AHUKINI to LYDGATE PARK
Bicycle/Pedestrian Path

DRAFT ENVIRONMENTAL ASSESSMENT

Prepared for:
The County of Kauai
4444 Rice Street
Lihue, Hawai'i 96766



Tax Map Key Numbers:
3-05-00
3-05-01
3-07-00
3-07-02
3-07-03
3-09-00
3-09-02
3-09-05
3-09-06

November 22, 2005

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AHUKINI POINT TO LYDGATE PARK BIKE AND PEDESTRIAN PATH

DRAFT ENVIRONMENTAL ASSESSMENT

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AHUKINI POINT TO LYDGATE PARK BIKE AND PEDESTRIAN PATH
DRAFT ENVIRONMENTAL ASSESSMENT

1.0 INTRODUCTION

1.1 PROPOSING AGENCY AND ACTION

1.1.1 Proposing Agency

The action is proposed by the County of Kaua'i, Department of Public Works.

1.1.2 Proposed Action or Project

The proposed action is to provide facilities for pedestrians and bicycles, and to connect with the Lydgate Park Bike and Pedestrian Path, and to construct a key segment of the Nawiliwili to Anahola Bike and Pedestrian Path proposed in the 1994 State of Hawaii Master Plan – Bike Plan Hawaii. It is further the intent of the project to preserve and convert and abandoned cane railway corridor. Residents and visitors to Kauai through implementation of this shared-use bicycle and pedestrian facility will realize the following benefits:

- Alternative form of transportation to the automobile, thereby reducing fuel consumption, pollution, roadway congestion and the need for parking lots.
- Affordable recreation for persons of all ages and abilities.
- Safe mode of transportation and recreation.
- Health benefits through exercise.
- Education/learning from interpretive signs located along the path.
- Economic stimulus from increased recreation product sales and rentals, non-motorized access to businesses and improved property values.
- Improved ecological health of the corridor from design concepts that will protect and enhance the environment.

The primary function of this project is to construct a construct a 10' wide concrete, shared-use path that is constructed of various low maintenance materials (concrete, composite plastics, stainless steel) from Ahukini Point to Lydgate Park.

1.2 Purpose of the Draft Environmental Assessment

The draft Environmental Assessment in an informational document prepared by the proposing agency and is used to evaluate the possible environmental effects of the proposed action. The Draft Environmental Assessment gives a detailed description of the proposed project and evaluates the direct, indirect and cumulative impacts. The document considers the alternatives to the proposed project and describes any measures proposed to minimize potential impacts. T, he public has thirty (30) days to review and comment on the Draft Environmental Assessment.

After the Draft Environmental Assessment has been finalized and public comments have been all responded to, the proposing agency, in this case, the Department of Public Works for the County of Kauai, or the approving the action reviews the final assessment and determines if any "significant" environmental impacts are anticipated.

If the agency determines that the project will not have a significant environmental impact, it issues a Finding of No Significant Impact (FONSI), and allows the project to proceed without further study. The public has thirty (30) days to challenge the findings in circuit court.

If the agency determines that the project may have a significant impact, a more detailed environmental impact statement (EIS) be prepared. An EIS preparation notice initiates a sixty (60) day period during which an aggrieved party may challenge the determination in court.

1.3 Steps in the Environmental Review and Implementation Process:

Proposed Project
Agency consultation and Assessment

AGENCY ANTICIPATES A FONSI

Begin Draft EA Process

Agency/Applicant consults Community and Experts

Draft EA is reviewed and Accepted by Proposing Agency

Draft EA Submitted to OEQC

OEQC Publishes Notice of Draft EA

30 Day Comment Period

Agency/Applicant Review Comments

Begin Final EA Process

Draft EA is Revised and Finalized, Comments Answered

AGENCY ACCEPTS FINAL EA
(If Agency does not accept Final EA, the EIS Process Begins 

Agency Issues FONSI

Final EA and FONSI Submitted to OEQC

OEQC Publishes Notice of Final EA and FONSI

30 Day Challenge Period

1.4 Permits and Approvals Required or Potentially Required

The following are the permits that will be required and the Environmental Laws that are related to this action:

1.4.1 National Environmental Policy Act (NEPA) (HAR 11-200-25)

A proposed project that includes the use of federal lands or funds may required adherence to federal EIS regulations (NEPA) as well as State EIS law.

1.4.2 Section 4(f) of the Federal Department of Transportation Act of 1966

Any proposed roadway which involves federal funding and is situated close to parks, recreational areas, wildlife refuges, historic sites, historic bridges and highways, archaeological resources, school playgrounds, recreational trails and bikeways.

*** Special Note regarding Section 6 (F):** Hanama'ulu Beach Park was the recipient of Conservation Lands funds for construction, and this project does interface with this park, however as there is no "taking" of park lands, a Section 6 (F) is not required, however, copies of the plans and a letter explaining the project will be submitted for acknowledgement of same.

1.4.3 Army Corps of Engineers Permits

1.4.3.1 Section 404 of the Clean Water Act (33 USC 1344)

Prohibits discharge of dredged or fill material into waters of the United States without a permit from the Corps of Engineers.

Any person, firm or agency (including Federal, State, and Local Governmental Agencies) planning to do work in the waters of the United States must obtain a permit from the U.S. Army Corps of Engineers.

Waters of the U.S. include: ocean waters, coastal and inland waters, lakes, rivers, and streams that are navigable, including adjacent wetlands, tributaries to navigable waters, fishponds connected to navigable waters, and intermittent streams.

1.4.3.2 Section 401 of the Clean Water Act (33 USC 1344)

1.4.4 Hawaii Coastal Zone Management (Chapter 205A, HRS)

Mandates each county to set up special management areas (SMA's) and forty (40') foot setbacks within which, permits are required for development. A Consistency Review with the State Office of Planning will be required.

1.4.5 State Department of Health Environmental Laws and Associated Administrative Rules:

1.4.5.1. Environmental Response Law (HRS 128D)
1.4.5.2 Department of Health (HRS 321)
1.4.5.3 Litter Control (HRS 339)
1.4.5.4 Solid Waste (HRS 340A)
1.4.5.5 Hawaii Law for Mandatory Certification of Private Cesspool Pumping Firms and Operating Personnel in Wastewater Treatment Plants (HRS 340B)
1.4.5.6 Safe Drinking Water (HRS 340E)
1.4.5.7 Hawaii Law for Mandatory Certification of Operating Personnel in Water Treatment Plants (HRS 340F)
1.4.5.8 Air Pollution Control (HRS 342B)
1.4.5.9 Ozone Layer Protection (HRS 342C)
1.4.5.10 Water Pollution (HRS 342D)
1.4.5.11 Non-Point Source Pollution Management and Control (HRS 342E)
1.4.5.12 Noise Pollution (HRS 342F)
1.4.5.13 Integrated Solid Waste Management (HRS 342G)
1.4.5.14 Solid Waste Pollution (HRS 342H)

1.4.5.15 Special Wastes Recycling (HRS 342I)
1.4.5.16 Hazardous Waste (HRS 342J)
1.4.5.17 Underground Storage Tanks (HRS 342L)
1.4.5.18 Used Oil, Transport, Recycling, and Disposal (HRS342N)
1.4.5.19 Asbestos (HRS 342P)

1.4.6 Conservation District Use Permit
Required for the placement of any solid material on the land if that material remains on the land for more than fourteen (14) days, or if it causes a permanent change in the land area. Board permits for large land uses, Departmental permits for minor land uses.

1.4.7 Land Use Law (HRS 205)
Relates to all the lands of Hawaii as either: Urban, Agricultural, Rural or Conservation. The Commission processes petitions to change the designated land uses.

1.4.8 State Environmental Policy (HRS 344)
This policy works with all state agencies to promote efforts to prevent or eliminate damage to the environmental and biosphere and stimulate the health and welfare of humanity, and enrich the understanding of the ecological systems and natural resources important to the people of Hawaii.

1.4.9 (NPDES) National Pollutant Discharge Elimination System Permit
Required by the State Department of Health as this project will disturb five acres of land.

1.4.10 Construction Noise Variance
This will be required for the period of time of construction from the State Department of Health.

1.4.11 Special Management Area Permit
Development within the SMA area requires a permit, however as this project has a construction budget that exceeds $125,000, a Major Special Management Use permit will be required.

1.4.12 Shoreline Setback Variance
Will be required from the County of Kauai, if the path is to be makai of 40’ from the shoreline setback.

1.4.13 Flood Zone Permit
Will be required for work within the Flood Zone from the County of Kauai

1.4.14 Building Permit
Will be required prior to the construction of buildings such as comfort stations from the County of Kauai.

1.5 Coordinating Agencies

1.5.1 Federal:

1.5.1.1 Federal Highways Administration
Administers the funding for TE projects, and consults on coordinating with all federal. state and local governmental offices.

1.5.1.2 U.S. Army Corps of Engineers
Reviews permits for fill materials in waters of the US.

1.5.1.3 U.S. Coast Guard, USCG Shore Maintenance Department
Reviews permits relating to marine environmental protection in navigable waters of the US.

1.5.1.4 U.S. Environmental Protection Agency (EPA)
Reviews permits under the ten comprehensive environmental protection laws to include the Clean Air and Water Acts, the Marine Protection, Research and Sanctuaries Act.

1.5.1.5 U.S. Department of Housing and Urban Development (HUD)
Reviews EIS initiated under NEPA or Chapter 343

1.5.1.6 U.S. Department of Agriculture, Natural Resources Conservation Service
Works with county, state, and federal agencies and with Hawaii's 16 Soil and Water Conservations Districts to prevent soil erosion and water contamination, and to improve water quality and quantity, soil productivity, wetlands ecosystems and wildlife habitats.

1.5.1.7 U.S. Department of the Interior, U.S. Fish & Wildlife Service, Ecological Services
Performs formal and informal consultation under Section 7 of the Endangered Species Act, reviews Federal, state and local permits and license application, environmental assessments and impact statements, general plans and land use amendments, clearinghouse reviews, water quality certifications, and issues regrading fish and wildlife resource study methods and design.

1.5.1.8 U.S. Geological Survey, Biological Resources Division, Pacific Island Ecosystems Research Center (PIERC)
Reviews and gives technical assistance, relating to conservation of indigenous biological resources occurring within the cultural, sociological, political and environmental environs of all lands and islands under US jurisdiction in the Pacific Basin.

1.5.2 State:

1.5.2.1 Department of Land and Natural Resources
Reviews all CDUA permits

1.5.2.1.1 Engineering Division
Submit permits relating to Water Resources management, mineral resources, flood prevention and control or water development.

1.5.2.1.2 Land Management Division
Submit any permits related to State Owned Lands that are not set aside for use by otehr governmental agencies. Is the office of record and maintains a central repository of all government documents dating back to the Great Mahele of 1848.

1.5.2.1.3 Aquatic Resources Division
Reviews all permits relative to pelagic, reef, and inshore aquatic resources protection and enhancement programs.

1.5.2.1.4 Forestry and Wildlife Division
Consults on issues relating to forest reserves, public hunting, wildlfie sanctuaries, commercial forestry on State lands, endangered species protection and management, and provides information on natural resources.

1.5.2.1.5 State Dept of Transportation, Statewide Transportation Planning Office
Reviews and coordinates any intergovernmental endorsements and approvals, integrating established plans and parameters and groundwork for the implementation of transportation plans.

1.5.2.1.6 Environmental Center (University of Hawaii)
Reviews EI statements, applications for various envirnmental pollution management permits, proposed environmental legislation and regulations and various state and federal plans which may have environmental implications.

1.5.2.1.7 Department of Health, Environmental Planning Office
Assists with planning services, maintains environmental plans, land use, environmental education and public information programs.

1.5.2.1.8 Department of Business, Economic Development and Tourism
1.5.2.1.8.1 Land Use Commission

Reviews any petitions to change land uses

1.5.2.1.8.2 Office of Planning, Coastal Zone Management Program (CZM)
Reviews any permits relating to coastal issues to ensure consistency in actions that can impact the coastal zone.

1.5.2.1.8.3 Office of Planning, Land Use Division
Reviews any issues relating to land use policies of the State of Hawaii

1.5.2.1.9 State Historic Preservation Division (DLNR)
Reviews all proposed projects for any effects they might have on historic properties. Can assist with the statewide inventory of properties on historical, architectural or cultural importance, and coordinates the Burial Sites Program and Historic Preserves Program. Any human remains that are unearthed are reported to this office.

1.5.2.1.10 Office of Environment and Quality Control
Reviews Draft EA's and Final EA's

1.5.3 County:

1.5.3.1 Kauai Planning Department and Planning Commission
Reviews all land-use related permits relating to variances, zoning, shoreline setback variances, special management area permits.

1.5.3.2 Kauai County Council
Has the final decision making authority in all land use issues.

1.5.3.3 Kauai Department of Public Works
Coordinating agency for this project, and is the approving agency.

1.5.3.4 Kauai Department of Water
Reviews Draft EA and Final EA for issues relating to water.

1.5.3.5 Kauai Police Department
Reviews path plan to ensure that police patrolling and emergency response access is adequate along the path corridor.

1.5.3.6 Kauai Fire Department
Reviews path plan to determine if emergency response access has been provided along the path corridor.

1.6 Project Summary

1.6.1 Project Name
Ahukini Point to Lydgate Park Play bridge Environmental Permitting.

1.6.2 Applicant
The applicant is the County of Kauai, Public Works Department.

1.6.3 Approving Agency
The approving agency is the County of Kauai, Public Works Department

1.6.4 Anticipated Determination
It is anticipated that a finding of No Significant Impact (FONSI) will be made for this project. The path will be aligned in areas with social trails, existing roads present, along the golf course, or Kapule/Kuhio Highway. The areas requiring bridging will receive bridging and abutments that are long enough and out of the drainageway to eliminate issues of slope for runoff. The habitats for the known endangered marine animal, the Monk Seal, will not be affected by the

construction or use of this project. The comfort station will be placed in the area of the Marine Camp, which has historically been the subject of disturbance.

1.6.5 Land Use Classifications

1.6.3.1 State Designations

Designated as Conservation, Agriculture and Urban Districts

1.6.3.2 County General Plan

The County of Kauai in 2000 revised and adopted the General Plan. This Plan considers long-range planning, development, protection of scenic views, conservation and other resources. The following are issues relative to this adopted General Plan that this project supports and/or exhibits:

1.6.3.2.1 Scenic Views

The County seeks to preserve scenic views and public resources in administering land use regulations. Scenic views with a high degree of intactness or vividness shall be protected. The scenic qualities of mountains, hills or other elevated sites shall be protected. The lowlands and open spaces, to include the shoreline, marshes, fishponds, bluffs overlooking the coast, historic or cultural properties shall be protected.

1.6.3.2.2 Historic and Archaeological Sites

The County seeks to preserve historic and archaeological sites and provide buffers in between them and other uses abutting them, and to provide pedestrian access to the sites, where appropriate.

1.6.3.2.3 Coastal Lands Policy

The County will work to acquire shoreline lands, and public access to same. To consider as uppermost importance to preserve and protect sandy beaches. If the portion of this path project does front on the coastline along the Wailua Golf Course at holes # 17, # 2 and # 1, it is part of the intent of the design to incorporate dune restoration as these are the areas subject to the most severe erosion.

Further, to protect the coast by allowing lands placed in the Conservation District and/or in the County along the coast to be used as a buffer from coastal erosion. To site structures inland of the buffers.

To analyze hazards of long-term coastal erosion to help determine appropriate setbacks.

In areas subject to coastal erosion, to provide for beach renourishment and to discourage hardening of the shoreline in any manner.

To provide for permanent pathway laterally along the coast located in the buffer zone and mauka of the shoreline. To site buildings near the shoreline to preserve the view to the shore, and to provide convenient parking to these areas and facilities.

1.6.3.2.4 Visitor Activities, Parks, & Natural Areas Policies

To manage parks, resources, streams beaches and other areas to conserve resources, encourage and provide for access to these areas, and to allow for group use. To enhance the visitor experience and provide jobs to residents. To interpret natural areas, historic and archaeological sites, and cultural activities, and to maintain and manage these facilities.

1.6.3.2.5 Open Lands Policies

Areas designated as Open, shall be protected to maintain or enhance the characteristics of the land. These lands can be coastal bluffs, stream valleys, native plant and wildlife habitats, and archaeological resources.

1.6.3.2.6 Scenic Roadway Corridors Policies

Scenic Roadway Corridors shall receive such designation to conserve the open space and scenic qualities and views along the most heavily traveled roadways.

1.6.3.2.7 Bikeways

The County wants to support and develop a bikeway system to provide for transportation, recreation and activities that are alternatives to vehicles.

This project does not require any variances or action contrary to these policies and objectives adopted by the County.

1.6.6 Special Designations

1.6.6.1 Special Management Area

The portions of the corridor located along the ocean give the project area a designation of Special Management Area.

1.6.6.2 Shoreline Setback

The shoreline setback is forty (40) feet from the certified shoreline, which essentially is where the vegetation line begins.

2.0 PRE-ASSESSMENT CONSULTATIONS

This is a summary of all meetings.

2.1 PROPERTY OWNERSHIP ISSUES

2.1.1 Wailua Golf Course

Met with Ed Okamoto, golf course superintendent and Frank Sullivan, golf course advisor, then conducted a golf course public meeting with all interested stakeholders.

The issues expressed by the stakeholders was to preserve the integrity of the signature hole number 17 with the path accessing the golf course in that area. Also at the beach in this area, and at holes number 1 and 2 are locations that according to the beach studies, are subject to serious erosion and need to be re-nourished with additional sand to maintain the integrity of the coast and keep the greens and fairways from eroding away in the future.

The fence at the driving range might need to be moved mauka to accommodate the path in the area there. And decisions need to be made relevant to bringing the path between the clubhouse parking lot and tee number 1 to Kapule/Kuhio Highway. This alignment would have the path parallel the existing fiber optic cable alignment.

2.1.2 Marine Camp, County of Kauai

The portion of land belonging to the County is south of the golf course, and is directly makai of the motocross course. The land here is red dirt, rather than sand. If the path is aligned here, this park area will be formalized into a better park facility and possibly have a comfort station located here. Existing fishing uses here will remain unchanged.

2.1.3 Kauai Beach Villas

We had an on-site meeting with Judy Dalton, the longest full-time resident of the complex. She told us that there are only eight full time home owners there, that the remaining condominiums are leased properties. At first she was comfortable with the path running makai of the units, but called back later to say that the north corner unit would be too close to the path, and still have the path remain mauka of the 40' setback.

2.1.4 Ocean Bay Plantation

Spoke with Jerry Corush, owners' representative for the developer about issues relating to earlier development concepts and problems associated.

It appears the main problem the developer had with commencement of this project was with the desire of the owners to have the zoning changed to Urban to allow for high end housing to be built on the property. This was the source of contention with some of the native Hawaiians who did not support a use of the land that would barr them from beach access. It is zoned Conservation along the coast, and mauka of that is either zoned, Rural/Urban. There is, however,

one section with special zoning along the ocean frontage of a portion of this property zoned O-ST-R, which is Scenic Ecological Resources.

2.1.6 Hanama'ulu Beach Park, County of Kauai

The other portion of land belonging to the County is the Hanama'ulu Beach Park. The path is scheduled to be aligned above the bluffs of the park and connect into the Hanama'ulu Railroad Bridge above the park.

2.1.7 Hanama'ulu Railroad Bridge, Grove Farm Plantation

Lihue Land Company of Grove Farm owns the Hanama'ulu Railroad Bridge and the land adjacent to the airport and Ahukini Landing. We met with Mike Furukawa, representative of Lihue Land Company and Doug Haigh, with County Public Works Department. Mike indicated an interest in dedicating the bridge and the lands mauka of the beach park to the county.

2.1.8 Lihue Airport Authority

Met with the Assistant Director of the Airport, Tim Skinner. He is in favor of the path project, and says that the Airport Authority is prepared to give an easement to the County for the path construction. Further, that the Airport Authority will construct the fence separating the path from airport property proper.

2.1.9 Ahukini Point, State Parks

Ahukini Point is a state parks recreation facility and Wayne Sousa of state parks issue was to make certain that the path project would not impede in any way the existing fishing use of the piers.

2.2 ARCHAEOLOGY RELATED ISSUES

2.2.1 County Archaeology

Spoke with Nancy McMahon and the issues she would like to see addressed in the design of the path are that all attempts be made not to disturb archaeological and cultural locations.

2.2.2 Office of Hawaiian Affairs

LaFrance Kapaka Arboleda's issues are to take into account the "nokulii" at the base of the Hanama'ulu Railroad Bridge which is a site of potential burials and to make sure that a monitoring plan is written to determine the way in which artifacts or bodies are to be addressed during construction.

Further, she met with us again on site at the Wailua Golf Course to discuss the idea of the path running down the south side of the driving range and between the tee of hole number 1 and the existing parking lot. She said that the fiber optic cable runs in this area, and that construction would have to consider this, as well as the mass burial site near the tee box at number 1. The path may incorporate a tunnel in this area to minimize the impact of the path users to the golfers, and LaFrance indicated that her office would work with the designers to keep the tunnel excavation minimal.

2.2.3 State Archaeology

Martha Yent, of the Department of Land and Natural Resources feels that consulting with and following the advice of Nancy McMahon and LaFrance Kapaka Arboleda is the best way to approach the cultural issues along the path corridor, and stay in touch with her about any issues. She confirmed that Dan Quinn is the director of State Parks.

In another meeting with Martha, she indicated that Hanama'ulu Beach Park received Conservation Lands Funds in the 1970's which would normally require 6(F) evaluation, however as the path would not constitute a "taking" of park lands, only acknowledgement of the issue is required with a letter to her office.

2.3 HISTORICAL ISSUES

2.3.1 Kauai Historical Society

Spoke with John Lydgate who had no issues relating to historical interests as relates to the path alignment at this time.

2.3.2 Kauai Historic Preservation

We met with Mary Requilman, Director of the Kauai Historic Preservation Office in Kauai, who reviewed the proposed alignments and indicated that our team already had all of the maps and/or information that her office has regarding the old railroad lines, housing for the plantation workers, and old road alignments in the Hanama'ulu beach park area.

2.4 SURVEYING AND CERTIFIED SHORELINE SURVEY ISSUES

2.4.1 Office of Accounting & General Services

Spoke with Nick Zaccaro, the State Surveyor in the Office of Accounting and General Services, who recommended we call and speak with Dolan Eversol of the Office of Conservation and Coastal Lands regarding coastal issues and beach re-nourishment.

Also to get back in touch with Nick when the Certified Shoreline Survey is completed and ready for his review.

2.5 HAWAIIAN AFFAIRS ISSUES

2.5.1 Office of Hawai'ian Affairs

Spoke with Lance Foster, the Deputy Administrator of the Hawaiian Rights Division, who said that LaFrance Kapaka Arboleda is the person who is best in touch with the relevant Hawaiian Rights issues, and to copy him any correspondence relating to Hawaiian rights issues.

2.5.2 Office of Hawai'ian Affairs

Lance Foster, Director of the Native Rights of the Land and Culture Division of OHA and Dr. Jonathan Likeke Scheur, a policy analyst IV gave advice to respect the native ahu loa's (native ancient path routes) in the path alignment where possible. He also suggested that we request help from the local Hawaiians for assistance in identifying where ancient paths were located and to possibly consider them in the alignment where possible.

2.5.3 Native Hawaiians

Met with Butch Durant and six other members speaking for other native Hawaiians to discuss the issues relating to Native Hawai' ian rights and land ownership. The group took time to explain the historical and ancient paths used to traverse, and the use of the lands, dry for living, wet for growing taro. No land belonged to any one person, and as such, the group does not recognize the rights to do so now. The lands of the corridor for this project are held by the native Hawaiians, and any use of the land would and should be determined by them. Any monies used for the path are used with knowing that the group can and/or could use the land for other purposes, and is therefore spent knowing that it may be temporary in nature, depending on the decisions of the native Hawaiians. They did feel, however, that a path would be a good use of the land, but would have preferred to align a path themselves based on the ancient paths, and determine themselves how the TE funds should be spent.

2.5.4 Hawaiian Homelands Organization

Spoke with Roland Licona, the District Supervisor of Homestead Services Division of the Department of Hawaiian Homelands at the Public Meeting Number Two regarding issues relating to Hawaiian Homelands about several issues pertinent to rights of Native Hawaiians. Will schedule a follow up meeting with him, and Mr. Lloyd Yonenaka, the associate in Honolulu for Hawaiian Homelands issues.

2.6 DISABILITY AND COMMUNICATION RELATED ISSUES

2.6.1 State Disability and Communication Access and the Department of Health

Spoke with Curtis Motoyama who described that his office will review all ADA issues and to follow the ADA Guidelines and the State Interpretive Guidelines. He will be reviewing the drawings for compliance with accessible routes from the parking lots to the path and the Comfort Stations. He offered to review the preliminary drafts for review.

2.6.2 Office Of the Mayor, ADA Office

Spoke with Christina Pilkington the ADA Coordinator for the Mayors Office who expressed concern that the path and all amenities associated with the path to be totally accessible for all path and park users.

2.7 FISHING ACCESS ISSUES

2.7.1 State Aquatic Resources Division

Spoke with Wade Ishikara of that department who says that fishing at Ahukini Bay and Ninini Point. and surf casting as well as thrownetting is done at the County Park north of the Radisson.

2.8 WETLANDS and DRAINAGE ISSUES

2.8.1 Environmental Protection Agency

Spoke with Wendy Wiltse in the Honolulu office who said she is willing to review past details we have used to cross wetlands using pilings with boardwalks floating over the wetland, or bridging to cross the wetland without creating "fill" in the wetlands, thereby, avoiding the need for a 404. She asked for a copy of the details we have used, the names and phone numbers of the Army Corps of Engineers officials we have worked with, photo's of the wetlands, and a map of the areas in question. She said she would defer to Lolly Silva's judgment on these issues. A wetland delineation was completed on the Ocean Bay Plantation (north east corner of the Ocean Bay Plantation property). The wetland delineation is pending confirmation by the Army Corps of Engineers. If accepted as delineated, the wetland can be avoided and left undisturbed from the proposed path.

2.8.2 Army Corps of Engineers

Spoke with Lolly Silva who is willing to review past details we have used to cross wetlands using pilings with boardwalks floating over the wetland, or bridging to cross the wetland without creating "fill" in the wetlands, thereby, avoiding the need for a 404. She asked for a copy of the details we have used, the names and phone numbers of the Army Corps of Engineers officials we have worked with, photo's of the wetlands, and a map of the areas in question

2.8.3 Army Corps of Engineers

Met with the following regulatory agency officials:

- Connie Ramsey, Ecologist 404 issues
- Ed Chen, with the 401 issues
- Shane Sumeda with Non Point Source Pollution Stormwater Drainage Division
- Watson Okubo, section Supervisor of the Monitoring and Analysis Section of the Clean Water Branch of the Hawaii State Department of Health
- Gary Uenunten, the official in Kauai working with Watson

Met with all the regulatory agency officials listed above in Honolulu, with the exception of Gary, with whom I met on site in Kauai to discuss issues related to water, water quality, stormwater drainage, effects of construction on the landscape, streams and the ocean. It was decided that Gary could help determine which streams needed to be tested for water quality, and how far from the tidal drainage area north of the Kauai Beach Villas the bridge abutments would need to be located. Further, that a NPDES permit would be required, and if any 404's were required, that would necessitate a 401 as well.

Also to ensure that the path does not interfere with the wetland functions occurring at the pond south of the Radisson, that a wetland delineation would need to be performed in that area.

2.9 ENDANGERED MARINE SPECIES

2.9.1 State of Hawaii Division of Aquatic Resources

A meeting was conducted in Honolulu with Dr. Jeffrey Walters, Co Manager of the National Marine Sanctuary; DLNR to discuss the endangered species of marine animals might occur and/or be affected by this project. Dr. Walters felt that the path project might be a mechanism for education for visitors and residents of Kauai. He offered to provide the words

and graphics for educational signage. He said that his associate on Kauai, Dr. Mimi Ulry would best be the person to help locate the sites for the signs as she is most familiar with the beaching and sittings of whales, sea turtles and monk seals.

2.9.2 State of Hawaii, DLNR

Met with Mr. Donald E. Heacock, State of Hawaii Aquatic Biologist, who works in Lihue. Mimi Ulry, a marine conservation coordinator with the Division of Aquatic Resources and is a Kauai veternarian who works with the office in Honolulu to protect and document monk seal activity on the coast of Kauai. Both Don and Mimi expressed concern over bringing the path inside the 40' setback especially in the areas that would be used by the monk seals to beach themselves and deliver babies.

2.10 ENDANGERED PLANT SPECIES

2.10.1 National Tropical Botanical Garden, Dr. David Lorence

Met with Dr. Lorence, Director of Science, E. Evans, Chair of Botany to discuss the potential for endangered plants on the proposed path corridors. Dr. Lorence reviewed the alignment, and indicated to us that there are no endangered species ever documented on our alignment. He said that there is an endangered grass in the dripping moist cliffs near Princeville, but nothing in or near our corridor.

2.11 COASTAL EROSION ISSUES

2.11.1 Office of Coastal and Conservation Lands

Met at the Office of Coastal and Conservation Lands (OCCL) of the Department of Lands and Natural Resources with Charles Fletcher, Dolan Eversole, and Sam Lemmo and discussed conceptual planning aspects of the bike path project.

Sam Lemmo, administrator for OCCL, accepted in concept a design along the coastline that included dune restoration (approximately 10 cubic yards per foot of shoreline), a modular and removable pathway, small sections of retaining wall on the mauka/golf course side of dune restoration to hold dune sand, and vegetation and watering to stabilize the dune.

He indicated that submission of a full EA describing this concept was consistent with departmental goals.

2.12 COUNTY POLICE AND SECURITIES ISSUES

Ron Venneman, Deputy Chief indicated that his primary issue was in access to the path for emergency vehicles and making sure that the police force would have access at reasonable intervals along the path corridor. Ron said that if he could have access at reasonable locations along the corridor this would be sufficient for his needs.

Also, that if vehicles could have access at either end of the Hanama'ulu railroad bridge this would give the officers close enough access on foot to assist in an emergency, and that it would be important for emergency call boxes to be installed in the more remote locations along the path corridor.

2.13 COUNTY FIRE AND EMERGENCY SERVICE ISSUES

David Bukoski, Prevention Chief, indicated that his primary issue was in access to the path for emergency vehicles. David said that if he could have access at approximately 1/4 mile locations along the corridor this would be sufficient for his needs. Also, that if vehicles could have access at either end of the Hanama'ulu railroad bridge this would give the officers close enough access on foot to assist in an emergency.

2.14 CONSULTATION MEETING MINUTES

See Appendix A

3.0 GENERAL DESCRIPTON OF PROPOSED ACTION

The purpose of the project is to provide non-motorized path facilities for pedestrians and cyclists for recreation, fitness, and an alternative transportation option to automobiles and as an environmentally friendly form of economic stimulus. This reach of the path will connect to the existing Lydgate Park bike and pedestrian path and will be a key segment of the Nawiliwili to Anahola Bike and Pedestrian Path proposed in the 1994 State of Hawaii Master Plan – Bike Plan Hawaii. It is further the intent of the project to enhance coastal geology and ecology and convert abandoned cane railway corridors whenever possible. The project will benefit residents and visitors to Kauai by connecting important destinations such as parks, areas of cultural and ecological significance along the coastline. A comprehensive bikeway system, which includes a sixteen (16) mile scenic coastal bike path on the east side of Kauai, will be a very significant amenity for Kauai resident and visitors.

It is the intent of this project to construct an eight to ten foot wide path to connect the existing path at Lydgate Park to Ahukini Point.

3.1 Technical Characteristics

Path alignment alternatives have been identified through site reconnaissance, meetings with key stakeholders and County officials, and from public comment held at two community wide meetings and one special interest meeting with users of the Wailua Golf Course. In addition, research of existing site conditions such as cultural and archeological issues, vegetation and wildlife, soils, topography, land use and coastal processes were also considered when identifying the various path alignment alternatives.

The Path alignment alternatives identified herein can be generally identified as a Coastal Path Alignment Alternative (Alternative 1.) and the Kapule/Kuhio Highway Path Alignment Alternative (Alternative 2.). Several other alignment alternatives were also identified that could involve possible combinations of both the Coastal and Kapule/Kuhio Highway Alignments. The path alignment alternatives discussed and the orders of which they appear in this document do not indicate a "best alternative" or favorite route at this time.

ALTERNATIVE 1 (COASTAL PATH) (Refer to Alternative Alignment Maps 1 through 5)

General

The Coastal Path Alignment Alternative is approximately 4.5 - miles in length. The path ranges from eight to ten feet wide, depending on the available land to accommodate the path and cost considerations. The required easement for the path will be a minimum of 16 feet (ten feet for the path, plus three foot wide shoulders on each side of the path). The maximum width required for the path will depend on the amount of grading disturbance required to construct the path and proposed path amenities that are desired along the path such as pocket parks, scenic overlooks, comfort stations, etc. Construction materials for the path vary from concrete to wooden or plastic composite materials, depending on durability and cost. The Coastal Path Alternative has been sub-divided into following 11 Reaches:

Sub Reach One - Airport

An on-street, Shared Road designation is planned for Ahukini Road, between Ahukini Point, and Kapule highway (See Figures 1a through 1c).

The Airport Authority owns the property along the upper ridge of Ahukini Point. An 8 - foot tall security fence is planned to separate the airport property from the path.

Figure 1a - Photo of Ahukini Road just south of Ahukini Point

Figure 1b - Improved section of Ahukini Road half way between Ahukini Point and the airport

Figure 1c - Photo of Ahukini Road adjacent to the airport. Kapule Highway can be seen in the background

Sub Reach Two - Ahukini Point
The path ends at Ahukini Point, the southern terminus of this project (See Figure 2a). Existing parking will serve as a trailhead and path access location. Ahukini Point will become a major destination and trailhead for path users.

A ramp will be required in order to make a connection between the upper ridge of the point and the parking lot. Since the elevation change is not significant, little if any retaining walls will be required for the path. A comfort station is proposed for Ahukini Landing (See Figure 2b through 2d). A septic tank and leach field sewer system is planned for the comfort station. The leach field will be located underneath the paved parking area. The proposed comfort station would be approximately 20 feet by 24 feet (480 square feet), constructed on a concrete slab on grade makai of the 40 - foot shoreline setback. The walls of the proposed comfort station will consist of concrete masonry units (CMU) and a wood framed roof with asphalt shingles. The approximate cost for the proposed comfort station is $250,000.00.

Potable water and electrical supply will come from the airport area.

Figure 2a - Photo of Ahukini Point

Figure 2b - Photo of the location of the proposed comfort station at Ahukini Point

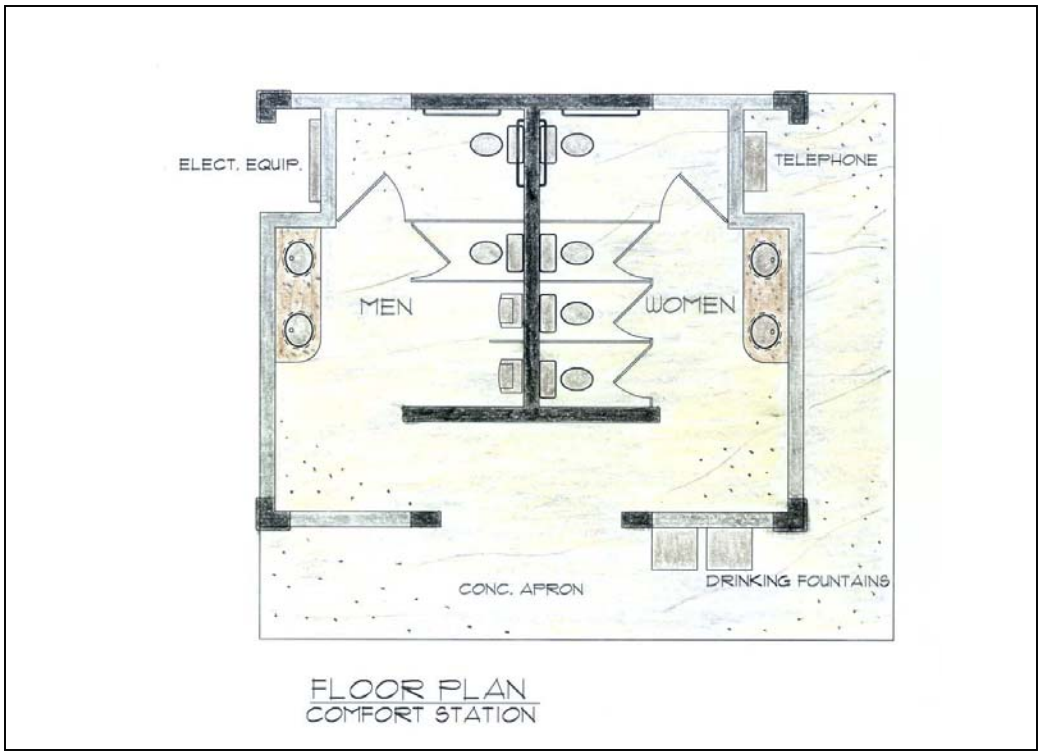


Figure 2c - Plan of the comfort station

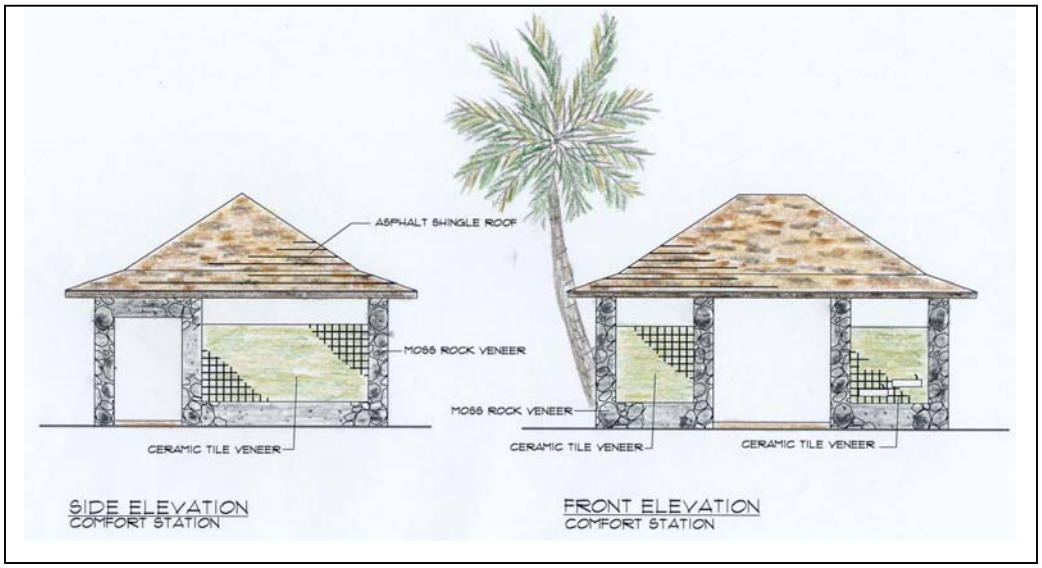


Figure 2d - Elevation of the proposed comfort station

Sub Reach Three - Grove Farms
Grove Farms owns the Hanama'ulu Railroad Bridge as well as the property mauka of Hanama'ulu Beach Park and the Hanama'ulu River. Heading south, the path would extend off of the south bridge abutment and ramp down to a lower grade where the path alignment turns towards Ahukini Point. The elevation change between the railroad grade and the lower area is approximately 25 – 30 feet. Three options have been explored on how the path ramp could be constructed for a length of approximately 600 lineal feet.

Option one is to fill and grade the entire length within the 5% maximum ADA slope. This is usually a low cost alternative, but with site access problems and significant height differentials, may not be an ideal option. This alternative also has the largest impact on the surrounding area. Filling will spread across a large width at the base and provide a "mini dam" in which provisions for drainage thru the dam must be addressed. In addition, drainage will need to collect into ponds on the uphill inlets and discharge in a concentrated flow on the downstream side. Estimated cost for option one is approximately $40 per cubic yard of fill, not including drainage improvements.

Option two consists of a segmental retaining wall system on at least one side of the path. It is possible that the wall will be needed on both sides of the path, depending on existing grades (See Figure 3a). Option two may be the most cost effective system with limited impact on the surrounding area. The drainage concerns are still the same as with option one. The estimated cost for option two is $50.00 per square foot of surface area of the segmental retaining wall, not including drainage improvements.

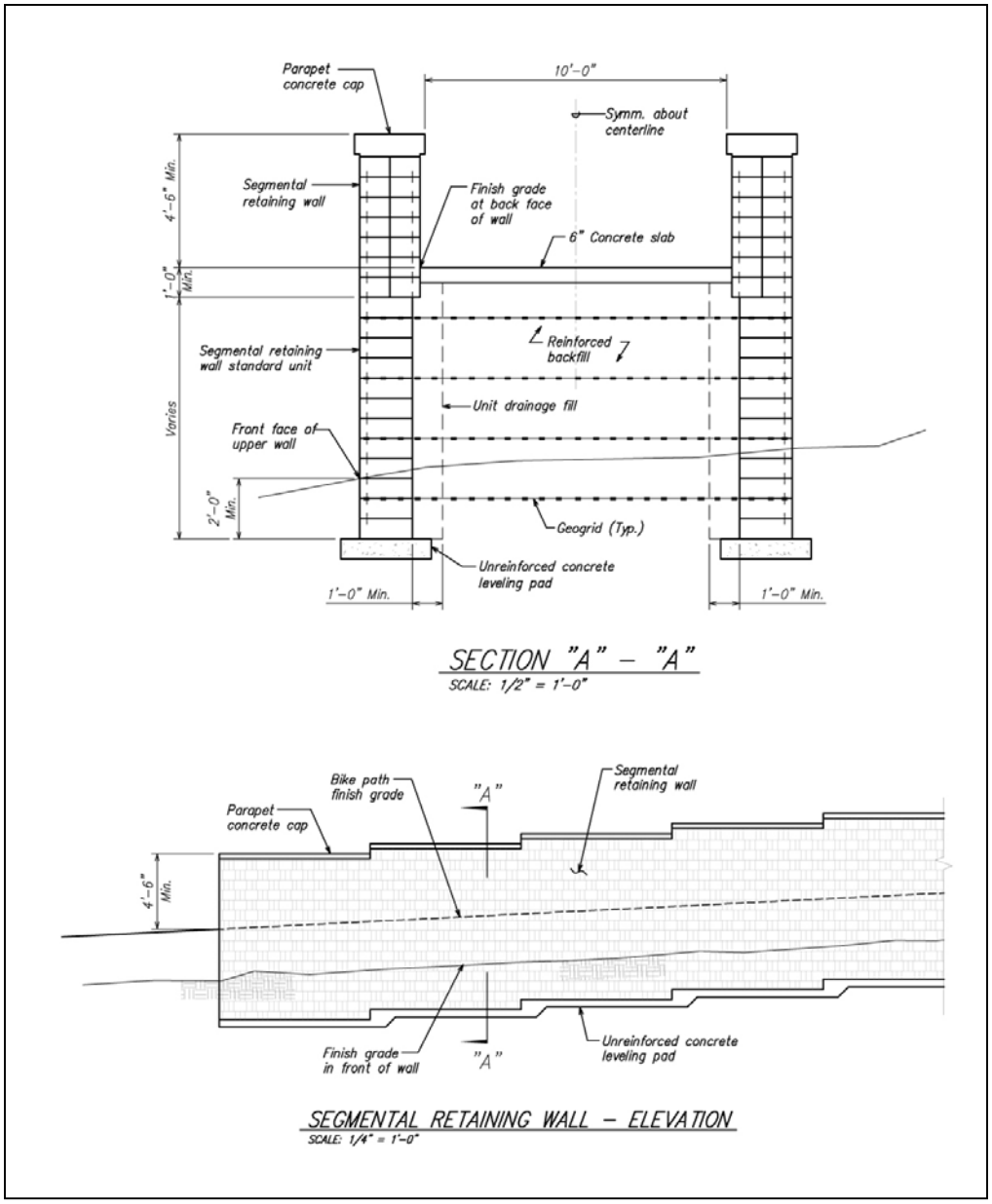


Figure 3a – Option two – Segmental Retaining Wall

Option three is an elevated, bridge structure. These may be constructed on spread footings or piles, depending on the soil characteristics in that area (See Figure 3b). This option is usually more expensive than the previous two options, especially if piles are required. There may be permitting issues that need to be resolved as well. An advantage of option three is that there is little impact on the surrounding vegetation and drainage patterns, as only the footing and/or the piles contact the ground. These footings only occur at selected, on center distances depending on alignment, soil conditions, topography of the area, etc. A budget of approximately $250.00 per square foot area of path deck should be considered for this option.

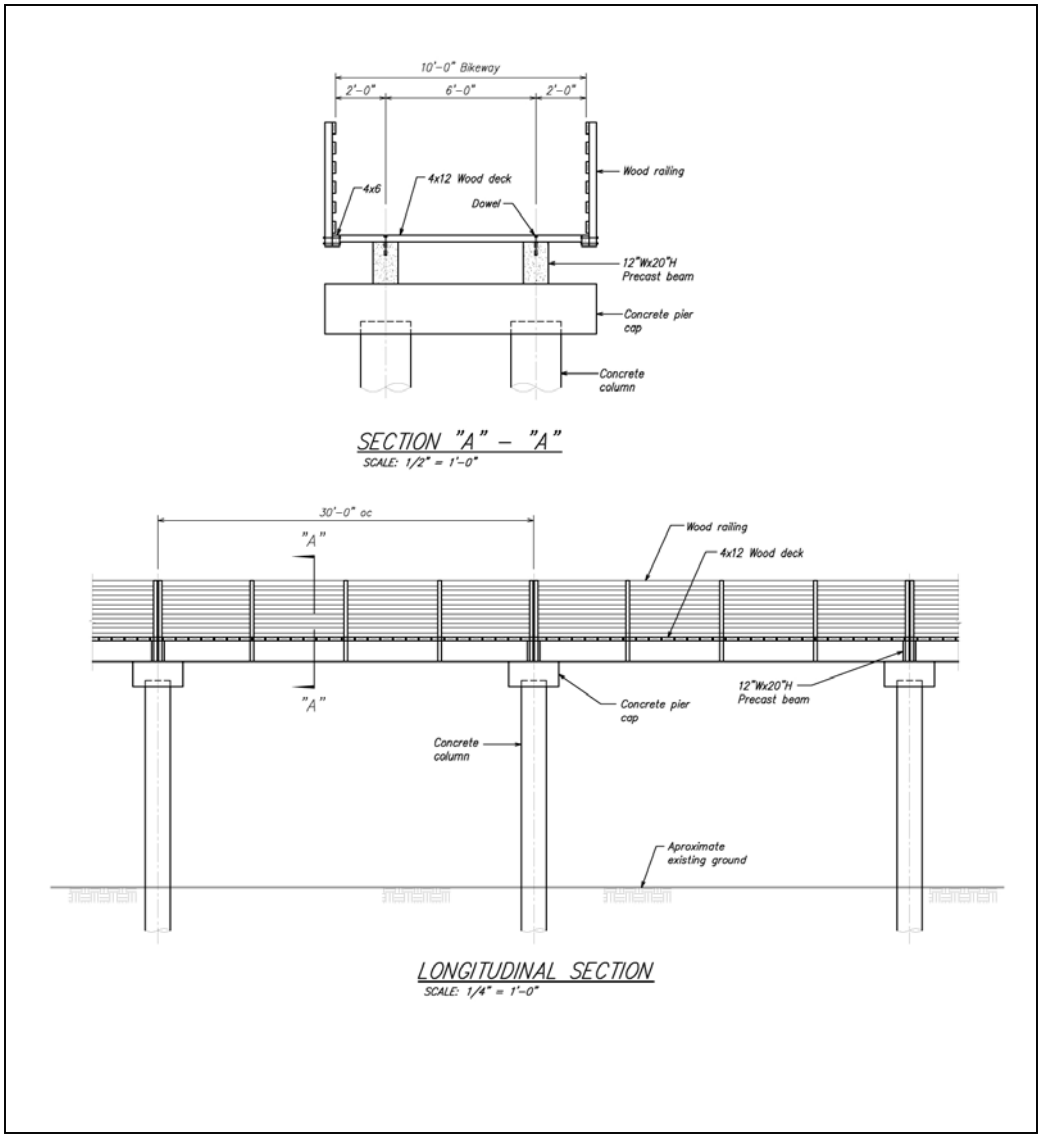


Figure 3b – Option three – Elevated bridge with wood/Trek deck on concrete columns

Once the path departs from the ramp as constructed in one of the three options listed above, it will extend onto an existing grade of an abandoned cane haul road. From this point the path gains elevation at a slope of approximately 3-5 percent, all of the way to the top of the slope and along the northern edge of the old cane field (See Figures 3c and 3d). The path continues along the bay side of the old cane field toward Ahukini Point and through vacant lands where car rental companies store cars (See Figure 3e). An eight-foot tall security fence is planned for the path in this area in order to keep path users from accessing the rental car lots.

Figure 3c - Photo of the existing lower cane haul road on the south edge of Hanama'ulu Bay

Figure 3d – Photo of upper cane haul road on the south edge of Hanama'ulu Bay

Figure 3e - Photo of open lands where rental cars are parked

Sub Reach Four - Hanama'ulu Railroad Bridge

The path continues along the existing**,** abandoned railroad grade until it reaches the Hanama'ulu Railroad Bridge (See Figure 4a and 4b). The Hanama'ulu Railroad Bridge spans over the roadway and the Hanama'ulu River. The path will be constructed on top of the existing railroad bridge. Structural analysis of the bridge indicates that the bridge is structurally sound, but will need some retrofitting and restoration in order to make the bridge safe for pedestrians and cyclists. These efforts would include widening of the deck to a width of 12-feet and adding safety railing (See Figure 4c). Concrete planks would be added to the top of the existing bridge. The planks would be doweled into the existing structure to provide stability. The approximate cost to restore and retrofit the Hanama'ulu Bridge is $300,000.00. Because of its height relative to the surrounding landscape; views from the bridge are spectacular. A residence currently exists below the north abutment and approach to the bridge. Currently, residents use the railroad grade for several dog kennels that would need to be removed to accommodate the path.

Figure 4a- Photo of the Hanama'ulu Bridge

Figure 4b – Photo of the Hanama'ulu Bridge

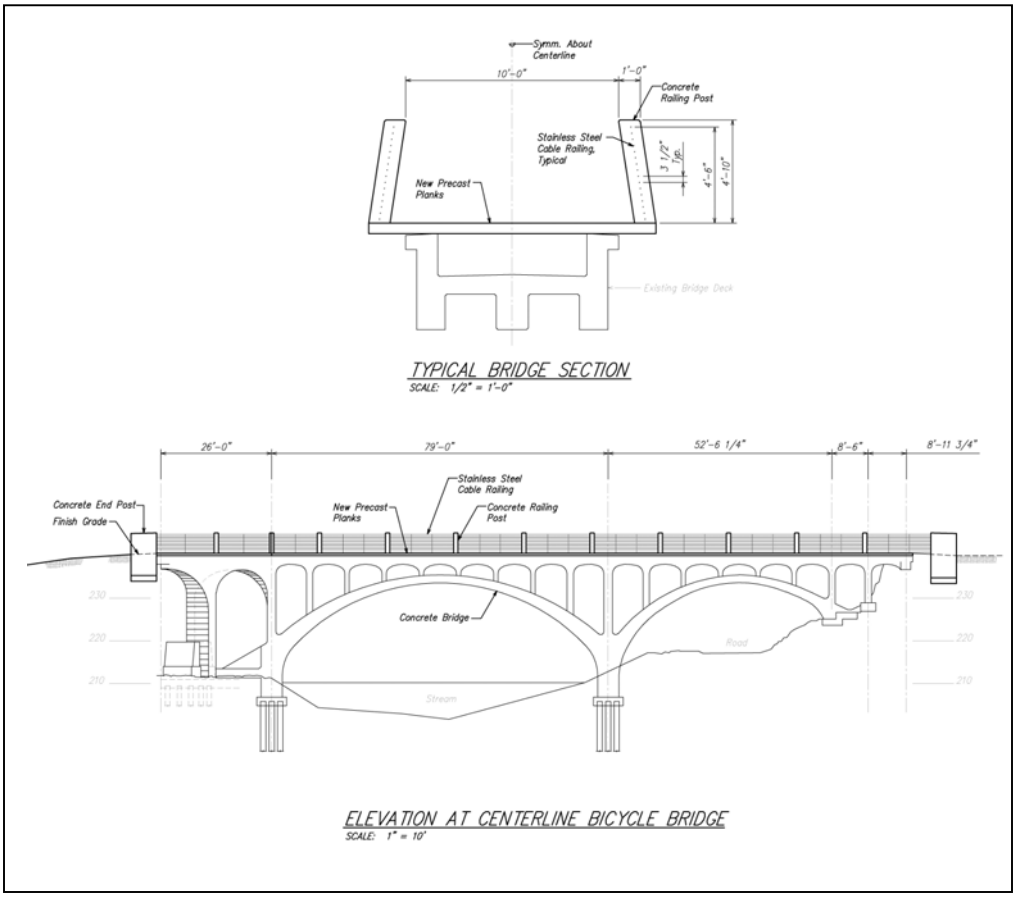


Figure 4c – Proposed Hanama'ulu Bridge retrofit

Sub Reach Five - Hanama'ulu Beach
The path will continue north on the abandoned railroad bed to Hanama'ulu Beach Park (See Figure 5a). In order to obtain access from between the railroad grade and beach park (an elevation of approximately 25 – 30 feet), a 10-foot width ramp of approximately 800 lineal feet will be required. In order to create a bench for the ramp, structural walls will be needed. Safety railing will be provided on the downhill side of the path and the ramp would not exceed a 5 percent slope, per accessibility requirements (See Figure 5b).

The ramp will extend to a point near the existing pavilion/comfort station and parking area located on the north end of the beach park. A visual inspection of the existing pavilion/comfort station was conducted resulting in the conclusion that the building is beyond repair (See Figure 5c). The inspection found that the foundation appears to be undermined due to leaking pipes and a clogged sewer line. The wood framed walls and roof are also termite and water damaged. Improvements to the pavilion/comfort station would consist of removing the existing structure and constructing a new building to replace the old pavilion/comfort station. The existing sewer system may be useable but further inspections are required to determine the condition of the sewer pipes, septic system or cesspool, and leach field. Water and electricity are already to the building. The approximate cost to demolish the old pavilion/comfort station and build a new one is approximately $300,000.00.

Hanama'ulu Beach Park will function as a trailhead/path access location as well as a major destination for path users.

Figure 5a - Photo of Hanama'ulu Beach Park taken from the highway bridge

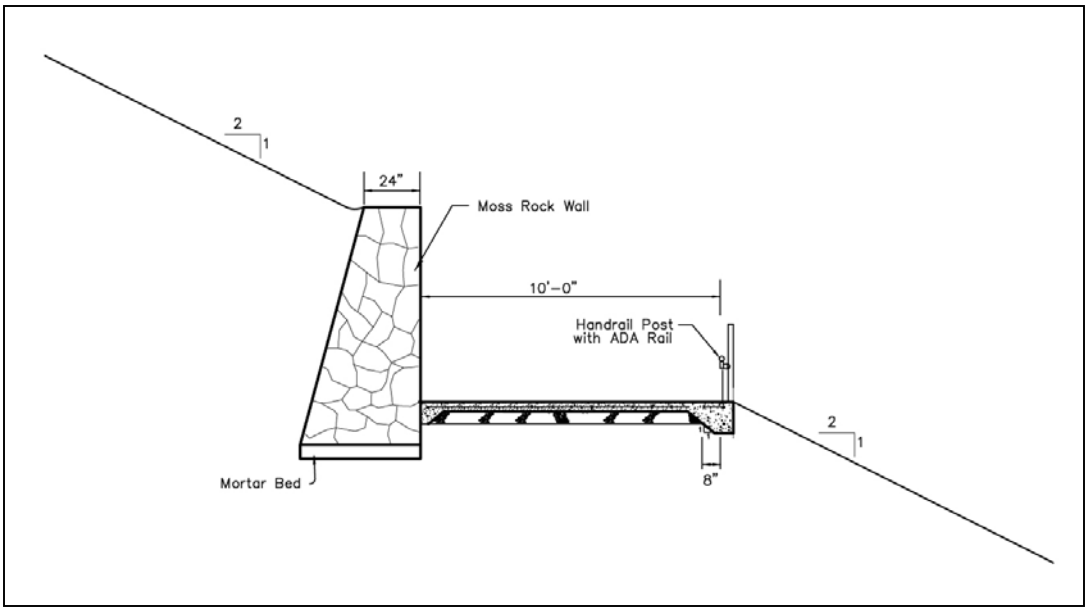


Figure 5b – Cross section of ramp

Figure 5c - Photo of existing comfort station at Hanama'ulu Beach Park

Sub Reach Six - Old Wharf Area

The path declines in elevation and eventually approaches and extends above the site of a plantation era wharf (See Figure 6a). A spur could be constructed from the path to the wharf where interpretive signs would explain the history of the bay and the wharf. The path continues along the coast, above rock riprap that was probably placed to protect the wharf and access road/railroad until it begins to rise in elevation as it approaches the northeastern tip of Hanama'ulu Bay and the Ocean Bay Plantation property (See Figure 6b). Spectacular views of the entire bay dominate the scenery in this entire reach of the coast.

Figure 6a – Photo of Wharf on north edge at Hanama'ulu Bay

Figure 6b –Photo of the abandoned access road/railroad on the north side of Hanama'ulu Bay

Sub Reach Seven - Ocean Bay Plantation
The path will follow along the railroad grade, gaining elevation until it reaches the cane field. From this point, the path can either follow the upper cane haul road that extends along the mauka edge of the field (See Figure 7a) or be constructed at a slightly lower elevation through a more scenic landscape (See Figure 7b). This area, located between the cane field and edge of the coastal cliffs has panoramic views of the ocean and is shaded with numerous trees. The upper cane haul road is hot due to a lack of trade winds and has minimal views to the ocean.

The path will continue north until it meets with an abandoned cane haul road that was probably constructed to provide access during the plantation period between the cane fields and the beach (See Figure 7c). There is an existing wetland pond near the beach and south of an existing drainage way (See Figure 7d). A wetland delineation will be required along the makai edge of the wetland to ensure that the path is not interfacing with any wetland vegetation or wetland processes, and still is mauka of the 40 foot ocean setback.

Figure 7a - Existing abandoned cane haul road on the upper bluff

Figure 7b – Existing landscape on the lower bench between the upper cane haul road and the bluff edge

Figure 7c – Photo of abandoned access road between cane field and beach

Figure 7d – Photo of the existing wetland

Sub Reach Eight - Radisson Hotel
North the wetland is another small tidal drainage way. Mr. Gary Uenunten, of the Health Department's Monitoring and Analysis Section in Kauai, stated during a meeting on site, that he has never witnessed any water in the drainage way. Regardless, a bike and pedestrian bridge may be planned over the drainage in order to avoid any future conflicts. Currently, vagrants live in the ditch, as evidenced by tents, and trash. The beach along the south end of the undeveloped property is a popular sunning location for the endangered Monk Seal, one of which was observed during one of the consulting teams field trips.

The path continues north and into an undeveloped parcel where, on the south end is an existing comfort station and parking area (See Figure 8a). The comfort station is owned and maintained by the property owner, however the public has a legal right to access and use the facility. A spur from the main path will be constructed to make the comfort station and parking area accessible to and from the path. Depending on how the vacant property is developed, the comfort station and parking area may be an important destination and/or access location for path users.

From the comfort station, the path continues between the hotel and the coast, respecting the 40 - foot shoreline setback. The path would be placed on top of the sand with minimal disturbance to existing grades and vegetation (See Figures 8b and 8c). The path structure would be designed as a removable path (See Figure 8d) in order to reduce the amount of disturbance to the underlying sand dune.

Figure 8a - Photo of the existing comfort station and coastal conditions

Figure 8b Before photo of the existing shoreline along the Radisson Hotel property

Figure 8c - Photo Simulation of the proposed path along the Radisson Hotel

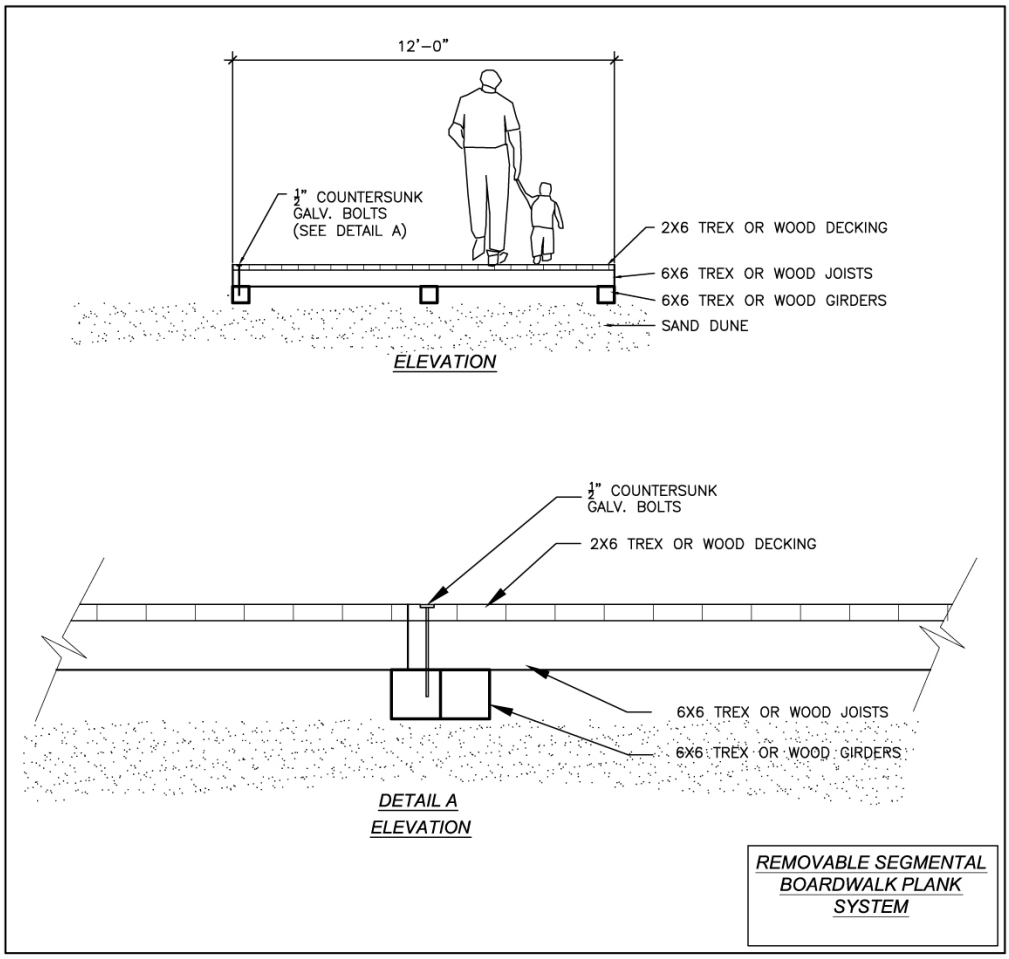


Figure 8d – Cross section of a 12 foot x 12 foot removable segmental path units

Sub Reach Nine - Kauai Beach Villas (KBV)
After passing the Radisson Hotel, the path extends makai of the condominiums (between the condominiums and beach). Currently only eight of the units in the KBV are lived in full-time and the remainder, are rental properties. The coastal alignment would bring the path to within 50 feet of one of the northern most units located near the beach (See Figure 9a). Several consulting team members met with one full time KBV resident. At the meeting the resident stated there would be no conflict with the path running between the condominiums and the coast as long as an ecologically sensitive method could be realized, and likened it to the existing path with the Kaha Lani Condominiums in Lydgate Park. However, after the meeting, the resident called to request that the consultant team study a mauka alignment that would utilize an existing bridge of the drainage way and continue mauka of the Radisson and KBV properties, connecting into Kauai Beach Drive. This option was considered and is described later in this document under Sub –Alternative 5 (Radisson Hotel Bypass).

On the north edge of the KBV property is a tidal drainage way that will need to be spanned with a 10-foot width by 90-foot length, bike and pedestrian bridge (See Figure 9a). Three options have been considered for the Radisson Bridge (See Figures 9b – 9d). The first option for the construction materials of this bridge is a pre-stressed plank structure with a concrete topping. The advantage of using the concrete planks is that they are shallow in depth and will provide the maximum of area underneath of the bridge for water to flow thru. The second option is a pre-stressed girder bridge with a concrete deck. The pre-stressed girder bridge has a wider cross section and therefore, less area for water to flow underneath of the bridge. Both bridges are durable and low in maintenance requirements.

The approximate cost for the pre-stressed plan bridge is $500,000.00, while the pre-stressed girder bridge is approximately $450,000.00. A low cost, pre-fabricated steel bridge with concrete deck is also considered. The bridge would be galvanized and coated with marine grade paint. The bridge would be able to handle vehicle loads up to 10,000 LBS. Maintenance costs would be a primary issue for painted steel bridges, however, if a diligent maintenance program were implemented the bridge could last as long as its concrete counterparts. The estimated cost to manufacture, ship and set the steel bridge would be approximately $250,000.00. All structures would be located mauka of the 40 - foot shoreline setback.

Figure 9a - Existing photo of ditch and condos

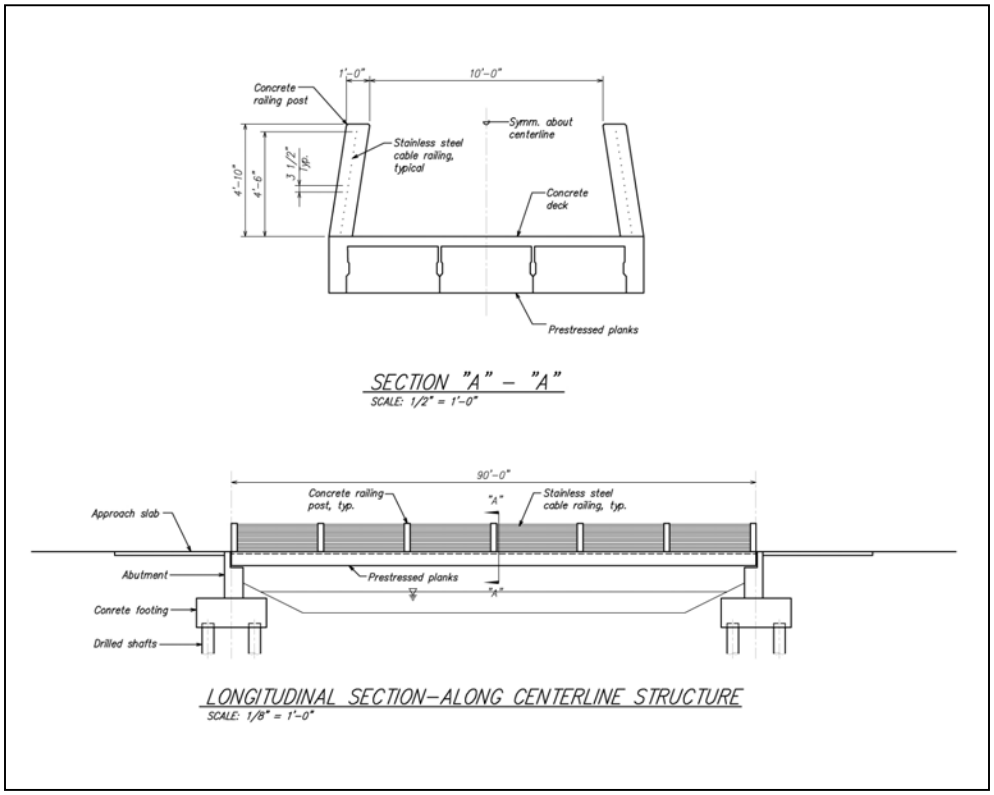


Figure 9b – Proposed bridge, Option 1 – Pre-stressed Planks

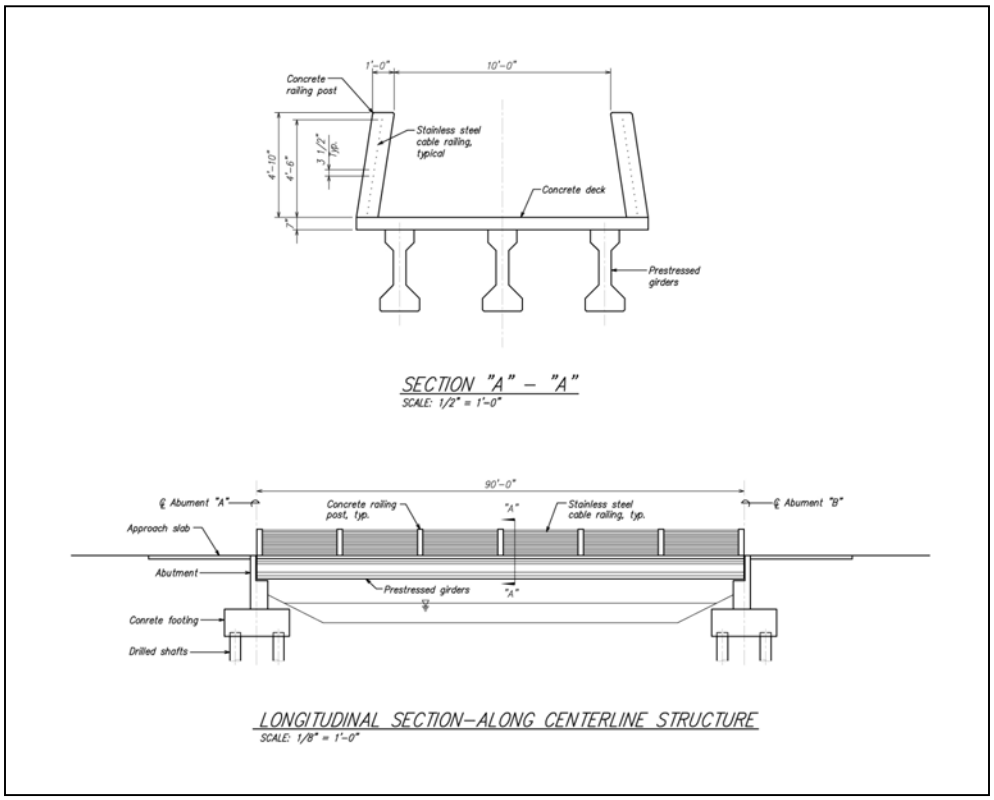


Figure 9c –Proposed bridge Option 2 – Pre-stressed girder

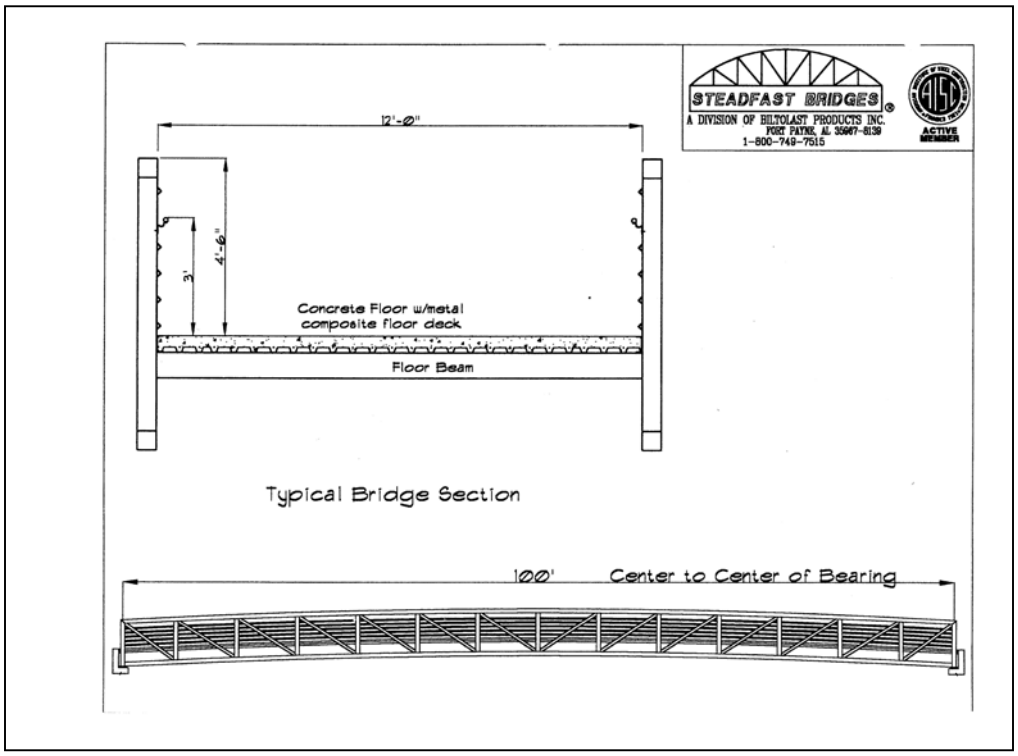


Figure 9d –Proposed Pre-fabricated steel bridge Option 3

Sub Reach Ten - Marine Camp

South of the golf course, the path will be aligned mauka of the 40 - foot shoreline setback and extend along the ocean into the county owned property known as Marine Camp. Currently, the area is used casually for parking cars, accessing the beach, fishing and unrestricted dirt bike use (See Figure 10a). Proposed improvements for this property may include a comfort station (with septic and leach field sewer system), drinking water, showers, pay phone and parking. The proposed comfort station would be of the same size and design as the comfort station proposed for Ahukini Point (see Sub Reach Two-Ahukini Point) except for the addition of showers.

The parking area will consist of gravel with large boulders used to control vehicle access within the park. The future beach park would be a trailhead/access location to the path system and would be a major destination for path users. Other potential uses for the site include a junior golf course, if the existing MotoCross facility is moved to another location.

Figure 10a – Existing conditions of the Marine Camp site

Sub Reach Eleven - Wailua Golf Course

The path continues north along the coast and into the golf course property at the 2nd green. With a continuous coastal alignment in this reach of the golf course, a significant dune re-nourishment effort will be required in order to provide a location for the path that allows the 1st and 2nd greens to remain in place. Dune refurbishment will provide a first line of defense from erosion for the golf course and will create/improve the dune ecology that does not currently exist in this reach of the coast. Dune refurbishment will consist of importing large quantities of sand and extensive revegetation utilizing native dune plants. Remnants of an old cane haul road exist along the 2nd fairway and green (See Figure 11a). Because of the old road, this area requires less sand for dune refurbishment than along the 1st fairway but will otherwise be similar to restoration efforts for the 1st fairway (See Figures 11b – 11d).

Two options for the path that will be constructed in conjunction with the dune were explored. The first option consists of composite plastic or wood materials attached to helical piers that are screwed through the new dune sand and into the soil below the new dune (See Figure 11e). The Helical Boardwalk Path will allow for the natural processes of the ocean/coastline to occur once the new dune restoration has been established. It is important that the Helical Boardwalk Path can be removed in this area since the structure would be located within the tsunami zone. A one-inch fabric, black chain link fence will be installed on the golf course side of the boardwalk path to protect path users form errand golf balls. Because of its design, the boardwalk path will make it difficult for path users to access the golf course. This was a need expressed by the golf course management, especially after recent vandalism of the golf course. In order to provide a visual screen between the golf course and path, vegetation will be planted along the edge of the golf course.

The second option is to utilize interlocking, 12 – foot by 12 – foot, removable path units (also see Sub Reach Eight – Radisson Hotel). These path units are constructed of treated wood or composite plastic lumber decking such as Trex attached on wood or Trex joists and girders. The planks set on top of the

dune sand and are anchored by augers and cable so that they do not become projectiles or will wash out into the ocean during storm events (See Figure 11f).

After passing the 18th tee the path continues north, makai of the driving range fence, (See Figures 11f and 11g).

Continuing north from the driving range the path approach the 18th tee and 17th green (See Figure 11h). The path will be located on the slope below the 18th tee and 17th green in such a manner that golfers may not be aware that the path is located near the green and tee. The path in this area will be an Helical Pile Boardwalk Path (See Figure 11i). The Helical Pile Boardwalk Path design is utilized where tidal erosion and limited space is a constraint. The design allows for the natural process of the ocean/coast occurring underneath and around the structure. The structure can be removed and reused if needed at a later date.

Figure 11a – Photo of the existing dune conditions and abandoned road along the 2nd fairway

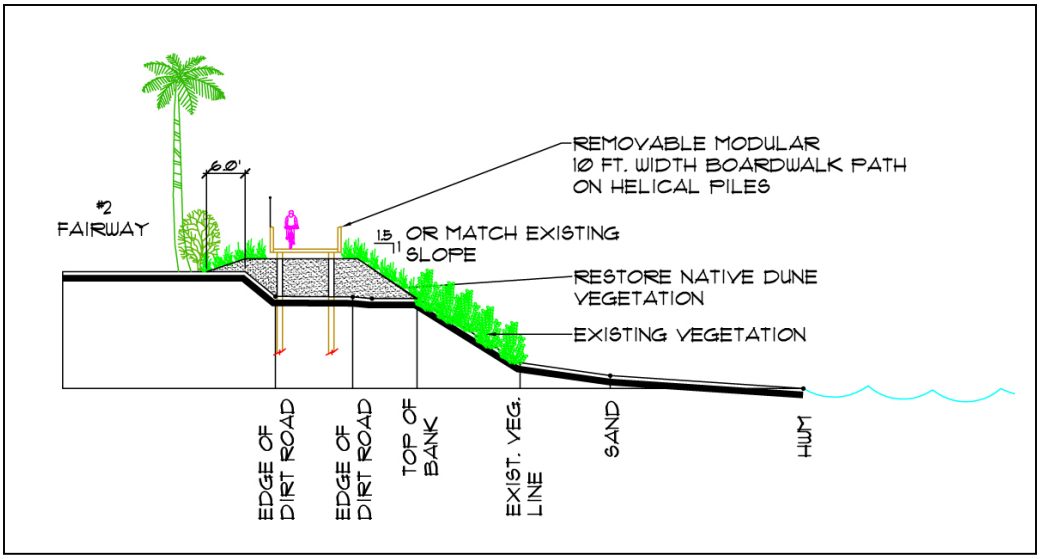


Figure 11b – Cross-section of dune restoration and helical pile boardwalk along the 2nd fairway

Figure 11c – Photo of the existing dune conditions along the 1st fairway

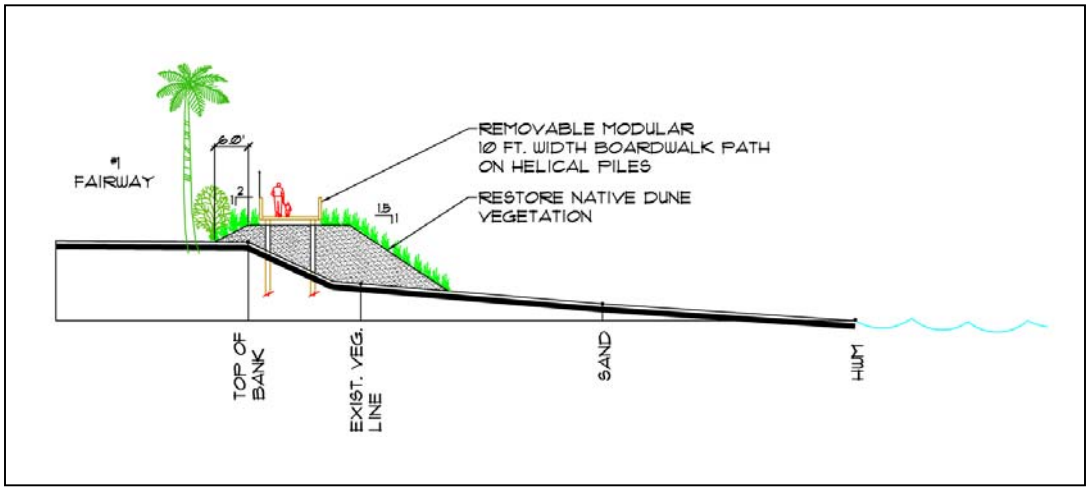


Figure 11d – Cross-section of dune restoration at 1st fairway

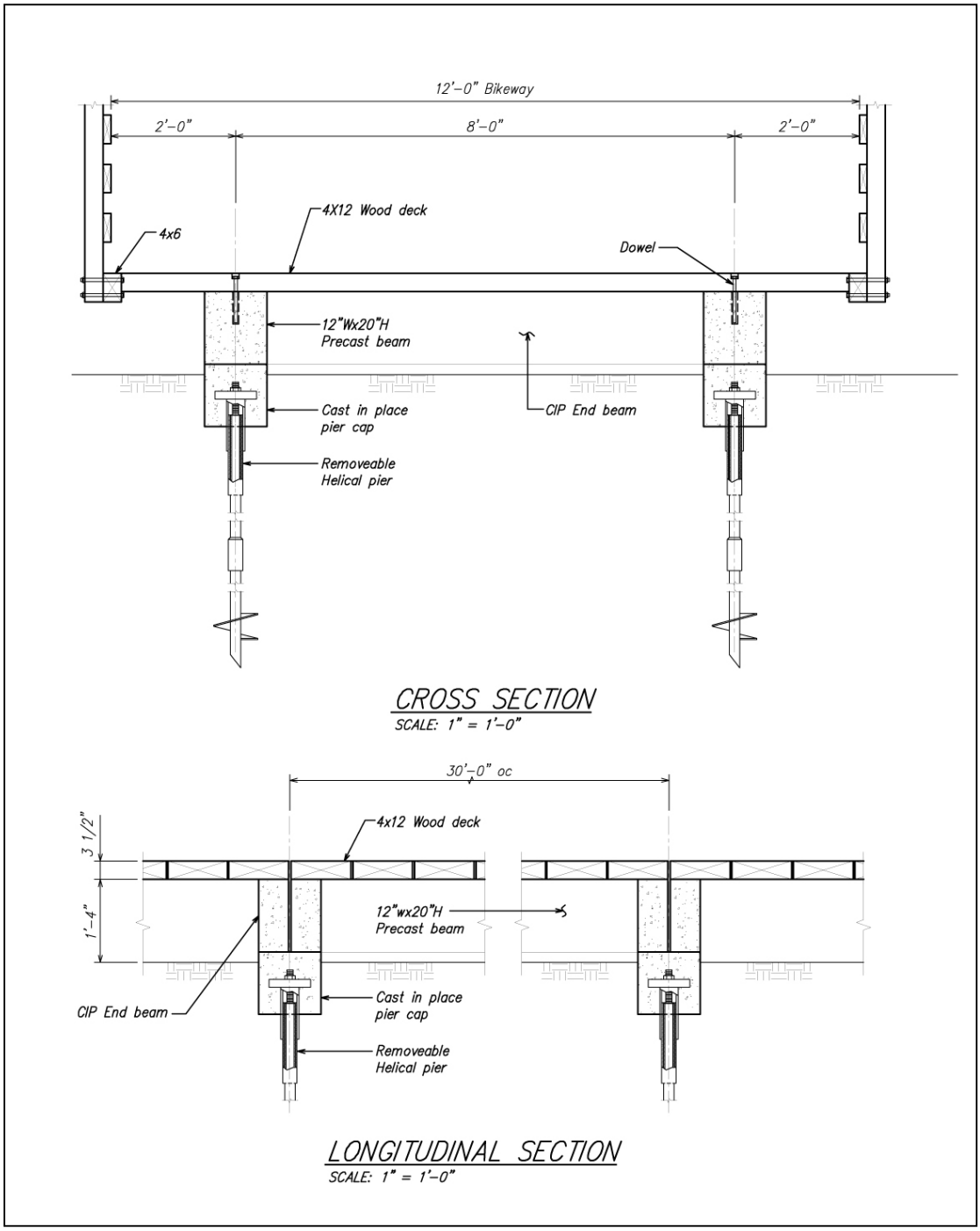


Figure 11e – Helical pile boardwalk

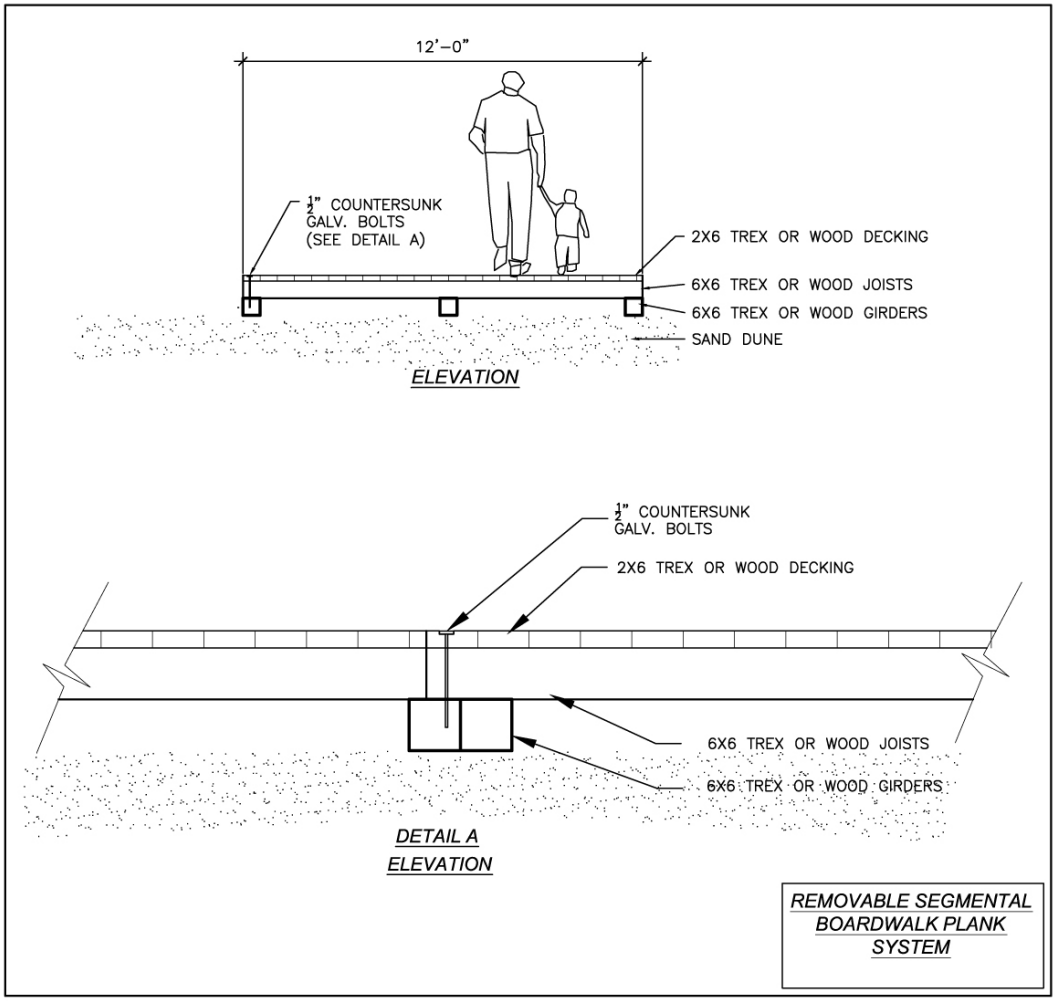


Figure 11f. Cross section of a 12 foot x 12 foot removable segmental path units

Figure 11g – Photo of the existing conditions behind the driving range fence

Figure 11h – Photo of the proposed path along the 1st fairway

Figure 11i - Photo of the 17th green at the Wailua Golf Course

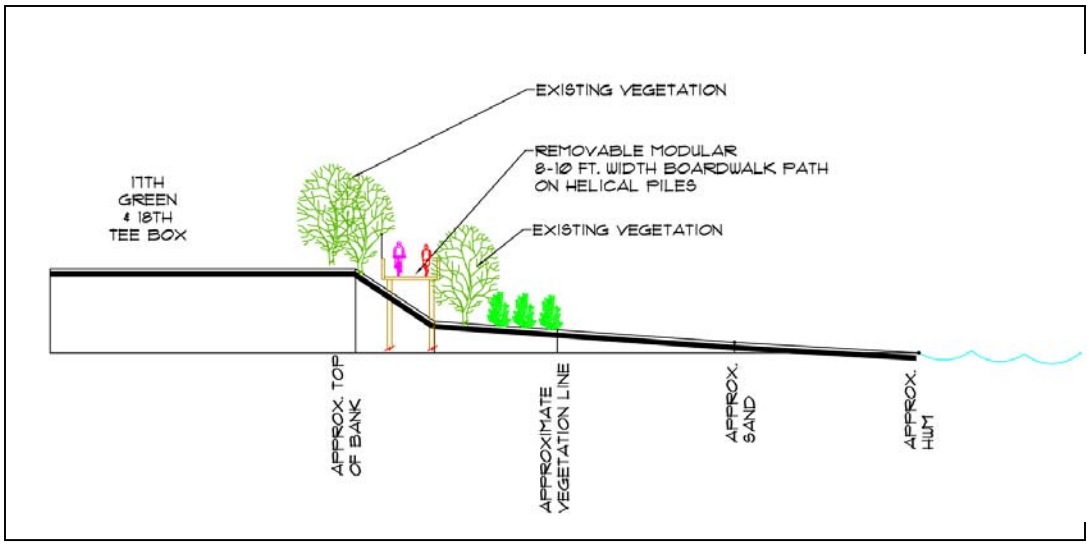


Figure 11j – Cross-section of proposed helical pile boardwalk at the 17th green and 18th tee

Sub Reach Twelve - Lydgate Park

The north terminus of the coastal path is the existing Kamalani Play Bridge located in Lydgate Park (See Figure 12a). Connected to, and extending from the play bridge will be a new 10 - foot width, 130-foot long bicycle and pedestrian bridge. The proposed bridge will span approximately 13 feet above an existing drainage that flows makai from the golf course. Two alternatives have been explored for the Lydgate Park Bridge. The first alternative is a cable suspension bridge with a wooden or Trex deck, (See Figure 12b). The cable suspension bridge will be designed so that it is in context with the aesthetics of the existing Kamalani Play Bridge. The second option is a pre-stressed girder/concrete deck bridge, (See Figure 12c). This type of construction would be more durable than the cable suspension bridge but would not be as compatible aesthetically with the Kamalani Play Bridge, however is consistent with other bridges that have been proposed for the Kauai Path Project. Both bridges are approximately 130 lineal feet long and ten feet wide. The cable suspension bridge is estimated to cost approximately $500,000.00, while the pre-stressed concrete bridge is estimated to cost approximately $700,000.00.

The new bridge will extend from the Kamalani Play Bridge, south onto an abandoned road through an ironwood tree forest, (See Figure 12d), and towards the 17th green of the Wailua Golf Course. Rock boulders will be installed along the base of the ironwood tree forest between the Kamalani Play Bridge and 17th Green in order to protect the sand dune from vehicles that can cause significant damage to the dune and dune vegetation.

Figure 12a - Photo of the Kamalani Play Bridge in Lydgate Park

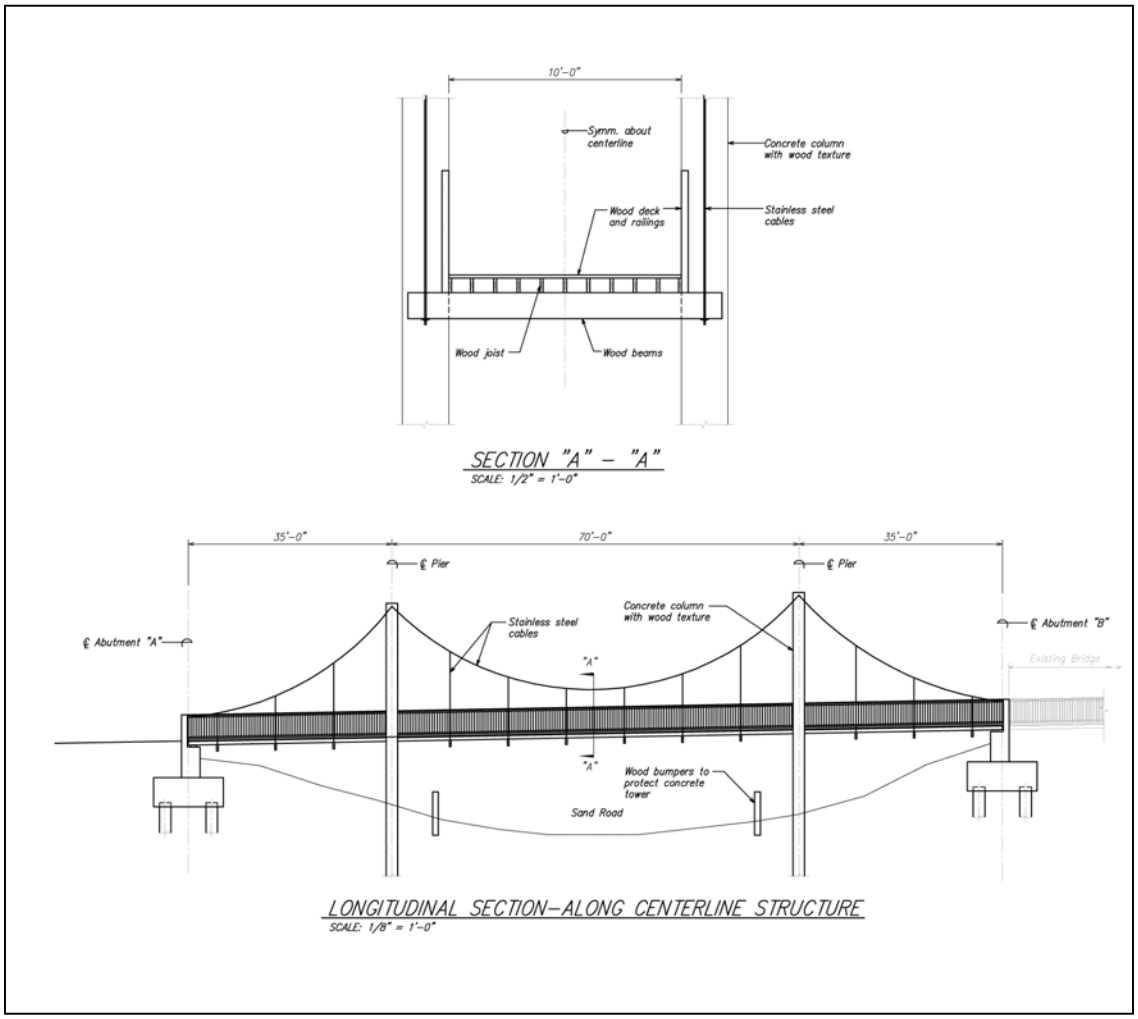


Figure 12b - Proposed Lydgate Park cable bridge option

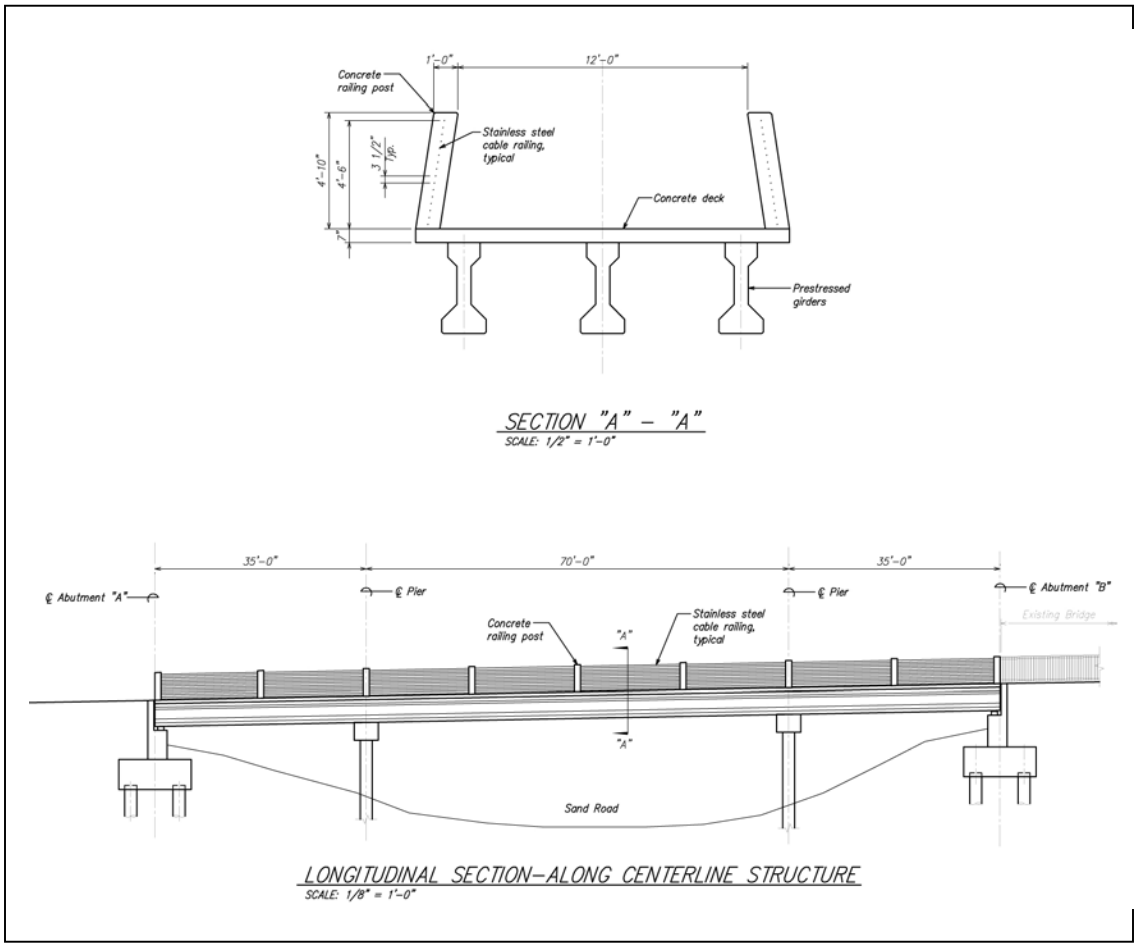


Figure 12c - Proposed Lydgate Park pre-stressed bridge option

Figure 12d - Abandoned road & proposed south landing for the Lydgate Bridge

ALTERNATIVE 2 (KAPULE/KUHIO HIGHWAY PATH)
(Refer to Alternative Alignment Maps 1 through 6)

General:
The Kapule/Kuhio Highway Path Alignment Alternative generally runs parallel to both the Kapule and Kuhio Highways for most of its length. However, since the Kapule Highway Bridge spanning over the Hanama'ulu River does not have accommodations for bicycles or pedestrians and any such accommodations would be unsafe and cost prohibitive, the path will need to depart the highway corridor and make a connection into the existing abandoned railroad grade on the north side of Hanama'ulu Bay (Refer to Sub Reaches One through Six) all of the way to Ahukini Point.

The highway path will connect into the abandoned railroad grade approximately 1,200 lineal feet north and east from the Hanamaulu Railroad Bridge. The total distance for the Kapule/Kuhio Highway Alternative is approximately 4.8 miles (3.5 from Lydgate Park to the abandoned railroad grade and approximately 1.3 miles from the connection to the abandoned railroad grade to Ahukini Point). The proposed path will be a 10 – foot width concrete path, except as described herein.

Sub Reach Thirteen – Ocean Bay Plantation Property
From the abandoned railroad grade a ramp will be required in order to gain approximately 20 feet of elevation to the upper cane haul road on the south end of the Ocean Bay Plantation property. The ramp will be approximately 400 lineal feet and will not exceed a 5 percent grade for accessibility concerns. The path turns mauka and extends along the south side of the Ocean Bay Plantation Property toward Kapule Highway for approximately 1,600 lineal feet at which time it turns to the north, extending along the makai side of the highway.

Sub Reach Fourteen – Kuhio and Kapule Highway
Because of noise and safety concerns, the path should be separated from the highway by a minimum distance of 30 feet (30'). The buffer area between the highway and path should be landscaped and a fence installed in order to improve the quality of experience and safety for path users.

The path will make at-grade crossings at three existing entrance roads off of Kuhio Highway. The first entrance drive is into the private business known as the Pineapple Stand (See Figure 14a), the second entrance road is to the Radisson Hotel and Kauai Beach Villas (See Figure 14b) and the third entrance road is into the Marine Camp and the existing comfort station sites. Because of safety concerns and the potential of heavy traffic at each of the entrance drives, signalized pedestrian crosswalks are proposed for each of these three entrance drives and any future entrance drives from the highway.

A path of approximately 200 lineal feet long will need to be created from fill dirt along the inside edge of the existing highway guardrail in the area just north of the driveway entrance for a private business (See Figure 14c).

Figure 14a – Photo of the driveway entrance to the private business.

Figure 14b – Photo along of the Radisson entrance road at Kuhio Highway

Figure 14c – Photo of area along the highway north of the private business.

Sub Reach Fifteen – South Golf Course

Once the path has crossed the entrance drive into the Marine Camp site, it will extend north on the approximate alignment of an existing golf course maintenance road (See Figure 15a) and continue mauka of the 4th green, 5th tee, 6th green, 7th fairway and the 9th fairway and makai of the drainage ditch. Just before the 4th fairway, a 12 - foot width, approximately 80 foot (80') long bike and pedestrian bridge crossing will be required to span over the drainage ditch in order for the path to continue northward along the highway. As with the Radisson Bridge, three options have been studied including a pre-stressed concrete girder bridge, pre-stressed concrete plank bridge and a pre-fabricated steel bridge (Refer to Sub-Reach Nine, Kauai Beach Villas).

A 10 foot (10') tall, black chain link safety fence and landscaping will be required along the makai edge of the path in order to protect path users from errand golf balls (See Figures 15b and 15c).

Figure 15a – Photo of maintenance road along golf course

Figure 15b – Before photo along the 7th fairway

Figure 15c - Photo simulation of the proposed path along the 7th fairway

Sub Reach Sixteen – Wailua Golf Course Parking Lot and Entrance Drive
After passing the 9th green the path intersects the only entrance driveway into the golf course from Kuhio Highway (See Figure 16a). The consulting team has been advised that this section of Kuhio Highway is one of the most dangerous roadways on the island, in part due to vehicles entering and departing the golf course. The path will need to cross over the entrance driveway in order to continue northward. Therefore, a signalized intersection with a user activated crosswalk phase is proposed for this path alternative in addition to regulatory signs that warn the motorist and path user of potential dangers. Even with these improvements, safety for motorists and path users at this intersection will still be a concern.

From the entrance driveway, the path will continue north within a narrow landscaped area between the highway and golf course parking lot (See Figure 16b).

Figure 16a – Photo of golf course entrance

Figure 16b – Photo of landscaped area between golf course parking and Kuhio Highway

Sub Reach Seventeen - Wailua Golf Course Re-Internment Site
At the north end of the parking lot is an existing re-internment site (See Figure 17a). Retaining walls will be required in order to create a bench for the path on the slope between the re-internment site and highway (See Figure 17b). Discussions with the State Archeologist, Nancy McMahon assigned to Kauai County suggested that a 30 - foot distance between the path and re-internment site is desirable.

The path continues north past the re-internment site toward the and below the 18th tee where additional retaining walls will be needed in order to create a bench for the path (See Figure 17c). Past this slope the path will pass mauka of the 10th tee and between the tee and irrigation pump station building located adjacent to the 10th tee (See Figure 17d).

Figure 17a – Photo of re-internment Site

Figure 17b – Photo slope area below the re-internment site

Figure 17c – Photo of the slope under the 18th tee just north of the re-internment site

Figure 17d – Photo of area between the 10th tee and pump house

Sub Reach Eighteen – North Golf Course

The path extends mauka on the edge of the 10th fairway (See Figure 18a) inside of the trees and along the 11th fairway and then behind the 12th green (See Figure 18b). The path will need to be protected from errant golf balls along the golf course fairways by installing a 10 - foot tall, black chain link fence along the makai edge of the path.

Figure 18a – Photo of along 10th fairway taken from the 10th tee

Figure 18b – Area behind 12th tee and along the 11th fairway.
Kuhio Highway is to the right of the photo

Sub Reach Nineteen - Lydgate Park
Once the path passes behind the 12th tee it will turn makai and extend along the north boundary of the golf course, terminating into the existing path in Lydgate Park located across from the Kaha Lani Condominium complex and just west of the Wailua Golf Course.

In addition to the Alternative Alignments One and Two, several Sub-Alignment Alternatives have been identified. The Sub-Alignment Alternatives can be combined with Alternatives One and Two to create a myriad of alignment options.

SUB-ALTERNATIVE 3 (OCEAN BAY PLANTATION – UPPER CANE HAUL ROAD)
(Refer to Alternative Alignment Maps 1 through 3)

Sub Reach Twenty
This path alternative takes advantage of the abandoned cane haul road that extends along the perimeter of the abandoned cane field on the upper level of the bluff (See Figure 20a). From the south, the path would connect into the abandoned railroad corridor on the north side of Hanama'ulu Bay at one of two locations including the same location as for the highway option discussed in Sub-Reach Thirteen (Refer to Connection Point "A" on Map 2) and at the south-west corner of the bay (Refer to Connection Point "B" on Map 1). The grade along the upper cane haul road is very flat making construction of the path easy and inexpensive. However, existing vegetation and changes in elevation screen views mauka and makai from the cane haul road and block trade winds, making the corridor climate hot as compared to the Coastal Alignment Alternative.

The north connection the Coastal Path Alternative occurs just south of the Radisson Property and the existing comfort station that was discussed in Sub Reach Seven – Ocean Bay Plantation (Refer to Connection Point "C" on Map 3). From Connection Point "C", the path extends up the slope on the alignment of an abandoned cane haul road that extended from the beach to the upper cane fields (See Figure 20b).

Figure 20a – Photo of upper cane haul road on the south side of Hanama'ulu Bay

Figure 20b – Photo of abandoned access road between the upper cane fields and beach

SUB-ALTERNATIVE 4 (HILTON LANE AND MARINE CAMP CONNECTIONS)
(Refer to Alternative Alignment Map 3)

Sub Reach Twenty-One
Several important connections to existing amenities and an alternative to the path bridge and location makai of the Radisson Hotel and Kauai Beach Villa Condos can be accomplished with Sub-Alternative 4. From the Highway Path Alignment, connections to the Marine Camp site and existing comfort station is completed by extending a path from the Highway Path Alternative at Connection Point "H" (on Map 3) along the un-named cane haul road (See Figure 21a) and Hilton Lane, (See Figure 21b) noting that the roadway reach mauka of the MotoCross Park has been closed to all traffic. The proposed path along Hilton Drive would be located on the makai side of the road (See Figure 21e) and will require a signalized crosswalk at Kauai Beach Road. A connection to the Marine Camp site and beach park would be accomplished with a spur path located along the un-named cane haul road at Connection Point "G", on Map 3.

Figure 21a – Photo of un-named cane haul road extending to the Marine Camp site

Figure 21b – Photo of Hilton Lane road

SUB-ALTERNATIVE 5 (RADISSON HOTEL BYPASS)
(Refer to Alternative Alignment Map 3)

Sub Reach Twenty-Two
As an alternative to locating the path makai of the Radisson Hotel and Kauai Beach Villas Condominium complex, including a bridge over the drainage ditch (Refer to Sub Reach Three) the path could turn mauka at Connection Point "E", departing the Coastal Alignment and extend along the north edge of the existing drainage ditch (See Figure 22a). At the old cane haul road (Connection Point "F") the path would turn south and over an abandoned cane haul railroad bridge (See Figures 22b and 22c). This Bridge is a cast-in-place concrete box culvert that is approximately 40 feet in length and 15 feet wide. Based on visual observation, the culvert bridge seems to be in excellent condition. If the culvert bridge is utilized for the final path alignment, safety railing will need to be installed along both edges of the culvert bridge. The path would continue south along Hilton Lane in the same manner as described above, until it returns to the Coastal Path Alignment at Connection Point "D".

Figure 22a – Photo of social trail along north edge of the ditch

Figure 22b – Photo of the abandoned box culvert railroad bridge

Figure 22c – Photo on top of the abandoned box culvert railroad bridge

SUB-ALTERNATIVE 6 (WAILUA GOLF COURSE TUNNEL)
(Refer to Alternative Alignment Map 4)

Sub Reach Twenty-Three
As an alternative to the Coastal Alignment along the 1st and 2nd fairways of the Wailua Golf Course, an additional alternative that combines a portion of both the Highway and Coastal Alternatives was explored. This sub-alternative involves dissecting the golf course along the south edge of the driving range and parking lot, thereby avoiding the entrance driveway into the golf course parking lot. In order to minimize disturbance to the golf course from this alignment, a tunnel is proposed to extend underneath the 1st tee.

From the Highway Alignment at Connection Point "I" the path turns makai between the parking lot and 9th green (See figure 23a). This area of the golf course has persons moving between the clubhouse and pro shop; parking lot, starters hut, 1st tee and 9th green and are the busiest and most congested place on the golf course. In addition, the Wailua Golf Course is rated as one of the top ten public golf courses in the nation. If the value of play were to be reduced, this prestigious status could be lost. In order to accommodate both path users and golf course patrons, the construction of a tunnel to extend underneath the 1st tee and cart paths is recommended (See Figure 23b). The tunnel would be constructed of prefabricated concrete sections and is similar to a cart path tunnel located on another golf course on the island. The 12-foot width tunnel will extend approximately 160 - lineal feet. In order to improve the view from the 9th green, landscaping would be provided along the edge of the tunnel approach path and tunnel entrance (See Figure 23c). From the tunnel, heading toward the ocean, the path raises in elevation and then extends through an existing stand of ironwood along the south edge of the driving range until in intersects with the coastal path at Connection Point "J" (See Figure 23e).

Concerns were raised during the evaluation of the tunnel alternative because the area is known to have a concentration of burials and is in the same general alignment as a fiber optic cable. An on-site meeting with a representative from the burial council reveled that if the tunnel were to be approved by

the council, the designers of the tunnel must demonstrate a minimum of disturbance to burials. In addition, the fiber optic cable would need to be avoided all together.

Figure 23a – Before photo between the 9th green and parking lot

Figure 23b - Photo simulation of tunnel

Figure 23c – Before photo looking over the 9th green

Figure 23d – Photo simulation looking over the 9th green after landscape improvements

Figure 23e – Photo looking toward ocean, driving range is on the left

Alternative Alignment Map 1 (11x17)

Alternative Alignment Map 2 (11x17)

Alternative Alignment Map 3 (11x17)

Alternative Alignment Map 4 (11x17)

Alternative Alignment Map 5 (11x17)

Alternative Alignment Map 6 (11x17)

3.2 Economic Characteristics

3.2.1 Some of the work required for determining the construction of this total project are listed below:

ESTIMATE OF PROBABLE CONSTRUCTION AND LAND ACQUISITION COSTS

The Estimates of Probable Construction and Land Acquisition Costs should be utilized for planning purposes only. Factors such as outdated and inaccurate topographic mapping and preliminary data typical of planning projects were used to calculate this estimate. As more accurate topographic and existing conditions mapping and data is made available, more accurate cost estimates can be determined.

The following Estimate of Probable Construction and Land Acquisition Costs are separated into the following Alternative Alignments:

- Alternative Alignment 1 (Coastal Path)
- Alternative Alignment 2 (Kapule/Kuhio Highway Path)
- Sub-Alternative 3 (Ocean Bay Plantation – Upper Cane Haul Road)
- Sub-Alternative 4 (Hilton Lane and Marine Camp Connections)
- Sub-Alternative 5 (Radisson Hotel Bypass)
- Sub-Alternative 6 (Wailua Golf Course Tunnel)

Alternative Alignment 1 (Coastal Path)
Refer to Alternative Alignment Maps 1 through 5

1. * Lydgate Park Cable Bridge (Lump Sum)	$500,000
2. ** Radisson Bridge; Pre-Stressed Concrete Plank (Lump Sum)	$500,000
3. Hanamaulu Bridge Retrofit (Lump Sum)	$300,000
4. ***Hanamaulu Bridge Segmental Retaining Wall/Ramp (Lump Sum)	$1,000,000
5. Concrete Path; 10ft width X 6in thick (17,600 lf @ $120.00/lf)	$2,112,000
6. Removable Segmental Path at the Radisson; 12ft width/Trex Deck (600 lf @ $150.00/lf)	$90,000
7. ****Removable Boardwalk Path; #2 fairway (1,500 lf @ $850.00/lf)	$1,275,000
8. ****Removable Boardwalk Path; #1 fairway (1,200 lf @ $850.00/lf)	$1,020,000
9. Removable Boardwalk Path; #17 fairway (500 lf @ $850.00/lf)	$425,000
10. Dune Restoration for the #2 fairway (1,500 lf @ $320.00/lf)	$480,000
11. Dune Restoration for the #1 fairway (1,200 lf @ $470.00/lf)	$564,000
12. Path Ramp with Retaining Walls; 10ft width (800 lf @ $2,700.00/lf)	$2,160,000
13 Comfort Station/Pavilion at Hanamaulu Beach Park (Lump Sum)	$300,000
14. Comfort Station at the Marine Camp Site with Gravel Parking (Lump Sum)	$250,000
15. Comfort Station at Ahukini Point with Parking Improvements (Lump Sum)	$275,000
Sub Total for Construction	**$11,251,000**
16. *****Land Acquisition (assumes an average corridor width of 25 feet)	
A. Grove Farms; 90,000 SF @ $23.30/SF	$2,097,000
B. Lihue Plantation Co., LTD; 175,000 SF @ $23.30/SF	$4,078,000
C. Haseko Corporation; 28,750 SF @ $53.45/SF	$1,537,000
D. Graham Beach Partners (Radisson and KBV) 23,750 SF @ $53.45/SF	$1,270,000
Sub Total for Land Acquisition	**$8,982,000**
Construction Contingency (20% of $11,251,000)	$2,250,200
TOTAL; ALTERNATIVE 1	**$22,483,200**

* Bridge Option Two – Pre-Stressed Concrete Girder; $700,000
** Bridge Option Two – Pre-Stressed Concrete Girder; $450,000
*** Wall/Ramp Option Two – Concrete Deck on Piles; $1,800,000
**** Removable Segmental Path Option set on dune sand:
# 2 fairway (1,500 lf @ $150.00/lf) $225,000

#1 fairway (1,200 lf @ $150.00/lf) $180,000

***** Land Acquisition costs per square foot prices are taken from a Real Property Assessment for the Bike Path that was completed by the County in 2004. Conservation lands were valued at an average of $23.30 per square foot; Resort/71 (at the 40 foot setback) lands were valued at $53.45 per square foot and APT/22 (highway frontage) lands were valued at $36.86 per square foot.

Alternative Alignment 2 (Kapule/Kuhio Highway Path)

Refer to Alternative Alignment Maps 1 through 6

1. * Golf Course Bridge; 80 lf Pre-Stressed Concrete Plank (Lump Sum)	$450,000
2. Signalized Cross Walk at Golf Course Entrance Drive (Lump Sum)	$125,000
3. Signalized Cross Walk at Private Business Entrance Drive (Lump Sum)	$175,000
3. Hanamaulu Bridge Retrofit (Lump Sum)	$300,000
4. **Hanamaulu Bridge Segmental Retaining Wall/Ramp (Lump Sum)	$1,000,000
5. Concrete Path; 10ft width X 6in thick (18,500 lf @ $120.00/lf)	$2,220,000
6. ***Golf Course Safety Fence; 10ft Tall, Black, One Inch Fabric (8,000 lf @ $80.00/lf)	$640,000
7. ****Highway Safety Fence; 8ft Tall, Black, Two Inch Fabric) (8,250 lf @ $70.00/lf)	$577,500
8. Path Ramp with Retaining Walls; 10ft width (1,200 lf @ $2,700.00/lf)	$3,240,000
9. Comfort Station/Pavilion at Hanamaulu Beach Park (Lump Sum)	$300,000
10. Comfort Station at Ahukini Point with Parking Improvements (Lump Sum)	$275,000
Sub Total for Construction	**$9,302,500**
11. Land Acquisition (assumes an average corridor width of 25 feet)	
A. Grove Farms; 90,000 SF @ $23.30/SF	$2,097,000
B. Lihue Plantation Co., LTD; 234,000 SF @ $36.86/SF	$8,625,000
Sub Total for Land Acquisition	**$10,722,000**
Construction Contingency (20% of $9,302,500)	**$1,860,500**
TOTAL; ALTERNATIVE 2	**$21,885,000**

* Bridge Option Two – Pre-Stressed Concrete Girder; $400,000
** Ramp Option Two – Concrete Deck on Piles; $1,800,000
*** Standard Galvanized Coating/No Black; $536,000
**** Standard Galvanized Coating/No Black; $495,000

Sub-Alternative Alignment 3 (Ocean Bay Plantation Property – Upper Cane Haul Road)

Refer to Alternative Alignment Maps 1 through 3

1. Concrete Path; 10ft width X 6in thick (6,900 lf @ $120.00/lf)	$828,000
2. Path Ramp with Retaining Walls; 10ft width (400 lf @ $2,700.00/lf)	$1,080,000
Sub Total for Construction	**$1,908,000**
3. Land Acquisition (assumes an average corridor width of 25 feet)	
A. Lihue Plantation Co., LTD; 135,000 SF @ $53.54/SF	$7,228,000
Sub Total for Land Acquisition	**$7,228,000**
Construction Contingency (20% of $1,908,000)	**$381,600**
TOTAL; SUB-ALTERNATIVE 3	**$9,517,600**

Sub-Alternative Alignment 4 (Hilton Lane and Marine Camp Connections)
Refer to Alternative Alignment Map 3

1. Concrete Path Between Connection Points "H" and "F"	
10ft width X 6in thick (2,100 lf @ $120.00/lf)	$252,000
1. Concrete Path Between Connection Points "F" and "D"	
10ft width X 6in thick (2,900 lf @ $120.00/lf)	$348,000
2. Concrete Path Between Connection Point "H" and Marine Camp Site	
10ft width X 6in thick (5,000 lf @ $120.00/lf)	$600,000
3. *Golf Course Safety Fence; 10ft Tall, Black, One Inch Fabric	
(600 lf @ $80.00/lf)	$48,000
4. Signalized Cross Walk at Radisson Hotel Entrance Drive (Lump Sum)	$175,000
5. Safety Railing for Existing Bridge (80 lf @ $100.00/lf)	$8,000
5. Comfort Station at the Marine Camp Site with Gravel Parking (Lump Sum)	$250,000
Sub Total Construction	**$1,681,000**
Construction Contingency (20% of $1,699,000)	**$336,200**
TOTAL; SUB-ALTERNATIVE 4	**$2,017,200**

* Standard Galvanized Coating/No Black; $40,200

Sub-Alternative Alignment 5 (Radisson Hotel Bypass)
Refer to Alternative Alignment Map 3

1. Concrete Path Between Connection Points "E" and "F"	
10ft width X 6in thick (1,400 lf @ $120.00/lf)	$168,000
2. Concrete Path Between Connection Points "F" and "D"	
10ft width X 6in thick (2,900 lf @ $120.00/lf)	$348,000
4. Signalized Cross Walk at Radisson Hotel Entrance Drive (Lump Sum)	$175,000
5. Safety Railing for Existing Bridge (80 lf @ $100.00/lf)	$8,000
Sub Total Construction	**$699,000**
Construction Contingency (20% of $699,000)	**$139,800**
TOTAL; SUB-ALTERNATIVE 5	**$838,800**

Sub-Alternative Alignment 6 (Wailua Golf Course Tunnel)
Refer to Alternative Alignment Map 4

1. Concrete Path Between Connection Points "I" and "J"	
10ft width X 6in thick (800 lf @ $120.00/lf)	$96,000
2. Pre-Cast Concrete Tunnel; 12 - foot width	
(160 lf @ $2,200.00/lf)	$352,000
3. *Golf Course Safety Fence; 10ft Tall, Black, One Inch Fabric	
(1400 lf @ $80.00/lf)	$112,000
4. Landscaping (Lump Sum)	$25,000
Sub Total Construction	**$585,000**
Contingency (20% of $585,000)	**$117,000**
TOTAL; SUB-ALTERNATIVE 6	**$702,000**

* Standard Galvanized Coating/No Black; $93,800

3.2.2 Benefit to the Community

One of the benefits of a path project is a safe mode of transportation and recreation to the community that is free. The economic benefit is incalculable for families to be able to access parks, fishing areas, recreation and historic sites on a continuous safe path system, for picnics and gathering with no expense is one of the most important economic benefits to the residents of Kauai.

3.2.3 Attracting Tourists

A path project of this caliber and layout has the potential to attract visitors and tourists to the island. The tourist dollars are of vital significance to the tax base, and to the quality of life for the full time residents.

3.3 Social Characteristics

The path begins at Ahukini Point, connects to Hanama'ulu Beach Park, and terminates at the playbridge in Lydgate Park. This corridor is located on the eastern shore of Kauai along the coastline near the mouth of the Wailua River. The property subject to this project is situated near high use housing populations of Wailua, Kapaa, and Hanama'ulu and is the halfway point of the Island for residents from the north shore and the west side.

Heavy use by the resident's and visitors to Kauai, results in Ahukini and Lydgate Park, and the Wailua Golf Course operating at near capacity. On weekends, the parking lots, picnic tables and the playground are full. In the past year, Lydgate Park had a total visitation of approximately 298,000 people. Records show that an average of 2,000 people a day come to the park on any given weekend throughout the year. Park usage at the present time is approximately 300,000 visitors a year. On weekdays, 80% of the users are visitors, and on weekends and holidays, 90% of the park users are local residents. The bike trail plan is the product of over three years of community input and dialog leading to a consensus of opinion regarding the elements of the park, of which the bike trail is one.

From the efforts of the Friends of Lydgate Park, a 12,000 s.f. playground was built in 1993, and reclaimed acres of parkland, planted and maintained hundreds of trees, built picnic tables and park benches, installed barbecues, showers, and drinking fountains. As the match for the Lydgate Park Path project, the community built a playbridge at the far south end of Lydgate, which serves as the terminus for this project.

This committee holds periodic community workdays and a large annual event. In addition, there are many individuals who volunteer on an on-going basis.

Improvements along the corridor will constitute a very significant economic development for Kauai and meet the important social need of quality recreational facilities for the people and visitors to Kauai. Kauai benefits economically when the infrastructure for visitors improves. The construction of the bike trail and comfort station will improve the reputation of Kauai and it is anticipated that this will bring in more visitors and will, in turn, improve the economy.

3.4 Environmental Characteristics

Specific studies for plants and animals were not conducted for this project as the only two areas of native vegetation were both studied for Environmental Impact Statements for previous projects. Those two areas are: 1) Ocean Bay Plantation for the property known as the "Moody" property, and for 2) Lihue Land Company for the Lihue-Hanama'ulu Master plan property west of Hanama'ulu Beach Park and over to the airport property by Ahukini Point landing. Both of these studies are referenced in the references section of this document.

The footprint of the path project is approximately five (5) miles. The land of this corridor is comprised of mostly sandy soil along the coastline with red dirt and lava boulders on the mauka side. The soils under and adjacent to Kuhio and Kapule Highways consist of fill dirt that was imported onto the site for construction of the highway.

An earlier archaeological reconnaissance of the property determined that there are no known documented visible archaeological sites on the corridor however, there is talk about a sacred cultural site located south of the Radisson.

A botanical reconnaissance of the corridor determined there are many native plants, trees, ground covers along the section from Ahukini, to include koa (Acacia koa), naupauka (Scaevola taccada), and Ilima (Sida fallax) and Milo (Thespesia populnea) . There are coconut palms at the ravine between Ahukini Point and the south end of the Hanama'ulu Railroad Bridge.

Also are non-natives that have been introduced even on the dunes. Above the fishing piers at Ahukin Point is a stand of junipers (Juniperus chinensis 'Pfitzeriana'). Along the coast and in the Railroad Bridge area are stands of Kou haole (Cordia sebestena). There is a large well-established Ironwood (Casuarina equisetifolia) grove existing on the north end of the property at the Lydgate Playbridge.

According to Dr. David Lorence, Director of Science, and the B. Evans Chair of Botany at the National Tropical Botanical Garden, there are no known terrestrial endangered plants on the island of Kauai. The plant species found along the corridor include, but are not limited to: guava, lantana, Chinaberry Tree (Melia azedarch), kolomana, hau, silk oak, Ironwood Trees, California grass, Guinea grass, and molasses grass (Melinis minutiflora), yellow granddilla vines (Passaflora laurifolia).

Where the sugarcane was taken out of production is primarily guinea grass and koa-haole. This as mentioned above, was documented in the Ocean Bay Plantation EIS in a study conducted by Char & Associates in September 2001 that no endangered species of plants were identified on their project site. Further, in the EIS prepared for the Lihue-Hanama'ulu Master Plan, conducted by Phillip Bruner, in August, 1994 found that there were no native land or water birds, but did find four Hawaiian Duck and Common Moorhens found off-site in the Hanama'ulu wetlands. The study recorded no native seabirds or migratory native birds, however, it was noted that the endangered Newell's Shearwater may fly over the property as they move between nesting and foraging.

An avian and terrestrial fauna study was conducted by Rana Production, Ltd. also in September, 2001 for the Ocean Bay Plantation EIS. The only endangered avian species found was the Hawaiian hoary bat (Lasiurus cinereus semotus). Of the avian endangered species documented are: Hawaiian coot (Fulica alai), the endangered subspecies of the ua'u (Pterodroma phaeophgia sandwichensis), the 'a'o (Puffinus auricularis newelis), and the 'ua'u kani (Puffinus pacificus).

3.5 Time Frame

The Phase I Environmental Permitting will be completed by the end of the first quarter of 2006. The design and engineering for the project phases will commence, and afterwards, construction.

3.6 Funding & Source

County and Federal

4.0 AFFECTED ENVIRONMENT

4.1 Property Description

The land of the corridor varies in topography, soils, and land uses. The area of Ahukini Point is highly urban with engineered fishing piers and jetty. The Hanama'ulu Beach Park is a cove where the waves are quieted by the function of the jetty.

The area above the rise at the Ahukini Fishing Piers rises sharply to a bluff that separates this property from the Airport Authority lands.

The land drops sharply into a ravine that approaches the abutments to the Hanama'ulu Railroad Bridge. The land gently slopes down to the ocean just south of the Radisson Hotel. The land is flat in the coastal area all the way across the Marine Camp, the Wailua Golf Course, and to the approach to the Kamalani Playbridge. The land of Kapule/Kuhio Highway is relatively flat, and highly engineered.

4.2 Geological Characteristics

4.2.1 Geology and Soils

There is a full soils report located in the Appendix B of this document

GEOLOGIC CONDITIONS

The Island of Kauai is composed of a single basalt shield volcano built by the extrusion of lava of the Waimea Canyon Volcanic Series during the late Pliocene Epoch (more than 2¼ million years before present). Following the cessation of this main shield building phase, there was renewed volcanic activity with the extrusion of basaltic lava of the post-erosional Koloa Volcanic Series and the concurrent deposition of the alluvial sediments of the Palikea Formation.

The majority of the Island of Kauai is covered by lava of the Waimea Canyon Volcanic Series. These lavas consist of four distinct formations: Napali, Olokele, Haupu, and Makaweli. These formations are comprised of thin-bedded a'a and pahoehoe flows to massive basalt flows that ponded in calderas and graben.

Rocks of the Koloa Volcanic Series cover most of the eastern half of the Island of Kauai. These rocks are generally characterized as thick flows of dense basalt extruded from groups of vents aligned in north-south trends in various locales. Associated with the vents are pyroclastic materials, which usually form low cinder cones at the vent.

During the Pleistocene Epoch (Ice Age), there were many sea level changes as a result of widespread glaciation in the continental areas of the world. As the great continental glaciers accumulated, the level of the ocean fell since there was less water available to fill the oceanic basins. Conversely, as the glaciers receded, or melted, global sea levels rose because more water was available. The land mass of Kauai remained essentially stable during these changes, and the fluctuations were eustatic in nature. These glacio-eustatic fluctuations resulted in stands of the sea that were both higher and lower relative to the present sea level of Kauai.

The basaltic rock built by the extrusion of lavas of the Koloa Volcanic Series are generally characterized by flows of jointed dense vesicular basalt inter-bedded with thin clinker layers. The weathering process has formed a mantle of residual soils which grade to saprolite with depth. In general, saprolite is composed of mainly silty material and is typical of the tropical weathering of volcanic rocks. The saprolite grades to basaltic rock formation with depth.

Erosion of the upper Koloa and Waimea Canyon Volcanic Series has deposited alluvial sediments along streams, drainageways, and low-lying areas. These sediments are generally unconsolidated to moderately consolidated, non-calcareous soil deposits. Agricultural and commercial developments within the last century have brought the project site to its present conditions.

The geology for the proposed path alignments were developed based on geologic references. The site geology for the two path alternatives is described in the following subsections.

Alternative No. 1

The proposed path alignment for Alternative No. 1 is mainly underlain by beach and dune sand deposits. The beach and dune sand deposits are characterized as unconsolidated calcareous deposits. These deposits are poorly graded and uniform in particle size. Recent alluvial deposits may be encountered further inland from the shoreline near the Kawailoa area and within the Hanama'ulu Stream area. The recent alluvial deposits are characterized as unconsolidated, non-calcareous soils. These recent alluvial deposits tend to be soft in consistency and compressible. In addition, basalt rock formation of the Koloa Volcanic Series may be encountered along the southern portion of the path alignment at the sides of Hanama'ulu Bay.

Alternative No. 2

This alternative alignment is mainly underlain by alluvial deposits consisting of recent and older alluvium. Characteristics of the recent alluvium are described above. The older alluvial deposits are more consolidated and stiffer in consistency compared to the recent alluvial deposits. The southern portion of path alignment is underlain by basalt rock formation of the Koloa Volcanic Series. We anticipate the presence of residual and saprolitic soils near the ground surface. These soils are developed from the in-situ weathering of the basalt formation. In addition, the northern portion of the path alignment near Lydgate Park is underlain by a dune sand deposit.

Specific soils information follows:

Beaches

Beaches (BS) occur as sandy, gravelly, or cobbly areas on all the islands in the survey area. They are washed and rewashed by ocean waves. The beaches consist mainly of light-colored sands derived from coral and seashells. A few of the beaches, however, are dark colored because their sands are from basalt and andesite.

Beaches have no value for farming. Where accessible and free of cobblestones and stones, they are highly suitable for recreational uses and resort development. (Capability classification VIIIw, non-irrigated).

Dune land

Dune land (DL) consists of hills and ridges of sand-size particles drifted and piled by wind. The hills and ridges are actively shifting or are so recently fixed or stabilized that no soil horizons have developed. The sand is dominantly from coral and seashells.

This miscellaneous land type occurs in coastal areas on the islands of Maui and Kauai.

Elevations range from nearly sea level to 150 feet. The annual rainfall amounts to 15 to 90 inches.

This land type is used for wildlife habitat and recreational areas and as a source of liming material. Vegetation is sparse, but ironwood trees, koa haole, tropical almond, kiawe, and mixed grasses have gained a foothold in places. (Capability classification VUle, non-irrigated).

Fill Land

This land type consists of areas filled with material from dredging, excavation from adjacent uplands, garbage, and bagasse and slurry from sugar mills. The areas are on the islands of Kauai, Maui, and Oahu.

Fill land (Fd).

This land type consists mostly of areas filled with bagasse and slurry from sugar mills. A few areas are filled with material from dredging and from soil excavations. Generally, these materials are dumped and spread over marshes, low-lying areas along the coastal flats, coral sand, coral limestone, or areas shallow to bedrock.

Hanalei Series

This series consists of somewhat poorly drained to poorly drained soils on bottom lands on the islands of Kauai and Oahu. These soils developed in alluvium derived from basic igneous rock. They are level to gently sloping. Elevations range from nearly sea level to 300 feet. The annual rainfall amounts to 20 to 120 inches. The mean annual soil temperature is 74° F. Hanalei soils are geographically associated with Haleiwa, Hihimanu, Mokuleia, and Pearl Harbor soils.

These soils are used for taro, pasture, sugarcane, and vegetables. The natural vegetation consists of paragrass, sensitiveplant, honohono, Java plum, and guava.

Hanalei silty clay, 0 to 2 percent slopes (HnA).

This soil is on stream bottoms and flood plains. Included in the areas mapped on Kauai along the Waimea River and in Waipaoiki Valley are small areas where the surface laver is 8 to 10 inches of reddish-brown silty clay. Included in the areas mapped on Oahu were small areas of very deep, well-drained alluvial soils and small areas of very poorly drained to poorly drained clay soils that are strongly mottled and are underlain by peat, muck, or massive marine clay.

In a representative profile the surface layer, about 10 inches thick, is dark-gray and very dark gray silty clay that has dark-brown and reddish mottles. The subsurface layer is very dark gray and dark-gray silty clay about 3 inches thick. The subsoil, about 13 inches thick, is mottled, dark-gray and dark grayish-brown silty clay loam that has angular blocky structure. The substratum is stratified alluvium. The soil is strongly acid to very strongly acid in the surface layer and neutral in the subsoil.

Permeability is moderate. Runoff is very slow, and the erosion hazard is no more than slight. The available moisture capacity is about 2.1 inches per foot of soil. Roots penetrate to the water table. Flooding is a hazard.

Representative profile: Island of Kauai, lat. 22°12'37.8" N. and long. 159°28'47" W.

Ap-0 to 6 inches, dark-gray (10YR 4/1) silty clay; common distinct mottles of dark brown (7.5YR 4/4), red (2.5YR 5/6), and dark reddish brown (5YR 3/4) ; weak, coarse and medium, granular structure; very hard, friable, sticky and plastic; abundant fine and medium roots; many fine and medium pores; very strongly acid; abrupt, wavy boundary. 4 to 6 inches thick.

A1g-6 to 10 inches, very dark gray (10YR 3/1) silty clay; many distinct mottles of dark reddish brown (5YR 3/4), yellowish red (5YR 4/6), dark brown (7.5YR 4/4), and dark grayish brown (10YR 4/2); weak, coarse, prismatic structure; very hard, firm, sticky and plastic; abundant fine and medium roots; common fine and medium pores; strongly acid; gradual, smooth boundary. 3 to 5 inches thick.

A3g-10 to 13 inches, mixed, very dark gray (10YR 3/1) and dark gray (10YR 4/1) silty clay; many distinct mottles of yellowish red (5YR 4/6) and dark reddish brown (2.5YR 3/4); weak, coarse, prismatic structure; very hard, firm, sticky and plastic; common medium and fine roots; many fine and medium pores; slightly acid; gradual, smooth boundary. 2 to 4 inches thick.

B21g-13 to 18 inches, mixed, dark-gray (10YR 4/1) and dark grayish-brown (10YR 4/2) silty clay loam; many distinct mottles of strong brown and dark red (2.5YR 3/6); massive, but a few pockets have weak, medium, angular blocky structure; hard, firm, sticky and plastic; few medium and fine roots; many fine and medium pores; neutral; gradual, smooth boundary. 4 to 7 inches thick.

B22g-18 to 26 inches, dark grayish-brown (10YR 4/2) silty clay loam; many distinct mottles of dark red (2.5YR 3/6) and strong brown (7.5YR 5/6); weak, coarse, prismatic structure breaking to weak, fine and medium, angular blocky; slightly hard, firm, sticky and plastic; few medium and fine roots; many fine and medium pores; neutral; gradual, smooth boundary. 7 to 9 inches thick.

C-26 to 36 inches, dark grayish-brown (10YR 4/2) silty clay loam; common distinct mottles of strong brown (7.5YR 5/6), dark red (2.5YR 3/6), and red (2.5YR 4/6); massive; slightly hard, friable, sticky and plastic; few medium roots; many, fine and medium, tubular pores; slightly acid; water stands above this layer.

The A horizon ranges from 10YR to 2.5Y in hue, from 3 to 4 in value, and from 1 to 2 in chroma. Mottles range from a few faint ones to many distinct ones. The B horizon ranges from 10YR to 2.5Y in hue, from 2 to 4 in value, and from 1 to 2 in chroma. Mottles in the B and C horizons range from few to many. The depth to the seasonal high water table ranges from 2 to 5 feet. The C horizon is stratified. It ranges from silty clay to sand in texture.

This soil is used for taro, pasture, and sugarcane. (Capability classification Iiw).

Kalapa Series

This series consists of well-drained soils at the base of slopes on the island of Kauai. These soils developed in material weathered from basic igneous rock and in colluvium. They are moderately sloping to very steep. Elevations range from 200 to 1,200 feet. The annual rainfall amounts to 60 to 100 inches.

The mean annual soil temperature ranges from *690* to *740* F. Kalapa soils are geographically associated with Hihimanu and Hanama'ulu soils. These soils are used mainly for water supply, woodland, wildlife habitat, and pasture. A small acreage is used for irrigated sugarcane. The natural vegetation consists of guava, lantana, joee, sensitiveplant, pilipiliula, ohia, Japanese tea, and ferns.

Kalapa silty clay, 40 to 70 percent slopes (KdF).
This soil is on uplands. In a representative profile the surface layer is dark reddish-brown silty clay about 10 inches thick. The subsoil, about 40 inches thick, ranges from dark-red to dark reddish-brown silty clay and clay that has subangular blocky structure. The substratum is dark-brown, duskyred, and dark-red silty clay and soft, highly weathered rock. The soil is very strongly acid throughout the profile.

Permeability is moderately rapid. Runoff is very rapid, and the erosion hazard is severe to very severe. In places roots penetrate to a depth of 5 feet or more.

Representative profile: Island of Kauai, lat. *21055'14"* N. and long. 159026'00.3"W.

This soil is used for water supply, pasture, and woodland. (Capability classification Vile, non-irrigated; pasture group 8; woodland group 14) .
This soil is used for irrigated sugarcane and pasture. (Capability classification I if irrigated, IVc if non-irrigated; sugarcane group 1; pasture group 2; woodland group 4).

Koloa Series

This series consists of well-drained soils on slopes of old volcanic vents and upland ridges on the island of Kauai. These soils are underlain by hard rock at a depth of 20 to 40 inches. They developed in material weathered from basic igneous rock. They are gently sloping to moderately steep. Elevations range from nearly sea level to 300 feet. The annual rainfall amounts to 40 to 60 inches. The mean annual soil temperature is 74° F. Koloa soils are geographically associated with Mamala and Waikomo soils. These soils are used for irrigated sugarcane. The natural vegetation is mainly koa haole.

Koloa stony silty clay, 3 to 8 percent slopes (KvB).
This soil occurs on upland slopes. Included in mapping were small areas that are more than 40 inches deep. In a representative profile the surface layer is dark reddish-brown stony silty clay about 7 inches thick. The subsoil, about 13 inches thick, is dark-red and dark reddish-brown stony silty clay that has subangular blocky structure. The substratum is hard rock. The soil is slightly acid to neutral throughout the profile.

Permeability is moderately slow. Runoff is slow, and the erosion hazard is slight. The available water capacity is about 1.8 inches per foot of soil. Roots penetrate to the bedrock. Representative profile: Island of Kauai, lat. 21°53'5.6" N. and long. 159°26'15" W.

This soil is used for sugarcane. (Capability classification lie if irrigated, IVe if nonirrigated; sugarcane group 1; pasture group 5; woodland group 5)

Koloa stony silty clay, 8 to 15 percent slopes (KvC).
On this soil, runoff is medium and the erosion hazard is moderate.

This soil is used for irrigated sugarcane. (Capability classification lIIe if irrigated, IVe if non irrigated; sugarcane group1; pasture group 5; woodland group 5)

Koloa stony silty clay, 15 to 25 percent slopes (KvD).
On this soil, runoff is medium and the erosion hazard is moderate to severe. Included in mapping were small areas where the slope is more than 40 percent. This soil is used for irrigated sugarcane, pasture, woodland, and wildlife habitat. (Capability classification IVe, irrigated or nonirrigated; sugarcane group 1; pasture group 5; woodland group 5).

Lihue Series

This series consists of well-drained soils on uplands on the island of Kauai. These soils developed in material weathered from basic igneous rock. They are gently sloping to steep. Elevations range from nearly sea level to 800 feet. The annual rainfall amounts to 40 to 60 inches. The mean annual soil temperature is 730 F. Lihue soils are geographically associated with loleau and Puhi soils.

These soils ~re used for irrigated sugarcane, pineapple, pasture, truck crops, orchards, wildlife habitat, woodland, and homesites. The natural vegetation consists of lantana, guava, koa haole, joee, kikuyugrass, molassesgrass, guineagrass, bermudagrass, and Java plum.

Lihue silty clay, 0 to 8 percent slopes (LhB).
This soil is on the tops of broad interfluves in the uplands. Included in mapping were small areas of a soil that has a very dark grayish-brown surface layer and a mottled subsoil.

In a representative profile the surface layer is dusky red silty clay about 12 inches thick. The subsoil, more than 48 inches thick, is dark-red and dark reddish-brown, compact silty clay that has sub-angular blocky structure. The substratum is soft, weathered rock. The surface layer is strongly acid. The subsoil is slightly acid to neutral.

Permeability is moderately rapid. Runoff is slow, and the erosion hazard is no more than slight. The available water capacity is about 1.5 inches per foot of soil. In places roots penetrate to a depth of 5 feet or more.

Representative profile: Island of Kauai, lat. 21059'06.7" N. and long. 159021'50"W.

This soil is used for sugarcane, pineapple, pasture, truck crops, orchards, wildlife habitat, and homesites. (Capability classification lie, irrigated or nonirrigated; sugarcane group 1; pineapple group 5; pasture group 5; woodland group 5)

Lihue silty clay, 8 to 15 percent slopes (LhC).
On this soil, runoff is slow and the erosion hazard is slight. This soil is used for sugarcane, pineapple, pasture, truck crops, orchards, wildlife habitat, and homesites. (Capability classification lIIe, irrigated or nonirrigated; sugarcane group 1; pineapple group 6; pasture group 5; woodland group 5)

Lihue silty clay, 25 to 40 percent slopes, eroded (LhE2).
This soil is similar to Lihue silty clay, 0 to 8 percent slopes, except that the surface layer is thin. Runoff is rapid, and the erosion hazard is severe. This soil is used for pasture, woodland, and wildlife habitat. Small areas are

used for pineapple and sugarcane. (Capability classification Vie, nonirrigated; pasture group 5; woodland group 5)

Lihue gravelly silty clay, 0 to 8 percent slopes (LIB).
This soil is similar to Lihue silty clay, 0 to 8 percent slopes, except that it contains ironstone-gibbsite pebbles and has brighter colors in the B horizon. Included in mapping in the Eleele area and north of the town of Hanama'ulu were small areas of soils that have a dark yellowish-brown, friable subsoil.

This soil is used for sugarcane, pasture, and homesites. (Capability classification lie, irrigated or nonirrigated; sugarcane group 1; pineapple group 5 ; pasture group 5 ; woodland group 5)

Lihue gravelly silty clay, 8 to 15 percent slopes (LlC).
On this soil, runoff is slow and the erosion hazard is slight. Included in mapping were areas where the slope is as much as 25 percent. This soil is used for sugarcane, pasture, wildlife habitat, and homesites. (Capability classification lIIe, irrigated or nonirrigated; sugarcane group 1; pineapple group 6; pasture group 5; woodland group 5)

Mokuleia Series

This series consists of well-drained soils along the coastal plains on the islands of Oahu and Kauai. These soils formed in recent alluvium deposited over coral sand. They are shallow and nearly level. Elevations range from nearly sea level to 100 feet. The annual rainfall amounts to 15 to 40 inches on Oahu and 50 to 100 inches on Kauai. The mean annual soil temperature is 74° F. Mokuleia soils are geographically associated with Hanalei, Jaucas, and Keaau soils.

In this survey area a poorly drained variant of the Mokuleia series was mapped. This soil, Mokuleia clay loam, poorly drained variant, is described in alphabetical order, along with other mapping units of this series.

These soils are used for sugarcane, truck crops, and pasture. The natural vegetation consists of kiawe, klu, koa haole, and bermudagrass in the drier areas and napiergrass, guava, and joee in the wetter areas.

Mokuleia fine sandy loam (Mr).
This soil occurs on the eastern and northern coastal plains of Kauai. It is nearly level. This soil has a profile like that of Mokuleia clay loam, except for the texture of the surface layer.

Permeability is moderately rapid in 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. (Capability classification Ills if irrigated, IVs if nonirrigated; sugarcane group 1; pasture group 3)

Mokuleia clay loam, poorly drained variant (Mta).
This soil occurs on Kauai. It is nearly level. The soil is poorly drained, and in this way, it differs from other soils of the Mokuleia series. The surface layer is dark brown to black and is mottled.

This soil is used for sugarcane, taro, and pasture. (Capability classification IIIw, irrigated or non-irrigated; sugarcane group 3; pasture group 3)

Rough Broken Land

Rough broken land (rRR) consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony. It occurs in gulches and on mountainsides on all the islands except Oahu. The slope is 40 to 70 percent. Elevations range from nearly sea level to about 8,000 feet. The local relief is generally between 25 and 500 feet. Runoff is rapid, and geologic erosion is active. The annual rainfall amounts to 25 to more than 200 inches.

These soils are variable. They are 20 to more than 60 inches deep over soft, weathered rock. In most places some weathered rock fragments are mixed with the soil material. Small areas of rock outcrop, stones, and soil slips are common. Included in mapping were areas of colluvium and alluvium along gulch bottoms.

This land type is used primarily for watershed and wildlife habitat. In places it is used also for pasture and woodland. The dominant natural vegetation in the drier areas consists of guava, lantana, Natal redtop, bermudagrass, koa haole, and molassesgrass. Ohia, kukui, koa, and ferns are dominant in the wetter areas. Puakeawe, aalii, and sweet vernalgrass are common at the higher elevations. (Capability classification VIIe, nonirrigated.

This land type is used mostly for the production of sugarcane. (Not in a capability classification)

The following is the Legend for the next Soil Maps:

Map Symbol	**Soil Name**
BS	Beaches
DL	Dune Land
Fd	Fill Land
HnA	Hanalei silty clay, 0 to 2 percent slopes
KdF	Kalapa silty clay, 40 to 70 percent slopes
KvB	Koloa stony silty clay, 3 to 8 percent slopes
KvC	Koloa stony silty clay, 8 to 15 percent slopes
KvD	Koloa stony silty clay, 15 to 25 percent slopes
LhB	Lihue silty clay, 0 to 8 percent slopes
LhC	Lihue sitly clay, 8 to 15 percent slopes
LhE2	Lihue silty clay, 25 to 40 percent slopes, eroded
LiB	Lihue gravelly silty clay, 0 to 8 percent slopes
LiC	Lihue gravelly silty clay, 8 to 15 percent slopes
Mr	Mokuleia fine sandy loam
Mta	Mokuleia clay loam, poorly drained variant
RRR	Rough broken land

Soil Unit Map 3.1 (11x17)

Soil Unit Map 3.2 (11x17)

Soil Unit Map 3.3 (11x17)

Soil Unit Map 3.4 (11x17)

Soil Unit Map 3.5 (11x17)

Soil Unit Map 3.6 (11x17)

4.2.2 Topography

The topography varies along the path corridor, from hilly at the Lydgate Play Structure, to relatively flat on the golf course and through the Marine Camp Site, two drainage ways occur in the project site including the drainage area north of the Radisson, the area fronting the Radisson, the wetlands which occur north of the Radisson Hotel. The layout rises at the gate to the Ocean Bay Plantation, otherwise known as the Ocean Bay Plantation and runs in a steady, but slight incline all across the bluff towards the Hanama'ulu railroad bridge, then drops dramatically to meet the airport property and flattens out at the bluff above the Ahukini Point fishing piers. The topography of Kapule/Kuhio Highway is relatively flat.

4.2.3 Climate

Climate conditions in the area are known to have mean temperatures ranging from 70.3 degrees Fahrenheit in the winter to 78.4 degrees Fahrenheit in the summertime. The relative humidity levels vary from 63% to 88%. The annual average rainfall is approximately 45 inches.

4.2.4 Air Quality

4.2.4.1 Air Quality Issues

The air on the island of Kauai is good and meets the standards of the Clean Air Act. The only issues related to air quality for this project would be during the actual construction of the project, and would be temporary in nature. There would be no long term negative consequences related to air quality to the island. There might possibly be positive long-term consequences for the air quality with reduced vehicular exhaust fumes from reduced car traffic with increased bicycle use along the corridor.

4.2.4.2 Air Quality Mitigation Measures for Construction Related Emissions

Construction Related Dust. Best Management Practices will be incorporated into the construction of the path project. Some of these measures will include:

- Irrigate the construction site during periods of drought or high winds
- Install silt screening in the areas of disturbance
- Clean roads of construction dirt from the construction vehicles
- Cover open beds of trucks hauling materials into and out of the site
- Disturb only the areas of construction that are in the immediate zone of construction to limit the amount of time that the areas will be subject to erosion

Vehicular Emissions. To minimize the amount of exhaust from the construction trucks and other vehicles, all equipment shall be maintained properly to minimize emissions during the time of construction.

The contractor shall incorporate the measures required by the State Department of Health Rules and Regulations in Chapter 43, Section 10 and the Hawai'i Administrative Rules Chapter 11-60.1 "Air Pollution Control, Section 11-60.1-33 related to Fugitive Dust emissions.

4.2.5 Coastal Resources and Processes

There is an additional Coastal Processes Report located in the Appendix section of this document.

The coastal segment from Ahukini Point to Lydgate Park is characterized by a complex shoreline environment. Rocky, stable coastal segments alternate with sandy stretches that experience both episodic and chronic erosion as well as quasi-stability.

The shoreline region of greatest vulnerability is the sandy coast along the Wailua Golf Course extending from the 17th green to the end of the 2nd fairway at the 2nd putting green. This coastal segment provides unparalleled views and access to the seashore, a sandy beach, a dynamic wave environment, and a broad fringing reef facing directly into prevailing trade wind seas.

While the beach is of moderate width and in places enjoys a healthy sand-budget, the coastal dune system has been severely impacted by anthropogenic efforts at shoreline stabilization. Large basalt boulders, dirt fill, non-endemic vegetation, frequent vehicular traffic, sand mining, and topographic leveling have reduced the dune portion of the profile to a secondary feature containing less than 5 CY/ft of sand, or rendering it absent all-together. The demise of the dune and its critically important role as a sand reservoir portends a future of poor shoreline stability in the face of continuing, probably accelerating sea-level rise and aperiodic storminess. Indeed, golfers report significant shoreline recession in recent decades exceeding 40 ft in places.

The pattern and rate of erosion along this segment is documented using a time series of early 20th Century NOAA T-sheets and more recent aerial photos. Resulting data are rough and only provide approximations of past trends without an error analysis. They nonetheless reveal that chronic erosion of 1 to 2 ft/yr occurs at erosional hotspots that are adjacent to shoreline segments that are unstable, but not chronically eroding. The unstable segments apparently react to strong windward storm events and hurricanes, while remaining quasi-stable during intervening years. It is this finding that led to the conclusion that dune nourishment might be a successful tool to enhance shoreline stability, especially during years lacking high storminess.

Enhanced sand volume in the coastal dune might serve several purposes: 1) Providing a bed for pathway construction that emphasized design features focused on minimal environmental impact and a small, lightweight footprint; 2) Burying a jeep trail used by off-road vehicles that impact the beach and dune system thereby eliminating in places and discouraging in others the local pattern of driving on the beach; 3) Restoring the endemic substrate for coastal vegetation growth; 4) providing a pathway route removed for the golf course but not located directly upon the beach, and; 5) restoring the natural function of the dune system as a storage location for excess beach sand.

The design of the dune is based on sand fill averaging 8-10 cy/ft, a robust volume of sand for this dynamic shoreline. Several unresolved questions characterize the dune restoration effort:
1) How long will the fill last? 2) Where can the county acquire a sufficient quality and quantity of sand? 3) Will the placed sand experience cementation? 4) Does sufficient sand exist for future maintenance?

Answers:

1) Unknown. But much of the shoreline does not record chronic erosion in the time series analysis and it is hoped that the placed sand will remain stable for 5 years. Locations experiencing chronic recession average rates of 1 to 2 ft/yr and the dune location is over 30 ft from the waters edge in most places – hence, provided a large storm does not remove the dune we gage a successful fill effort as one lasting approximately 5 years before renourishment.
2) Sand sources are currently being assessed by county and university sources for placement at Poipu Beach Park. Two primary locations exist – Mahalepu and Mana plain. Both sources need to be further evaluated with regard to such issues as should the sand be improved with washing and should additional geologic exploration of cleaner sandy strata at Mana be performed.
3) It is not expected that the placed sand will undergo cementation because it is removed from daily high tide and not subject to intertidal carbon dioxide production. One action that should improve the sand success would be to wash it and remove the large volume of fines.
4) There does appear to be sufficient sand for future nourishment but it is still located in the ground. The county must not wait to acquire and process this sand as the timing of when it will be needed is unknown.

On inescapable conclusion of this project has been the realization that sand is a valuable commodity and the county budget process should include a recurring item for the exploration, and processing of high quality sand. Continued erosion resulting from sea level rise, past poor management practices, and storminess along the Kauai shoreline will require an increasing commitment to sand nourishment if the county wishes to maintain tourism as a primary industry.

4.2.6 Hydrology and Water Quality

The proposed path project will cross a tidal drainage area located between the Marine Camp and the Kauai Beach Villas, and another drainage area south of the Radisson. The second drainage area, is dry and does not function as a drainage area except in periods of extreme precipitation. The project also crosses the Hanama'ulu Stream. There is a pond between the Radisson and the Ocean Bay Plantation property. Gary Uenunten, of the Water Quality Division will test the water in all of these areas to determine current water quality issues.

Priorities ranking for the streams along the proposed path corridor are impacted by the following ranking system. EPA regulations codify and interpret the requirement in Section 303(d)(l)(A) of the Act that States establish a priority ranking for listed waters. The regulations at 40 CFR 130.7(b)(4) require States to prioritize waters on their Section 303(d) lists for TMDL development, and also identify those WQLSs targeted for TMDL development in the next two years. In prioritizing and targeting waters, States must, at a minimum, take into account the severity of the pollution and the uses to be made of such waters. See Section 303(d)(l)(A). As long as these factors are taken into account, the Act provides that States establish priorities. Further, the State of Hawaii may consider other factors relevant to prioritizing waters for TMDL development, including immediate programmatic needs, vulnerability of particular waters as aquatic habitats, recreational, economic, and aesthetic importance of particular waters, degree of public interest and support, and State or national policies and priorities. See 57 FR 33040, 33045 (July 24, 1992), and EPA's 1991 Guidance.2.

The State's listing criteria provide that, in general, streams listed are based on data collected from two or more sampling sites. This criterion is based on a concern that data from a single sampling station may not be representative of water quality conditions for the whole stream. Unlike many States, Hawaii has not formally segmented its relatively short fresh water streams into discrete reaches in its water quality standards. The State's technical judgement that data from a single sampling point may not be representative reflects the consideration that water quality conditions may vary substantially within fairly short distances along Hawaiian streams.

(This information is provided from the EPA, Region IX, Letter to the Deputy Director for Environmental Health, Honolulu.)

The Kapaa Stream was listed as a Priority 1 stream in 2002 for turbidity, and showed exceedance for the wet season turbidity standard. More sampling was recommended for this stream during the dry season.

The Hanama'ulu Stream is listed as a Priority 2a stream showing exceedance of wet season turbidity.

4.2.6.1 Potential Impacts

The path will not negatively impact any of these systems. All drainage areas will be bridged, and the pond or any associated wetlands soils or plants will not be disturbed. The Hanama'ulu stream will be crossed with the retrofit of the historic Hanama'ulu Railroad Bridge.

4.2.7 Natural Hazards

The natural hazards endemic to all of Hawaii, to include Kauai , involves tsunami action. There have been four episodes since 1946. These occurrences happened in 1946, 1957, 1960 and 1964 respectively. The runup heights vary from 9.5 feet to 20 feet.

Most of the area of the project is designated VE by the FEMA Flood Insurance Rate Maps for Kauai.

Further natural hazards include hurricanes and swells. Swells have had a range of waves from four to ten feet. The most recent hurricanes to affect the island of Kauai were Hurricane Iwa in 1982, and Hurricane Iniki in 1992. The wave action from these hurricanes varied from 17 to 40 feet.

Earthquakes in Hawaii are typically associated with volcano action. The data suggests that Kauai has had lower intensity of seismic activity than most of the Hawaiian islands. The Island of Kauai is designated as a Seismic Zone 1, which is the lowest rating according to the Uniform Building Code criteria.

4.2.7.1 Mitigation Measures

The path will be designed in such a way to minimize impacts from wave action. If the coastal path alignment is selected, the path fronting the shoreline will be designed as a removable boardwalk attached on helical piles or a

plank system that sits directly on top of the sand. The structures of the comfort stations will be located outside of the Federal Emergency Management Agency (FEMA) VE Zone as identified on the Flood Insurance Rate Maps (FIRM) dated September 16, 2005. In addition, the comfort stations will be located behind the 40 - foot shoreline setback. The Kapule/Kuhio Highway alignment would be the less subject to these forces. The affect of seismic activity does not alter based on the alignment choices.

4.2.8 Noise

Currently, the noise of the corridor is not significant, with the exception of the sound of the traffic along Kapule/Kuhio Highway. The effect of the path to current noise levels would be mostly an issue with the golfers on Wailua Golf Course.

4.2.8.1 Mitigation Measures

When construction is commencing, there will be typical associated noise. This impact is temporary and confined to the period of construction. The impacts to the golfers is more long term. The nightime impacts of path users to the Kauai Beach Villas and/or the Radisson Hotel could be an issue if the path is used during those times.

4.2.9 Hazardous Materials

4.2.9.1 Hazardous Waste Issues

§11-261-3 Definition of hazardous waste. (a) A solid waste, as defined in section 11-261-2, is a hazardous waste if: (1) It is not excluded from regulation as a hazardous waste under subsection 11-261-4(b); and (2) It meets any of the following criteria:(i) It exhibits any of the characteristics of hazardous waste identified in subchapter C except that any mixture of a waste from the extraction, beneficiation, and processing of ores and minerals excluded under subsection 11-261-4(b)(7) and any other solid waste exhibiting a characteristic of hazardous waste under subchapter C only if it exhibits a characteristic that would not have been exhibited by the excluded waste alone if such mixture had not occurred or if it continues to exhibit any of the characteristics exhibited by the non-excluded wastes prior to mixture. Further,for the purposes of applying the Toxicity Characteristic to such mixtures, the mixture is also a hazardous waste if it exceeds the maximum concentration for any contaminant listed in table I to section 11-261-24 that would not have been exceeded by the excluded waste alone if the mixture had not occurred or if it continues to exceed the maximum concentration for any contaminant exceeded by the nonexempt waste prior to mixture. (ii) It is listed in subchapter D. 261-8 §11-261-3 (iii) It is a mixture of a solid waste and a hazardous waste that is listed in subchapter D solely because it exhibits one or more of the characteristics of hazardous waste identified in subchapter C, unless the resultant mixture no longer exhibits any characteristic of hazardous waste identified in subchapter C, or unless the solid waste is excluded from regulation under paragraph 11-261-4(b)(7) and the resultant mixture no longer exhibits any characteristic of hazardous waste identified in subchapter C for which the hazardous waste listed in subchapter D was listed. (However, non-wastewater mixtures are still subject to the requirements of chapter 11-268, even if they no longer exhibit a characteristic at the point of land disposal). (iv) It is a mixture of solid waste and one or more hazardous wastes listed in subchapter D; however, the following mixtures of solid wastes and hazardous wastes listed in subchapter D are not hazardous wastes (except by application of subparagraphs (a)(2)(i) or (ii) of this section) if the generator can demonstrate that the mixture consists of wastewater the discharge of which is subject to regulation under either section 402 or section 307(b) of the Federal Clean Water Act (including wastewater at facilities which have eliminated the discharge of wastewater).

4.2.9.2 Hazardous Waste Sites Listed

- Radisson Kauai Beach Resort – No Further Action Required
- Kauai Hilton Beach Villas – No Further Action
- Amfac Sugar, Lihue Herbicide Mixing Plant, 3-4671 Kapule/Kuhio Highway, Ongoing Superfund

4.2.9.3 Mitigation Measures

It is not expected that there is any hazardous material impact by the construction or the path to be impacted by the hazardous sites that may or may not be along the corridor.

4.3 BIOLOGICAL ENVIRONMENT

This document does not include specific assessments for plants, birds or marine animals as the only areas of this project that are relatively undisturbed were studied with the preparation of the EIS for the Ocean Bay Plantation project, and the Lihue/Hanama'ulu Master Plan. Both of these studies are listed in the references section of this document.

According to Dr. David Lorence, Director of Science, and the B. Evans Chair of Botany at the National Tropical Botanical Garden, there are no known terrestrial endangered plants on the island of Kauai. The plant species found along the corridor include, but are not limited to: guava, lantana, Chinaberry Tree (Melia azedarch), kolomana, hau, silk oak, Ironwood Trees, California grass, Guinea grass, and molasses grass (Melinis minutiflora), yellow granddilla vines (Passaflora laurifolia). Where the sugarcane was taken out of production is primarily guinea grass and koa-haole. It was documented in the Ocean Bay Plantation EIS in a study conducted by Char & Associates in September 2001 that no endangered species of plants were identified on their project site.

4.3.1 SIGNIFICANT HABITATS

a. Sandy Substrate Areas
Plants in this area include naupaka (Scaevola sericea), tree heliotrope (Tournefortia argeneaa), 'aki'aki grass (Sporobolus virginicus) pohuehue (Ipomoea pes-caprae) and nana (Vigna marina) and hala (Pandanus tectorius).

b. Rocky Outcrops
Ironwood Trees, naupaka, ilima papa (Sida fallax), pa'uohi'iaka (Jacquemontia ovalifolia ssp. sandwicensis), 'aki'aki grass, and 'akulikuli (Sessuvium portulacastrum).

c. Abandoned Sugar Cane Fields
Plants on these abandoned fields include: Guava, lantana, Chinaberry Tree, kolomona, hau, silk oak and Ironwood Trees, California grass, Guinea grass, and molasses grass.

d. Forested Areas
Dominated by Ironwood Trees, Coconut Palms, some java plum, and Eucalyptus citirodora.

e. Lydgate Park Play Bridge Section
The area here is a swale that allows vehicle traffic to the beach under the play structure. The bridge from the existing play structure south towards the golf course will connect the play bridge to the existing grade in the ironwood trees. The grades on each side of the play bridge lead down a steep bluff to the swale. The soil is sandy and the woods south of the play bridge are comprised primarily of ironwoods.

f. Wailua Golf Course
The fairways and green areas that the path intersects with are gentle sloping, with final grades to the ocean at hole number 17 and 2. The driving range area is flat. All soils are sandy or sand. Along hole number 2, there is an abandoned asphalt road between the fairway and the ocean.

g. Marine Camp Section
Here is an area of red dirt and sand that has been subject to serious interference in the past. Much of the original sand and topsoil has been removed and dirt has been replaced in this area.

The terrain is relatively flat, and leads to a drainage area north of the Radisson Hotel.

h. Radisson Hotel and Kauai Beach Villas
The area where the path will be aligned will be is flat and mostly grassed as it runs directly in front of rooms and the cabana and bar.

i. Wetlands # 2
The area immediately south of the Radisson is known as "nukolii" and is considered fragile. It is known to have been a mass burial area and has wetlands. The wetlands here have wetland vegetation and standing water and the topography is lowland and sloping to the center where the water has collected.

j. Ocean Bay Plantation
This area rises in topography and has varied vegetation with stands of trees and understory and also, areas of guinea grass where the sugar cane was taken from cultivation. This area leads to a steep bluff south of Hanama'ulu towards Hanama'ulu Beach.

k. Hanama'ulu Beach
This area has a large parking lot and large grassed areas accessing the curve of the beach. There are two comfort stations located at the beach park and picnic tables and a shade meeting structure. The river flows directly south of the beach park and the railroad bridge crosses over leading to Hanama'ulu.

l. Ahukini Point
There is a bluff above the fishing piers and parking lot. The recreational area is very flat, and the bluff above that belongs to the airport authority rises steeply above the fishing piers.

m. Kapule/Kuhio Highway
Kapule/Kuhio Highway is a very busy, major thoroughfare for the island. The traffic moves fast and would pose significant safety issues as well as cultural ones specifically relating the the existing re-internment site in the parking lot of the Wailua Golf Course. It may be necessary, however to locate portions of the path along this roadway, due to property acquisition and/or easement difficulties.

4.3.1.1 Mitigation Measures
None of the plants observed along any of the potential corridors is threatened, endangered or is a species of concern for the U.S. Fish and Wildlife Service 1999a, and b.

It is not anticipated that there will be any negative impact to the habitats and/or plant communities along the corridor; however, the following is a list of the measures that will be taken:

- The path will be routed around any major trees, avoiding the drip line.
- The plants will be irrigated, at least until they are established.
- The plant material selected will fit with the character and nature of the surrounding landscape.
- Areas disturbed by construction will be re-vegetated as soon as possible after construction of each area.

- To minimize erosion along the coast, plant materials along the coast will not be disturbed during or to facilitate path alignment.

- If the path alignment occurs along the coast in the area of the 1st. and 2nd. Fairway of the golf course, dune renourishment may be incorporated by adding sand to the existing beach to create and augment dunes in the areas of coastal erosion.

- In order to protect wetlands that may occur along the alternative routes of the corridor, the first course of action will be to avoid the wetlands. If avoidance is not feasible, the wetlands will be bridged with the abutments outside of the wetland area, and/or a boardwalk may be floated over the wetlands, thereby not constituting a "fill" in the wetlands.

- The only areas along any of the alternatives for the path where native vegetation occurs is in the area of the ironwood forest leading south between the Lydgate Park Playbridge and the Wailua Golf Course, in the area of Ocean Bay Plantation, behind Hanama'ulu Beach Park by the Hanama'ulu Railroad Bridge and the bluff leading to Ahukini Point. The final path alignment will be routed to avoid any major trees in these areas, and the social trail in the ironwood trees will be used to place the path in this area.

4.3.2 FLORA

NEHE (Lipochaeta integrifolia) and PA'U O HI'IKA (Jacquemontia ovalifolia)

GUINEA GRASS

MOTHER IN LAW TONGUE (Sansevieria trifasciata)

KOLOMANA (Senna surattensis)

VITEX ROTUNDIFOLIA (Beach Vitex)

NOHU (Tribulus cistoides)

PSYDRAX ODORATA (Alahe'e)

KOU HAOLE (Geiger Tree)

COCONUT PALM (Cocos nucifera) and LOULU LELO (Prichardia hillebrandii)

NAUPAKA KAHAKAI (Scaevola taccada)

SIDA FALLAX (Ilima)

4.3.3 TERRESTRIAL FAUNA

This document does not include specific assessments for plants, birds or marine animals as the only areas of this project that are relatively undisturbed were studied with the preparation of the EIS for the Ocean Bay Plantation project, and the Lihue/Hanama'ulu Master Plan. Both of these studies are listed in the references section of this document.

In the EIS prepared for the Lihue-Hanama'ulu Master Plan, conducted by Phillip Bruner, in August, 1994 found that there were no native land or water birds, but did find four Hawaiian Duck and Common Moorhens found off-site in the Hanama'ulu wetlands. The study recorded no native seabirds or migratory native birds, however, it was noted that the endangered Newell's Shearwater may fly over the property as they move between nesting and foraging.

An avian and terrestrial fauna study was conducted by Rana Production, Ltd. also in September, 2001 for the Ocean Bay Plantation EIS. The only endangered avian species found was the Hawaiian hoary bat (Lasiurus cinereus semotus) . Of the avian endangered species documented are: Hawaiian coot (Fulica alai), the endangered subspecies of the ua'u (Pterodroma phaeophgia sandwichensis), the 'a'o (Puffinus auricularis newelis), and the 'ua'u kani (Puffinus pacificus).

4.3.3.1 Mitigation Measures

It is not anticipated that there will be any negative impact to the terrestrial environment during construction, however, it is anticipated that a signage program can be incorporated into the path program to educate path users to the importance of the terrestrial environs of the corridor.

4.3.4 MARINE FAUNA

This document does not include specific assessments for plants, birds or marine animals as the only areas of this project that are relatively undisturbed were studied with the preparation of the EIS for the Ocean Bay Plantation project, and the Lihue/Hanama'ulu Master Plan. Both of these studies are listed in the references section of this document.

According to Dr. Jeffrey Walters, the Co-Manager of the Hawaiian Islands Humpback Whale National Marine Sanctuary for the State of Hawaii, Department of Land and Natural Resources Division of Aquatic Resources, Kauai serves as a location for pioneer the humpback whales, green sea turtles and monk seals coming south and population. There are approximately 200-300 seals in the main eight Hawaiian islands. A typical day for a monk seal is to lay on the beach during the day to dry out and digest food and to rest, then to go into the sea to feed during the night.

Kauai is the prototype for re-populating the monk seal populations. They have a thirteen month gestation period which begins in June.

The Green Sea Turtles are threatened. They breed in the northwest islands and come south to feed and live. They are at present, exploding in population. The Hawksbill Turtle will nest on other main Hawaiian islands, but on Kauai.

The Humpback Whale season is November to May, with January to March being the peak season.

MONK SEAL BEACHED MAKAI OF THE RADISSON HOTEL

4.3.4.1 Mitigation Measures

It is not anticipated that there will be any negative impact to the marine animal environment during construction, however, it is anticipated that an educational signage program can be incorporated into the path program to educate path users about Monk Seals and a description identifying the importance of the protocol that is followed when a Monk Seal beaches itself onto the shore. In addition interpretive signs can be established for other marine animals such as green sea turtles, whales, and tropical fish that are occasionally be observed along of the corridor.

The Hawaii Division of Aquatic Resources has offered to assist the County and the design team in the development of this signage program.

4.4 SOCIO-ECONOMIC ENVIRONMENT

4.4.1 Archaeological, Historic and Cultural Resources and Native Hawaiian Rights Issues

The full discussion of Archaeological, Historic and Cultural Resources and Native Hawaiian Right Issues is found in Appendix B of this document.

4.4.1.1 Impacts to Socio-Economic Environment Impacts

The pathway essentially runs north-south from Ahukini to Lydgate Park. Both traditional Native Hawaiian archaeological sites and historical sites are present within and near the pathway area. These are summarized below, as is cultural information for the area.

4.4.1.2 Impacts to Archaeological Resources

There have been at least 15 archaeological projects conducted in this area from Thrum in 1907 to SCS in 2004. These have led to the documentation of numerous prehistoric sites. In 1906 Thrum compiled *heiau* throughout the islands. In this area, he recorded two *heiau*: Ahukini and Kalauokamanu. These *heiau* were not marked on maps but were simply described. Both *heiau* had been destroyed supposedly as of 1855. During Bennett's island-wide survey in 1928-1929, the two *heiau*, now known as Site 101 and Site 102 were also noted. Ahukini Heiau supposedly was built near Ahukini Point on a bluff overlooking the sea while the location of Kalauokamanu was never identified. He did note that both *heiau* were previously destroyed.

Site 1839, occurring to the north of Hanama'ulu Bay, represents the first fully known prehistoric site in the coastal Hanama'ulu area. This site is a prehistoric complex occurring on the flats and is composed of a wall and terrace suspected to be related to temporary habitation. Proceeding to the north, around the point and onto the flat coastal plains toward Wailua, several prehistoric sites are present. Site 1838 consists of a prehistoric cultural deposit partially eroding out of modified sand dunes. The layers contained charcoal, shells, and coral fragments. The site had been disturbed during military training exercises in the 1940s. The cultural deposit, now a small remnant, was dated to AD 1170-1400, and represents temporary habitation of the area.

Site 885, also occurring just to the south of the present-day Raddison Hotel, represents a possible traditional Native Hawaiian burial ground. Multiple burials have been documented in this sandy location. The most well-known site in this area, due to the influx of CRM research related to golf course activities and development of Lydgate Park, is Site 103, originally recorded by Bennett during island-wide survey in 1928-1929. Bennett makes first mention of Site 103 in this area: "in the sand dunes that run along the shore half way between Hanama'ulu and Wailua River are many burials." At this writing, over 66 burials have been identified throughout the golf course area alone, with most of these having been re-interred in a burial crypt at the golf course itself. Site 1980, which occurs on the golf course to the east of the existing correction facility, represents eight traditional-period burials identified in sandy contexts between coastline and marshy areas to the west. This site is likely associated with the aforementioned Site 103.

Overall, the flatlands between the Kawailoa Dunes and Kalepa Ridge contain swampy areas fed by springs at the base of the ridge that allowed for limited prehistoric taro cultivation on the margins of the marsh. The coastal dunes between the marshland and the sea were primarily used for human interment (Site 103) while the direct coastline contains evidence for temporary or seasonal fishing camps and other marine acquisition. Should the path alignment occur along Kapule/Kuhio Highway in the area of the re-internment site, the re-internment site would be affected.

4.4.1.3 Impacts to Historical Resources

Historical sites are also prevalent along this portion of the path. Ahukini Landing itself, a probable late 19th construction, is present inside the breakwall of the bay. Plantation housing for sugar cane workers has been noted just to the south of the point. Foundations still exist in remnant state. Moving inland to the west, several more sites are present. Site 1845 is the historic Hanama'ulu Railroad Bridge. This bridge is being preserved and represents the plantation era. Site 2066 consists of multiple features: an upright (burial?), historic road, and historic house foundation. Site 2067 consists of a historic cemetery perhaps dating to the 1880s. The cemetery is present on the *mauka* side of the highway on the edge of former sugar cane lands. Prior to construction of Ahukini Landing, an old wharf was present on the northern flank of Hanama'ulu Bay. This is Site 1843 and consists of a concrete wall, foundation, and sugar cane road. This is the location of the old wharf. Site 1841 occurs just to the north of the bay and also represents the historic period: a road and a trail running along the coast. It is possible this trail has some time depth from prehistoric times.

As one rounds the point to the north of Hanama'ulu Bay, three sites are present above the rocky coastline. Site 2068 consists of a looted, historic-period trash dump dating between 1880 and 1910. Datable artifacts include glass and ceramic fragments that were recovered from the bluff, at the edge of plantation lands. Site 1840, nearby, consists of a historic-period retaining wall related to sugar cane or military transport. Site 1846, consisting of two historic railroad bridges used for hauling sugar cane from the fields to Lihue, is present more inland and south of the Radisson Hotel. Finally, a WWII Marine Camp was present also to the south of the Radisson Hotel.

The historic infrastructure from Ahukini Landing toward the Lydgate area is dominated by plantation-era construction representing transport and processing relative to the sugar cane industry. It is very possible that the disturbance caused by the historic sugar cane industry destroyed many prehistoric sites in the area, including dryland agricultural loci and house sites (see Corbin *et al*. 2002). During WWII, the military enhanced some of these features for their own transport and access and often created new roads through the area. However, the history of this area still remains entrenched within the bygone plantation-era.

4.4.1.4 Impacts to Cultural Resources

As Corbin *et al*. (2002) state, Hanama'ulu translates as "tired (as from walking) bay" and is said to be the birthplace of the hero Kawelo. This area was referred to as Puna District at the time of the Great Mahele of 1848, not Lihue District as it is now. The Hanama'ulu area is not specifically mentioned in many historical texts. However, Hanama'ulu is noted *Olelo No`eau*, a book of Hawaiian sayings and epithets (Corbin *et al*. 2002:B-1):

No Hanama`ulu ka ipu puehu ("The quickly emptied container belongs to Hanama`ulu").

Pukui (1983:No. 2230) identified another quote about the area:
"Said of the stingy people of Hanama`ulu, Kaua`i—no hospitality there. At one time, food containers would be hidden away and the people of Hanama`ulu would apologize for having so little to offer their guests."

From Hanama'ulu Bay to the west, toward Lihue, multiple Land Commission Awards are present. In general, the LCA's primarily denote *lo`i* lands (taro fields). Here, dryland taro cultivation was probably practiced while coconut, sweet potato, and breadfruit were also likely grown. The Mahele records of the Hanama'ulu area tell of native tenants living in the valleys and by the shoreline. House sites, taro pond fields, irrigation systems, dryland agricultural parcels, fishponds, pastures, and other features were across the landscape. Many of these lands were cleared during Plantation days, thus masking or erasing these sites.

The cultural significance of the Wailua Area, further to the North, is well documented. Center of the isle's political and economic universe, Wailua was the chiefly seat of Kaua`i during prehistoric times, as is attested by the numerous *heiau* and other ceremonial sites occurring along the Wailua River basin. The Wailua area is covered in some detail in other sources.

4.4.1.5 Impacts to Native Hawaiian Rights

According to Wade Ishikara, of Department of Land and Natural Resources, Aquatic Resources Division, many local men fish in the areas of the Marine Camp and Ahukini Point. According to LaFrance Kapaka Arboleda, of Office of Hawaiian Affairs, Burial Council indicates that in the area south of the Hanama'ulu Railroad Bridge, may be an area of mass burials, known as "nokuli'i".

Swimming and fishing is available at the Hanama'ulu Beach Park, and fishing is also common at Ahukini Point.

None of these areas will be damaged or affected nor will access to these areas by the native Hawaiians or local fishermen or park users be impeded by the construction of the path project.

According to members of a native Hawaiian family and their friends, there are a number of ancient historic paths used by the native Hawaiians, which may or may not occur on this path corridor.

Further, this group stakes a claim on all the property of the corridor, with the view that all the land of Hawai'i belongs to all the native Hawaiians. All lands that contain wetlands or ponds are to be preserved for taro fields, and all the dry land should be preserved for home sites.

Swimming and fishing is available at the Hanama'ulu Beach Park, and fishing is also common at Ahukini Point.

None of these areas will be damaged or affected nor will access to these areas by the native Hawaiians or local fishermen or park users be impeded by the construction of the path project

4.4.1.6 Summary

Overall, this portion of eastern Kauai contains abundant evidence for historic networks related to plantation-era days and prehistoric sites related to burial and temporary habitation loci. While none of the sites beyond Ahukini Landing remain in spectacular form, they do allude to land tenure in the area during the late 1880s onwards. The two prehistoric sites identified near the rocky coastline north of Hanama'ulu Bay provide foreshadowing for the large number of prehistoric sites occurring to the north along the sandy coastal flats. The former presence of two *heiau* in the Ahukini area reflects a ceremonial presence as well as indicating that a fairly substantial prehistoric population was presumably living in the area, most likely around the bay and inland valleys. These inland valleys were cultivated for taro and other subsistence crops. The path will cross these various important historical zones, which give opportunities for educational signage and outdoor classroom experiences.

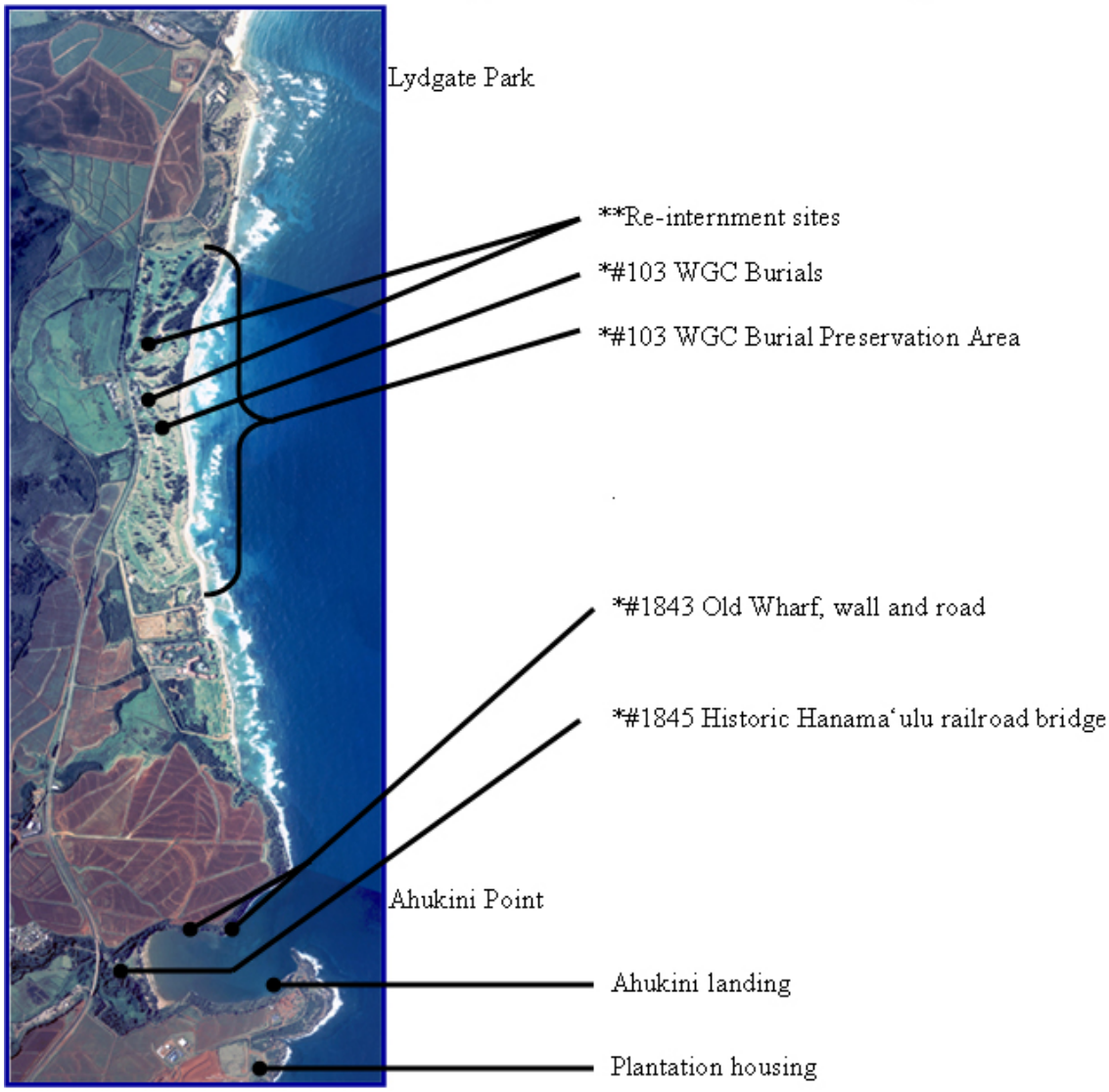
4.4.2 Mitigation Measures

The historic and cultural sites are to be avoided where possible.
A mitigation and Monitoring Plan shall be developed to determine what measures will be taken when and if cultural artifacts are found during and/or before construction commences.

To protect the historic character of the Hanama'ulu Railroad Bridge, work to the bridge will be as minimal as possible. Structural repairs will be done to restore and stabilize the bridge. Further, handrails and other features that will be required for public safety shall be incorporated with sensitivity to the historic nature of the bridge and to minimize the visual effect of handrails by using tension cabling for the handrails.

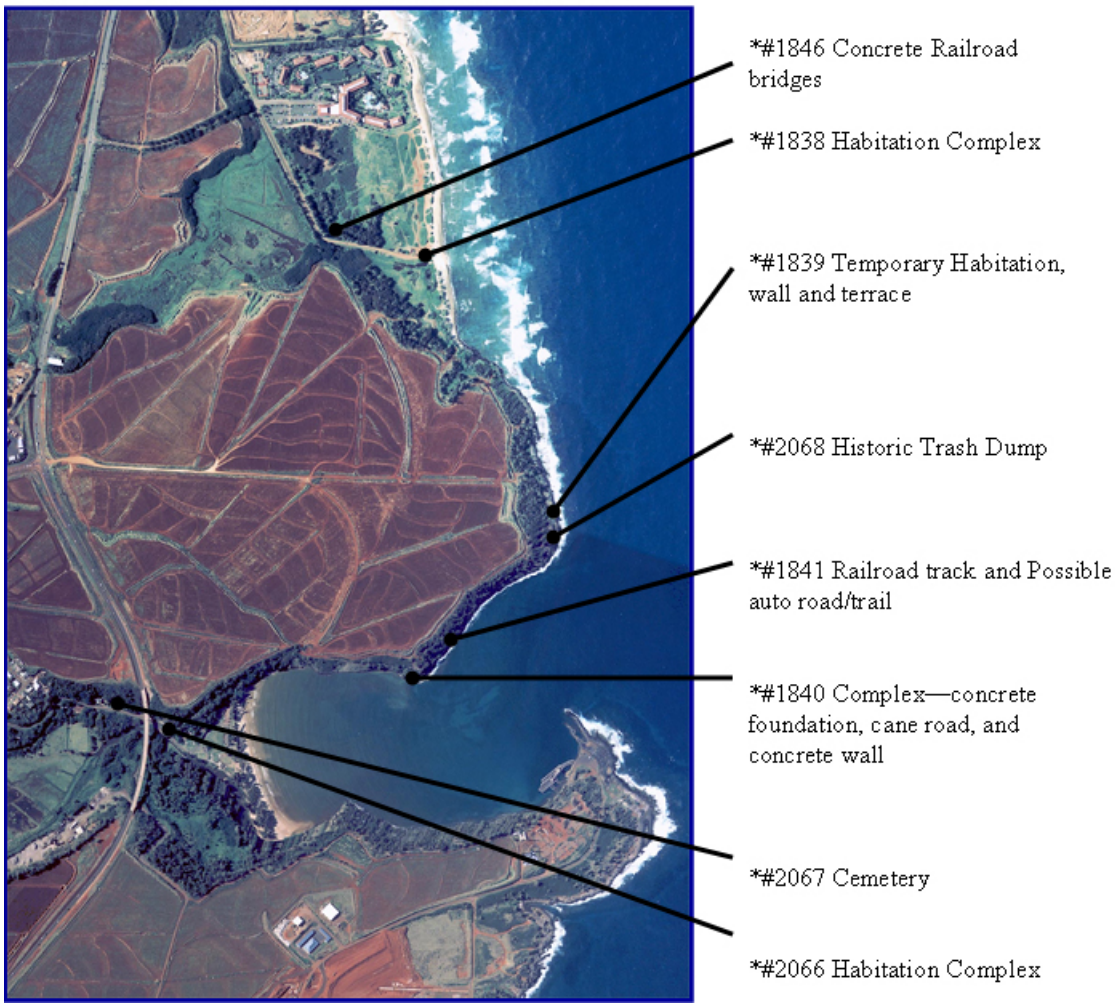
The design team is to work with the Office of Hawaiian Affairs and Hawaiian Homelands, local Hawaiians and Burial Council, and whomever OHA recommends to understand the needs and wishes of the Native Hawaiians. The ancient ala loa (ancient paths) are to be used where feasible and desirable, and signage to celebrate and educate about the Hawaiian heritage should be incorporated where budget and design allows.

Archaeological Conditions Map



*Known Archaeological Sites

Archeological Conditions Map



*Known Archaeological Sites

4.5 PUBLIC INFRASTRUCTURE AND FACILITIES

4.5.1 Vehicular Access

Access to the path by vehicles can be accomplished in several locations along the corridor:

Beginning from the north end, there is parking available at the Play Structure at Lydgate Park. Cars can access the system at the Wailua Golf Course, at the Marine Camp area, also access is available from the Radisson Hotel to the existing Comfort Station, access is available to the Hanama'ulu Beach Park, and from Ahukini Point where parking is available.

4.5.2 Water

The County Water Department will supply adequate water to the path project.

4.5.3 Wastewater

The waste from the comfort stations will use septic tanks and leach fields.

4.5.4 Power & Communications

There is power and electricity in Kapule/Kuhio Highway. The existing capacity is adequate to serve the project.

4.5.5 Schools

The only school near the project corridor vicinity is King Kaumaulii Elementary School in Hanama'ulu

4.5.6 Parks & Recreation Facilities

There are three county parks and one state parks recreational facility within the boundaries of this project. On the north end is the county park, known as Lydgate Park. The second county park is the Marine Camp, and towards the south end of the project is the third county park, Hanama'ulu Beach Park. Ahukini Point at the south end is a State Park Recreation Area providing fishing opportunities.

4.6 Public Health and Safety

4.6.1 Police Services

Services will be provided by the County of Kauai Police Department. The Deputy Chief, Ron Venneman requests that access be available for the police cars at reasonable points along the corridor, that the path use at night be considered the same as any other County park facility, and that emergency call boxes be installed in the more remote locations along the corridor.

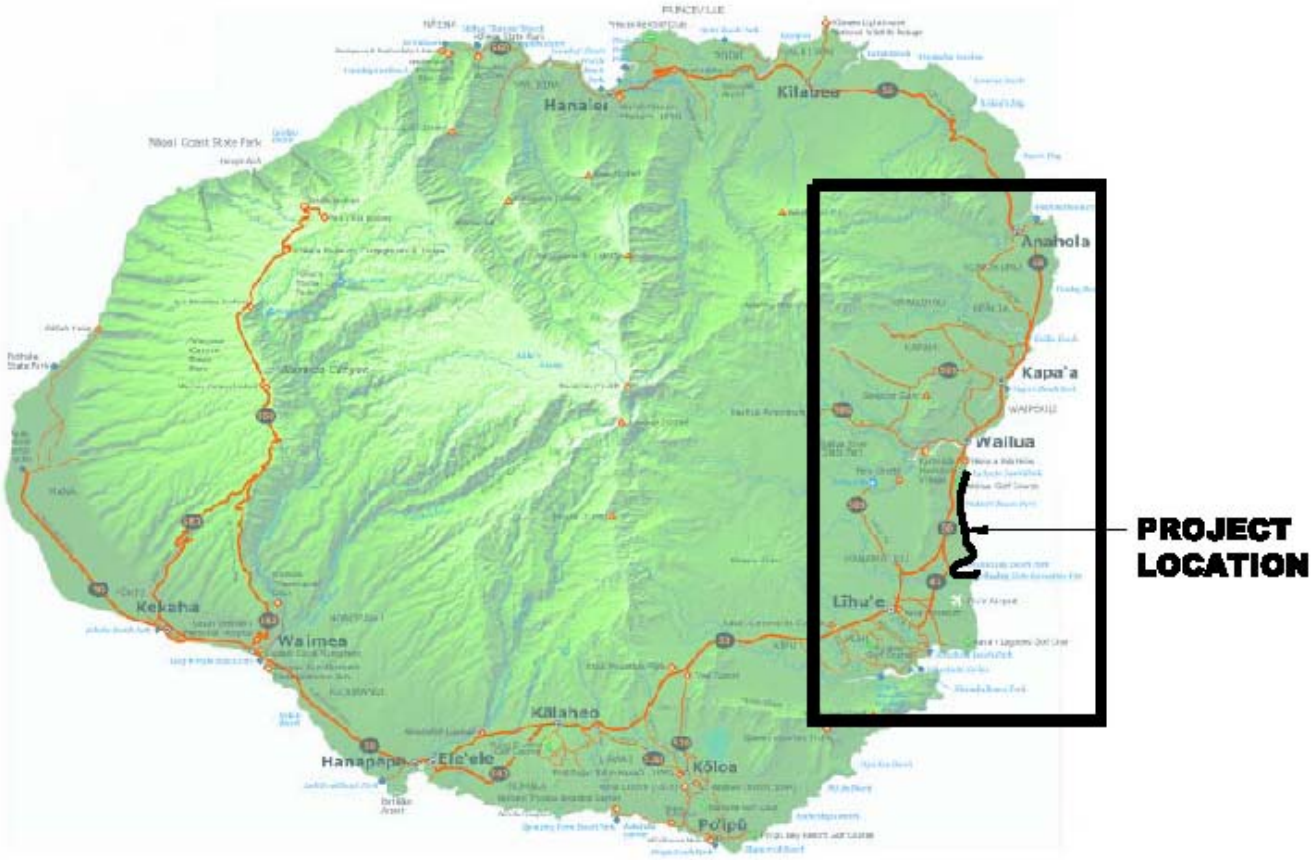
4.6.2 Fire and Emergency Services

Fire protection and Emergency services will be provided from the County of Kauai Fire Department. The closest hospital is Wilcox Hospital in Lihue, and will be the service provider for emergencies.

The Prevention Captain, Chief David Bukowski, requests that access be available for fire trucks at intervals of no less than ¼ mile, and on either end of the Hanama'ulu Railroad Bridge.

5.0 DESCRIPTION OF AFFECTED ENVIRONMENT

5.1 LOCATION MAP



KAUA'I
PROJECT LOCATION MAP

5.2 TAX MAPS

5.2.1 Tax Map Key 3-05-00

5.2.2 Tax Map Key 3 –05-01

5.2.3 Tax Map Key 3 –07-00

5.2.4 Tax Map Key 3 –07-02

5.2.5 Tax Map Key 3 –07-03

5.2.6 Tax Map Key 3 –09-00

5.2.7 Tax Map Key 3 –09-02

5.2.8 Tax Map Key 3 –09-05

5.2.9 Tax Map Key 3 –09-06

5.3 COUNTY AND STATE ZONING MAPS

COUNTY ZONING MAP

STATE ZONING MAP

5.4 FEMA FIRM MAPS (1 OF 5)

Flood Map Panel 0327

Flood Map Panel 0326

Flood Map Panel 0214

Flood Map Panel 0212

Flood Map Panel 0213

6.0 SUMMARY OF MAJOR IMPACTS

6.1 Short-Term Impacts

6.1.1 Noise
There will be some noise associated with the path and comfort station construction, however, it will not be of such issue as to disturb the activities of the park users, and will be limited only to the duration of construction.

6.1.2 Air
The amount of air contamination resulting from path and comfort station construction will be minimal as excavation is not required for either.

6.1.3 Energy, Mineral Resources
The resources required for construction will not be excessive and will be required only for the course of the construction of the project.

6.1.4 Construction, Utilities
The impacts of the construction of the project will be restricted to the construction of the path, pedestrian bridges and comfort stations. The utilities required for the Hanama'ulu Beach Park comfort station renovation are in place as they were needed for the operation of the building that was formerly in the location of the comfort station.

6.1.5 Underground Storage Tanks
There are no known underground storage tanks on the project corridor.

6.1.6 Hazardous Waste Sites
- Radisson Kauai Beach Resort – No Further Action Required
- Kauai Hilton Beach Villas – No Further Action
- Amfac Sugar, Lihue Herbicide Mixing Plant, 3-4671 Kapule/Kuhio Highway, Ongoing Superfund.

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6.1.7 Construction
The construction impacts are minimal.

6.1.8 Traffic
There will be no disruption to existing traffic patterns for the construction of the project.

6.1.9 Employment
The construction of the project will be a positive impact on the economy of Kauai as there will be needed the required number of laborers and supervisors for construction.

6.2 Long-Term Impacts

6.2.1 Land Use Changes
The proposed path corridor alternatives presented in this Draft EA are compatible with existing land use designations and are not anticipated to require any land use designation changes. The following is a summary of the issues related to the land use for the corridor.

6.2.2 State Land Use Classification
The State Land Use Commission, in Chapter 205 and 205A, HRD and Chapter 15-15, Hawaii Administrative Rules, (HAR) has the right to classify all lands in the State of Hawaii, and has ruled that they all fall within one of four categories, either Conservation, Urban, Rural, or Agriculture.

Most of the lands of the corridor fall into the Conservation Zone, and will require the preparation of a Conservation District Use Permit.
Further, lands mauka of the Conservation Zone on the Ocean Bay Plantation Property are zoned Urban, and also is an area behind the Hanama'ulu Beach Park owned by Grove Farms, around the Hanama'ulu Railroad Bridge is zoned Conservation (State) and Open (County). There is Industrial zoning in the area near the County's Refuse Transfer Station near the Airport.

6.2.3 County of Kauai Land Use Regulations

The County of Kauai General Plan regulates the long-term plans and development for all land, water and natural resources located on the island. Further, the General Plan specifies implementation action plans to manage growth and development. This is especially important in areas of sensitivity and viewshed opportunities.

The details of the County General Plan is outlined and discussed at length in Section 1.6.3.2 of this document.

Of special significance in this project is the Special Treatment Zone located along the coast on the Ocean Bay Plantation property.

6.2.3.1 Zoning

The project will not require any zoning changes from the County.

6.2.3.2 Special Management Area

The issues for this project that relate to the SMA are that development of this project will occur within the SMA, and will therefore require a permit, additionally, the budget for this project exceeds the $125,000 requiring a Major Special Management Area Use permit.

6.2.4 Churches and Institutions

There are no churches or institutions located in the vicinity of the project corridor to be affected.

6.2.5 Controversy Potential

There is widespread support for this project from the community and political leaders. The controversies brought to light at this point are from the family of native Hawaiians who feel the lands are theirs to determine the use and future of, and some of the golfers who do not want any pedestrian and/or path interface with the golf course.

6.2.6 Economic

There are no negative long-term impacts resulting from the bicycle and pedestrian path project.

6.2.7 Section 4(f)

Depending upon final path alignment location, can and/or may involve interaction with the following Section 4(f) properties, and therefore, a Section 4(f) permit is required:

- The State Parks facility, Ahukini Recreation Fishing Pier
- The County Parks facility, Hanama'ulu Beach Park
- The historic Hanama'ulu Railroad Bridge
- The historic Old Wharf at Hanama'ulu bay
- The County Parks facility, the Wailua Golf Course
- The County Parks facility, Lydgate Park

6.2.8 Historical Sites

The construction and use of the path and comfort station facilities will have no negative impact on any historic resources unless the path alignment is selected that is along Kapule/Kuhio Highway in the area of the existing re-internment site in the parking lot of the Wailua Golf Course. The Hanama'ulu Railroad

Bridge is in disrepair, and has some spalling of the concrete. Refurbishing this structure will make it stronger and last longer than without this project.

6.2.9 Archaeological Sites

No archaeological, cultural or historic sites will be negatively impacted with this project, with the exception of that mentioned in the item above.

6.2.10 Wetlands

No long-term impacts as all wetlands will be bridged or avoided.

6.2.11 Water Quality

The project will not affect water quality.

6.2.12 Wild/Scenic Rivers

There are no wild or scenic rivers on the project site.

6.2.13 Farmlands

There are no active farmlands on the corridor. The sugar cane fields that were on the Ocean Bay Plantation site and behind the Hanama'ulu Beach Park are no longer in production.

6.2.14 Endangered/Threatened Species

The only documented endangered marine species within the confines of the corridor are the Monk Seals, whose habitats will be unaffected by the project. The birds that have been documented will not be affected by this project. There are no endangered plant species on the island of Kauai.

6.2.15 Floodplains

The trail will be built with construction techniques and materials that are floodable. The comfort station will be built out of the floodplain. Best Management Practices program will be designed prior to commencement of construction to minimize storm water runoff during construction.

6.2.16 Traffic

There are no long-term impacts to traffic

6.2.17 Visual

The visual impacts are positive as there will be landscaping treatments along the bicycle and pedestrian path.

7.0 ALTERNATIVES TO THE PROPOSED ACTION

7.1 No Action Alternative

The No Action alternative involves no changes in the site. The trail project has been identified in the Lydgate Park Master Plan as one of the most important aspects of the park, and in Bike Plan Hawaii . Further, the project has been awarded TEA funds for the construction of the project, and there is high anticipation for the amenities of the trail and comfort station.

If the trail does not get built, there will be the entire south end of Lydgate Park that will become run down, and more and more, visitors to the park will be hesitant to use this end of the property, and will make this segment not be connected to the rest of the path system.

The golf course current use will remain the same, however, according to the coastal erosion studies, the beach in the area of holes # 17, 2 and 1 will continue to severely erode and the golf course will have to be re-designed and areas re-constructed.

If the project does not get built, the activities of the Marine Camp will continue with fishing and the motocross cyclists will continue to use the land for overflow for motocross cycling.

There will be no change to the activities at the Radisson or Kauai Beach Villas, to include a continuation of the homeless population that currently live in the drainageway south of the Radisson.

It is undetermined what the development plans are for the Ocean Bay Plantation with or without the completion of this project.

No action will certainly mean the further decline of the condition of the Hanama'ulu Historic Railroad Bridge.

There will be no changes for the Grove Farm, Airport, or Ahukini Point properties and facilities with no action on this project.

7.2 Alternative Development Options

At present, there are no other development uses for the property of the corridor of which we are aware.

7.3 Community Input

All of the park features of the corridor have enjoyed tremendous community input, consensus and support, despite that the park elements have never been available to pedestrians or cyclists.

As Lydgate Park lies in the middle of a dedicated bicycle/pedestrian path proposed to run seventeen miles from Nawiliwili Harbor to Anahola Beach Park, the community input asked for an opportunity to individuals and families for cycling, walking, or jogging in a safe place that is ADA accessible. The bike trail project is an outgrowth of this input, and not that the trail project idea was developed and presented to the community. This project is the product of the community expressed needs and vision.

The team has held a variety of meetings with stakeholders, special interest groups and have conducted two public meetings and has received support and suggestions for routing, materials, signage, educational opportunities, and extended uses to include equestrian.

Details about the first two public meetings is located in Section 13 of this document.

8.0 EXPECTED DETERMINATION

8.1 Finding of No Significant Impact (FONSI)

Based on the findings and investigations as evidenced in this report, the proposed path is not expected to result in negative significant social, ecoomic, cultural, or environmental impacts. As a result, it is anticipated that, as per the provisions of Subchapter 6 of Chapter 200, Title 11, Hawai'i Administrative Rules of the Department of Health, that a Finding of No Significant Impact (FONSI) will be determined for this project.

8.2 Findings / Significance Criteria and Reasons

According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, it's expected consequences, both primary and secondary, it's cumulative impact with other projects, and it's short and long term effects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant impact environmental impact will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

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

The proposed project will not cause any irrevocable loss of natural or cultural resources. The park features on the corridor have been historically used socially for park use, recreation and fishing. View corridors from inside the path to the ocean will not be impacted with the construction of the trail, and the comfort station will be located on the mauka side of the path.

As previously noted, no significant archaeological or historical sites are visible on the corridor. Should any archaeologically significant artifacts, bones, or other indicators of previous on-site activity be uncovered during the construction phase, their treatment will be conducted in strict compliance with the requirements of the Department of Land and natural Resources.

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

The alignment occurs within parks and park corridors that are dedicated to active and passive recreation. Currently, there is no restriction or direction given to people who walk, run or jog within the parks or through the various habitats. With the construction of the trail, the users will restrict movement to the trail and thereby protect the environment from encroachment.

3. *Conflicts with the State's long term environmental policies and guidelines as expressed in Chapter 344 HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders;*

The proposed trail project is consistent with the Environmental Policies established in Chapter 344, HRS, and the National Environmental Policy Act (NEPA).

4. *Substantially affects the economic or social welfare of the community or state;*

The proposed project will provide a significant and positive impact on the Kauai community in the short term with employment opportunities, and in the long term with enhanced and improved recreational opportunities.

5. *Substantially affects public health;*

During construction, there will be minor impacts to air quality and noise levels. After completion of the construction work, these will be insignificant or undetectable. The positive aspects of the proposed project in the areas of economic and social benefits of the community are greater than the "No Action" alternative.

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

Impacts on public facilities will not be an issue. It is expected that the trail project will bring more people to Kauai, but it is not expected that the trail project will bring an increase in population to live in Kauai.

7. Involves a substantial degradation of environmental quality;

The trail project will not degrade the environment either by its construction or by its use.

8. Is individually limited by cumulatively has considerable effect on the environment, or involves a commitment for larger action;

The Ahukini Point to Lydgate Park Bike Trail will make the parks usable and will be sited away from environmentally sensitive areas, and does not commit resources or energy for a larger action.

9. Substantially affects are rare, threatened or endangered species or it's habitat;

No endangered plant or animal species will be affected by the project.

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

There are no air quality or noise issues surrounding this project. All measures will be taken during construction to protect from runoff.

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 areas, geologically hazardous land, estuary, freshwater or coastal areas;*

Even though much of the corridor is located on the oceanfront, the path will be built off the dunes or coastal zones and will not affect erosion or bank stabilization.

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

The views into or out of the corridor will not be affected by the path.

13. *Requires substantial energy consumption*;

The construction of the path, the bridges and/or comfort station will not require substantial consumption of energy or resources, neither will the use of same.

9.0 REFERENCES

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United States Department of Agriculture, Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Molokai, and Lanai, State of Hawaii, August 1972.

The Environmental Guidebook, prepared by the Office of Environmental Quality Control, State of Hawaii, October 1997.

The Lydgate Park Master Plan Report, dated, June 1999.

The Ocean Bay Plantation Final Environmental Impact Statement, dated June 2002. Prepared by Group 70 International, Inc. for EWM Kauai, LLC.

Lihue-Hanmaulu Master Plan Final Environmental Impact Statement, dated January, 1995. Prepared by PBR Hawaii for The Lihue Plantation Company, Ltd. and AMFAC/JMB Hawaii, Inc.

Survey Name: Inventory Survey Ocean Bay Development, PHRI, 2000 (for the area between the Radisson and Hanama'ulu Bay)

Study Name: Archaeological Monitoring During Wailua Golf Course Irrigation System Renovation, County of Kauai, Dept. of Public Works, (TMK: 3-9-05: Portion 1) SCS Archaeology, Fager and Spear 12, 2000

Survey Name: Archaeological Inventory Survey with Subsurface Testing for Proposed Fiber Optic Cable Landing, Wailua Golf Course, Kauai (TMK: 3-9-portions Plat 02 and 05)

Assessment Name: Archaeological Assessment of A Corridor For a Proposed Bike Path in Lydgate State Park 2001 (TMK: 3-0-06) by David Sheidler

Study Name: Archaeological Monitoring of the Kapule/Kuhio Highway Widening Project, 1995, by Carol Kawachi

Survey Name: Archaeological Survey of Wailua River Mount, TMK: 4-1-04: 01, 1993, Carol Kawachi

Study Name: Archaeological Investigations: Lydgate Area, Wailua River State Park, (TMK: 3-9-06:4) 1987, Martha Yent.

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Survey Name: Archaeological Inventory Survey, Ocean Bay Plantation at Hanamau'ulu, Land of Hanama'ulu, Lihue District, Island of Kaua'i. PHRJ Report 2182-082101. Prepared for EWM Kauai, LLC. (October, 2001), by A.B. Corbin, with A.T. Walker, L. Kalima, H.W. Smith, and S.T. Goodfellow.

Study Name: Cultural Impact Assessment Study, Ocean Bay Plantation at Hanama'ulu. Land of Hanama'ulu, Lihue District, Island of Kauai (TMK: 4-3-7-3:1 ; 4-3-9-5:5). Technical Report for Environmental Imapct Statement. Prepared by PHRJ for EWM Kauai, LLC., December, 2001.

Study Name: A Cultural Resource Reconnaissance for the Wailua River Hydropower Study. Prepared for the U.S. Army Corps of Engineers. Prepared by Archaeological Research Center Hawaii (ARCH 14-79, F.K.W. Ching, 1981.

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Letter Report: Supplement to Archaeological Letter Report of November, 1988 for Mr. Shiro Nishimura, Archaeological Reconnaissance and Test Pitting of a Proposed Sub-Division, (TMK: 3-2-08-1, Nawiliwili, Puna, Kauai Island, Lett4er report dated May 20, 1989.

Study Name: The Archaeology of Puna, Kauai, Niumala, Ahupua'a, Loke Kuapa O Alekoko, Hawaiian Archaeological Journal, 73-1. Archaeological Research Encter Hawaii, Prepared for Kanoa Estate by F.K. W. Ching with P.B. Griffin, W. Kikuchi, W.H. Albrecht, J.C. Belshe, and C. Stauder, 1973.

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Study Name: The Heiau at Wailua, Kauai Historical Society, Lihue, Kauai, prepared by E. Damon, 1934.

Study Name: Phase I Literature Review, Archaeological Assessment and Recommendations for the Kauai Community Correctional Center Sewage Force-Main Project, International Archaeological Research Institute, Inc. Prepared for the Division of Public Works, Honolulu, prepared by C. Erkelena, and D.J. Welsh., 1993.

Survey Name: Archaeological Survey and Subsurface Testing at Kanoa Estate Lands, Niumalu, Kauai, Cultural Surveys, Hawaii, Prepared for Kanoa Estate, Inc. Prepared by W.H. Folk and H.H. Hammatt, 1991.

Survey Name: Archaeological Inventory Survey with Sub-Surface Testing for the Proposed Fiber Optic Cable Landing, Wailua, Kauai (revised January 1994) Cultural Surveys Hawaii. Prepared for R.M. Towill Corporation by W.H. Folk and G.K. Ida, E.W. Novack and H.H. Hammatt. 1994.

Study Name: Archaeological Reconnaissance of an 18 Acre Parcel in Lihue Town, Kalapaki, Report prepared by Archaeological Research Center for M.J/ Burke and Co. (ARCH 1135) Prepared by H.H. Hammatt, 1978a.

Study Name: Archaeological Reconnaissance of Ninini Point Area, Kalapaki, Report prepared by Archaeological Research Center for Belt Collins and Associates, (ARCH 14-176) by H.H. Hammatt, 1978b.

Study Name: Archaeological Reconnaissance of an 118 Acre Parcel in Lihue Town, Kalapaki, Puna, Kauai Report prepared by Archaeological Research Center for M.J. Burke and Co. (ARCH 14-298), 1978c.

Survey Name: Archaeological Reconnaissance Survey of 150 Acres of Coastal Land, Kalapaki, Kauai Island, Cultural Surveys Hawaii. Prepared for Belt Collins and Associates. Prepared by H.H. Hammatt, 1988.

Study Name: Archaeological Assessment of Phase III, IV, V. Kauai Lagoons Resort, Cultural Surveys Hawaii, by H.H. Hammatt, 1990.

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Survey Name: Archaeological Inventory Survey of 61.6 acres in Nawiliwili, Kauai. Cultural Surveys Hawaii, Prepared for Shiraishi, Yamada, and Murashigo. Prepared by H.H. Hammatt, and V.S. Creed, 1992.

Survey Name: Archaeological Inventory Survey, Grove Farm Kihue/Puhi Project Area, Lands of Nawiliwili, Niumahi, and Sa'iku, Lihue District, Island of Kauai, PHRJ Report 498-092893. Prepared for Grove Farm Properties, Inc. by J.D. Henry, and A.T. Walker, K. Maly, and P.H. Rosendahl. 1993.

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Survey Name: Archaeological Inventory Survey, Likue, Puhi. Hanama'ulu Master Plan, Land of Hanama'ulu, Kalapaki, Nawiliwili, Niumaulu, and Wailua, Lihue District, Island of Kauai. PHRJ Report 894-020591. Prepared for AMFAC/JMB Hawaii, Inc. Prepared by A.T. Walker, L. Kalima, and S.T. Goodfellow. 1991.

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Survey Name: Archaeological Inventory Survey, Hanama'ulu Affordable Housing Project Area. Land of Hanama'ulu, Lihue District, Island of kauai, PHRJ Report 729-122689. Prepared for AMFAC, Inc. and Helber, Hastert and Kimura, Planners. Prepared by A.T. Walker and P.H. Rosendahl. 1990.

10.0 PUBLIC MEETINGS
10.1 Public Meeting Number One

AGENDA
Environmental Assessment Public Meeting #1

Wednesday, June 22, 2005
7:00 PM to 9:00 PM
King Kaumuali`i Elementary School
Hanama`ulu, Hawaii

7:00 – 7:10	Welcome to Attendees Introduction of County officials in attendance Summary of the agenda for meeting Introduction of Doug Haigh, County Project Manager
7:10 – 7:25	Presentation on Nawiliwili – Anahola Bike & Pedestrian Path Project by Doug Haigh Questions and answers
7:25 – 8:00	Introduction Merle Grimes, MDG, Inc LLC, team lead Introduction of team and respective roles Presentation on Ahukini-Lydate Bike & Pedestrian Path Environmental Assessment project Questions and answers
8:00 – 8:05	Small group exercise instructions Break into 4 groups Each group has one or more project team members Groups provided with maps and colored markers Assignment: Mark **special and significant places** in **green** Mark **preferred trail alignments in blue** Mark **desired amenities and locations in red** Use **post-it notes** to provide more detail 5 minute summary report to the large group
8:05 – 8:40	Small groups meet to complete their assignments
8:40 – 9:00	Small group summary reports – 5 minutes max each
9:00	Next steps and brief closing remarks

AHUKINI-LYDGATE BIKE & PEDESTRIAN PATH

Environmental Assessment Public Meeting #1

Wednesday, June 22, 2005
7:00 PM to 9:00 PM
King Kaumuali`i Elementary School

MEETING NOTES

WELCOME AND MEETING OVERVIEW

Project Team Public Communications Consultant and meeting facilitator, Roxanne MacDougall opened the meeting and reviewed the agenda and objectives, which were:

- Provide information on the scope of the environmental assessment project
- Present a visual tour of the path corridor, with discussion on potential alignments
- Answer questions and receive public input on the project

OVERALL MULTI-USE PATH HISTORY AND BACKGROUND

Doug Haigh, Chief of the County Building Division and Project Manager for the Nawiliwili to Anahola Bike and Pedestrian Path Project provided background on the origins of the project. Details on this information may be found in the County of Kaua`i website, on a page devoted to the bike and pedestrian path project. The page address is www.kauai.gov/bikepath/aspx.

AHUKINI-LYDGATE PATH PRESENTATION

Lead consultant, Merle Grimes, of Merle D. Grimes LLC, presented an extensive discussion of the options and issues related to this phase of the path. A PowerPoint slide show was used to provide a visual tour of the path corridor.

During the presentation, members of the consulting team provided additional information. Sara Simmons-Fife, Sweetgrass Design, described the complex permitting process required as part of the environmental assessment. Charles Fletcher, PhD, University of Hawaii coastal expert, discussed the causes of beach erosion and the possibilities available for a win/win solution that protects the golf course while providing a coastal path. He stressed that beach erosion can not be stopped, but it can be delayed and reduced by periodic replenishing of the dunes. Mike Dega, SCS Archeology, spoke about the historically and culturally significant sites along the ocean side path. There are numerous prehistoric sites, as well as plantation era sites. These would be protected and educational signage installed along the path.

QUESTIONS, ANSWERS AND COMMENTS:

Question from Attendee: If I started my own bicycle company, for the bike path, there are a lot of people out there who walk. Who takes precedence?

Doug Haigh (project manager for the County) answers: As people, we work it out. Signs tell the protocol.

Merle Grimes (team lead) answers: In Lydgate, the Federal funding is to reduce vehicular traffic. Bicycles are a major component of that. We design these at a standard that can accommodate a variety of uses. The path allows for walkers, joggers, cyclists which is the reason for the 10-12' path. Some neighborhoods require a 14' wide path. Sometimes we put a stripe down the middle to differentiate users.

Cyclists have every right to be on the path.

The etiquette, calls for cyclists first. Signage like at Lydgate indicates that when a cyclist is approaching a pedestrian or slower cyclist is to announce "on your right, passing on your left". Usually it just works out.

There are no national liability issues typically with mixed use path projects. Most paths are there for recreation. The highway cyclists who want to go fast are usually on the highways.

Comment from Attendee: Planning of this is wonderful, in the future more tourists will be in front of the Kauai Villas and the Radisson, there will be more of this, and wonder what the impact will be in the future, the hotels will be encouraging people to use the paths, not use the highway. This is a good thing.

Comment from Attendee: Liberta Aubau, Kamehameha will be building school at the edge of the golf course on Leho Drive, and the fourteen acre area confronting Aloha Beach hotel, there will be a commercial development by the Department of Hawaiian homes. Across the highway from the Correctional Facility all the way to the Wailua River there will be new homes planned. The first increment will be 200 homes in 2007. Will offer a copy of the plan.

MAP EXERCISE
After the presentation, and questions/answers, meeting participants gathered around a map of the corridor. They marked special places, preferred path alignments and amenities. They discussed their preferences with the consulting team.

CLOSE
Merle Grimes thanked the participants for their excellent feedback. The second public meeting will be held August 22, 2005 at the Lydgate Park Pavilion.

Ahukini-Lydgate Bike & Pedestrian Path
Press Release

June 1, 2005

FOR IMMEDIATE RELEASE
Contact: Roxanne MacDougall 808-822-5798

Re: **Ahukini-Lydgate Bike & Pedestrian Path Public Information Meeting #1**

The first of three public information meetings for the Ahukini-Lydgate Bike/Pedestrian Path has been scheduled for June 22, 2005, at King Kaumuali`i Elementary School from 7:OO PM until 9:00 PM.

MDG, Inc. has been contracted by the County Department of Public Works to evaluate alternative alignments and prepare the environmental assessment for the shoreline bicycle and pedestrian path which will run from Ahukini Landing to the Kamalani Kai Bridge in Lydgate Park. This project is one segment of the overall plan to have a 16-mile coastal trail which will connect Nawiliwili Harbor with Anahola. The first phase, the Lydgate Bike & Pedestrian Path project, was designed by MDG, Inc.

The community is invited to attend this first meeting to learn about the project and to give input to the planning process. Meeting participants will learn about path alignment options, give feedback on their preferences and identify potential areas of concern.

The MDG team will create a section with the County website dedicated to providing information on the Ahukini-Lydgate project, as well as the overall bike path. Information on the website will be provided at Public Meeting # 1.

For more information, contact Public Communication Project Consultant Roxanne MacDougall at 822-5798.

(see attached overview and background article about the Nawiliwili – Anahola project)

Ahukini-Lydgate Bike & Pedestrian Path
Press Release

June 1, 2005

FOR IMMEDIATE RELEASE
Contact: Roxanne MacDougall 808-822-5798

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For more information, contact Public Communication Project Consultant Roxanne MacDougall at 822-5798.

The following information was published for the County of Kauai Path website and was posted on June 21, 2005.

MacDougall
and Associates

Nawiliwili to Anahola Bike/Pedestrian Path

In 1994, the Hawai`i Department of Transportation completed a statewide master plan. Based on public input at community meetings on Kaua`i, a 16-mile coastal bike and pedestrian trail from Nawiliwili to Anahola was included in the plan.

In 1999, with the impetus of the Lydgate Park Master Plan and with active support from Mayor Marianne Kusaka, the County was able to secure $2.6 million of Federal Highway Administration funds for the first section of the trail. County funding and volunteer labor for the bridge construction provided a match for Federal funds. After completion of the project, the County was reimbursed for almost all of the costs.

This 2.5 mile, 10-foot wide concrete path runs from the Wailua River to the Kamalani Kai Bridge. In conjunction with this phase of the overall path project, additional amenities were added: landscaping, a campground, refurbishing of an old restroom facility, new restrooms with showers, and an arts pavilion. All are linked by the path and are key elements of the overall plan for expanding Lydgate Park.

Also in 1999, then Councilmember Bryan Baptiste chaired public meetings to get input for planning the coastal trail. The path was named Ala Hele Makalae, "the path to walk or to go along the coast". An advisory group was formed and continues to meet. Today, Mayor Baptiste is a strong advocate for the project. The overall goals for the Nawilwili to Anahola bike/pedestrian path are:

- Protect shoreline access for residents and visitors, including those with mobility impairments.
- Promote health and fitness.
- Enhance access to culturally significant areas.
- Preserve historic railroad corridors.
- Provide alternative transport routes.

In 2001, Kealia Makai Holdings, with Justin Hughes as manager, dedicated 7.23 acres of Kealia Beach lands to the County of Kaua`i, for the purposes of creating a public park. The County budgeted $75,000 in Capital Improvement Funds for the bike/pedestrian path.

In 2002 the Kealia Makai Property Owners Association, with Tom McCloskey as manager, dedicated 59 acres along the old cane road from Kealia Beach to Ahihi Point near what is known as "Donkey Beach". The County received a $200,000 HUD grant for the planning of the Kapaa-Kealia path, with the support of Senator Daniel Inouye.

These land donations were valued at $7.4 million and used in 2003 as a “soft match” for the approval of Federal Highway Administration (FHWA) funding for the entire trail. A soft match is the contribution a county makes to the overall cost of a project, which gives the government the incentive to then make federal funds available. The contributions may be in the form of land donations or community labor, as in the building of the Kamalani Kai bridge. The value of these donated lands were critical in giving impetus and funding to Kaua`i’s coastal trail project.

Also in 2003, FHWA approved a $10 million budget for the Kapa`a to Kealia section of the trail and $250,000 for the Lydgate to Kapa`a environmental assessment. In 2004, FHWA approved $500,000 for the Ahukini Landing to Lydgate Park environmental assessment

FHWA provides what are called “Transportation Enhancement Funds”. These funds are to be used for providing facilities for pedestrians and bicycles, safety and educational activities for pedestrians and cyclists, acquisition of scenic easements and scenic or historic sites, scenic/historic highway programs, landscaping and historic preservation. The Nawiliwili to Anahold Bike/Pedestrian Path fits exactly into this category of federal funds. In addition, FHWA provides congestion mitigation and air quality improvement program funding.

The federal funds provided to the Kaua`i project are designated specifically for bike/pedestrian trails. They can not be used for other highway related needs. The County does not have the discretion to use these funds for any other purpose. The total cost of the entire trail system is anticipated to be in the range of $30 million. This cost is based on the need for each segment of the trail to have an environmental assessment phase and a design/build phase. Each requires the expertise of numerous professionals in the fields of environmental science, Hawaiian culture, archeology, engineering, construction, bridge design, public communications and the complex permitting process. Kaua`i is fortunate be among the communities selected to receive these
targeted federal funds.

The County of Kaua`i will contribute capital improvement funds where needed and when available. It will also fund the on-going maintenance of the path system through the budget of the Parks Department. Design and construction specifications are for a highly cost-effective,
low-maintenance path and related improvements.

The Kaua`i Coastal Path will be completed in **six sections**, each of which will require its own **environmental assessment report process** and **design/build process**, both offering a series of three public meetings. Therefore, **each section of the trail will have a total of six public meetings** during its development.

The environmental assessment project team will include public feedback in their research to determine **three alternate alignments** and amenities for the path. The County will then decide which recommendation to accept. It will hire a **design/build project team to finish the design and complete the construction,** also with public education and input.

Phase I, 2.5 miles through Lydgate Park, is now completed and being enjoyed by residents and visitors.

Phase II will run from Lihi Boat Ramp in Kapa`a to Ahihi Point at Kuna Bay, or Donkey Beach. This 4.3 mile stretch will include the improvement of the existing cane haul bridge and cane road, as well as addition of an equestrian trail from Kealia Beach to Kuna Bay. The environmental assessment has been completed, the County has selected an alignment option and the contract has been awarded for the design/build, which is expected to be completed in 2006 or early 2007. This section includes the improvement or replacement of four bridges.

Phase III will run 2 miles from Lydgate Park to Lihi Boat Ramp in Kapa`a. The environmental assessment is in process. Construction and land acquisition funds have been allocated for fiscal year 2005-2006. The design/build team has not yet been selected.

Phase IV covers 4 miles from Ahukini Landing to Lydgate Park. The environmental assessment process began in May 2005 and is expected to be completed by year end. Construction and land acquisition funds have been allocated for fiscal year 2005-2007. This section of the trail will include Hanama`ulu Beach Park, open lands between the park and the Radisson, and the Wailua Golf Course. The recommended alignments will be greatly dictated by the geographic features and terrain along the coast.

Phase V will be the 3 miles from Kuna Bay to Anahola. An environmental assessment will begin in 2005, with construction projected for 2006.

Phase VI will connect the path from Ahukini to Nawiliwili, 8 miles, the longest stretch of the overall project. The environmental assessment will begin 2006 and construction is projected for 2008.

The Nawiliwili to Anahola Bike/Pedestrian Path will be one-of-a-kind, not only in Hawaii, but throughout the world. It will provide coastal access, in compliance with the Americans with Disabilities Act and will offer scenic views, picnic pavilions and restroom facilities all along the way. It will be a treasure that Kaua`i residents and visitors will be able to enjoy for many years to come.

10.2 Public Meeting Number Two

AHUKINI-LYDGATE BIKE & PEDESTRIAN PATH

Environmental Assessment Public Meeting #2

Monday, August 22, 2005
7:00 PM to 9:00 PM
Lydgate Park Pavillion

MEETING NOTES

NOTE: THIS EVENT WAS FILMED BY HOIKE PUBLIC TELEVISION AND WILL BE AIRED ON CHANNEL 52.

WELCOME AND MEETING OVERVIEW

Project Team Public Communications Consultant and meeting facilitator, Roxanne MacDougall opened the meeting and reviewed the agenda and objectives, which were:

- Provide information on potential path alignments
- Answer questions and receive input on proposed or new alignments, significant places and desired path amenities.

OVERALL MULTI-USE PATH HISTORY AND BACKGROUND

Doug Haigh, Chief of the County Building Division and Project Manager for the Nawiliwili to Anahola Bike and Pedestrian Path Project provided background on the origins of the project. Details on this information may be found in the County of Kaua`i website, on a page devoted to the bike and pedestrian path project. The page address is www.kauai.gov/bikepath/aspx.

AHUKINI-LYDGATE PATH PRESENTATION

Lead consultant, Merle Grimes, of Merle D. Grimes LLC, presented an extensive discussion of the options and issues related to this phase of the path. A PowerPoint slide show was used to illustrate the geography and simulate various ways the path might be designed. Six maps were taped to tables, so that participants could look at them and write comments during the presentation.

Several path alignment options were discussed, including:

- A totally coastal pathway, running from Ahukini Landing to the Kamalani Kai Bridge, along the ocean. This option will require beach restoration along the Wailua Golf Course, where erosion is a major problem.
- A route that moves inland to go around the golf course along the highway.
- A route that partially goes along the ocean side of the golf course and also goes along the highway, with a tunnel to move pedestrians and cyclists across the golf course, with minimal disturbance to golfers.
- A route that avoids the golf course entirely by going mauka of the highway.

During the presentation, four members of the consulting team provided additional information. Sara Simmons-Fife, Sweetgrass Design, described the complex permitting process requires as part of the environmental assessment. Charles Fletcher, PhD, University of Hawaii coastal expert, discussed the causes of beach erosion and the possibilities available for a win/win solution that protects the golf course while providing a coastal path. He stressed that beach erosion can not be stopped, but it can be delayed and reduced by periodic replenishing of the dunes.

Frank Sullivan, golf course designer, spoke about the use of tunnels in golf courses. He has implemented a tunnel at Pua Kea golf course.

Mike Dega, SCS Archeology, spoke about the historically and culturally significant sites along the ocean side path. There are numerous prehistoric sites, as well as plantation era sites. These would be protected and educational signage installed along the path.

Merle Grimes concluded the presentation, with a summation of the options. He then opened the floor to questions, answers and comments.

QUESTIONS, ANSWERS AND COMMENTS:

C- If we don't restore the dunes, we will lose part of the golf course. This is the simple fact that we must recognize. We don't have a choice.

Q - What about the moving of boulders. Several years ago, the county had issues with

A - We will not be moving existing boulders. They will be buried in the sand.

Q - What are the options for connecting with the Kamalani Kai Bridge? Can we consider a cable bridge? What about the wheel chair area?

A - We are intending to design a bridge compatible with the existing bridge. We can consider a cable bridge and will ensure wheelchair access.

C - Please make the path accessible with dogs, and horses if possible. Allow dogs on leashes so people have a place to walk their dogs.

C - The Kapaa Business Association is in support of the path. The speaker had some concerns about putting the path along the golf course lower to the beach, in order not to block the view from the golf course. The tunnel is better than going alon the dunes. There are safety issues with people potentially getting hit by golf balls. The fence and protection takes away golfers' view of the ocean. This is one of the top public golf courses in the country. We don't want to hurt this position.

C - I prefer the coastal route. I also prefer that you keep the signs low to the ground so they don't intrude upon the views and environment.

Q - Why would you consider any non-coastal options? Other options are not for pedestrians and not true to the "Beach access forever" slogan. Also, the county is overwhelmed now. How will they handle litter, vandals, unauthorized vehicles, etc? Will there be a ranger?

A - A maintenance plan will be included with the environmental assessment. It is difficult to determine costs until the path alignment is selected. The issues you raise will be explored with County officials. Vehicles can be locked out. Other communities have formed non-profits to support the maintenance, safety and enjoyment of the pathways. Kaua`i could consider such a model.

C - "Undesirables" will be on and around the path at night, making it unsafe. It is hard to stop them.

Comment submitted in writing at the end of the meeting:

New TEA funding just passed. More money for cycle/pedestrian projects comes down to the state DOT in the millions. Use that money for the Kapule/Kuhio Highway cycle/pedestrian improvements later (make the State DOT accountable). Use this money, the current TEA funds, for the coastal path.

SMALL GROUP EXERCISE

The participants were asked to break into small groups. Each group had one or more project team members with them. The groups worked with the black and white area maps taped to the tables. They were given colored markers. Their assignment:

- Mark special and significant places in green
- Mark preferred trail alignments in blue
- Mark desired amenities and locations in red
- Use post-it notes to provide more detail

There was active participation and a wealth of feedback provided. The consultants collected all maps and will process the feedback provided.

FINAL UNOFFICIAL "STRAW" VOTE

To get a sense of where people were in their preferences at the end of the meeting, the audience was polled on their choice of path options. The results were:

- Coast path only - 27 votes
- Tunnel options - 4 votes
- All highway option - 0 votes
- Mauka option - 0 votes.

CLOSE

Merle Grimes thanked the participants for their excellent feedback. The third and final meeting will be held in the late fall/early winter. The date will be announced through multiple media, including the web page www.kauai.gov/bikepath.aspx.

Ahukini-Lydgate Bike & Pedestrian Path

August 1, 2005

FOR IMMEDIATE RELEASE
Contact: Roxanne MacDougall 808-822-5798

Re: **Ahukini-Lydgate Bike & Pedestrian Path Public Information Meeting #2**

The second of three public information meetings for the Ahukini-Lydgate Bike & Pedestrian Path has been scheduled for **Monday, August 22, 2005, at the Lydgate Park Pavilion from 7:OO PM until 9:00 PM.**

Merle D. Grimes, LLC. has been contracted by the County Department of Public Works to evaluate alternative alignments and prepare the environmental assessment for the shoreline bicycle and pedestrian path which will run from Ahukini Landing to the Kamalani Kai Bridge in Lydgate Park. This project is one segment of the overall plan to have a 16-mile coastal trail which will connect Nawiliwili Harbor with Anahola. The first phase, the Lydgate Bike & Pedestrian Path project, was designed by MDG, Inc.

Meeting #1 was held June 22, 2005 from 7:00 PM to 9:00 PM at King Kaumual`i Elementary School. It provided an overview of the Ahukini-Lydgate project, as well as a visual tour of the general route of this segment of the path. Participants shared information on preferred path alignments, desired amenities, and significant places.

Meeting #2 will also offer an overview of the Ahukini to Lydgate environmental assessment project, for those who missed Meeting #1. Consultants will provide more specific information on their research for potential path alignments. Meeting participants will be invited to ask questions, and to give input on their preferences and concerns.

The Planning Team has created a page in the County website dedicated to providing information on the Ahukini-Lydgate project, as well as the overall bike path. It currently contains an overview of the Nawiliwili-Anahola path project. As meeting notes and other documents are created, they will be posted on the web page. The web address is www.kauai.gov/bikepath.aspx.

For more information, contact Public Communication Project Consultant Roxanne MacDougall at 822-5798.

The Garden Island – Thursday, June 9

Bike-way focus shifts to Hanama‘ulu segment

By Lester Chang - The Garden Island

With Kaua‘i, work underway to develop the second leg of a proposed 16-mile bicycle and pedestrian coastal pathway to beautify East county officials are turning their attention to the next phase.

Representatives from MDG, Inc. and county officials will be holding the first of three public-informational meetings for a four-mile pathway from the Ahukini State Recreational Pier near Lihu‘e Airport to Lydgate Park in Wailua on Wednesday, June 22, from 7 p.m. to 9 p.m. at King Kaumuali‘i Elementary School in Hanama‘ulu.

The meeting comes on the heels of recent actions by county leaders to award a nearly $12-million contract to Jas. W. Glover leaders to design and build a 4.3-mile leg of the coastal trail from the county Lihi Park by the Pono Kai Resort in Kapa‘a to Ahihi Point, commonly known as "Donkey Beach."

The entire 16-mile project, which consists of six phases, is intended to preserve access to and beautify the coastline from Ahukini to Anahola. The project will result in much easier beach access, benefiting residents and visitors.

For the latest project, MDG Inc. leaders have been contracted by officials in the Kaua‘i County Department of Public Works to study various alignments before one is selected and is developed.

The consultant also will be preparing an environmental assessment for the pathway.

Determining the alignment will not be easy. Two years ago, the owner of a 400-plus-acre parcel located north of Hanama‘ulu Bay had his own ideas about how the bicycle path should be developed on his property.

E.W. Moody, a Las Vegas-based landowner, had proposed an upper-end residential project and golf course on his property in 2003.

At the time, Moody had proposed a bicycle pathway in his own project, and wanted to maintain the improvement, county officials were told at the time.

County officials said they would work with him in determining the alignment of the project, nonetheless.

Residents are invited to the June 22 meeting to learn about the project and to give input, according

to Roxanne MacDougall, a consultant on the project.

An environmental assessment began in May, and is expected to be completed by the end of this year, MacDougall said. Some $500,000 in Federal Highway Administration funds will be used for that task, she said.

Construction and land-acquisition funds have been allocated for fiscal years 2005-2007. Mac-Dougall said that the coastal leg will include portions of Hanama‘ulu Beach Park, open lands between the park and the Radisson Kauai Beach Resort and the Wailua Golf Course, and that the alignment will be dictated by the terrain.

The first phase of the six-phase, 16-mile project, includes a 2.5-mile trail through Lydgate Park. This portion has been completed and is being used by the public.

The second phase involves the construction of a 4.3-mile leg from Lihi Park to Donkey Beach.

The other three phases include: a 2-mile portion from Lydgate Park to Lihi Park; a 3-mile leg from Kuna Bay to Anahola; and an 8-mile portion from Ahukini to Nawiliwili Harbor. The total cost of the 16-mile pathway is anticipated in the range of $30 million, primarily from federal dollars.

Kaua‘i County officials will contribute capital-improvement funds when needed and when available, they said. The maintenance of the pathway will be undertaken by county workers when the entire 16-mile project is completed. For more information on the latest project, please contact MacDougall at 822-5798.

- *Lester Chang, staff writer, may be reached at 245-3681 (ext. 225) or lchang@pulitzer.net.*

PRO BIKE LETTER TO THE EDITOR

1. Mr. Rapozo wasn't it you and the County Council that OK'd the $4.3 million and 6 months of closure for a main artery 20' x 20' mini Olohena Bridge to the Wailua and Kapa‘a Homesteads? At the same time denying the $1/4 million, 2 week closure, 35 year life expectancy alternative bridge; instead of using the $4.3 million to start another lane over the Wailua River?

2. Mr. Rapozo comparing a $30 million project to "screens on the Kekaha Neighborhood Center" isn't that a tremendous stretch of imagination; like comparing an apple with a Redwood Forest. And shame on the adult children of the seniors in Kekaha...if the situation is so bad why don't they screen the place for their folks. It has to be less than $1 million. Plus how many Seniors are in Kekaha compared to the population of the greater Kapa'a neighborhoods of the Kawaihau District that will have the opportunity to use the bike path. Geeeesh!!! The bike path will bring out more and more people as they discover the wonderful feeling of vitality from exercise in a beautiful environ.

3. Mr. Rapozo kids on the bike path headed to beach activities from the largest residential district on Kauai more than likely are staying away from drugs and crime. The kids need diversion from drugs and crime...bike paths serve that purpose and free up parents from having to drive them to and from a very healthy activity. The bike path is free for all ages and all the members of the community. If you want to save money...close the Wailua Golf Course which serves so few for too much of our tax dollars.

4. I think Mr. Doug Haigh has made it perfectly CLEAR, over and over. The FEDS say the money is for the bike path only...or let us know and we'll give the money to another less stupid community in America. Which part of "Federal $ earmarked for a bike path only" do you not understand? You yourself said that we can't let the $4.3 million for the Olohena Bridge not come to Kauai....why not Fed $ for this awesome bike path. As well, should we give the generous Hughes and the McClusky's their ocean front land back and let them bar us from ever going to that area again. Sounds like shooting oneself in the foot.

5. And Mr. Mickens, your complaint of an "ugly concrete path"...well Glenn, come on, you been here long enough. How about the "ugly asphalt (now broken up and uglier) haul cane roads" with those monster ugly haul cane trucks of the past, some with cane still burning in the back; circling much of the island from field to mill. The bike path will be like heaven compared to the hell of hauling cane. And Mr. Mickens, the reason sane people do not use the "bike paths" of our now Kauai Super Highways is because it is an insane risk to ones life to use them, you can't figure that one out?

We need a safe bike path, and we need it now for every age group on Kauai and especially Kawaihau district.

• *Jay Trennoche*
Kapa'a

APPENDIX A

CONSULTATION MEETING MINUTES

ORGANIZED BY DATE AND TIME

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	February 2, 2005
TIME OF CONVERSATION:	8:30 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Doug Haigh, County Project Manager, Public Works
MEETING SUBJECT:	General Permitting Issues

Sara called Doug to get some general information basic to beginning the permitting process.

The issues discussed are listed below:

Certified Shoreline Survey
Sara asked Doug who the team should coordinate the survey with from the County. Doug said it would be George Kalisik.

Mapping
Sara asked Doug about existing mapping, and he said that the current aerials are from 1975.

State Parks
Sara told Doug that she had talked with Wayne Sousa to get an idea from him of what the issues State Parks might have with this project, and Wayne indicated that he felt that the County had invaded the setback around the Hikinnala Heiau at the Aloha Beach Resort at the area of the turnaround. He would not work with the County until this issue had been resolved.

Doug said that these issues were resolved in the Environmental Assessment for Lydgate Park as evidenced by the comment letters in the record.

Tax Map Keys and STP Number
Sara asked Doug for assistance in determining what the TMK's are for this project and Doug said he would get her the numbers. He said that the STP for this project is : 070051

Property Ownership
Sara needed confirmation about who the property owners are that might be consulted on the project.

Doug said that Sara was to contact the owners to determine what their issues might be. Sara indicated that usually this communication does not typically occur at this stage of the permitting, and Doug said that Sara should contact Pat Phung for the go-ahead.

Doug said that the owner of the Hanama'ulu Railroad Bridge to Ahukini Point is Lihue Land Company and the contact person is Mike Furukawa, 808-245-3678.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	April 20, 2005
MEETING TIME:	9:00 a.m.
MEETING LOCATION:	Doug's Office
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Doug Haigh Tim Bynum Merle Grimes Sara Simmons-Fife
MEETING SUBJECT:	Kick Off Meeting with Client

Lydgate Sports Fields
Doug requested that the maps be reprinted at 20 scale. Merle and Sara agreed.

Ahukini to Lydgate Park Limits of Project
Sara requested information regarding the exact limits and boundaries of this segment. Doug indicated that this segment would begin at Ahukini Point, access the Hanama'ulu Railroad Bridge, the Hanama'ulu Beach Park and end at the play bridge at Lydgate.

Highway Access to the Project
Doug said the access to the project would be from Kapule/Kuhio Highway

Invoices
Doug said that we are to invoice based on a Schedule of Values, and he would email us the spreadsheet to use.

Identifying Property Owners
Doug said that the Moody Property is owned by the Hosako Corporation. A man named Dave Walters may have an option of it.

Tim said that the contact for the Radisson Hotel is Mr. Brian Anderson, who lives on the Big Island. Neither Tim nor Doug had a name for the Kauai Beach Villa's, but indicated that the facility is north of the Radisson.

Doug said that Tom Bartlett could help with property ownership.

Tim said he would get me a name for a contact with the Motocross Group.

Contact names for information about the Hanama'ulu Beach Park are Eddie Cereta, Olli and Rocky Sasaki and Kathy Simon.

Property Owners, cont.

Doug said that the Ahukini Point contact is Harbors and State Parks, and the Airport is the Airport Authority. At Port Allen, there are helicopters only.

Mapping
Doug said that the ownership maps and tax maps are in a .tif format. And that he would get us an electronic version of the FIRM maps from Harry Beatty.

Schedule
Doug would give us the schedule for the project to be completed, minus the days and weeks when permits are being reviewed and the clock stops. But, overall, Doug thinks there is 211 days in the contract. The date for the first public meeting was discussed. Dates in May and June were considered. Due to scheduling conflicts with the County including pre-scheduled County Council meetings, the public meeting presentation was scheduled for Wednesday, June 22, 2005.

The Motocross Facility Interaction with the Path Project
Tim said that later we might pave the road at the trailhead by the motocross. He wants to see that the ATV's are stopped from accessing the beach. Doug suggested that we might negotiate with the Radisson to use their road.

Tim said he would get Sara the contact name for the Motocross group. Further, that this group wants a bathroom and running water. Currently there is dangerous inaction with the highway, and that possibly the facility may be moved, and the compensation to the group may be giving them fifteen acres for the new facility.

Junior Golf Facility
Tim mentioned that there is interest in developing a Junior Golf project with the group called First Tee. If there is expansion of the golf course, there has been talk of it occurring where the Motocross currently is located.

Beach and Dune Renourishment
Merle brought up the subject of sand needed for dune renourishment and where the sand might come from.

Tim asked if we could possibly capture enough sand from the Radisson to perform the beach renourishment. Doug asked how much sand we needed. Merle said that we need roughly 10,000 yards of sand per 200 feet of restoration. Doug said the County currently has 25,000 cubic yards of available sand. Merle requested that Doug reserve it for this project so when and if we need it, the sand would still be available.

Merle said that the renourishment might involve removing the existing asphalt road at the 2nd fairway of the golf course.

Wetlands Issues
Sara asked about known wetlands issues, and Doug recommended she talk to Pat Phung first about 404 issues.

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	April 28, 2005
TIME OF CONVERSATION:	4:15 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	George Kalisik
MEETING SUBJECT:	Time of Validity of the Certified Shoreline Survey

Sara spoke with George regarding the issue of timing for beginning the process of the surveyor performing the Certified Shoreline Survey.

George said that typically the certification is valid with the County for purposes of the SMA permit, for a period of six months, however, the County will consider valid and will accept the certification for a period of one year.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE: May 2, 2005

TIME OF CONVERSATION: 3:00 p.m.

FROM: Sara Edi Simmons-Fife

DISCUSSION WITH: John Lydgate, President, Kauai Historical Society

MEETING SUBJECT: Historic Preservation Issues

Sara called John to inform him of the project, to describe the interaction with Lydgate Park and the perameters of the project.

Sara inquired of John what Historic Preservation issues the team should be aware of and what he would like to see incorporated into the project.

John said that at this time he had no issues, and that Sara should contact LaFrance regarding any cultural issues.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	4:30 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	LaFrance Kapaka Arboleda, OHA
MEETING SUBJECT:	Native Hawaiian and Cultural Issues

Sara Edi introduced LaFrance to this segment of the path project, and briefly outlined the path alternatives.

In response to what issues might be a factor in deciding the best route for the path, LaFrance said that there is possibly a nukolii "mass burial" at the golf course. There may be another one south of the Radisson. It was controversial when the zoning was changed from Agricultural to Urban for the Radisson and Kauai Beach Villas to be constructed.

Another area that might be of concern is the area above the bluff south of Hanama'ulu. This is the area that the developer of the Moody property wanted to use.

Other than these, LaFrance recommended we talk about the Native Hawaiian rights issues with someone. She recommended we talk with Butch Durant, and gave me Cheryl Obatake-Lovell's phone number to get in touch with them.

Other than these issues, LaFrance said that she had no other issues at this time, but would let us know if she thinks of something else that would be helpful.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	4:45 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Nick Zaccaro, State Surveyor, Accounting & General Services Dept.
MEETING SUBJECT:	Certified Shoreline Survey

Sara called Nick and introduced herself and the project. She described the problem of determining the timing to begin the shoreline surveying and submitting this to his office for certification.

Nick said that typically the County's recognize the certifications for a period of one year.

He further suggested Sara contact Dolan Eversol, of the Office of Conservation and Coastal Lands (808-587-0377) to discuss the issue of beach replenishment.

Nick said for us to call him back when we are ready to begin the CSS.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	4:45 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Martha Yent, State Parks
MEETING SUBJECT:	Sensitivity Issues, Archaeology

Sara called Martha to acquaint Martha with this segment of the trail project in Kauai, and asked Martha if there were issues of sensitivity and/or issues she might have with a trail being constructed on the proposed corridor.

Martha said that there is a two acre heiau nearby, and that she would like to see interpretive signs if we come near this or any other historic/cultural sites.

She told me that now Daniel Quinn is the permanent Director of State Parks, and updated her email address to: Martha.e.yent@hawaii.gov

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE: May 2, 2005

TIME OF CONVERSATION: 6:00 p.m..

FROM: Sara Edi Simmons-Fife

DISCUSSION WITH: Pat Phung, FHWA project manager

MEETING SUBJECT: Project in General, 404 Issues

Pat and Sara discussed the issue of the wetlands on the proposed corridor. Sara wanted to discuss with Pat the subject of using boardwalks to avoid the need for a 404 as Merle and Sara have done on similar projects in Georgia.

Pat recommended Sara call Lolly Silva with the Army Corps of Engineers (808-438-7023) regarding the issue. He was that if we do have to apply for a 404 for any of the wetland areas, we should apply for a Nationwide as this does not require EPA coordination.

Pat further said that the County Council did an EA, and need to approve alternatives.

He said that there was a recent article in the Honolulu Advertiser on the past Friday regarding the path projects in Kauai.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	7:30 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Lance Foster, Director, Native Hawaiian Rights, OHA
MEETING SUBJECT:	Native Hawaiian Rights

Sara introduced herself to Lance, and the project. She gave him a brief overview of the proposed alternatives for the path alignment.

She asked Lance if he had any initial issues or advice. Lance indicated that LaFrance Kapaka Arboleda was his Kauai person, he said that he would defer community awareness issues to her. If there are issues that come up beyond her knowledge or require his interaction, give him a call.

He further offered that we can send our documentation to him for an informal review. And be available to answer questions.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	7:45 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Curtis Motoyama, 808-586-8121 Dept. Of Health, State of Hawaii, Disability & Communication
MEETING SUBJECT:	ADA and Accessibility Issues

Sara introduced herself and this path project to Curtis. She asked him what his concerns and issues might be relative to this project.

Curtis said that he would be reviewing the project for compliance with the Americans with Disabilities guidelines, as well as the State Interpretive Guidelines.

He would be looking specifically for compliance with accessible routes from the parking lots to the comfort stations. He would allow no routes to be grassed. We are responsible to use the new Outdoor Development Guidelines for Trails, Picnic Benchers. We can refer to the web site www.access-board.gov for specifics.

Further, Curtis offered to review preliminary drawings.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	8:00 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Mike Napier, 808-891-0525 x 34, GIS Specialist Pacific Disaster Center
MEETING SUBJECT:	Mapping

Sara introduced herself to Mike and described an overview of the path project. She asked Mike if he could assist with mapping to include:

FEMA Firm Maps
USGS Quad Maps to include Lydgate to Ahukini.

Mike responded that he could not send digital FEMA maps, but could email USGS Quads as pdf's.

Sara requested he send them to the email address of Merle Grimes at merle@mdgdenver.com.

Mike said he would do so right away.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	8:15 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Christina Pilkington, 808-241-6203, ADA Coordinator Office of the Mayor, Kauai
MEETING SUBJECT:	Accessible Issues

Sara re-introduced herself to Christina from the Lydgate project prior. Sara gave Christina a brief overview of this phase of the path project and inquired what Christina's issues would be relative to accessibility.

Christina said that she would require that the project comply with all Federal, State and County accessibility regulations. That her new email address is: mayorsada@kauai.gov, and that she had ideas she would like to see incorporated at the swimming beach at Lydgate.

She would like to have a floating boardwalk built similar to one on the beach in New Jersey. She would like to see wheelchairs be made available to people that are custom made to specifications that would allow the chairs to go into the water.

Sara and Christine discussed the coastal erosion issues along the corridor, and she asked if we could email her a copy of the photo prepared by Dr. Chip Fletcher showing the areas of most severe erosion, and where it is projected that the coast will be in fifty years.

Sara assured her that as soon as this was available by email, it would be sent to her.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	8:30 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Wayne Sousa, 808-274-3445, State Parks Department
MEETING SUBJECT:	State Parks Properties on the Corridor

Sara re-introduced herself to Wayne from the Lydgate Path project, and gave a brief overview of the alignment options for this segment of the path.

She asked Wayne to verify which properties along the corridor belonged to State Parks.

Wayne indicated that Ahukini Point was State Parks property.

Wayne said that until he felt he had gotten resolution to the loop at the initial Lydgate Path project at the north terminus of the project by the Aloha Beach Resort, he would not support this project. Wayne felt that the loop invaded the setback from the Hikinaala Heiau east of the hotel. Sara said that all issues had been resolved in the Final EA for the Lydgate project, but Wayne did not agree.

With this in mind, Sara asked Wayne to comment on the current project, and Wayne said he will be looking at Ahukini what the potential impacts may be. He insists that no changes be made to the state recreational fishing pier and current parking. At all costs, fishing was to remain at the pier.

He recommended Sara get in touch with Wade Ishykara regarding Aquatic resources. Wade's number is: 808-274-3344.

Wayne updated his email address as wayne.h.sousa@hawaii.gov.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	8:45 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Wade Ishikara, 808-274-3344, cell: 635-7200
MEETING SUBJECT:	Aquatic Resources

Sara introduced herself to Wade, and gave a brief overview of the project and the potential alignments.

She asked Wade what his issues might be, and/or what our opportunities for providing aquatic opportunities might be on the corridor.

Wade said that most fishing occurs at Ahukini Bay, Nawiliwili Bay, and at the lighthouse at Ninini Point at the north end of Nawiliwili, and at the County park area. Most fishing is done by surfcasting and/or throw-netting.

Wade said that people are typically fishing for papio (ulna, jack fish), and bottom feeders to include goatfish (weke) and surgeonfish.

The endangered species that occur there include the monk seal and the green sea turtles.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	9:00 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Mike Furukawa, Lihue Land Co, 245-3678 x 224
MEETING SUBJECT:	Grove Farm Property Access Issues

Sara introduced herself and gave Mike a brief overview of this segment of the path project and the alignment opportunities.

She asked Mike what property along the corridor belongs to Lihue Land Company. He indicated that most likely his company owns the Hanama'ulu Railroad Bridge, and the property east of the County Beach Park at Hanama'ulu, and around to the Airport and Ahukini State Parks property.

Mike said he was in favor of the project, but would like to have a meeting with Doug Haigh to discuss opportunities and issues. Sara confirmed she would have the meeting set up.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 2, 2005
TIME OF CONVERSATION:	9:30 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Wendy Wiltse, E.P.A., Honolulu Office, 541-2752
MEETING SUBJECT:	Wetlands Issues

Sara introduced herself to Wendy, and gave her a brief overview of the project, and this segment of the path, with the beginning and ending locations and an idea of the options in between.

Sara described that the potential wetland interaction with the path is south of the Marine Camp, between there and the Kauai Beach Villas, in the tidal drainage area. The other wetland issue is the pond south of the Radisson Hotel at the existing comfort station in the parking lot, and the Ocean Bay Plantation property.

Sara described the floating boardwalk solutions that MDG has used in projects in the south with Army Corps of Engineers where we have avoided the need for 404 permits with these path solutions. She asked Wendy if she would consider such solutions to interaction with the wetlands.

Wendy explained that E.P.A. And U.S.A.M.C. Have joint jurisdiction with regard to wetlands, but her office has the ultimate authority in the permitting phase over Army Corps as per the Clean Water Act.

She recommended that we contact Lolly Silva, and that she would most likely defer to Lolly's judgement as to what is needed with the wetlands and what is needed regarding 404 permits.

We discussed the community built playbridge, and Sara said she would email Wendy a picture of the bridge to Wendy.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 16, 2005
TIME OF CONVERSATION:	3:00 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Lolly Silva, Army Corps of Engineers, 808-438-7023
MEETING SUBJECT:	Wetlands and 404 and 401 Permits

Sara introduced herself and gave Lolly a brief overview of the path project in Kauai, and the beginning and terminus of this segment and what the potential alignments might be in-between.

Sara described her conversation with Pat Phung and Wendy Wiltse regarding the work of MDG in the south and how they have accessed wetlands with boardwalks and thus avoided the requirement for a 404 permit. Sara asked Lolly if she would consider similar rulings with these techniques.

Lolly requested that Sara send her:

- Photos of the projects
- Design Details
- Maps of the projects
- Names of the Corp representatives Sara has worked with in this capacity.

Lolly gave Sara her address as:

Lolly Silva
USACE, Honolulu District
Building 230
Fort Shafter
Honolulu, HI 96858

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	May 17, 2005
TIME OF CONVERSATION:	5:00 p.m.
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Jerry Corush, Ocean Bay Plantation project manager 613-866-1608 (cell) with CSW of Ottowa, Canada
MEETING SUBJECT:	Ocean Bay Plantation Property Access Issues

Sara introduced herself to Jerry and gave him an overview of this segment of the Kauai path project.

She described the areas that the design team were considering access into and through the Ocean Bay Plantation property.

Jerry took some time to describe what the Ocean Bay Plantation project had been about. He described that the initial plan had been to build high end houses on roughly 5 acre sites, with a golf course.

The 560 acre project required a zoning change from Agriculture to Urban in the General Plan, and that County council had refused the change. There were issues with the native Hawaiian sovereignty special interest group members.

Then, his design called for offering 40 acres for the County to build affordable housing, but the zoning change request was still denied.

Sara asked Jerry if she could have a copy of the Environmental Assessment that was prepared for his project. Jerry declined.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	June 16, 2005
MEETING TIME:	1:00 p.m. Hawaii time
MEETING LOCATION:	Kauai OHA office
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	LaFrance Kapaka, OHA Merle Grimes, MD, llc Sara Simmons-Fife
MEETING SUBJECT:	Path Alignment at Re-Internment Site at Golf Course

Merle described the alignment of the path along Kapule/Kuhio Highway, and his concerns about how it will relate to the existing Re-Internment site.

We walked to the re-internment site and reviewed the available land between it and Kapule/Kuhio Highway, and realized that as the area is very narrow, the path in this location would negatively impact the cultural site.

Further, LaFrance described that she felt the path with this alignment would:
1. Have too much impact
2. Create “sluffing’ makiing the slope fail
3. Require at least a buffer of 10’ around the re-internment site.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	June 20, 2005
MEETING TIME:	3:30 p.m. Hawaii Time
MEETING LOCATION:	Residence of Butch Durant
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Sara Edi Simmons-Fife Merle D. Grimes Butch Durant, 808 - 245-3742 Roland Durant Robert Durant
MEETING SUBJECT:	Native Hawaiian Rights

Merle and Sara Edi introduced themselves to the Durants, and with a map of the corridor, reviewed the concept of the regional path project, and the specific segment of Lydgate Park to Ahukini Point.

The Durants began to explain their position regarding the land. They described that they are Polynesian, not American. That, in their view, the United States is illegally occupying the lands of Hawaii. That all lands of Hawaii, belong to the natives and that in their opinion, no trail can be built.

The “kula” is the land where the water can’t get to, and this relates to the contracting rights of native Hawaiians. The “ili” are the ancient neighborhoods to protect the taro patches. The “loi” is the land that is accessible to water. Same as for the taro and fish ponds. Using the value of the land Americans will come across the rights of the native Hawaiians, and that if the Federal Government gives monies for a trail to be built, they do it at their own risk.

The high water mark represents the native Hawaiians. Their authority comes from boundaries and all is to be a benefit to the natives.

They described that they do not recognize the County government, will not recognize addresses given to the land by the County, and do not pay County property taxes, but said they do pay Federal taxes.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	June 20, 2005
MEETING TIME:	4:00 p.m. Hawaii Time
MEETING LOCATION:	Tim Skinner's Office, 808-246-1400
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Tim A. Skinner, Ass. Airports District Superintendent State of Hawaii, Dept. Of Transportation, Airports Div. Sara Edi Simmons-Fife Merle D. Grimes
MEETING SUBJECT:	Airport Property Access

Merle and Sara introduced themselves to Tim, and gave a brief overview of the regional path project and the specifics of this segment of the path. Merle described the beginning of the project as being the state of Hawaii fishing piers at Ahukini Point, and the ending at the playbridge at Lydgate Park.

Merle described how the path will interact with airport property, and that the alignment will need to be on the bluff by the airport property.

Tim said the airport is in complete support of the project, and the fence that will need to be constructed between the path and airport property can be designed by the team, but will be constructed and paid for by the Airport Authority.

Tim gave Merle a map of the airport property, and Merle and Tim discussed the possibility of a future segment of the path using the airport road to get access to the highway when the path continues towards Nawiliwili. Tim said the airport would support this path access road.

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	June 22, 2005
MEETING TIME:	8:30 a.m.
MEETING LOCATION:	Residence of Butch Durant
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Butch Durant Roland Durant Robert Durant Wally Waialiale Eric ? John ? Merle D. Grimes Sara Edi Simmons-Fife
MEETING SUBJECT:	Native Hawaiian Rights Issues

The meeting was held at Butch's to continue the discussion of native Hawaiian rights issues for June 20, 2005. Butch had invited others who are interested in this issue, however, two of the attendees did not share their last names.

Merle asked the group to speak some about the Old Wharf landing. If they could describe what the uses were and how it was used, and what cultural products the ancient Hawaiians imported and exported from there, prior to the plantation period. Merle described that if the path alignment went past the old wharf, this would provide an opportunity for education regarding the past of the landing.

The Durants said that the people is where it starts, that their rights transfer to the people and is in conflict with using the wharf for any reason other than what the native Hawaiians would have it.

The Senators are the land issue, and the citizens are the Federal. The mineral rights have no value. The idea for the native Hawaiian is not money, but the land from ancient times.

They said they would not offer any of their ancient story for educational purposes as they do not want to share their story. When the Americans took over the Hawaiian islands, the native Hawaiian lost his story. Now, they have no heritage, no history. They do "nahele" or share from the heart. The "konoliki" was the end of them according to Butch. For the native Hawaiian, the land would be used only to feed the people.

In order to understand what the Durants are talking about, they suggest we must use the native Hawaiians as a benchmark, as a place to begin. The rights of the Polynesians never went away, just because the U.S. Occupies the lands of Hawaii.

Roland Durant said that we must consider the Durant kuleana and use that right to say what you can do. That the native Hawaiian right begins three miles off shore, and includes all of the land of the islands.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 12, 2005
MEETING TIME:	9:00 a.m., Hawaii Time
MEETING LOCATION:	1151 Punchbowl Room 330, Honolulu
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Dr. Jeffrey Walters, DLNR, 808-651-7668 Sara Edi Simmons-Fife
MEETING SUBJECT:	Endangered Marine Species Issues

Sara Edi introduced herself, and described the regional path project for Kauai, and the specifics of this segment of the path. She showed Jeff drawings of the corridor and the potential alignment opportunities.

Sara asked Jeff to describe what the issues were going to be that the design team should be aware.

Jeff described his work as co-manager fo the whale program, and work with Aquatic Resources and the monk seals on all of the Hawaiian islands.

Jeff described some of the issues with monk seals. Some of those issues include:

The NOAH sponsored research has found that there are approximately 13,000 monk seals in the northern Hawaiian islands. That there are pioneers coming south and populating and the numbers have tripled, possibly quadrupled.

There are approximately 200-300 seals in the main eight islands from Niihau to Hawaii.

On a typical day a monk seal will lay on a beach during the day and dry out and digest food and rest.

Kauai is the prototype for repopulating monk seals. The area makai of the Radisson Hotel on Kauai is a prime place for them to beach. Jeff would like to see signage to educate the public. Should the path project include opportunities for signage, he will supply the language and images for such signs.

He offered that he and his staff would offer technical support for where to locate the signs as well.

On speaking of the turtles, Jeff described that they breed in the north west islands and come south to feel and live. They are exploding in population. The Hawksbill turtle will nest in the main Hawaiian islands, not really on Kauai. Jeff said of the Humpback Whales that the season for the to birth is from November to May, with the peak period being January to March.

Jeff gave Sara Mimi Ulry's name and number to call for assistance locating signs in Kauai.

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 12, 2005
MEETING TIME:	10:00 a.m. Hawaii Time
MEETING LOCATION:	OHA Offices 711 Kapiolani Blvd. Suite 500, Honolulu
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Lance Foster, Director Native Rights, Land, Culture, 594-1888 Jonathan Scheuer, OHA Policy Analyst Sara Edi Simmons-Fife
MEETING SUBJECT:	Native Hawaiian Sovereignty Issues

Sara re-introduced herself to Lance, and met Jonathan. She used the aerial maps to show the proposed path and described some of the issues that have come up regarding native Hawaiian issues. She asked Jonathan and Lance to help clarify who owns what and how she can best work with the Durant family and their sovereignty issues.

Lance recommended that the design team work with the native Hawaiian sovereignty members to help identify the ancient paths, called “ala loa” translated roughly as “old road”. This would pay tribute to the Mo’i”.

Jonathan explained briefly the three varying perspectives regarding sovereignty.
1. There are the “independents”. Those who feel that the islands are occupied by the U.S.
2. Those who are the “de-colonization” contingent. Those who feel that Hawaii has been colonized by the U.S., And thus can be “de-colonized”.
3. Those who feel that they are seeking a “nation within a nation” status, similar to the situation of the American Indians Jonathan made the point that OHA falls within this group.

Jonathan made the point that the purpose of this part of the discussion, was to note that just because one group claims to be speaking on behalf of Hawaiians, it does not mean that they represent all viewpoints, and good planning requires consultation across the major factions.

Lance then discussed the Akaka bill and described that it refers to the relationship between the Federal government and the Hawaiian governing body. That there is to be a tribal roll and in a few years there is to be a governing body.

Lance referred Sara to the book, Hawaii State Constitution as a good book to cipher through the native Hawaiian rights issues.

Meeting adjourned

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 12, 2005
MEETING TIME:	12:00 p.m. Hawaii Time
MEETING LOCATION:	State Parks Office, 711 Kapiolani Blvd., Honolulu
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Martha Yent, State Archaeologist Sara Edi Simmons-Fife
MEETING SUBJECT:	Archaeology, Cultural Resources, State Parks Issues

Sara reviewed the aerial photo of the path corridor with Martha, and described the path concept and alignment options. Sara asked Martha what the issues were going to be regarding State Parks, archaeology and cultural resources.

Martha said that we had identified most issues relating to Archaeology, and that she had reviewed the corridor for former Land and Water Conservation funds, and found that in the 70's Hanama'ulu Beach Park had received funds. She acknowledged that the path would intersect with the park, however, this interaction would not be considered a "taking" and therefore would not require a 6(F). She described that a letter acknowledging this interaction would be required. She gave Sara a sample of a typical letter, and requested that two copies be sent to her for processing at the proper time.

Sara and Martha discussed that there would be required a 4(F) analysis and commitment to action as Ahukini Point is a state parks property.

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 12, 2005
MEETING TIME:	1:00 p.m. Hawaii Standard Time
MEETING LOCATION:	Department of Health 919 Ala Moana Blvd. Rm. 301 Honolulu
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Watson Okubo, Section Supervisor, Monitoring & Analysis Section Connie Ramsey, ACOE, Ecologist (404 issues) Ed Chen, ACOE, (401 Issues) Shane Sumeda, (NPDES Issues)
MEETING SUBJECT:	Water Quality, Wetlands Issues, Stormwater Issues

Sara introduced herself to the group, and described the path corridor using the aerial photo map showing the path beginning and terminus, and the potential path alignment opportunities.

Sara then brought the drawings, sketches, and maps requested by Lolly Silva and Wendy Wiltse from wetlands projects Sara has worked on in the south where boardwalks over the wetlands were allowed and did not require 404 permits. Connie said she would present them to Lolly and if this became an issue or opportunity on this or future projects, we could re-visit the drawings and ideas.

Shane then described the NPDES permits that would be required for a project of this scope and magnitude of disturbance. He said taht the permit would cover point source de-watering during construction and storm water discharge of one acre of disturbance.

The area of disturbance to consider for the NPDES permit includes the staging area for the construction equipment as well as the width of the equipment.

Shane said the the drinking water, the irrigation lines and the sewer will all have to be pressure tested. The pressure test or disinfected water lines require a hydro-testing permit.

Connie and Ed spoke regarding the 404 and 401 issues. Connie said that should the design call for beach and/or dune renourishment, there is a SSBN (Small Application

Scale Beach Renourishment) streamlined form to cover the permits. Ed said that typically when a 404 is needed, that triggers the requirement for a 401.

Ed described the SPGP permit that is one form for four agency with consultations on a variety of issues.

Watson spoke about salinity and water quality regarding the Hanama'ulu Stream, the tidal drainage area south of the Marine Camp, and the wetland pond south of the Radisson Hotel parking lot. She said that his on-island colleague, Gary Ueunten can assist the team with water quality and with noise abatement issues. Watson said that it would be required that we show the sources for the run-off and the receiving waters.

If we cross a Class A ocean, or a Class II Stream, .5 milligrams of salinity is marine. If we need a Section 10 permit, we will not need a 401, and if we incorporate beach renourishment, we will definitely need the SPGP (State Program General Permit). Watson gave Sara Gary's phone number and offered that Gary could assist the team in determining salinity and if the waters are ocean tidally influenced.

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 17, 2005
MEETING TIME:	8:30 a.m. HST
MEETING LOCATION:	County of Kauai Public Works Conference Room
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Mike Furukawa, Grove Farm Doug Haigh, Public Works Tim Bynum, Office of the Mayor Merle D. Grimes, MDG, team lead Sara Edi Simmons-Fife
MEETING SUBJECT:	Property Acquisition Issues

The meeting began with Merle describing the path alignment on the aerial photo map to Mike to show how the Grove Farm property interfaces with the proposed path alignment.

Sara asked if it was known for sure that the Hanama'ulu Railroad Bridge does in fact belong to Grove Farm. Mike confirmed that the bridge does belong to his company, and that Kauai Lagoons land is at Ahukini Point.

Mike suggested that Grove Farm has some interest in donating the bridge and land surrounding it to the County for a park. Doug said that if such an arrangement is worked out that the County would want to use the value of the bridge as part of the match.

Currently the property is zoned as industrial.

Doug asked Sara to be sure to identify the special zoning on the Ocean Bay Plantation property, Sara agreed.

Mike said that Sara can borrow the EIS prepared for the property to assist her in the permits she is required to secure for this project, and gave directions to his office.

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 17, 2005
MEETING TIME:	10:30 a.m. HST
MEETING LOCATION:	Starbucks Coffee Shop
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Mimi Ulry. DLNR, Marine Conservation Coordinator Donald Heacock, DLNR, Aquatic Biologist Merle D. Grimes, MDG, team lead Sara Edi Simmons-Fife
MEETING SUBJECT:	Endangered Species Issues

The meeting began with Merle describing the path alignment on the aerial photo map to Mimi and Don to acquaint them with the project and potential interaction with the coast, and potential habitats for monk seal, and sea turtles.

Sara shared information regarding her meeting in Honolulu with Dr. Jeff Walters, Mimi's boss, describing that Jeff wanted us to meet with Mimi so she would be up to speed about the project, and his desire that she assist the team in locating the best places for the educational signage for the turtles and seals.

Don spoke about a similar project he wanted us to look into. Web address is: www.greencovebasinsustainabledevelopment.

Mimi and Don indicated that there are no endangered fish.

Also the recommeded that the team look into the National Fish & Wildlife Federal Grants for funding for beach renourishment.

The recommended for endangered plant species we get in touch with the following individuals at the National Tropical Botanical Garden (808-332-7324):

- Steve Perlman
- Ken Wood
- David Lorence

Don and Mimi gave Sara their email addresses:
Donheacock@midpac.net
Mimi.ulry@hawaii.gov

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 18, 2005
MEETING TIME:	1:00 p.m. HST
MEETING LOCATION:	Radisson Hotel lobby, and on site at Kauai Beach Villas
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Judy Dalton, Kauai Beach Villa's full time Resident (246-9067) Sara Edi Simmons-Fife Merle D. Grimes, MDG, llc
MEETING SUBJECT:	Encroachment Issues

Merle and Sara met Judy in the lobby of the Radisson Hotel, and discussed the project, and using the aerial photo map, discussed the scope of the project and how it fits into the regional plan. We showed her the potential alignments and how Kauai Beach Villas fit into the plan.

We then all walked out to the site of the drainage area north of the Villas, and walked the potential route of the path.

Judy said that she had lived in her unit for fifteen years and could verify that the drainage area changes drastically different times of the year. She felt that the design should protect the dune makai of the Kauai Beach Villas. She said how important it was to her that vehicular access to the beachfront be closed.

She gave us the name of the President of the Home Owners Association (HOA) as David Walters, and Lynn McCrory who is associated with Pahio Development.

She indicated that there would be support from the other homeowners for the path to be constructed makai of the Villas, if it was done as successfully as we had done at the Kaha Lani condominiums at Lydgate Park.

Meeting adjourned.

* NOTE: After the meeting, Judy contacted Merle to say that she had reconsidered, and now would require the path to be routed mauka of the Villas and use the existing footbridge, and that we could put the path in the parking lot of the Villas if necessary.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 18, 2005
MEETING TIME:	4:00 p.m. Hawaii time
MEETING LOCATION:	Wailua Golf Course
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	LaFrance Kapaka, OHA Jim Powell, SCS Archaeology Merle Grimes, MD, llc Sara Simmons-Fife
MEETING SUBJECT:	Path Interaction with Golf Course,

Merle showed LaFrance the area where the proposed path would run south of the driving range between thee tee for hole number 1 and the parking lot for the clubhouse and intersect with Kapule/Kuhio Highway at the south side of the entrance drive.

He described the proposed tunnel and the reason it was required for this alignment for safety for the path users, and for minimizing the interference of the path user to the golfer.

LaFrance and Jim discussed the presence of the nukolii at the base of the tee box, as well as the alignment of the fiber optic cable that also runs along this route.

It was decided that should this alignment be desired, and the tunnel be required, that the design must have the tunnel as shallow as possible, and that she would review the design and make a decision at that time.

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AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 18, 2005
WORKSHOP TIME:	7:00 p.m. HST
WORKSHOP LOCATION:	Wailua Golf Course
FROM:	Sara Edi Simmons-Fife
WORKSHOP ATTENDEES:	Tim Bynum, Mayors Office Doug Haigh, County Public Works, project manager Ed Okomoto, Golf Course Manager Various golfers on island Merle D. Grimes, MDG, llc Sara Edi Simmons-Fife Dr. Chip Fletcher, University of Hawaii Frank Sullivan, Team Golf Course Consultant Thomas Noyes, Team Computer Imaging Consultant Roxanne MacDougal, Team Public Facilitator
WORKSHOP SUBJECT:	Path Routing Interaction with Wailua Golf Course

The workshop began with Merle introducing the team to the golf course stakeholder group, and gave a brief overview of the project and the various situations that the path will have to interact with the golf course.

Merle described the Highway Alignment first, using a power point presentation constructed by Thomas. Merle showed and described that should the path be aligned along the highway in the area of the golf course, it would require a tall net to be installed along hole #10 and at the # 17 green to keep the balls out of the highway and off the path. The other solution for this area, would be to re-build the tees lower.

The path must avoid the existing re-internment site that is located in the parking lot at the highway. From the team discussions with the State Archaeologist, Nancy McMahon, she wanted to see a thirty foot (30') buffer around the re-internment site. Merle also described the crossing at the entrance to the Golf Course as very dangerous.

Then, he described the Coastal Path issues and how this alignment relates to the Golf Course.

Merle said that this alignment could potentially have several sub alternatives. That the path would begin on the north end at the point of the existing playbridge at Lydgate Park.

This connection may be a swinging bridge. The path would go past the 17th green and be tight at the green. At the 18th tee, would be a boardwalk and the path would be hidden down the slope. Thomas' power point presentation then showed a photo simulation at the 17th to show the helical piles and boardwalk.

Behind the driving range in 1994 and 1995, behind the driving range, is eroded and some natural vegetation has come back. A fiber optic cable at the south end of the range was installed in 1994.

MEETING AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 19, 2005
MEETING TIME:	1:00 p.m. HST
MEETING LOCATION:	National Tropical Botanical Gardens, Kalaheo
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Dr. David Lorence, Dir. Of Science, Chair of Botany, 332-7324 Merle D. Grimes, MDG, llc, team lead Sara Simmons-Fife
MEETING SUBJECT:	Endangered and Threatened Plants on the Corridor

Merle and Sara introduced themselves and the project with David, showing him the potential path alignment with the aerial photo map. Sara inquired of David what would be the issues relating to endangered or threatened plants on the corridors.

David said that there are no endangered plant species on this end of Kauai. He said there is one endangered grass that grows on the cliffs on the Napali coast, by the Princeville Hotel, but no plants to worry about on this end of the island at all.

David spoke generally about the plants of the island, mentioning naupaka, vitex, and uva ursi, and theat we could get in touch with Tim Flynn, regarding birds, and the galanhil, a mud hen and a stint.

Sara inquired of David to give suggestions of the best plant reference guides, and he suggested she get a copy of Wetland Plants of Guan/Micronesia, author Stemmerman

And A Guide to the Pacific Wetland Plants, ACOE, Honolulu and a resource person would be Dr. Clyde Imada with the Bishop Museum, 848-4175.

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK PHONE MEETING MINUTES

DATE:	August 19, 2005
TIME OF CONVERSATION:	3:00 p.m. HST
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	Nancy McMahon, State Archaeologist assigned to Kauai
MEETING SUBJECT:	Archaeology, Cultural Resources, Historic Preservation Issues

Nancy attended the first public meeting, so she is acquainted with the corridor, and Sara asked her what would be issues that Nancy felt should be of consideration during the design and routing of the path.

She said that all of the issues that La France was bringing to our attention would be the same ones for us.

Sara asked Nancy who might the author of some studies of the Grove Farm properties, and Nancy said that most likely Rosendahl would be the persons work to look up.

Nancy said for us not to hesitate to contact her for other issues or help.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 19, 2005
MEETING TIME:	4:00 p.m. HST
MEETING LOCATION:	Residence of Butch Durant
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Butch Durant Roland Durant Robert Durant Merle D. Grimes Sara Simmons-Fife
MEETING SUBJECT:	Native Hawaiian Issues

Sara and Merle met briefly with the Durants to give one more opportunity for the Durants to participate in the location of the path, signage, and amenities that would honor the ancient ways, paths and areas of interest.

Roland Durant said that we must show regocnition of the "ili" .

That we need to identify the culture of the ili alapua and that the boundaries come from the people.

The Durants declined to participate in locating any of the ala loa's (ancient pathways) or any sacred sites on the map.

Merle and Sara reminded the Durants of the Public Meeting on the 22nd, and invited them to come.

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 22, 2005
MEETING TIME:	9:00 a.m. HST
MEETING LOCATION:	Kauai Historical Society Offices, Lihue
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Mary Requilman, Pres. Kauai Historical Society Merle D. Grimes Sara Edi Simmons Fife
MEETING SUBJECT:	Historic Resources focusing on the Railroad lines

Merle and Sara met with Mary to discuss the path project and used the aerial photo map to show her the limits of the project and discuss the plantation era use of the property at the Old Wharf, the railroad lines on the Ocean Bay Plantation property, the Hanama'ulu Railroad Bridge, the fishing pier at Ahukini and the housing that was constructed for the plantation workers.

Mary told Merle that the railroads brought sugarcane and pineapples to the Old Wharf for export, and received imported goods from back in the ancient Polynesian times.

Sara asked Mary about more documentation regarding all of these issues, and Mary said that all of the pertinent photos had already been given to SCS Archaeology on our team, but that she would be available to answer any further questions the team had.

Meeting adjourned.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	August 22, 2005
MEETING TIME:	1:00 p.m. HST
MEETING LOCATION:	Marine Camp
FROM:	Sara Edi Simmons-Fife
MEETING ATTENDEES:	Gary Ueunten, Dept. Of Health, Clean Water Section (241-3323) Merle D. Grimes, MDG, llc Sara Edi Simmons-Fife
MEETING SUBJECT:	Water Quality, and Noise Abatement

Sara and Merle met Gary on site at the Marine Camp where they introduced themselves and the project to Gary. Sara asked Gary what the issues would be for protecting the integrity of the water both on the beach, as well as in the drainageways that interact with the path alignment.

Gary said that he would recommend and that he would conduct at our request tests for salinity, oxygen, conductivity, and pH at the following locations:

1) The drainage area south of the Marine Camp
2) Hanama'ulu Stream
3) Hanama'ulu Beach
4) Ahukini Point

Gary said with the scope of the project, a NPDES permit would be required and that tests would need to be done for total soluble solids. The permit would cover the entire project.. And that the location from the ocean for the bridge north of the Radisson, may be an SMA isssue.

If a 401 is required, the State waters must be defined, and Lolly Silva can assist with this.

Also, that the drainage area by the Marine Camp is tidal in nature, but interestingly it runs away from the ocean rather than towards it. Also, that the drainage area south of the Radisson comfort station and parking lot in his experience has never functioned as a drainage way.

AHUKINI POINT TO LYDGATE PARK MEETING MINUTES

DATE:	November 1, 2005
TIME OF CONVERSATION:	10:15 p.m. EST
FROM:	Sara Edi Simmons-Fife
DISCUSSION WITH:	David Bukowski, Prevention Captain County of Kauai Fire Department
MEETING SUBJECT:	Fire and Emergency Services Issues

Sara spoke with David and briefly described an overview of the limits of the project and the various options for alignments for the path project.

David indicated that his primary issue was in access to the path for emergency vehicles. David said that if he could have access at approximately 1/4 mile locations along the corridor this would be sufficient for his needs. Also, that if vehicles could have access at either end of the Hanama'ulu railroad bridge this would give the officers close enough access on foot to assist in an emergency.

APPENDIX B

REPORTS

A-1 ARCHAEOLOGICAL CONDITIONS REPORT

A-2 PRELIMINARY GEOTECHNICAL REPORT

A-3 GEOLOGIC STATUS OF THE SHORELINE REPORT

A-4 STRUCTURAL REPORT

A-1 ARCHAEOLOGICAL CONDITION REPORT

SCS Project Number 426-1

ARCHAEOLOGICAL CONDITION REPORT FOR AHUKINI-LYDGATE SEGMENT OF THE KAUA`I PATHWAYS PROJECT KAUA`I ISLAND, HAWAI`I

Prepared by:
Michael Dega, Ph.D.
and
James Powell, B.A.
September 2005

Prepared for:
Merle D. Grimes, LLC.
1042 Broken Arrow Circle
Elizabeth, Colorado 80107

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INTRODUCTION

This interim report discusses the various archaeological and historic preservation issues related to construction and maintenance of the Kaua`i Pathway project and focuses on the segment stretching from Ahukini Point to Lydgate Park. The report lists the known archaeological sites having been documented along this segment, the estimated significance of these sites, and potential mitigation of these sites and sensitive areas during construction of the pathway. As a quasi sensitivity zone report, predictive models are forwarded which detail any possible historic preservation challenges that could impact construction or location of the pathway.

PART I KNOWN ARCHAEOLOGICAL SITES: A SUMMARY

A. Ahukini Point to the Raddison Hotel Area:

Based on a literature review of the proposed pathway alignments, there have been at least 15 archaeological projects conducted in this area from Thrum (1907) to Scientific Consultant Services, Inc. (SCS) in 2004. In 1906 Thrum compiled an inventory of *heiau* throughout the islands. Within the currently discussed segment from Ahukini to Lydgate, he "recorded" two *heiau*: Ahukini and Kalauokamanu. These *heiau* were not marked on maps but were simply described. Both *heiau* had been destroyed supposedly as of 1855. During Bennett's island-wide survey in 1928-1929, the two *heiau*, now known as Site 101 and Site 102 were also noted. Ahukini Heiau supposedly was built near Ahukini Point on a bluff overlooking the sea while the location of Kalauokamanu was never identified. Bennett (1931) did also note that both *heiau* were previously destroyed. Bennett makes first mention of Site 103, a burial ground in this area: "in the sand dunes that run along the shore half way between Hanama'ulu and Wailua River are many burials."

From Hanama'ulu Bay to the west, toward Lihue, multiple Land Commission Awards are present. In general, the LCA's primarily denote *lo`i* lands (taro fields). Here, dryland taro cultivation was probably practiced while coconut, sweet potato, and breadfruit were also likely grown. The Mahele records of the Hanama'ulu area tell of native tenants living in the valleys and by the shoreline. House sites, taro pond fields, irrigation systems, dryland agricultural parcels, fishponds, pastures, and other features were constructed across the prehistoric-traditional landscape. Many of these lands were cleared during Plantation days, thus masking or erasing much evidence for these sites.

At least eleven known archaeological sites are present in the Hanama'ulu area toward the Wailua Golf Course. As one moves from south to north, or Ahukini Point toward Wailua, several sites are present of both a historic and prehistoric nature. First, Ahukini landing itself, a probable late 19th construction, is present inside the breakwall of the bay. Plantation housing for sugar cane workers has been noted just to the south of the point. Foundations still exist in remnant state. Moving inland to the west, several more sites are present:
Site 1845 is the historic Hanama'ulu Railroad Bridge. This bridge is being preserved and represents the plantation era.

Site 2066 consists of multiple features: an upright (burial?), historic road, and historic house foundation;

Site 2067 consists of a historic cemetery perhaps dating to the 1880s. The cemetery is present on the *mauka* side of the highway on the edge of former sugar cane lands.

Site 1843: prior to construction of Ahukini Landing, an old wharf was present on the northern flank of the bay. This is Site 1843 and consists of a concrete wall, foundation, and sugar cane road. This is the location of the old wharf.

Site 1841 occurs just to the north and also represents the historic period: a road and trail running along the coast. It is possible this trail has some time depth from prehistoric times but it has not yet been dated.

As one rounds the point to the north, three archaeological sites are present above the rocky coastline. Site 2068 consists of a looted, historic-period trash dump dating between 1880 and 1910. Datable artifacts include glass and ceramic fragments that were recovered from the bluff, at the edge of plantation lands. Site 1840, nearby, consists of a historic-period retaining wall related to sugar cane or military transport; Site 1839, occurring about 25 m to the east of the trash dump represents the first fully known prehistoric site in this coastal area. This site is a prehistoric complex occurring on the flats and composed of a wall and terrace suspected to be related to temporary habitation. No carbon dates are available for this site.

Proceeding to the north, around the point and onto the flat coastal plains toward Wailua, both historic and prehistoric sites are present. Site 1838 consists of a prehistoric cultural deposit partially eroding out of modified sand dunes. The layers contained charcoal, shells, and coral fragments, this expected so near the coastline. The site had been disturbed during military

training exercises in the 1940s. The cultural deposit, now a small remnant, was dated to AD 1170-1400, and represents temporary habitation of the area. This pattern of remnant cultural deposits and temporary activities near the coast holds through the Kealia area and beyond, and is one concern for the present work. The final historic site in this area is Site 1846, two historic railroad bridges used for hauling sugar cane from the fields to Lihue. This site is present more inland and south of the Radisson Hotel.

Site 885, also occurring just to the south of the Raddison hotel, represents a possible traditional Native Hawaiian burial ground. Multiple burials have been documented in this sandy location, from the Raddison through Wailea Golf Course and Lydgate Park.

Overall, this first section contains abundant evidence for historic networks related to plantation-era days and prehistoric sites related to burial and temporary habitation loci. While none of the sites beyond Ahukini landing remain in spectacular form, they do allude to land tenure in the area during the late 1880s onwards. The two prehistoric sites identified near the rocky coastline provide foreshadowing for the immense number of sites occurring to the north along the sandy coastal flats. Site 885 and beyond provide our first glimpses at this pattern.

B. Wailua Golf Course to Wailua River

The most well-known site in this area, due to the influx of CRM research related to golf course activities and development of Lydgate Park, is Site 103, originally recorded by Bennett during island-wide survey in 1928-1929. At this writing, over 66 burials have been identified throughout the golf course alone, with most of these having been re-interred in a burial crypt and preserve area at the golf course itself. This discussion focuses on the area from the south end of the golf course and west to the Correctional Facility to the Wailua River. In this location, we enter one of the most sacred and site-rich areas of the island, an area that will be crucial for pathway development.

The *ahupua`a* of Wailua is situated in the old district of Puna but today is located in two separate judicial districts: south of Wailua River is Lihue District or *moku* and north of the river is Kawaihau District. Wailua Ahupua`a is the largest *ahupua`a* in both districts and extends from the shoreline to Mt. Wai`ale`ale. In this segment, we stop at the southern bank of the Wailua River, the largest navigable stream in the Hawaiian Islands. The southern extent of this area is relatively minor compared with the near-river areas. In this tract, very few LCA's were issued. The flatlands between the dunes and Kalepa Ridge contain swampy areas fed by springs at the base of the ridge that allowed for limited taro cultivation on the margins of the marsh. The

coastal dunes between the marshland and the sea were primarily used for human interment (Site 103) while the direct coastline would contain evidence for temporary or seasonal fishing camps and other marine acquisition.

The first site we visit in this artificial corridor is Site 1980, which occurs on the golf course to the east of the correction facility. This site consists of eight traditional-period burials identified in sandy contexts between coastline and marshy areas to the west. It is likely this site could be included as a portion of Bennett's Site 103. As we move north into golf course lands, several more sites are present, particularly Site 103 and its 66+ known burials. Forty-four burials were identified during trenching by SCS in 2000. Also recovered were prehistoric implements (two adzes, sinkers, hammerstone) and historic items (glass and porcelain). Sites -542 through -546 and Site -819 compose portions of Site 103 burials found during monitoring work in 1977. Site -9357, a burial also part of the Site 103 complex, was identified on the grounds of the County correctional facility. A burial preserve area has also been established at the golf course, across from the first tee box.

Two archaeological sites were identified and documented during monitoring in 2003 by SCS at the Kumalani area of Lydagate, just off the golf course. Additional burials related to Site -103 were identified. A total of three incomplete burial sites and two isolated findspots from previously disturbed burials were identified. All were thought to be from traditional contexts. The second site, Site -356, consisted of a traditional cultural layer located within natural sand dune deposits. The site was assessed as a habitation layer and dated to A.D. 1440–1660, a traditional time period consistent with other archaeological finds in the area. Stone tool implements, charcoal, and shell were found at the site. Scattered stone tools (hammerstone, adze fragment) were identified in the sand dune during construction of the Kumalani playground.

While not directly impacting the pathway in this segment, the following is presented to provide additional context to the archaeology of the area. Staying on the south side of the river, near the coastline, we enter the more sacred Wailua River mouth area. On one side is Lydgate Park and across the highway from the hotel is a heiau complex. Staying near the coast, Site -105 is present within the park, much of the site having been preserved today. This site consists of Hikinaakala Heiau and Pu`uhonua o Hauola (city of refuge). This site was first recorded by Thrum in 1906 and later by Bennett (1931), Kikuchi (1974), and Yent (1989). This site is part of the Wailua Complex of Heiau National Historic Landmark. Yent's work at the site concluded that there were two occupational episodes at this site, one historic-period and one earlier occupation. This occupation may or may not have been associated with the *heiau* itself.

Another significant site is present in the area. In 1949, Mrs. Rebecca Banks recorded 36 petroglyph figures on boulders stretching across the mouth of Wailua River. These boulders became a National Historic Landmark in 1962. This petroglyph field was re-surveyed in 1973 and 1984 by Bill Kakuchi and he noted that there may be more in the river and that some boulders had been damaged during clearing the mouth of the river. Jim Powell of SCS states that you can see the site at times of low tide, etc.

The final area of concern on the southern bank of the Wailua River, prior to actually reaching the river, is Site -104 and Site -104a. The main site is Malae Heiau, part of the Wailua Complex of Heiau National Historic Landmark. The *heiau* is a walled, square enclosure measuring over 2 acres in size. Construction of this site occurred in phases through time, with early episodes from AD 1480-1580 and later construction at 1700-1800 and 1720-1840 respectively. Site -104a was identified by Kikuchi in 1987 and consists of an adze workshop/flake scatter occurring to the north-northeast of the *heiau* and extending to the marina. It is likely that the lithic manufacturing workshop was related to prehistoric occupation and use of the *heiau* and environs.

This summary was meant to provide a brief overview of known archaeological sites within the Ahukini-Lydgate pathway corridor in order to understand potential impacts to the sites and to gauge additional site types (*i.e*., burials) that may be identified during archaeological Monitoring of the area.

C. Cultural Resources from Ahukini-Lydgate

As Corbin *et al*. (2002) state, Hanama'ulu translates as "tired (as from walking) bay" and is said to be the birthplace of the hero Kawelo. This area was referred to as Puna District at the time of the Great Mahele of 1848, not Lihue District as it is now known. The Hanama'ulu area is not specifically mentioned in many historical texts. However, Hanama'ulu is noted *Olelo No`eau*, a book of Hawaiian sayings and epithets (Corbin *et al*. 2002:B-1):

*No Hanama`ulu ka ipu puehu* ("The quickly emptied container belongs to Hanama`ulu")

Pukui (1983:No. 2230) identified another quote about the area:

> "Said of the stingy people of Hanama`ulu, Kaua`i—no hospitality there. At one time, food containers would be hidden away and the people of Hanama`ulu would apologize for having so little to offer their guests."

From Hanama'ulu Bay to the west, toward Lihue, multiple Land Commission Awards are present. In general, the LCA's primarily denote *lo`i* lands (taro fields). Here, dryland taro cultivation was probably practiced while coconut, sweet potato, and breadfruit were also likely grown. The Mahele records of the Hanama'ulu area tell of native tenants living in the valleys and by the shoreline. House sites, taro pond fields, irrigation systems, dryland agricultural parcels, fishponds, pastures, and other features were across the landscape. Many of these lands were cleared during Plantation days, thus masking or erasing these sites.

The cultural significance of the Wailua Area, further to the North, is well documented. Center of the isle's political and economic universe, Wailua was the chiefly seat of Kaua`i during prehistoric times, as is attested by the numerous *heiau* and other ceremonial sites occurring along the Wailua River basin. The Wailua area is covered in some detail in other sources.

PART II SIGNIFICANCE AND MITIGATION OF THE SITES

The following table denotes significant sites previously identified along this portion of the pathway from Lydgate Park to Ahukini and provides introductory mitigation possibilities for these sites.

Table 1: Lydgate to Ahukini Sites (North to South)

Site #	Location	Mitigation
# 103 WGC burials Burial Preservation Area	Between driving range & 1st Tee / fairway, along fiber optic cable route. Exact boundaries Unknown.	Reroute path to avoid burials-preserve area.
# 103 WGC Burials	Throughout dunes of WGC.	Monitor all pathway excavations.
# 1838, Habitation site	NE corner of Moody property at shoreline	Monitor all pathway excavations
# 1839, Temporary Habitation site	East side of Moody property	Monitor all pathway excavations
# 1840, possible retaining wall for RR / cane haul road	East side of Moody property	Rehabilitate and include in bike path
# 1841, original RR bed / cane haul road to Kou Wharf	Along SE edge of Moody property	Rehabilitate and include in bike path
# 1843, Kou Wharf, wall and road.	South side of Moody property on Hanama'ulu Bay. Orginal wharf and access for Hanama'ulu Sugar Plantation.	Rehabilitate and include in bike path as rest stop / fishing area. Signage.
# 1845, RR Bridge	Crosses Hanama'ulu Stream, west of beach park.	Rehabilitate and include in bike path. Signage.
# 1846, Two concrete bridges.	RR bridges crossing Kawailoa marsh area.	Rehabilitate and include in bike path.
# 2066 Habitation complex	North west of RR Bridge 3 1845	Avoid Fea. A, (possible burial) Include Fea. B (road), and Test Fea. C. (possible habitation).
# 2068 Historic trash dump	Along eastern edge of Moody property	Monitor as pathway is built through area

The primary form of archaeological mitigation during pathway construction is Monitoring. In certain areas, particularly along the coastline and known burial areas, full-time Monitoring is required due to the likelihood of encountering burials or isolated remains. Other forms of mitigation for this project include rehabilitation of historic features (see above), Data Recovery (in the instance new or significant deposits are identified), Burial Treatment and Preservation, as needed. This mitigation is required and primarily important as there has been a lack of formal Inventory Survey completed along sensitive portions of the pathway, particularly from the plains north of Hanama'ulu Bay to the Wailua Golf Course and south of Hanama'ulu Stream.

SCS will continue to discuss mitigation requirements with the SHPD throughout this process. Again, mitigation requirements are often dependent upon the final course of the pathway and the findings during construction. To aid in preparing for all scenarios, we have employed an ecological model for examining potential site types in the pathway segment area.

PART III SENSITIVE AREAS DURING CONSTRUCTION OF THE PATHWAY

Site sensitivity along this pathway is partially determined by the types of soils encountered. There are five main ecological zones along the pathway, with several being sensitive in terms of archaeological resources. The zones are presented first, followed by a listing of pathway areas that may be sensitive for various cultural resources.

The first zone (Zone I) consists of coastal dunes, which include frontal accretion deposits, backslopes, the crest, and the slip face. Zone I predominantly consists of an area spanning from the high-tide water mark of the ocean to the lower portion of the slip face near the interdune area, or, where the backside of the dune becomes flat and expansive. Zone I sediments are primarily composed of beach sands. These sands are subject to variable sorting when high-energy depositional events such as storm surges or tsunamis typically lead to the deposition of courser sand grains while low energy events can lead to well-sorted, often fine-grained, sedimentary deposition. This is a dynamic zone in terms of landscape morphology as it constantly evolves through wind and tides, particularly if vegetation or modern impediments do not curtail dune migration. It is often in Zone I that archaeological signatures for temporary occupation activities such as fishing camps are identified.

Zone II represents a more stable land surface occurring leeward and inland from the terminus of Zone I. This zone composes the coastal plain or back beach environment. The latter term alludes to the formation of interdune deposits. Both Zone I and Zone II primarily consist of calcareous sand beaches derived from the decomposition of coral and seashells. These sandy deposits and associated coralline basements occur far inland in some areas, a symptom of the Holocene high sea stand occurring between *c.* 5,500 years ago and lasting until about 2,000 years ago (Fletcher and Jones 1996:639). It is frequently within this sandy, back beach area that significant archaeological resources related to permanent habitation and burials are found (e.g., Site 103; see Table 1).

Zone III consists of a landform located at or very near sea level, but removed from the coastal inland of Zone II. This zone is characterized as 'marsh land,' or ponded areas that are approximately equal in elevation to sea level yet retain more terrigenous characteristics. Zone III often consists of slightly depressed areas amenable to water and soil catchment. This marsh land does contain some sandy sediment, but alluvial clays dominate soil matrices. It is within Zone III that *lo`i* agriculture was suggested to have been practiced during traditional times (see Creed et al. 1995) and fishponds are often present (e.g., Kawailoa Pond south of the Radisson Hotel). Later, these lands were filled and utilized for rice cultivation and modern occupation. Zone III contrasts brilliantly with Zone II in that it provides a near-coastal alternative for agricultural production normally only afforded at much more inland locations. Permanent residents of the near coastal environment (Zone II in particular) could practice both intensive agriculture while gathering resources from an immediately adjacent ecological zone. It is this situational affordability that allowed for Zone II occupation at the interface of several other significant resource zones.

Zone IV is demarcated by considerable increases in elevation and changes in topography. This zone is common mostly along the southern flank of the pathway route near Hanama'ulu and along the highway, if the pathway is to be placed there. This zone primarily consists of rolling hills and plateaus that lead into more mountainous terrain. Now primarily consisting of grassy plains, subsurface deposits are dominated by the presence of red clays. Some historic and modern uses of this landscape include sugar cane cultivation and pasturing activities. Due to the intensive landscape modifications associated with these historic and modern uses, surface archaeological structures are fairly uncommon, although there are exceptions (Malae Heiau in Wailua). This zone contains red clay soils derived from the decomposition of underlying basalt. The soils are rich in iron and other nutrients amenable to the industrial production of certain crops (*e.g.*, sugar cane). During prehistoric and early historic times, Zone IV could have been

used as another transition zone between lowland and upland locales. Trails linking lowland and upland sites and resource procurement zones, small-scale agricultural sites, habitation sites (both permanent and temporary loci), and some *heiau* were constructed in this zone. However, although several site classes may have occurred in Zone IV, the archaeological signatures of these site types may be minimal or non-existent. Zone IV gives way to another zone, the uplands.

The fifth zone (Zone V) consists of the uplands/steep slope lands cut by widely spaced erosional gullies and major drainages consisting of deep ravines. These drainages often create alluvial flats at their terminal points near the coastline (forming Zone III; Hanama'ulu area). Also, plateaus are formed between the valleys and the routes occasionally course along side slopes. Rock outcropping is common is several areas, particularly along the northern flank of Hanama'ulu Bay.

While each of these zones contributed to traditional and historic economies, archaeological signatures for traditional habitation and activity have been most evident in the back beach zone (Zone 2). This zone contained the artifacts produced for on-site use and off-site procurement of resources, midden and faunal remains indicative of food preparation and consumption, subsurface features such as postholes indicative of dwellings, and hearths characteristic of cooking locales, among others. Typically, the greatest quantity of archaeological sites indicating continuous use of the eastern Kaua`i landscape has been recovered from this back beach, accretion zone, the current project area not being an exception. While there is a specific correlation between soil types and the presence/absence of sites along this eastern coast, in this case, the documentation of the greatest proportion of sites being in Zone II does not provide such a simple association. Archaeological inquiry has been primarily conducted in Zone II as infrastructure and housing construction has rapidly expanded. Naturally, the more inquiry into one zone versus other zones skews the results somewhat. It is this caveat that archaeological models defining intensive landscape use through time must address

Ecological Subzones and Archaeological Sites

The back beach, or accretion zone area (Zone II), containing the predominant cultural layers identified in this project area, occurs at the interface of two other ecological zones. Zone I is represented by the immediate coastline, which often includes interdune deposits, crests and slipfaces, and backslope areas. Zone III, a bounding surface for Zone II, consists of an inland marshy area used through history for *lo`i*, fishponds, and wetland resources. This dynamic

coastal to slightly inland ecological setting containing three discrete ecological zones, was utilized on a continuous basis along eastern Kaua`i for at least 800 years (see Creed *et al*. 1995).

It has been postulated elsewhere (Dega and Buffum 2001; Dega and Morawski 2002) that Zone II back beach locations were the stable, lowland land surfaces on which primary permanent occupation and associated activities occurred during pre-Contact times. Temporary habitation loci, work areas (e.g., lithic workshops), recreational activity areas, fishing camps, and some burial areas are site types occurring directly along the coastline (Zone I). For the most part, direct coastal areas were transient in that dune movement and erosion were common. Back beach, accretion deposit areas were much more stable and selected for sustained, permanent habitation. Permanent house sites, ceremonial structures, some agricultural features, and such have been documented with more frequency in the Zone II area of eastern Kaua`i. Both burials and subsurface cultural layers often denoted as the paleo A-horizon along eastern Kaua`i have been most often identified in this ecological zone. The present archaeological project may reinforce this hypothesis. The western flank of the back beach zone (Zone III) commingled with depressed, marshy areas extending to the base of hill slopes to the west. These marshy areas, as noted above, were also utilized continuously throughout history, from lo`i and fishpond use to resource gathering areas. During historic times, these marshy areas were often filled and utilized for rice cultivation (see Creed et al. 1995). We continue to explore the possibility that a fishpond also occurred in this back beach area, the Kawailoa Pond south of the Radisson Hotel.

Historic Preservation Challenges

As discussed further above, several avenues of mitigation are possible for historic properties discovered prior to, or during, construction of the pathway. These include archaeological Monitoring, Data Recovery, Burial Treatment, and site Preservation. The primary impact to construction or location of the pathway appears to be in the form of traditional Native Hawaiian burials. Several known burial areas occur within or near proposed pathway routes. Such is the nature of coastal pathways in Hawaii. The singular challenge will be to more readily define the possible boundaries of the burial areas (and established preserve area such as occur at Wailua Golf Course) and to practice avoidance of the these areas. In working with the SHPD, other site types, such as traditional-period temporary habitation locations or camps and such, may be mitigated through Data Recovery sampling. Rehabilitation and Preservation of sites (see Table 1) will occur as part of the Preservation effort of known sites in the area, none of these occurring in the proposed pathway corridors. The greatest challenge again will be avoidance and protection of known burial preserve areas along the pathway. SCS and the contractors will work with the SHPD and Kaua`i/Ni`ihau Islands Burial Council to assess and mitigate known burials and those that are inadvertently discovered during construction.

Part IV: Interpretive Signs along Ahukini-Lydgate Pathway

This section provides a table (Table 2) listing possible signs and interpretations that may be placed along this portion of the bikepath. This table is open for revision and consultation will occur to refine potential signs in the area.

Table 2: Potential Signage: Ahukini Landing toward Wailua River

#	Location	Sign Site	Size	Description
1	Ahukini Landing	Overlooking Bay and Wharf	L	Description of sugar plantations Lihue to Kapaa. Landing history
2	Ahukini Bluff, South Shore	Beginning of decline into valley	S	Description of RR
3	Hanama'ulu Valley	South end of historic RR Bridge	L	Description of traditional agriculture activities
4	Hanama'ulu Bay	North end of historic RR bridge	L	Description of traditional shoreline activities
5	Kou, Old Landing	At landing north shore of Hanama'ulu Bay	S	Use by Hanama'ulu Sugar Plantation
6	Hanama'ulu / Wailua Ahupua'a	Border between Hanama'ulu & Wailua Ahupua'a	S	Quote Historic descriptions from 19th century travelers and residents
7	Marine Camp	Beach area near Motocross track	S	Historical account
8	Wailua Golf Course/ Hawaiian Burial Area Site -103	Beach south of # 2 green, on trail	S	Description of Hawaiian Burial Area
9	Hanama'ulu Sugar Company	Undetermined	L	Chronology and Sugar Company Information
10	Historic Sites of Hanama'ulu Ahupua`a	Ahukini Point (start of path)	L	Nu`ukoli, Kawailoa, Hanama'ulu Dairy, Wailua Airport, Marine Camp, Luckenback Shipwreck
11	Prehistoric and Historic Sites of Hanama'ulu	Ahukini Point (start of path)	L	Ahukini Heiau, Ahukini Terminal and Railway Company, Ahukini Camp, Ahukini Landing, Railroad Track of Old Bridge, Hanama'ulu Park

CONCLUSIONS

This interim report sought to discuss the various archaeological and historic preservation issues related to construction and maintenance of the Kaua`i Pathway project and focuses on the segment stretching from Ahukini Point to Lydgate Park. The report lists the known archaeological sites having been documented along this segment, the estimated significance of these sites, and potential mitigation of these sites and sensitive areas during construction of the pathway. The historic preservation challenges that may be faced during construction of the coastal pathway are presented, with recommendations for mitigation also being forwarded. SCS will continue to refine this document in consultation with the SHPD and various community organizations. In total, the relationship between known archaeological sites and possible pathway routes presents a dynamic opportunity to further explore the history of the Ahukini-Lydgate area while preserving the rich history of the area.

References available

A-2 PRELIMINARY GEOTECHNICAL REPORTS

October 6, 2005
W.O. 5411-00

Mr. Merle D. Grimes
MDG, Inc.
1042 Broken Arrow Circle
Elizabeth, CO 80107

HANAMA'ULU RIVER BRIDGE
AHUKINI-LYDGATE BIKE/PEDESTRIAN PATH
FEDERAL-AID PROJECT NO. STP-0700(51)
LIHUE, KAUAI, HAWAII

Dear **Mr. Grimes:**

This letter describes the findings from our literature research performed and presents our preliminary geotechnical considerations for the Hanama'ulu River Bridge for the proposed Ahukini-Lydgate Bike/Pedestrian Path project on the Island of Kauai, Hawaii.

We understand that the bike and pedestrian path will be about 10 to 12 feet wide and will consist of a 6-inch thick concrete path. One of the path alignment alternatives travels primarily along the existing shoreline from Ahukini Landing to Lydgate Park. The other path alignment alternative travels further inland along Kapule/Kuhio Highway. One of the path alignment alternatives will traverse one existing major structure, the Hanama'ulu River Bridge. Since the Hanama'ulu River Bridge may be historic, construction of a replacement bridge structure may not be possible. Therefore, the Hanama'ulu River Bridge structure will probably require modifications.

The existing Hanama'ulu River Bridge is a 2-span concrete arch bridge with 53 and 79-foot long spans. The bridge was built in the 1920's with a bridge deck about 10 feet wide. The bridge piers and abutments are supported on a pile foundation except for the Kapaa-side abutment that is supported on spread footings bearing on rock. The type of pile and other details of the pile foundation were not shown on the available drawings. In addition, subsurface soil information was not provided on the drawings.

Based on geologic maps, the Hanama'ulu River area is underlain by recent alluvial deposits. The recent alluvial deposits are characterized as unconsolidated, non-calcareous soils. These recent alluvial deposits tend to be soft in consistency and compressible. We anticipate that the existing bridge structure is mainly underlain by recent alluvial deposits.

We understand that the existing bridge will be renovated with a new bridge deck on the existing bridge. The bridge deck will consist of precast concrete planks with stainless steel cable railings and concrete railing posts. In addition, new concrete end post structures will be constructed.

The load capacity of the existing bridge foundation will need to be determined for the additional loads of the new bridge deck structure. We understand that bridge scour need not be considered in the bridge design.

We appreciate the opportunity to be of continued service to you on this project. If you have questions or need additional information, please contact our office.

Respectfully submitted,

GEOLABS, INC.

By _____
Gerald Y. Seki, P.E.
Senior Geotechnical Engineer

GS:cj

(h:\5400 Series\5411-00.gs1)

October 5, 2005
W.O. 5411-00

Mr. Merle D. Grimes
MDG, Inc.
1042 Broken Arrow Circle
Elizabeth, CO 80107

PRELIMINARY GEOTECHNICAL ENGINEERING STUDY
AHUKINI-LYDGATE BIKE/PEDESTRIAN PATH
FEDERAL-AID PROJECT NO. STP-0700(51)
LIHUE, KAUAI, HAWAII

Dear **Mr. Grimes:**

This report describes the findings from our literature research performed and presents our preliminary geotechnical considerations for the proposed Ahukini-Lydgate Bike/Pedestrian Path project between Ahukini Landing and Lydgate Park on the Island of Kauai, Hawaii. This report is intended to provide preliminary geotechnical considerations for planning and for the development of the Environmental Assessment only. Our work was performed in general accordance with the scope of services outlined in our revised fee proposal of June 9, 2005. The general location and vicinity of the project site are shown on the Project Location Map, Plate 1.

SUMMARY OF FINDINGS

Based on our literature research performed for the proposed Ahukini-Lydgate Bike/Pedestrian Path project, we anticipate that the proposed path alignments will traverse beach and dune sand deposits, alluvial soils and volcanic rock. The beach and dune sand deposits generally consist of poorly-graded sands. Portions of the project site are underlain by recent alluvial deposits that are typically soft and compressible. One of the path alignments travels close to an estimated wetland area. In addition, portions of the proposed alignments are underlain by basalt formations. We anticipate that the areas with basalt formations are covered by stiff residual and saprolitic soils, to basalt rock formation.

Several geotechnical considerations that may have a significant impact on project cost and construction time were identified during our literature research. In addition, the geotechnical considerations may have adverse impacts to the project during construction. These geotechnical considerations include settlement due to soft soil deposits, slope raveling, potential rockfall hazards, seepage of groundwater, and flooding associated with high rainfall storms. Special attention should be given to soft ground stabilization, cut slope design, subgrade stabilization, drainage design, and erosion control measures during the design and construction of the bike/pedestrian path project.

We anticipate that the proposed path alignments will traverse soft, loose, and/or unstable ground, such as gullies and stream crossings underlain by recent alluvial soils. Methods to reduce the anticipated path settlements and increase the path stability include removal of the soft and/or loose soil deposits and replacement with compacted fill materials, installation of a working platform or drainage blanket prior to fill placement, and utilizing soil stabilization methods, such as vibro-replacement or jet-grouting to improve the soft and/or loose soil deposits for construction.

In addition, a settlement waiting period likely will be required for embankment construction over the soft ground areas to reduce the potential for shear failure in the soft material and to reduce post construction settlements of the embankment. In addition, a surcharge program with settlement monitoring may be required to reduce the settlement waiting period.

It is proposed to place the new path on the existing Hanama'ulu River Bridge structure. The load capacity of the existing bridge foundation will need to be determined for the additional loads of the new bridge deck structure. New bridge structures will be required for the drainageway crossing near the Radisson Hotel and for the roadway crossing near the Kamalani Bridge. Since poor subsoil conditions may be encountered at the crossing sites, a deep foundation system such as drilled shafts or driven piles may be required to support the new bridge structures. In areas subjected to scour, the new bridge structure should be designed for scour. We understand that the use of viaduct bridge structures is being considered for crossing the soft ground areas. Because of the soft subsoil conditions, we anticipate that a deep foundation system will likely be required to support the viaduct bridge structures.

It should be noted that the findings and preliminary recommendations provided in this report are intended for planning and development of the Environmental Assessment only. The text of this report should be referred to for detailed discussion of our findings and preliminary recommendations.

PROJECT CONSIDERATIONS

The proposed Bike/Pedestrian Path project is located between Ahukini Landing and the existing Lydgate Park on the Island of Kauai, Hawaii. The project involves completion of the planning phase, including obtaining approval of the environmental assessment. The study corridor is located between Ahukini Landing and a point near the existing Lydgate Park, and from the shoreline to the Kapule/Kuhio Highway.

Alternative path alignments were developed during the initial phase of the planning study for the project. These path alignments were reduced to two main alternative path alignments for engineering evaluation to quantify potential costs for grading and major structures. Geotechnical input will be required to identify potential hazards, such as soft ground conditions, rockfall, and other conditions that may have a large impact on project costs and construction time.

We understand that the bike and pedestrian path will be about 10 to 12 feet wide and will consist of a 6-inch thick concrete path. One of the path alignment alternatives travels primarily along the existing shoreline from Ahukini Landing to Lydgate Park. The other path alignment alternative travels further inland along Kapule/Kuhio Highway.

One of the path alignment alternatives will traverse one existing major structure, the Hanama'ulu River Bridge. Since the Hanama'ulu River Bridge is historic, construction of a replacement bridge structure may not be possible. Therefore, the Hanama'ulu River Bridge structure will probably require modifications. In addition, two new bridge structures and a tunnel structure are proposed along the alignments.

Based on the relatively flat site topography along most of the path alignments, we anticipate that the majority of the cuts and fills will be on the order of less than 10 feet. However, major cuts and fills on the order of up to about 20 to 30 feet are anticipated for the construction of the proposed path alignment located between Hanama'ulu Bridge and Ahukini Landing.

PATH ALIGNMENT ALTERNATIVES

We understand that two main path alignment alternatives were developed for the project. These selected path alignment alternatives were studied for this report and are described below. The different paths and segments for the path alignment alternatives are shown on the Site Plans, Plates 2.1 through 2.6.

Alternative No. 1

Path Alternative No. 1 generally runs along the existing shoreline. The path starts from Ahukini Landing, circles around Hanama'ulu Bay, and travels near the shoreline to Lydgate Park. At the back of Hanama'ulu Bay, the path alignment is located away from the shoreline and within a low-lying area. In addition, the path crosses over the existing historic Hanama'ulu Bridge in this area.

An alternative segment that connects the shoreline path up to Kapule/Kuhio Highway is proposed near the Wailua Golf Course driving range. This alternative segment includes a tunnel section that crosses an existing pathway. In addition, new bridge structures are proposed near the Radisson Hotel and the Kamalani Play Bridge at Lydgate Park.

Alternative No. 2

Path Alternative No. 2 connects with Path Alternative No. 1 near the northern portion of Hanama'ulu Bay. This alternative path alignment follows existing cane haul roads and runs along the eastern side of Kapule/Kuhio Highway to Lydgate Park. This path alternative also includes alternative path segments that travels from Kapule/Kuhio Highway down to the shoreline near the Radisson Hotel.

GEOLOGIC CONDITIONS

The Island of Kauai is composed of a single basalt shield volcano built by the extrusion of lava of the Waimea Canyon Volcanic Series during the late Pliocene Epoch (more than 2¼ million years before present). Following the cessation of this main shield building phase, there was renewed volcanic activity with the extrusion of basaltic lava of the post-erosional Koloa Volcanic Series and the concurrent deposition of the alluvial sediments of the Palikea Formation.

The majority of the Island of Kauai is covered by lava of the Waimea Canyon Volcanic Series. These lavas consist of four distinct formations: Napali, Olokele, Haupu, and Makaweli. These formations are comprised of thin-bedded a'a and pahoehoe flows to massive basalt flows that ponded in calderas and graben.

Rocks of the Koloa Volcanic Series cover most of the eastern half of the Island of Kauai. These rocks are generally characterized as thick flows of dense basalt extruded from groups of vents aligned in north-south trends in various locales. Associated with the vents are pyroclastic materials, which usually form low cinder cones at the vent.

During the Pleistocene Epoch (Ice Age), there were many sea level changes as a result of widespread glaciation in the continental areas of the world. As the great continental glaciers accumulated, the level of the ocean fell since there was less water available to fill the oceanic basins. Conversely, as the glaciers receded, or melted, global sea levels rose because more water was available. The land mass of Kauai remained essentially stable during these changes, and the fluctuations were eustatic in nature. These glacio-eustatic fluctuations resulted in stands of the sea that were both higher and lower relative to the present sea level of Kauai.

The basaltic rock built by the extrusion of lavas of the Koloa Volcanic Series are generally characterized by flows of jointed dense vesicular basalt inter-bedded with thin clinker layers. The weathering process has formed a mantle of residual soils which grade to saprolite with depth. In general, saprolite is composed of mainly silty material and is typical of the tropical weathering of volcanic rocks. The saprolite grades to basaltic rock formation with depth.

Erosion of the upper Koloa and Waimea Canyon Volcanic Series has deposited alluvial sediments along streams, drainageways, and low-lying areas. These sediments are generally unconsolidated to moderately consolidated, non-calcareous soil deposits. Agricultural and commercial developments within the last century have brought the project site to its present conditions.

The geology for the proposed path alignments were developed based on geologic references. The site geology for the two path alternatives is described in the following subsections.

Alternative No. 1

The proposed path alignment for Alternative No. 1 is mainly underlain by beach and dune sand deposits. The beach and dune sand deposits are characterized as unconsolidated calcareous deposits. These deposits are poorly graded and uniform in particle size. Recent alluvial deposits may be encountered further inland from the shoreline near the Kawailoa area and within the Hanama'ulu Stream area. The recent alluvial deposits are characterized as unconsolidated, non-calcareous soils. These recent alluvial deposits tend to be soft in consistency and compressible. In addition, basalt rock formation of the Koloa Volcanic Series may be encountered along the southern portion of the path alignment at the sides of Hanama'ulu Bay.

Alternative No. 2

This alternative alignment is mainly underlain by alluvial deposits consisting of recent and older alluvium. Characteristics of the recent alluvium are described above. The older alluvial deposits are more consolidated and stiffer in consistency compared to the recent alluvial deposits. The southern portion of path alignment is underlain by basalt rock formation of the Koloa Volcanic Series. We anticipate the presence of residual and saprolitic soils near the ground surface. These soils are developed from the in-situ weathering of the basalt formation. In addition, the northern portion of the path alignment near Lydgate Park is underlain by a dune sand deposit.

SURFACE TERRAIN

The terrain along the bike/pedestrian path project limits varies significantly from level, low-lying areas to sloping hillside areas. A brief description of the topography along the proposed alignments is presented below. These descriptions are based on United States Geological Survey (USGS) topographic maps.

Alternative No. 1

The initial roadway alignment from Ahukini Landing travels around Hanama'ulu Bay with the ground surface varying from low-lying near the mouth of the bay to sloping hillsides along the sides of the bay with ground surface elevations up to about +80 feet Mean Sea Level (MSL). The remaining portion of the alignment travels along the shoreline with ground surface elevations from about +5 to +20 feet MSL.

Alternative No. 2

Since this alternative path alignment is further inland, the ground elevations along Alternative No. 2 are generally higher compared to Alternative No. 1. The existing ground surface near Hanama'ulu Bay is about Elevation +80 feet MSL and generally slopes downwards as the alignment travels along Kapule/Kuhio Highway to Lydgate Park to about Elevation +5 to +20 feet MSL.

EXISTING/NEW BRIDGE STRUCTURES AND TUNNEL

The proposed path alignments will traverse existing and new bridge structures and a new tunnel structure. Description of the bridge and tunnel structures is provided in the subsequent subsections.

Existing Hanama'ulu River Bridge

The Hanama'ulu River Bridge is a 2-span concrete arch bridge with 53 and 79-foot long spans. The bridge was built in the 1920's with a bridge deck about 10 feet wide. The bridge piers and abutments are supported on a pile foundation except for the Kapaa-side abutment that is supported on spread footings bearing on rock. The type of pile and other details of the pile foundation were not shown on the available drawings. In addition, subsurface soil information was not provided on the drawings. We anticipate that the existing bridge structure is underlain by recent alluvial deposits.

We understand that the existing bridge will be renovated with a new bridge deck on the existing bridge. The bridge deck will consist of precast concrete planks with stainless steel cable railings and concrete railing posts. In addition, new concrete end post structures will be constructed.

The load capacity of the existing bridge foundation will need to be determined for the additional loads of the new bridge deck structure. We understand that bridge scour need not be considered in the bridge design.

New Bridge Near Radisson Hotel

A new one-span bridge structure is proposed to cross an existing drainageway near the Radisson Hotel. The new bridge will be supported at it ends by concrete abutment structures and will be about 90 feet in length. The use of prestressed planks or girders is being considered with stainless steel cable railings. Based on the geologic maps, the new bridge site is generally underlain by recent alluvial and beach sand deposits.

New Tunnel Structure Near Driving Range

A new path tunnel structure is proposed near the Wailua Golf Course Facility. The 160-foot long tunnel will be composed of concrete construction and will be about 12 feet wide by 10 feet high. The tunnel structure is situated on a path connecting the Alternative No. 1 Coastal Path with the Alternative No. 2 Highway Path. Based on the geologic maps, the tunnel site is generally underlain by dune sand deposits.

New Bridge Structure Near Kamalani Bridge

A new three-span bridge structure is proposed near the existing Kamalani Bridge within the Lydgate Park area. The new bridge will be about 140 feet in length with span lengths of 35 and 70 feet. The proposed bridge will consist of wooden deck and railings, concrete pier columns, and concrete abutment structures. The wooden deck will be supported by stainless steel cables. We anticipate that the new bridge site is underlain by a dune sand deposit.

WETLAND AREA

We estimate that the proposed Alternative No. 2 path alignment will travel close to an estimated wetland area. In general, these areas are characterized by swamp or marsh-like environment with possible presence of standing water. Wetland sites may contain various forms of unique wildlife, which may require preservation. The approximate location of the estimated wetland site is shown on Plates 2.4 and 2.5.

From a geotechnical engineering point-of-view, swamps and marshlands often imply the presence of soft soils. It should be noted that areas not designated as a "Wetland Site" may also contain deposits of soft soils. These areas are further discussed in the Geotechnical Considerations section.

GEOTECHNICAL CONSIDERATIONS

Based on our desk-top study of the project site, several types of geotechnical considerations may have the potential for adverse impacts on the stability of the planned structures as well as the future maintenance of the proposed path. The geotechnical considerations may include, but are not limited to, the following:

- Settlement Due to Soft Soils
- Slope Raveling or Failure
- Rockfall Hazard
- Seepage of Groundwater
- Flooding by Rainfall

Settlement Due to Soft Soils

Areas underlain by recent alluvium are susceptible to consolidation and settlement over time as man-made fills are placed over these soft ground areas. Based on our literature research, soft soils are likely to be encountered at stream crossings, drainageways, wetland areas and other localized areas. A thorough field exploration should be performed at these locations where soft soil deposits are suspected in order to determine the lateral extent, thickness, and consolidation characteristics under the proposed fill loading conditions. The soft soil areas should be further evaluated to provide recommendations for design and construction of embankments and/or bridge viaduct structures over these areas. The estimated soft ground areas are shown on the Plates 2.1 through 2.6.

Slope Raveling or Failure

Based on the aerial photographs and available topographic maps of the project site, we anticipate that earthwork for the proposed bike and pedestrian path project will involve cuts at various locations throughout the site. We anticipate that substantial cuts of up to about 20 feet in the saprolite and/or weathered rock may be required. Therefore, some slope raveling and localized slope failures may occur on very steep cut slopes. Most of these slope raveling and failures tend to occur in steeply cut slopes with slope inclinations of about 1H:1V or steeper. Because of these existing conditions, cut slope inclinations for the larger cut slopes will need to be evaluated on a case-by-case basis when the vertical profile of the alignment is established.

Rockfall Hazard

It should be noted that areas adjacent to relatively steep hillsides are susceptible to rockfall. Rockfall involves the detachment and fall of rock material from the slope face that can present dangerous conditions for bike and pedestrian traffic. Because of these potential issues, cut slope inclinations for the larger cut slopes will need to be evaluated on a case-by-case basis when the vertical profile of the alignment is established.

Seepage of Groundwater

We anticipate that the soils encountered during path construction may have relatively high water contents due to the high rainfall and high groundwater levels. In addition, perched groundwater tables may exist in some areas. Because of the high moisture anticipated in the weathered materials, earthwork cuts may expose permeable layers responsible for transmitting seepage of subsurface groundwater, which in turn may cause potentially unstable cut faces.

Flooding by Rainfall

Based on a review of available topographic maps of the site, the Island of Kauai contains numerous rivers, streams, and drainage paths as a result of the high volume of tropical rainfall. Extended periods of heavy rainfall may swell drainage pathways to their capacity and flood low-lying areas. We wish to emphasize that adequate modeling of scour potential and storm water runoff should be performed for the design of new bridge structures.

CLOSURE

We appreciate the opportunity to provide geotechnical services to you on this project. If you have questions or need additional information, please contact our office.

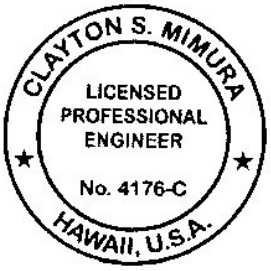
Respectfully submitted,

GEOLABS, INC.

By _____
Gerald Y. Seki, P.E.
Senior Geotechnical Engineer

By _____
Clayton S. Mimura, P.E.
President

CSM:GS:as



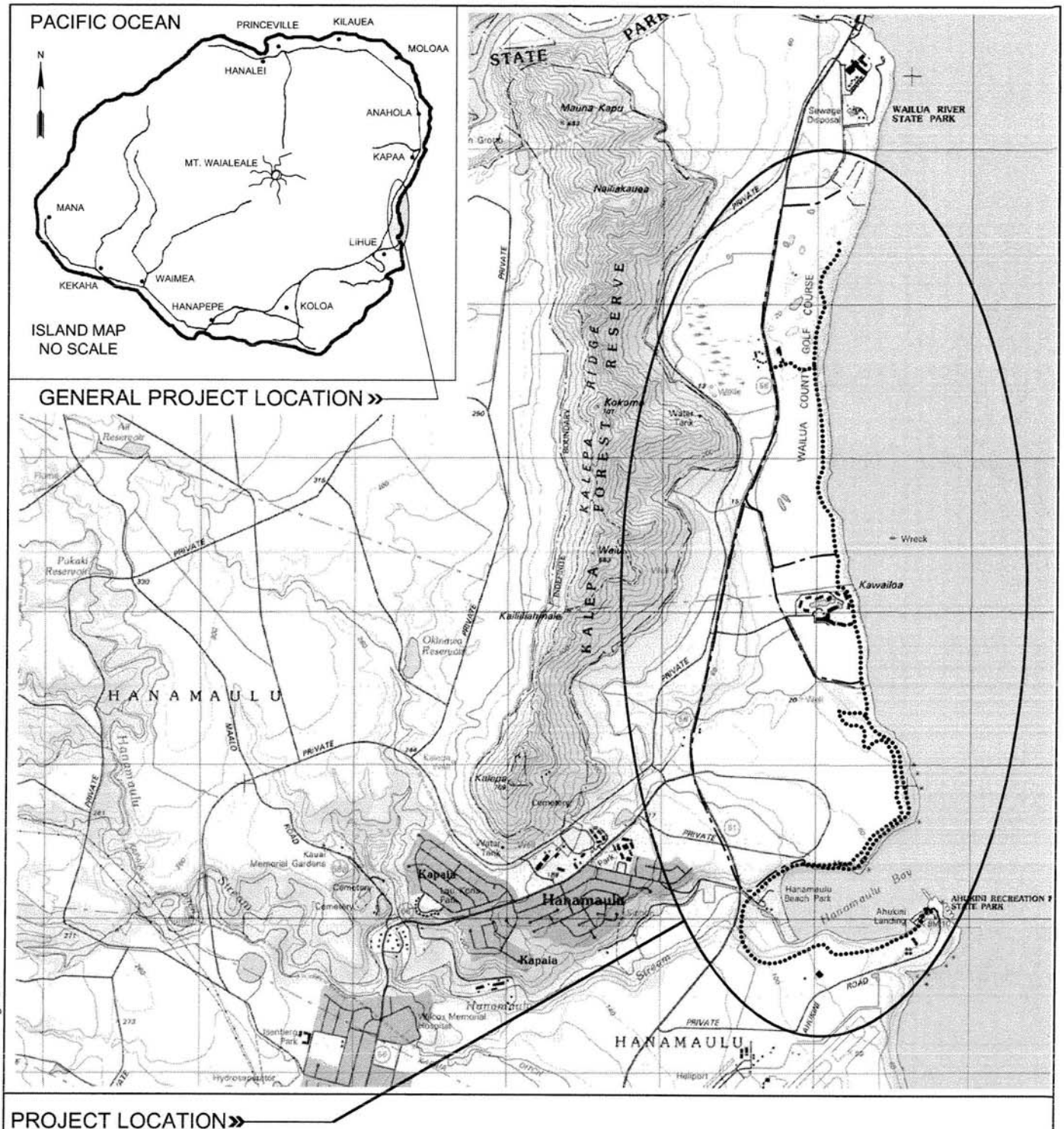
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

_____ 4-30-06
SIGNATURE EXPIRATION DATE
OF THE LICENSE

Attachments: Project Location Map, Plate 1
Site Plans, Plates 2.1 thru 2.6

(4 Copies to Addressee)

(h:\5400Series\5411-00.gs1)



LEGEND:

····· ALTERNATE NO. 1

—·— ALTERNATE NO. 2

3000 1500 0 3000 FT.

GRAPHIC SCALE

N

REFERENCE: MAP CREATED WITH TOPO!® ©2001 NATIONAL GEOGRAPHIC (WWW.NATIONALGEOGRAPHIC.COM/TOPO).

PROJECT LOCATION MAP

AHUKINI-LYDGATE BIKE/PEDESTRIAN PATH
FEDERAL AID PROJECT NO. STP-0700(51)
LIHUE, KAUAI, HAWAII

GEOLABS, INC.

Geotechnical Engineering

DATE	DRAWN BY	PLATE
SEPTEMBER 2005	HYC	1
SCALE	W.O.	
1" = 3,000'	5411-00	

User: KIM File Created: September 30, 2005 File Last Updated: October 04, 2005 11:51:22am
File: T:\Drafting-9904\Working\5411-00Ahukini-Lydgate\BikePath\5411-00PLM.dwg\PLM

SOIL MAP PLATE 2.1

SOIL MAP PLATE 2.2

SOIL MAP PLATE 2.3

SOIL MAP PLATE 2.4

SOIL MAP PLATE 2.5

SOIL MAP PLATE 2.6

A-3 GEOLOGICAL STATUS OF THE SHORELINE REPORT

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Charles Fletcher, Ph.D.

November 29, 2005

Merle D. Grimes, LLC
1042 Broken Arrow Circle
Elizabeth, Colorado 80107
303-571-5787 wk
303-571-5788 fx

Dear Mr. Grimes:

Following is my report on the geologic status of the shoreline at Wailua.

Physical Setting

The shoreline at Wailua on Kauai's east coast experiences persistent trade winds that blow 50 to 80% of the winter months, and 85 to 95% of the summer months[1]. These winds are incident to the shore at Wailua from a northeasterly angle such that they create a southward littoral current capable of transporting suspended sand and other materials in the water column. These winds may accelerate under the influence of the east Kauai vortex that develops due to diurnal heating of the upland. As a result, 25 to 35 knot winds are not uncommon and a moderate alongshore coastal current develops from the north to the south during gusting periods.

The trades cause the formation of a strong and persistent sea state in the waters offshore. Most of the long-period swell energy is dissipated at the seaward crest of the fringing reef, and the shoreline is characterized by 1 to 3 foot wind-waves with short periods (5-10 sec.), but openings and channels in the reef do allow shoreline access to higher energy waves. The primary energy controlling marine sediment transport at Wailua comes from tidal flow, long period surge, local wind-waves and their resulting currents across the reef-flat surface moving predominantly from north to south as well as directed offshore through channels and into depressions in the reef. The result is a shoreline that is not straight. Rather it has evolved pronounced curvatures and protuberances due to sediment accumulation and removal in response to both alongshore sediment transport and channel incision.

The reef-flat at Wailua is dominated by carbonate sediments produced as skeletal debris from various benthic organisms on the adjacent reef (carbonate algae, micromolluscs, coral fragments, and fossil carbonate lithic (rock) fragments). Closer to shore and along the littoral zone and beach, sediments tend to be clean carbonate sands produced by the reefal organisms.

The immediate upland on the northern and central sections is a sandy coastal plain with an origin related to a recent, past higher sea level (ca. 2000 yr ago), dune formation, and alongshore sediment accumulation. The upland along the southern section is basaltic, of volcanic origin.

[1] Sanderson, M. 1993. Prevailing Trade Winds, University of Hawaii Press, 126 p.

Controls on Shoreline Position

Shorelines maintain equilibrium (their position) under the influence of three environmental controls: sediment supply, waves and currents, and sea-level movements. These three factors compete for control over shoreline position. Sea level has been rising at approximately 1.5 to 2.4 mm/yr for most of the last century or more, and may, more recently, have experienced an acceleration in rate. Waves and currents have likely experienced little change in the last few centuries, although structures intersecting the littoral zone (such as the swimming pond) will influence their local impact. Sediment supply may vary widely due to human influences, seasonal changes in sediment production and delivery, and long-term shifts in sediment availability. A shoreline with sufficient sediment supply can maintain its position even while sea level and wave energy increase.

The shoreline at Wailua can be analyzed for changes in physical position over the last 75 years using a time series of historical aerial photographs and maps.

Methodology

The following map displays results of our historical shoreline analysis. Historical beach positions, color coded by year (see figure), were determined for the Wailua coastline using orthorectified and georeferenced aerial photographs and National Ocean Survey (NOS) topographic survey charts. We use the low water mark as the historical shoreline position (or shoreline change reference feature, SCRF). For locations in which there is coastal armoring or rocky shoreline seaward of any vegetation, the SCRF is delineated along the high water mark. Movement of the SCRF is used to calculate erosion/accretion rates at shore-normal transects spaced every 20 m (66 ft) along the shoreline. The 1987 SCRF is not used in the calculation of the annual erosion hazard rate, however it provides a gauge of seasonal uncertainty.

Erosion rates are determined at yellow shore normal transects (20 m). Annual erosion rates are displayed in a shore-parallel histogram graph located offshore of the coast on the diagram. Colored bars on the graph correspond to shore-normal transects; approximately every fifth transect and bar are numbered. Where necessary, some transects have been purposely deleted during data processing; as a result, transect numbering is not consecutive everywhere. Where complete beach loss has occurred, erosion rate calculations apply only to the time period when a beach existed.

Results

Our historical shoreline analysis reveals that the Wailua coast experiences intermittent historical variability in the form of some coastal segments that have long-term stability and others that display chronic erosion.

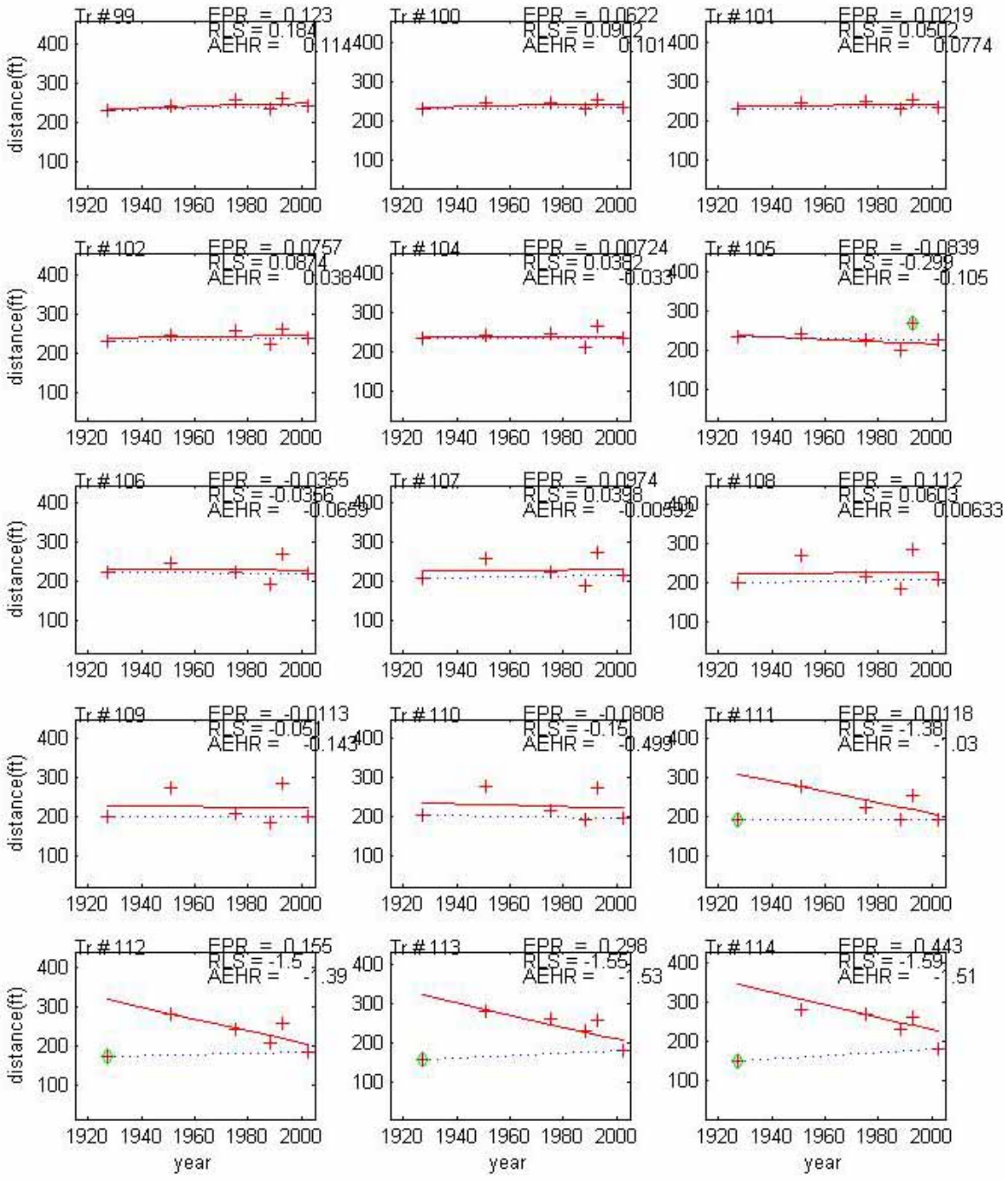
The northern portion of the coast at Lydgate Park suffers from chronic erosion at rates exceeding 2 ft/yr in places. This is due to the negative influence of the rock-wall swimming pond on sediment availability to the adjacent coast immediately to the south. The negative effects of the rock wall taper off at a distance of about 1500 feet to the south and the shoreline achieves greater long-term stability beyond this.

Along the Wailua Golf Course shoreline, the effects of erosion tend to be temporally sporadic and inconsistently spaced. Localized erosion characterizes places where reef channels and depressions intersect with the sandy beach to capture sands and divert them offshore. These are locations where

sands might otherwise reside along the beach. The practice range is one such location where erosion rates of 1 to 2 ft/yr characterize the last several decades.

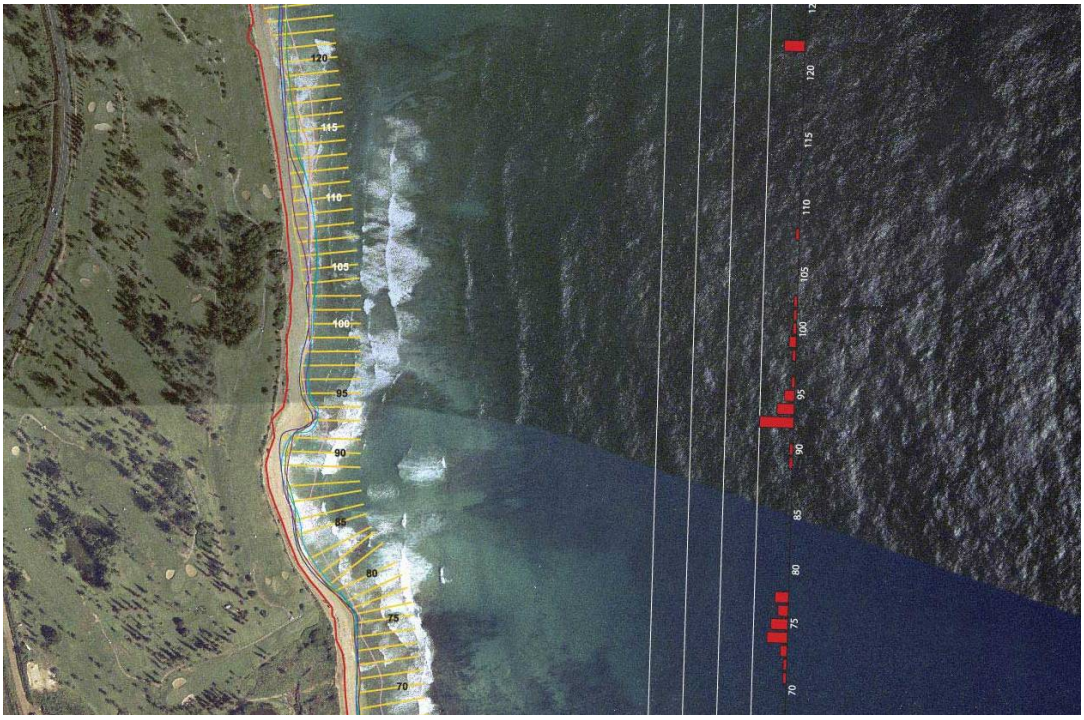

Kauai
Study Area
Wailua River
HISTORICAL SHORELINES
1927
Nov 1950
Apr 1975
July 1987
May 1988
Oct 1992
Feb 2002
Erosion rate measurement locations (shore normal transects)
Historical beach positions, color coded by year, are determined using ortho-rectified and georeferenced aerial photographs and National Ocean Survey (NOS) topographic survey charts. The low water mark is used as the historical shoreline, or shoreline change reference feature (SCRF).
For situations in which there is coastal armoring or rocky shoreline seaward of any vegetation, the vegetation line is drawn along the seaward side of the rock or armoring. If there is no sandy beach in these areas, both the vegetation line and the SCRF are delineated along the mean high water line.
Movement of the SCRF is used to calculate erosion rates along shore-normal transects spaced every 20 m (66 ft) along the shoreline. The 1987 SCRF is not used in the calculation of the AEHR, however it provides a gauge of seasonal uncertainty.
EROSION RATES
Annual Erosion Hazard Rates (AEHR)
50 Year Hazard Line
Erosion rates are measured every 20 m along the shoreline. These sites are denoted by yellow shore normal transects. The AEHRs are shown on the shore-parallel histogram graph. Colored bars on the graph correspond to shore-normal transects; approximately every fifth transect and bar are numbered. Where necessary, some transects have been purposely deleted during data processing; as a result, transect numbering is not consecutive everywhere. Where complete beach loss has occurred, erosion rate calculations apply only to the time period when a beach existed.
The 50 year erosion hazard line is derived by multiplying the AEHR for each transect by 50 and projecting the calculated distance along each transect from the most recent data point (2002).
Kuhio Highway
Kuhio Highway
Kuhio Highway
159°20'50" W
40"
30"
20"
10"
159°20' W
50"
40"
159°19'30" W
464100m W
464700m W
243800m N
22°02'40" N
22°02' N
22°01' N

The first and second fairways show a history of relative stability when averaged over time. However, direct inspection of the coastline, and interviews with observers, indicate that the coast undergoes periods of retreat during high wave and wind events. The presence of large stone blocks at the location where a natural dune would otherwise exist, confirm a history of attempts to armor the coast to prevent land loss. A closer look at the history of shoreline positions on this section of coast, between transects 125 and 75, reveals the intermittent history. Transects 99-114 (below) illustrate and exemplify this.



The plot of shoreline positions through time, as typically captured in transect (Tr) #108, shows that two episodes of erosion characterize the otherwise stable shoreline. The period 1927-1950 is characterized by a strong erosion trend that apparently recovered over the following decades. Another erosion trend from 1988-1992 also displays strong shoreline displacement that also recovered in the subsequent decade.

The 1927-1950 trend may be due to a storm event, sand-mining from the beach, or reef blasting all of which are known to have occurred periodically over the course of the early to middle 20th century. The fact that the low water mark (the seaward front of the beach) recovered to nearly its original position following each erosion period suggests that a storm event, causing temporary sand removal, was the culprit for displacing the shoreline rather than permanent sand removal associated with blasting or mining. The 1992 erosion trend is the result of high wave energy related to Hurricane Iniki.



Overall, it appears that the position of the low water mark, which we map as the shoreline reference feature, and which is located at the seaward edge of the beach at the base of the sloping foreshore, has essentially maintained its position over the past 75 years. That history has been characterized by erosion events that temporarily displace the toe landward, which subsequently recovers, but permanently cuts-back the edge of the fairway, which does not recover. This has led to placement of stone blocks in a fruitless effort to stop erosion that would cease on its own anyway upon the termination of the storm. Net stability of the beach toe, and chronic retreat of the dune edge, suggest that the beach width has increased over time and that the beach relies on dune sand released by erosion to maintain its position.

Nature of the Erosion Problem

Coastal erosion occurs when a sandy shoreline (with a beach) experiences a deficiency in sand volume preventing it from maintaining a stable position on the edge of the ocean. The sand

deficiency may be caused by human actions, a rise in sea level, or a major event such as a storm or tsunami.

In response to a sand deficiency, the land abutting the beach may erode. This releases sand from the abutting dunes to feed the beach – in the process the shoreline migrates landward some distance and may stabilize once again if the sand deficiency is restored. Although the beach will migrate landward, it may not experience any narrowing due to erosion if it receives the sand eroded from the dunes. That is, a wide beach can persist even as it migrates landward at the expense of the abutting land. Hence, there is a difference between coastal erosion (land loss) and beach erosion (beach loss). Because of this phenomenon, for the environmental health of the beach (and because the beach is often more valuable than the land) it may be appropriate to let the erosion continue as a means of restoring a sand deficiency.

If a sand deficiency is temporary (such as a seasonal event associated with seasonal wave changes) any erosion will be temporary and repair itself from one year to the next. If a deficiency persists from year to year this signifies an ongoing impact to sand volume. Likely causes may include ongoing sea-level rise, ongoing human impacts, or continuing recovery from a large one-time impact such as a storm or tsunami. In such a case the landward recession is chronic.

In cases where chronic erosion destroys private land and/or threatens built structures, abutting owners have a tendency to develop remedial measure to stop the erosion. The most common measure is to build a seawall. However, this impounds the dune sand that would otherwise nourish the beach, and on a chronically eroding shoreline, seawalls will cause the beach to disappear. This is an undesirable result as the original goal of most coastal land use is to enjoy the economic and environmental benefits of the beach. In Hawaii particularly, the beach is a public resource and it is inappropriate to allow private land use to impact conservation land.

Unfortunately, in Hawaii where chronic erosion is a widespread problem, past practice has been to build seawalls in response to erosion. As a result, the total length of beaches on the island of Oahu has decreased by 25% due to seawall building, over 400 seawalls exist on the Maui shoreline with fewer than half being properly permitted, and public access to the sea is significantly decreased throughout the state because beach loss limits shoreline use.

Ironically, the attempt to armor the Wailua fairway coastline has not prevented landloss, and because the armoring is haphazard and poorly engineered, neither has it significantly interfered with sand movement from the dune to the beach. However, the dune does have a sand deficiency, and were the dune to undergo sand augmentation it would likely experience enhanced stability, ecological restoration, and offer better protection to the recessing fairway.

Appropriate Development - Pathway

Although the most appropriate coastal development emphasizes mitigating coastal hazards such as storm surge, erosion, and tsunami inundation by avoiding the problem through broad setbacks of several hundred feet or more, too many times we are forced to develop in the coastal hazard zone because of logistical, economic, and even philosophical constraints.

The Pathway project is a typical example. Laudably promulgated on the philosophy of “public access forever”, the pathway would be ideally sited on a modular, low-impact surface with minimal solid area facing the sea at a distance of at least 100 feet and most appropriately 200 feet setback from the vegetation line. Unfortunately, at locations where upland improvements force the pathway to a

considerably more seaward position, or landward, away from the coast altogether, attempts must be made to accommodate the presence of unexpected traits in the new venue.

Pushed to the seaward edge of the fairway, perched on the edge of an episodically retreating upland surface, the design of the path should attempt to minimize hazard exposure, environmental impact, and negative influences on the function of the golf course. Hence, the following general guidelines are proposed.

The pathway should:

1. Restore the natural sand volume and geometry of the original coastal dune, as well as its critically important function as a coastal environment;
2. Present an absolute minimum surface area toward seaward forces;
3. Withstand strong instantaneous buoyant, shearing, and concussive forces associated with marine inundation and high winds;
4. Withstand temporary erosion events associated with storms;
5. Be amenable to future post-erosional sand placement to restore the dune system.

This results in essentially two structural options.

1. Build a lightweight pathway surface consisting of lockable modular sections floating on a sand foundation in connection with dune restoration. Dune construction should be located as far landward as possible, between the seaward-most line of stable vegetation on the beach and the fairway rough. It should emphasize a slope of 2:1 or greater (3:1) and a fill volume of approximately 8-10 yds^3/ft of frontage. Modular path sections should have a tethering system to prevent scattering during flooding. A small retaining wall to prevent sand spillage onto the pathway is acceptable. The dune should be strongly vegetated. A source of sand needs to be identified both for the initial restoration, as well as for replacement of sand eroded in future years.
2. Build a hanging pathway on narrow externally threaded auger piles of sufficient strength to allow broad spacing to avoid interference with wave processes. This version would likely survive marine forces intact and allow sand placement below and between the pathway superstructure. Piles would be augered several feet below grade and allow for marine flooding and erosion without subsequent damage to the path. Following the season of high wave action, sand restoration could ensue.

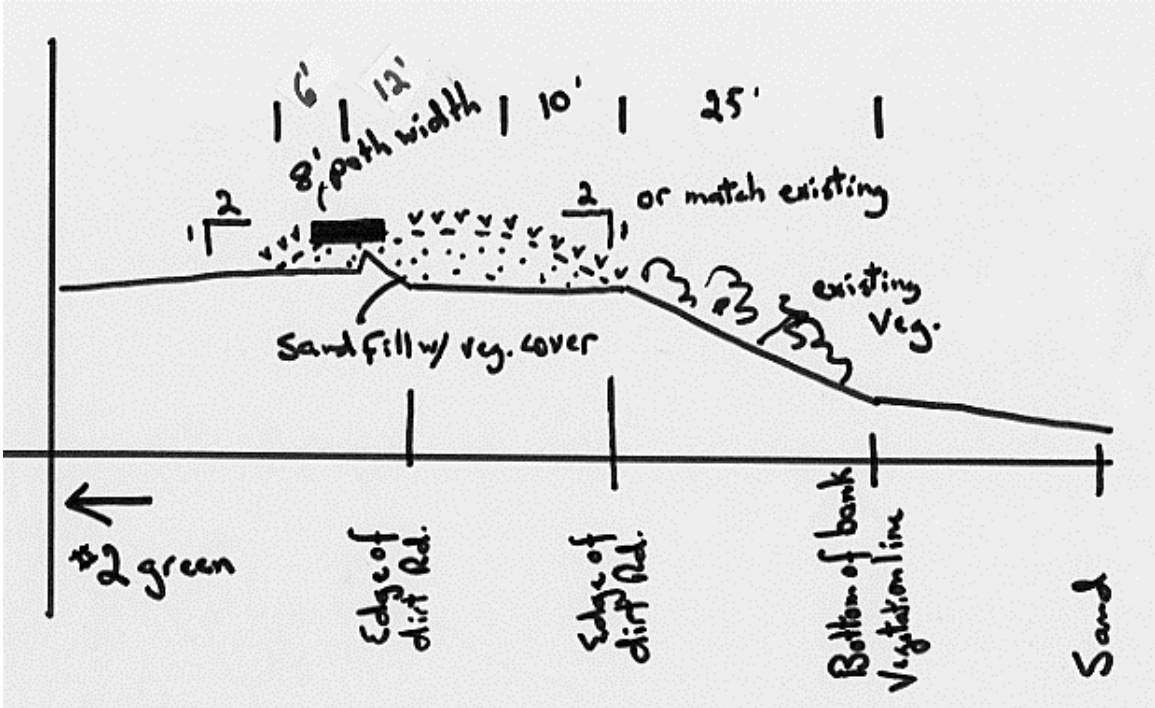
In both cases the existing topographic grade will simply be buried by the restored dune. This includes burying the stone blocks, dirt road, eroded escarpments, and other topographic features.

Both of these approaches emphasize the application of sand nourishment to the coastline. Although sand nourishment is not a permanent solution to coastal recession, it is the most consistent with natural environmental processes, it is the most permitable approach from a regulatory point of view, it represents a maintenance commitment, and does entail ongoing costs in repairing future erosion damage.

Kauai has three sand sources: Mana, Mahaulepu, and offshore. Offshore sand mining has not been considered here although this option is viable if the County wishes to pursue it further. Mana sand is the best developed resource at this time. However, the sand from Mana has shown a tendency to compact and harden when placed in the intertidal zone. This effect should be mitigated in the present

circumstance due to its removal from daily tidal inundation as part of a dune. The most effective approach to improving the sand is to wash it using a wet elevator and airfall system. With this treatment it is unlikely that the dune fill will undergo hardening. A sand improvement system such as this exists at the Mahaulepu quarry.

The following figure provides a generalized restoration section.



Shoreline South of Wailua Golf Course

Data on shoreline change to the south of the golf course indicates that erosion increases in the area of the Kauai Hilton hotel and to its south. Erosion on the south end of the Hilton property reaches a chronic rate of ~0.3 ft/yr and to the south in the area of the dirt road that accesses the shore, erosion reaches ~0.5 ft/yr.

The remainder of the shoreline to Ahukini Point was not analyzed with regard to shoreline change history. The majority of this coastline is rocky and not subject to pronounced erosive forces. Despite this, the placement of the bike path does present a challenging permitting issue as it will be subject to marine inundation during storm and tsunami events and frequent wave forces if it is placed too close to the higher intertidal zone. The bath should be structurally designed to withstand shearing, concussive, and buoyant marine forces.

The location of the path along the rocky shoreline should emphasize keeping the widest possible open space (set-back) between any evidence of marine influence and the seaward edge of the path. Where the path will have to be squeezed between rocky shore and heavy vegetation, it is most advantageous to conduct vegetation cutback, and locate the path in the upland direction.

The photo(s) below illustrates where it would be problematic to permit a pathway on the upper most boulders and seaward of the vegetation – the path will need to be located within the vegetation zone and *well* (~20ft) landward of the uppermost boulder zone. Exact location of the pathway in this section would be best performed with a coastal expert, a chainsaw, and flagging ribbon. In the bottom photo, the location of the old road/railbed does not *exactly* represent the optimal location. The bike path would be best located mauka of the road, or at least on the mauka edge of this feature.

Charles Fletcher
Professor of Marine Geology and Geophysics

A-4 STRUCTURAL REPORT

AHUKINI LANDING TO LYDGATE PARK
STRUCTURAL STATUS REPORT

KSF, Inc.

October 5, 2005

The path from Ahukini Landing to Lydgate Park may require the following proposed new structures or retrofit work on existing structures (refer to Map S-1), depending on the final path alignment.

1. Proposed Ramp South of the Existing Hanama'ulu Railroad Bridge
2. Existing Hanama'ulu Railroad Bridge Retrofit
3. Proposed Retaining Wall for Path Access Ramp at the Hanama'ulu Beach Park
4. Proposed Retaining Wall Path on the North Shore of Hanama'ulu Bay
5. Existing Cane Haul Box Culvert Bridge - Radisson Bypass Alternative
6. Proposed Temporary Integrated Boardwalk Plank System
7. Proposed Radisson Hotel Bike/Pedestrian Bridge
8. 4th Fairway – Proposed Bike/Pedestrian Bridge
9. 2nd Fairway – Proposed Helical Pile Boardwalk Path with Dune Restoration
10. 1st. Fairway – Proposed Helical Pile Boardwalk Path with Dune Restoration
11. 17th Green – Proposed Helical Pile Boardwalk Path
12. Proposed Lydgate Park Bike/Pedestrian Bridge

The following is a status report of structural assessment work completed to date:

1. Proposed Ramp South of the Existing Hanama'ulu Railroad Bridge

Three alternatives were prepared for this structure.

a. **Embankment**: Fill and re-grade the entire area to keep slopes within the ADA 5% maximum. This should be a low cost solution but accessibility problems and large height/grade differentials will increase construction difficulty. This solution impacts a wide area. The filled areas are likely to cause drainage problems, as runoff will be accumulated on the uphill side of the fill.

b. **MSE:** Use a mechanically stabilized earth, segmental retaining wall system to define the path. This system utilizes a system comprised of concrete masonry units with geotextile tiebacks to retain and stabilize the backfill. This may be the most cost effective system with the least impact on the area. Drainage concerns will be similar to "a" above as uphill runoff will be accumulated (Refer to Drawing S-2).

c. **Bridge:** Construct an elevated structure. A bridge requires foundation and superstructure work and would be the most costly especially if deep foundations (piles) are required. A major advantage of an elevated structure will be its limited impact on the surrounding area as the topography will be minimally affected and drainage will not be an issue (Refer to Drawing S-3).

Estimate of Probable Construction Costs:

- Embankment Option: Not available at this time. Estimate requires detailed topographic survey
- MSE/Segmental Retaining Wall Option: $1,000,000.00
- Elevated Bridge/Ramp Option: $1,5000,000.00 ($250.00 per s.f. plan area of deck)

2. Existing Hanama'ulu Railroad Bridge Retrofit

The following is a report summarizing our work regarding the Structural Assessment and Recommendations for the Historic Hanama'ulu Railroad Bridge (Refer to Drawing S-4).

a. Observations

The bridge appears to be in very good condition considering its age and ocean front exposure. Several site visits have been conducted. At this time, no exploratory evaluations such as coring and concrete sampling have been performed. Several minor spalled areas are visible from the ground. The top "trough" which formed the original roadway for the railway was filled with dirt and debris. Once cleaned, additional concrete damage can be expected due to constant moisture from the organic material. It is expected that these concrete defects can be readily repaired using conventional chip-and-patch methods. (See Section "E")

Photo of the Hanama'ulu Railroad Bridge

Another view of the Hanama'ulu Railroad Bridge

b. **Structural Assessment**

An original plantation drawing was available indicating dimensions but containing very little other information regarding reinforcing steel or the foundation piles. The bridge was modeled using a STRUDL finite element program neglecting any reinforcing steel. Loading from the proposed, new concrete deck used to widen the path was included. The structure, with smaller secondary arches supported on longer span primary arches, was found to be completely in compression. Concrete compressive stresses were in the 500-psi range. This would partially explain the few observed spalls as the absence of tensile cracks has allowed the concrete to continue to protect the reinforcing steel.

c. **Foundation Assessment**

Geolabs, Inc is assessing the substructure. Initial indications are that the existing foundation will be adequate to support the new path as the new loads will be of the same order of magnitude as originally intended. Field assessments to probe the depth of the top of the pile cap and collection of boring samples have yet to be completed. Unknown will be the size, depth, number and condition of the original piles, assumed to be timber. This information will be extremely difficult to ascertain.

d. **Design and Recommendations**

Various schemes to modify the top deck for an increased width and guardrails have been reviewed. The recommend solution uses pre-cast concrete planks attached to the existing structure with epoxy embedded steel dowels. The planks span across the width of the existing bridge to provide a widened path and will provide a durable, low maintenance pathway. Intermittent concrete posts that support steel cables are used for their minimal visual impact and low cost.

e. **Concrete Repairs**

All concrete repairs shall be done in accordance with recommended practices of the International Association of Concrete Repair Specialists. Properly installed repairs will assure that the life of the structure can be extended with a minimum of additional concrete maintenance. All repairs visible from the ground shall be finished to match the color and texture of the existing concrete. In areas such as the upper trough, where continuous moisture and debris build up can be anticipated, any reinforcing steel exposed for repairs shall be coated with an anti corrosion material. Replacement segments of reinforcing shall be galvanized, stainless steel coated or FRP.

It is recommended that additional drains be installed along the length of the upper trough to remove any accumulated water. Also, the entire trough surface area should be coated with a waterproofing membrane as this area will be in accessible and difficult to maintain once the new roadway decking is installed.

Estimate of Probable Construction Costs:
$300,000.00 to $500,000.00

3 and 4. Proposed Retaining Wall Path – Hanama'ulu Beach Park and on the North Shore of Hanama'ulu Bay

Retaining walls will be required on steep slopes in order to provide a location for the bike/pedestrian path (Refer to Drawing S-5). Typically, the slope of the path shall not exceed a 5 percent grade for accessibility requirements. The path grade can exceed 5 percent, but not greater than 8.33 percent for a length, not to exceed 30 feet before a landing of at least 5 feet long is required that does not exceed a 2 percent grade. Whenever the path grade exceeds 5 percent, hand railing is required.

Estimate of Probable Construction Costs:
$2,700.00 per lineal foot

5. Existing Cane Haul Box Culvert Bridge - Radisson Bypass Alternative

An existing cane haul box culvert structure located upstream and mauka of the Radisson may be used as an alternate route. The concrete appears to be in good condition. Substantial cost savings may be realized with this alternative as only retrofit safety railings and an overlay surfacing material will be required.

Estimate of Probable Construction Costs:
$65,000.00 (railing and concrete path surface)

6. Proposed Temporary Segmental Boardwalk Plank System

The temporary integrated boardwalk plank system is designed to sit directly on top of the existing sand with minimal disturbance to the sand sub-grade and vegetation. The 12 - foot by 12 - foot planks (Refer to Drawing S-6) are prefabricated off-site. They

are connected with stainless steel bolts and can easily be removed. Stainless steel anchor/augers that are attached to the planks will be screwed into the sand in order to keep the planks from washing away or becoming projectiles during flood and high wind conditions.

Estimate of Probable Construction Costs:
$90.00 per square foot

7. Proposed Radisson Hotel Bike/Pedestrian Bridge

In order to span the ditch at this location, a 90 - foot span bridge is required. Three single span alternatives are proposed. All alternatives are designed to expedite construction and keep the work out of the water to avoid permitting issues.

a. **Pre-stressed Concrete Plank:** A pre-stressed concrete planks with a cast in place concrete topping (Refer to Drawing S-5). The pre-cast plank has a thin cross section and will have a lesser impact on the stream flow than a concrete girder bridge would have.

b. **Pre-stressed Concrete Girder:** Pre-stressed girders with a concrete deck are considered as an alternate (Refer to Drawing S-6). The advantage of this system is a lighter structure requiring a more economical foundation. The depth of the girders is a disadvantage. Raising the bridge will affect the on-grade portion of the trail on either end of the bridge, as retaining walls may be required. If the girder structure is lowered, stream flow may be adversely affected.

c. **Pre-fabricated Carbon Steel Bridge:**

Pre-fabricated steel bridges have become common, low cost alternatives on the mainland. For marine environments such as the Kauai bike/pedestrian path, the bridge will need to be hot-dipped galvanized and then painted with a marine grade coating of which there are many color options.

The pre-fabricated bridge sits on two abutments and can easily span without a center support pier for distances up to 140 lineal feet. They are typically 10 foot in width and have a concrete deck that is installed after the bridge has been set on its two abutments. The bridge has a 10,000 LBS vehicle load and a lifting weight of 37,543 LBS.

The manufacturer has a limited warranty of 10 years for the bridge. The actual life of the bridge will greatly depend on the maintenance routine that is implemented on the bridge. Steel bridges such as the Golden Gate Bridge are examples of painted steel bridges that can last indefinitely with proper maintenance.

Estimate of Probable Construction Costs:
Pre-stressed Concrete Plank Option: $500,000.00
Pre-stressed Concrete Girder Option: $450,000.00
Pre-fabricated Steel Bridge Option: $250,000.00

8. **4th Fairway – Proposed Bike/Pedestrian Bridge**

A bridge with a span of approximately 80 lineal feet will be required in order to cross over the ditch at this location. The same three bridge design options that were considered for the Proposed Radisson Hotel Bridge in Section Seven are proposed for this bridge and there is no significant difference in cost.

Estimate of Probable Construction Costs:
Pre-stressed Concrete Plank Option: $500,000.00
Pre-stressed Concrete Girder Option: $450,000.00
Pre-fabricated Steel Bridge Option: $200,000.00

9. **2nd Fairway – Proposed Helical Pile Boardwalk Path with Dune Restoration**

A helical pile supported boardwalk system is used along the coastline where there is tidal erosion and limited space (Refer to Drawings S-9 and S-10). Environmental and permitting constraints in the shoreline area prohibit permanent structures. The helical pile is removable; yet stable enough to support the boardwalk even if there is substantial sand erosion. The entire boardwalk system may be dismantled and the helical piles removed thus qualifying the structure as "temporary

Estimate of Probable Construction Costs:
$850.00 per lineal foot, including safety railing and excluding dune restoration

10. **1st. Fairway – Proposed Helical Pile Boardwalk Path with Dune Restoration**

The same Helical Pile Boardwalk Design used for the 2nd fairway will be utilized for the 1st fairway; however, the dune restoration design is slightly different (refer to drawing S-11).

Estimate of Probable Construction Costs:
$850.00 per lineal foot, including safety railing and excluding dune restoration

11. **17th Green – Proposed Helical Pile Boardwalk Path**

The same Helical Pile Boardwalk Design used for the 1st and 2nd fairways will be utilized for the 1st fairway; however, no dune restoration is needed (Refer to Drawing S-9).

Estimate of Probable Construction Costs:
$850.00 per lineal foot, including safety railing and excluding dune restoration

12. Proposed Lydgate Park Bike/Pedestrian Bridge

A bridge over the unpaved sand road is required mauka of the play structure. A 140 - foot span bridge will allow continued vehicular access to the beach via the sand road. Two alternatives were considered:

a. **Suspension Bridge.** In keeping with the aesthetic theme of the Kamalani Play Bridge structure, a suspension bridge is recommended (Refer to Drawing S-12). Reinforced concrete piers and a stainless steel cable will support the bridge span. The decking will be framed of either Trex or wood timber planks.

b. **Concrete Girder Bridge.** As an alternate to the suspension structure, a 3 span concrete girder bridge is proposed (Refer to Drawing S-13). Although more costly, a concrete structure will be more durable and require much less maintenance than the suspension bridge option.

Estimate of Probable Construction Costs:
Suspension Bridge Option: $500,000.00
Concrete Girder Bridge Option: $700,000.00