



MEMORANDUM

DATE: September 3, 2024

TO: Department of Land and Natural Resources (DLNR)
Office of Conservation and Coastal Lands (OCCL)
1151 Punchbowl Street, Room 131
Honolulu, Hawai'i 96813
E: dlnr@hawaii.gov

LOCATION: Kauai Kailani Condominiums
4-586 Kūhiō Highway
Kapa'a, Hawai'i 96746

PROJECT: Kauai Kailani Beach Restoration (Project No. 201752)

SUBJECT: Preliminary Completion Report for Category II Small-Scale Beach Nourishment Seaward of Kauai Kailani Condominiums at 4-856 Kūhiō Highway, Kapa'a, Kaua'i, TMK: (4) 4-3-009:041

1. Introduction

This memorandum was prepared on behalf of the Kauai Kailani Association of Unit Owners (AOUO) to document the initial completion of the beach nourishment and temporary sandbag groin construction fronting the Kauai Kailani property in Kapa'a, Kaua'i. The Conservation District Use Permit (CDUP) for the Small-Scale Beach Nourishment (SSBN) project was approved by the State of Hawai'i on June 4, 2019 (SSBN KA 19-3830), with three (3) subsequent time extensions issued on July 3, 2020, June 8, 2021 (KA-21-11) and April 23, 2022 (KA-22-08), which allowed for additional required permit approvals. The approved SSBN CDUP allows for future maintenance re-nourishment of the beach, as needed, to accommodate for erosion events, but the project is to be completed within ten (10) years.

2. Background

The project site is located along the shoreline fronting the Kauai Kailani Condominiums at 4-856 Kūhiō Highway in Kapa'a, on the east side of the island of Kaua'i (Figure 1). Chronic and episodic coastal erosion following the removal of a concrete groin at the northern boundary of the site in 2012 resulted in the loss of the sandy beach. The shoreline erosion caused soils, trees, vegetation, and other debris to fall into the nearshore waters. A

temporary shoreline erosion control was installed in 2017 with the approval of the DLNR. The geotextile fabric structure was permitted to remain in place while a long-term solution was actively developed. The subject beach restoration project is the long-term sustainable solution that was designed and constructed to help stabilize the shoreline and buffer the property from erosion and other coastal hazards. The recent beach nourishment work involved placing sand fill along approximately 210 linear feet (ln. ft.) of shoreline fronting the Kauai Kailani Condominiums. The borrow site for obtaining the beach quality sand was the mouth of the Waipouli Drainage Canal. The restored beach was stabilized against coastal erosion by the installing an 80 ft. long by 18 ft. wide groin constructed of sand-filled geotextile fabric containers.



Figure 1. Project location map

3. Project Timeline

Estrella Enterprises LLC (“Contractor”) was contracted by the Kauai Kailani AOUO to perform the work. Construction began with the recovery of sand from the Waipouli Drainage Canal on January 30, 2023. Construction work was substantially completed by June 28, 2023, when the groin and beach fill was initially completed. Construction of the project was not entirely complete, however, until dune vegetation was established on the beach berm and monitoring data showed that additional sand for nourishment repairs would not be required following the winter season. In March 2024, a temporary pedestrian barrier that helped protect plantings of native grasses, vines and shrubs while they established was removed. Future maintenance renourishment may be performed on an as needed basis until June 4, 2029, as allowed by SSBN KA 19-3830.

4. Construction Process

The Contractor began the work by installing best management practices (BMPs) to reduce the risk to ocean water quality from project activities. The BMPs at the borrow site included a sand plug and silt curtain at the mouth of the Waipouli Drainage Canal mouth. Fiber rolls were installed along the bank at locations of disturbed soils. Shrubs and other vegetation were cleared in limited areas for equipment to access the canal embankment. An estimated 1,400 cubic yards (cu. yd.) of beach quality material were recovered from the canal by mechanical dredging. The sand was dewatered and screened of coarse material. An archeologist, Exploration Associates Ltd., monitored the spoils for any potential artifacts. The sand was then transported to the stockpile location to be aerated for at least two (2) weeks. Dredge spoils were carefully observed to keep beach quality material separate from other soils.

At the site of the beach restoration seaward of the Kauai Kailani property, the Contractor began work by installing BMPs consisting of a silt curtain and temporary wave barrier. Beach sand recovered from the dredge site was used to create an access path for heavy equipment in the nearshore area. Construction of the groin began at the site with the leveling of the foundation footprint. Loose sand was moved aside, and stones were arranged to form a level pad at the planned foundation elevation. The foundation was constructed around the limestone “beach rock” formation parallel to the shoreline. To avoid disturbing this natural geology, the limestone shelf became the foundation pad in areas where it was encountered. In this way, the groin design was modified during construction to adapt to the natural geology.

The recovered beach quality material was used to fill Elcorock® 2.5 cubic meter geotextile fabric containers. The groin was formed by stacking three (3) layers of the containers above the foundation fabric placed over the stone foundation pad. A stepped structure was formed with each successive layer offset horizontally by about two feet from the layer below. Voids between the Elcorock® containers and the irregular underlying limestone shelf were filled with non-woven geotextile fabric filled with imported sand.

Upon completion of the groin, the Contractor placed the recovered sand along the shoreline to fill the beach according to the nourishment profile. A beach berm was graded and cordoned off with a temporary pedestrian barrier to help protect plantings of native grasses, vines and shrubs while they established.

During inspections, Oceanit engineers observed that temporary high visibility safety fencing was installed around the active work and staging areas to restrict access of all non-authorized personnel. Construction signs were posted forefront and center of the site. Work along the shoreline was conducted during periods of expected favorable tide

and wave conditions. Contractor personnel kept watch for sea turtles, monk seals, or other endangered or protected species entering the vicinity of the construction activities. Water quality monitoring was performed by Owen Environmental prior to, during and after construction in accordance with the project's the Section 401 Water Quality Certification (1055.FNL.20 and time extension 1055.EXT.22).

5. Observed Deviations

Oceanit observed the Contractor made three (3) deviations from the project design during the construction, which are as follows:

1. The density of coconut and ironwood trees on TMK (4) 4-3-007:027 made sand stockpiling on the lot challenging. Instead, the Contractor made arrangements to stockpile dredged material on TMK (4) 4-3-007:008 with property owner and County of Kauai approval.
2. As the loose sand was excavated, the shape of the existing limestone reef shelf in the groin footprint became known. To install the groin, design adjustments were made to blend the structure with the natural topography and prevent disturbance to the existing geological feature. The seaward end of the groin was modified to step up onto the limestone shelf. The change resulted in a groin crest elevation of about +9 ft. MLLW for the seaward-most portion of the groin.
3. An approximately one to two foot tall sand berm, with 2:1 (H:V) side slopes, planted with native shoreline vegetation, was installed on the landward boundary of the beach nourishment area.

6. Project Monitoring

To observe the project construction, Oceanit performed frequent inspections during construction and monitored the project post-construction while vegetation was establishing on the restored beach berm. A field camera monitoring system was installed prior to the beach fill and groin construction. The beach monitoring program has continued since completion of the initial construction to evaluate the project performance and help determine when additional renourishment of the beach is needed.

The field camera was installed in March 2023, with a vantage point that allowed for observation of the nourished beach and groin structure. The camera frequently collected images throughout the day, recording the changing tide and seasonal cycles. Data reported by the NOAA water level gage at Nawiliwili (Station ID 1611400) was referenced to identify camera images taken at similar tide levels. These images were compared to assess the changes to the beach fill and groin over time.

Observations and photographs of the project were made during periodic site inspections. Photographs taken during the inspections before, during and after construction are included in Attachment A as Figures 1 through 21. The only observed damage to the groin's geotextile containers since construction is a small puncture in the geotextile fabric at the seaward-most crest of the groin (Figure 19). Photographs of the project beach profile and the sandbag groin taken during a recent site inspection are provided in Figures 20 and 21.

Field camera photographs are documented in Figures 22 through 32. These photographs were selected from the extensive monitoring dataset. Each selected photograph was taken during a low tide condition, which allows for visual comparison of the beach fill area when it is fully exposed.

7. Conclusion

Based on our observation, the Kauai Kailani AOUO has implemented the initial phase of this project according to the general conditions of the CDUP. Monitoring data collected before, during and after the construction of the project show the stability of the groin and beach fill. Following the groin construction and the initial sand placement, only minor fluctuations in the project beach profile have been observed. Besides an apparent man-made puncture, no damage or displacement to the geotextile containers have been observed. The establishment of resilient dune plants on the beach berm is observable in the monitoring data. Overall, the project beach has been stable over the initial monitoring period. The Kauai Kailani AOUO is continuing to collect data under its monitoring program to determine when additional nourishment is required.

For additional information, or should you have any questions or comments, please contact Dr. Michael Foley, P.E., by telephone at (808) 531-3017 or by email at mfoley@oceanit.com.

Attachments: **Attachment A** – Photographs

Cc: Kauai Kailani AOUO

ATTACHMENT A
Photographs



Figure 1. Photograph taken before construction, on October 21, 2016, showing the pre-existing extent of shoreline erosion at the Condominiums, facing north



Figure 2. Photograph taken before construction, on October 31, 2018, showing typical nearshore conditions, facing east



Figure 3. Photograph taken before construction, on October 20, 2020, showing pre-existing sandbag shoreline protection fronting the Condominiums, facing south



Figure 4. Photograph taken before construction, on January 18, 2021, showing southern end of pre-existing sandbag shoreline protection fronting the Condominiums, facing north



Figure 5. Photograph taken before construction, on August 1, 2018, showing Waipouli Drainage Canal, facing west



Figure 6. Photograph taken before construction, on August 1, 2018, showing sand accumulation at the eastern end of Waipouli Drainage Canal, facing east



Figure 7. Photograph taken during construction, on February 1, 2023, showing sand plug and silt curtain BMPs at the eastern end of Waipouli Drainage Canal, facing north



Figure 8. Photograph taken during construction, on February 8, 2023, showing temporary sand stockpiles being screened for coral fragments, with geotextile foundation fabric, fiber roll and silt fence BMPs



Figure 9. Photograph taken during construction, on February 16, 2023, showing the dredged Waipouli Drainage Canal, facing east



Figure 10. Photograph taken during construction, on March 31, 2023, showing installation of the sandbag groin during low tide, facing south



Figure 11. Photograph taken during construction, on April 10, 2023, showing placement of beach nourishment during low tide, with silt curtain BMP in place, facing south



Figure 12. Photograph taken during construction, on May 17, 2023, showing the dredged Waipouli Drainage Canal, facing east



Figure 13. Photograph taken during construction, on May 17, 2023, showing sandbag groin, beach nourishment and unvegetated sand berm, facing south



Figure 14. Photograph taken during vegetation establishment, on August 29, 2023, showing sandbag groin, beach nourishment and partially vegetated sand berm, facing south



Figure 15. Photograph taken after vegetation establishment, on March 19, 2024, showing sandbag groin, beach nourishment and vegetated sand berm, facing south



Figure 16. Photograph taken after vegetation establishment, on March 19, 2024, showing sandbag groin and beach nourishment abutting adjacent property to the north, facing south



Figure 17. Photograph taken after vegetation establishment, on March 19, 2024, showing beach nourishment and vegetated sand berm, facing south



Figure 18. Photograph taken after vegetation establishment, on March 19, 2024, showing sandbag groin, beach nourishment and vegetated sand berm, facing north

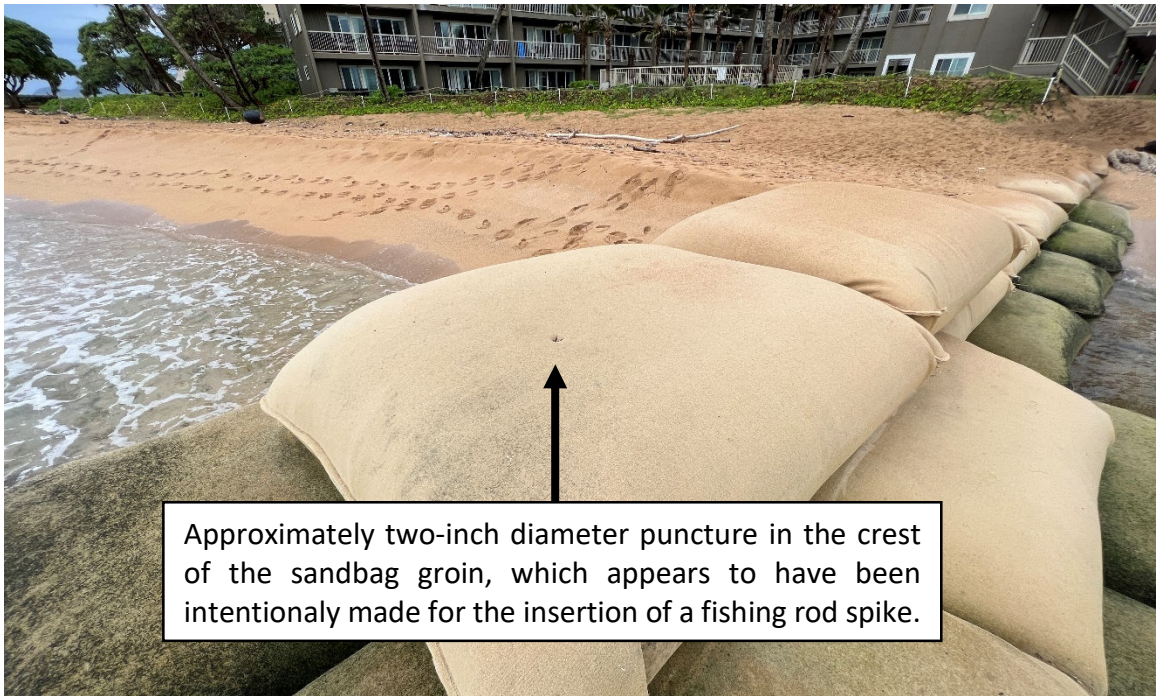


Figure 19. Photograph taken on November 30, 2023, showing minor damage that was observed to one of the groin's geotextile containers



Figure 20. Photograph taken during site inspection on August 9, 2024, facing north



Figure 21. Photograph taken during site inspection on August 9, 2024, facing south



Figure 22. Photograph taken on March 23, 2023, at 9:33 AM, during project construction



Figure 23. Photograph taken on June 6, 2023, at 12:05 PM, after sand fill and groin placement



Figure 24. Photograph taken on July 3, 2023, at 11:05 AM



Figure 25. Photograph taken on August 1, 2023, at 9:05 AM



Figure 26. Photograph taken on October 10, 2023, at 6:33 AM



Figure 27. Photograph taken on November 20, 2023, at 5:30 PM



Figure 28. Photograph taken on December 22, 2023, at 5:27 PM



Figure 29. Photograph taken on January 6, 2024, at 5:29 PM



Figure 30. Photograph taken on February 6, 2024, at 6:01 PM



Figure 31. Photograph taken on March 11, 2024, at 11:02 AM



Figure 32. Photograph taken on April 1, 2024, at 5:46 PM