



US Army Corps
of Engineers
Honolulu District

Public Notice of Application for Permit

Regulatory Branch (1145b)
Building 230
Fort Shafter, Hawaii 96858-5440

Public Notice Date: December 12, 2012
Expiration Date: January 12, 2012
Permit File Number: POH-2011-00011

Interested parties are hereby notified that an application has been received for a Department of the Army permit for certain work in waters of the United States as described below and shown on the attached drawings.

APPLICANT: County of Kauai, Department of Public Works, 4444 Rice Street, Moikeha Bldg, Suite 275, Lihue, Hawaii, 96766-1340.

AGENT: Mr. Brian Takeda, R. M Towill Corporation, 2024 North King Street, Suite 200, Honolulu, Hawaii, 96819.

LOCATION: Pacific Ocean along Moanakai Road, Kauai Isle, Hawaii. TMK: (4) 4-5-002: 023
Coordinates: 22.06472 N, 159.31722 W.

WORK: The applicant proposes to replace a 520-ft long portion of the existing seawall (revetment) with a hybrid stone rubblemound revetment and an offset seawall. Turbidity curtains and sandbags/flexible intermediate bulk containers (FIBC) filled with clean and compatible sand would be installed to protect the marine environment and deflect waves while work is in progress.

PURPOSE: Coastal bank stabilization.

ADDITIONAL INFORMATION: The existing seawall along Moanakai Road was previously reconstructed without a permit from the Department of the Army (DA) because it was exempt from regulation under Section 404 of the Clean Water Act pursuant to Section 404(f)(1)(B) and did not involve structures or work in or affecting navigable waters that would have been subject to regulation under Section 10 of the Rivers and Harbors Act of 1899. Currently, the Moanakai Road is threatened by erosion from waves washing through the seawall, resulting in sinkholes along the road's shoulder and structural instability. The damaged seawall is also safety hazard that threatens the public's safe use of the adjacent road, shoulder, and beach. To prevent further erosion and collapse of approximately 1,080 linear ft of county road, the applicant proposes to replace the center portion of the existing seawall at the Moanakai Road and Makaha Road intersection with a new hybrid seawall-revetment structure. The new revetment-seawall would be 520-ft long consisting of a 4-ft deep revetment with a dual layer of stones, a 100 to 200 lb stone layer overlaid with a layer of 1,500 to 2,000 lb armor boulders, and bounded at the crest with a concrete rubble masonry (CRM) seawall

(Appendix A). Temporary best management practices (BMPs) (e.g., turbidity curtains, sandbags/FIBCs) would be installed prior to the start of work, which would involve complete removal of the existing seawall and construction of a new revetment with a reduced footprint of 0.06 acre within waters of the U.S.

MITIGATION: The seawall would result in a final footprint that reduces the existing footprint of the seawall structure by 60% of its original size within waters of the U.S. The proposed project would employ site-specific BMPs and would not result in any additional loss of waters of the U.S. or cause significant or long-term adverse impacts to aquatic resources functions and services, including special aquatic sites (e.g., wetlands, coral reefs, vegetated shallows), and therefore, compensatory mitigation is not warranted.

WATER QUALITY CERTIFICATION: The proposed action would result in a discharge of fill material into a water of the U.S. and would require authorization from the Corps under Section 404 of the Clean Water Act of 1972 (33 U.S.C. 1344) (CWA). Under Section 401 of the CWA, the Corps may not issue a permit for the described work until the applicant obtains a certification, or a waiver of certification, from the State of Hawaii, Department of Health, Clean Water Branch.

COASTAL ZONE MANAGEMENT ACT CERTIFICATION: The proposed action will affect land or water uses in the Coastal Zone. Under Section 307(c)(3) of the Coastal Zone Management Act of 1972, as amended by 16 U.S.C. 1456(c)(3), the Corps may not issue a permit for the described work until the applicant obtains a Federal Consistency Concurrence from the State of Hawaii, Department of Business, Economic Development, and Tourism, Office of Planning.

PUBLIC HEARING: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state clearly and concisely, the reasons and rationale for holding a public hearing.

CULTURAL RESOURCES: The latest published version of the National Register of Historic Places (NRHP) has been consulted for the presence or absence of historic properties, including those listed in or eligible for inclusion in the NRHP. There are no listed or eligible properties in the vicinity of the worksite. Consultation of the NRHP constitutes the extent of cultural resource investigations by the District Engineer at this time, and he is otherwise unaware of the presence of such resources. This application is being coordinated with the State Historic Preservation Division (SHPD). Any comments SHPD may have concerning presently unknown archeological or historic data that may be lost or destroyed by work under the requested permit would be considered in our final assessment of the described work.

The Corps requests consultation with Native Hawaiian Organizations and individuals to gather information regarding historical properties, including Native Hawaiian cultural practices and historic uses in the proposed permit area.

ENDANGERED SPECIES: Pursuant to Section 7 of the Endangered Species Act of 1973 (16 U.S. C. 1531 *et seq.*) (ESA), federal agencies must consult with the National Marine Fisheries Service (NMFS) and/or U.S. Fish and Wildlife Service (USFWS) on any action that may affect a species listed (or proposed for listing) under the ESA as threatened or endangered or any designated critical habitat. We have determined the following listed species have the potential to occur near the project location:

- Hawksbill sea turtles (*Eretmochelys imbricate*), endangered
- Green sea turtles (*Chelonia mydas*), threatened
- Hawaiian monk seals (*Monachus schauinslandi*), endangered
- Hawaiian Petrels (*Pterodroma phaeopygia sandwichensis*), endangered

Newell's Shearwaters (*Puffinus auricularis*), endangered
Hawaiian hoary bats (*Lasiurus cinereus semotus*), endangered

The project location is absent of designated critical habitat for ESA-listed species.

Based on the applicant's proposed project scope and site-specific best management practices (BMPs) (Appendix B), the Corps has preliminarily determined this project may affect, but would not likely adversely affect the federally listed species identified above. Pursuant to Section 7 of the ESA, we will be initiating informal consultation with NMFS and USFWS.

ESSENTIAL FISH HABITAT: Pursuant to Section 305(b) the Magnuson Stevens Fishery Conservation and Management Act of 1996 (16 U.S.C. 1855(b)) (Magnuson-Stevens Act) and associated federal regulations found at 50 CFR Part 600, Subpart K, the proposed work is being evaluated for possible effects to Essential Fish Habitat (EFH). The Honolulu District area of responsibility includes areas of EFH as Fishery Management Plans. We have reviewed the January 20, 1999, Western Pacific Fishery Management Council's Environmental Assessment to locate EFH area as identified by the National Marine Fisheries Service (NMFS). We have determined that the described activity within the proposed area will not adversely affect EFH, including federally managed fishery resources.

AUTHORITY: This permit application will be reviewed under the following authorities:

(X) Perform work in or affecting navigable waters of the United States – Section 10 of the Rivers and Harbors Act 1899 (33 U.S.C. 403).

(X) Discharge dredged or fill material into waters of the United States – Section 404 of the Clean Water Act (33 U.S.C. 1344). The Corps' public interest review will consider the guidelines developed under Section 404(b)(1) of the CWA, which are promulgated at 40 CFR Part 230.

() Transport dredged material for the purpose of dumping it into ocean waters - Section 103 Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1413). The Corps' public interest review will consider the criteria established under authority of Section 102(a) of the Marine Protection, Research and Sanctuaries Act of 1972, as amended (40 CFR Parts 220 to 229), as appropriate.

EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people.

The U.S. Army Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; and other interested parties in order to consider and evaluate the impacts of this activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition, or deny a permit for the work. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National

Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the activity.

COMMENT AND REVIEW PERIOD: Conventional mail or e-mail comments on this public notice will be accepted and made part of the record and will be considered in determining whether it would be in the public interest to authorize this proposed work. In order to be accepted, e-mail comments must originate from the author's e-mail account and must include on the subject line of the e-mail message the permit applicant's name and reference number as shown below. All e-mail comments should be sent to **joy.n.anamizu@usace.army.mil**. Conventional mail comments should be sent U.S. Army Corps of Engineers, Honolulu District, Building 230 (Attn: CEPOH-EC-R/J. Anamizu), Ft. Shafter, HI 96858-5440. Both conventional mail and e-mail comments must include the permit applicant's name and reference number, as shown below, and the commentor's name, address, and phone number. **All comments whether conventional mail or e-mail must reach this office, no later than the expiration date of this public notice to ensure consideration.** Please include the reference number: **POH-2011-00011.**

Comments on the described work, with the reference number, should reach this office no later than the expiration date of this Public Notice to become part of the record and be considered in the decision. Please contact **Ms. Joy Anamizu** at (808) 835-4308 if further information is desired concerning this notice. This public notice is issued by the Chief, Regulatory Branch.

District Engineer.
U.S. Army, Corps of Engineers

Attachments

- Appendix A: DA permit application and construction drawings
- Appendix B: Site-specific best management practices

18. Nature of Activity (Description of project, include all features)

See Attachment 1, Block 18.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

See Attachment 1, Block 19.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

See Attachment 1, Block 20.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type	Type	Type
Amount in Cubic Yards	Amount in Cubic Yards	Amount in Cubic Yards

See Attachment 1, Block 21.

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres See Attachment 1, Block 22.

Or
Liner Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See Attachment 1, Block 23.

24. Is Any Portion of the Work Already Complete? Yes No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

Address -- See Attachment 1, Block 25.

City -- State -- Zip --


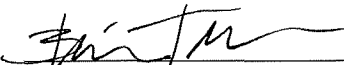
26. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
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See Attachment 1, Block 26.

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

	<u>4-7-12</u>		<u>4/16/2012</u>
SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

Section 2

Supplemental Information

**Department of the Army Permit Application
ENG4345A**

**Moanakai Seawall Repair and Reconstruction
Kapa'a, Kaua'i, Hawai'i**

Block 17

**Directions to the Site from Līhu'e Airport
To Moanakai Road, Kapa'a, Kaua'i**

Directions from Līhu'e Airport

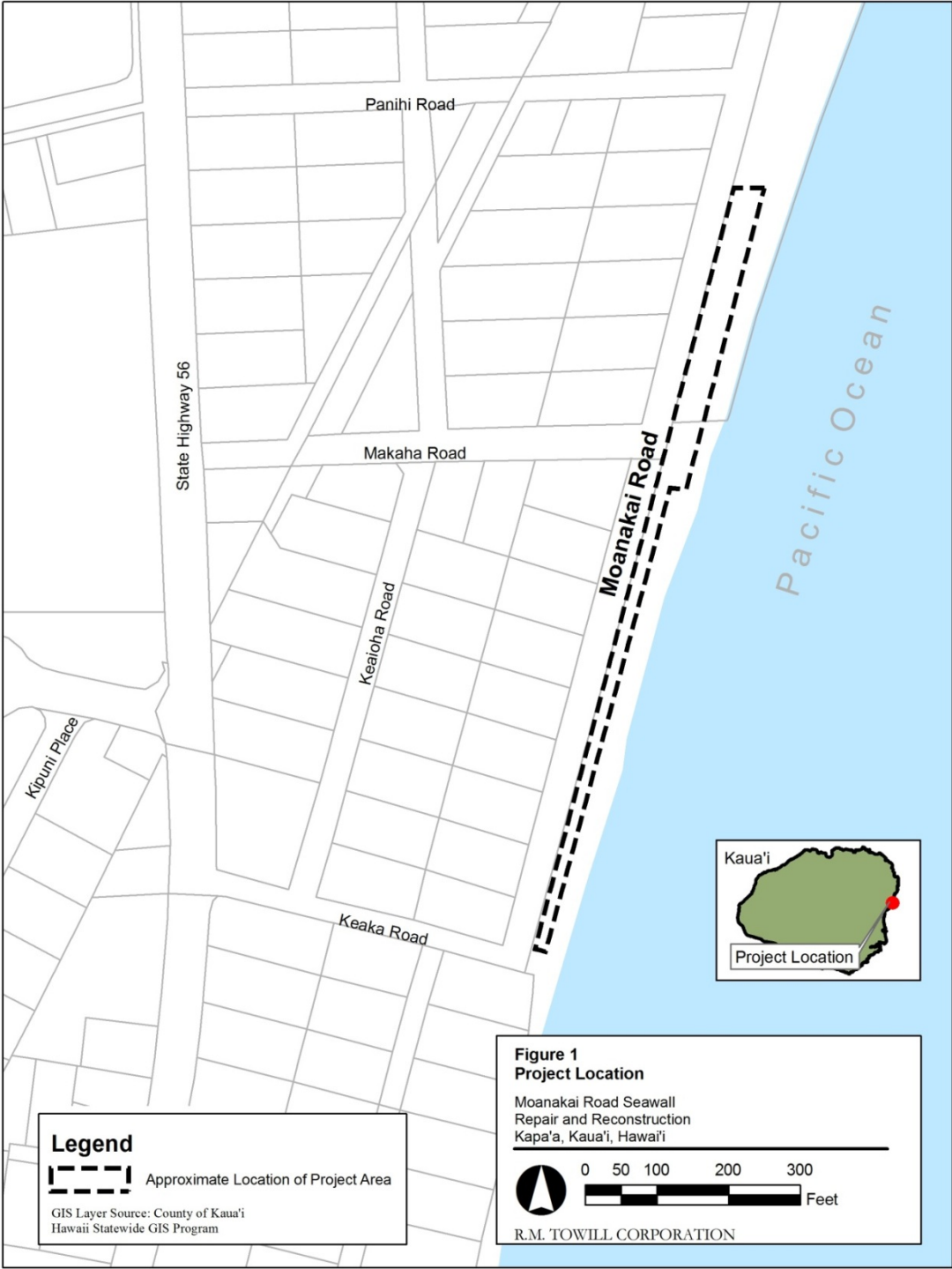
7.3 miles

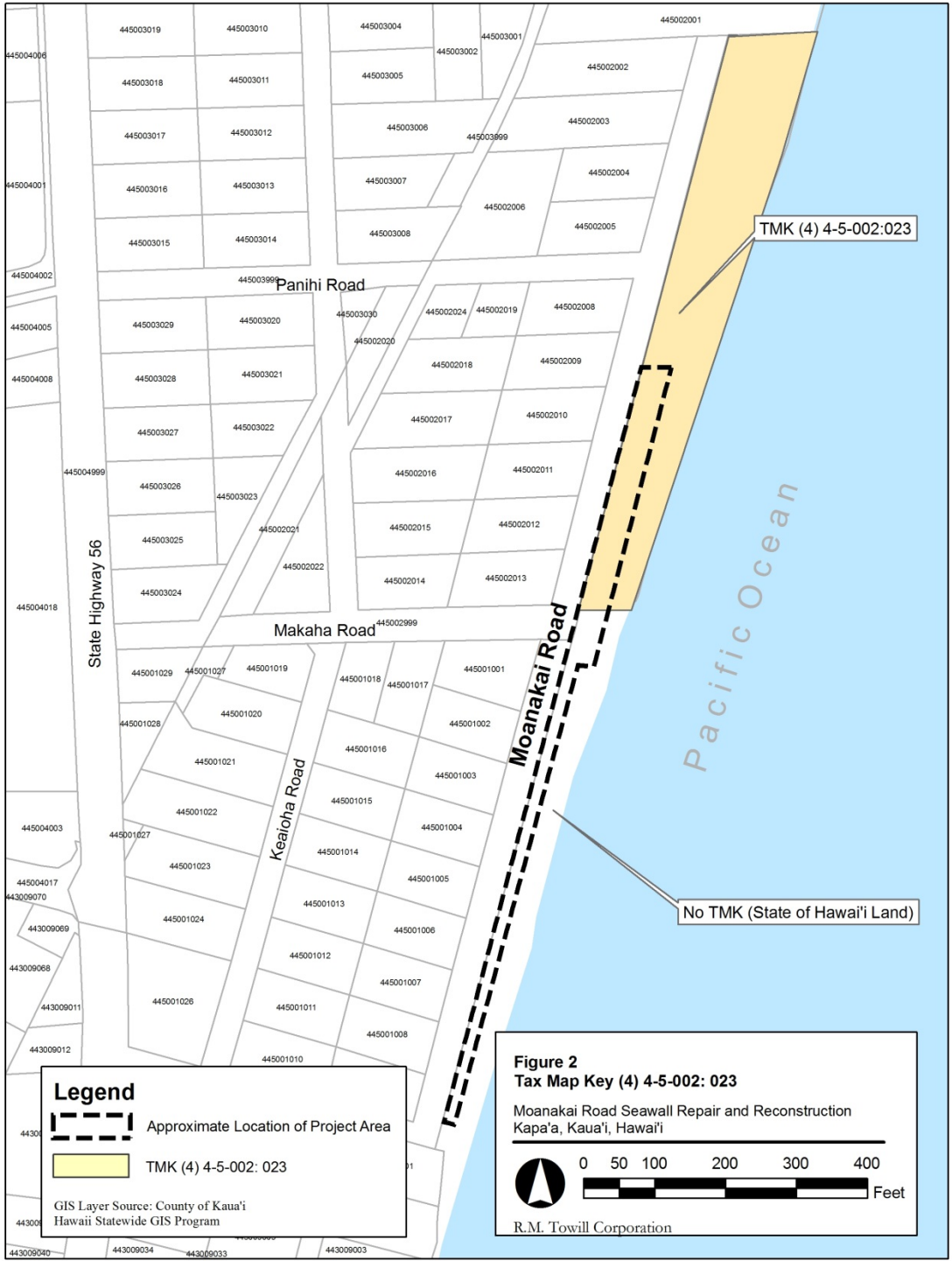
- | | |
|--|--------|
| 1. Depart Mokulele Loop toward Ho'olimalima Pl | 0.0 mi |
| 2. Bear right and then turn right onto Ka'ana St | 0.0 mi |
| 3. Turn right onto HI-51 / Kapule Hwy | 1.9 mi |
| 4. Bear right onto HI-56 / Kūhiō Hwy | 5.1 mi |
| 5. Turn right onto Keaka Rd | 0.0 mi |
| 6. Turn left onto Moanakai Rd | 0.0 mi |

Existing Conditions

The project site, owned by the State of Hawai'i, is located within an approximately 1,080 foot corridor running parallel to Moanakai Road and partially within Tax Map Key (4) 4-5-002: 023, Kapa'a Ahupua'a, Kawaihau District (Puna Moku), Kaua'i. See **Figure 1, Project Location** and **Figure 2, Tax Map Key**. East of Moanakai Road is the Pacific Ocean, and to the west are single family residences. The Moanakai seawall runs parallel to and between Moanakai Road and the coastline. The south end of the seawall begins near the intersection of Moanakai Road and Keaka Road, extending for approximately 1,080 feet northward along the eastern shoulder of Moanakai Road. Moanakai Road ends approximately 400 feet south of the Waika'ea Canal.

Nearly twenty years since its construction, the seawall is presently in poor condition with erosion occurring between the road and seawall in the form of sinkholes and undermining of the shoulder of the road. This condition poses a risk of shoreline erosion, damage to property, and the safety of vehicles, passengers, and users that traverse along Moanakai Road (i.e., pedestrians, joggers, bicyclists, fishermen, and sightseers).





Block 18

Nature of Activity

The Kaua'i County's Department of Public Works (DPW) proposes to repair and restore the existing Moanakai seawall. The objectives of the proposed project include the following:

- Provide improved shoreline protection to address the immediate need for vehicular and pedestrian safety for users of Moanakai Road;
- Maintain safe public access to the shoreline;
- Minimize the possibility of adverse future effects to the surrounding shoreline from dilapidation of the Moanakai seawall; and
- Preserve the existing property along both makai and mauka ends of the project site.

The proposed project will be divided into two segments; the southern reach (stations 0+00 to 5+70) and the northern reach (stations 5+70 to 10+50). The southern reach, while some damage is evident, does not appear to be sufficient to significantly de-stabilize the revetment. Ongoing maintenance of this reach will be undertaken as the most viable alternative, e.g., filling the sink holes, removing dead trees and replacing them with armor stone. The repairs and maintenance can be done above the MHHW (mean higher high water) line and behind the existing revetment.

The existing revetment along the northern reach is badly damaged and has failed completely, or is likely to fail in the future. This portion of the revetment will be rebuilt in accordance with generally accepted design practice.

Southern Reach (Stations 0+00 to 5+70)

1. All trees, stumps and vegetation that interfere with the stability of the structure will be removed.
2. Base course and cement cap will be saw cut and sinkholes will be lined with geotextile filter fabric prior to filling.
3. Fill will be replaced in sinkholes, as needed. Removed trees will be replaced with armor stone and also filled as needed with appropriate material, e.g., gravel, base course, or crusher run.
4. All debris will be hauled off-site and disposed at a county-approved landfill site in conformance with County of Kaua'i regulations.

Northern Reach (Stations 5+70 to 10+50)

This portion of the revetment will be rebuilt based on a hybrid seawall containing elements of both a revetment and a seawall which are proposed to reduce the overall revetment footprint. The seawall would be constructed as a CRM or similar material wall prior to construction of the revetment. The top of the CRM wall is designed to have a typical elevation +9.5 feet MLLW. While the elevation of the road varies along the project reach, the crest elevation should remain constant, and if variability in the structure elevation is required to meet road requirements, then the variability should be made to the CRM wall, rather than the rocks. The base of the wall should extend to below the armor layer.

The steps involved will include:

1. Existing revetment will be removed, working inward from shore to the road. As required the contractor will maintain the existing revetment.
2. Loose sand and gravel will be excavated to place the revetment stone on hard, non-erodible, rock substrate.
3. Smaller two- to four-hundred pound underlayer stones will be placed on geotextile fabric.
4. A single armor stone layer will be placed over the underlayer stone and geotextile fabric. Existing armor stone will be reused as available to create the revetment¹. The stones will be carefully chosen and placed in a keyed and fitted manner to minimize gaps between stones and ensure maximum contact between adjacent stones.
5. A reinforced concrete header will be constructed at the top of the revetment against the crest stones. Imported granular fill will be used to fill in areas mauka of the concrete header before replacing the road shoulder.
6. Base course will be used to reconstruct the road shoulder against the concrete header.

The area of disturbance on the Northern Reach will extend about 20 feet outward from the end of the existing seawall. The estimated amount of fill to be placed below the MHHW is approximately 1,600 cubic yards of fill material for 520 linear feet (we interpret MHHW to be comparable to the mean high tide level).

See **Figure 3, Alternative 2 – Hybrid Seawall/Revetment** (below).

¹ “Standard rock revetment design practice is for armor stones to be within the allowable size range to maximize interlocking and stability, as well as to insure that layer thicknesses and “neat line” slope tolerances are maintained. Of the 10 armor stones measured, only one is considered to be of proper size to be reused. Based solely on this, it can be tentatively concluded that about 10% of the rocks on site may be reused.” (**Appendix A of Final EA**, Section 5.5, Additional Design Considerations, Moana Kai Road Coastal Assessment, Sea Engineering, Inc., 2011).

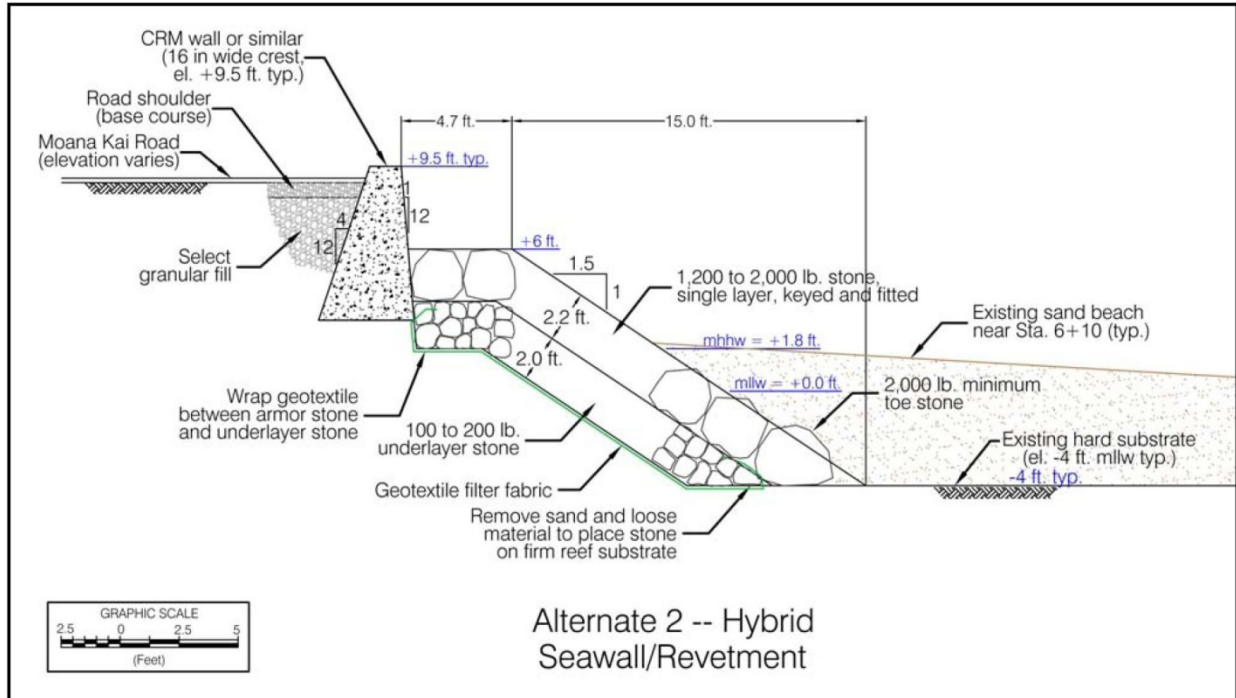


Figure 3
Alternative 2 – Hybrid Seawall/Revetment
Moanakai Seawall Repair and Reconstruction
Kapa‘a, Kaua‘i, Hawai‘i
 (Source: Sea Engineering, Inc., 2011)

*Toe Design (See **Figure 4, Alternative 1 Showing Toe Scour Apron**)*

The cross sections shown for the alternatives are predicated on the assumption that there is a hard substrate layer at approximate elevation -4 ft., based on this feature being shown in as-built drawings of the project site (see **Figures 3** and **4** above). There have thus far been no investigations to confirm this assumption. If hard substrate is found to differ slightly from the as-built drawings, the revetment could be extended or shortened as needed to fit.

In the event hard substrate is not encountered during construction, an alternative toe configuration designed for soft substrate should be used. **Figure 4, Alternative 1 Showing Toe Scour Apron**, shows Alternative 1 with a toe scour apron specifically designed for use in soft substrate, such as sand. The scour apron for Alternative 2 (**Figure 3, Alternative 2 – Hybrid Seawall/Revetment** above) would be similar.

The scour apron design has additional armor stones and underlayer placed at the toe of the revetment in order to reduce the potential for scour, which would destabilize the revetment. The scour apron adds approximately 3.3 feet to the cross section width. The toe stones shown in the alternative designs would be placed at the same elevation to facilitate transition of the revetment between regions of hard substrate and soft substrate.

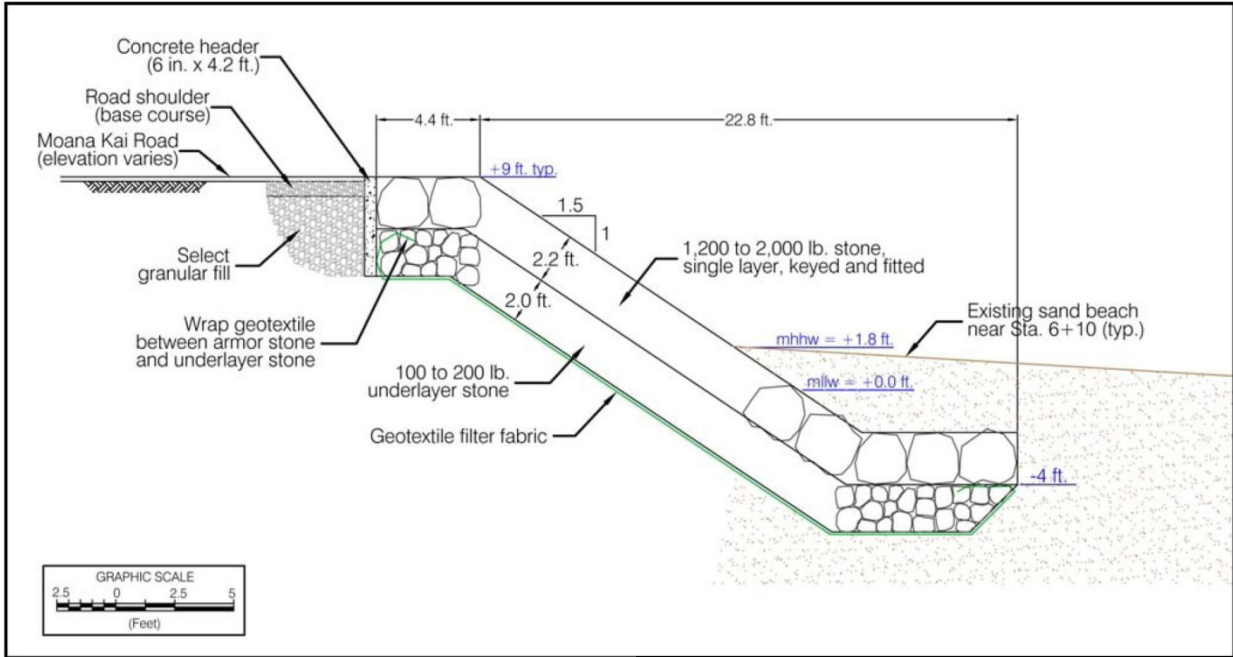


Figure 4
Alternative 1 Showing Toe Scour Apron

Moanakai Seawall Repair and Reconstruction
Kapa'a, Kaua'i, Hawai'i

(Source: Sea Engineering, Inc., 2011)

*Revetment Termination (See **Figure 5, Concept Revetment Terminations**)*

Construction of the revetment against non-erodible material is recommended practice to reduce the potential of undermining and flanking. The revetment foundation is the existing hard substrate that was identified in the as-built drawings. Founding the revetment on hard substrate prevents the toe stone from being undermined and the revetment from being destabilized. An alternative toe design was presented in the event that hard substrate is not encountered. The threat of flank erosion near Station 5+70 can be reduced by wrapping the proposed revetment in a radial manner, maintaining the 1V:1.5H slope, until it intersects the existing revetment on the south. Terminating the new revetment this way reduces the discontinuity in the two revetments and reduces the potential for flanking of either portion of revetment. A plan view of this intersection is shown in **Figure 5, Concept Revetment Terminations**.

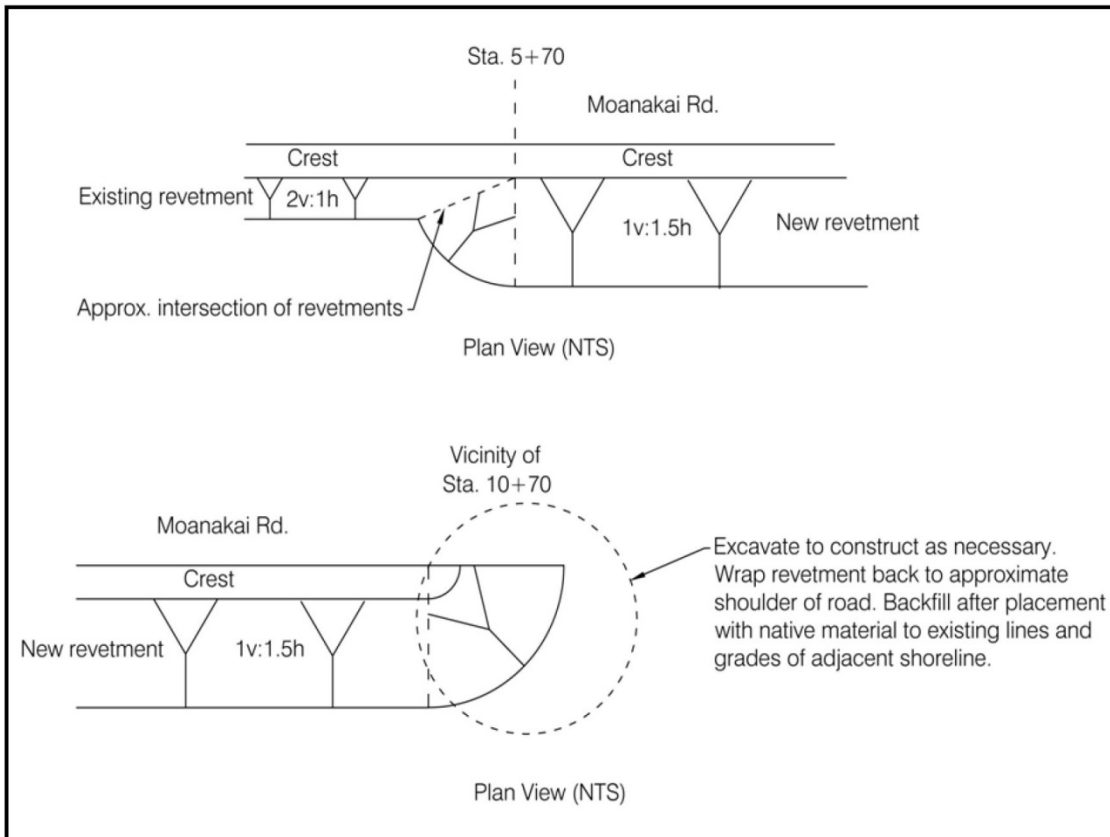


Figure 5
Concept Revetment Terminations

Moanakai Seawall Repair and Reconstruction
Kapa'a, Kaua'i, Hawai'i

(Source: Sea Engineering, Inc., 2011)

At the northern end of the proposed revetment (Sta. 10+70), there is no non-erodible material against which to terminate, which presents a risk of structure failure should flank erosion occur. The existing revetment, however, does not appear to terminate against non-erodible material, and there is no indication that there has been any erosion as a result. The best option in this case is to excavate the sand from this area and wrap the revetment 90 degrees to the shoulder of the road, where it would terminate against the existing substrate along and below the shoulder of the road. To reduce the exposure of the revetment termination and the road shoulder from erosion, the end of the revetment should be buried using native material to existing lines and grades, compacting if necessary. The point where the revetment terminates and ties in to the road shoulder is above the Mean Higher High Water (MHHW) and landward of the certified shoreline.

This termination should be visually inspected regularly for erosion and maintained as needed. A typical inspection schedule might be as follows: every month for three months, then every three months for 9 months. Should there be no apparent flanking or other threat to the revetment or road, inspections annually and following large wave events thereafter would be sufficient. In the event of erosion, proper steps should be taken based on the specific nature of the erosion.

Block 19

Project Purpose

The DPW proposes to repair and restore the condition and function of the seawall with the following objectives:

- Provide improved shoreline protection to address the immediate need for vehicular and pedestrian safety for users of Moanakai Road;
- Maintain safe public access to the shoreline;
- Minimize the possibility of adverse future effects to the surrounding shoreline from dilapidation of the Moanakai seawall; and
- Preserve the existing property along both makai and mauka ends of the project site.

Block 20

Reason(s) for Discharge

The proposed improvements are designed to minimize impacts to the existing beach sand. The exposed toe of the proposed revetment was limited to the MHHW line which we interpret to be similar to the Mean High Tide Line. However, the revetment must extend below the MHHW line in order to rest on the existing hard substrate. Construction of the revetment across the MHHW line is necessary in order to reach hard substrate on which to found the structure and avoid the instability that caused the existing problem. To limit the intrusion seaward of MHHW, a hybrid structure composed of a seawall and a lower revetment has been put forth as the preferred plan.

Block 21

Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

Type of Discharge	Volume or Length
DREDGE	
Beach sand (temporary removal)	965 CY
Boulders from Existing Revetment	445 CY
FILL	
Boulders/revetment	1,450 CY
Granular Fill Material	150 CY
Filter Fabric	13,000 SF
Sand Bags/FIBCs (temporary BMPs)	18 TONS

Block 22

Surface Area in Acres of Wetlands or Other Waters Filled

The toe of the existing revetment located below the MHHW mark covers approximately 4,500 square feet (0.10 acres). The proposed toe of the new revetment structure will be located in the same location however will cover an area of only about **2,750 square feet (0.06 acres)**.

Block 23

Description of Avoidance, Minimization and Compensation

To protect the surrounding area and surface waters, the project will employ the use of sand bags and or FIBCs (wrapped in impervious sheeting) to isolate the project area and prevent turbid water resulting from construction activities from leaving the work site. See also the attached Site-Specific BMPs Plan.

Because the replacement sea wall will result in a reduced footprint, compensation for loss of habitat is not anticipated.

Block 25

Addresses of Adjoining Property Owners, Lessees, etc. whose Property Adjoins the Waterbody

State of Hawai'i, Department of Land and Natural Resources
Land Division
1151 Punchbowl Street, Room 220
Honolulu, Hawai'i 96813

County of Kaua'i
Moanakai Road Right-Of-Way
4444 Rice Street, Suite 175
Lihu'e, Hawai'i 96766

Block 26

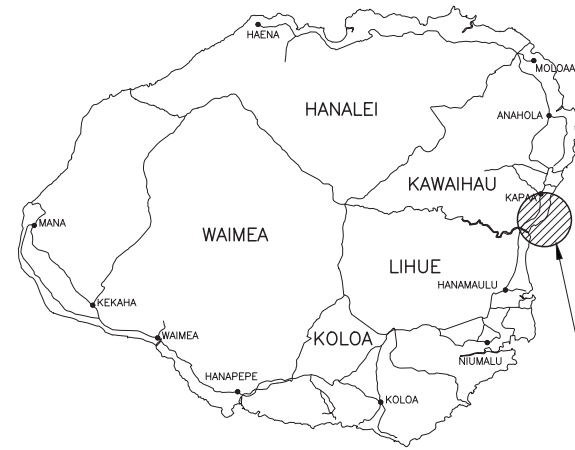
List of Other Certifications or Approvals/Denials from other Federal, State or Local Agencies for Work Described in this Application

AGENCY	TYPE APPROVAL	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
Dept. of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands	Conservation District Use Permit	Application Under Preparation			
DLNR, Land Division	Approval to implement this project on State of Hawai'i property	Application Under Preparation			
County of Kaua'i, Planning Department	Special Management Area Permit		3/9/2012	Under Review	
County of Kaua'i, Planning Department	Shoreline Setback Variance		3/9/2012	Under Review	
State of Hawai'i, Dept. of Health, Clean Water Branch	Section 401 Water Quality Certification		2/1/2012	Under Review	
State of Hawai'i, Dept. of Health, Clean Water Branch	NPDES Construction Stormwater Permit	Application Under Preparation			
State of Hawai'i, Office of Planning	CZM Federal Consistency Determination	Application Under Preparation			

DEPARTMENT OF PUBLIC WORKS
 COUNTY OF KAUAI

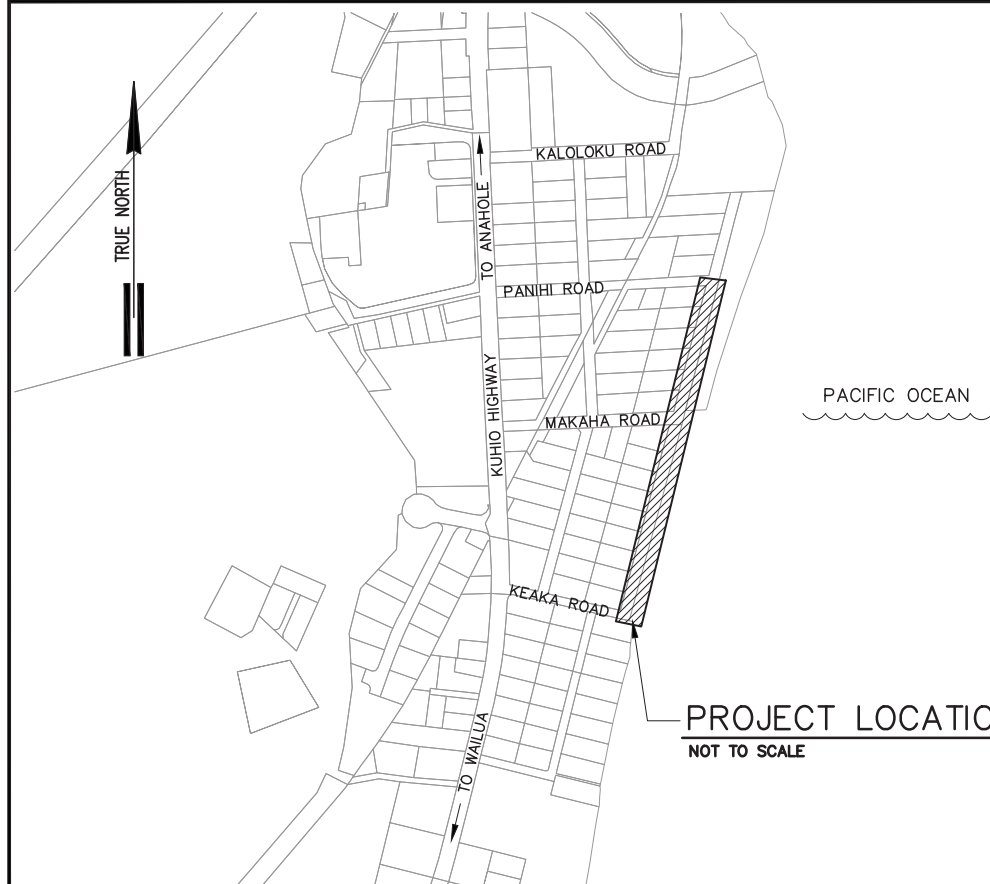
CONSTRUCTION DRAWINGS
 FOR
 REPAIR/RECONSTRUCTION OF
 MOANAKAI ROAD SEAWALL
 KAPAA, ISLAND OF KAUAI, HAWAII

PLANS PREPARED BY:



SITE LOCATION
 NOT TO SCALE

VICINITY MAP
 NOT TO SCALE



PROJECT LOCATION
 NOT TO SCALE

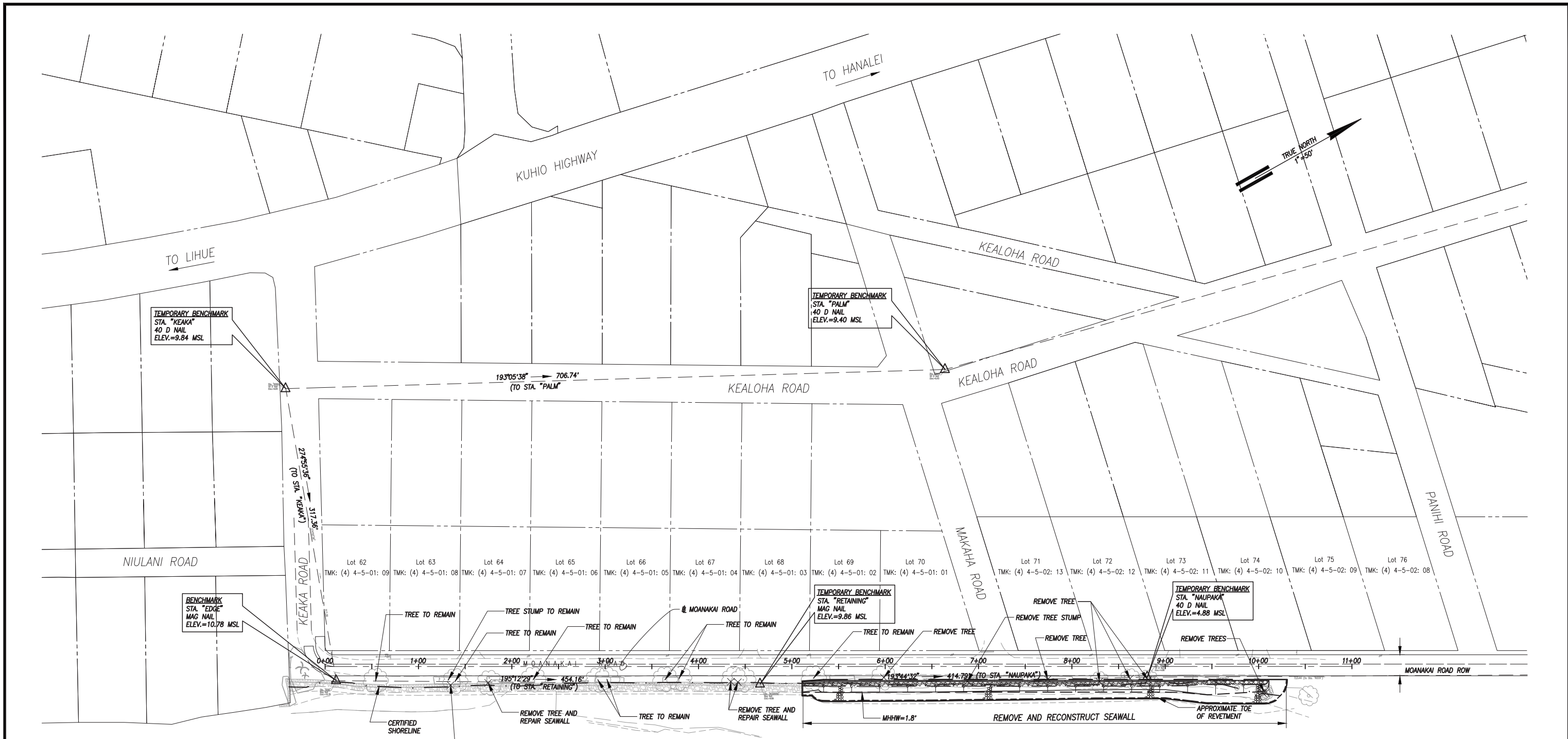
INDEX TO DRAWINGS

<u>DRAWING NO.</u>	<u>SHEET NO.</u>	<u>DESCRIPTION</u>
T-1	1	TITLE SHEET
C-1	2	NOTES
C-2	3	GENERAL SITE PLAN
C-3	4	SITE PLAN
C-4	5	GRADING AND EROSION CONTROL PLAN
C-5	6	TRAFFIC CONTROL PLAN
C-6	7	TYPICAL SECTIONS
C-7	8	DETAILS
S-1	9	CROSS SECTIONS

APPROVED:

 Mayor
 County of Kauai
 Date

 County Engineer, Dept. of Public Works
 County of Kauai
 Date



GENERAL SITE PLAN
SCALE: 1" = 50'

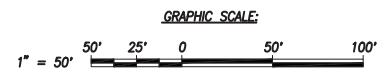
EARTHWORK SUMMARY
(FOR PERMIT PURPOSES ONLY)

SUMMARY:
ESTIMATED TOTAL CUT: 3400 CY
ESTIMATED TOTAL FILL: 2630 CY
THE CONTRACTOR SHALL CONDUCT HIS OWN EARTHWORK SUMMARY.



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Michael H. Okamoto
SIGNATURE
4/30/10
LICENSE EXP. DATE



R. M. TOWILL CORPORATION
808 842 1133 420 Waiakama Road Suite 411 Honolulu Hawaii 96817-4941

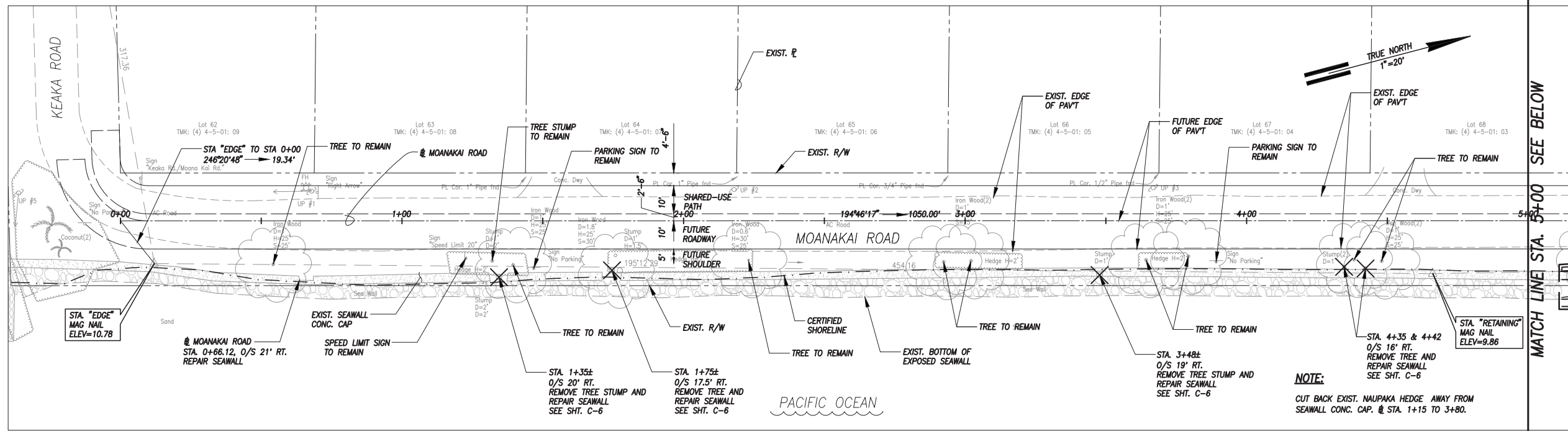
DEPARTMENT OF PUBLIC WORKS
COUNTY OF KAUAI
REPAIR/RECONSTRUCTION OF MOANAKAI ROAD SEAWALL
Kapaa, Kauai, Hawaii

SCALE: AS NOTED
DATE: JAN. 2012

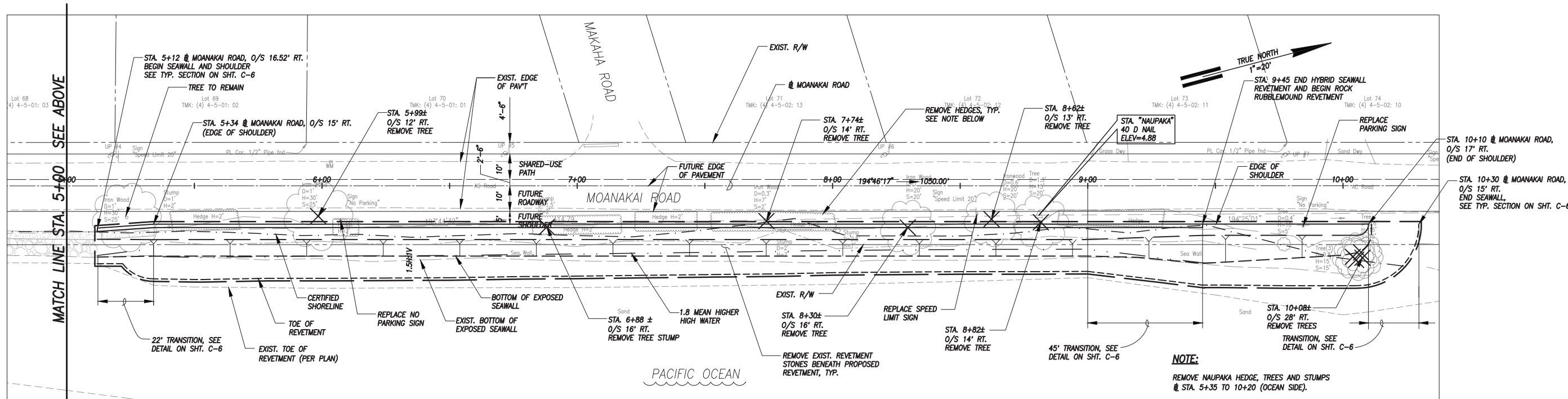
DRAWN BY: JP
TRACED BY: MHO
CHECKED BY: MHO

F.B. C.B. MAP NO. SHEET C-2 OF 9 SHEETS

APPROVED _____ COUNTY ENGINEER



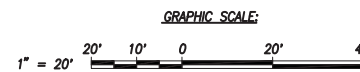
SITE PLAN - STA 0+00 TO 5+00
SCALE: 1" = 20'



SITE PLAN - STA 5+00 TO 10+50
SCALE: 1" = 20'

LEGEND:

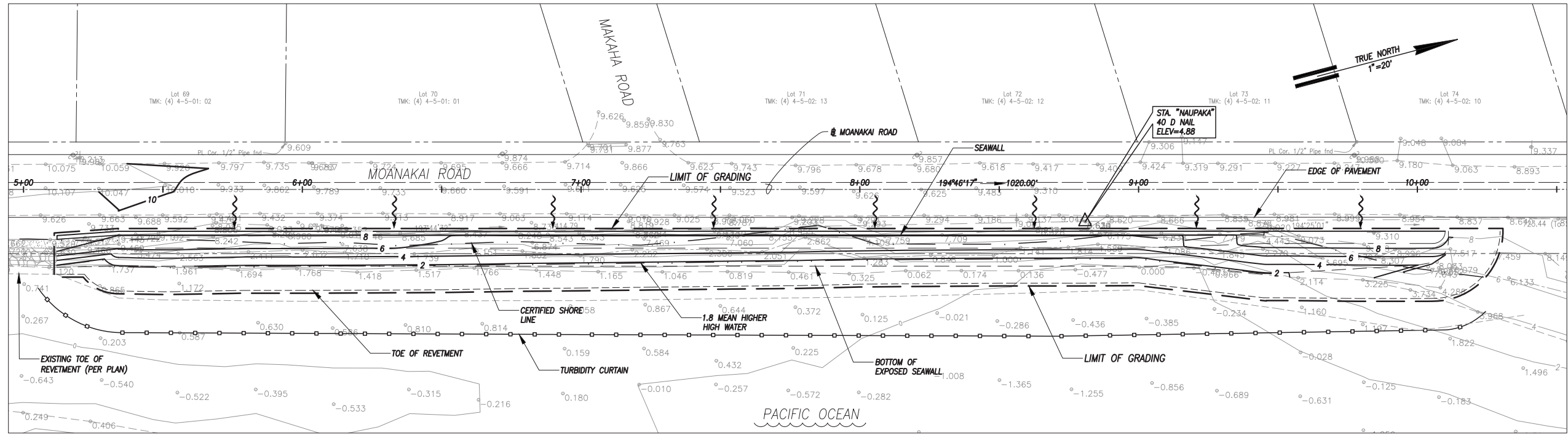
- EXIST. TOE OF REVETMENT (PER PLAN)
- TOE OF REVETMENT
- EXIST. BOTTOM OF EXPOSED REVETMENT
- BOTTOM OF EXPOSED REVETMENT
- EXIST. TOP OF REVETMENT
- TOP OF REVETMENT
- 1.8' MEAN HIGHER HIGH WATER
- CERTIFIED SHORE LINE



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Michael H. Okamoto
SIGNATURE
4/30/10
LICENSE EXP. DATE

<p>R. M. TOWILL CORPORATION COUNTY OF KAUAI DEPARTMENT OF PUBLIC WORKS REPAIR/RECONSTRUCTION OF MOANAKAI ROAD SEAWALL Kapaa, Kauai, Hawaii</p>			
<p>SCALE: 1" = 20'</p>		<p>DATE: JAN. 2012</p>	
<p>DRAWN BY: JP</p>	<p>F.B.</p>	<p>C.B.</p>	<p>MAP NO.</p>
<p>CHECKED BY: MHO</p>			<p>SHEET</p>
<p>APPROVED _____</p>			<p>COUNTY ENGINEER</p>
			<p>OF 9 SHEETS</p>



EROSION CONTROL NOTES AND BEST MANAGEMENT PRACTICES (BMPs):

1. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY SAND MOVING WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
2. ALL CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY.
3. MAINTAIN TURBIDITY CURTAIN AS APPROVED BY THE ENGINEER, DURING SITE WORK AND UNTIL PERMANENT EROSION CONTROLS ARE IN PLACE.
4. PERMANENT SAND DUNE STABILIZATION WITH PERENNIAL, INDIGENOUS VEGETATION SHALL BE APPLIED AS SOON AS PRACTICAL AFTER FINAL GRADING.

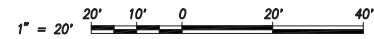
GRADING AND EROSION CONTROL PLAN

SCALE: 1" = 20'

LEGEND:

	EXISTING CONTOURS
	FINISHED CONTOURS
	LIMIT OF GRADING
	TURBIDITY CURTAIN
	DIRECTION OF SURFACE DRAINAGE
	FINISHED REVETMENT SLOPE
	EXIST. ELEVATION

GRAPHIC SCALE:



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Michael H. Okamoto
SIGNATURE

4/30/10
LICENSE EXP. DATE

R. M. TOWILL CORPORATION
Planning - Engineering - Environmental Services - Photogrammetry - Surveying - Construction Management
808 842 1133 420 Waiakama Road Suite 411 Honolulu Hawaii 96817-4941

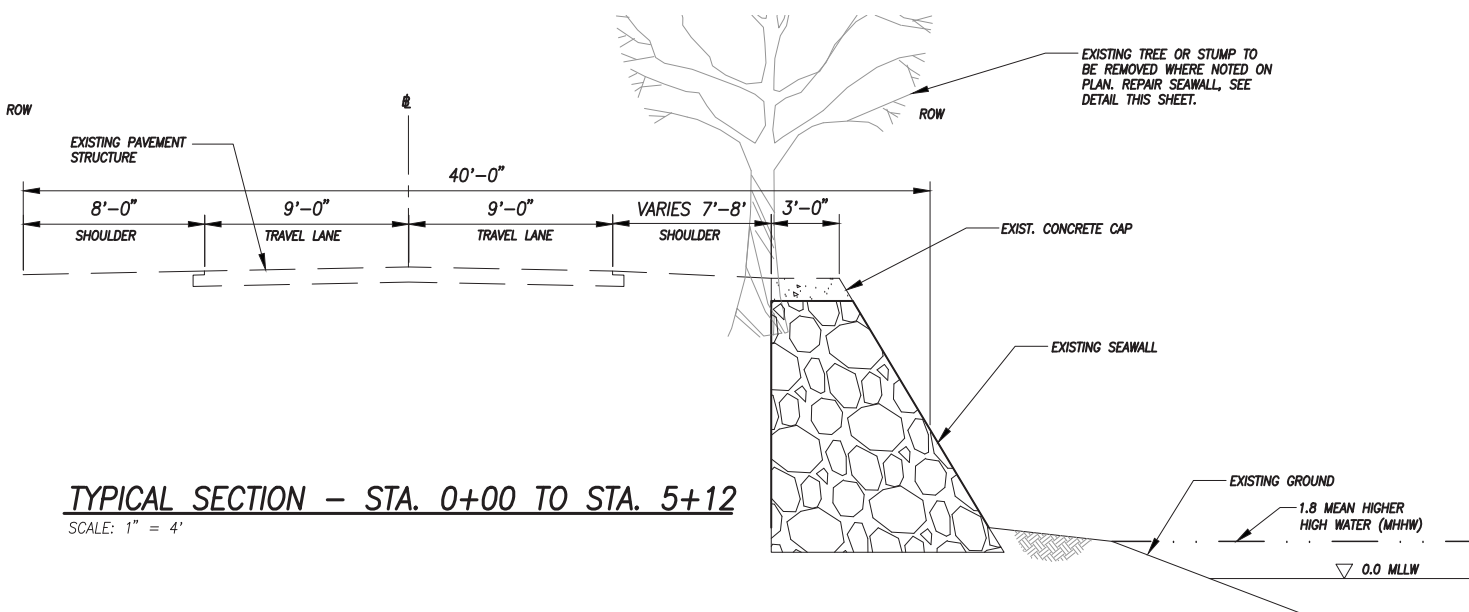
DEPARTMENT OF PUBLIC WORKS
COUNTY OF KAUAI
REPAIR/RECONSTRUCTION OF MOANAKAI ROAD SEAWALL
Kapaa, Kauai, Hawaii

SCALE: AS NOTED
DATE: JAN. 2012

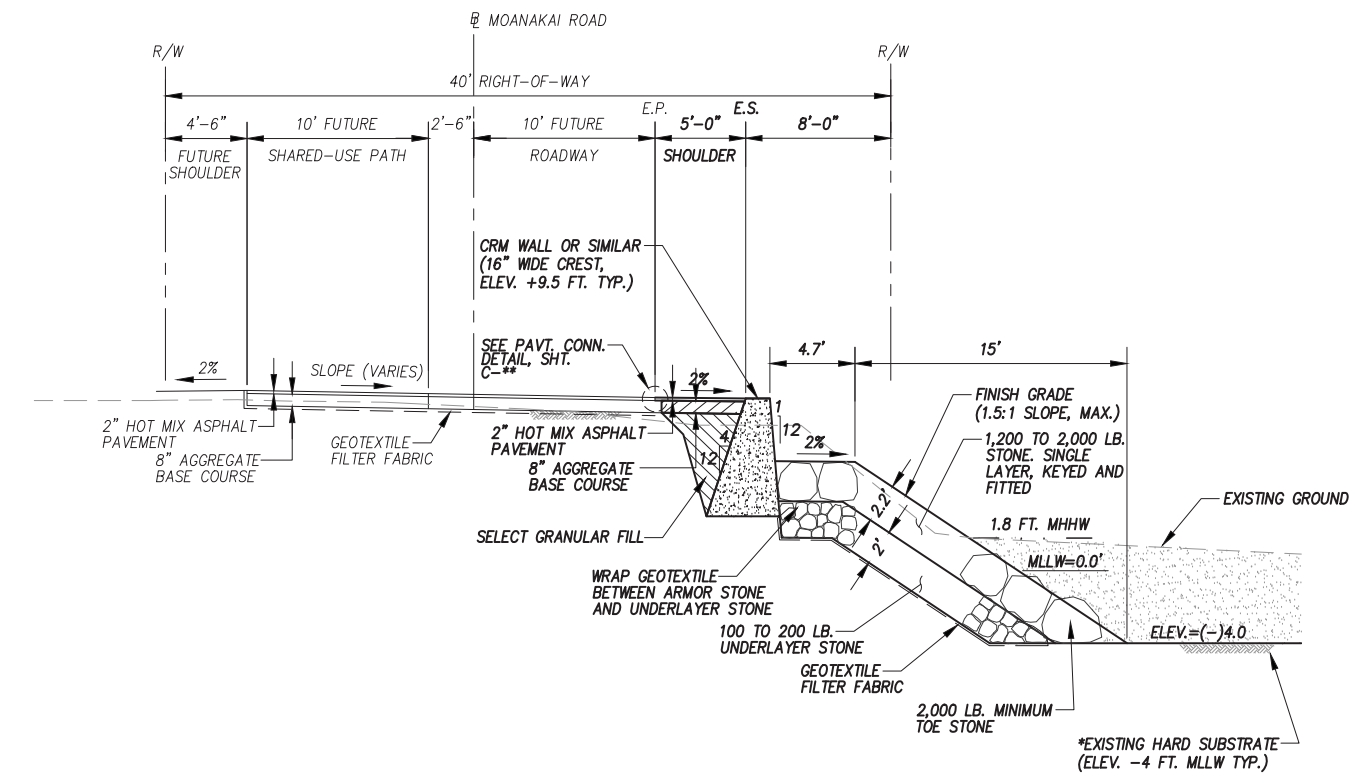
DRAWN BY: JP
TRACED BY: MHO
CHECKED BY: MHO

F.B. C.B. MAP NO. SHEET C-4 OF 9 SHEETS

APPROVED _____ COUNTY ENGINEER

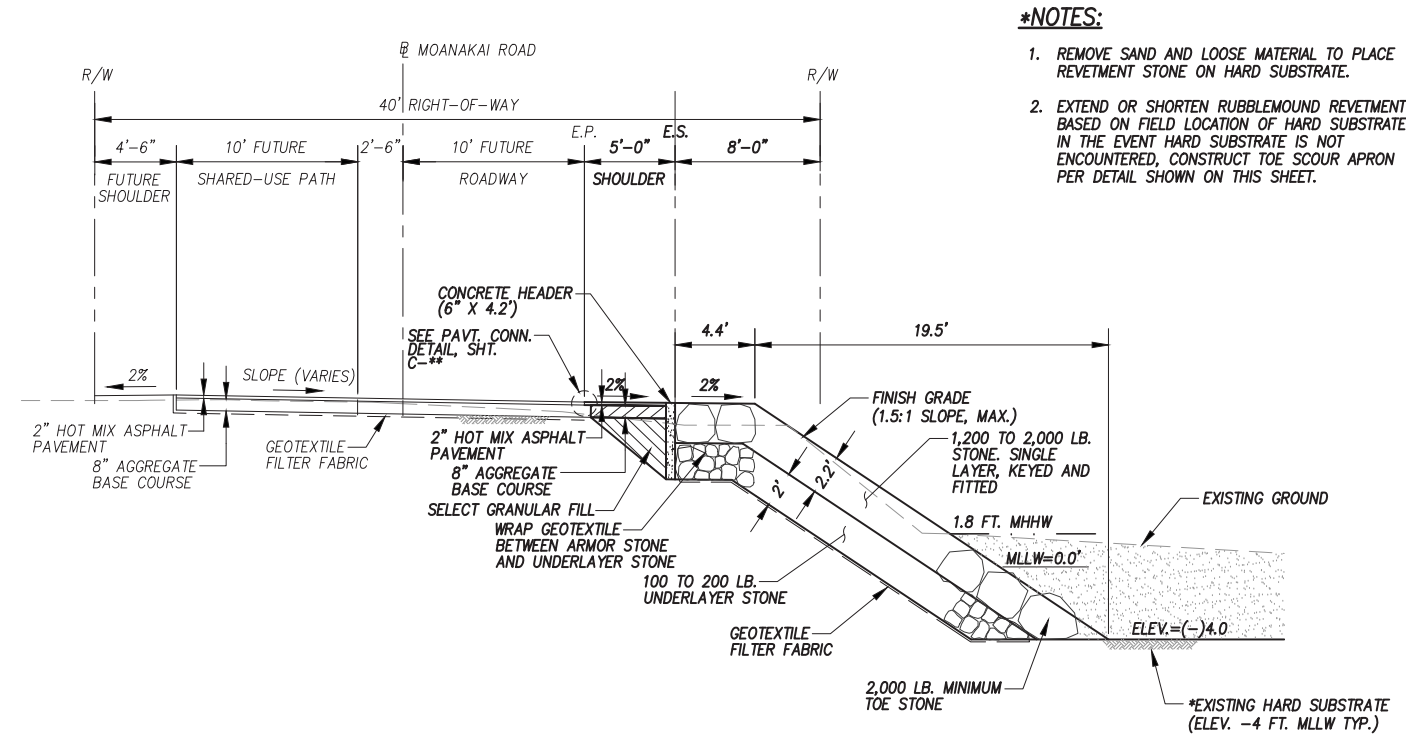


TYPICAL SECTION - STA. 0+00 TO STA. 5+12
SCALE: 1" = 4'

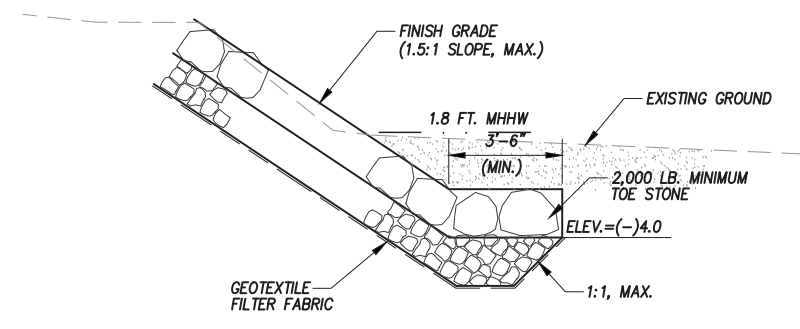


TYPICAL SECTIONS - SEAWALL/ROCK RUBBLEMOUND REVETMENT
SCALE: 1" = 5'
(STA. 5+12 TO STA. 9+45)

MOANAKAI ROAD SEAWALL
SCALE: 1" = 5'

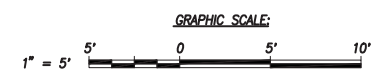


TYPICAL SECTIONS - ROCK RUBBLEMOUND REVETMENT
SCALE: 1" = 5'
(STA. 9+45 TO 10+30)



TYPICAL DETAIL - TOE SCOUR APRON
SCALE: 1" = 5'

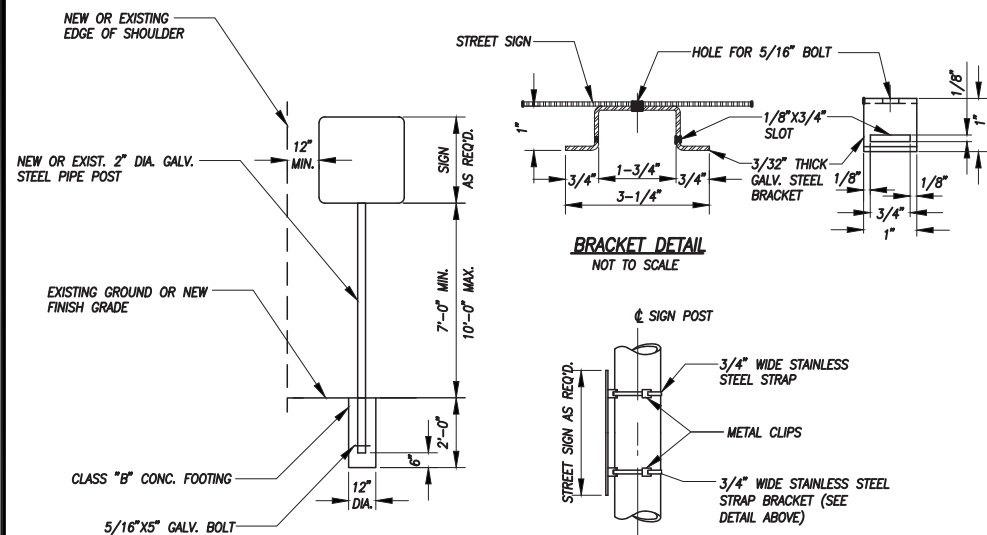
- *NOTES:**
1. REMOVE SAND AND LOOSE MATERIAL TO PLACE REVETMENT STONE ON HARD SUBSTRATE.
 2. EXTEND OR SHORTEN RUBBLEMOUND REVETMENT BASED ON FIELD LOCATION OF HARD SUBSTRATE. IN THE EVENT HARD SUBSTRATE IS NOT ENCOUNTERED, CONSTRUCT TOE SCOUR APRON PER DETAIL SHOWN ON THIS SHEET.



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Michael H. Okamoto
SIGNATURE
4/30/10
LICENSE EXP. DATE

<p>R. M. TOWILL CORPORATION COUNTY OF KAUAI</p>			
<p>DEPARTMENT OF PUBLIC WORKS REPAIR/RECONSTRUCTION OF MOANAKAI ROAD SEAWALL Kapaa, Kauai, Hawaii</p>			
SCALE: AS NOTED	F.B.	C.B.	DATE: JAN. 2012
DRAWN BY: JP	CHECKED BY: MHO	MAP NO. SHEET	C-6
APPROVED _____			OF 9 SHEETS



INSTALLATION OF NEW SIGN POST
NOT TO SCALE

DETAIL - TYPICAL SIGN POST

SCALE: NOT TO SCALE

STRAP MOUNTING DETAIL
NOT TO SCALE

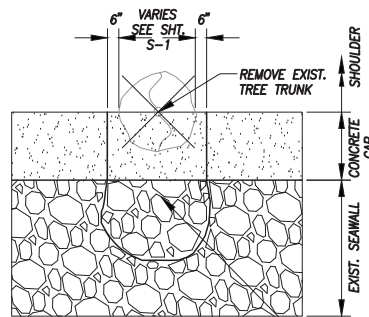
NOTE:
ALL SIGNS INSTALLATIONS MUST MEET LATERAL & HEIGHT CLEARANCES, INCLUDING NEW SIGNS THAT WILL BE POSTED ON TO EXIST. SIGN POSTS. EXTEND, RELOCATE OR REPLACE AS REQUIRED TO MEET CLEARANCE REQUIREMENTS.

NOTES:

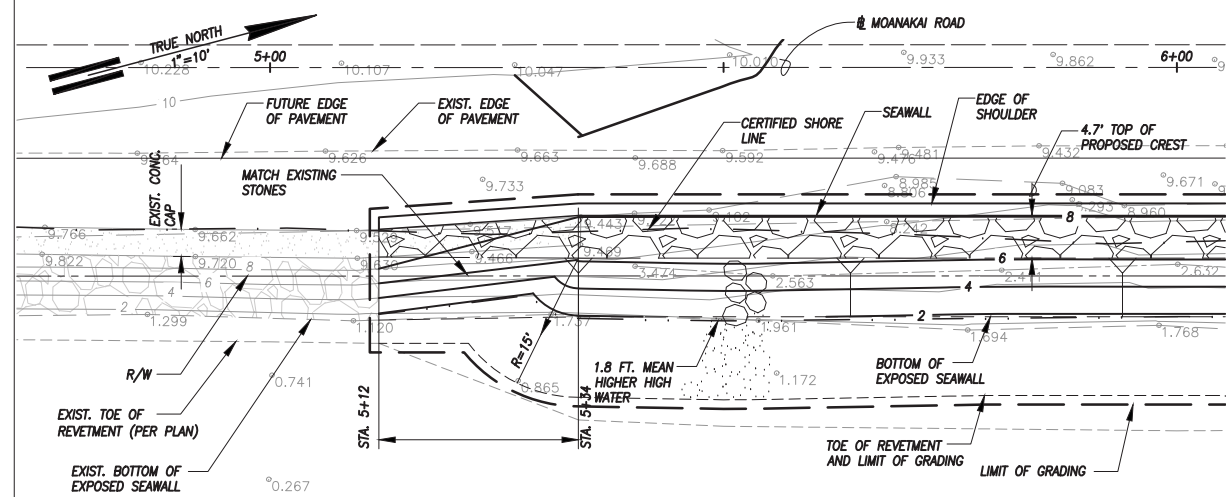
1. REMOVE TREE, TREE STUMP, ALL VEGETATIVE MATERIAL.
2. BACKFILL WITH SELECT GRANULAR FILLS MOISTURE-CONDITIONED AND COMPACTED TO AT LEAST 90% RELATIVE COMPACTION.
3. SHOULDER REPAIR SHALL CONSIST OF 6" BASE COURSE ON COMPACTED GRANULAR FILL (SEE SHT. S-1).

PLAN - REMOVE TREE/TREE STUMP AND REPAIR SEAWALL

SCALE: 1"=4'



REMOVE AND RESET STONES AS REQUIRED TO REMOVE TREE TRUNK/TREE/ROOTS

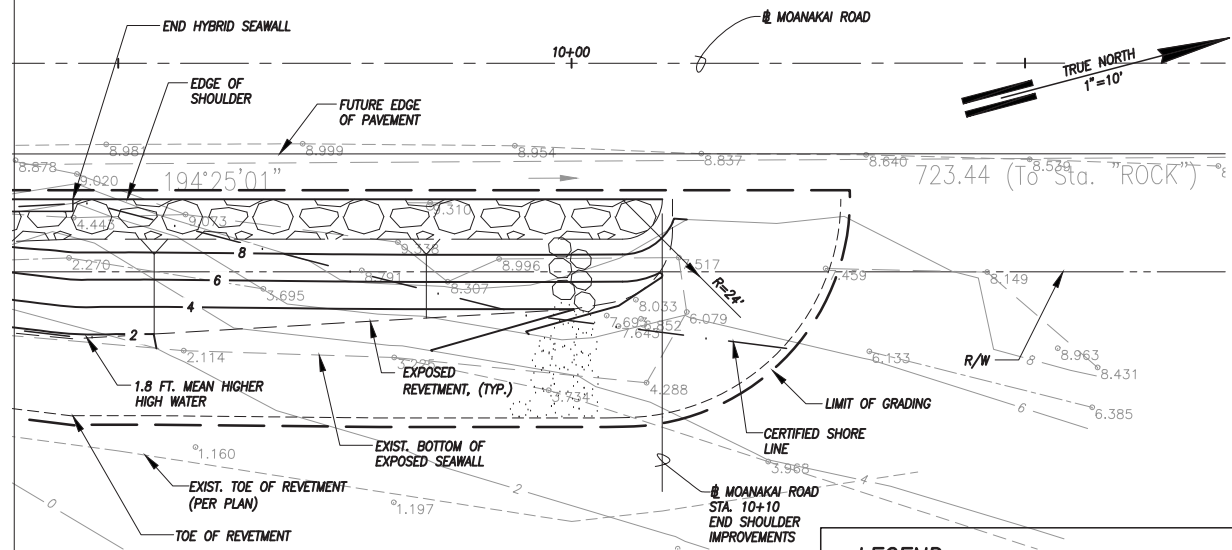


DETAIL - REVETMENT TRANSITION (STA. 5+12)

SCALE: 1" = 10'

LEGEND:

- 8 — EXISTING CONTOURS
- 2 — FINISHED CONTOURS
- — LIMITS OF GRADING
- ⊗ EXPOSED REVETMENT
- ⊗ REVETMENT BENEATH SAND

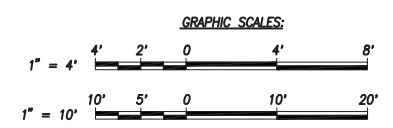


DETAIL - REVETMENT TRANSITION (STA. 10+06)

SCALE: 1" = 10'

LEGEND:

- 8 — EXISTING CONTOURS
- 2 — FINISHED CONTOURS
- — LIMITS OF GRADING
- ⊗ EXPOSED REVETMENT
- ⊗ REVETMENT BENEATH SAND



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Michael H. Okamoto 4/30/10
SIGNATURE LICENSE EXP. DATE

R. M. TOWILL CORPORATION
COUNTY OF KAUAI
REPAIR/RECONSTRUCTION OF MOANAKAI ROAD SEAWALL
Kapaa, Kauai, Hawaii

DEPARTMENT OF PUBLIC WORKS
COUNTY OF KAUAI
REPAIR/RECONSTRUCTION OF MOANAKAI ROAD SEAWALL
Kapaa, Kauai, Hawaii

SCALE: AS NOTED DATE: JAN. 2012

DRAWN BY: JP F.B. C.B. MAP NO.
TRACED BY: SHEET
CHECKED BY: MHO C-7
APPROVED COUNTY ENGINEER OF 9 SHEETS

Site-Specific Best Management Practices (BMPs) Plan

Moanakai Seawall Repair and Reconstruction Kapa‘a, Kaua‘i, Hawai‘i

March 2012

INTRODUCTION

This BMPs Plan addresses handling of construction-related effluent associated with the Moanakai Seawall Repair and Reconstruction project.

The proposed project involves the repair and restoration of the existing Moanakai seawall located along the eastern shoreline of the town of Kapa‘a on the island of Kaua‘i. The Moanakai seawall was constructed in late 1992 in response to coastal erosion as a result of Hurricane Iniki. Nearly twenty years since its construction, the seawall is presently in poor condition with erosion occurring between the road and seawall in the form of sinkholes and undermining of the shoulder of the road. Refer to site photos in the attached Final EA.

Physical Characteristics

The project site is located within an approximately 1,080 foot corridor running parallel to Moanakai Road. The shoreline and ocean lie to the east of Moanakai Road, and to the west are single family residences. The Moanakai seawall runs parallel to and between Moanakai Road and the coastline. The south end of the seawall begins near the intersection of Moanakai Road and Keaka Road, extending for approximately 1,080 feet northward along the eastern shoulder of Moanakai Road. Moanakai Road ends approximately 400 feet south of the Waiakea Canal. As construction will occur partially in the County of Kaua‘i right-of-way, the project is also on County land.

The Moanakai seawall is a rock rubble-mound revetment constructed with two profiles. The southern 570 feet of the structure has a steep seaward face, and a 2.5- to 3-foot wide concrete cap provides a walkway. The northern 480 feet of the structure has a gentler slope and no cap.

Biological Characteristics

The existing Moanakai seawall project area consists of mostly hard surfaces that include paved areas comprising the road travelway and shoulders, and rocky ground with loosely scattered pockets of soil. Vegetation found in this area is sparse with the exception of introduced and exotic species used for landscaping and ground cover along the roadway and within adjoining and nearby residential lots. No plant species within the project are considered threatened or endangered, or which otherwise are considered to be rare or of special significance by the State of Hawai‘i or federal government.

Terrestrial fauna found at the project site principally consists of small mammals and birds. None of these terrestrial species are listed as candidate threatened or endangered species by the State or Federal government. Seabird species that are threatened and which may from time to time visit

the project area include the Newell's Shearwater or Hawaiian Shearwater and the Hawaiian Petrel or 'ua'u.

The basalt boulders of the seawall and revetment are sparsely inhabited. Small numbers of barnacles, nerite snails, periwinkles, mussels, and *a'ama* crabs occur in the intertidal zone. No algae were observed on the basalt boulders.

Chemical Characteristics

The following is a summary of the water quality analysis of the adjacent waters:

- The temperature was quite high, although not unusual for measurements taken in shallow water during the late afternoon towards the end of summer.
- The salinity measured is indicative of seawater with little freshwater input.
- The water was supersaturated (saturation greater than 100%) with oxygen and the pH was slightly elevated—indicating the presence of photosynthesizing algae.
- Chlorophyll α , a direct indicator of phytoplankton biomass, was also slightly elevated, as were turbidity and total suspended solids (TSS).
- Ammonia (a dissolved form of inorganic nitrogen) was elevated at Sta. "Mid", although nitrate nitrite (another dissolved inorganic nitrogen species) was low at all stations.
- Total nitrogen (TN), which includes inorganic, organic, and particulate nitrogen moieties, was low, as was total phosphorus (TP).

See Water Quality Survey done for the project (in the attached Final EA) for all parameters tested.

Construction Best Management Practices (BMPs) Plan

I. Construction Activity and the Construction Sequence

Summary of proposed work will include the following:

1. Mobilization.
2. Install pollution prevention measures (erosion control devices, sand bags, FIBCs, etc.).
3. Repair/Reconstruct seawall in phases.
4. Restore portions of roadway and shoulders as necessary.
5. Apply landscaping along shoulders and restore all disturbed areas.
6. Remove erosion control devices.

Construction is scheduled to begin in late 2012 and will be built in two (2) phases described below:

Phase 1 - Southern Reach (Stations 0+00 to 5+70)

1. All trees, stumps and vegetation that interfere with the stability of the structure will be removed.
2. Base course and cement cap will be saw cut and sinkholes will be lined with geotextile filter fabric prior to filling.
3. Fill will be replaced in sinkholes, as needed. Removed trees will be replaced with armor stone and also filled as needed with appropriate material, e.g., gravel, base course, or crusher run.
4. All debris will be hauled off-site and disposed at a county-approved landfill site in conformance with County of Kaua'i regulations.

Phase 2 - Northern Reach (Stations 5+70 to 10+50)

This portion of the revetment will be rebuilt based on a hybrid seawall containing elements of both a revetment and a seawall which are proposed to reduce the overall revetment footprint. The seawall would be constructed as a CRM or similar material wall prior to construction of the revetment. The top of the CRM wall is designed to have a typical elevation +9.5 feet mllw. While the elevation of the road varies along the project reach, the crest elevation should remain constant, and if variability in the structure elevation is required to meet road requirements, then the variability should be made to the CRM wall, rather than the rocks. The base of the wall should extend to below the armor layer.

The steps involved will include:

1. Existing revetment will be removed, working inward from shore to the road. As required the contractor will maintain the existing revetment.
2. Loose sand and gravel will be excavated to place the revetment stone on hard, non-erodible, rock substrate.
3. Smaller two- to four-hundred pound underlayer stones will be placed on geotextile fabric.
4. A single armor stone layer will be placed over the underlayer stone and geotextile fabric. Existing armor stone will be reused as available to create the revetment. The stones will be carefully chosen and placed in a keyed and fitted manner to minimize gaps between stones and ensure maximum contact between adjacent stones.
5. A reinforced concrete header will be constructed at the top of the revetment against the crest stones. Imported granular fill will be used to fill in areas mauka of the concrete header before replacing the road shoulder.
6. Base course will be used to reconstruct the road shoulder against the concrete header. The area of disturbance on the Northern Reach will extend about 20 feet outward from the end of the existing seawall. The estimated amount of fill to be placed below the Mean Higher High Water is 1,600 cubic yards of fill material along 520 linear feet.

II. Materials and Heavy Equipment to be Used

Equipment may include, but is not limited to: excavators, loaders, cranes, trucks delivering supplies, pneumatic hand-operated tools, chainsaws, asphaltic rock products and fill material, and related construction materials which will include the following:

- | | |
|----------------------------|-----------------------------|
| -Concrete | -Aggregate fill material |
| - Sand | -Geotextile fabric material |
| -Plastic sheeting material | -Rocks/boulders |
| -Sandbags/FIBCs | |

III. Quality of Discharge

Fill materials will be comprised of clean imported aggregate fill and boulders. All materials used will be in accordance with specifications for construction of such facilities by the State and County. No materials containing contaminated soils or other hazardous wastes will be permitted for use. Any excess material will be disposed of at a County-approved facility.

No pre-existing conditions are present which would result in potential for adverse impacts due to construction storm water runoff. Construction materials that could contribute to release of pollutants into State waters will be covered with PVC sheet plastic or similar material to prevent inadvertent contact and mixing with storm water. Sand bags shall be placed to divert storm water flows around active work areas and material storage locations. Adjacent road surfaces will be kept free of dirt and mud.

Flexible Intermediate Bulk Containers (FIBCs) will be deployed during Phase 2 (northern segment) of the project to isolate the work area from the beach and ocean. The Phase 2 work will be done in short segments (approximately 100 feet) to minimize disturbed sections of the seawall at any one time. Once the work on the seawall segment reconstruction is completed, the active work area will be restored and all equipment removed prior to the relocation of the FIBCs to the next work area.

IV. Potential Pollutants

Potential for pollutants of concern will be limited to the following:

1. Soil erosion from the disturbed areas
2. Petroleum products
3. Leaking fluids from vehicles and construction machinery
4. Concrete
5. Demolition Debris

Earthwork (temporary sand removal) activities shall be sequenced to minimize the exposure time of exposed surface areas. Erosion will be minimized through the installation of FIBCs to completely isolate the active work area from the surrounding beach or ocean.

Materials and supplies, including imported aggregate fill, will be brought onto the project site on an “as needed” basis. Any material that is stored for longer periods will be covered with PVC sheeting or similar material to prevent contact with storm water runoff at the site.

All erosion control measures shall be checked daily and repaired as necessary.

Storage of petroleum-based products shall be prohibited on-site.

All materials while stored on-site shall be kept in a neat, orderly manner and covered as necessary.

Clean up material for petroleum, oils, and lubricant-associated products will be retained on-site in the event of accidental spills. The clean up materials will be either stored in a covered shelter or on construction vehicles. Lidded containers will be used to contain spilled material to prevent mixing with storm water. Contained spill material will be disposed of at a County-approved facility.

Leaking fluids from vehicles and construction machinery will be handled as follows:

Leaking or poorly-maintained construction equipment and machinery will not be permitted on site. Any equipment or machinery found to be faulty will be immediately repaired or replaced.

Refueling and maintenance of construction equipment and machinery will be at designated areas with measures to contain accidental spills.

Vehicle washing will not be performed on-site.

In order to prevent or reduce the discharge of pollutants to storm water from concrete waste, the following BMPs will be implemented:

Accidentally spilled concrete material will be cleaned up immediately.

Mixing of excess concrete will be avoided.

Disposed concrete will be contained in a lidded container to prevent mixing with storm water in the event of rainfall.

Wash-out of concrete trucks shall not be done on-site.

Concrete work will not be performed during stormy weather conditions.

To prevent demolition debris from entering the ocean, FIBCs will be deployed to contain all debris resulting from demolition activities. Demolition activities will not be allowed during rainfall events or during high surf conditions.

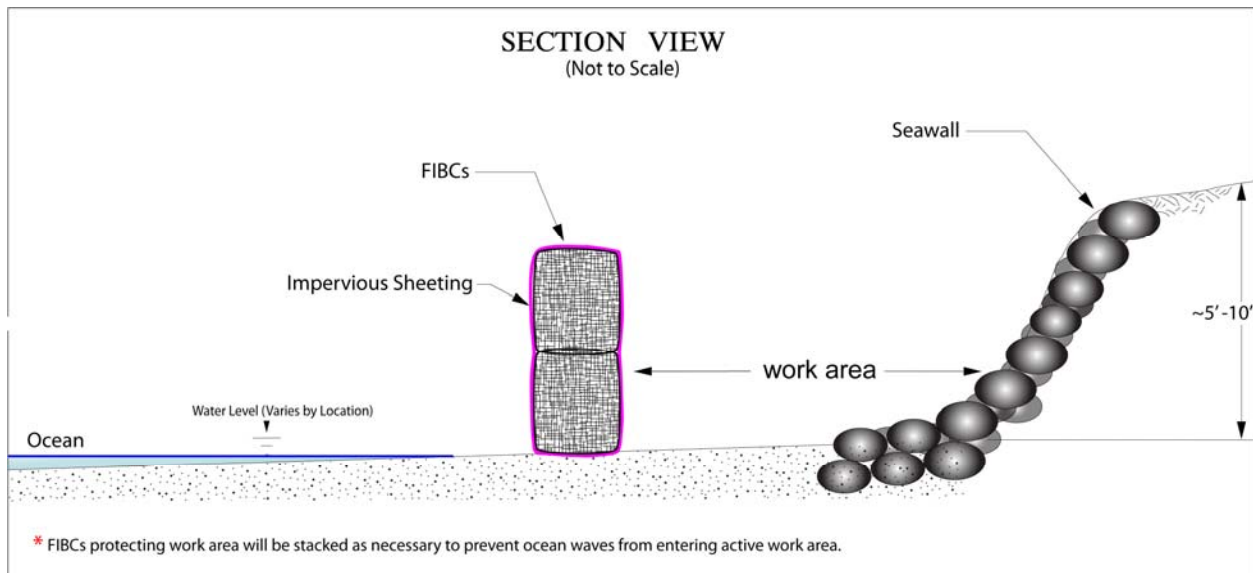
V. Temporary Construction and Restoration Plan

Conditions as identified in Hawaii Administrative Rules, Chapter 11-55, Appendix C, Special Conditions for Land Disturbances, shall be adhered to.

All pollution prevention measures (sand bags, FIBCs, etc.) will be deployed and/or implemented prior to the start of construction activities. The ocean-side sandbags deployed during Phase 1 of the project will be removed at the end of the work day and re-deployed prior to the start of the following repair activities (see *Exhibit 1 - Site-Specific Water Pollution Prevention Plan*). These measures will be maintained throughout the entire construction period.

The demolition and reconstruction work will be done only after the FIBCs have been deployed to isolate the active work site from the adjacent areas. See typical section detail below.

Sand bags (14" x 26" – 50lb capacity) wrapped with an impervious liner will be used in Phase 1. Phase 2 work will utilize FIBCs wrapped with impervious liners (see Section view below). Sand bag/FIBC fill material will be clean, imported sand. As much as possible the sand will be of similar color and grain size to the existing sand of the site.



Removal of the temporary structures placed in the shoreline (i.e., sandbags, FIBCs) will be done only during fair weather conditions. Following removal of the temporary structures, the site will be immediately stabilized and appropriate erosion control measures implemented to minimize/eliminate erosion impacts.

Major construction activities will only be done when fair weather conditions are expected. Should large storm events or high surf conditions occur, all equipment will be removed from the shoreline and the site secured to prevent adverse impacts from flood waters.

The adjacent roadways/paved surfaces will be regularly cleaned to remove any excess dirt, mud and/or debris resulting from construction activities. Because most of the activity will not involve soil material; only sand, aggregate, and boulders, stabilized construction entrances will not be utilized. However, should construction vehicles get dirty, the vehicle tires will be cleaned prior to leaving the work area.

Additional measures may be implemented once the project contractor has been selected and allowed to assess site conditions. Any proposed revisions to this BMPs Plan aimed to increase the effectiveness of erosion control measures will be submitted to for review and approval prior to the start of construction activities.

Following construction, all areas disturbed as a result of the construction activities will be restored and/or stabilized (landscaped and/or paved). Additionally, all equipment no longer necessary to the site will be removed. Construction debris and refuse will be disposed of at a County-approved facility by the contractor.

VI. Construction Schedule

Construction is anticipated to begin in late 2012, most likely in November or December and last for approximately 12 months. More detailed information including dates when the general contractor will begin and end the site disturbance, dates when erosion control measures will be implemented and removed, and dates when major construction activities will begin and end, will be submitted once a project contractor has been selected and not less than 30 days prior to start of construction activities.