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SEP 08 2011

**Bernard P. Carvalho, Jr.**
Mayor

**Larry Dill, P.E.**
County Engineer

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Deputy County Engineer

**DEPARTMENT OF PUBLIC WORKS**
**County of Kaua'i, State of Hawai'i**
4444 Rice Street, Suite 275, Līhu'e, Hawai'i 96766
TEL (808) 241-4992 FAX (808) 241-6604

July 28, 2011

Mr. Gary Hooser, Director
Office of Environmental Quality Control
235 South Beretania Street, Room 702
Honolulu, Hawai'i 96813

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'11 AUG 11 P12:05
OFC. OF ENVIRONMENTAL QUALITY CONTROL

Dear Mr. Hooser:

Subject: Draft Environmental Assessment: Repair/Reconstruction of Moanakai Seawall, Kapa'a, Kaua'i, Hawai'i

The County of Kaua'i, Department of Public Works, requests publication of the subject document in the next issue of The Environmental Notice. Enclosed are the following items:

- One (1) copy in pdf format and a completed OEQC publication form on CD
- One (1) hard copy of the Draft Environmental Assessment (DEA)
- DEA Distribution List

If you have any questions, please call the undersigned at (808) 241-4849.

Sincerely,

Larry Dill, P.E.

cc: Brian Takeda
R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawai'i 96819

## Tuiolosega, Herman

**From:** Doug Haigh <dhaigh@kauai.gov>
**Sent:** Wednesday, September 07, 2011 11:33 AM
**To:** Tuiolosega, Herman
**Cc:** Michael Okamoto; Brian Takeda
**Subject:** Moanakai Seawall DEA
**Attachments:** DEA Submittal Letter to OEQC.docx

I apologize that our submittal letter did not include our initial determination. As discussed in Chapter 10 of the DEA we expect a Finding of No Significant Impact.

Douglas Haigh, PE, CFM
Chief, Building Division
Department of Public Works
County of Kauai

Phone: 808-241-4849
Fax: 808-241-6806
E-mail: dhaigh@kauai.gov

# OEQC Publication Form
# The Environmental Notice

**Instructions to Applicant or Agency**:

1. Fill out this Publication Form and email to: oeqc@doh.hawaii.gov
2. Send one (1) pdf and one (1) hardcopy of the EA / EIS to OEQC

| | |
|---|---|
| **Name of Project:** | Repair/Reconstruction of Moanakai Seawall |
| **Applicable Law:** | Ch. 343 HRS |
| **Type of Document:** | Draft Environmental Assessment |
| **Island:** | Kaua'i |
| **District:** | Kapa'a |
| **TMK:** | (4) 4-5-002: 023 |
| **Permits Required:** | • Conservation District Use Permit<br>• Special Management Area Permit<br>• Shoreline Setback Variance<br>• Department of the Army Permit<br>• Section 401 Water Quality Certification Permit<br>• Coastal Zone Management Federal Consistency Determination Permit<br>• NPDES Permit for Discharges Associated with Construction Stormwater<br>• NPDES Permit for Construction Activity Dewatering Effluent |
| **Name of Applicant or Proposing Agency:** | County of Kaua'i<br>Department of Public Works |
| Address | 4444 Rice Street, Suite 275 |
| City, State, Zip | Līhu'e, HI 96766 |
| Contact and Phone | Larry Dill, P.E., County Engineer, (808) 241-4996 |
| **Approving Agency:** | County of Kaua'i |
| Address | Department of Public Works |
| City, State, Zip | 4444 Rice Street, Suite 175 |
| Contact and Phone | Līhu'e, HI 96766<br>Larry Dill, P.E., County Engineer, (808) 241-4996 |
| **Consultant** | R. M. Towill Corporation |
| Address | 2024 N. King Street, Suite 200 |
| City, State, Zip | Honolulu, Hawai'i 96819-3494 |
| Contact and Phone | Brian Takeda, Project Coordinator, (808) 842-1133 |

**Project Summary**: Summary of the direct, indirect, secondary, and cumulative impacts of the proposed action (less than 200 words).

The proposed project involves the repair and reconstruction of the Moanakai Seawall to maintain the protection of the shoreline from further wave and stormwater related erosion. An Erosion Control Plan (ECP) will provide measures to control storm-water runoff from the project site. An NPDES permit for the discharge of construction related stormwater will be filed. A Best Management Practices (BMPs) Plan will be submitted to control and treat the discharge of pollutants into receiving waters. The direct impacts related to construction activities will be contained within the property and should not create any indirect, secondary or cumulative impacts within the property or to adjacent properties.
The proposed repair and reconstruction is not expected to result in significant adverse impacts to geology, soils, hydrology, stream flow, biological resources, air quality, natural hazards, cultural resources, socio-economics, or land uses. Minimal impacts may consist of minor traffic, noise and air quality disturbances to residents in the surrounding area of the site, however impacts will be temporary, and conditions will return to their previous state once construction is complete.

Hawai‘i Revised Statutes, Chapter 343, Draft Environmental Assessment

# *Repair/Reconstruction of Moanakai Seawall*

Kapa‘a, Kaua‘i, Hawai‘i

July 2011

County of Kaua‘i
Department of Public Works
4444 Rice Street, Suite 175
Lihue, Hawai‘i 96766

R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawai‘i 96819

HRS, Chapter 343, Draft Environmental Assessment

# *Repair/Reconstruction of Moanakai Seawall*

Kapaʻa, Kauaʻi, Hawaiʻi

July 2011

Prepared for:

County of Kauaʻi
Department of Public Works
4444 Rice Street, Suite 175
Lihue, Hawaiʻi 96766

Prepared by:

R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaiʻi 96819

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**Appendix C** - Repair/Reconstruction of Moanakai Seawall: Marine biological survey for Moanakai Road seawall improvements, Kapaʻa
Kauaʻi, Hawaiʻi AECOS, Inc., October 2010

**Appendix D** - Repair/Reconstruction of Moanakai Seawall: Archaeological Monitoring Plan for the Moanakai Sea Wall Repair Project Kapaʻa Ahupuaʻa, Kawaihau District (Puna Moku), Island of Kauaʻi Cultural Surveys of Hawaiʻi, July 2010

**Appendix E** - Repair/Reconstruction of Moanakai Seawall: Cultural Impact Assessment for the Moanakai Seawall Repair Project, Kapaʻa Ahupuaʻa, Kawaihau District, Kauaʻi Island Cultural Surveys of Hawaiʻi, July 2010

# *Section 1*
# *Project Summary*

| | |
|---|---|
| **Project** | Moanakai Seawall Restoration<br>Kapa‘a, Island of Kaua‘i, Hawai‘i |
| **Applicant** | County of Kaua‘i<br>Department of Public Works |
| **Accepting Agency** | County of Kaua‘i<br>Department of Public Works |
| **Agent** | R. M. Towill Corporation |
| **Location** | Coastal Kapa‘a, Island of Kaua‘i, Hawai‘i |
| **Proposed Action** | Repair and restoration to existing seawall |
| **Site Determined** | Yes |
| **Present Use** | Seawall |
| **Tax Map Key (TMK)** | (4) 4-5-002: 023 |
| **Total Project Area** | Approximately 1 Acre |
| **Flood Insurance Rate Map (FIRM)** | #1500020204E, Zone VE |
| **State Land Use District** | Urban |
| **Special Management Area** | Yes |
| **County of Kaua‘i Zoning** | Urban Center |
| **Land Owner** | State of Hawai‘i |
| **Permits That May be Required** | Conservation District Use Permit; Special Management Area Permit; Shoreline Setback Variance; Department of the Army Permit; Section 401 Water Quality Certification Permit; Coastal Zone Management Federal Consistency Determination Permit; NPDES Permit for Discharges Associated with Construction Stormwater; NPDES Permit for Construction Activity Dewatering Effluent |
| **Anticipated Determination** | Finding of No Significant Impact (FONSI) |

# *Section 2*
# *Project Purpose and Location*

## *2.1 Purpose of 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, island of Kaua‘i, Hawai‘i. The coastline in this area is characterized by a combination of river and stream mouths, sandy beaches, fringing coral reef, and shore protection structures that include the seawall (**see Photo 1**). The Department of Public Works (DPW), County of Kaua‘i, proposes to restore and repair the existing seawall to maintain the protection of the shoreline from further wave and stormwater related erosion.

The Moanakai seawall was constructed in late 1992 in response to accelerated coastal erosion that was occurring as a result of the direct passing of Hurricane Iniki over the island of Kaua‘i on September 11, 1992. Kaua‘i was declared a federal disaster area by President Bush the day after on September 12, 1992 (FEMA, 2004). The seawall was declared an emergency project and work to restore protection to the shoreline was completed immediately thereafter.

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 (**see Photos 2 and 3**). 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 sight-seers).

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 the 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 project will benefit both the residences and visitors who use the area for transit along the Moanakai Road. Recreational users will benefit from improvements to the seawall that will address further erosion and dilapidation of the structure.

Photo 1: View of coral rubble beach and protected swimming area
(Source: Sea Engineering, Inc., 2011)

Photo 2: Tree stump and hole at station 3+85
(Source: Sea Engineering, Inc., 2011)

Photo 3: Erosion formed hole at station 1+05
(Source: Sea Engineering, Inc., 2011)

## *2.2 Purpose of Environmental Assessment*

The purpose of this Environmental Assessment (EA) is to address the requirements of Hawaiʻi Revised Statutes (HRS), Chapter 343, and Hawaiʻi Administrative Rules (HAR), Chapter 11-200. The specific action that requires the preparation of this EA includes the use of county or state lands and/or funds for development.

This EA provides information and evaluation of the potential for adverse environmental impacts on the natural and built environment associated with the proposed project. This EA will also inform interested parties of the proposed project and seek public comment on relevant environmental issues that should be addressed during preparation of the Final EA.

## *2.3 Project Location*

East of the Moanakai Road is the Pacific Ocean, and to the west are single family residences. The Moanakai seawall is approximately 1,080 feet long and runs parallel to the Moanakai Road and 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 side of Moanakai Road. Moanakai Road ends approximately 400 feet south of the Waikaʻea Canal (**see Figure 2-1, Project Location**).

The project site is located within an approximately 1,080 foot corridor, between Moanakai Road and Tax Map Key (4) 4-5-002: 023, Kapaʻa Ahupuaʻa, Kawaihau District (Puna Moku), Kauaʻi Island (**see Figure 2-2, Tax Map Key**). This site is owned by the State of Hawaiʻi.

# *Section 2 – Figures*

***Repair/Reconstruction of Moanakai Seawall***

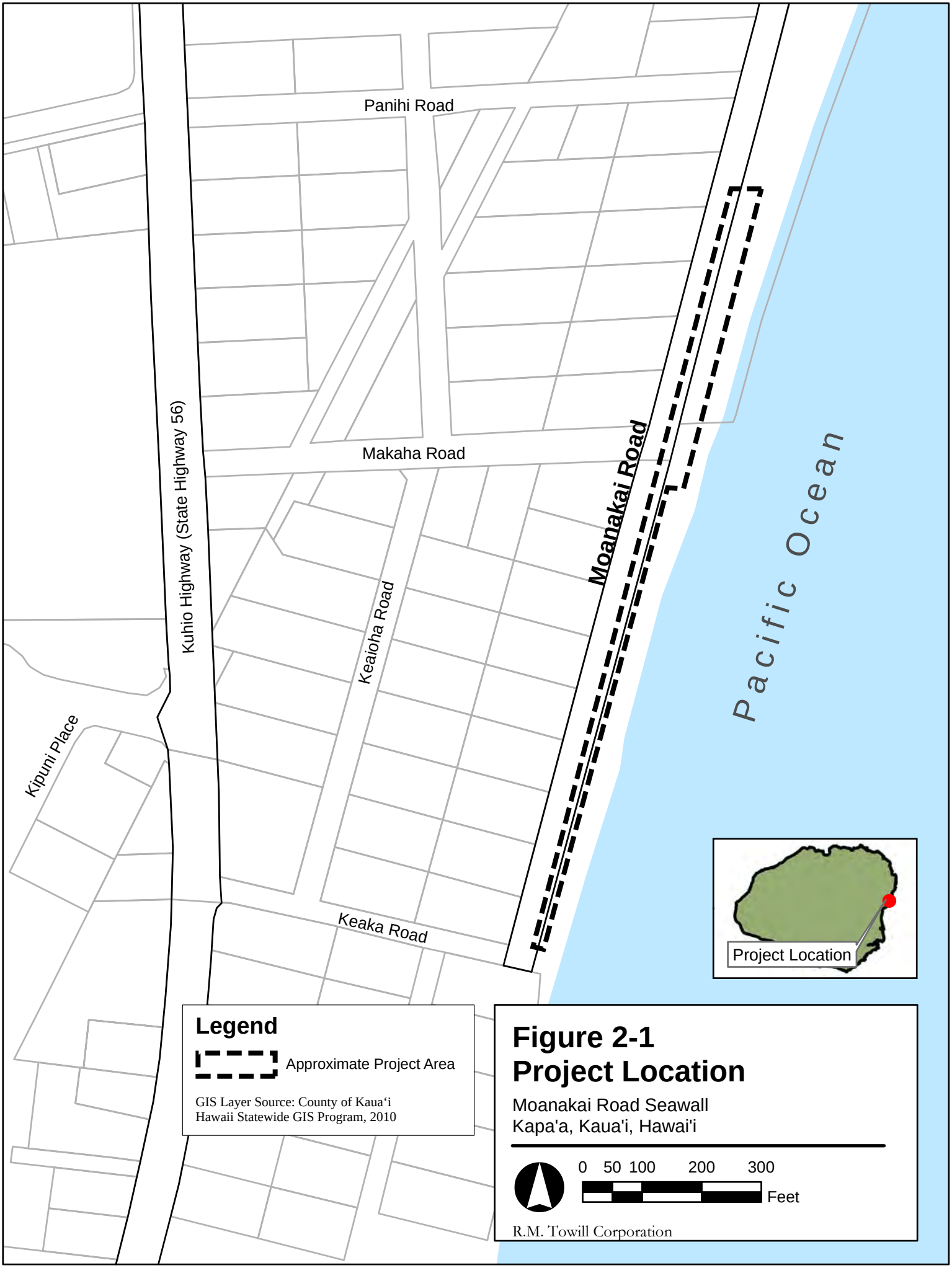
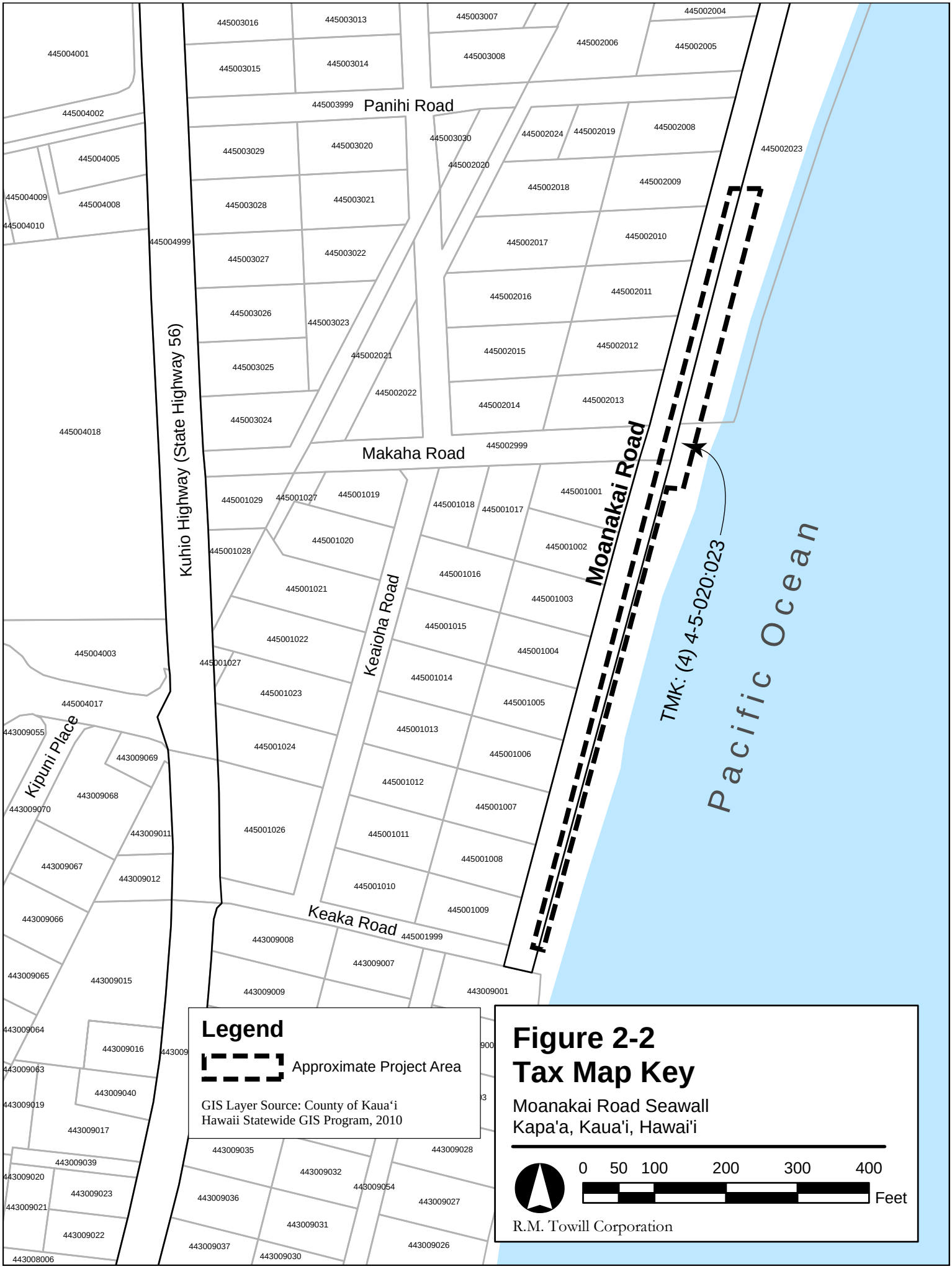



**Figure 2-1**
**Project Location**

Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i




**Legend**

Approximate Project Area

GIS Layer Source: County of Kaua'i
Hawaii Statewide GIS Program, 2010

# Figure 2-2
# Tax Map Key

Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i

0 50 100 200 300 400 Feet

R.M. Towill Corporation

# *Section 3*
# *Project Description, Estimated Construction Cost and Schedule*

## *3.1 Primary Issues and Recommendations*

A Coastal Assessment report was prepared in 2011, by Sea Engineering Inc., (see **Appendix A**, Repair/Reconstruction of Moanakai Seawall: Moana Kai Road Coastal Assessment). The purpose of the assessment was to provide an evaluation and conceptual design for the repaired seawall structure and surrounding area. The objectives of the Coastal Assessment included:

- Evaluate coastal processes and oceanographic parameters at the project site;
- Identify areas of damage or erosion along the structure;
- Evaluate effectiveness of the existing structures; and
- Produce conceptual solutions and designs to replace the existing structure, if necessary.

The results of the report are summarized below in three sections as: (1) existing structure; (2) primary issues; and (3) recommendations.

### *3.1.1 Existing Structure*

*South Reach (Stations 0+00 to 5+70, See Photo 4 for general area)*

The neighboring property to the south of the project site contains a steep-faced CRM (cement rubble masonry) seawall. The toe of the seawall has been undermined by erosion and has collapsed, leaving the base of the seawall exposed to further erosion and undermining. The project structure begins at station 0+00 and is offset inshore from the neighboring seawall by 15 to 20 feet; the southern 25 feet of the structure is obscured by a thick naupaka hedge. Overall, the structure is essentially straight, bowing only slightly in a few places. The southern reach of the revetment transitions into the northern reach at station 5+70.

The as-built cross section for the south reach is shown in **Figure 3-1, As-Built Cross Section of Southern Reach of Revetment**. The existing revetment is constructed primarily of armor stone with no underlayer or geotextile filter fabric that would reduce the possibility of soil or fill material from the backshore side being siphoned through the armor stone by water motion and wave action.

During the site visit, the dimensions of 15 representative armor stones were measured in three locations along the southern reach, showing the nominal stone diameter to range from 1.8 to 6.0 feet, with an average of 3.2 feet, which would weigh approximately 2.6 tons. The field investigation also showed the slope of the face of the revetment to be 15V (vertical):9H (horizontal) (even though the as-built slope is labeled 12V:6H), which is consistent with the 1.5V:1H slope interpreted from a March 2010 topographic survey. This side slope is steeper than is typically recommended for rock rubblemound revetments, for which a standard design practice would be a flatter 1V:1.5H or 1V:2H slope. The revetment has a 2.5 to 3-foot wide grouted CRM cap that acts as a walkway. The as-built drawing indicates that a solid basalt layer at elevation -4

feet provides the foundation for the revetment. Crest elevations along the southern reach of revetment were measured to range from about +9.5 feet to +11.0 feet mllw (mean lower low water).

Photo 4: Typical view of beach and revetment in southern reach (Source: Sea Engineering, Inc., 2011)

*Northern Reach (Stations 5+70 to 10+50, See Photo 5 for general area)*

This section of revetment is shown in **Figure 3-2, As-Built Cross Section of Northern Reach of Revetment**, and has a flatter slope than the southern section consistent with standard design practice. This section of revetment is to be constructed of a single layer of armor stone with a slope of 1V:2H; however, the topographic survey shows the revetment to have a slightly steeper 1V:1.5H face slope. While there is no indication on the drawings that an underlayer or geotextile filter fabric was used, smaller stones were observed in the armor stone voids. The drawing shows the crest to be two stones wide.

Stone size is not discernable from the as-built drawings; however, ten stones were measured from two locations during the site visit. The nominal diameter of those stones ranged in size from 1.9 to 6.0 feet with an average of 3.9 feet. Crest elevation along this reach of revetment ranged from about +8.5 to +9.5 feet mllw (mean lower low water).

The north section of revetment extends from station 5+70 to station 10+50. The crest of the northern section of revetment is generally obscured by fill material or vegetation, typically naupaka, along the roadway. Portions of the crest show some evidence of fill with smaller stones. North of the end of the revetment, the beach widens to about 40 feet north of the end of the revetment and extends more than 900 feet from the end of the revetment past Waipoli Park to Waikaea Canal.

Photo 5: View of beach, revetment and protected swimming area in northern reach
(Source: Sea Engineering, Inc., 2011)

*Structure Condition*

Locations of erosion or damage were noted during the site visit. Construction of the revetment appears to have been performed with the goal of preserving existing trees along the revetment alignment. Thus, in several locations, trees or tree stumps were found to be projecting from the top of the revetment. Tree mortality and the subsequent root decay have produced gaps in the revetment that leave the backshore unprotected against wave action and the effects of erosion (see **Appendix A** for further detail).

### *3.1.2 Primary Issues*

The existing rock revetment shore protection was not constructed in accordance with standard design practice for this type of structure, the primary issues being the following:

- The southern half of the revetment has a side slope much steeper than is recommended for a rock rubblemound structure. Despite this, it does appear to be stable, with little or no evidence of stone movement. This may be partly attributable to the very large stones used to construct the revetment, which generally greatly exceed the stone size required for the wave heights at the shore.
- No filter (e.g., geotextile filter fabric) or underlayer of smaller stone was placed behind the large armor stone; thus, water motion and wave action, as well as ground water flow during heavy rains, can remove fine grained material from behind the armor through the voids between stones. This will cause the stones to shift and settle, and result in

sinkholes forming behind the revetment. Unfortunately, this problem is difficult to correct without removing and rebuilding the entire revetment.

- The revetment was constructed around trees, which can eventually affect the stability of the revetment stone, either by continued growth of the tree and its roots which can dislodge and move the stone, or by the tree dying and its decay resulting in a void between stones.

### *3.1.3 Recommendations*

The emergent rock bench seaward of the shoreline acts as natural shore protection by significantly limiting the wave heights and energy at the shoreline, and this contributes to the effectiveness of the revetment. Recommendations for shore protection maintenance and repair are as follows:

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

According to Sea Engineering, Inc., while some damage is evident, the damage does not appear to be sufficient to significantly de-stabilize the revetment. Ongoing maintenance of this reach is considered a viable alternative, e.g., filling the sink holes, removing dead trees and replacing them with armor stone. It appears that repairs and maintenance can generally be done above the mhhw (mean higher high water) line and behind the existing revetment, and thus out of federal (Department of the Army) permit jurisdiction and the State Conservation District.

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

The existing revetment in this reach is badly damaged and has failed completely, or is likely to fail in the future. Sea Engineering Inc., recommends that this portion of the revetment be rebuilt in accordance with generally accepted design practice. The various design options considered for the northern reach of the project included:

- Two alternative seawall designs were evaluated: Alternative 1 – Rock Rubblemound Revetment, and Alternative 2 – Hybrid Seawall/Revetment. While both designs address the requirement for a properly engineered and designed seawall, the principal difference is that Alternative 2 further reduces the footprint of the structure within the surrounding area, thereby allowing for the installation of less mass within the shoreline environment;
- An alternative design to anchor the toe of the seawall is provided to address different substrate conditions and to maintain sufficient stability of the revetment structure; and
- Appropriate methods to stabilize the respective ends of the revetment are recommended to maintain protection against erosion.

## *3.2 Description of Proposed Plan*

The following plan prepared by Sea Engineering, Inc., will be utilized by the County of Kaua'i, as described below.

*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 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 revetment[1]. 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.

[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." (Section 5.5, Additional Design Considerations, Moana Kai Road Coastal Assessment, Sea Engineering, 2011).

The area of disturbance on the Northern Reach will extend about 20 feet outward from the end of the existing seawall (see **Figure 3-2** and **Figure 3-4**).

*Toe Design (see Figure 3-5)*

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 3-1** and **3-2**). 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 3-5** shows Alternative 1 with a toe scour apron specifically designed for use in soft substrate, such as sand. The scour apron for Alternative 2 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.

*Revetment Termination (see Figure 3-6)*

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 3-6**.

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.

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.

## *3.3 Estimated Construction Cost and Schedule*

The estimated construction cost for this project is $1.6 million to be funded by the County of Kaua'i. The anticipated project duration is 6 to 12 months with construction to be scheduled starting in 2011.

# *Section 3 – Figures*

***Repair/Reconstruction of Moanakai Seawall***

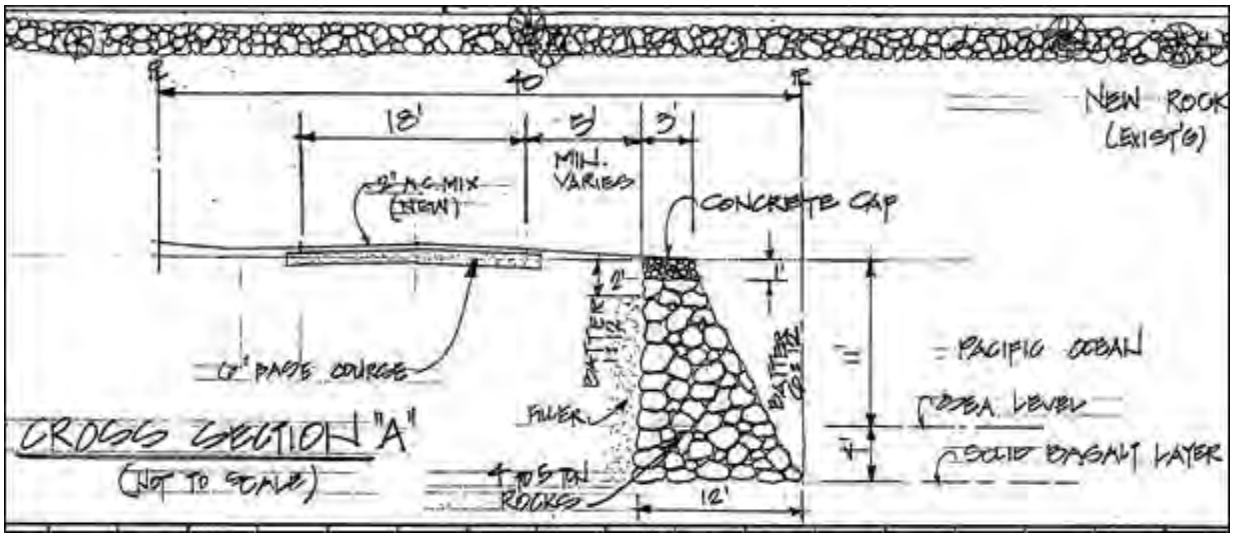



Figure 3-1: As-built Cross Section of Southern Reach of Revetment
(Sea Engineering, Inc., 2011)

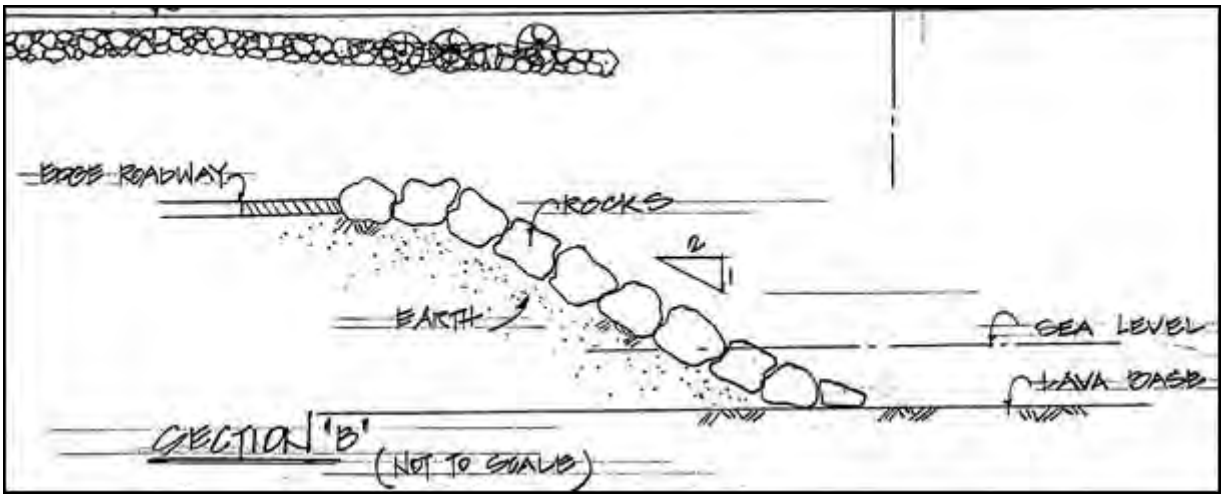



Figure 3-2: As-built Cross Section of Northern Reach of Revetment
(Sea Engineering, Inc., 2011)

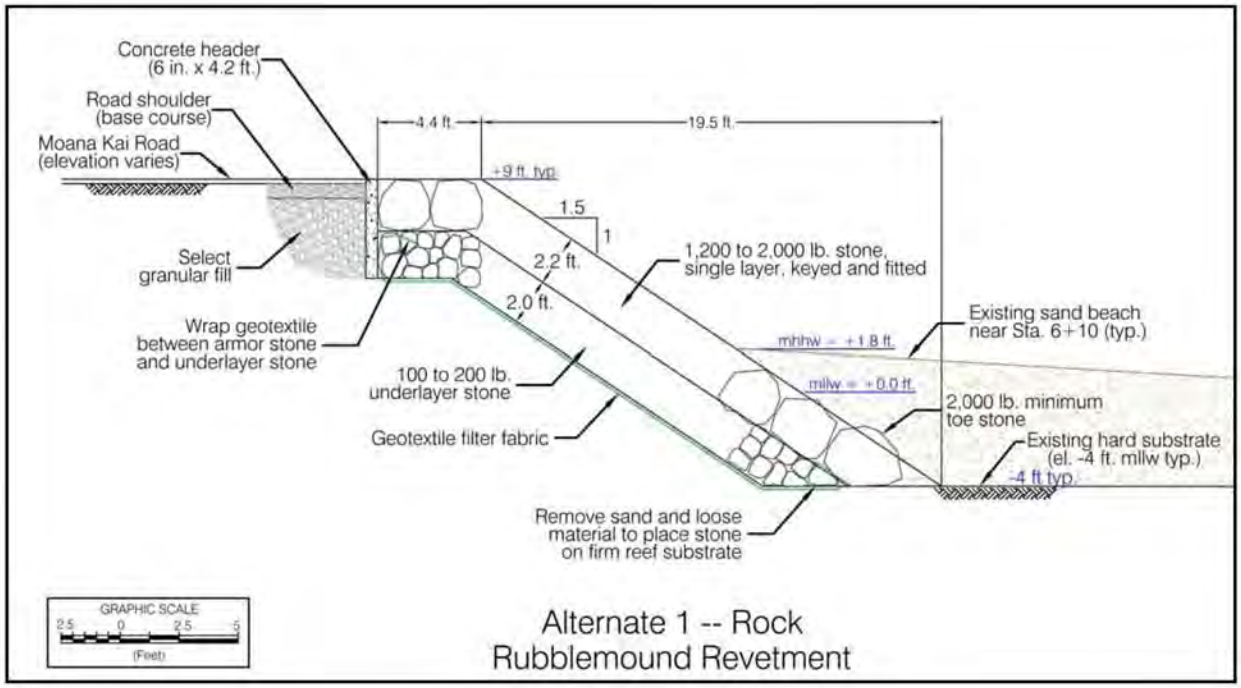



Figure 3-3, Alternative 1 – Rock Rubblemound Revetment

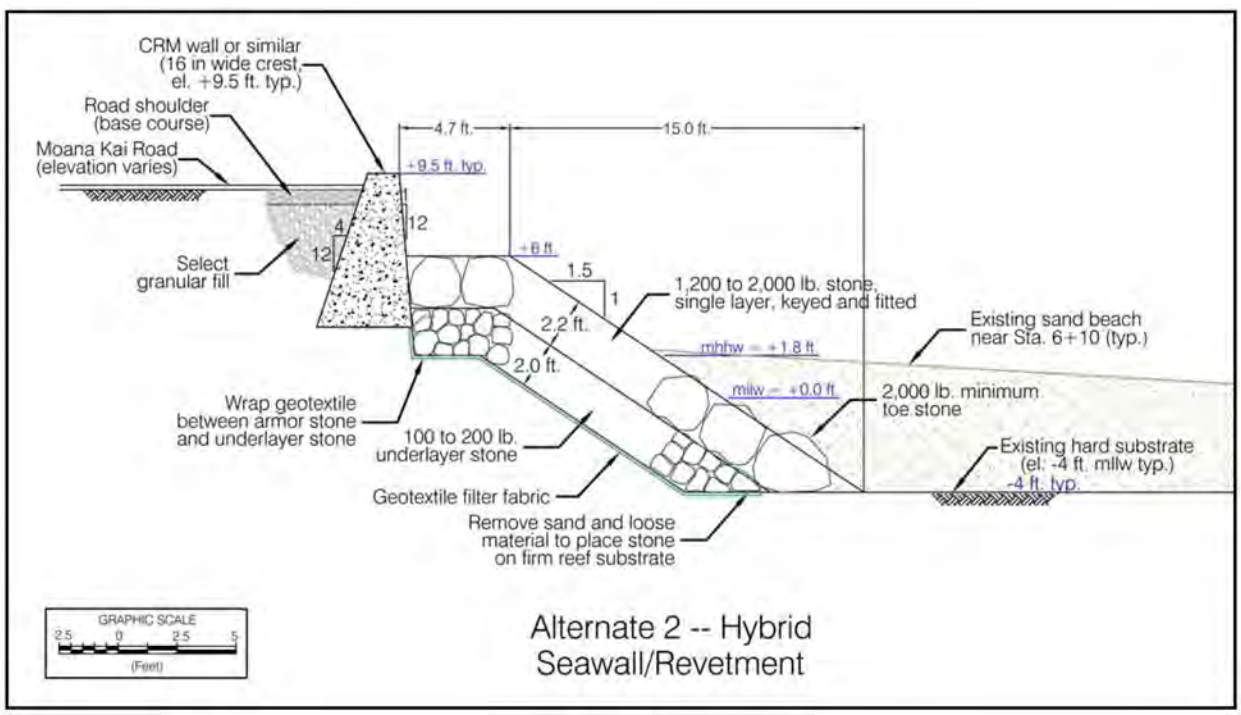



Figure 3-4, Alternative 2 – Hybrid Seawall/Revetment
(Sea Engineering, Inc., 2011)

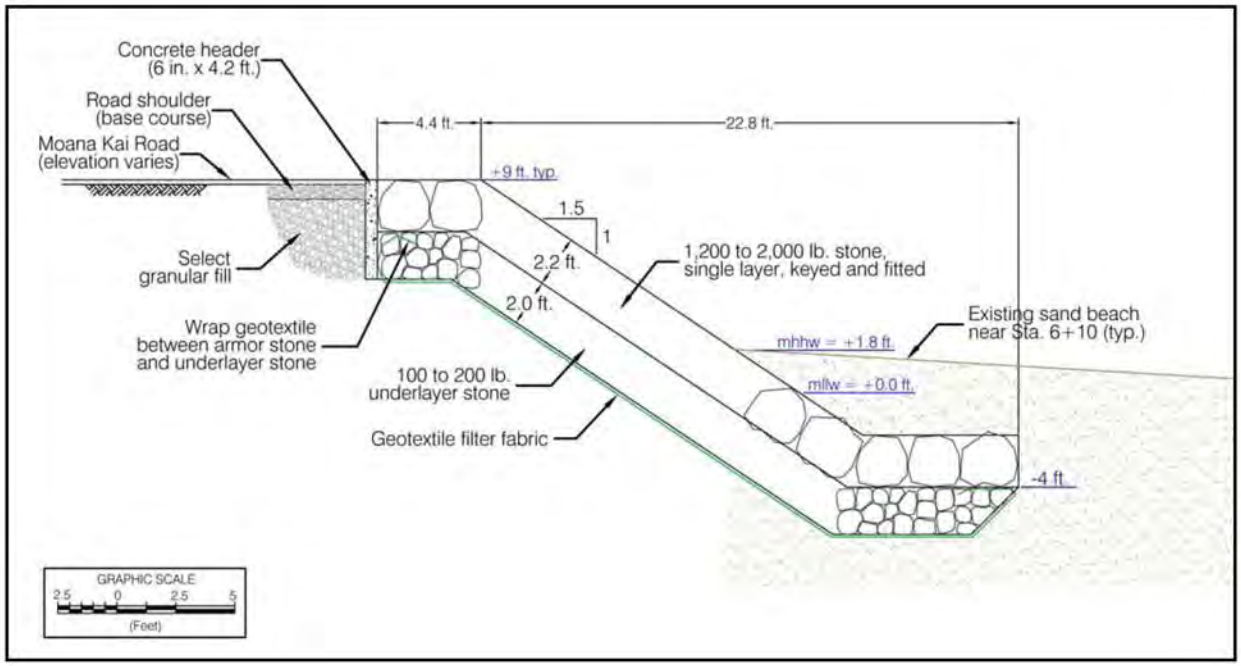



Figure 3-5, Alternative 1 Showing Toe Scour Apron
(Sea Engineering, Inc., 2011)

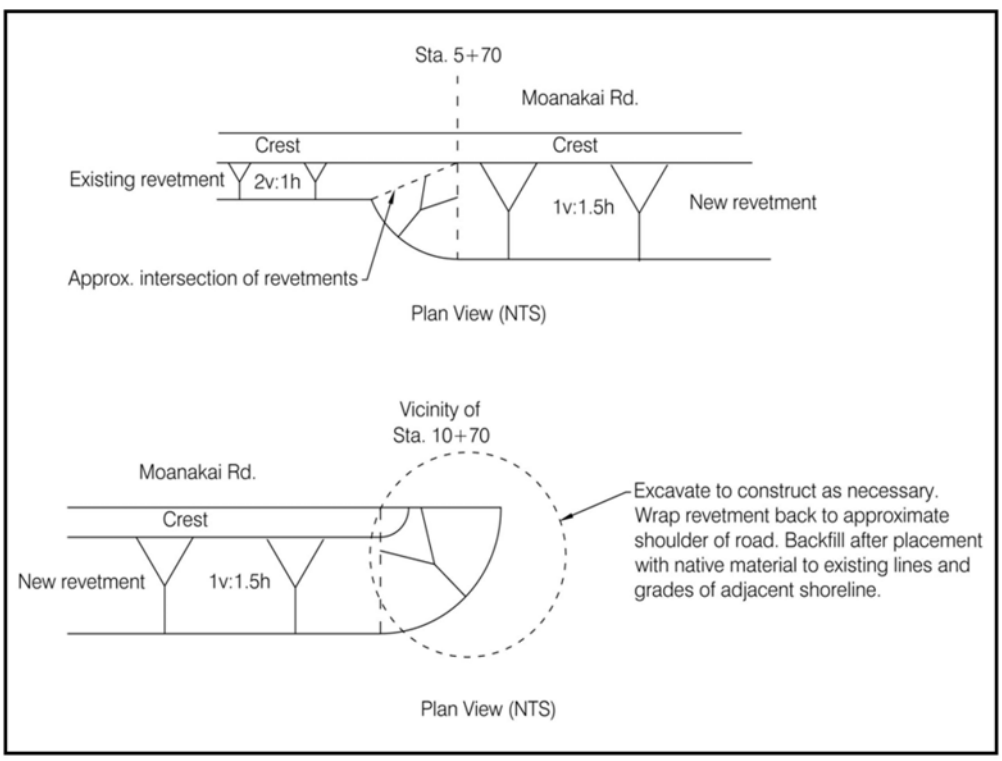



Figure 3-6
Concept Revetment Terminations
(Sea Engineering, Inc., 2011)

# *Section 4*
# *Project Alternatives and Preferred Alternative*

## *4.1 Alternatives to the Proposed Action*

Alternatives to the proposed project that were considered include: (1) the No Action Alternative; (2) the Delayed Action Alternative; (3) Alternative Design 1; and (4) Alternative Design 2/Preferred Alternative. A description of each of these alternatives is provided below.

### *4.1.1 No Action*

The No Action alternative involves taking no further action to repair or restore the Moanakai seawall. Taking no action would avert the potential for negative adverse environmental impacts associated with construction activities and would eliminate the expenditure of public funds for design, engineering, and construction. However, taking no further action would maintain the existing substandard structural condition of the Moanakai seawall which is of a structure in dilapidated condition susceptible to further shoreline erosion and wave processes that could eventually lead to the failure of the structure.

Taking no further action would also fail to accomplish the objectives for this project which are to provide: improved shoreline protection to address the immediate need for vehicular and pedestrian safety for users of the Moanakai Road; the maintenance of safe public access to the shoreline (e.g., recreational users could be at increased risk of injury from loose rocks and cobbles along the shoreline); minimizing the possibility of adverse future effects to the surrounding shoreline from further dilapidation of the Moanakai seawall; and, preserving the existing property along both makai and mauka ends of the project site.

Because the No Action alternative would fail to address the objectives for this project and fail to maintain an existing public facility for the safety and benefit of the community, it was rejected from further consideration.

### *4.1.2 Delayed Action*

The Delayed Action alternative involves the construction of the project, but at a later date. Delaying the proposed project would temporarily avoid the potential for adverse environmental effects and the need for the expenditure of funds for planning, design, development, and construction activities. However, because the potential for environmental impacts and project costs would only be delayed, impacts and costs associated with the project would eventually be borne when the project is implemented:

- Construction costs would be averted in the short-term, but could ultimately prove to be higher due to inflation and other factors while generating environmental outcomes similar to the preferred alternative of proceeding with the project.
- Delayed action would forestall the project's implementation schedule with the possible result of further deterioration to the seawall requiring repair and restoration. The potential environmental impacts and mitigation measures required for the project is expected to either remain unchanged or require additional mitigation due to the possibility of further deterioration of the seawall over time.

Delaying the project to a later time is expected to have many of the same effects as the No Action alternative, with the additional prospect of potentially higher costs associated with further deterioration of the seawall from ongoing natural coastal shoreline processes.

Because the Delayed Action alternative would also fail to accomplish the objective of the project, it was also rejected from further consideration.

### *4.1.3 Alternative Design 1*

Alternative Design 1 (**Figure 3-3, Alternative 1 – Rock Rubblemound Revetment**) was developed by Sea Engineering, Inc., and is based in part on the relatively low design wave heights at the shore. The design incorporates a single armor stone layer placed over underlayer stone and geotextile filter fabric. The design section has a two-stone crest and a face slope of 1v:1.5h, based on the assumption of intersecting hard substrate at elevation -4 feet mllw (mean lower low water). A larger toe stone is specified to increase stability. An underlayer of smaller stone, as well as a geotextile layer is included in the design to reduce the potential for fine material to escape through voids in the stone.

Although Alternative Design 1 addresses the requirement for the design of a shoreline protection structure consistent with generally accepted design and engineering practice, the County of Kaua'i requested that the structure also possess a minimal footprint while meeting design requirements. The purpose for seeking to minimize the footprint of the structure is to increase or improve upon the area of shoreline available for public recreational use. Because Alternative Design 2 (see below) achieves this objective, the Alternative Design 1 was removed from further consideration.

(see **Appendix A**, Section 5.2, for further detail).

### *4.1.4 Alternative Design 2/Preferred Alternative*

This revetment alternative was developed to reduce the overall footprint of the structure and is designed containing elements of both a seawall and a revetment. This design features a revetment with a lower crest elevation that reduces the seaward extent of the structure, and the potential for increased overtopping at higher wave conditions is limited with the use of a seawall.

Because the hybrid design addresses the requirements of the project to improve safety while reducing the potential for adverse visual and aesthetic impacts associated with the repair of the revetment, it is selected as the preferred alternative.

As required, the revetment toe design will be subject to adjustment in order to address the presence of either hard or soft substrate. In the event that hard substrate is encountered at the approximate -4 feet elevation the toe design as shown in **Figure 3-4** will be utilized. However, in the event that soft substrate is found, a toe scour apron as indicated in **Figure 3-5**, would be added to the Hybrid Seawall/Revetment design.

(see **Appendix A**, Section 5.2, for further detail).

# *Section 5*
# *Description of Existing Site Conditions, Potential Impacts, and Proposed Mitigation*

## *5.1 Existing Site Conditions*

The Moanakai seawall is fronted by a sand and coral gravel beach, and bounded by the ocean to the east and Moanakai Road to the west. The coastline in this area is characterized by a combination of river and stream mouths, sandy beaches, fringing coral reef, and shore protection structures that includes the Moanakai seawall. Further to the west or mauka of the Moanakai Road are single family residences that are part of the town of Kapa'a. Kapa'a is mostly rural with residential development and a small concentration of buildings for commercial and industrial uses around the center of Kapa'a Town. (Sea Engineering, Inc., 2011).

The Moanakai seawall is a rock rubblemound 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 (**see Photo 6**). (Sea Engineering, Inc., 2011).

Photo 6: Transition between revetment profiles (Source: Sea Engineering, Inc.)

Between station 0+00 and station 3+00 (measured from south to north), the beach is 20 to 25 feet wide and is composed primarily of sand. For approximately 75 feet north of station 3+00, the beach is about 15 to 20 feet wide and contains a higher percentage of coral gravel. Beyond this area, the beach is predominately sand; in some locations through here, there was no dry sand beach at the time of a site visit in August 2010. The beach widens gradually to the north, to a width of about 40 feet (Sea Engineering, Inc., 2011).

A fossil rock bench that extends the full length of the project site is shown in Photos 1, 4 and 5. The rock bench is 60 to 75 feet wide with elevations of up to +3 feet relative to mean lower low water (mllw). At the north end of the project area, the rock bench is further offshore and provides a shallow, protected swimming area in its lee. The rock bench diminishes and then disappears 350 feet past the north end of the revetment. Offshore of the rock bench, a reef flat with typical depths of 3 to 5 feet extends approximately 1,500 feet from shore (Sea Engineering, Inc., 2011).

## *5.2 Climate*

### *5.2.1 Description*

Kapaʻa Ahupuaʻa is located on the windward side of Kauaʻi and is exposed to the prevailing tradewinds and their associated weather patterns. Līhuʻe, which is approximately 6 miles away from Kapaʻa, has an average rainfall of 41.06 inches. Rainfall occurs sporadically throughout the year, with most precipitation occurring during the months of March and April. Monthly temperatures in the area of Līhuʻe are in the range of 69.8 degrees Fahrenheit (F) mean temperature in February and 81.1 degrees F in August. The annual mean temperature is 75.7 degrees F (The State of Hawaiʻi Data Book, 2009).

### *5.2.2 Potential Impacts and Proposed Mitigation*

Improvements to the seawall will not affect the climate; however, the proposed project will be affected by climatic conditions such as rainfall. Impacts and mitigation measures for these climatic factors are discussed in Section 5.8, Natural Hazards.

## *5.3 Geology and Topography*

### *5.3.1 Description*

The topography of Kapaʻa is characterized as fairly flat, with irregularly-shaped gulches and small valleys in the uplands, through which small tributary streams including Kapahi, Makaleha and Moalepe run. While some of these streams combine with other tributaries in neighboring Keālia to form Kapaʻa Stream (often referred to as Keālia River), which empties into the ocean at the northern border of the *ahupuaʻa*, others flow directly into the lowlands of Kapaʻa, creating a large (approximately 170-acre) swamp area that has been mostly filled in modern times (Handy and Handy 1972:394, 423). Elevation within Kapaʻa town ranges from about 5-7 feet mean sea level (msl) along the shoreline up to 10-15 feet msl along mauka properties. Towards the northern end of Kapaʻa, elevations increase to about 15-20 feet msl.

### *5.3.2 Potential Impacts and Proposed Mitigation*

The potential for significant adverse effects to topography and geology are not anticipated based on the limited scope and scale of the proposed project. The project site will be cleared of excess material and graded. The extent of grading will cause no major changes in topography, as the foundation for the seawall already exists; because of this, adverse impacts are not expected.

Protection from construction storm water runoff will be addressed through the use of a Best Management Practices (BMPs) plan to govern all work to ensure proper treatment of storm water runoff to waters of the State. This will include the use of vegetative, structural and management practices, as required, to prevent untreated construction storm water runoff from entering state

water and reduce the effects of erosion and weathering. See Section 5.5, Soils, for further discussion.

## *5.4 Erosion and Wave Patterns*

### *5.4.1 Description*

Coastal erosion along this section of shoreline was evaluated by the University of Hawai'i's Coastal Geology Group (CGG). The CGG used historical aerial photographs dating from 1927 to 2008 to compare changes along the shoreline. The aerial photographs were ortho-rectified[2] and geo-referenced[3], and the low water marks on the photographs were digitized to provide a record of the long-term changes to that representative coastal feature. The erosion map shows annual erosion rates in the project area (transects 159-177) of up to about one foot per year. (**see Figure 5-1, Historical Shoreline Map**). (Sea Engineering, Inc. 2011).

The wave climate in Hawai'i is typically characterized by four general wave types. These include northeast tradewind waves, southern swells, North Pacific swells, and Kona wind waves. Tropical storms and hurricanes also generate waves that can approach the islands from virtually any direction. Unlike winds, any and all of these wave conditions may occur at the same time. (Sea Engineering, Inc. 2011).

Tradewind waves occur throughout the year and are most persistent April through September when they usually dominate the local wave climate. They result from the strong and steady tradewinds blowing from the northeast quadrant over long fetches of open ocean. Tradewind deepwater waves are typically between 3 to 8 feet high with periods of 5 to 10 seconds, depending upon the strength of the tradewinds and how far the fetch extends east of the Hawaiian Islands. The direction of approach, like the tradewinds themselves, varies between north-northeast and east-southeast and is centered on the east-northeast direction. The project site is directly exposed to tradewind wave energy. (Sea Engineering, Inc. 2011).

Southern swells are generated by storms in the southern hemisphere and are most prevalent during the summer months of April through September. Traveling distances of up to 5,000 miles, these waves arrive with relatively low deepwater wave heights of 1 to 4 feet and periods of 14 to 20 seconds. Depending on the positions and tracks of the southern hemisphere storms, southern swells approach between the southeasterly and southwesterly directions. The project site is somewhat sheltered from southern swells by the island of Kaua'i itself; however, some wave energy does refract and diffract around the island and impact the site. (Sea Engineering, Inc. 2011).

During the winter months in the northern hemisphere, strong storms are frequent in the North Pacific in the mid latitudes and near the Aleutian Islands. These storms generate large North Pacific swells that range in direction from west-northwest to northeast and arrive at the northern Hawaiian shores with little attenuation of wave energy. These are the waves that have made surfing beaches on the north shore of O'ahu famous. Deepwater wave heights often reach 15 feet

[2] A geometrically corrected image or photograph so that the distances shown are uniform and can be measured as with a map. en.wiktionary.org/wiki/orthorectified.

[3] The process of associating map information held in an image file with its location on the earth so that, for example, each pixel becomes associated with a latitude and longitude allowing routes and tracks to be correctly plotted and displayed. www.maps-gps-info.com/maps-gps-glossary-g.html.

and in extreme cases can reach 30 feet. Periods vary between 12 and 20 seconds, depending on the location of the storm. The project site is not directly exposed to north swells; however, this wave energy does refract and diffract around the island and impact the site. (Sea Engineering, Inc. 2011).

Waves that approach from the southeasterly to southwesterly direction associated with Kona winds and Kona lows are known as Kona storm waves. Kona storms occur when the winter low pressure systems that travel across the North Pacific Ocean dip south and approach the islands. Strong southerly and southwesterly winds generated by these storms result in large waves on exposed shorelines and often heavy rains. These events are infrequent; however, they can result in very large waves with deepwater heights up to 15 feet (Noda, 1991). Periods typically range from 6 to 10 seconds. The project site is not directly exposed to Kona storm waves. (Sea Engineering, Inc. 2011).

Severe tropical storms and hurricanes have the potential to generate extremely large waves, which in turn could potentially result in large waves at the project site. Recent hurricanes impacting the Hawaiian Islands include Hurricane Iwa in 1982 and Hurricane Iniki in 1992. Iniki directly hit the island of Kauaʻi and resulted in large waves along the southern shores of all the Hawaiian Islands. Damage from these hurricanes was extensive. Although not frequent or even likely events, they should be considered in the project design, particularly with regard to coastal structure stability. (Sea Engineering, Inc. 2011).

### *5.4.2 Potential Impacts and Proposed Mitigation*

The potential impacts associated with wave energy involve the exposure of the Moanakai Seawall to wave energy that can erode the materials comprising and supporting the seawall. These impacts would involve a loss of the structural material used to anchor the revetment stones or rocks, with the resultant movement and/or collapse of the seawall itself. Mitigation against wave energy forces will involve factoring into the design of the seawall appropriate parameters that include the structural composition of the repaired and restored seawall to withstand the design wave, and wave crest elevation and wave runup values.

Further detail on these factors is provided in **Appendix A**, Repair/Reconstruction of Moanakai Seawall: Moana Kai Road Coastal Assessment (Sea Engineering, Inc., 2011).

## *5.5 Soils*

### *5.5.1 Description*

The soil types in the surrounding area of the proposed project include beaches (BS) and Mokūleʻia fine sandy loam (Mr) (**see Figure 5-2, Soils**). According to Soil Survey of Islands of Kauaʻi, Oʻahu, Maui, Molokaʻi, and Lānaʻi, State of Hawaiʻi, as prepared by the U.S. Department of Agriculture, 1972:

> *"Kapaʻa soils have a subsurface layer of dark-brown to yellowish-brown, friable silty clay. The subsoil is yellowish-red to reddish-brown friable silty clay and clay loam. The substratum is soft, weathered basic igneous rock (Soil Survey, 4)."*
>
> *"Mokūleʻia fine sandy loam (Mr).—This soil occurs on the eastern and northern coastal plains of Kauaʻi. It is nearly level. This soil has a profile like that of Mokūleʻia clay loam,*

*except for the texture of the surface layer. Permeability is moderately rapid on the surface layer and rapid in the subsoil. Runoff is very slow and the erosion hazard is slight. The available water capacity is about 1 inch per foot in the surface layer and 0.7 inch per foot in the subsoil. Included in mapping were small areas where the slope is as much as 8 percent. This soil is used for pasture (Soil Survey, 95)."*

### *5.5.2 Potential Impacts and Proposed Mitigation*

No long term adverse impacts are anticipated to the area soils. Work at the site will principally involve the repair and reconstruction of the existing seawall. Ground disturbance will only be undertaken during construction, and any waste material that cannot be reused will be removed from the project site. Potential impacts involving soil stability or erosion will be addressed by the design of the project in accordance with industry practices for the construction of structures such as seawalls, by a professional engineer licensed in the State of Hawai'i.

Adherence to Federal, State, and County of Kaua'i regulations and guidelines governing construction of the project shall also be employed including the review and approval of the construction plans and related environmental entitlements that will be filed with the appropriate governmental agencies for this project. This will include the preparation of an Erosion Control Plan (ECP) and the implementation of erosion controls in accordance with the State and County of Kaua'i requirements. A list of environmental entitlements is provided in Section 7 of this document.

Mitigation against the loss of soils and construction materials in storm water runoff will be addressed through adherence to the requirements of Hawai'i Administrative Rules (HAR), Chapter 11-55, Water Pollution Control (National Pollutant Discharge Elimination System [NPDES] Permit Program), and Section 209, Water Pollution and Erosion Control.

Vegetation and/or structural controls will be used to stabilize surfaces that are exposed or susceptible to runoff and/or wave action. Use of native vegetation will be considered. Structural controls will include use of surfacing that is consistent with the area surroundings while meeting runoff and wave design requirements.

The following are typical BMP measures that would be applied to the subject project to address NPDES construction stormwater requirements:

Before Construction

- Existing ground cover will not be destroyed, removed or disturbed more than 20 calendar days prior to start of construction.
- Erosion and sediment control measures will be in place and functional before earthwork may begin, and will be maintained throughout the construction period. Temporary measures may be removed at the beginning of the work day, but shall be replaced at the end of the work day.

During construction:

- Clearing shall be held to the minimum necessary for grading, equipment operation, and site work.

- Construction shall be sequenced to minimize the exposure of cleared surface areas. Areas of one phase shall be stabilized before another phase can be initiated. Stabilization shall be accomplished by protecting areas of disturbed soils from rainfall and runoff by use of structural controls such as berms or vegetative controls such as grass seedling or hydromulching.
- Temporary soil stabilization with appropriate vegetation shall be applied on areas that remain unfinished. Permanent soil stabilization using vegetative controls shall be applied as soon as practicable after final construction.
- All control measures will be checked as necessary.
- Maintenance and fueling of construction equipment and vehicles shall be preformed only in designated areas. Clean up materials shall be placed in a conspicuous location to facilitate cleanup in the event of inadvertent leaks or spills. Refueling and maintenance of vehicles and equipment shall not be permitted outside of designated refueling areas.
- All liquid materials including petroleum, oils, and lubricants (POLs), solvents and cleaners shall be stored in sealable containers. No open containers for the storage of such materials will be permitted.

After construction:

- All equipment no longer necessary to the site will be removed. Construction debris (that cannot be recycled in accordance with Section 1805 of Public Law 109-59) and refuse will be disposed of at an approved facility that accepts construction and demolition debris waste by the contractor.

## *5.6 Water Resources and Hydrology*

### *5.6.1 Surface Water*

There are no standing bodies of water on the subject property and no channels to carry flowing surface waters. Storm waters that fall on the subject property drain toward the ocean, either over land or through existing storm sewer systems.

The only major surface water feature of the site includes the ocean, directly to the west of the project site. Other surface water features including perennial or intermittent streams are not present in close vicinity of the proposed site, although three wetland features are located in proximity to the site (see Section 5.7, Wetlands).

Waiākea Canal is a straightened and hardened canal that flows through Kapa'a town and discharges into the ocean between boulder jetties. This canal has boulder riprap banks and a sand bottom. There is a boat launching ramp and dock located nearby the existing cane haul road bridge used by pedestrians and bicyclists. Lihi Park is an undeveloped park area located along the southern side of this canal.

### *5.6.2 Surface Water, Potential Impacts and Proposed Mitigation*

Potential impacts to water quality include the potential for the generation of silt and sediments in storm water runoff from the project site discharging into the ocean. In order to address this potential, mitigative measures that include the use of a County approved ECP and construction

storm water BMPs plan will be employed to control against soil, sediment and construction related erosion.

Construction activities will temporarily disturb soils on the property, however, silt fences, berms and other applicable erosion control measures will be implemented to prevent soil, sediment, and construction related debris from discharging into the nearby marine waters. As required, exposed soils will be covered with PVC sheet plastic and/or berms shall be used to prevent inadvertent contact and mixing with storm water. During construction, silt curtains will be employed around the work area to limit the migration of silt and sediments into the coastal water column ().

### *5.6.3 Nearshore Water Quality*

A nearshore water quality survey was conducted by AECOS, Inc., on September 24, 2010 and is discussed in the report Repair/Reconstruction of Moanakai Seawall: Water quality survey for Moanakai Road seawall improvements, Kapa'a Kaua'i, Hawai'i (**see Appendix B**). The methods and findings of the investigation are summarized below.

*Methods*

AECOS biologists measured certain parameters in the field and collected water samples for analyses in the laboratory at three stations ("North", "Mid", and "South") in the Project area. The stations were located in the water shoreward of the beach rock formation. An additional sample was collected at station (Sta.) Mid to serve as baseline data for the NPDES application. Field measurements were made and samples collected around 3:30 pm during the high tide.

*Findings*

Water quality at the project site is good. All three stations had similar water quality, indicating the water is well-mixed. 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 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).

Table 1. Water quality characteristics of nearshore waters off Moanakai seawall, Kaua'i, as determined at LHW on September 24, 2010.

| | **Time Sampled** | **Temp. (ºC)** | **DO (Mg/l)** | **DO sat. (%)** | **Salinity (psu)** | **pH** | **Chl α (µg/l)** |
|---|---|---|---|---|---|---|---|
| **North** | 1538 | 29.5 | 7.19 | 114 | 35 | 8.19 | 0.31 |
| **Mid** | 1549 | 29.3 | 7.41 | 118 | 35 | 8.25 | 0.44 |
| **South** | 1515 | 28.9 | 7.05 | 110 | 34 | 8.13 | 0.42 |
| | | **Turbidity (ntu)** | **TSS (mg/l)** | **Ammonia (µgN/l)** | **Nitrate + nitrite (µgN/l)** | **Total N (µgN/l)** | **Total P (µgP/l)** |
| **North** | | 1.16 | 8.8 | 18 | <1 | 132 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Mid** | 1.04 | 8.3 | 38 | <1 | 121 | 5 |
| **South** | 1.06 | 8.7 | 6 | <1 | 116 | 4 |

The detection limits of the methods required to be used for nutrient analysis of water quality samples for NPDES permit applications (HDOH, 2007a, 2007b) are higher than that used to characterize the water quality of the project area. No nutrients (ammonia, nitrate nitrite, TN, or TP) were detected in levels above the reporting limits for these analyses (Table 2). Oil and grease was not detected in the sample.

Table 2. Baseline water quality data from nearshore waters at Moanakai seawall, Kaua'i at Sta. "Mid" to be used for NPDES application

| | **Time Sampled** | **Temp. (ºC)** | **DO (Mg/l)** | **DO sat. (%)** | **Salinity (psu)** | **pH** | **Oil & Grease (mg/l)** |
|---|---|---|---|---|---|---|---|
| **Mid** | 1549 | 29.3 | 7.41 | 118 | 35 | 8.25 | <1.0 |
| | | **Turbidity (ntu)** | **TSS (mg/l)** | **Ammonia (µgN/l)** | **Nitrate + nitrite (µgN/l)** | **Total N (µgN/l)** | **Total P (µgP/l)** |
| **Mid** | | 1.04 | 6.9 | <100 | <100 | <500 | <100 |

Waters off the east coast of Kaua'i are designated as Class A with state water quality criteria pertaining to either "wet" and "dry" conditions. The coastal waters within the lagoon off the Moanakai seawall fall into the "wet" set of criteria due to the freshwater input along the coastline from Waikaea Canal to the north and Waipouli Canal to the south. As stated in the water quality regulations, it is the objective of Class A waters that their use for recreation and aesthetic enjoyment be protected.

### *5.6.4 Nearshore Water Quality, Potential Impacts and Proposed Mitigation*

Since the water quality at the project site is good. Project specific best management practices (BMPs), including silt curtains, will need to be developed to ensure that water quality of the lagoon and adjacent reef flat are protected from sedimentation and project related runoff. Any brief periods of impaired water quality associated with construction should have minimal impacts inside the lagoon or on the nearby reef flat as daily water exchange is high in these areas. Much of the construction should occur on land, which will reduce the risk of concrete and construction related material spills into marine waters.

Potential exists for short term impacts from construction activities on the water quality of the nearshore environment. Activities involving mechanical equipment in the vicinity of the shoreline can lead to increased turbidity during construction, but adverse effects can be mitigated through the use of silt curtains and the curtailment of certain activities during high tide, adverse seas, or high rainfall conditions. Temporary increases in suspended sediments as a result of construction activities will cease once the project is completed.

Care must be taken to avoid depositing construction materials, oil, grease, hydraulic fluid, fuel and/or any other noxious chemicals fluids directly or indirectly into the marine environment. Discharges can be mitigated by employing best management practices (BMPs) including, but not necessarily limited to:

1. Proper storage, handling, and disposal of construction and waste materials away from the shore;
2. Construction equipment washing and other similar activities done in a manner that allows for the proper disposal of the resultant wastewater;
3. Maintenance of heavy machinery to ensure fluids of any kind is not leaked;
4. Proper use of silt curtains during construction activities; and
5. Water quality monitoring to ensure compliance with permit requirements.

Further discussion on BMPs for storm water and dewatering can be found in Section 5.5.2.

The employment of BMPs during construction of the proposed project will involve the preparation of BMPs associated with the types of discharges that are anticipated. The types of discharges that will be addressed by the NPDES permit program include: discharges of construction storm water and construction dewatering. All NPDES permit applications prepared for this project will be in accordance with HAR, Chapter 11-55, Water Pollution Control.

The mitigations described above, as well as the measures that will be provided in the project environmental permit applications including the Section 404/10 Department of the Army and Section 401 Water Quality Certification permit applications are anticipated to be sufficient to ensure against construction, operations related, and inadvertent or accidental spills of pollutants in state waters. No adverse impacts to nearshore waters are therefore anticipated. As required, the applicant intends to further consult with the State DOH-CWB during construction and operation of facility to maintain all regulatory requirements.

### *5.6.5 Groundwater*

Ground water in Kapa'a comes from diked basal ground water derived from rainfall. The rainfall is absorbed into the ground and is impeded by a series of volcanic dikes. These dikes supply the basal lens of fresh water that sits under the island. The quality of groundwater in the area is very good and requires no treatment except disinfection (http://www.kauaiwater.org/ce_ws_lihue.asp).

### *5.6.6 Groundwater, Potential Impacts and Proposed Mitigation*

The proposed project is not anticipated to itself constitute an adverse potential impact on the groundwater resources of the area. The potential for construction related impacts to groundwater are principally anticipated to involve discharges percolating into the ground from stormwater commingling with demolition debris, sediments, and stored construction materials. Mitigation measures include the preparation of a NPDES Construction Stormwater Permit to ensure against mixing and discharges of storm water runoff with construction associated materials and debris. A BMPs Plan will address the potential for mixing of stormwater with construction materials and debris by describing management, structural, and vegetative controls that may be applied at the project site (refer to Section 5.5.2 for discussion of further mitigation measures).

## *5.7 Wetlands*

### *5.7.1 Description*

Wetlands play an integral role in the environment. They prevent erosion in the surrounding area through the presence of wetland associated plants with root systems that hold soil in place. The plants also serve as a physical barrier and absorb energy from waves. Wetlands also provide a natural filtration system for runoff. Nutrients swept into the wetland from runoff are absorbed by plant roots and microorganisms that live in the soil, or stick to the soil particles themselves. Through this process, most of the nutrients and pollution in the water are absorbed and retained and are prevented from entering the ocean (Environmental Protection Agency, 2010).

There are four U. S. Fish and Wildlife (USFWS) National Wetlands Inventory coded wetlands in the vicinity of the project site (**see Figure 5-3, Wetlands**). These wetlands are designated M2USP, M2USN, M1UBL and R2UBHx. The following describes each code based on the USFWS description:

M2USP and M2USN:

> M – System MARINE: The Marine System describes open ocean and high energy coast lines with salinities exceeding 30 parts per thousand (ppt) and little or no dilution except outside the mouths of estuaries.
>
> 2 – Subsystem INTERTIDAL: This is defined as the area from extreme low water to extreme high water and associated splash zone.
>
> US – Class UNCONSOLIDATED SHORE: Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class.
>
> P – WATER REGIME Irregularly Flooded: Tidal water floods the land surface less often than daily.
>
> Or,
>
> N – WATER REGIME Regularly Flooded: Tidal water alternately floods and exposes land surface at least once daily.

M1UBL:

> M – System MARINE: The Marine System describes open ocean and high energy coast lines with salinities exceeding 30 parts per thousand (ppt) and little or no dilution except outside the mouths of estuaries.
>
> 1 – Subsystem SUBTIDAL: These habitats are continuously submerged substrate, (i.e. below extreme low water).
>
> UB – Class UNCONSOLIDATED BOTTOM: Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%.
>
> L – WATER REGIME Subtidal: The substrate is permanently flooded with tidal water.

R2UBHx:

R – System RIVERINE: The Riverine System includes all wetlands and deepwater habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. Upland islands or Palustrine wetlands may occur in the channel, but they are not part of the Riverine System.

2 – Subsystem LOWER PERENNIAL: This Subsystem is characterized by a low gradient and slow water velocity. There is no tidal influence, and some water flows throughout the year. The substrate consists mainly of sand and mud. The floodplain is well developed. Oxygen deficits may sometimes occur.

UB – Class UNCONSOLIDATED BOTTOM: Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%.

H – WATER REGIME Permanently Flooded: Water covers the land surface throughout the year in all years.

x – SPECIAL MODIFIER Excavated: Lies within a basin or channel that have been dug, gouged, blasted or suctioned through artificial means by man.

### *5.7.2 Potential Impacts and Proposed Mitigation*

The potential for construction related impacts to the nearby salt marsh wetlands and coastal waters can result from a release of materials or debris directly falling into the water, and by stormwater runoff that could mix with sediments and construction materials. These discharges would most likely occur during construction with the excavation of soil and the use of materials such as concrete.

Mitigation measures to ensure protection against construction associated discharges will be employed at the site and will include the following:

- ECP - Discharges of construction associated stormwater runoff will be subject to preparation and filing of an ECP as required by the County of Kaua'i Department of Public Works. Erosion control measures will be as prescribed in the County's Erosion and Sedimentation Standards. These measures include limiting the areas subject to excavation before allowing work in new areas; planting grass or applying hydromulch to stabilize bare surfaces; and use of a stabilized construction entry to inhibit the spreading of sediments unto adjoining roads from construction vehicles leaving the job site.
- To prevent negative impacts to the salt-marsh wetland, the work area may be sectioned off using silt curtains or other appropriate measures to isolate the work area and prevent earth-moving activities from directly impacting the *muliwai*. All land disturbances will be stabilized prior to removal of silt curtains (or similar) erosion control measures.
- A NPDES NOI Form C, Construction Stormwater permit application will be prepared to ensure against mixing and discharge of storm water runoff with construction associated materials and debris. A BMPs Plan will address the potential for mixing of stormwater with construction materials by describing management, structural, and vegetative controls that may be applied at the project site.

The use of the mitigation measures prescribed above is expected to ensure against the potential for adverse effects to wetlands.

## *5.8 Natural Hazards*

### *5.8.1 Description*

The Hawaiian Islands are susceptible to five main types of natural hazards: earthquakes and volcanic activity; hurricanes; tsunamis; and flooding. Natural hazards including hurricanes, flooding, and tsunamis are unavoidable for coastal areas.

*Earthquakes and Volcanic Activity*

Natural hazards in the Hawai‘i region are infrequent and rarely destructive. The most frequent are small earthquakes that usually go unnoticed. Earthquakes occurring in Hawai‘i are closely linked to volcanic activity. Numerous earthquakes take place every year, with the majority beneath the Island of Hawai‘i. The largest earthquake in the recent past occurred in 2006 approximately 6 miles southwest of the Island of Hawai‘i measuring 6.7 on the Richter scale. Volcanic activity will not affect the proposed project directly through volcanic eruption, as there are no active volcanoes on the island of Kaua‘i.

Kaua‘i is located in the Zone 1 category for seismic activity as established by the Uniform Building Code (UBC). The UBC provides minimum design criteria to address the potential for damage due to seismic disturbances. The range of seismic risk varies from Zone 0, indicating no damage, to Zone 4, indicating major damage.

Although the possibility of earthquakes on Kaua‘i is lower than on other islands, the potential for damage to the proposed project site may occur from an earthquake of sufficient magnitude. The potential for damages to the proposed seawall will be minimized by complying with appropriate Federal, State, and County design standards.

*Hurricanes*

Heavy rains and strong winds associated with tropical storms occasionally impact the Hawaiian Islands and can cause flooding and major erosion. Hurricanes occasionally approach the Hawaiian Islands, but rarely reach the islands with hurricane force wind speeds.

Hawaii’s annual “hurricane season” is from June through November. Hawai‘i has experienced the full effects of five hurricanes since 1949. The first Hiki (1950) moved from east to west, north of the islands. The other four, Nina, (1957), Dot (1959), Iwa (1982) and Iniki (1992), all traveled on more-or-less northerly headings. Except for Hiki, the storms moved across, or very close to, Kaua‘i. Hurricane Iwa passed within 30 miles of Kaua‘i and Iniki passed directly over Kaua‘i. Nina remained southwest and west of the islands (U.S. Navy, 2002).

*Tsunami*

Tsunamis are a series of enormous waves created by an underwater disturbance such as an earthquake, landslide, volcanic eruption, or meteorite. A tsunami can move hundreds of miles per hour in the open ocean and smash into land with waves as high as 100 feet or more. From the area where the tsunami originates, waves travel outward in all directions. Once the wave

approaches the shore, it builds in height. The topography of the coastline and the ocean floor will influence the size of the wave. There may be more than one wave and the succeeding one may be larger than the one before. That is why a small tsunami at one beach can be a giant wave a few miles away. (http://www.fema.gov/hazard/tsunami/index.shtm)

All tsunamis are potentially dangerous, even though they may not damage every coastline they strike. A tsunami can strike anywhere along most of the U.S. coastline. The most destructive tsunamis have occurred along the coasts of California, Oregon, Washington, Alaska, and Hawaiʻi (http://www.fema.gov/hazard/tsunami/index.shtm). Most tsunami affecting the Hawaiian Islands come from sources in the zone of mountain building that borders the Pacific Ocean. Hawaiʻi has experienced nine damaging tsunami since 1820 (University of Hawaiʻi at Hilo, 1983).

A tsunami can occur at any time with limited or no warning. Persons in low lying shoreline or beach areas are advised to immediately go to higher ground.

According to the Kauaʻi Civil Defense Agency, the tsunami evacuation boundary includes the entire project site to just below Kealoha Road (**see Figure 5-4, Tsunami Hazard Map**).

*Flooding*

Sudden high waves and the strong currents they generate are perhaps the most consistent and predictable coastal hazards in Hawaiʻi (University of Hawaiʻi at Hilo, 1998). According to the Flood Insurance Rate Map (FIRM) #1500020204E, the project area is located Zone VE, an area inundated by 100-year flooding with velocity hazard (wave action); Base Flood Elevations (BFEs) have been determined. (**see Figure 5-5, Flood Zones**).

### *5.8.2 Potential Impacts and Proposed Mitigation*

*Earthquake and Volcanic Activity Hazard*

Although the proposed project is not required to be designed in accordance with State or County building codes, the design will be in accordance with the regulatory requirements and design guidelines[4] of the U. S. Army Corps of Engineers. Mitigation measures to address the potential for earthquake hazards will be addressed by requiring that structures proposed for this project be built, at a minimum according to the relative low Kauaʻi values for seismic activity in accordance with the 2003 International Building Code (IBC).

*Hurricane and Tsunami Hazards*

To mitigate against potential impacts from hurricanes, the proposed project will ensure that improvements are designed to present building codes which offer some protection from damage.

To mitigate against tsunami and storm surge impacts, engineering analyses will be preformed to determine proper design criteria to be applied to structures associated with this project. The State and County of Kauaʻi Civil Defense will implement established procedures in the event of a flood or tsunami.

*Flood Hazard*

The proposed project involving seawall improvements is located within the Federal Emergency Management Agency (FEMA) Flood Zone VE. The proposed project intends to protect the

[4] U. S. Army Corps of Engineers, Shore Protection Manual (1984); and, Coastal Engineering Manual (2006)

shoreline from storm surges, and will be constructed for this purpose; thus significant impacts to the seawall are not expected.

No habitable structures are proposed that would constitute an unreasonable risk to life or property. Given the requirement for the proposed project to be located within proximity of the shoreline, the proposed use is considered reasonable and is not anticipated to have a significant impact on flood conditions. No further mitigation measures related to flooding are planned or proposed.

## *5.9 Flora and Fauna*

### *5.9.1 Flora*

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.

Terrestrial flora found at the project site include native species such as naupaka (*Scaevola taccada*) and introduced species, such as coconut (*Cocos nucifera*) and Ironwood trees (*Casuarina equisetifolia*), with mostly herbaceous plants including grasses and weedy species typical of disturbed areas. 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.

The natural vegetation in the surrounding area of the project site consists of *kiawe* (*Prosopis pallida*) *klu* (*Acacia farnesiana*), *koa haole* (*Leucaena leucocephala*), and bermudagrass (*Cynodon dactylon*) in the drier areas and Napier grass (*Pennisetum purpureum*), guava (*Psidium guajava*), and joee (*Verbena litoralis*) in the wetter areas (Foote et al. 1972:95; visual confirmation by CSH, 2010).

Existing homes, landscaped lawns and plantings also cover surrounding areas of the site. These may contain commonly grown ornamental species such as areca palm (*Chrysalidocarpus lutescens*), avocado (*Persea americana*), various croton (*Codiaeum variegatum*) hibiscus (*Hibiscus rosa-sinensis*), plumeria (*Plumeria rubra*), papaya (*Carica papaya*), and Alexandra palm (*Archontophoenix alexandrae*).

No threatened or endangered plant species were observed within the project limits.

### *5.9.2 Flora, Potential Impacts and Proposed Mitigation*

No adverse effects to rare, threatened or endangered flora are anticipated as all work will remain within an already disturbed area. Upon the completion of work, all areas of exposed soils will be replanted to maintain erosion and sediment control.

### *5.9.3 Fauna*

Terrestrial fauna found at the project site principally consists of small mammals and birds. These species include mice, cats (*Felix domesticus*), dogs (*Canis familiaris*), barred doves (*Feopelia*

*striata*), rats (*Rattus ssp*.), Pacific Golden Plovers (*Pluvialis fulva*), feral chickens (*Gallus gallus*) and finches (*Cardopacus mexicanus frontalis*). None of these terrestrial species are listed as candidate threatened or endangered species by the State or Federal government.

The potential for marine fauna and flora that may be present at the site was assessed by AECOS Consultants, Inc., in the report Repair/Reconstruction of Moanakai Seawall: Marine biological survey for Moanakai Road seawall improvements, Kapa'a, Kaua'i, Hawai'i, in 2010 (see **Appendix C**). Biologists recorded environmental characteristics and species of marine fauna and flora observed in all these areas. Biologists walked along the revetment boulders and the limestone bench, and snorkeled the waters in the lagoon and over the reef flat. Marine algae, fishes, and macroinvertebrates were identified in the field and verified with various texts (Hoover, 1999; Huisman, et al. 2007). A listing, including relative species abundance for *limu* and marine animals observed is found in **Appendix C**. The following is a summary of the findings of the AECOS Consultants, Inc., report, organized by the location inspected.

*Revetment*

The basalt boulders of the seawall and revetment are sparsely inhabited. Small numbers of barnacle (*Chthamalus proteus*), nerite snail (*Nerita picea*), periwinkle (*Littoraria intermedia*), mussel (*Brachiodontes crebristriatus*), and a'ama crab (*Grapsus tenuicrustatus*) occur in the intertidal zone. No algae were observed on the basalt boulders.

*Lagoon*

Schools of varying size classes of āholehole (*Kuhlia xenura*) and mullet (*Mugil cephalus* or 'ama'ama) use these protected lagoon waters. Juvenile manini (*Acanthurus triostegus*) and adult tilapia (*Sarotherodon melanotheron*) also school in the lagoon. The north end of the lagoon hosts slightly larger fishes and reef fishes, including small schools of weke ula (*Mulloidichthys vanicolensis*), saddle wrasse (*Thalassoma duperrey*), and belted wrasse (*Stethojulis balteata*). Noticeably absent on the lagoon side are sea urchins. Many juvenile fishes, including butterflyfishes, wrasses, manini, flagtails, and mullet inhabit these calmer waters.

*Bench*

The limestone bench has many cracks, holes, and depressions in which gobies and blennies reside. The south end of the bench is submerged less frequently than the north end and therefore hosts organisms adapted to conditions of the upper interidal. Most notable, at the south end, are the many false 'opihi (*Siphonaria normalis* or 'opihi 'awa) and thousands of tiny snails (keeled periwinkle, *Paesiella tantilla*). In addition, small brown egg masses were observed in this area nearby false 'opihi scars devoid of algae. The water-filled depressions of the bench host goby (Bathygobius sp.), marbled blenny (*Entomacrodus marmoratus*), snakehead cowry (*Cypraea caputserpentis*), and coralline algae nodules. Yellow-foot and black-foot 'opihi (*Cellana sandwicensis* and *C. exarata*) also occur, but in small numbers towards the north end. Biota at the north end of the bench are more subtidal marine in nature. Teated sea cucumbers (*Holothuria whitmaei* or loli), zebra blenny (*Istiblennius zebra*), and xanthid crabs are common here. Live, unattached coral fragments (*Porites spp., Pocillopora meandrina, Psammocora stellata*, and *Poc. damicornis*) are present in water-filled depressions; these likely cast up during high sea conditions from parent colonies on the adjacent reef flat. Algae here include green bubble algae

(*Dichtyosphaeria versluysii*), *Sargassum echinocarpum*, and *Padina japonica*, with *Padina* being most common.

*Reef Flat*

Corals are represented by at least 9 species. The most common coral genus is *Pocillopora* with three species represented: *Poc. damicornis* (lace coral), *Poc. meandrina* (cauliflower coral), and *Poc. eydouxi* (antler coral). Next most common is *Porites*, also with three species: *P. lobata* (lobe coral), *P. lutea* (mound coral), and *P. compressa* (finger coral). Also present are *Psammocora stellata* (stellar coral), *Montipora patula* (sandpaper rice coral), and *Cyphastrea ocellina* (ocellated coral), all in low numbers and with low cover. A visual estimate of coral cover over the reef area surveyed is less than 5%. The most well-represented fishes on the reef flat are wrasses (Family *Labridae*) with numerous juvenile saddle wrasse (*Thalassoma duperrey*) and belted wrasse (Stethojoulis balteata) present. Various damselfish, including the brighteye damsel (*Plectroglyphidodon imparipennis*), Hawaiian sergeant (*Abudefduf abdominalis*), and Hawaiian Gregory (*Stegastes marginatus*) are also present. Convict tang and brown surgeonfish feed on the sparse algae present. Conspicuously absent are parrotfish and jacks.

### *5.9.4 Fauna, Potential Impacts and Proposed Mitigation*

Some terrestrial wildlife species may be displaced into surrounding areas during construction as a result of increased activity and noise at the project site. Existing conditions however are expected to return to the area upon the completion of construction. Thus, the project is not expected to have a long-term adverse effect to the area's terrestrial fauna.

The AECOS Consultants, Inc., assessment determined that direct impacts to the marine environment from the proposed project will be minimal. The seawall and revetment basalt boulders host very little life and no sensitive biological resources occur in the immediate project area; any loss of biota will be small with recovery occurring rapidly.

Sea turtles, spinner dolphins, and humpback whales were not observed during the survey; however, they may occur in the project vicinity (although well offshore). The project area is not within the Hawaiian Islands Humpback Whale National Marine Sanctuary, but Humpback whales may occur in offshore waters. The generation of adverse sound levels should not be a problem to protected species, as no blasting or pile driving is anticipated. Monk seals are known to frequent the project area; however, if BMPs are followed, the project will not adversely affect the monk seal or other protected resources.

BMPs will be used to ensure that marine biota of the lagoon and adjacent reef flat are protected from sedimentation and project-related runoff. Construction may cause a temporary increase in turbidity, but this will be minimized with the use of silt curtains. Any brief periods of impaired water quality associated with construction should have minimal long term impacts inside the lagoon or on the nearby reef flat as daily water exchange is high in these areas. Construction will occur on land, which will reduce the risk of cement and construction-related material spills directly into the marine waters (AECOS Consultants, Inc., 2010).

The following BMPs to minimize the potential for adverse effects to threatened and endangered species will be implemented as recommended in the following guidelines provided by the National Marine Fisheries Services (NMFS/PIRO, 2008). As appropriate, adjustments to specific

provisions involving the length of time for monitoring may be adjusted to a shorter period (i.e., 10 – 15 minutes) if it is clearly observed by on-site personnel that no marine protected species are present in the work area and safety zone:

- For on-site project personnel that may interact with a listed species potentially present in the action area, provide education on the status of any listed species and the protections afforded to those species under Federal laws. The National Marine Fisheries Service (NMFS) may be contacted for scheduling educational briefings to convey information on marine mammal behavior, and explain why and when to call NMFS and other resource agencies.
- Establish a safety zone around the project area whereby observers will visually monitor this zone for marine protected species 30 minutes prior to, during, and for 30 minutes as a post project activity.
- Upon sighting of a monk seal or turtle within the safety zone during the monitoring time period or during project activity, immediately postpone or halt the activity until the animal has left the zone. Conduct activities only if the safety zone is clear of monk seals and/or turtles.
- If a marine protected species is in the area, either hauled out onshore or in the nearshore waters, a 150 foot buffer must be observed with no humans approaching them. If a monk seal/pup pair is present, a minimum 300 foot buffer must be observed. Record information on the species, numbers, behavior, time of observation, location, start and end times of project activity, sex or age class (when possible), and any other disturbances (visual or acoustic).
- In the event that a marine protected species enters the safety zone and the project activity cannot be halted, conduct observations and immediately contact NMFS staff in Honolulu to facilitate agency assessment of collected data. For monk seals contact the Marine Mammal Response Coordinator, David Schofield at (808) 944-2269, as well as the monk seal hotline at (888) 256-9840. For turtles, contact the turtle hotline at (808) 983-5730.

The requirement for further mitigative measures will be based on regulatory review of the project as required from the respective Federal, State and County governmental agencies. Regulatory review of the project from these agencies may involve the addition of mitigative measures or other controls to reduce impacts to flora and fauna. The applicant shall review the project with the appropriate governmental agencies, thereby reducing the potential for adverse impacts to the environment.

## *5.10 Archaeological Resources*

### *5.10.1 Description*

Cultural Surveys Hawai'i, Inc. (CSH) conducted an archaeological literature review and study for the proposed project in the report, Repair/Reconstruction of Moanakai Seawall: Archaeological Monitoring Plan for the Moanakai Sea Wall Repair Project, July 2010 (**Appendix D**). The CSH study included historical research on archival sources, historic maps, Land Commission Awards and previous archaeological reports to construct a history of land use and to determine if archaeological sites have been recorded on or near the property. The study

also included preparation of a report including the results of the historical research and recommendations for further archaeological work, as appropriate.

The results of the investigation are summarized below in: (1) background research; and (2) recommendations.

### *5.10.2 Background Research*

*Historical Uses of the Area*

The association of the *ahupuaʻa* of Kapaʻa with legendary historical figures such as Mōʻīkeha implies that the area was settled prior to Mōʻīkeha's time (early fourteenth century), although the extent of this settlement is not known. Handy (1940) counts Kapaʻa as one of the major settlement areas of Kauaʻi in pre-contact times, and both Vancouver (1798) and Wilkes (1840) were impressed with this "most fertile and pleasant district" with its fields of "sugarcane, taro" and other crops. Through archaeology and other sources, it is known that at one time agricultural and domestic activities extended into the far *mauka* areas of Kapaʻa, but were abandoned by the mid-nineteenth century.

During the Māhele, Kapaʻa was retained as Crown Lands. The *ʻili* of Paikahawai and Ulukiu in Kapaʻa Ahupuaʻa were retained as Government Lands. Land Commission Awards show that six *makaʻāinana* were awarded land parcels in Kapaʻa. During the late 19th and early 20th century, Kapaʻa experienced the plantation era with the commercial cultivation of sugarcane, rice, and pineapple. Freight shipping and a railroad system also developed to cater to commercial activities of the plantations.

In the 1920s, land immediately *mauka* of the project area was first developed for residential homes. Floods in 1940 led to the dredging and construction of the Waikaʻea and Mōʻīkeha Canals. Subsequent dredging of the reefs and shoreline north of the project area may be responsible for accelerated erosion along the coast in the area.

The Land Commission Awards (LCAs) pattern in Kapaʻa shows *loʻi* and *kula* on the rim of the swamplands and extending into the watered valleys. Marshlands without known LCAs may have had *loʻi* along the edges. However, in the early twentieth century, the entire area behind Kapaʻa Town consisted of rice and *kula* lots. Flood control measures were instituted in the 1960s and marshlands, used previously for taro and then taken over by the rice farmers, were drained and became cane and pasture.

*Traditional and Legendary Accounts of Kapaʻa*

*Ka Lulu o Mōʻīkeha*
Kapaʻa was the home of the legendary *aliʻi*, Mōʻīkeha. Akina (1913) tells the story of how Mōʻīkeha's son, Kila, stocked the islands with the fish *akule*, *kawakawa*, and *ʻōpelu*.

*Pākaʻa and the wind gourd of Laʻamaomao (Keahiahi)*
Kapaʻa also figures prominently in the famous story of Pākaʻa, and the wind gourd of Laʻamaomao. Pākaʻa was the son of Kūanuʻuanu, a high-ranking retainer of the Big Island ruling chief Keawenuiaʻumi, and Laʻamaomao, the most beautiful girl of Kapaʻa and member of a family of high status *kahuna*. Kūanuʻuanu left the island of Hawaiʻi, traveled throughout the other islands, and finally settled on Kauaʻi, at Kapaʻa.

*Kaweloleimākua*
Kapaʻa is also mentioned in traditions concerning Kawelo (Kaweloleimākua), Ka'ililauokekoa (Moʻikeha's daughter, or granddaughter, dependent on differing versions of the tale), the *moʻo* Kalamainuʻu and the origins of the *hīnaʻi hīnālea* or the fish trap used to catch the *hīnālea* fish, and the story of Lonoikamakahiki.

*Kalukalu grass of Kapaʻa*
*Kalukalu* is a sedge grass used for weaving mats and is associated with lovers. Kauaʻi was famous for this peculiar grass, and it probably grew around the marshlands of Kapaʻa.

*Previous Findings*

The pattern of archaeological studies in Kapaʻa Ahupuaʻa is somewhat skewed, with a dozen projects in urban Kapaʻa Town and very little work along the coast. Major archaeological sites have been found in the Kapaʻa Town area, including extensive cultural layers with burials and other cultural features underlying Kūhiō Highway near All Saints Gym and near the older part of Kapaʻa Town between Waikaʻea Canal and Kapaʻa Beach Park, *makai* of Kūhiō Highway (Hammatt 1991; Kawachi 1994; Creed et al. 1995; Jourdane 1995; Calis 2000). The *maukamakai* extent of these cultural layers has not been clearly defined. These extensive cultural deposits associated with pre-contact and early historic habitation are known to exist in a relatively narrow sand berm that makes up the physiogeography of Kapaʻa.

Marshy areas are *mauka* of Kapaʻa Town, although most of the marshlands have been filled in within recent decades. Five *kuleana* awarded during the Māhele are located adjacent to the present highway. The more *mauka* studies (Spear 1992; Chaffee et al. 1994a, 1994b; Hammatt, Ida and Chiogioji 1994; McMahon 1996) are thought to be located towards the *mauka* fringe of the sand berm, approaching more marshy conditions and have generally reported no significant or minimal findings. Less than 1.5 km to the south of Waikaʻea Canal is another extensive subsurface cultural deposit that is associated with a pre-contact fishing encampment located at the southern boundary of Waipouli adjacent to Uhalekawaʻa Stream (Waipouli Stream) and the ocean (Hammatt et al. 2000). (**see Figure 5-6, U.S. Geological Survey Map**).

No historic properties have been previously identified within the immediate vicinity of the project area, however, due to presence of Mokūleʻia Fine Sandy Loam sediments, human burials or intact cultural materials may be encountered during project activities.

### *5.10.3 Recommendations*

On-site archaeological monitoring is recommended for all ground disturbance conducted below the existing ground surface to facilitate the identification and treatment of any burials that might be discovered during project construction, and to alleviate the project's effect on nonburial archaeological deposits.

Under Hawaiʻi State historic preservation legislation, "Archaeological monitoring may be an identification, mitigation, or post-mitigation contingency measure. Monitoring shall entail the archaeological observation of, and possible intervention with, on-going activities which may adversely affect historic properties" (HAR, Chapter 13-279-3). For this project, the proposed monitoring program will serve as a mitigation measure that insures proper documentation should historic properties be encountered during development work.

Hawai'i State historic preservation legislation governing archeological monitoring programs requires that each monitoring plan discuss eight specific items (HAR, Chapter 13-279-4). The monitoring provisions below address the eight requirements in terms of the archaeological monitoring for the construction within the project area.

1. *Anticipated Historic Properties:*
   *The project area has a potential for pre-contact and post-contact cultural deposits as well as human burials.*
2. *Locations of Historic Properties:*
   *Historic properties may be encountered anywhere within the project area.*
3. *Fieldwork:*
   - *On-site archaeological monitoring is recommended for all ground disturbance activities below the existing ground surface. On-call monitoring consisting of weekly inspections is recommended for all additional ground disturbances. Any departure from this will only follow consultation with and written concurrence from the State Historic Preservation Division (SHPD)/Department of Land and Natural Resources (DLNR).*
   - *The monitoring fieldwork may encompass the documentation of subsurface archaeological deposits (e.g., trash pits and structural remnants) and will employ current standard archaeological recording techniques. This will include drawing and recording the stratigraphy of excavation profiles where cultural features or artifacts are exposed as well as representative profiles. These exposures will be photographed, located on project area maps, and sampled. Photographs and representative profiles of excavations will be taken even if no historically-significant sites are documented. As appropriate, sampling will include the collection of representative artifacts, bulk sediment samples, and/or the on-site screening of measured volumes of feature fill to determine feature contents.*
   - *If human remains are identified, no further work will take place, including no screening of back dirt, no cleaning and/or excavation of the burial area, and no exploratory work of any kind unless specifically requested by the SHPD. All human skeletal remains that are encountered during construction will be handled in compliance with HRS, Chapter 6E-7 and 6E-8 and HAR, Chapter 13-300 and in consultation with SHPD/DLNR.*
4. *Archaeologist's Role:*
   *The on-site archaeologist will have the authority to stop work immediately in the area of any findings so that documentation can proceed and appropriate treatment can be determined. In addition, the archaeologist will have the authority to slow and/or suspend construction activities in order to insure that the necessary archaeological sampling and recording can take place.*
5. *Coordination Meeting:*
   *Before work commences on the project, the on-site archaeologist shall hold a coordination meeting to orient the construction crew to the requirements of the archaeological monitoring program. At this meeting the monitor will emphasize his or her authority to temporarily halt construction and that all historic finds, including objects such as bottles, are the property of the landowner and may not be removed from*

*the construction site. At this time it will be made clear that the archaeologist must be on site during subsurface excavations, if warranted.*

6. *Laboratory work:*
   *Laboratory analysis of non-burial related finds will include standard artifact and midden recording, as follows: Artifacts will be documented as to provenience, weight, length, width, type of material, and presumed function. Bone and shell midden materials will be sorted down to species, when possible, then tabulated by provenience, and presented in table form.*
7. *Report Preparation:*
   *One of the primary objectives of the report will be to present a stratigraphic overview of the project area which will allow for predictive assessments of adjacent properties, which may be the subject of future development. The report will contain a section on stratigraphy, description of archaeological findings, monitoring methods, and results of laboratory analyses. The report will address the requirements of a monitoring report (HAR, Section 13-279-5). Photographs of excavations will be included in the monitoring report even if no historically-significant sites are documented. Should burial treatment be completed as part of the monitoring effort, a summary of this treatment will be included in the monitoring report. Should burials and/or human remains be identified, then other letters, memos, and/or reports may be requested by the Burial Sites Program.*
8. *Archiving Materials:*
   *All burial materials will be addressed as directed by the SHPD/DLNR. Materials not associated with burials will be temporarily stored at the contracted archaeologist's facilities until an appropriate curation facility is selected, in consultation with the landowner and SHPD.*

### *5.10.4 Potential Impacts and Proposed Mitigation*

According to CSH, there are no known archeological sites in the immediate construction area. However, due to the presence of Mokūle'ia Fine Sandy Loam sediments, human burials or intact cultural materials may be encountered during project activities.

On-site monitoring is highly recommended for all ground disturbances. This will include disturbance below the existing ground surface to facilitate the identification and treatment of any burials that might be discovered during project construction, and to alleviate the project's effect on non-burial archaeological deposits. For this project, the recommended on-site monitoring will serve as a mitigation measure to insure proper documentation should historic properties be encountered during construction.

The aforementioned archaeological monitoring plan referenced in Section 5.10.3, Recommendations, fulfills the requirements of HAR, Chapter 13-279-4 and supports the proposed project's historic preservation review under HRS, Chapter 6E-8 and HAR, Chapter 13-284. The plan is intended for review and approval by the SHPD/DLNR.

## *5.11 Cultural Resources*

### *5.11.1 Description*

A review of the proposed project site in accordance with the requirements of Session Laws of Hawaiʻi (SLH), Act 50, was undertaken by CSH in the report, Repair/Reconstruction of Moanakai Seawall: Cultural Impact Assessment for the Moanakai Seawall Repair Project in July 2010, to identify a correlation between the law and the proposed project (**see Appendix E**).

The use of the project site for traditional or cultural practices is not anticipated to be adversely affected as the project site consists of a previously disturbed area that is adjacent to the shoreline and therefore allows for public shoreline access. The modified condition of the site also includes the presence of introduced plant species (**see Section 5.8, Flora and Fauna**) not normally associated with cultural gathering or use activities.

The following is a summary of the principal findings of the Cultural Impact Assessment (CIA).

The CIA included effort to contact and consult with Hawaiian cultural organizations, government agencies, and individuals with knowledge of and/or concerns about traditional cultural practices, resources, and beliefs related to the project area. In interviews done by CSH with long-time local residents, it was noted that the two main sources of cultural practice in the project area consist of fishing and *limu* gathering; however, the abundance of native species of fish and *limu* have greatly declined over the years. According to CSH all of the participants to the CIA attributed the depletion of ocean resources near the project area to the following factors: predation by the Hawaiian monk seal, sharks, and turtles, among others; windsurfing activities; and the introduction of invasive species such as *taʻape* (Bluestripe snapper, an introduced species) and *roi* (Striped or Blue spotted grouper, also an introduced species). No impacts directed from the seawall or proposed improvements were implied.

Participants in the interviews also claimed that native plants for *lāʻau lapaʻau* (traditional plant medicine) are more difficult to find in Kapaʻa today. Plants used for *lāʻau lapaʻau* included *pōpolo* (glossy nightshade), *ʻuhaloa* (American weed), *kukui* (candlenut), *ʻōlena* (tumeric), and plantain. These plants are used for ailments such as colds, congestion, cold sores, sore throat, ear aches, and ulcers. Participants believe that invasive plants like guinea grass, as well as the use of pesticides during the plantation era, have killed many of the useful plants.

The natural vegetation in the surrounding area consists of *kiawe* (*Prosopis pallida*) *klu* (*Acacia farnesiana*), *koa haole* (*Leucaena leucocephala*), and bermudagrass (*Cynodon dactylon*) in the drier areas and Napier grass (*Pennisetum purpureum*), guava (*Psidium guajava*), and joee (*Verbena litoralis*) in the wetter areas (Foote et al. 1972:95; visual confirmation by CSH, 2010). None of these plants were mentioned for use in traditional or cultural practices.

### *5.11.2 Potential Impacts and Proposed Mitigation*

According to CSH the maintenance of access to the ocean for gathering, ceremonial and recreational uses is crucial because the ocean is an extension of the Hawaiian people. Concern regarding project-related contamination of the nearby marine resource system should also be considered since these resources are culturally valuable to Native Hawaiians. Mitigation measures including the use of silt fencing/curtains, berms, and other applicable erosion controls are planned to be in place prior to and during the construction phase to ensure that contaminants do not discharge into the ocean. During construction, BMPs will be employed to prevent potential pollutant (sediment) discharges into storm water runoff. The BMPs will also be maintained for the duration of the construction period (see Section 5.5.2, Potential Impacts and Mitigation Measures, relating to Soils) for further information).

Construction of the proposed project is not expected to adversely impact long term access to the area for fishing or gathering activities. Temporary impacts however, may occur along segments of the approximately 1,050 foot construction area when heavy equipment is in use. During this period as each phase of construction progresses it will be necessary to cordon or restrict access to the immediate area of the seawall undergoing work to maintain public safety and ensure security of the site. The areas of temporary closure however, will not limit access to the shoreline since access will remain open along either side of the work area. This temporary period of closure will also be mitigated through the provision of an alternative access path in the area along Panihi Street. Unrestricted access will return to the site following the completion of construction.

## *5.12 Noise Conditions*

### *5.12.1 Description*

Regulation of noise is governed by the State Department of Health (DOH) through HAR, Title 11, Chapter 46, "Community Noise Control." Allowable day and nighttime noise standards for sensitive receptors have been established for residential, preservation, hotel, apartment, and business districts. Existing noise levels at the site are relatively low due to the existing residential zoning of the site. The maximum allowable day and night noise levels at the project site are as follows:

| *Time* | *Allowable Levels* |
|---|---|
| *7:00 am to 10:00 pm* | *55 dBA* |
| *10:00 pm to 7:00 am* | *45 dBA* |

Construction associated noise is anticipated to result from clearing and grading activities involving the use of a crane, bulldozer, excavator, grader, paver, dump trucks, concrete delivery trucks, jackhammers and other powered hand tools. Construction vehicles and workers will also occasionally have to pass through residential areas as they traverse along Moanakai Road from and to the job site.

### *5.12.2 Potential Impacts and Proposed Mitigation*

The potential noise receptors that may be adversely affected by construction associated noise will primarily include nearby residences and recreational users of the nearby beach and shoreline. However, noise generated from construction activities will for the most part not

radiate or extend beyond the immediate surrounding project site. The construction related noise is expected to be temporary, of limited duration, and restricted to daytime hours.

Mitigation measures to address the generation of temporary construction related noise includes:

- All equipment will be properly muffled in accordance with noise and air emissions regulations of the DOH.
- All combustion and air-powered equipment will be maintained in proper working order. Any equipment that is in disrepair shall be replaced or repaired prior to use.
- Work will be limited to weekdays during daylight hours between 8:30 am and 3:30 pm. No work will be scheduled on federal or state holidays.
- The contractor will secure a noise permit from the DOH prior to the initiation of the seawall improvements.

Although the generation of some noise will be unavoidable to accomplish the required repair and restoration of the seawall, the mitigation measures as proposed will help to minimize and reduce construction related noise associated impacts. Upon the completion of work no further construction noise will be generated and pre-existing background noise levels will return to the area.

No further measures are anticipated to be required.

## *5.13 Air Quality*

### *5.13.1 Description*

No sampling data was collected on air quality. Air quality at the project site is generally good due to the regular presence of tradewinds and the location of the site along the eastern coastline of the island. Existing major sources of air pollution are not present with the exception of vehicular exhausts from use of the Moanakai Road.

### *5.13.2 Potential Impacts and Proposed Mitigation*

Construction activities are expected to have little to no impact since the project will be of limited duration, and where engine exhausts may be a source of potential air pollution, all internal combustion equipment will be governed in accordance with applicable state regulations in HAR, Chapters 11-59 and 11-60, relating to Air Pollution Control.

During construction, fugitive dust is expected to be generated. Fugitive dust will be controlled with the regular wetting of the soil by the contractor and/or by the use of dust screens, as required. The use of water for dust control will only be in amounts sufficient to dampen the soils to inhibit the generation of dust without causing sediments to runoff to state waters. There will be no long-term effects to air quality once construction is completed.

## *5.14 Visual Resources*

### *5.14.1 Description*

The Kaua‘i General Plan identifies important scenic resources such as major land forms, open spaces, viewing points, scenic drives, etc. Consequently, the Kawaihau Planning District Heritage Resources map was reviewed to identify such resources that may be affected by the project.

According to the map, the project site lies within the “Residential, Urban Center, Resort, Transportation, Military” resource area and does not provide any natural, historic, cultural, or scenic features directly within the corridor that would be affected by the project (**see Figure 5-7, Scenic Resources**).

### *5.14.2 Potential Impacts and Proposed Mitigation*

The proposed project is expected to have no long-term, indirect or cumulative effects on visual resources. Construction activities will temporarily alter the visual resources of the area, due to the presence of equipment and personnel in the vicinity of the project site, but should not be considered a negative effect, as repairs at the site will advance the aesthetic value of the area once completed. Upon the completion of construction all equipment and personnel will be removed and the site will be permitted to return to existing conditions with no permanent visual intrusion to the site. No mitigation measures are anticipated to be required.

## *5.15 Socio-Economic Environment and Demographics*

### *5.15.1 Description*

The town of Kapa‘a offers an array of hotels, shopping centers, and tourist-oriented shops and restaurants.

In 2000, the Kapa‘a Census Designated Place (CDP) had a total population of 9,472, 3,129 households, and 2,281 families, with the median age of residents at 35.2. The population density was 971.2 people per square mile (375.1/km²). There were 3,632 housing units at an average density of 372.4/sq mi. The racial demographics of the Kapa‘a area included 27.81% White, 0.34% African American, 0.52% Native American, 31.67% Asian, 9.95% Pacific Islander, 1.00% from other races, and 28.72% from two or more races. Hispanic or Latino of any race accounted for 9.46% of the population.

The median income for a household in the 2000 census was $39,448, and the median income for a family was $45,878. Males had a median income of $30,129 versus $25,680 for females. The per capita income for Kapa‘a was $16,878. About 14.1% of families and 15.7% of the population were below the poverty line, including 18.6% of those under age 18 and 12.6% of those aged 65 or over (Hawai‘i Census, 2000).

### *5.15.2 Potential Impacts and Proposed Mitigation*

In the short term, construction expenditures associated with the proposed project will have a beneficial impact on the local construction industry, and construction activities will benefit the community indirectly through the creation of jobs. Construction crew members will most likely

come from all areas of Kauaʻi, including some workers from the Kapaʻa area. However, the crew size will have no significant effect relative to the local or regional population.

No long-term adverse impacts are expected. The proposed project will not, by itself, stimulate unexpected changes in population. It will, however, accommodate current and future economic and social activities in the area by improving shoreline protection, improving the aesthetics of the shorefront, maintaining access to the shoreline, minimizing adverse effects on neighboring shorelines, preserving existing property, and preventing erosion and sinkholes from reoccurring.

## *5.16 Public Facilities and Services*

### *5.16.1 Roads and Transportation*

Kūhiō Highway is a State Department of Transportation (DOT) operated highway that generally runs along the coastline. Within the project corridor, the highway is the primary thoroughfare providing vehicular access through Kapaʻa Town. Kūhiō Highway is a three-lane State arterial highway from its junction with Kapule Highway and Kamoa Road in Waipouli. From Waikaʻea Canal, this highway becomes a two-lane road with on-street parking provided through Kapaʻa Town. From the northern end of Kapaʻa Town up through Anahola, Kūhiō Highway is a two-lane arterial highway. Within Kapaʻa Town, the posted speed limit is 25 mph which increases to 50 mph north of the town to Anahola.

Moanakai Road is a narrow two-lane AC road which starts at Keaka Street and runs parallel to the coastline for approximately 1,600 feet. The speed limit on this road is 20 mph.

### *5.16.2 Roads and Transportation, Potential Impacts and Proposed Mitigation*

Short-term construction activities associated with the project will involve the use of a crane and/or bulldozer/backhoe to move heavy boulders and form the appropriate slope for the seawall revetment. This use of equipment may require temporary lane closures along segments of the Moanakai Road to maintain public safety. Portions of the Kūhiō Highway could also be disrupted by the movement of construction vehicles and equipment that are in transit to the site.

As required, a traffic control plan will be prepared and coordinated with the Department of Public Works and required County and State agencies for review and approval. The traffic control plan will identify the use of specific vehicular controls and safety equipment to maintain the flow of traffic around active areas of work. This would include the use of signage, and flagmen or police officers to direct the flow of traffic during construction activities.

### *5.16.3 Utilities*

There are no utilities present that would be affected by the proposed project.

### *5.16.4 Utilities, Potential Impacts and Proposed Mitigation*

No utilities to the surrounding area are expected to be impacted during the proposed improvements. No mitigation measures are anticipated and none are proposed.

## *5.17 Solid Waste*

### *5.17.1 Description*

The County of Kaua‘i operates an island-wide system of municipal solid waste collection and disposal. The Kekaha Landfill is a County owned facility serving as the primary disposal site for solid waste. Refuse transfer stations that serve as collection points for solid waste requiring disposal are located throughout the island. The Kapa‘a Transfer Station is the closest station serving the project site.

The proposed project is expected to generate construction related waste typical of similar projects involving earthwork and construction of a seawall. The waste generated is expected to consist of vegetation, rocks and sediments, and construction related waste and expended materials. Whenever possible excavated materials will be reused either on-site or for other County related projects.

### *5.17.2 Potential Impacts and Proposed Mitigation*

The construction of the proposed project is not expected to result in long term impacts to solid waste facilities based on the limited scope and scale of work. Short-term impacts are anticipated in the form of construction debris that will be generated requiring disposal. The construction contractor shall be responsible for the disposal of construction debris at a county-approved landfill or disposal site in conformance with County regulations.

Materials excavated from the site that are intended to be reused will either be stockpiled on-site at a designated location or hauled off-site for reuse by the County.

## *5.18 Recreational Resources*

### *5.18.1 Description*

The project area is located within coastal Kapa‘a and is used by residents and visitors for recreation and fishing. Baby Beach, as shown in **Photo 7,** abuts the north end of the Moanakai Seawall. It is a safe place for children to swim due to protection from the reef. The beach is used daily, particularly by families with children. The area is also a popular kite surfing site due to the prevailing trade winds. In addition, ironwood trees along the seawall provide shade and a scenic location for people to drive through and park on the *makai* side of Moanakai Road.

Various segments along the Moanakai Road are also widely used by fishermen to access the ocean. Consultations by CSH with community members indicated that all participants were long-time fishermen in the ocean area fronting Baby Beach. Participants spoke particularly of skin diving for fish in the area. However, all participants agreed that the reef adjacent to the project area has changed with less fish and seaweed over time. All participants attributed the depletion of ocean resources near the project area to a number of factors that include predators such as the Hawaiian monk seal, sharks, and turtles; windsurfing activities; and the introduction of invasive species such as *ta‘ape* and *roi* (CSH, 2010).

Photo 7: Baby Beach (Source: Cultural Surveys Hawai'i, Inc.)

### *5.18.2 Potential Impacts and Proposed Mitigation*

As described above, Moanakai Road is used as a beach access road for shoreline recreation, as well as for fishing. However, should construction for the proposed project commence, work should not significantly affect beach access because both Baby Beach and the ocean can be accessed from Panihi Street, north of the project area.

The period of time involving closure of Moanakai Road is expected to be temporary and will last only for the duration that mobilization, construction activities, and use of the detour beach access is required. Upon completion of all work the area will be reopened to the public as prior to construction.

# *Section 5 – Figures*

***Repair/Reconstruction of Moanakai Seawall***

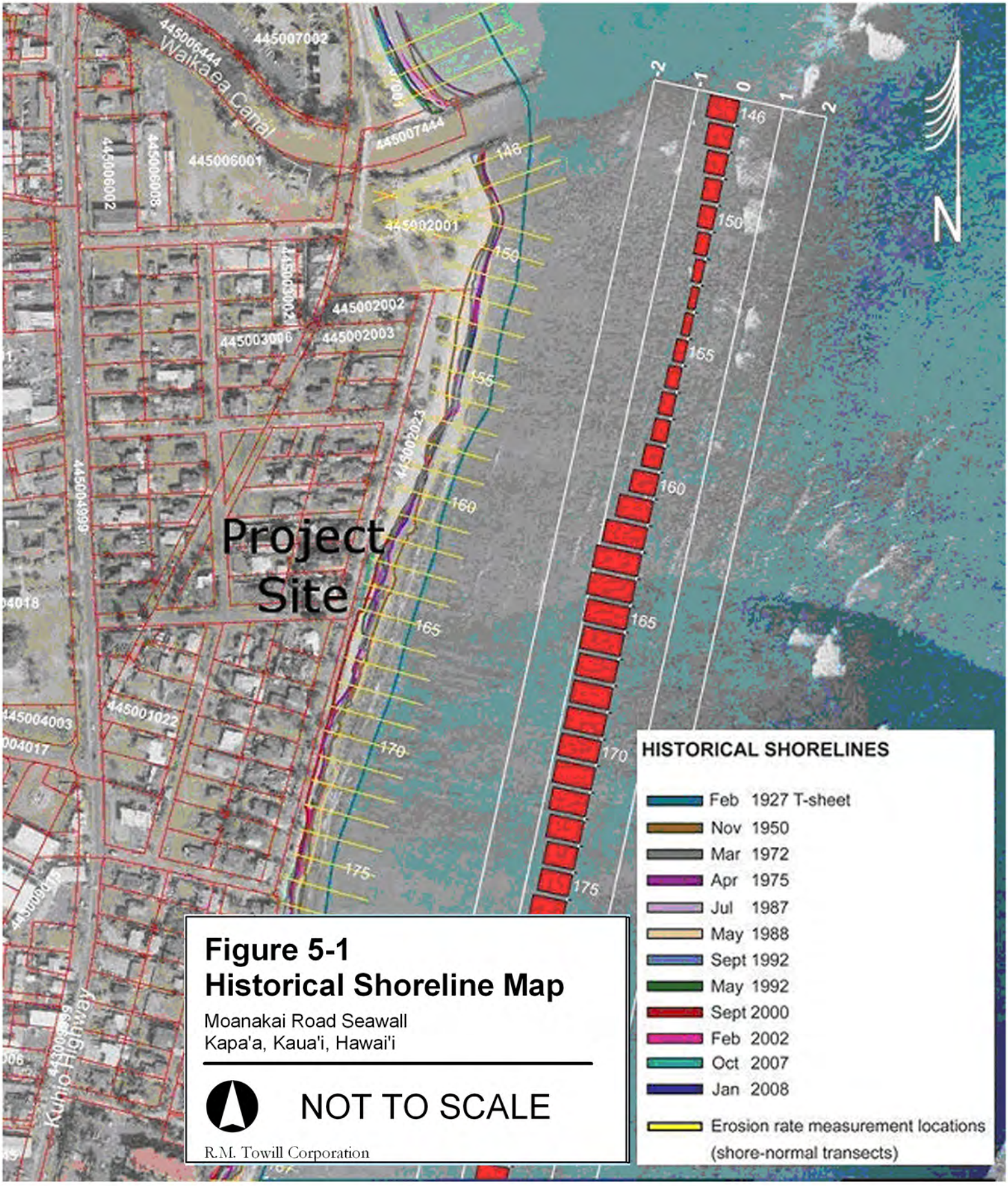



**Figure 5-1**
**Historical Shoreline Map**

Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i

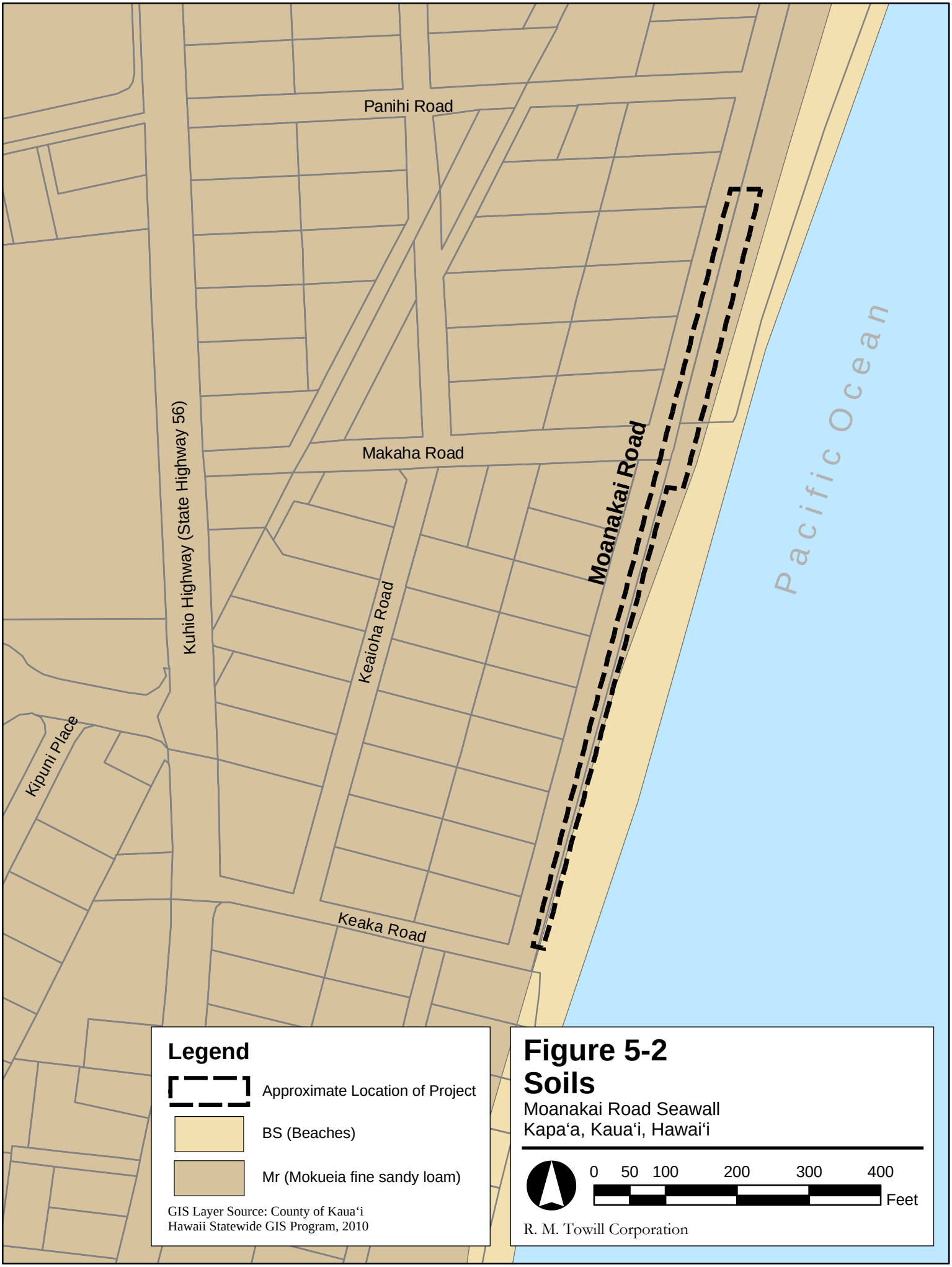



**Figure 5-2**
**Soils**
Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i

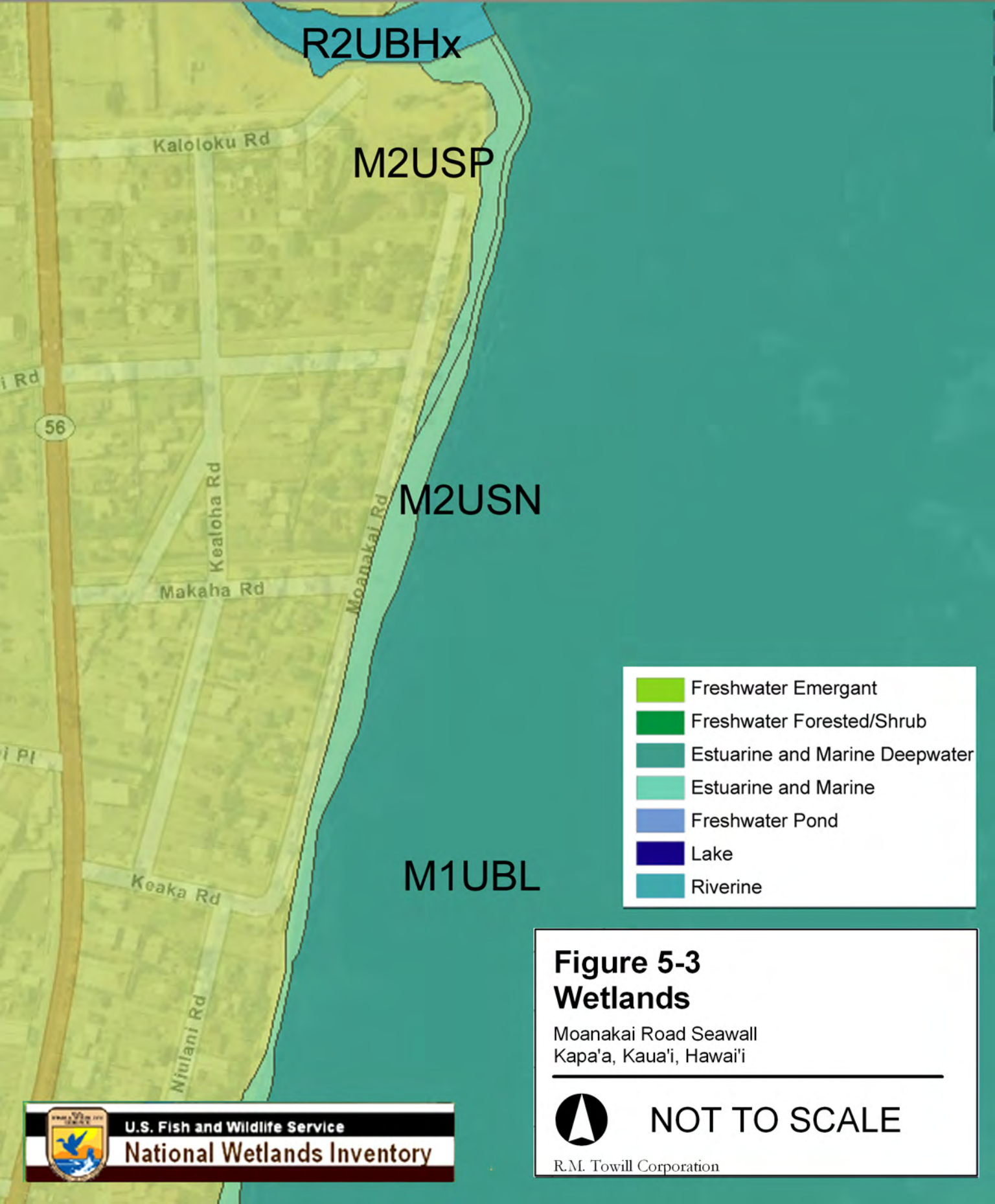
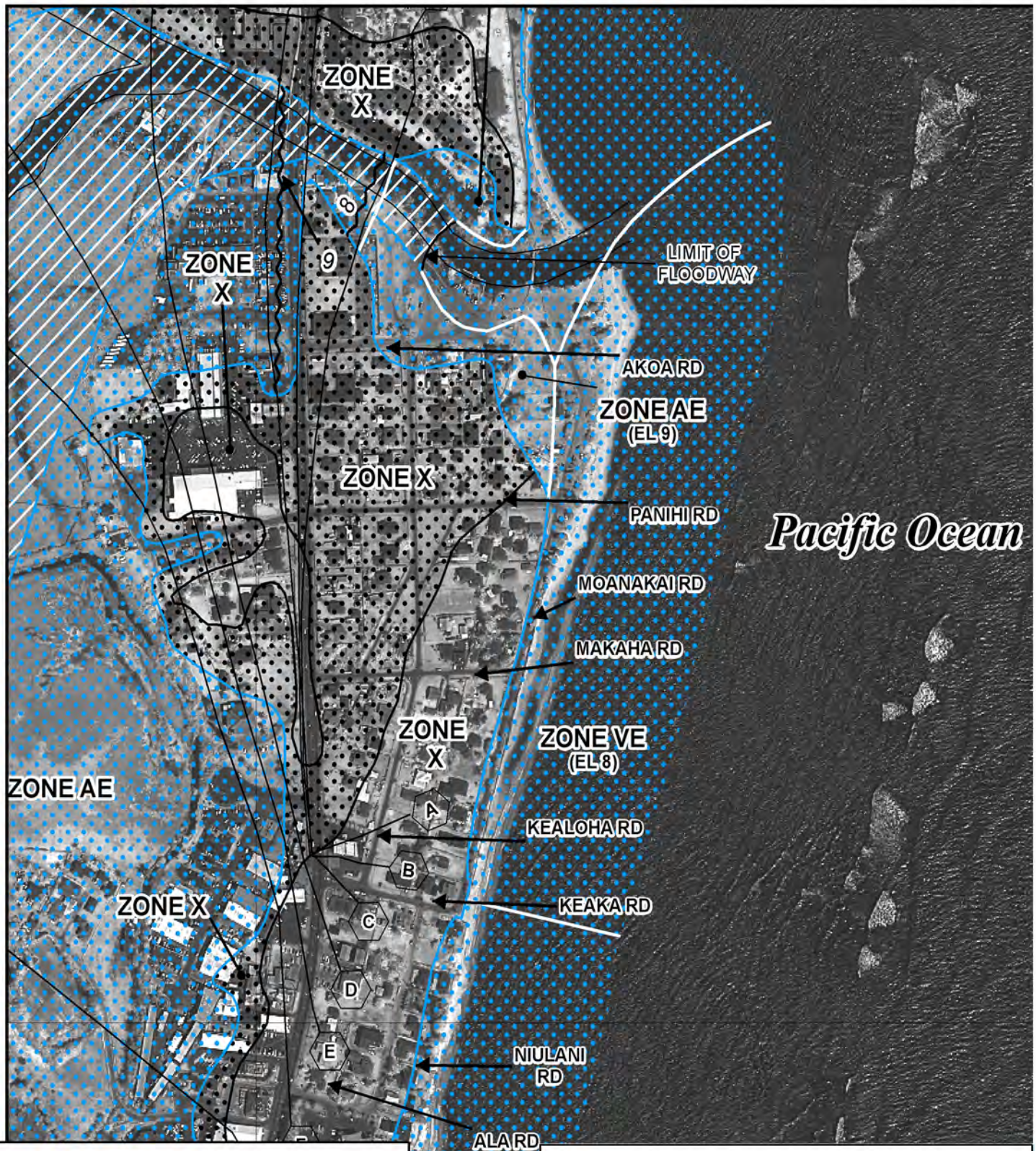



**Figure 5-3**
**Wetlands**

Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i

**Figure 5-4**
**Tsunami Hazard Map**

Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i




## Legend

Zone X An area that is determined to be outside the 100- and 500-year floodplains.

Zone AE An area inundated by 100-year flooding, for which BFEs have been determined.

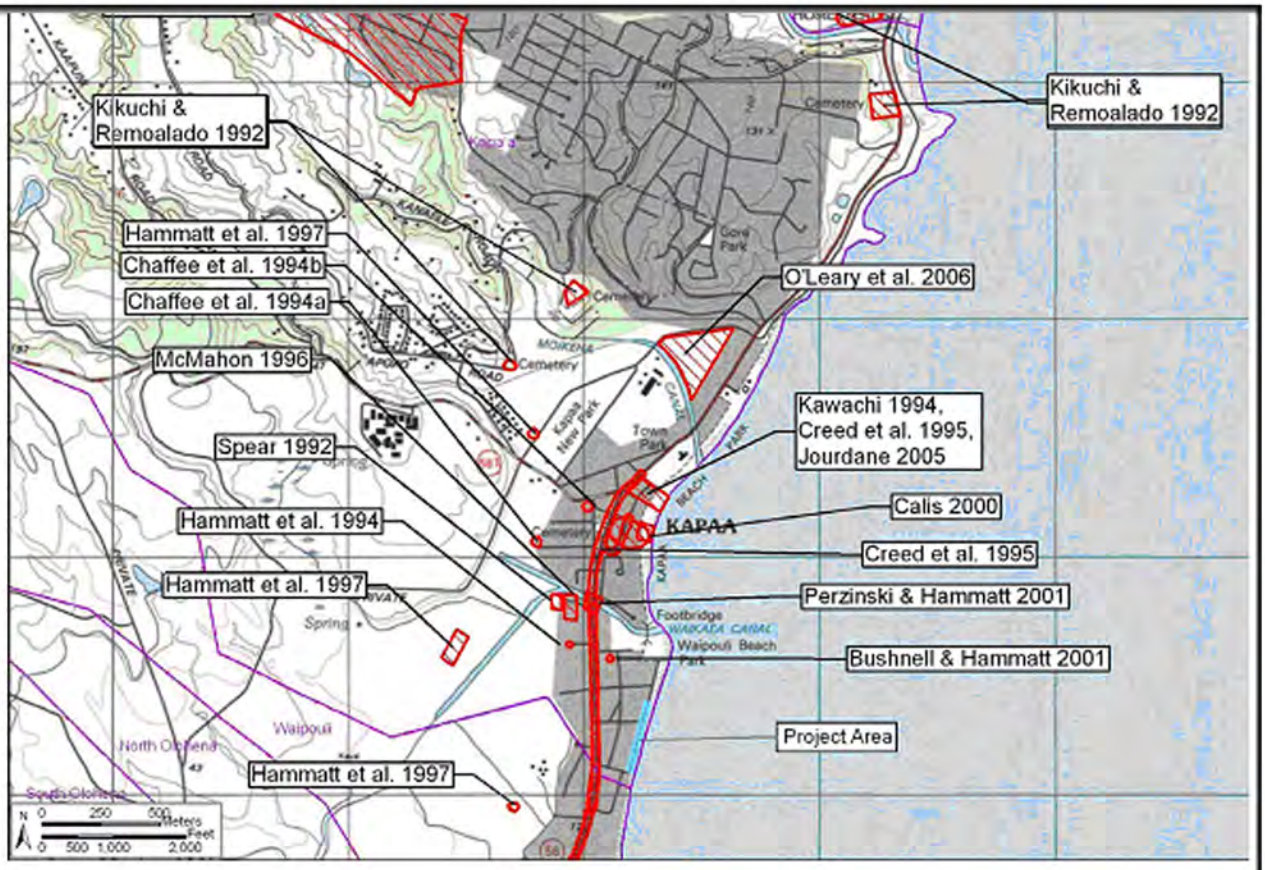
Zone VE An area inundated by 100-year flooding with velocity hazard (wave action); BFEs have been determined.

# Figure 5-5
# Flood Zones

Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i

NOT TO SCALE

R.M. Towill Corporation




U.S. Geological Survey Map, showing location of previous archaeological studies in Kapa'a

(Source Cultural Surveys Hawai'i, Inc.)

# Figure 5-6
# U.S. Geological Survey Map

Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i

NOT TO SCALE

R.M. Towill Corporation

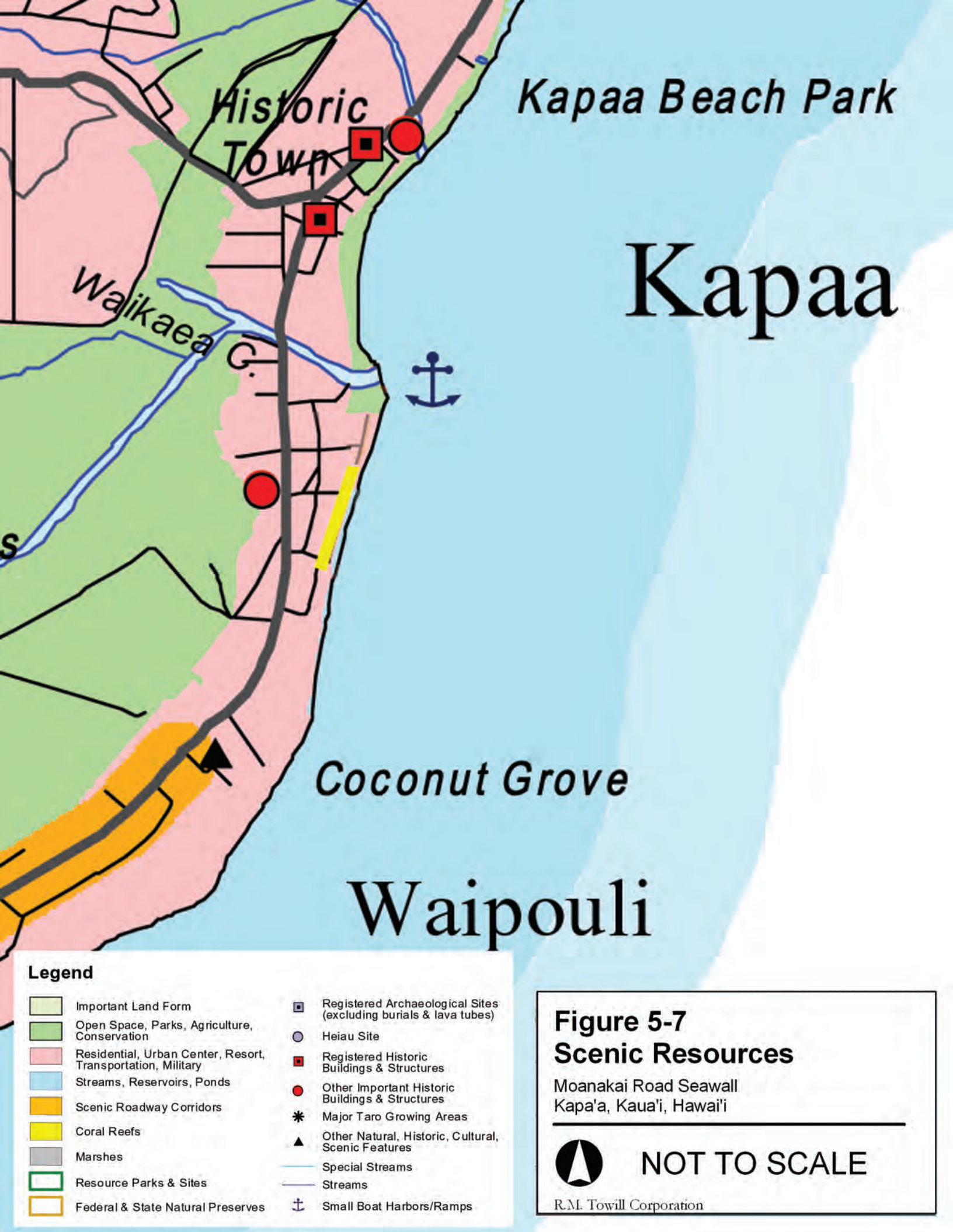



**Figure 5-7**
**Scenic Resources**

Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i

# *Section 6*
# *Relationship to Land Use Policies, Plans, and Controls*

## *6.1 Overview*

Federal, State and County of Hawai'i policies, plans, and land use controls are established to guide development in a manner that enhances the environment and quality of life. The establishment of policies, plans, and land use controls at all levels of government are further promulgated to help ensure that the long-term social, economic, environmental, and land use needs of the community and region can be met. The proposed project's relationship to land use policies, plans, and controls for the region and proposed activity are as follows.

## *6.2 Federal*

Various activities required to construct the project will trigger permitting requirements under the Clean Water Act (CWA). These include the following:

1. Section 404 of the CWA will require a permit before dredge or fill activities may be discharged into waters of the United States. The U. S. Army Corps of Engineers (USACE), Regulatory Branch, and the Department of Health (DOH), Clean Water Branch, will be consulted for the proposed project to identify permitting requirements pertinent to their respective areas of jurisdiction under to the Clean Water Act. A jurisdictional determination from the USACE will be sought. The determination will identify the requirements for a Section 404 Permit from the Department of the Army (DA).

2. Section 401 of the CWA requires a Water Quality Certification (WQC) for actions that require certain Federal permits (such as the Section 404 Permit to conduct an activity, construction or operation that may result in discharge to waters of the United States. The DOH, Clean Water Branch issues the WQC for Hawai'i waters.

3. Section 402 of the CWA requires NPDES permits for point source discharges including storm water discharges associated with construction activities that disturb a land area of 1 acre or more and discharge storm water from construction sites to waters of the U. S. The DOH-CWB issues the NPDES for Hawai'i waters.

   Two NPDES permits will be required based on discharges of construction stormwater[4] and the need for construction dewatering during construction activities to restore the revetment[5].

   In order to maintain compliance with NPDES permitting requirements, methods, measures, and practices that will be included for the NPDES NOI Forms C and G permit applications will involve the provision of BMP Plans to treat effluent and dewatering discharges from the area of work. The BMPs will provide, but not be limited to the following:

[4] NPDES Notice of Intent (NOI) Form C, Construction Stormwater Permit Application.
[5] NPDES Notice of Intent (NOI) Form G, Construction Activity Dewatering Effluent

- A Site-Specific BMPs plan will be prepared to minimize and prevent runoff and discharges of pollutants into State waters. The BMP Plans will be prepared by the construction contractor as part of the project construction plan and will be submitted to the DOH-CWB for review and approval.
- Discharge pollution prevention measures will be employed in all phases of the project.
- Control measures to prevent discharges of untreated effluent will be in place and functional before construction activities begin, and will be maintained throughout the construction period.
- The BMPs will include guidelines and mitigation measures to minimize and prevent runoff, discharge pollution, and other detrimental effects related to construction activities. In addition, contingency plans will be included as part of the BMPs to address the potential for heavy rain conditions.

The NPDES NOI Form G and C permit applications will be prepared in compliance with HAR, Chapter 11-54, Water Quality Standards, and Chapter 55, Water Pollution Control.

## *6.3 State of Hawai'i*

### *6.3.1 Hawai'i State Plan*

The Hawai'i State Plan, adopted in 1978, and promulgated in HRS, Chapter 226, consists of three major parts:

Part I, describes the overall theme including Hawaii's desired future and quality of life as expressed in goals, objectives, and policies.

Part II, Planning Coordination and Implementation, describing a statewide planning system designed to coordinate and guide all major state and county activities and to implement the goals, objectives, policies, and priority guidelines of the Hawai'i State Plan.

Part III, Priority Guidelines, which express the pursuit of desirable courses of action in major areas of statewide concern.

The proposed project is consistent with the objectives and policies of the Hawai'i State Plan. Specifically, the proposed action will reduce impacts associated with the potential threat of hazards and disasters. Described below are sections of the Hawai'i State Plan's goals, objectives, and policies that are relevant to the proposed action.

*§226-13 Objectives and policies for the physical environment--land, air, and water quality. (a) Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:*

*(1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.*

*(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.*

*(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.*

*(8) Foster recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures and visitors. [L 1978, c 100, pt of §2; am L 1986, c 276, §12]*

The proposed project will reduce the threat to life and property from erosion, flooding, tsunamis and hurricanes. The design and development of this project will address the needs of the community and region through the improvement of an existing facility for shoreline protection, to maintain access to the shoreline, to minimize adverse effects on neighboring shorelines, and to preserve existing property. The project will be developed in accordance with all laws and regulations necessary to ensure against the potential for adverse environmental effects.

### *6.3.2 State Land Use Law*

The State Land Use Commission classifies all lands in the State of Hawai'i into one of four land use designations: Urban, Rural, Agricultural and Conservation. According to HRS, Chapter 205, an explanation of land use districts is provided:

> *"Chapter 205, HRS, Districting and classification of lands:"*
>
> *"(a) There shall be four major land use districts in which all lands in the State shall be placed: urban, rural, agricultural and conservation. The land use commission shall group contiguous land areas suitable for inclusion in one of these four major districts. The commission shall set standards for determining the boundaries of each district provided that:"*
>
> *"(1) In the establishment of boundaries of urban districts those lands that are now in urban use and a sufficient reserve area for foreseeable urban growth shall be included;"*
>
> *"In establishing the boundaries of the districts in each count, the commission shall give consideration to the master plan or general plan of the county."*
>
> *(b) Urban districts shall include activities or uses as provided by ordinances or regulations of the county within which the urban district is situated.*

The proposed action would involve activity on land classified as Urban. The proposed project does not require changing the existing State Land Use designation as the current designation is compatible with the proposed seawall improvements. County of Kaua'i land uses within the Urban District are regulated through the Zoning Ordinance, Chapter 8. No action from the State Land Use Commission is required to implement the proposed seawall repairs (**see Figure 6-1, State Land Use District**).

### *6.3.3 Coastal Zone Management Act (CZMA)*

All land and water use activities in the state are required to comply with Hawaii's Coastal Zone Law in HRS, Chapter 205A. The State designates the Coastal Zone Management Program (CZMP) to manage the intent, purpose and provisions of HRS, Chapter 205(A)-2, as amended, for all areas from the shoreline to the seaward limit of the State's jurisdiction, and any other area which a lead agency may designate for the purpose of administering the CZMP.

The following is an assessment of the project with respect to the CZMP objectives and policies set forth in Section 205(A)-2.

1. Recreational resources

   *Objective: Provide coastal recreational opportunities accessible to the public.*

   *Policies:*

   *A) Improve coordination and funding of coastal recreational planning and management; and*

   *B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:*

*(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;*

*(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;*

*(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;*

*(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;*

*(v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;*

*(vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;*

*(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and*

*(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.*

Recreational and shoreline facilities, and public access to the shoreline will not be permanently affected by the project; area activities can commence as soon as construction is completed and the site demobilized by the contractor. Residents will not be adversely affected but may be temporarily limited by equipment noise, dust, and construction related traffic that will be minimized and mitigated to the extent practicable. Moanakai Road is also widely used by fishermen to access the ocean. Consultation by CSH, Inc., with community members indicated that all participants were long-time fishermen in the ocean area fronting Baby Beach. Construction should not significantly affect beach access because both Baby Beach and the ocean will remain accessible from Panihi Street, north of the project area.

2. Historic resources

*Objective: Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in (C) and American history and culture.*

*Policies:*

*(A) Identify and analyze significant archaeological resources;*

*(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and*

*(C) Support state goals for protection, restoration, interpretation, and display of historic resources.*

There are no archaeological or cultural resources that are known to be present within the immediate area of the seawall, as much of the project vicinity had been previously disturbed during the construction of the preexisting seawall and roadway. However, in accordance with HRS, Chapter 6E and the requirements of the DLNR, SHPD, should any historic resources, including human skeletal and significant cultural remains, be identified during the construction of the proposed project: (1) work will cease in the immediate vicinity of the find; (2) the find will be protected from any additional disturbance by the contractor; and (3) the SHPD, will be contacted immediately at (808)

692-8015 (Kaua'i) or (808) 692-8015 (Main Office, O'ahu) for further instructions including the conditions under which work activities may resume.

3. Scenic and open space resources

*Objective: Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.*

*Policies:*

*(A) Identify valued scenic resources in the coastal zone management area;*

*(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural land forms and existing public views to and along the shoreline;*

*(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and*

*(D) Encourage those developments that are not coastal dependent to locate in inland areas.*

The potential for adverse visual impacts is anticipated to be minimal. The improvements are on the existing seawall; so there will be no drastic changes to visual resources in the area. The proposed project is expected to be consistent with the surrounding use of land to meet the growing need of repair to the structure. Public access to the area will be maintained during the construction period; however, residents may be affected by equipment noise, dust, and construction related traffic. These activities will be limited to the Moanakai Road seawall for a temporary period of time and will not cause any permanent changes to any scenic or open space resources.

4. Coastal ecosystems

*Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.*

*Policies:*

*(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;*

*(B) Improve the technical basis for natural resource management;*

*(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;*

*(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and*

*(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.*

Coastal ecosystems will not be affected by the project. No use of the coastal ecosystem will be required. During construction, BMPs will be employed to prevent potential pollutant (sediment) discharges in storm water runoff and will be in place and functional before project activities begin. All designated BMPs will be maintained throughout the construction period.

5. Economic uses

*Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.*

*Policies:*

*(A) Concentrate coastal dependent development in appropriate areas;*

*(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and*

*(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:*

*(i) Use of presently designated locations is not feasible;*

*(ii) Adverse environmental effects are minimized; and*

*(iii) The development is important to the State's economy.*

The proposed project has been assessed for potential social, visual, and environmental impacts in accordance with County of Kaua'i regulations. With implementation of the mitigation measures as identified in this document, no adverse impacts are expected to result. In the short term, construction expenditures will have an overall beneficial impact on the local construction industry, and construction activities will benefit the community indirectly through the limited creation of jobs.

6. Coastal hazards

*Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.*

*Policies:*

*(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;*

*(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;*

*(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and*

*(D) Prevent coastal flooding from inland projects.*

The proposed project has been evaluated for potential impacts associated with natural hazards including flooding, erosion, and pollution. Natural hazards such as hurricanes, flooding, and tsunami are unavoidable for coastal areas. To mitigate from hurricanes, the proposed project will ensure that improvements are designed to present building and construction codes which offers some protection from damage. To mitigate tsunami and storm surge impacts, engineering analyses will be preformed that will determine proper design criteria. Given the requirement for the proposed project to be located within proximity of the shoreline, the proposed use is considered reasonable and is not anticipated to have a significant impact on flood conditions.

7. Managing development

*Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.*

*Policies:*

*(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;*

*(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and*

*(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.*

The proposed project conforms to all State and County of Kaua'i land use regulations. A comprehensive list of permits that may be required can be found in Section 7, Permits and Approvals That May Be Required. While the proposed project site is under jurisdiction of the CZMA, no coastal resources will be adversely affected.

8. Public participation;

*Objective: Stimulate public awareness, education, and participation in coastal management.*

*Policies:*

*(A) Promote public involvement in coastal zone management processes;*

*(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and*

*(C) Organize workshops, policy dialogues, and site-specific mitigation to respond to coastal issues and conflicts.*

The provision for public participation will be provided through the environmental review process promulgated in HRS, Chapter 343. Public comments will be received during the public comment period associated with the filing of the Draft Environmental Assessment for this project. In addition, environmental permit applications filed for the subject project will be subject to governmental agency and public review as required under law.

9. Beach protection;

*Objective: Protect beaches for public use and recreation.*

*Policies:*

*(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;*

*(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and*

*(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.*

The proposed project is designed to repair and restore the seawall not only to improve shoreline protection, but to improve the aesthetics of the shorefront, maintain access to the shoreline, minimize adverse effects on neighboring shorelines, preserve existing property, and prevent erosion and sinkholes from reoccurring.

10. Marine resources

*Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.*

*Policies:*

*(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;*

*(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;*

*(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;*

*(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and*

*(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.*

Marine biological, water quality, and coastal engineering assessments were conducted to determine the effect of the proposed project on marine resources. These studies are included in this document (**see Appendices**). All necessary permit applications and environmental and building approvals will be secured prior to the initiation of construction activities. See Section 7, Permits and Approvals That May Be Required, for further detail.

## *6.4 County of Kaua'i*

### *6.4.1 General Plan*

The County of Kaua'i's General Plan (GP) is a policy document for the long range comprehensive development of the Island of Kaua'i. According to the County of Kaua'i, the GP provides the legal basis for all subdivision, zoning and related ordinances. It also provides the legal basis for the initiation and authorization for all public improvements and projects.

*1.2 Purpose*

*Pursuant to the provisions of the Charter for the County of Kaua'i, the General Plan sets forth in graphics and text, policies to govern the future physical development of the county. The General Plan is intended to improve the physical environment of the County and the health, safety and general welfare of Kaua'i's people.*

*The General Plan states the County's vision for Kaua'i and establishes strategies for achieving that vision. The strategies are expressed in terms of policies and implementing actions. They may be augmented and changed as new strategies are developed.*

*The General Plan is a direction-setting, policy document. It is not intended to be regulatory. It is intended to be a guide for future amendments to land regulations and to be considered in reviewing specific zoning amendment and development applications.*

*The vision, the maps and text policies, and the implementing actions are intended to guide county actions and decisions. In addition, the maps and text policies are intended to guide the County in specific types of actions: making revisions to land use and land development regulations; deciding on zoning changes; preparing and adopting Development Plans and Public Facility Plans; and preparing and adopting capital improvement plans.*

Chapter 3, Caring for Land, Water and Culture, identifies the specific relationship of the project to the GP:

*"Kaua'i's coastal areas are safeguarded to preserve beaches, natural landmarks, Hawaiian fishponds and other Native Hawaiian sites. Coral reefs, surfing sites and fishing grounds are also protected. The beaches and shoreline area belong to the public trust, and the County assures that access from public roads to the shoreline is maintained and improved."*

The proposed project will repair and restore the seawall not only to improve shoreline protection, but also to improve the aesthetics of the shorefront, maintain access to the shoreline, minimize

adverse effects on neighboring shorelines, preserve existing property, and prevent erosion and sinkholes from reoccurring.

### *6.4.2 Special Management Area*

The County of Kaua'i has designated the shoreline and certain inland areas of Kaua'i as being within the Special Management Area (SMA). SMA areas are designated sensitive environments that should be protected in accordance with the State's Coastal Zone Management policies, as set forth in HRS, Section 205A, Coastal Zone Management.

The entirety of the proposed project is located within the SMA (**see Figure 6-2, Special Management Area**). Based on the location of the proposed project within the SMA, a SMA permit application will be prepared and filed with the County of Kaua'i Planning Department.

### *6.4.3 Zoning*

According to the County of Kaua'i Zoning Map, the project site is zoned as within the Urban Center zoning district (**see Figure 6-3, Zoning**). No change to the zoning of the project site will be necessary as work will be to restore an existing public facility. According to County Ordinance, Chapter 8, Comprehensive Zoning Ordinance, a Shoreline Setback Variance permit will be required for this project:

> *Sec. 8-13.4 Permits Required.*
>
> *(a) A Class IV Zoning Permit is required for any construction, development, use or activity proposed to be carried out within forty (40) feet of the upper reaches of the wash of waves other than storm or tidal waves, or within the shoreline setback area as established by the State Land Use Commission pursuant to Chapter 205, HRS, whichever is the lesser. The Planning Commission shall issue a permit only if the requirements of both Chapter 205, HRS and this Chapter have been met.*

# *Section 6 – Figures*

***Repair/Reconstruction of Moanakai Seawall***

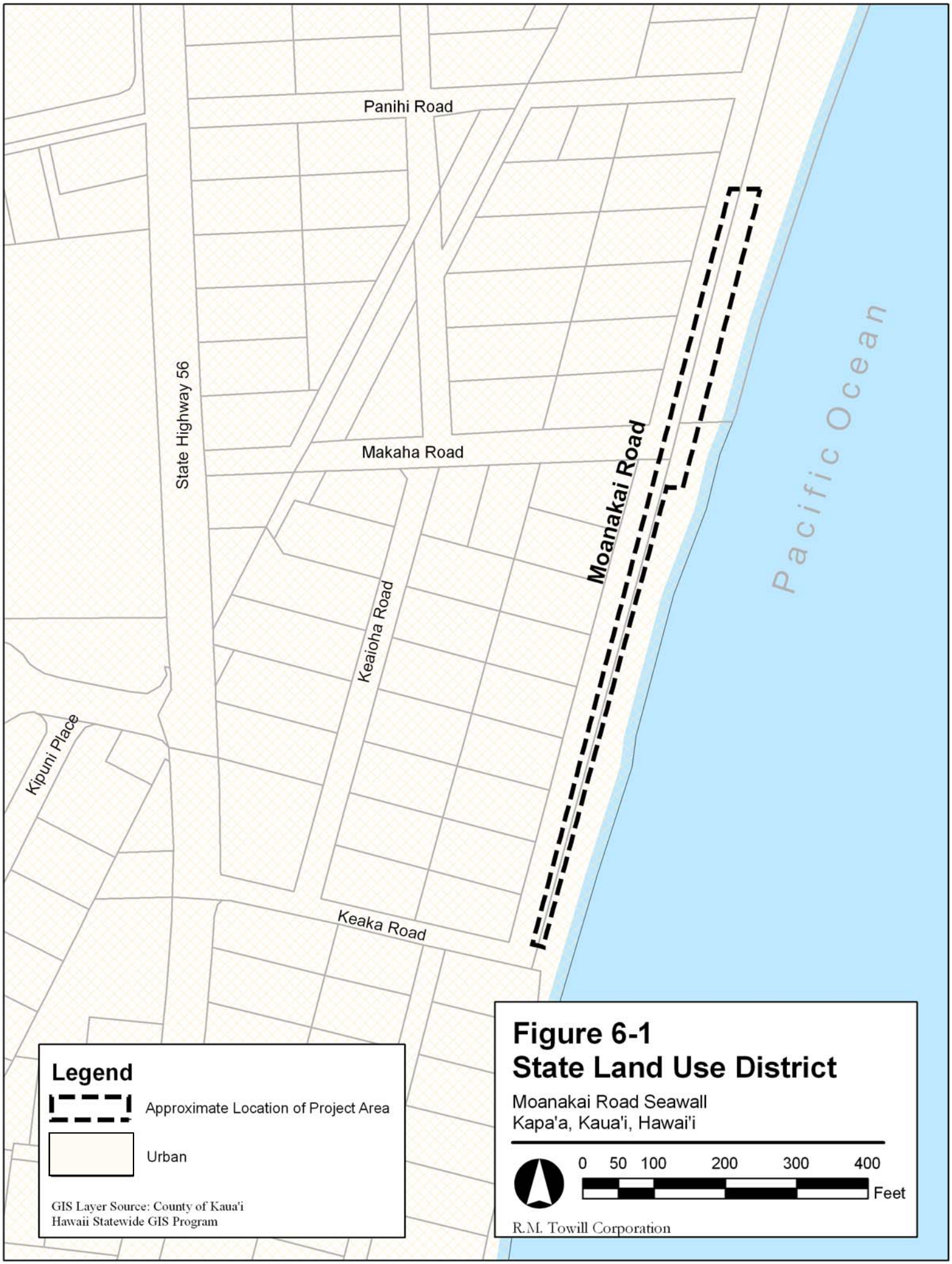
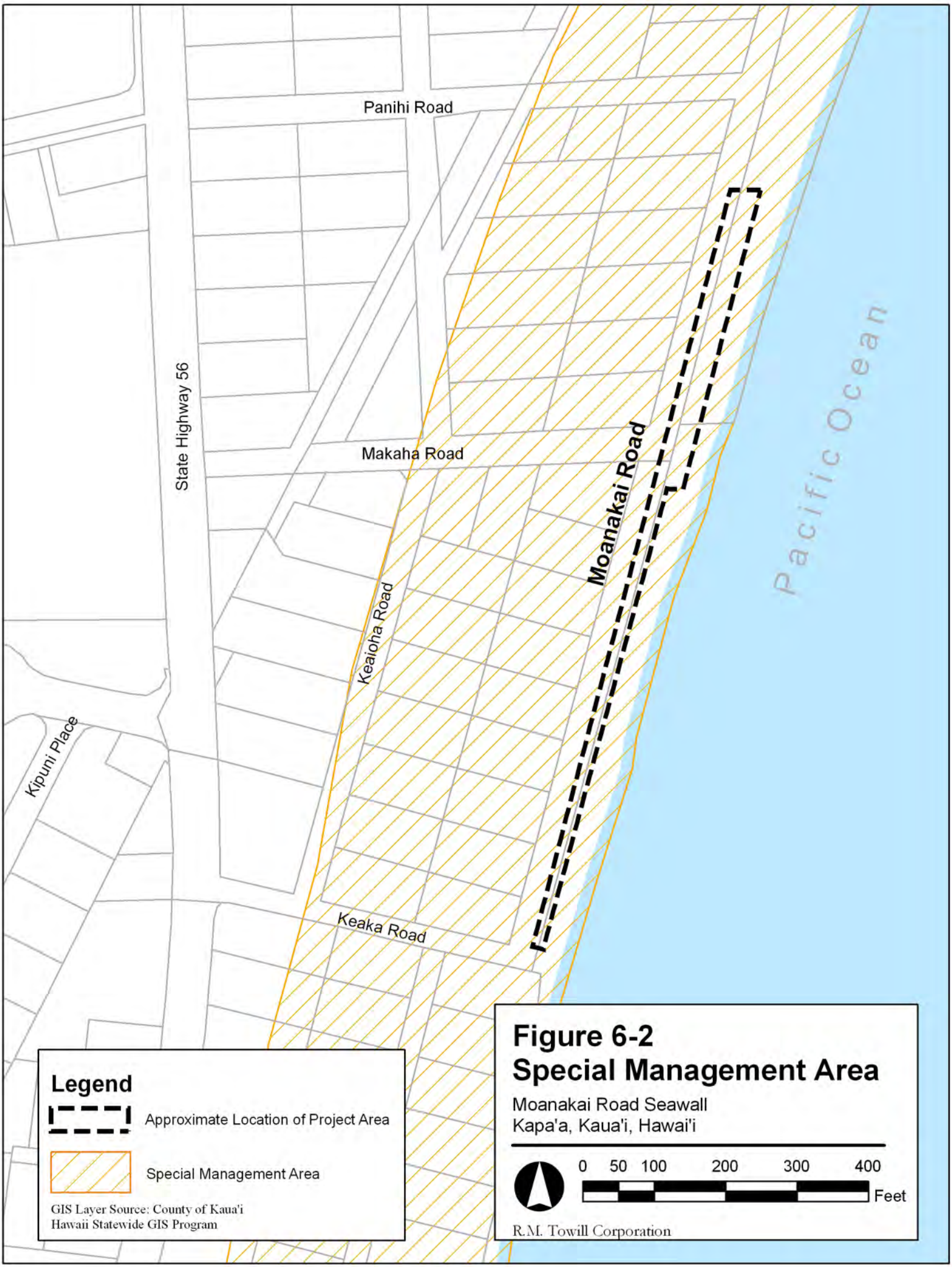



**Figure 6-1**
**State Land Use District**

Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i


Panihi Road
State Highway 56
Makaha Road
Moanakai Road
Keaioha Road
Kipuni Place
Keaka Road
Pacific Ocean
Legend
Approximate Location of Project Area
Special Management Area
GIS Layer Source: County of Kaua'i
Hawaii Statewide GIS Program
Figure 6-2
Special Management Area
Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i
0 50 100 200 300 400
Feet
R.M. Towill Corporation

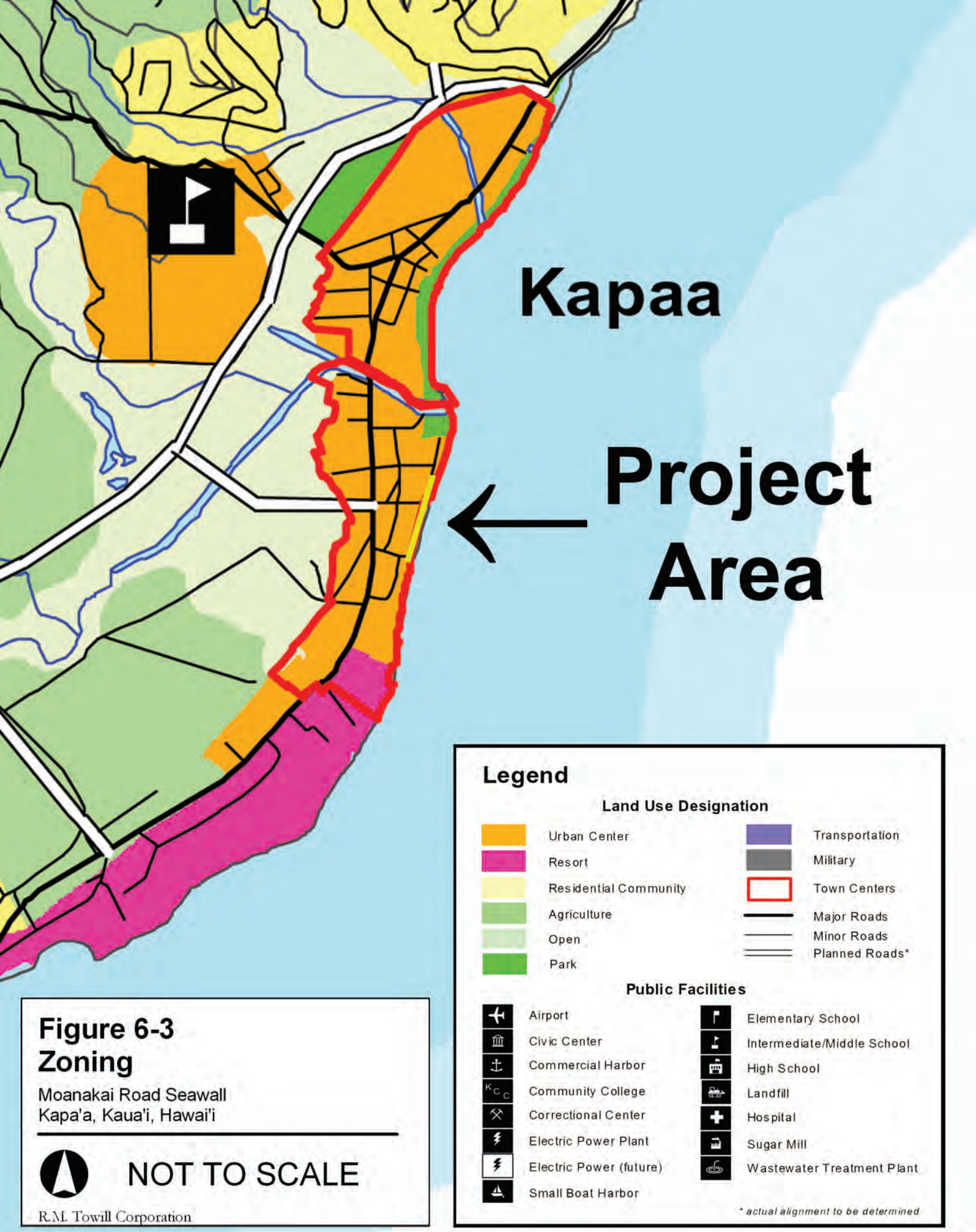



**Figure 6-3**
**Zoning**
Moanakai Road Seawall
Kapa'a, Kaua'i, Hawai'i

# *Section 7*
# *Permits and Approvals That May Be Required*

## *7.1 Federal*

Department of the Army Permit Application (Section 404, CWA/
Section 10 Rivers and Harbors Act of 1899)
U. S. Army Corp of Engineers

## *7.2 State of Hawai‘i*

Section 401, Water Quality Certification Permit Application
Department Health (DOH), Clean Water Branch

Coastal Zone Management Federal Consistency Determination Permit Application
Department of Business, Economic Development, & Tourism
State Office of Planning

Conservation District Use Permit
Office of Conservation and Coastal Lands,
Department of Land and Natural Resources (DLNR)

State Certified Shoreline Determination
State Survey Office, Department of Accounting and General Services (DAGS), and
Office of Conservation and Coastal Lands, DLNR

NPDES General Permit Applications:
Notice of Intent (NOI) Form C: Storm Water Associated with Construction Activities
and NOI Form G: Construction Activity Dewatering
DOH, Clean Water Branch

## *7.3 County of Kaua‘i*

Shoreline Setback Variance Permit Application
County of Kaua‘i, Planning Department

Special Management Area Permit Application
Kaua‘i Planning Department

Construction Plan Approvals and Road Permit
Kaua‘i, Department of Public Works

# *Section 8*
# *Agencies and Organizations Consulted for the Environmental Assessment*

The following agencies, organizations, and individuals will be contacted during the Chapter 343, HRS, environmental review process to disclose the environmental conditions of the site, the proposed undertaking, and the potential impacts and mitigation measures that will be applied to ensure against adverse impacts.

## *8.1 Federal*

U. S. Army Corps of Engineers

U. S. Fish and Wildlife Service (as applicable)

## *8.2 State of Hawai'i*

Department of Land and Natural Resources

State Historic Preservation Division

Department of Transportation – Highways Division

Department of Civil Defense

## *8.3 County of Kaua'i*

Department of Public Works

Planning Department

Department of Water Supply

Department of Civil Defense

Fire Department

Police Department

## *8.4 Elected Officials, Organizations and Individuals*

State Senator Ronald D. Kouchi, 7th Senatorial District

State Representative Derek S.K. Kawakami, 14th Representative District

Kaua'i County Council Chair Jay Furfaro

# *Section 9*
# *Summary of Effects*

## *9.1 Short Term Effects*

Short term effects associated with the proposed project will be principally during the construction phase. The County of Kaua'i and its designated contractor will require access to the project site via Moanakai Road. Noise will be temporarily generated from construction and related mobilization of equipment for the temporary duration of work. Construction equipment is expected to include, but not be limited to, a crane, backhoe(s), front-end loader(s), or excavator(s), dump trucks and powered hand tools. All equipment will be muffled in accordance with standard engine operating practices to minimize noise. Upon construction completion, noise levels will return to ambient levels.

Fugitive dust may be generated during construction. The contractor will be required to control fugitive dust through the regular wetting of soils and ground areas susceptible to the generation of dust during work activities. Only enough water will be used to wet the surface of ground areas and prevent the generation of runoff.

Protection of water quality will be through the use of mitigative measures including silt fencing/curtains, berms, and other applicable erosion controls to prevent construction stormwater related soils and silt from leaving active areas of work. Specifications for the use of these measures will be through the construction plan approval process and the required NPDES permit applications that will be filed prior to the start of work.

Upon completion of work all construction equipment, machinery, and personnel will be demobilized from the job site with no further disturbance to the area. As required, all debris and waste materials will be disposed of at an approved refuse facility, and active areas of work will be replanted as required with vegetation similar to that found at the existing site.

## *9.2 Long Term Effects*

Long term benefits derived from this project include improved shoreline protection, improved aesthetics of the shorefront, provision to maintain access to the shoreline, and the minimization of adverse effects on neighboring shorelines through proper engineering and design of the proposed seawall repairs. The project will benefit residents and visitors who use the area for habitation and recreational activities as it will prevent future erosion from dilapidation of the existing seawall.

No long term adverse effects are anticipated. Upon the completion of work, all equipment used on-site will be demobilized and all debris and waste materials disposed of at an approved County refuse facility.

## *9.3 Significance Criteria*

In accordance with the provisions set forth in HRS, Chapter 343, and the significance criteria in HAR, Chapter 11-200-12, this Environmental Assessment has preliminarily determined that the project will have no significant adverse impact to air and water quality, existing utilities, noise, archaeological or cultural sites, or wildlife habitat. All anticipated impacts will be temporary and will not adversely impact the environmental quality of the area.

According to the Significance Criteria:

1. *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;*

The proposed project is not anticipated to adversely impact any natural or cultural resources. The existing project site was previously disturbed by clearing and grading to accommodate paving and construction of the existing Moanakai Road and seawall. If any potential remains (natural or cultural) exist at the site, such remains are expected to have been recovered or destroyed during prior development activities.

However, in the event that any remains or artifacts are encountered, practices as identified in Section 5.10 Archaeological Resources, will be applied. In accordance with HRS, Chapter 6E and the requirements of the DLNR, SHPD, should any historic resources, including human skeletal and significant cultural remains, be identified during the construction of the proposed project: (1) work will cease in the immediate vicinity of the find; (2) the find will be protected from any additional disturbance by the contractor; and (3) the SHPD, will be contacted immediately at (808) 692-8015 (Kaua'i) or (808) 692-8015 (Main Office, O'ahu) for further instructions including the conditions under which work activities may resume.

2. *Curtails the range of beneficial uses of the environment;*

The proposed project site is located on land owned by the State of Hawai'i and is used as a seawall protecting the shoreline fronting the area of the Moanakai Road from further coastal erosion following Hurricane Iniki in September 1992. The proposed project will seek to maintain this use and will not curtail the range of other beneficial uses of the environment. In order to reduce the potential for adverse environmental impacts the planned seawall repairs will be based on a hybrid seawall and revetment design to minimize the footprint needed for the structure.

3. *Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in chapter 343, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;*

The proposed project is consistent with the environmental polices, goals and guidelines as delineated in HRS, Chapter 343, and as documented in this Environmental Assessment.

4. *Substantially affects the economic welfare, social welfare, and cultural practices of the community or State;*

The proposed project has been assessed for potential social, visual, and environmental impacts in accordance with the requirements of HRS, Chapter 343, and HAR, Chapter 11-200. With implementation of the mitigation measures as identified in this document, no substantial impacts

are expected to result. In the short term construction activities will benefit the construction industry and the community indirectly through the creation of jobs.

5. *Substantially affects public health;*

The proposed project will be developed in accordance with Federal, State, and County of Kaua'i, rules and regulations governing public safety and health. Potential sources of adverse impacts have been identified and appropriate mitigative measures developed. The primary public health concerns are anticipated to involve air, water, noise, and traffic impacts associated with construction activities. However, it is expected that these impacts will be either minimized or brought to negligible levels by the appropriate use of the mitigation measures described in this document.

6. *Involves substantial secondary impacts, such as population changes or effects on public facilities;*

The proposed project will not, by itself, stimulate unexpected changes in population. It will, however, accommodate current and future economic and social activities in the area by improving shoreline protection, improving the aesthetics of the shorefront, maintaining access to the shoreline, and minimizing adverse effects on neighboring shorelines.

7. *Involves a substantial degradation of environmental quality;*

The proposed project will be developed in accordance with the environmental policies of HRS, Chapter 343. The analysis provided in this Environmental Assessment indicates that no adverse environmental degradation is anticipated or expected.

8. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;*

The proposed project is designed to specifically address the need for repairs to an existing seawall and does not involve a commitment for other, larger actions. The potential for cumulative impacts associate with the proposed project are not anticipated or expected.

9. *Substantially affects a rare, threatened, or endangered species, or its habitat;*

Sea turtles, spinner dolphins, and humpback whales were not observed during the marine survey, although they may occur well offshore of the project site. Monk seals are known to visit the project area; however, if BMPs are followed, the project will not adversely affect the monk seal or other protected resources. BMPs will be used to ensure that marine biota of the lagoon area and adjacent reef flat are protected from sedimentation and project-related runoff (see Section 5.9.4, Fauna, Potential Impacts and Proposed Mitigation, for further detail).

10. *Detrimentally affects air or water quality or ambient noise levels;*

Any potential for adverse impacts to air, water quality, or noise levels will be addressed by use of appropriate mitigative measures as described in this Environmental Assessment.

11. *Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;*

The proposed project is located in an erosion prone area due to the dilapidated condition of an existing seawall. The proposed project is intended to repair and restore the condition and function of the seawall to reduce erosion and provide some protection from strong waves and storm surge impacts. The design of the proposed hybrid seawall/revetment will be in accordance with accepted engineering design standards to ensure that a reasonably safe and secure facility will be constructed. The proposed action is not expected to have a significant impact on flood conditions.

12. *Substantially affects scenic vistas and view planes identified in county or state plans or studies;*

The proposed site is not anticipated to adversely affect scenic vistas or view planes along the shoreline. The project area is already in use as a seawall and does not itself possess any sensitive characteristics that would detract from or adversely impact the surrounding visual environment. Visual impacts associated with construction activities will be temporary and will cease with the removal of construction equipment and personnel.

13. *Requires substantial energy consumption.*

The proposed project will require use of energy primarily in the form of petroleum-based fuels for construction vehicles and equipment. Electricity will also be required and may be provided by a generator or by direct connection to outlets provided on-site. Other uses of energy will be in the form of labor to complete the project. Upon completion of the project, there will be no further requirement for the use of construction related energy. Operation of the structure is not expected to result in any further use of energy resources.

Based on the review and analysis of the above factors, it has been preliminarily determined that a HRS, Chapter 343, Environmental Impact Statement (EIS) will not be required, and that an anticipated Finding of No Significant Impact (FONSI) should be issued for this project.

# *Section 10*
# *Summary of Findings and Significance Determination*

In accordance with the provisions set forth in HRS, Chapter 343, and the significance criteria in HAR, Chapter 11-200-12, this Environmental Assessment has evaluated and assessed the potential for environmental impacts associated with the proposed project and it is preliminarily determined that a HRS, Chapter 343, EIS will not be required.

The proposed project is not expected to result in significant adverse impacts to geology, soils, hydrology, stream flow, biological resources, air quality, natural hazards, cultural resources, socioeconomics, or land uses. Minimal impacts may consist of minor traffic, noise and air quality disturbances to residents in the immediate surrounding location of the site, but will completely cease once construction is complete.

# *Section 11*
# *Draft Environmental Comments and Responses*

This section is reserved for comments and responses for the Draft Environmental Assessment.

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