groin and a beach restoration with sand from the Waipouli Drainage Canal. The project is designed to restore the beach to its former width and provide natural erosion protection. A site map is provided in Figure 1-2.



a) Photograph of Kauai Kailani beach taken prior to groin removal.



b) Aerial photograph of Kauai Kailani beach taken prior to groin removal.



c) Photograph of Kauai Kailani beach following groin removal with emergency erosion protection taken on October 31, 2018



d) Photograph of Kauai Kailani beach following groin removal looking down from the Kauai Kailani Apartment buildings taken on October 31, 2018.

Figure 1-1: Photographs Taken Before (a,b) and After (c,d) Groin Removal



Figure 1-2: Project Site Map

2. OBJECTIVES

Field activities were conducted to fulfill the DLNR Office of Conservation and Coastal Lands (OCCL) response to comments for a SSBN application submitted on September 14, 2018. In general, OCCL requested that the following four additional field tasks be performed:

- Task 1: Estimate nearshore currents;
- Task 2: Environmental description of site conditions at the proposed stockpile area;
- Task 3: Additional sand sampling from the Waipouli Canal at the canal mouth, 200 feet (ft), and 600 ft upstream, each at the surface and two (2) to three (3) ft below ground surface (bgs); and
- Task 4: Characterize the marine bottom type at fill site.

This report describes the methods, results, and conclusions for each field task.

3. FIELD TASKS

3.1 Estimate Nearshore Currents

Methods

Surface current measurements were taken from within the tidal reef flat lagoon during high tide (~2.2 ft) using a small buoy attached to a 10 ft line. The time for the buoy to travel 10 ft and the direction of travel were recorded. Current measurements beyond the reef crest in offshore area were estimated; recording the direction and time it took for a free-floating current drough to float approximately 50 ft. Measurements were recorded during high tide conditions to capture the highest expected flow velocities during the day (Figure 3-1). A map depicting locations where surface current measurements were taken is included as Figure 3-2. Contrasting conditions at the site during high (i.e., current measurement period) and low tides are depicted in photographs included in Tables 3-1 and 3-2, respectively.

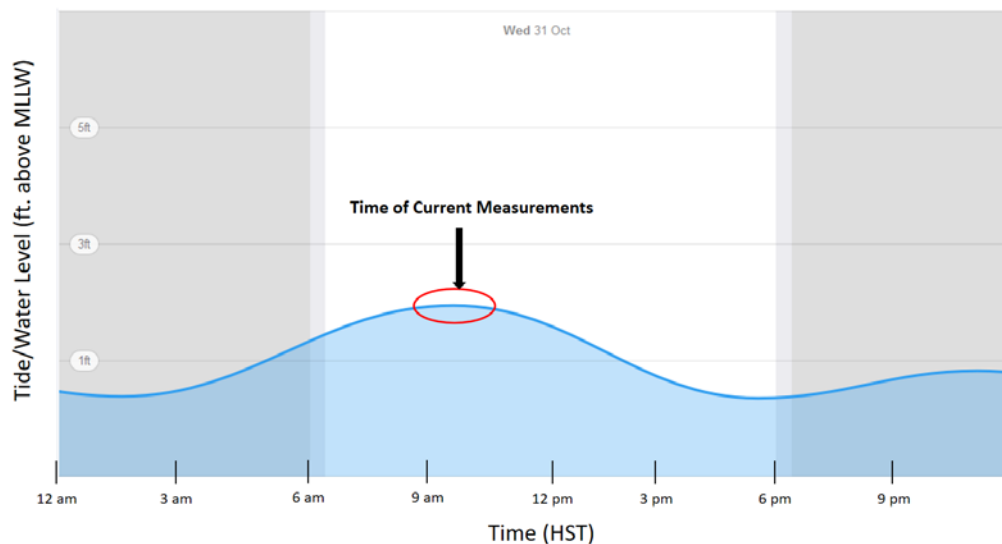


Figure 3-1: Tide Cycle on October 31, 2018 Recorded by NOAA Gage at Nawiliwili

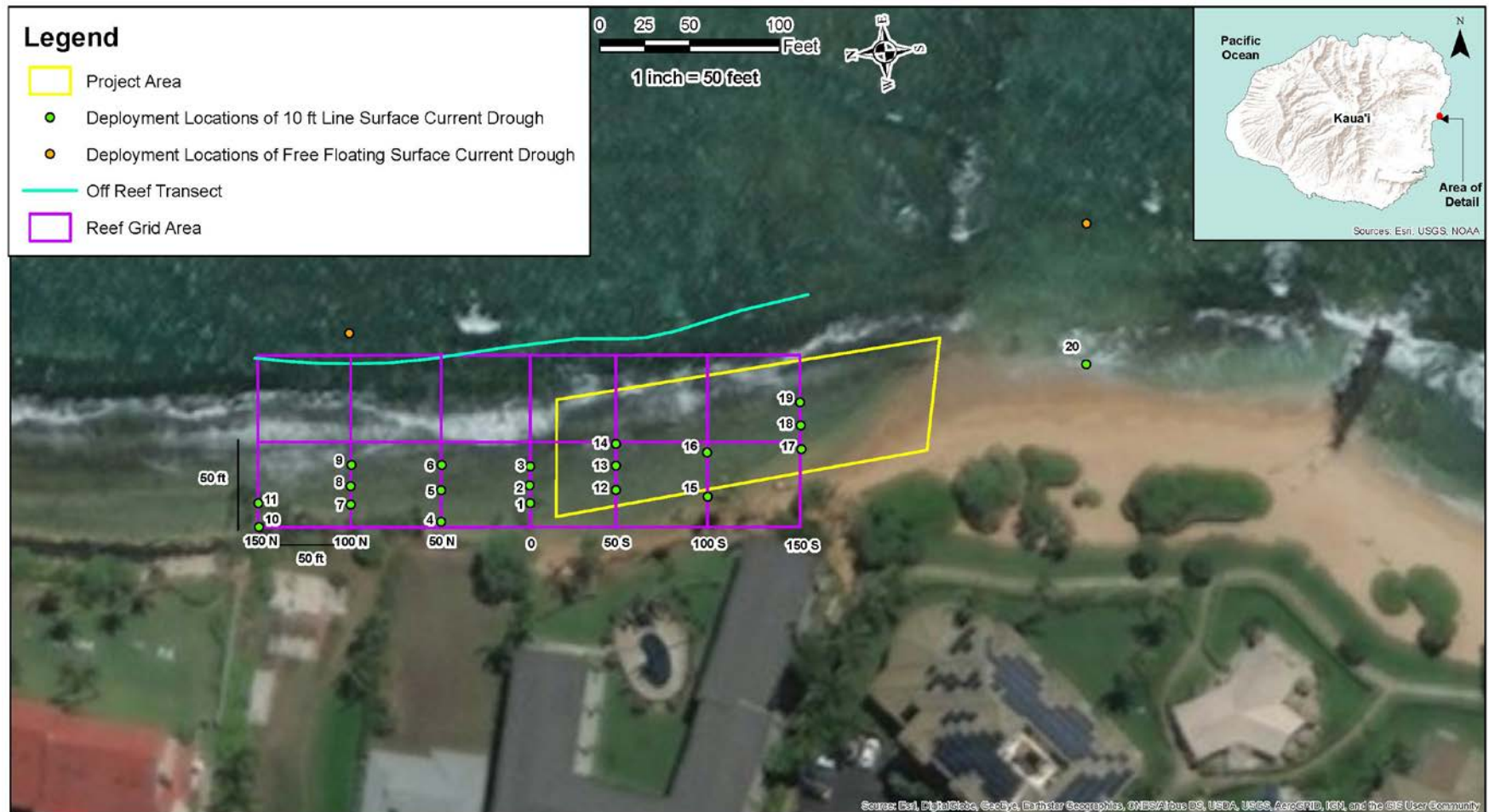


Figure 3-2: Surface Current Measurement and Benthic Observation Locations

Table 3-1: Photographs Taken During High Tide Conditions at the Site on 10/31/2018








No.	Photograph	Description
1		Photograph of the reef flat area inundated during high tide. Photograph taken from the shoreline at about the former groin location, facing northeast.
2		Photograph taken facing southeast along the structure temporarily providing emergency shoreline erosion protection.
3		Photograph taken from the Kauai Kailani backyard looking north at the project site. Waves can be seen breaking over the reef crest.

Table 3-2: Photographs Taken During Low Tide Conditions at the Site on 10/31/2018

No.	Photograph	Description
1		Photograph looking along the former groin location facing northeast.
2		The bottom in the channel area is sandy with scattered rock and coral rubble. Photograph taken facing east.
3		The beach rock reef is exposed during low tide and waves generally do not top the reef crest, resulting in a placid channel area. Photograph taken facing southeast.

No.	Photograph	Description
4		Photograph taken while standing on the beach rock reef looking north along a secondary channel cutting along the reef crest parallel to the shoreline.

Data

Surface current measurement data recorded from the sample locations depicted in Figure 3-2 are included in Table 3-3 below:

Table 3-3: Surface Current Measurement Data During High Tide

Surface Current Measurement Location ¹	Measurement No. (in Fig. 3-2)	Approximate time to float 10 ft (s)	Calculated Surface Current Speed (ft/sec)	Approximate surface current velocity direction
0, 10	1	7	1.4	S
0, 20	2	6.8	1.5	S
0, 30	3	10	1	S
50 N, 0	4	18	0.6	W -> S
50 N, 20	5	5	2	W -> S
50 N, 30	6	7	1.4	W -> S
100 N, 10	7	8	1.3	W -> S
100 N, 30	8	10	1	S
150 N, 0	9	n/a, too much wave action	n/a	S
150 N, 0	10	8	1.3	S
150 N, 10	11	5.5	1.8	S

Surface Current Measurement Location ¹	Measurement No. (in Fig. 3-2)	Approximate time to float 10 ft (s)	Calculated Surface Current Speed (ft/sec)	Approximate surface current velocity direction
50 S, 10	12	18	0.6	S
50 S, 20	13	13	0.8	S
50 S, 30	14	16	0.6	S
100 S, 5	15	19	0.5	S
100 S, 20	16	10	1	S
150 S, 10	17	28	0.4	SE
150 S, 20	18	27	0.4	SSE
150 S, 30	19	11	0.9	SSE
200 S, 0	20	7	1.4	SE

*Approximate distance along shoreline in relation to previous groin location (ft and direction), Approximate distance seaward of shoreline (ft)

Results

Based off the nearshore current measurement data, a map depicting surface current patterns is shown in Figure 3-3.

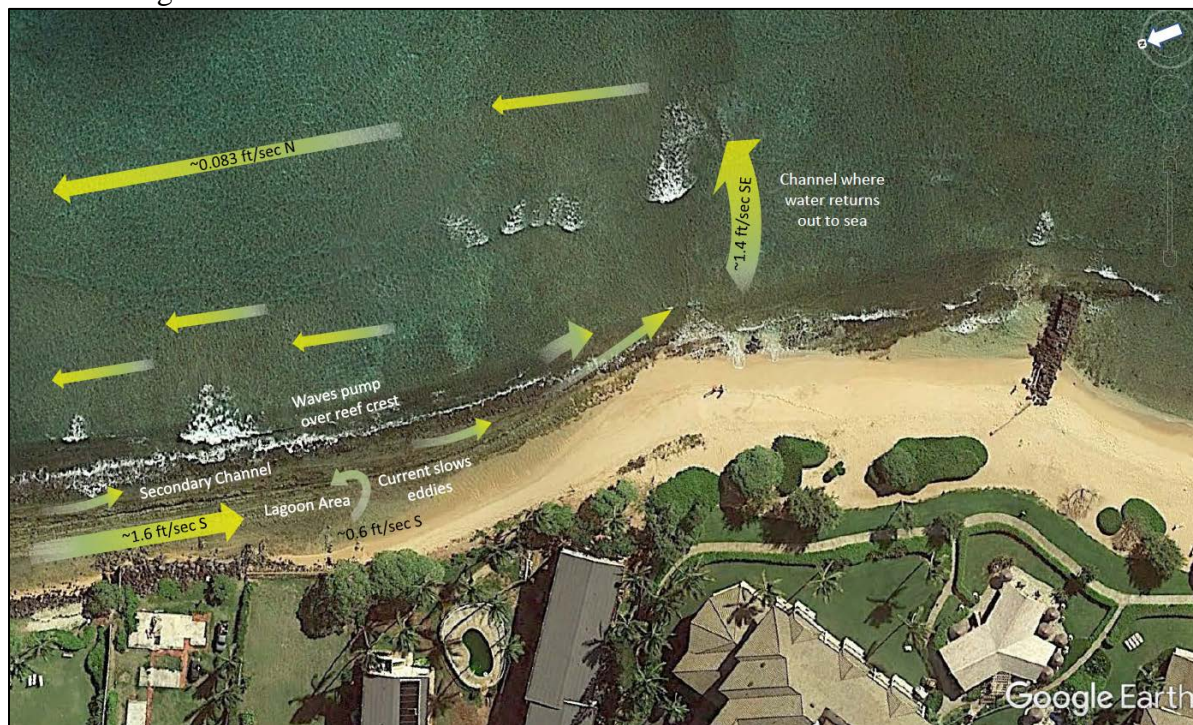


Figure 3-3: Approximate Surface Current Flow Direction and Velocities (Length of Arrows)

Conclusions

Nearshore current measures show a brisk current induced by wave run up over the shallow reef crest during high tide (Tables 3-1, 3-3). At low tide, current velocities in the reef flat area are near zero (Table 3-2). The proposed upstream groin would stabilize the targeted nourished beach fronting Kauai Kailani by preventing the southerly current from wicking sand away from the beach and carrying it south and out of the channel where the water returns offshore (Figure 3-3).

3.2 Environmental Site Description of Stockpile Area

Methods

The proposed stockpile area for the dredge sand (Figure 1-2) is located in the parcel with tax map key (TMK) number (4) 3-007:027 owned by Coconut Plantation Beach Investors, LLC. Oceanit personnel visited the site to identify existing flora and fauna and investigate and document site conditions.




Photographs/Results



The proposed sand stockpile location, depicted in Figure 1-2, is located in a non-native ironwood tree grove (*Casuarina equisetifolia*) (Table 3-4; Photographs 1-2). As is typical of these groves, the ground surface under the canopy is littered with a blanket of leaf debris that suppress growth of understory species. Away from the stockpile area, only a few tree heliotropes (*Heliotropium foertheranum*), beach naupaka (*Scaevola taccada*), and one sea grape (*Coccoloba uvifera*) tree were observed growing underneath of the canopy (Table 3-4; Photograph 3). East of the proposed stockpile site, another potential stockpile area located within a coconut tree grove was examined. This secondary stockpile site was overgrown with thick stands of the invasive Guinea grass up to ten (10) ft tall (*Megathyrsus maximus*) (Table 3-4; Photograph 4), and several large *Ficus spp.* trees were observed growing near to the fence demarcating the northern delineation of the property boundary.

The avian species observed in the area included the common mynah (*Acridotheres tristis*) nesting in the ironwood canopy, the zebra dove (*Geopelia striata*), and numerous chickens (*Gallus gallus domesticus*) on the ground. Numerous deceased gastropod shells were located among the detritus, including the highly invasive rosy wolf snail (*Euglandina rosea*) (Table 3-4; Photograph 5), the garden pest giant African snail (*Achatina fulica*), and the common non-native Asian trampsnail (*Bradybaena similaris*). No endangered or threatened species (e.g., Hawaiian yellow-faced bee or seabirds) were observed in the vicinity of the stockpile area.

There is a natural one (1) to two (2) ft rise in the topography between the stockpile area and the shoreline.

Table 3-4: Photographs of Proposed Stockpile Site

No.	Photograph	Description
1		Proposed stockpile location under ironwood trees facing <i>makai</i> (east).
2		Proposed stockpile location under ironwood trees facing north. Adjacent property TMK (4) 3-007:011 can be seen in the background.
3		Beach naupaka and tree heliotrope growing in the understory outside the proposed stockpile site. Photograph taken facing north.

No.	Photograph	Description
4		Second identified potential stockpile area <i>mauka</i> and east of ironwood site. The secondary site is within a coconut grove with thick Guinea grass. Photograph taken facing south.
5		Invasive rosy wolf snail (<i>Euglandina rosea</i>) shells found within the ironwood detritus littered on the surface of the stockpile area.

Conclusions

Based on the environmental conditions observed, the stockpile area is suitable for stockpiling the dredged sand before it is used for the beach nourishment. A natural one (1) to two (2) ft rise in the topography between the stockpile area and the shoreline would provide a buffer to prevent a direct runoff flow connection to the ocean. No endangered or threatened species were observed in the stockpile area vicinity. In addition, best management practices (BMPs) will be employed to prevent pollution from entering the coastal environment. Therefore, no significant environmental impacts are expected by using the stockpile area.

3.3 Additional Sand Sampling from Waipouli Canal

Methods

Sand samples were extracted from the Waipouli Drainage Canal from the surface to approximately three (3) ft bgs or until refusal. Sample locations began at the drainage outlet interface with the ocean (hereby referred to as the “canal mouth”). One hundred (100)-ft increments from the canal mouth to 600 ft upstream were mapped. Core samples were taken at the middle of the canal from the canal mouth, 100 ft, 200 ft, 400 ft, and 600 ft (exceeding OCCL’s request of samples from the canal mouth, 200, and 600 ft). Approximate sand sampling locations are shown in Figure 3-4.

Sand samples were collected as the tide was receding. At the time of the sampling, the sand plug surface was above water and extended from approximately 50-250 ft upstream. Samples taken from further upstream of the sand plug were immersed in approximately one (1) ft of standing water.

A polyvinyl chloride (PVC) pipe was driven to three (3) ft bgs or until refusal. At depth, the pipe was cupped and carefully removed from the ground. The sand core was removed from the pipe and photographed. Core samples were collected for further study from surface to six (6) inches bgs and the depth samples were collected from about 2.5 to three (3) ft bgs.



Figure 3-4: Waipouli Canal Approximate Sand Sampling Locations

Results

Descriptions of sand samples collected are included in Table 3-5 below. Photographs of sand profiles are included in Table 3-6.






Table 3-5: Descriptions of Sand Samples Collected

Location	Sample #	Depth (ft bgs)	Time Collected	Notes:
Canal Mouth	1	0'	1530	All samples collected from middle the canal
	2	1.5'-2'	1530	Refusal encountered at 2 ft bgs
200 ft upstream	6	0'	1600	2" above water level in sand plug
	7	2.0'-3.0'	1600	2" above water level in sand plug
600 ft upstream	8	0'	1615	7" below water level in canal, not connected to ocean
	9	2.0'-3.0'	1615	7" below water level in canal, not connected to ocean
100 ft upstream	3	2.0'-2'10"	1545	1-2" above water level in sand plug
	4	2'10"-3.0'	1545	1-2" above water level in sand plug
	5	0'	1545	1-2" above water level in sand plug
400 ft upstream	10	0'	1630	1' below water level in canal, not connected to ocean upstream of sand plug
	11	2'-2.5'	1630	1' below water level in canal, not connected to ocean. Bent tip at end may have prevented sediment from filling in
	12	0.5'-2'	1630	1' below water level in canal, not connected to ocean upstream of sand plug

Conclusions

All collected sand samples will be provided to OCCL for review. Based on the investigation, sand removed from zero to three (3) ft bgs between the canal mouth to approximately 400 ft upstream appears to be suitable for beach nourishment. Sand located at 400 ft and greater upstream of the Waipouli canal mouth is darker in color than existing beach sand at the project site. The dark appearance of these sand grains is expected to fade once exposed to light and wave action at the beach fill site. In addition, this sand may be used to fill sand bags to create the temporary groin instead of being placed directly on the beach. The core sand sample collected at 600 ft contained organic material unsuitable for beach placement. To avoid the use of unsuitable material, BMPs such as dredging and stockpiling oversight by qualified staff may be employed.

Table 3-6: Photographs of Sand Profiles from Waipouli Canal

Location upstream (ft)	Photograph	Location upstream (ft)	Photograph
0		400	
100		600	
200			

3.4 Marine Bottom Type at Fill Site

Methods

Marine bottom type in the tidal channel area to the beach rock reef crest was observed during low tide (~0.9 ft). At low tide, the reef crest is exposed and waves rarely break into the tidal lagoon area, which results in a pond with little current flow (Table 3-2). Photographs were taken and observations were made of the marine bottom type in the project area. The percent cover was described utilizing a grid system of 50 square-ft grids. The location of the former groin (and proposed groin location) demarcated the center of the grid system, and the grids spanned 150 ft to the north and south of the former groin in 50-ft increments (Figure 3-2). Individual percent cover of each grid was estimated and used to estimate average percent cover of the project area. Descriptions of biota observed were also recorded. The bottom type map of the reef flat zone is shown in Figure 3-5.

Field personnel swam offshore of the reef crest along the transect shown in Figure 3-2 to observe benthos outside of the project area.

Benthic habitat data from the National Oceanic and Atmospheric Administration (NOAA)¹ were also obtained. The data show that the major benthic biological cover and type in the project area is classified as “Turf” (Figure 3-5). “Turf” is defined as turf algae: “densely packed algae, usually filamentous, which rise less than one centimeter above the substratum upon which they are growing” (NOAA definition). No other benthic habitat classification is in the project vicinity.

Results

The project site marine bottom type consists of approximately 40 percent (%) carbonate sand, 25% coral rubble, 30% beach rock, and 5% large rocks and boulders (Figure 3-6). The longshore channel sand area was littered with coral rubble and sparse rock. Most of the biotic organisms living within the fill site were mobile fish, crustaceans (e.g., hermit crabs), sea cucumbers, brown algae, and marine gastropods that could either move on their own or be relocated prior to construction. In the hard reef area, only a few sea urchins, gastropods, and turf algae were present.

No live corals were observed in the reef flat area. Corals were observed in the offshore area outside of the project site and consisted mainly of cauliflower corals (*Pocillopora meandrina*), *Porites lobata*, and few *Montipora spp.* and *Acropora spp.* individuals. This area is in shallow water exposed to high wave action, therefore live corals are rare in the area.

¹ Source: National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS), 2017. NOAA Shallow-Water Benthic Habitats: Hawaii: Kauai. 22 November. Available online at: http://www.pacioos.hawaii.edu/metadata/hi_noaa_kaua_benthic_habitats.html.

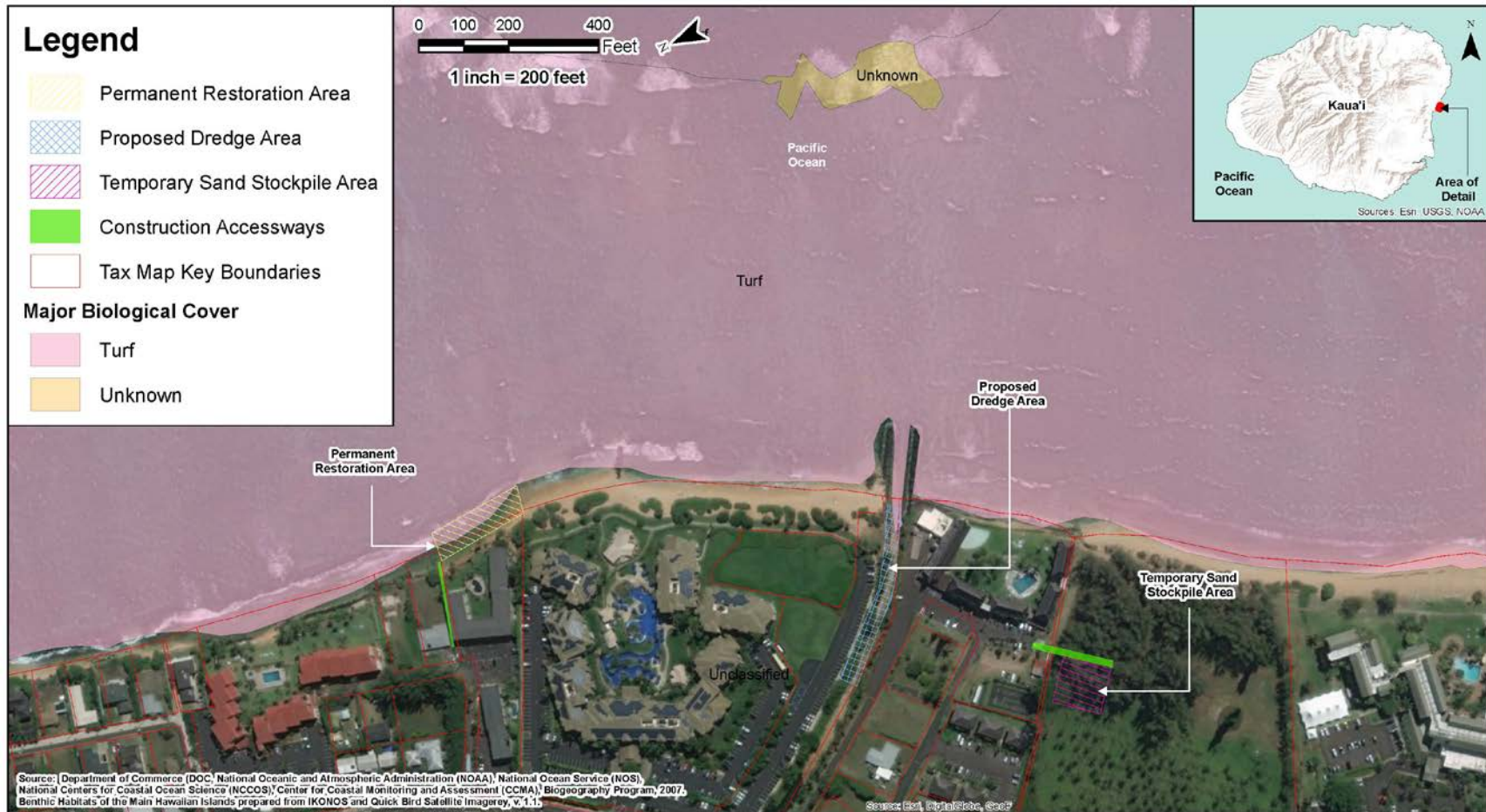


Figure 3-5: NOAA Major Benthic Biological Cover

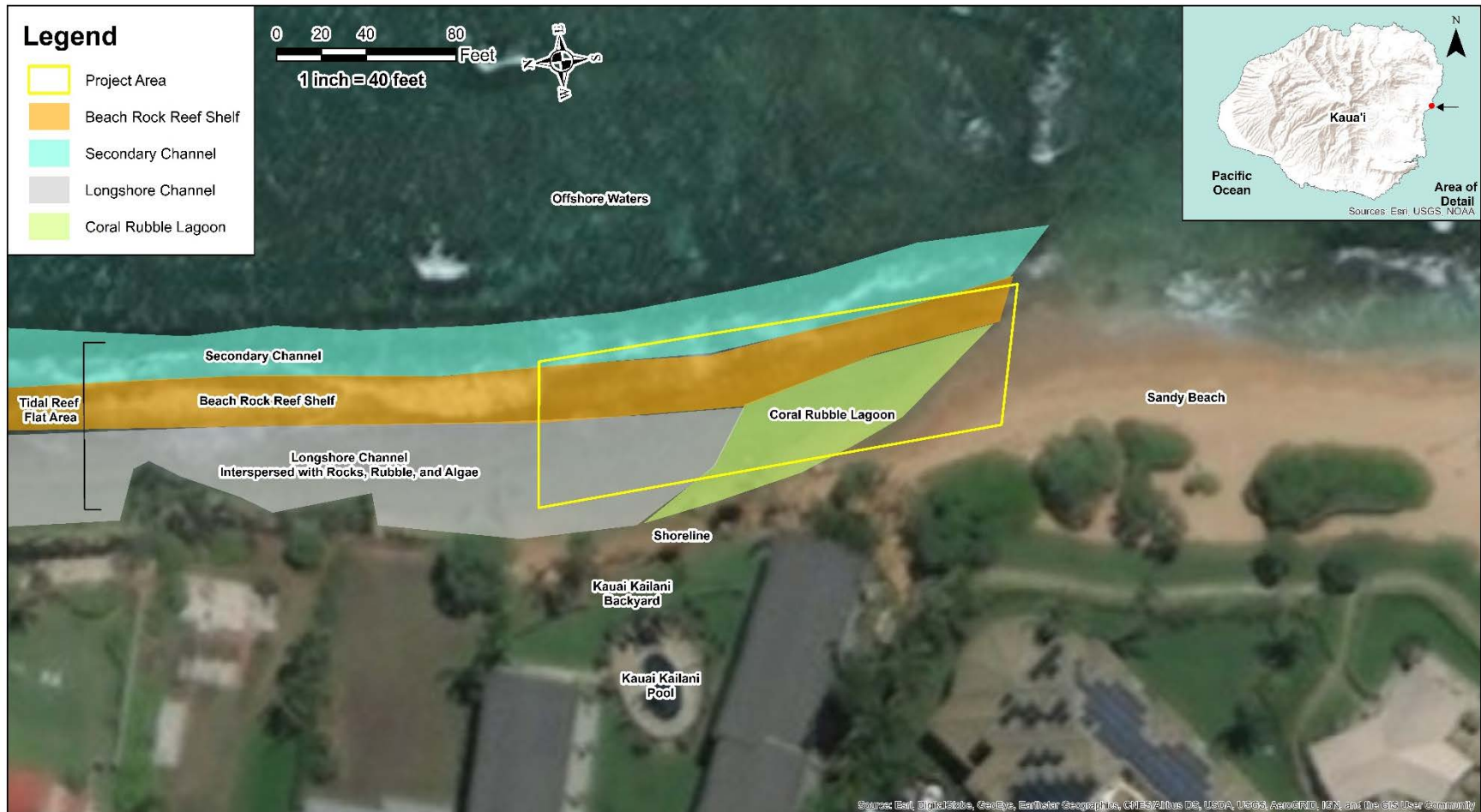


Figure 3-6: Marine Bottom Type Map

Conclusions

The proposed project is not expected to have an impact on existing corals. The bottom type of the proposed beach and groin are mainly calcareous sand, hard beach rock, and coral rubble. No live corals are within the fill site, and only common motile biological organisms were observed in the project area. The strong wave action during high tide and exposed reef at low tide may prevent the establishment of a more diverse marine community. To minimize impacts sessile or less motile organisms such as sea cucumbers and gastropods, BMPs for the proposed project may include relocation of species prior to placing the beach fill or groin.