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GOVERNOR OF HAWAII

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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OFC. OF ENVIRONMENTAL QUALITY CONTROL

Mr. Scott Glenn, Interim Director
Office of Environmental Quality Control
State of Hawaii
Department of Health
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Mr. Glenn:

With this letter, the Department of Land and Natural Resources hereby transmits the final environmental assessment and finding of no significant impact (FEA-FONSI) for the Mana Drag Race Strip Electrical and Lighting Upgrades project situated at Tax Map Key (4) 1-2-002: 009, 036 & 040, in the Waimea District on the island of Kauai, for publication in the next available edition of the *Environmental Notice*.

Enclosed is a completed OEQC Publication Form, two copies of the FEA-FONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact Mr. Carty Chang of our Engineering Division at 587-0230.

Sincerely,

SUZANNE D. CASE
Chairperson

Enclosures: Two (2) hard copies of the FEA-FONSI
One (1) hard copy of the OEQC Publication Form
One (1) CD containing the FEA, OEQC Publication Form and summary

FILE COPY
MAR 23 2016

AGENCY PUBLICATION FORM

Project Name:	Mana Drag Race Strip Electrical and Lighting Upgrades
Project Short Name:	Mana Drag Strip Improvements
HRS §343-5 Trigger(s):	(1) Use of State lands and funds (2) Use within conservation district
Island(s):	Kauai
Judicial District(s):	Fifth Circuit
TMK(s):	(4) 1-2-002: 009, 036 & 040
Permit(s)/Approval(s):	Conservation District Use Permit, Shoreline Setback Determination, Special Management Area Permit, National Pollutant Discharge Elimination System Permit
Proposing/Determining Agency:	Department of Land and Natural Resources
Contact Name, Email, Telephone, Address	Adrian Chang Department of Land and Natural Resources Engineering Division 1151 Punchbowl Street, Room 221 Honolulu, Hawaii 96813 Ph: (808) 587-0260 Email: adrian.n.chang@hawaii.gov
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	The Limtiaco Consulting Group
Contact Name, Email, Telephone, Address	Kyle Kaneshiro The Limtiaco Consulting Group 1622 Kanakanui Street Honolulu, Hawaii 96817 Ph: (808) 596-7790 Email: kyle@tlcghawaii.com

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Status (select one)	**Submittal Requirements**
____ DEA-AFNSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.
__X__ FEA-FONSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
____ FEA-EISPN	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
____ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
____ DEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
____ FEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.
____ FEIS Acceptance	The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter

Determination	of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
FEIS Statutory Acceptance	Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.
____ Supplemental EIS Determination	The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.
____ Withdrawal	Identify the specific document(s) to withdraw and explain in the project summary section.
____ Other	Contact the OEQC if your action is not one of the above items.

Project Summary
Provide a description of the proposed action and purpose and need in 200 words or less.

The State of Hawaii, Department of Land and Natural Resources (DLNR), in cooperation with the Garden Isle Racing Association (GIRA), proposes electrical and lighting improvements at the Kauai Raceway Park (KRP) located in Mana, Kauai, Hawaii. The KRP does not currently have a permanent electrical power connection; portable generators are brought to the site to power lighting, electrical equipment, and mechanical equipment for GIRA's monthly race events at the facility. A mixture of temporary lighting and street-light style light poles are currently used to light the facility for evening events.

The proposed electrical and lighting improvements include installation of approximately 19 stadium-style light poles along the length of the existing race track. The lighting will be downcast to mitigate potential adverse effects to the local seabird population. Additionally, overhead power lines will be extended from the Kauai Island Utility Cooperative distribution system on Kaumualii Highway to the KRP to provide permanent electrical power to the facility.

The project will increase visibility at the facility during evening events, providing a safer and more enjoyable experience for participants. The project will also reduce the KRP reliance on temporary lighting and portable generators.

Final Environmental Assessment

Mana Drag Race Strip
Electrical and Lighting Upgrades

Mana, Kauai, Hawaii

March 2016

Prepared for:

State of Hawaii
Department of Land and Natural Resources

Prepared by:

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Final Environmental Assessment

MANA DRAG RACE STRIP
ELECTRICAL AND LIGHTING UPGRADES

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

Mana, Kauai, Hawaii

Prepared For:

State of Hawaii
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813

Prepared By:

The Limtiaco Consulting Group
Civil Engineering and Environmental Consultants
1622 Kanakanui Street
Honolulu, Hawaii 96817

March 2016

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LIST OF ABBREVIATIONS

Abbreviation	Definition
%	Percent
AC	Asphalt concrete
AIS	Archaeological Inventory Survey
AMP	Archaeological Monitoring Plan
BLNR	Board of Land and Natural Resources
BMPs	Best Management Practices
CAB	Clean Air Branch
CDUP	Conservation District Use Permit
County	Kauai County
CWB	Clean Water Branch
CZM	Coastal Zone Management
CZO	Comprehensive Zoning Ordinance
DAR	Division of Aquatic Resources
dBA	A-weighted decibels
DLNR	Department of Land and Natural Resources
DoFAW	Division of Forestry and Wildlife
DOH	State of Hawaii, Department of Health
DPW	Kauai County, Department of Public Works
EA	Environmental Assessment
ft	Foot/feet
GIRA	Garden Isle Racing Association
HAR	Hawaii Administrative Rules
HRS	Hawaii Revised Statutes
IRHB	Indoor and Radiological Health Branch
KFD	Kauai Fire Department
KIUC	Kauai Island Utility Cooperative
KRP	Kauai Raceway Park
KPD	Kauai Police Department
NAAQS	National Ambient Air Quality Standards
NFIP	National Flood Insurance Program
NHRA	National Hot Rod Association
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System

Abbreviation	Definition
NRCS	Natural Resources Conservation Service
OCCL	Office of Conservation and Coastal Lands
OHA	Office of Hawaiian Affairs
SAAQS	State Ambient Air Quality Standards
SHPD	State Historic Preservation Division
SMA	Special Management Area
SMA Rules	Special Management Area Rules and Regulations of the County of Kauai
State	State of Hawaii
TMDLs	Total maximum daily loads
TMK	Tax Map Key
USFWS	U.S. Fish and Wildlife Service

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EXECUTIVE SUMMARY

The State of Hawaii, Department of Land and Natural Resources (DLNR), in cooperation with the Garden Isle Racing Association (GIRA), proposes electrical and lighting improvements at the Kauai Raceway Park (KRP) located in Mana, Kauai, Hawaii. The KRP does not currently have a permanent electrical power connection; portable generators are brought to the site to power lighting, electrical equipment, and mechanical equipment for GIRA's monthly race events at the facility.

The project site is located on portions of Tax Map Key parcels (4)1-2-002: 036 & 040, which are owned by the State and operated by GIRA. GIRA operates the KRP on a month-to-month lease granted by the DLNR. The project site is adjacent to the shoreline, and surrounding uses include the Kekaha Landfill, Kekaha Rifle Range, a shrimp farm, and agricultural properties. The project site is located along Kaumualii Highway with Kekaha to the southeast and the United States Navy's Pacific Missile Range at Barking Sands to the northwest.

The proposed electrical and lighting improvements include installation of approximately of 19 stadium-style light poles along the length of the existing race track. The number of lights may vary based on the location of the final Kauai County (County) shoreline setback line. The project also involves provisions for an LED scoreboard, to be installed at a later time.

In order to provide power to the proposed lighting and scoreboard, overhead power lines will be extended from the existing Kauai Island Utility Cooperative (KIUC) distribution system on Kaumualii Highway to the project site along an existing access road. Also proposed is installation of approximately 0.8 miles of new overhead electrical lines strung on utility poles installed at a maximum spacing of 200 feet. A maximum of 26 utility poles are anticipated for installation. Finally, appurtenant electrical structures such as transformers, electric meters, pull boxes, and underground electrical conduits will be installed. These improvements are herein referred to as the "Project".

The Project will not have significant adverse impacts to climate, topography, groundwater, socio-economic considerations, drainage, and water and wastewater utilities.

Because the Project is located adjacent to the shoreline, a Coastal Assessment was prepared in support of the Project in April 2015. The Coastal Assessment noted that the beach adjacent to the project site is highly dynamic and its depth has the potential to vary greatly due to seasonal erosion and accretion. An erosional trend was noted near the eastern end of the drag race strip. The Project improvements will be located *mauka* of the County's shoreline setback line to mitigate any impacts of

coastal erosion to the proposed Project, and to minimize any impact the Project may have on coastal resources. The Project will be designed in accordance with applicable designs standards for development within the coastal high hazard area in accordance with National Flood Insurance Program standards.

The project site serves as potential habitat for numerous threatened and endangered species. The Hawaiian petrel, Newell's shearwater, band-rumped storm petrel, Hawaiian Stilt, Hawaiian common moorhen, Hawaiian coot, Hawaiian duck, Hawaiian "Nene" goose, Hawaiian hoary bat, green sea turtle, Hawaiian monk seal, and panicum niihauense are species which may have critical habitat in or near the project site. Proposed activities that have a potential to impact these species are the installation of artificial lighting, installation of overhead electrical lines, and grubbing associated with construction.

Artificial lighting has been known to disorient the fledgling for a number of these seabird species. Downcast lighting – special light fixtures that direct light toward the ground, limiting the amount of light projected to the surrounding area – is proposed to mitigate this impact. Artificial lighting can also potentially impact the green sea turtle, disorienting hatchlings as they try to find their way to the ocean. To mitigate this impact, the lighting will be directed *mauka*, limiting the artificial light that is projected toward the shoreline.

Seabirds have been known to strike overhead electrical lines when traveling between their nesting grounds in mountainous areas and their feeding grounds along the coastline. To mitigate this impact, the proposed overhead electrical lines will be installed at a height lower than the top of the treeline surrounding the project site.

Grubbing (removal of plants) associated with construction has the potential to impact species that nest and feed in lower elevation areas along the shoreline. To mitigate this impact, a biological monitor will survey the project site prior to construction to ensure no endangered or threatened species are present in areas to be grubbed. While panicum niihauense – an endangered species of grass – is not known to occur in the area, the project site could potentially serve as habitat for this species. The Project will not affect the area's potential as a habitat for panicum niihauense since it involves only minimal trenching and no grading.

The project site consists primarily of sandy soils, which have been known to produce native Hawaiian burials. Archaeologists performed a surface and sub-surface survey of the project site and did not find any archaeological or historic materials. An archaeological inventory survey (AIS) outlining their findings has been prepared and was accepted by the State Historic Preservation Division (SHPD). An Archaeological

Monitoring Plan has been prepared and accepted by the SHPD. Archaeological monitoring will be conducted during construction.

The Project proposes installation of numerous vertical structures, including stadium lighting, which has the potential to impact visual resources in the surrounding area. The proposed improvements will be located in an area of the project site where surrounding trees obstruct views of these structures from most vantage points. These structures may still be visible from areas to the southeast of the Project, including Kekaha and portions of Kaumualii Highway. Public views of the project site from Kekaha and Kaumualii Highway are located over a mile away, thus the proposed lighting will not have a significant visual impact during the day. Downcast lighting will mitigate visual impacts of the proposed lighting at night.

The Project will not have significant adverse impacts to the KIUC distribution system. The additional lighting does not represent a significant load to the KIUC system, and GIRA runs race events at the KRP once a month. KIUC will be consulted throughout the design and construction process.

The Project will result in temporary impacts to geology and soils, surface waters, air quality, noise, and traffic during construction. These impacts will be of the type and magnitude typical of minor construction projects. For example, ground disturbance for installation of underground utilities has the potential to release fugitive dust into the air and increases the potential for erosion due to stormwater runoff. Construction will also result in increased noise and traffic for the duration of construction. Appropriate construction best management practices will be used to mitigate these impacts. The contractor will comply with all applicable State and County regulations regarding air quality, stormwater runoff quality, noise, and traffic control.

The Project will obtain a Conservation District Use Permit (departmental permit) and a National Pollutant Discharge Elimination System Permit from the State, and a Shoreline Setback Application and Special Management Area Use Permit application will be submitted to the County.

The Project is located on lands of the State and proposes the use of State funds. Thus, it is subject to the State environmental review process pursuant to Chapter 343, Hawaii Revised Statutes (HRS) and Chapter 11-200, Hawaii Administrative Rules (HAR). This Environmental Assessment (EA) identifies and evaluates potential impacts associated with the Project, and is submitted on behalf of the DLNR, which is the proposing agency for the Project.

This Final EA has been prepared in accordance with the requirements of Chapter 343, HRS and Chapter 11-200, HAR, including performing consultation with

agencies that may have jurisdiction or expertise regarding the Project. This EA has resulted in a Finding of No Significant Impact.

PROJECT SUMMARY

Proposing Agency:	State of Hawaii Department of Land and Natural Resources
Location:	Mana, Kauai, Hawaii
Tax Map Key:	(4)1-2-002: 009, 036 & 040
Land Area:	20 acres
Recorded Fee Owner:	State of Hawaii
Existing Use:	Mana Drag Race Strip
State Land Use Classification:	Conservation District, Limited Subzone
General Plan Land Use Designation:	Agriculture
County Zoning Designation:	Parcel 009 – Conservation Parcel 036 – Ag/Conservation Parcel 040 - Conservation
Proposed Action:	The State of Hawaii, Department of Land and Natural Resources proposed electrical and lighting improvements at the Kauai Raceway Park. The proposed project involves installation of approximately 19 stadium-style light poles along the drag race strip and provisions for future installation of an LED scoreboard. Overhead electrical lines will be extended from Kaumualii Highway to the facility to provide power to the proposed improvements. The project includes appurtenant electrical facilities such as transformers and underground electrical conduits.
Impacts:	The proposed improvements will be setback from the shoreline so that it will not impact coastal resources. The use of downcast lighting and constructing overhead electrical lines along an existing treeline will mitigate potential impacts to endangered and threatened species. Temporary construction related impacts will be mitigated with the use of best management practices.
Determination:	Finding of No Significant Impact

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1. INTRODUCTION

The State of Hawaii, Department of Land and Natural Resources (DLNR), in cooperation with the Garden Isle Racing Association (GIRA), proposes electrical and lighting improvements at the Kauai Raceway Park (KRP) located in Mana, Kauai, Hawaii. The proposed improvements include the installation of permanent stadium-style lighting at the facility, provisions for installation of an LED scoreboard, installation of electrical service from the Kauai Island Utility Cooperative (KIUC), and installation of appurtenant electrical facilities such as transformers, underground electrical conduits, electrical meters, and pull boxes. The facility will be connected to the KIUC power distribution system by extension of overhead electrical lines from Kaumualii Highway to the KRP. These improvements are herein referred to as the "Project.

The Project is located on lands of the State of Hawaii (State) and proposes the use of State funds, and is subject to the State environmental review process pursuant to Chapter 343, Hawaii Revised Statutes (HRS) and Chapter 11-200, Hawaii Administrative Rules (HAR). This Environmental Assessment (EA) identifies and evaluates potential impacts associated with the project, and is submitted on behalf of the DLNR, which is the proposing agency for the project.

This Final EA has been prepared in accordance with the requirements of Chapter 343, HRS and Chapter 11-200, HAR, including performing consultation with agencies that may have jurisdiction or expertise regarding the proposed projects. This EA has resulting in a Finding of No Significant Impact.

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2. SETTING AND PROJECT DESCRIPTION

2.1. Project Need and Objectives

The KRP, located in Mana, Kauai, is home to a National Hot Rod Association (NHRA) sanctioned quarter-mile race track. The facility – one of only two NHRA sanctioned race tracks in the State – is operated by GIRA. GIRA is a non-profit corporation which runs monthly events at the KRP, promoting safe motorsports and responsible street driving.

From March through September, these monthly events run into the evening. The preferred time for drag race events is the evening because heat can adversely affect car performance. Lighting during evening events is currently provided by a mixture of streetlight-style light poles and portable lights. Both the street lights and portable lights are powered with the use of portable generators. During the months of October and November, racing events occur during the day. No events are run at the KRP from the months of December through February. GIRA, in consultation with the United States Fish and Wildlife Service (USFWS), has decided not to use night-time lighting from the months of October through February to avoid impacts on threatened and endangered seabirds. Seabirds have been known to become disoriented by artificial lighting.

The Project proposes installation of stadium-style light poles to provide additional lighting along the length of the race track. The Project will increase visibility at the facility during nighttime and twilight events, providing a safer and more enjoyable experience for racers. The Project will also reduce the KRP reliance on temporary lighting and portable generators. Project construction will not impact the race schedule; evening events will continue to occur only between the months of March and September. Evening races in September will continue to be held prior to September 15.

2.2. Project Location

Figure 2-1 shows a location map of the proposed Project.

The Project is located in the Mana area on the southwest shore of Kauai. KRP – which includes the drag race strip, bleacher seating, control building, parking and pit areas, and other associated facilities – is located on a portion of Tax Map Key (TMK) parcels (4)1-2-002: 036 & 040, which are owned by the State and operated by GIRA. The facility occupies *makai* portions of Parcels 036 and 040, while agricultural uses occupy *mauka* areas of the parcels.

The facility is accessed via a gravel-paved road located on TMK parcel (4)1-2-002:009, which is owned by the State and operated by the Kauai County, Department of Public Works (DPW) as part of the Kekaha Landfill. The access road

is utilized by both the Kekaha Landfill and the KRP facilities. The access road occupies an approximately 2-acre portion of parcel 009.

The Project is located approximately 1 mile northwest of Kekaha on the *makai* side of Kaumualii Highway (State Route 50). The project site is bordered by the Kekaha landfill to the northwest, agricultural land to the northeast, a shrimp farm to the southeast, and the beach and Pacific Ocean to the southwest.

2.3. Existing Conditions

Figure 2-2 shows the existing conditions at the KRP.

KRP is a well-maintained facility operated by GIRA. GIRA hosts monthly events at the park, providing a safe venue for local motor enthusiasts to race street-legal cars, imports, Jr. Dragsters, and professional race cars at this NHRA-sanctioned facility.

The focus of the facility is a 55-foot (ft) wide drag race strip with two tandem lanes that stretches approximately 0.8 miles along the shoreline. The drag race strip is paved partially in concrete (near the starting line) and partially in asphalt-concrete (AC) pavement. The first quarter mile of the drag race strip is used for racing, while the remainder of the track is required for staging and shutdown (to allow vehicles to come to a stop after crossing the finish line) areas. The track is lighted by street-light style light posts spaced out along the *mauka* edge of the drag race strip. Light posts on both the *mauka* and *makai* side of the drag race strip provide lighting at the starting and staging areas. Existing lighting at the KRP is powered by portable generators which are brought to the track during race events.

Running parallel to the drag race strip along its *makai* edge is a return road. This road allows cars to return the pit area once their heat is completed. The return road is accessed via a number of turnaround points located along the length of the track.

A two-story control structure is located *makai* of the starting line. The second story of the structure is enclosed, and is used by GIRA personnel to control events. The first story is partially enclosed and is used for event registration.

Makai of the control structure is an AC-paved pit area where cars are parked between heats. During events, participants are allowed to set up equipment and work on their cars in the pit area. Portable generators and portable lighting are set up in the pit area during events to provide power and light for participants. The generators and lighting are removed upon completion of each event.

Located *mauka* of the starting line is an AC-paved parking area. Wooden bleachers in the parking area are used by spectators for viewing events.

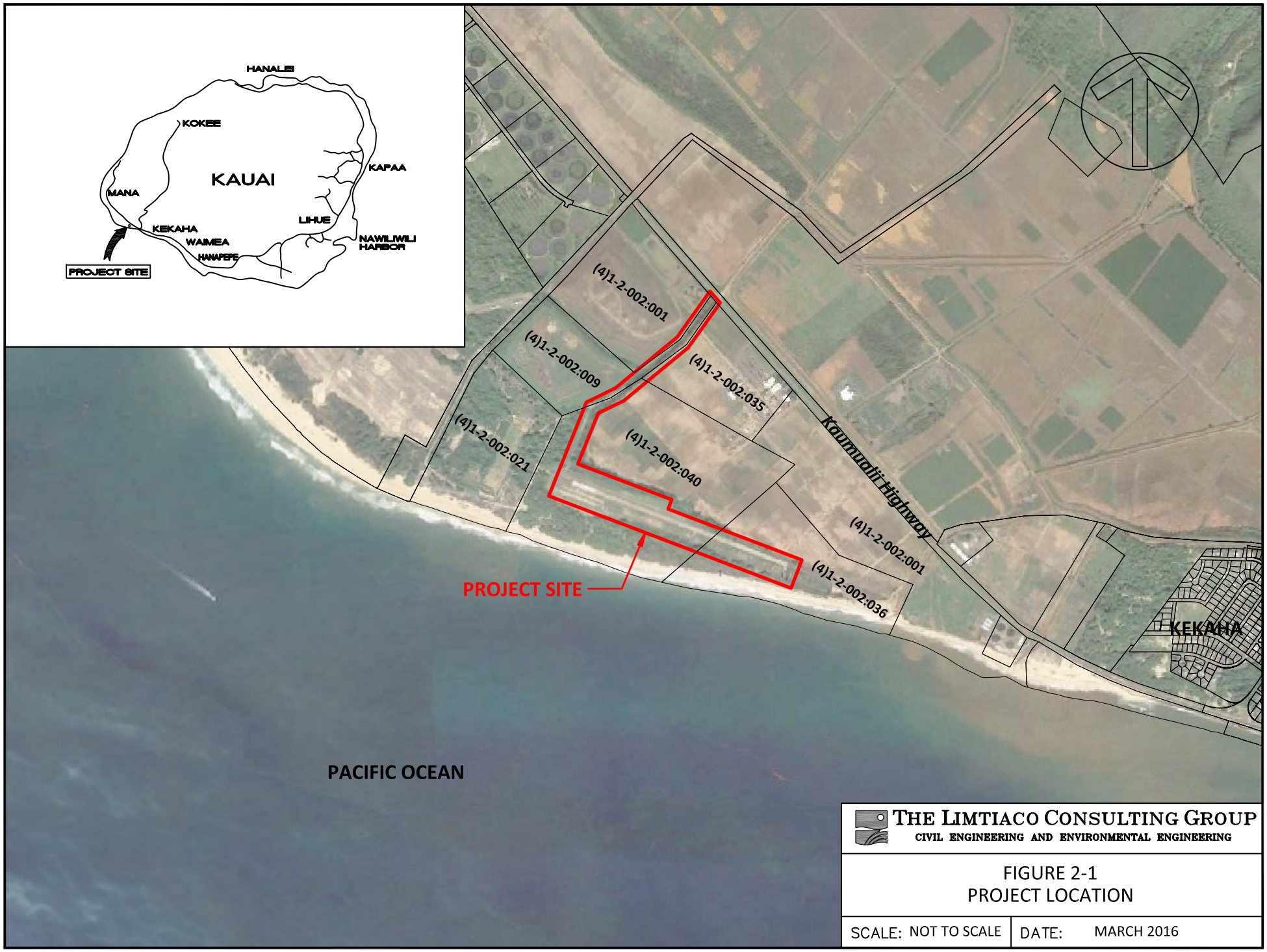

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FIGURE 2-1
PROJECT LOCATION

SCALE: NOT TO SCALE | DATE: MARCH 2016

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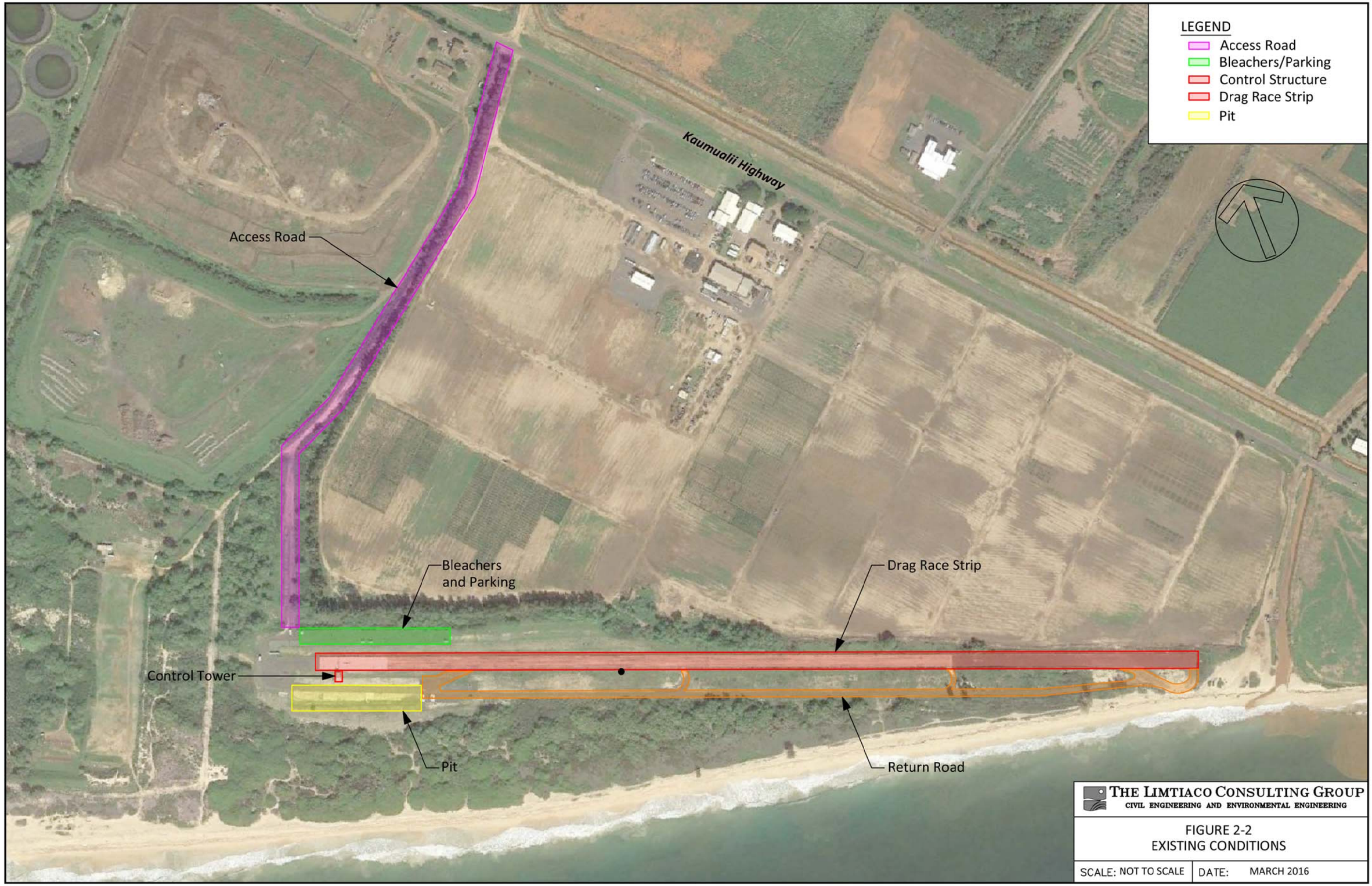

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL ENGINEERING

FIGURE 2-2
EXISTING CONDITIONS

SCALE: NOT TO SCALE | DATE: MARCH 2016

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A gravel-paved access road is used to access the KRP from Kaumualii Highway. The access road runs from northeast to southwest through TMK parcel (4)1-2-002:009, and connects to AC-paved parking area of the KRP at the northeastern corner of the facility. Trees run along the southeast edge of the access road, partially obscuring views of neighboring properties.

The drag race strip and its appurtenant facilities are located on a large level area that has been cleared of vegetation.

2.4. Proposed Improvements

The Project proposes installation of numerous stadium-style light poles. The proposed light poles and fixtures are similar to those showing in **Photo 1**.

Photo 1 – Lighting at the nearby H.P Faye park, similar to the lighting proposed as part of the Project.

Because of the Project's proximity to the shoreline, downcast lighting is proposed to mitigate any possible adverse effects to the local seabird population. Artificial lighting close to the shoreline can potentially disorient threatened and endangered seabirds, including the Hawaiian petrel, Newell's shearwater, and Band-rumped petrel. Downcast lighting uses special visors to direct light toward the ground, as opposed to typical stadium lighting that spreads light across a broad area. Downcast lighting will prevent light from projecting shoreward and will reduce its visibility to nearby shorebirds. An example of downcast lighting is shown in **Appendix A**.

The Project will include provisions for installation of an LED scoreboard; an underground electrical connection will be installed at approximately the quarter-mile point of the race track. The scoreboard itself may be purchased as part of the Project, depending on available funding. However, the scoreboard will be installed at a later time. While the make and model of the scoreboard will be determined by the contractor (after the EA process has been completed), it will be similar to the scoreboard shown on the cutsheets provided in **Appendix B**.

In order to provide power to the proposed lighting and scoreboard, overhead power lines will be extended from the existing KIUC system on Kaumualii Highway to the project site. The Project proposes installation of approximately 0.8 miles of new overhead electrical lines, strung on utility poles installed at a maximum spacing of 200 ft. It is anticipated that 26 utility poles will be installed as part of the Project. The

exact number of utility poles required will be determined during Project design, after completion of the EA process.

The new overhead lines will extend from Kaumualii Highway down the facility access road to the entrance of the KRP, turn East to run parallel to the drag strip, and finally cross to the *makai* side of the drag strip at approximately the halfway point of the track. **Figure 2-3** shows the approximate location of the proposed electrical lines. In order to mitigate the potential for seabirds striking the overhead lines, the proposed electrical lines will be constructed below the ironwood treeline that runs adjacent to the facility access road.

From the final overhead utility pole, electrical lines will be run in an underground conduit parallel to the drag race strip. The underground conduit, which is shown on **Figure 2-3**, will run from the start of the drag race strip to the Shoreline Setback Line. The proposed lighting and scoreboard will draw power from this underground electrical conduit.

The project area, including the overhead electrical lines and electrical and lighting improvements at the KRP, is approximately 20 acres.

2.5. Land Ownership

TMK parcels (4)1-2-002:009, 036 & 040 are owned by the State. GIRA operates the KRP on a month-to-month lease granted by the DLNR.

2.6. Surrounding Uses

The facility is located in an agricultural area just north of Kekaha and is surrounded by various uses. Northwest of the property are the Kekaha Rifle Range and the Kekaha Landfill, northeast are agricultural lands, southeast is a shrimp farm, and southwest is a stretch of sandy beach and the Pacific Ocean. Further to the northwest is the Pacific Missile Range at Barking Sands, which is operated by the United States Navy. **Figure 2-4** shows the different uses surrounding the KRP.

2.7. State Land Use

KRP is located within the Limited subzone of the Conservation land use district, as designated by the State. GIRA has operated the KRP by right-of-entry since 1999. Areas *mauka* of the facility have been designated as part of the Agricultural land use district and areas to the southeast have been designated as part of the Urban land use district. **Figure 2-5** shows a map of the State land use districts.

§13-5-12, HAR states that the objective of the Limited subzone of the Conservation land use district is to limit uses where natural conditions suggest constraints on

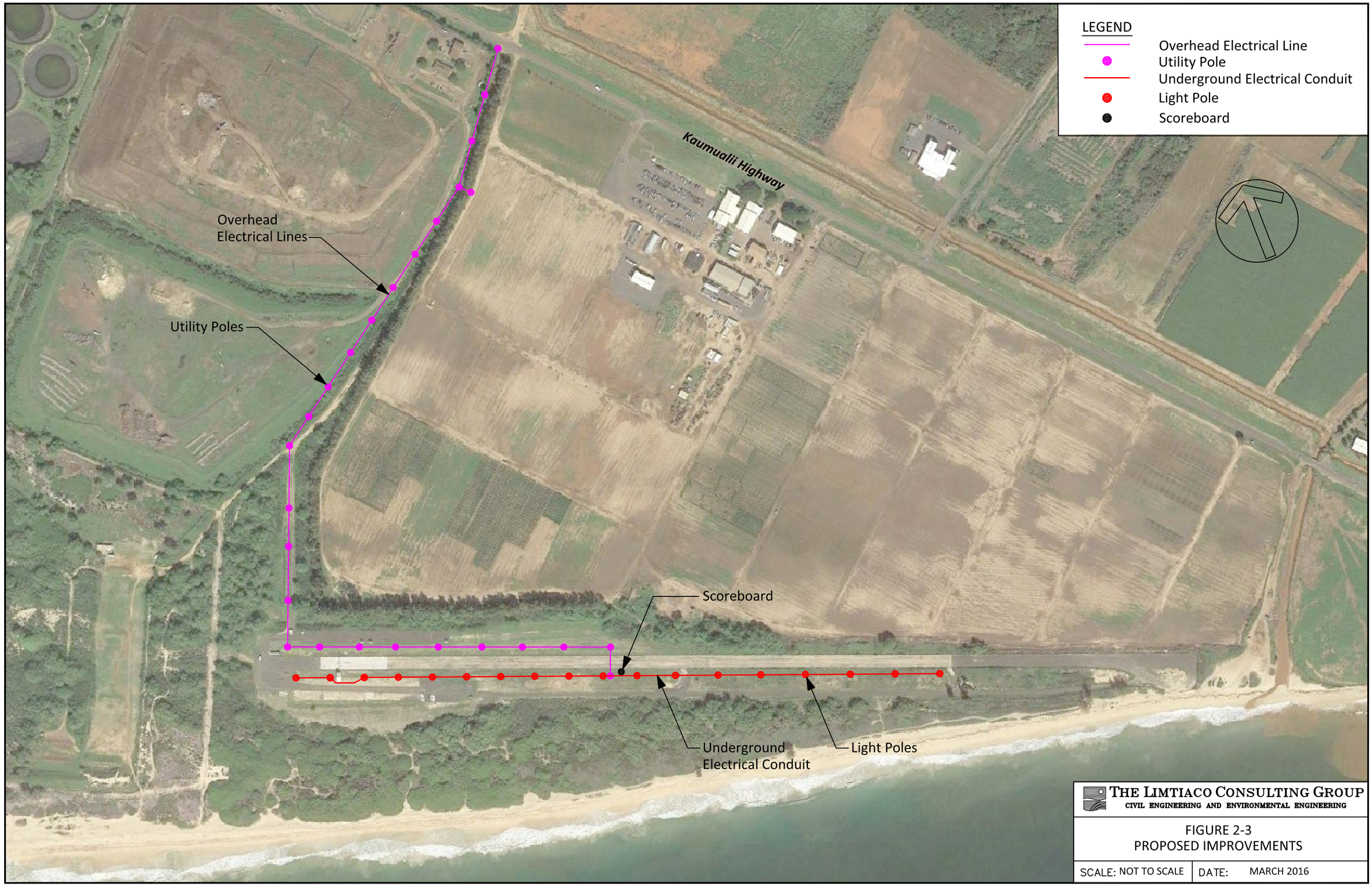

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FIGURE 2-3
PROPOSED IMPROVEMENTS

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FIGURE 2-4
SURROUNDING USES

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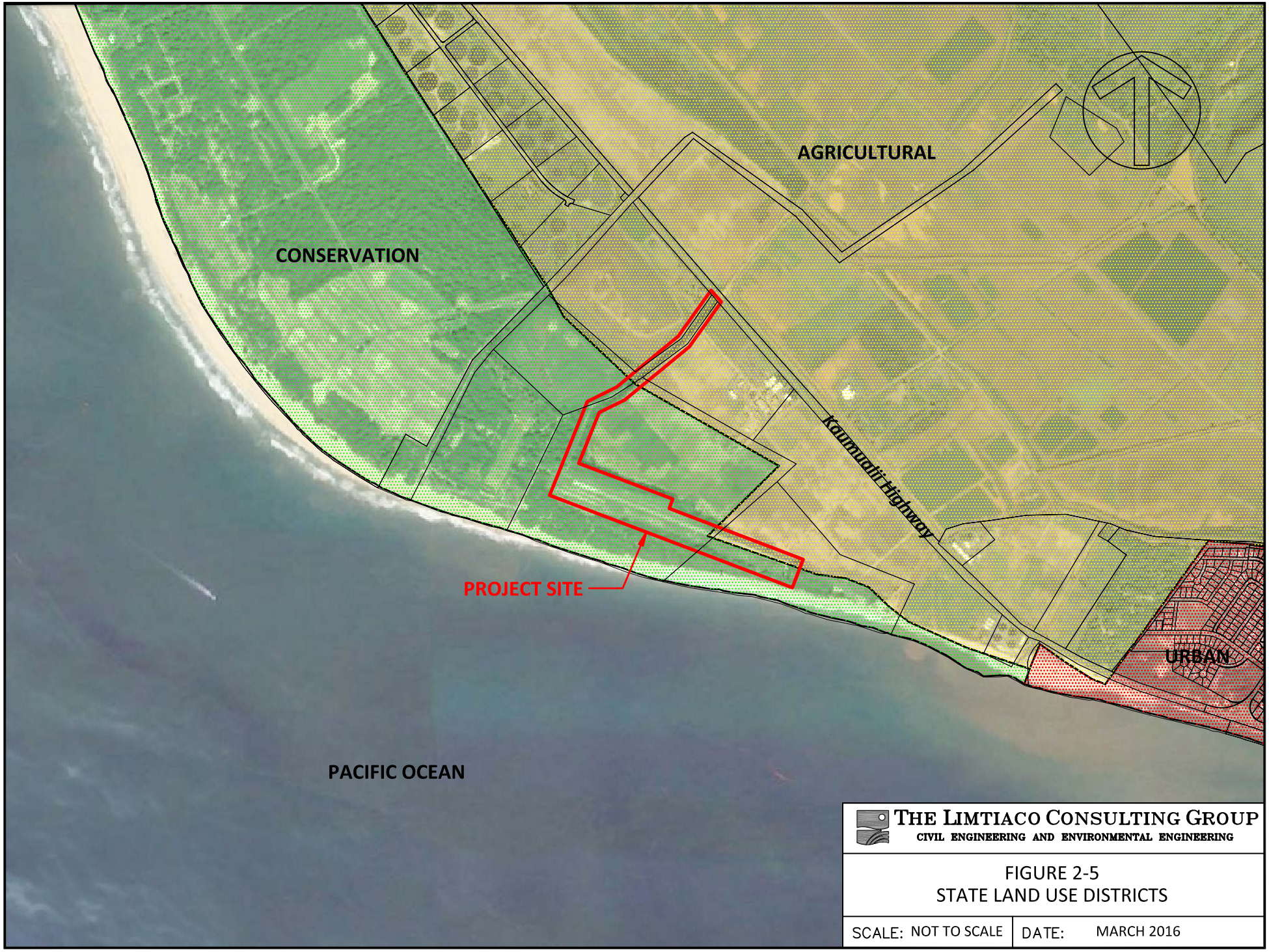

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FIGURE 2-5
STATE LAND USE DISTRICTS

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human activities. Consultation with the DLNR, Office of Conservation and Coastal Lands (OCCL) indicates that the Project will be required to obtain a Conservation District Use Permit (CDUP). Pursuant to §13-5-22, HAR, a "Departmental Permit" will be required. Departmental Permits are approved by the Chairperson of the Board of Land and Natural Resources (BLNR). The OCCL has indicated that a public hearing will not be required for the CDUP.

2.8. County Zoning

Figure 2-6 shows the Kauai County (County) zoning districts at the project site and in the immediately surrounding areas. Note that the County does not appoint zoning designations for areas within the State Conservation District. As such, the majority of the Project is located on land which does not have a County zoning designation.

Portions of the facility access road on TMK (4)1-2-002:009 are located within the County Agricultural zoning district. Article 8 of the County Comprehensive Zoning Ordinance (CZO) states the following objectives within the Agricultural Zoning District:

> *(a) To protect the agriculture potential of lands within the County of Kauai to insure a resource base adequate to meet the needs and activities of the present and future.*
>
> *(b) To assure a reasonable relationship between the availability of agriculture lands for various agriculture uses and the feasibility of those uses.*
>
> *(c) To limit and control the dispersal of residential and urban uses within agricultural lands.*

The proposed overhead electrical lines located in the agricultural district are consistent with the zoning objectives stated in the CZO. The overhead lines are located along an existing access road, which has limited potential for agricultural development. Construction of the electrical lines will not promote further development of urban uses within the agricultural zoning district.

2.9. Special Management Area

The Project is located within the County Special Management Area (SMA), and is subject to the *Special Management Area Rules and Regulations of the County of Kauai* (SMA Rules). **Figure 2-7** indicates parcels which are located in the SMA.

Section 5.0 of the SMA Rules states that any use, activity, or operation proposed within the SMA defined as "Development" is subject to review by the County

Planning Department. Section 1.4.H. of the SMA Rules states that development includes installation of underground utility lines and appurtenant aboveground fixtures. As such, an SMA permit application has been submitted to the County Planning Department for the Project.

2.10. Shoreline Setback

The Project is located in a parcel which abuts the shoreline. As such, it is subject to the Shoreline Setback and Coastal Protection rules outlined in Article 27 of the County CZO. The proposed shoreline setback is shown in **Figure 2-8**. This proposed shoreline setback is subject to approval by the County Planning Department, and a Shoreline Setback Determination has been submitted concurrently with the review period for this Final EA. The Project will be designed so that no development takes place within the Shoreline Setback Area.

2.11. Project Schedule

Planning and design for the Project are anticipated for completion in April 2016. Construction is anticipated to start in August 2016 and to be completed by December 2016.

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FIGURE 2-6
KAUAI COUNTY ZONING

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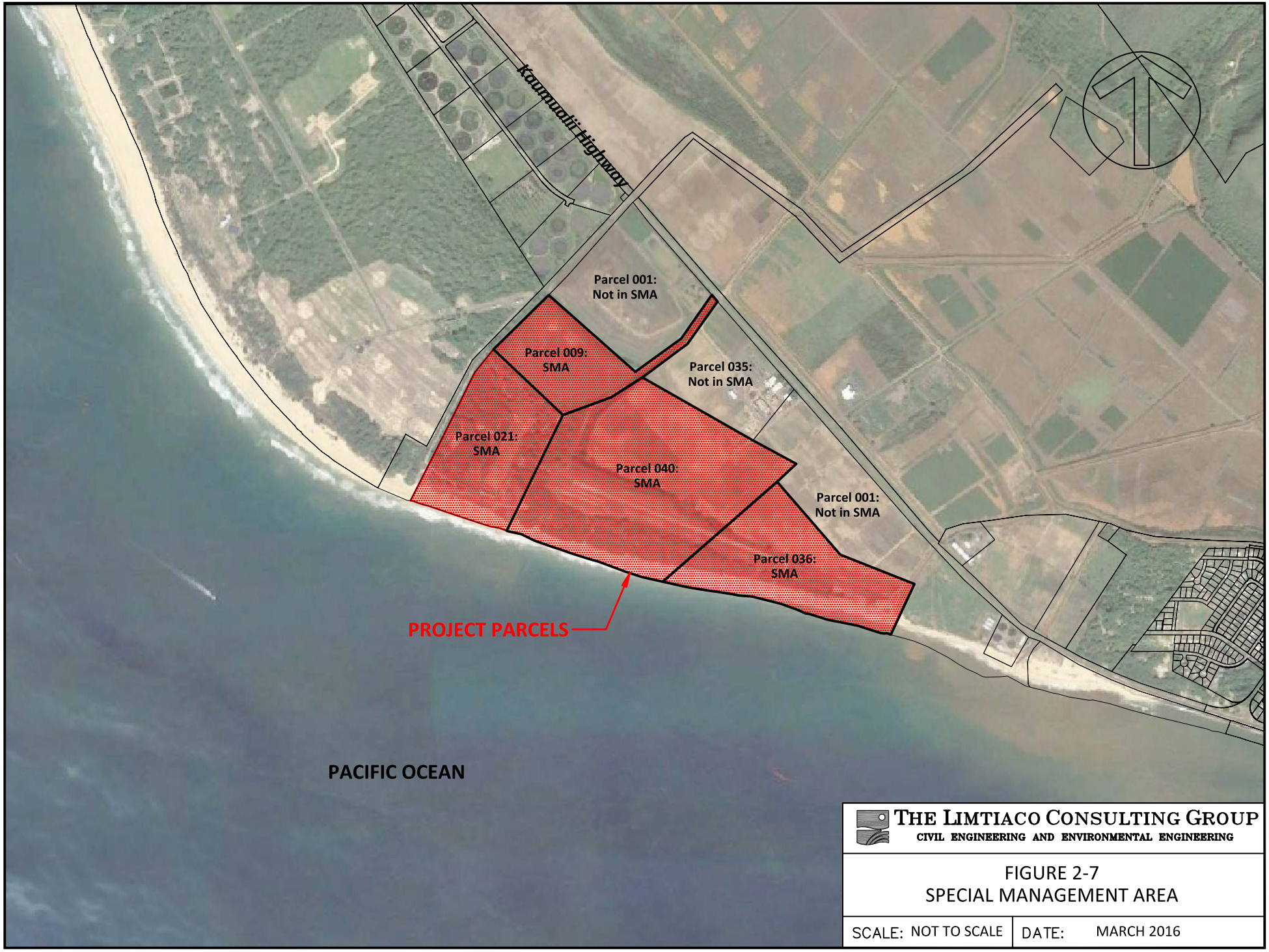

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FIGURE 2-7
SPECIAL MANAGEMENT AREA

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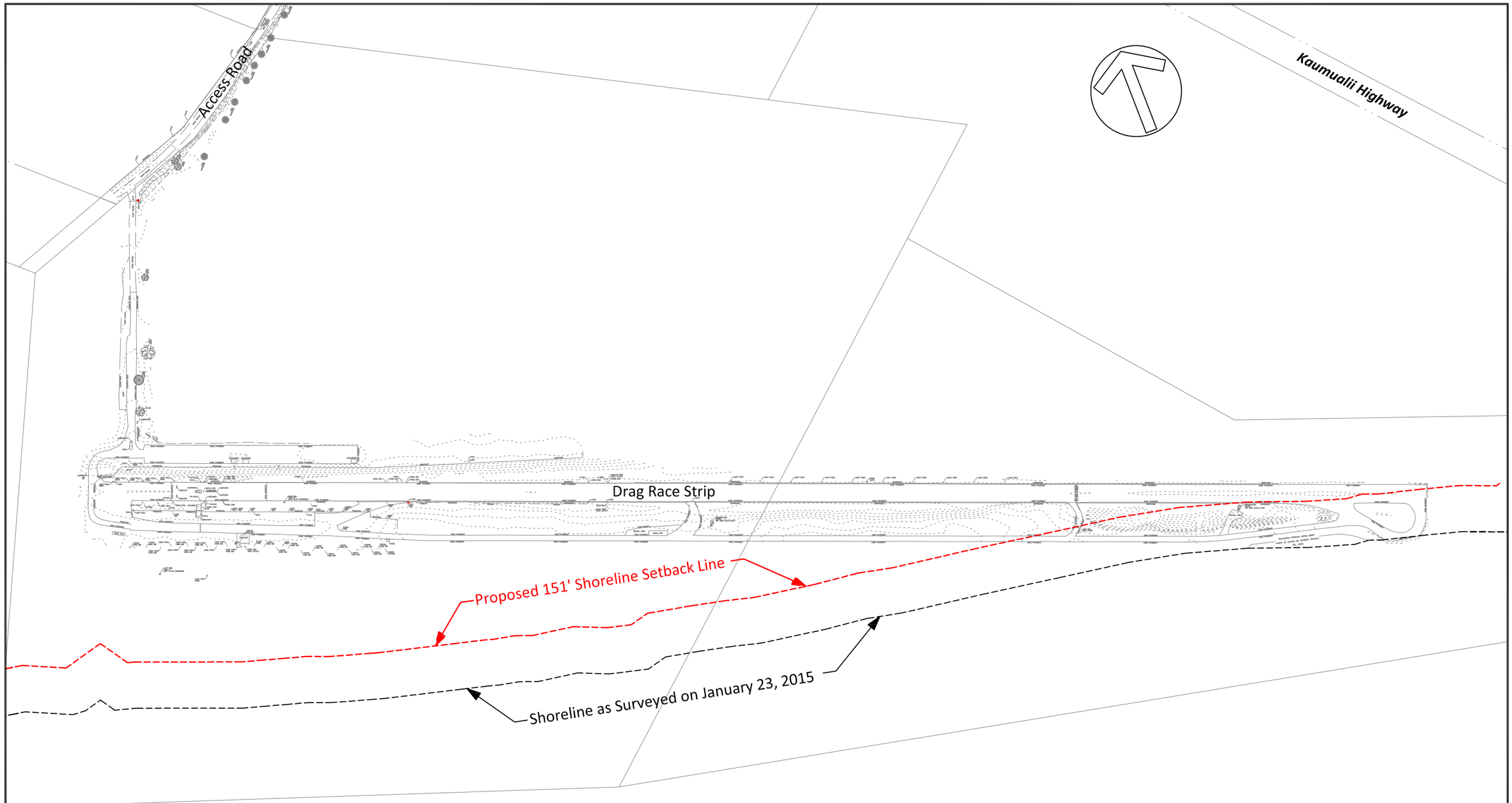

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FIGURE 2-8
PROPOSED SHORELINE SETBACK

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3. DESCRIPTION OF THE EXISTING ENVIRONMENT, PROJECT IMPACTS, AND MITIGATION MEASURES

3.1. Climate

The climate throughout the State is generally characterized by mild temperatures with low daily and monthly variability, moderate humidity, persistent trade winds, and abundant sunshine. The Hawaiian climate is further characterized by a two-season year: the summer season from May through September is generally warmer and less wet than the cooler, winter season from October through April (WRCC, 2015). Rainfall distribution across the State varies greatly according to geographic conditions, elevation and long-term climatic cycles.

The project site is on Kauai's drier leeward coast, and receives less than 20 inches of rainfall per year (UHGD, 2013). Average air temperatures range from a low of 72° Fahrenheit in January to a high of 79° Fahrenheit in August (UHGD [2], 2014).

Impacts and Mitigation Measures

The Project will not have any impacts on climatic conditions. No mitigation measures are necessary.

3.2. Geology and Soils

The *Web Soil Survey* of the Natural Resources Conservation Service (NRCS) indicates that the property is comprised entirely of Jaucas loamy fine sand, with zero to eight percent slopes (NRCS, 2013). The NRCS gives this soil type the designation "JfB". JfB soils are typically found in old beach areas and windblown sand deposits in the western and southern parts of Kauai. Soil characteristics include high permeability, slow runoff, slight erosion hazard due to water, and high erosion hazard due to wind. Workability of this type of soil can be difficult due to the loose and unstable nature of the soil (SCS, 1972). A map of soils in the vicinity of the project site, as classified by the *Web Soil Survey*, is provided in **Figure 3-1**.

Impacts and Mitigation Measures

The Project will involve trenching for installation of approximately 2,250 linear-ft of underground electrical conduit. A typical trench for electrical conduit installation may be approximately 1 ft wide and 2 to 3 ft deep. The trench could be backfilled with native material or approved borrow material, to be determined during the design phase. This trench will cover only a small area of the project site (approximately 0.05 acres) and, as such, is not expected to have a significant impact on soils or geologic conditions. Minor trenching may also be required for the installation of each utility pole for the proposed overhead electrical line.

Areas disturbed by trenching and other construction activities will temporarily be more susceptible to wind and stormwater erosion. Construction best management practices (BMPs) will be employed to mitigate impacts that soil erosion may have on local air and surface water quality. A National Pollutant Discharge Elimination System (NPDES) permit will be obtained from the State Department of Health (DOH), Clean Water Branch (CWB) prior to commencing any construction activities. The contractor will be required to comply with all NPDES permit conditions and State regulations regarding storm water quality. The contractor will also be responsible for implementing an appropriate dust mitigation plan and complying with the DOH, Clean Air Branch (CAB) air quality standards. Proper implementation of BMPs will mitigate temporary construction related impacts due to soils.

The Project will not cause long-term impacts to soils and geology. No permanent mitigation measures are necessary.

3.3. Topography

The KRP is located on the coastal plains on the southwest side of the island. The site is fairly level and there are no distinguishing topographic features within the facility. Based on a topographic survey performed in support of the Project on February 6, 2015, elevations at the KRP range from 9 to 12 ft above sea level. The topographic survey is provided in **Appendix D**.

Impacts and Mitigation Measures

No grading is proposed as a part of the Project. As such, there will be no impact to any topographic features. No mitigation measures are necessary.

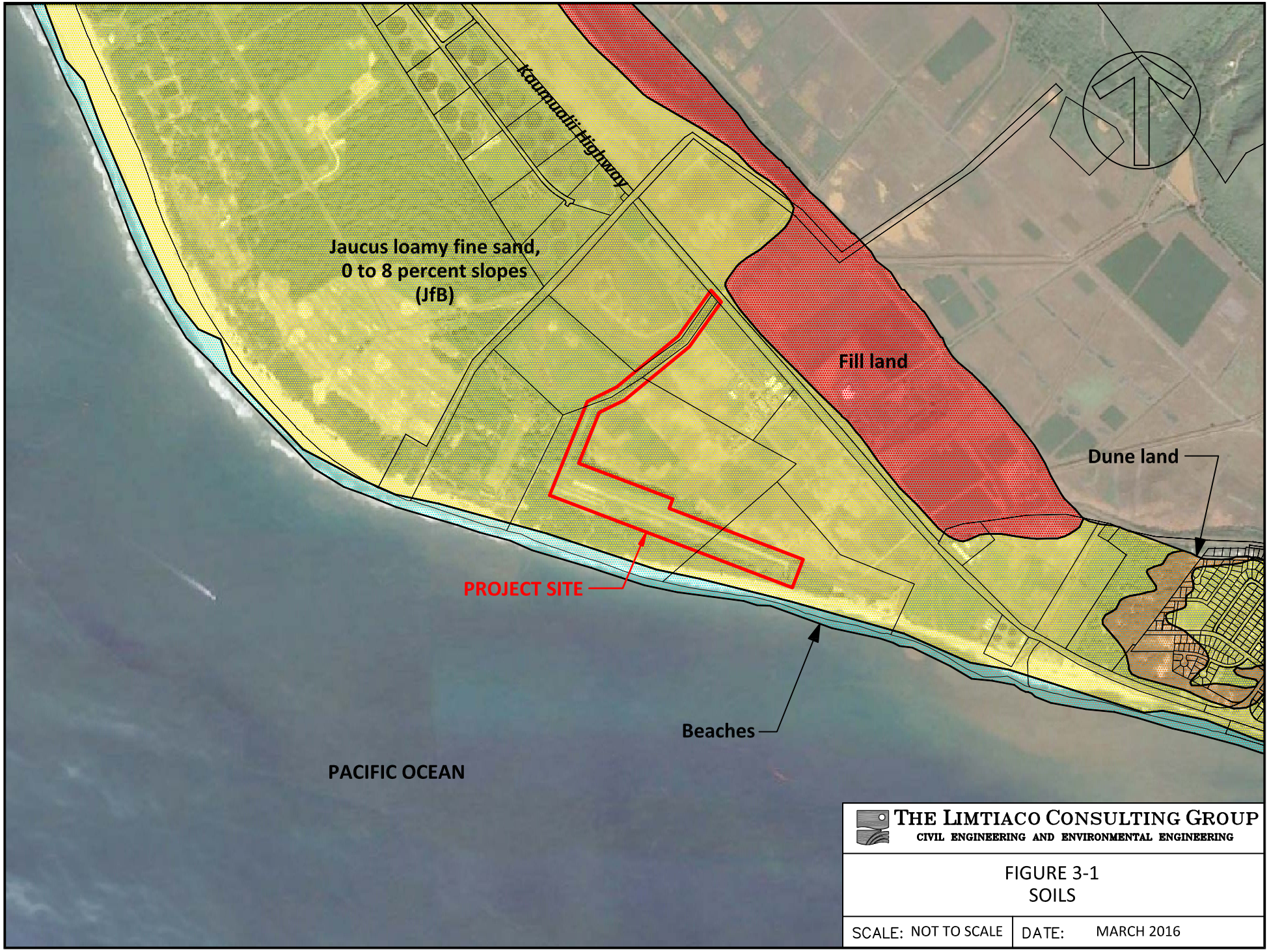

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FIGURE 3-1
SOILS

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3.4. Shoreline

Photo 2 – Sand encroaching on the East end of the drag race strip.

KRP is located on two shoreline parcels. The shoreline, which runs at a shallow angle adjacent to the drag race strip, is further from the drag race strip on the West end of the track and is directly adjacent to the drag race strip on the East end of the track. Based on a shoreline survey performed on January 23, 2015, the shoreline is located over 500 ft from the KRP on the West end of the facility, and is directly adjacent to the drag race strip on the East end of the facility. **Figure 2-8** shows the approximate location of the shoreline relative to KRP. The beach in the vicinity of the project site is sandy, and varies in depth depending on seasonal erosion/accretion patterns. On the West end of the facility, a vegetated earthen mound separates the drag race strip from the beach. On the East end of the facility, the sandy beach runs up against the facility, with sand often found on paved areas of the track. **Photo 2** shows proximity of the beach to the East end of the facility.

As was discussed in **Section 2.10**, the Project is subject to County Shoreline Setback rules because it is located on parcels that abut the shoreline. **Figure 2-8** provides a location of the proposed shoreline setback line. The proposed shoreline setback line is subject to County approval, and a Shoreline Setback Determination has been submitted concurrently with this Final EA. The Project will be designed so that no development takes place within the Shoreline Setback Area.

Due to the proximity of the KRP and the Project to the shoreline, a Coastal Assessment was performed in support of the Project. The Coastal Assessment, which is included in **Appendix E**, was completed in April 2015. The Coastal Assessment addresses the coastal setting in the area adjacent to the project site, evaluates possible coastal hazards, describes ongoing shoreline processes (i.e., waves, currents, and sediment movements), analyzes historic coastal erosion/accretion patterns, and discusses possible coastal impacts of the Project.

The Coastal Assessment noted that the beach adjacent to the project site is highly dynamic and that its depth has the potential to vary greatly depending on seasonal conditions. An erosional trend was noted toward the eastern end of the drag race strip, which is consistent with the conditions shown in **Photo 2** above.

Impacts and Mitigation Measures

As discussed in the Coastal Assessment, the East portion of the facility may be susceptible to coastal erosion. However, the proposed improvements are located sufficiently to the West of this area and over 200 ft inland from the shoreline. The Coastal Assessment concludes that the Project is located sufficiently distant from the shoreline that it is not expected to impact any coastal processes. As such we do not anticipate the proposed improvements to have any impact on typical shoreline processes or to be impacted by typical shoreline processes.

The Coastal Assessment also noted the approximant inundation line that occurred when Hurricane Iniki struck Kauai on September 11, 1992. It should be noted that the Eastern-most portions of the proposed Project are located within area inundated during hurricane Iniki and that similar storm inundation could occur in the event of a similar magnitude storm. However, this was an exceptional storm event that is not indicative of typical conditions.

3.5. Groundwater

According to the DLNR, Commission on Water Resource Management aquifer classification system, Project is located over the Kekaha Aquifer System Area of the Waimea Aquifer Sector Area (CWRM, 2008). Due to the property's proximity to the ocean and sandy soil conditions at the project site, it is likely that groundwater at the property is highly saline. As such, it is unlikely that groundwater in the vicinity of the property could potentially serve as a source of potable water.

Because no geotechnical study was performed as a part of this Project, the depth to groundwater is unknown. However, it can reasonably be expected that the depth to groundwater at the project site is relatively shallow due to the site's proximity to the ocean and the low elevation at the project site. Proximity to the ocean and sandy soil conditions make it likely that groundwater at the project site is hydrologically linked to nearby coastal areas.

Impacts and Mitigation Measures

The Project will not have any long-term effects on local groundwater resources. No permanent mitigation measures are necessary.

Temporary construction activities with the potential to cause groundwater contamination will be mitigated with the use of BMPs. The contractor will be required to implement a BMP plan to address potential construction impacts such as minor leaks of oil or gasoline from construction equipment.

The contractor will determine the means and methods of construction. As such, it is unknown at this time whether dewatering will be required for installation of foundations for the proposed light poles. If dewatering is required, the contractor will be required to comply with all State regulations for dewatering, including Chapter 11-54, HAR. If dewatering is required, it will not be in quantities large enough to have an adverse effect on local groundwater or nearshore waters.

3.6. Surface Waters

The property is located along the shoreline Northwest of Kekaha Beach Park. A small drainage channel discharges into the Pacific Ocean just east of the project site.

According to the CWB Water Quality Standards Maps, the Pacific Ocean is a Class A Marine Water (DOH, 2014). Chapter 11-54, HAR states that the objective for Class A Marine Waters is that “their use for recreational purposes and aesthetic enjoyment be protected” (HAR 11-54, 2009).

Nearby Kekaha Beach park is listed as an impaired waterbody in the *2014 State of Hawaii Water Quality Monitoring and Assessment Report*, a biennial report prepared by the DOH pursuant to §303(d), Clean Water Act. This report documents the results of DOH sampling efforts Statewide and assesses waterbodies with respect to the State water quality standards. According to the report, Kekaha Beach Park has not met the State water quality standard for levels of turbidity. The site was assigned a “low” priority for development of “total maximum daily loads” (TMDLs): the maximum level of a given pollutant that the stream can receive in order to meet the State water quality standards (DOH [2], 2014).

Impacts and Mitigation Measures

The Project is not expected to result in any long-term impacts to nearby surface water quality. The proposed improvements, which include the installation of stadium lighting, an LED scoreboard, overhead and underground power lines, and appurtenant devices (e.g., transformers) will not result in the discharge of any pollutants to State waters. The Project will not result in increased areas of impermeable surfaces, and thus will not result in an increase of stormwater runoff from the project site. The Project does not propose any grading, and thus will not result in changes to stormwater runoff patterns.

Temporary construction activities have the potential to impact surface water quality. Although the proposed Project does not include major earthwork,

some ground-disturbing activities will occur. As with any construction activity that includes ground disturbance, stormwater can potentially carry loose soil, excess nutrients, and other pollutants to nearby waterbodies. Operation and staging of construction equipment also carries the potential to release pollutants to nearby surface waters (e.g., fuel spills and oil leaks). The contractor will be required to implement BMPs to mitigate potential surface water contamination. For example, silt fence or filter socks may be used to reduce the potential for erosion from the construction site. Spill kits and daily inspection of construction equipment may be used to reduce the risk from fuel spills or leaking equipment. A BMP plan will be designed and implemented by the contractor. The contractor will consider the use of non-potable water for temporary BMPs such as equipment wash-outs and dust control.

It is anticipated that the proposed project will require NPDES permit coverage for storm water runoff associated with construction activities. A Notice of Intent (NOI) for NPDES general permit coverage will be submitted to the CWB at least 30 days prior to commencing any construction activities. Comments from the DOH Kauai District Health Office, dated July 10, 2015, indicate that a determination letter from the State Historic Preservation Division (SHPD) must be submitted with the NOI or permit application. As discussed in **Section 3.11**, an Archaeological Inventory Survey and Archaeological Monitoring Plan have been accepted by the SHPD. These acceptance letters will be submitted with the NOI, as necessary.

The contractor will be required to comply with all NPDES permit conditions and State regulations regarding storm water quality.

The Water Quality Standards of the State are outlined in Chapter 11-54, HAR. Projects within the State must conform with the State's general policy of water quality anti-degradation (§11-54-1.1, HAR), designated uses (§11-54-3, HAR), and water quality criteria (§11-54-4). Compliance with the State water quality standards is required for all project activities.

Anti-Degradation

The State's anti-degradation policy states that (1) the water quality necessary to protect existing uses shall be maintained and protected, (2) water quality must be maintained in order to support the propagation of fish, shellfish, wildlife, and recreation, (3) the quality of existing high-quality waters such as waters of national and state parks and wildlife refuges must be maintained and protected, and (4) in those areas where potential water quality impairment associated with thermal

discharge is involved, the anti-degradation policy and implementing method shall be consistent with Section 316 of the Clean Water Act.

Designated Uses

Due to topographic conditions, runoff from the project site will flow toward the Pacific Ocean, which is the nearest State surface water. The Pacific Ocean in the vicinity of the project site is classified as a Class A Marine water by the DOH. §11-54-3, HAR states that the objective of Class A Marine waters is that their use for recreational purposes and aesthetic enjoyment should be protected. Class A Marine waters should not act as receiving waters for any discharge which has not received the best degree of treatment or control.

Water Quality Criteria

The water quality criteria generally states that all waters shall be free of substances attributable to domestic, industrial, or other controllable sources of pollutants, including: materials that will settle to form objectionable sludge or bottom deposits; floating floatable debris, oil, grease, scum, or other floatable materials; substances in amounts sufficient to produce taste in the water or detectable off-flavor in fish, or in amounts sufficient to produce objectionable color or turbidity in receiving waters; high or low temperatures, biocides, pathogenic organisms, toxic, radioactive, corrosive, or other deleterious substances; substances or conditions or combinations thereof in concentrations which produce undesirable aquatic life, and; soil particles resulting from erosion on lands involved in earthwork. A list of pollutants along with their acute and chronic limits is provided in §11-54-4, HAR.

As discussed above, the project will not result in any long-term impacts to nearby surface water quality. Temporary construction activities have the potential to impact storm water runoff quality; however, the contractor will be required to implement BMPs to mitigate potential surface water contamination. As a result, the water quality of nearby surface waters will be protected. The project will not impact existing uses and will not adversely affect the propagation of fish, shellfish, wildlife, and recreational uses. The project does not involve any thermal discharge. The project will not result in any adverse impacts to recreational uses and aesthetic enjoyment of any State waters. Construction best management practices will be employed to ensure that construction activity does not cause any violations of the water quality criteria.

The potential for surface water contamination will be mitigated with the use of BMPs and by complying with NPDES permit conditions. As such, the Project will not threaten the designated uses of potentially effected waterbodies as defined in Chapter 11-54, HAR.

3.7. Flood Hazard

According to the Federal Emergency Management Agency Flood Insurance Rate Map, Community Panel Number 1500020251F (revised November 26, 2010), the project site is within Flood Zones AE and VE with flood elevations ranging from 8 to 10 ft. (see **Figure 3-2**). Areas within Flood Zone VE are considered to have a 1 percent (%) annual chance of a flood event with additional hazards due to storm-induced velocity wave action. Areas within Flood Zone AE are considered to have a 1% annual chance of flooding. A copy of panel 1500020251F is provided in **Appendix F**. The proposed improvements will be designed in accordance with standards for development within flood zones, as outlined in the CZO.

Impacts and Mitigation Measures

The proposed Project does not involve any occupied structures. As such, minimum impacts are anticipated from potential flood hazards. Electrical equipment that may be susceptible to flood hazard will be designed to be outside of the flood zone or above the flood elevation shown on the Flood Insurance Rate Map. The Project will comply with National Flood Insurance Program (NFIP) regulations for development within the flood hazard district, as outlined in Title 44, Code of Federal Regulations. The project will also comply with all applicable County regulations for development within the flood hazard district. These measures will mitigate any potential adverse impacts to the project site from flood hazards.

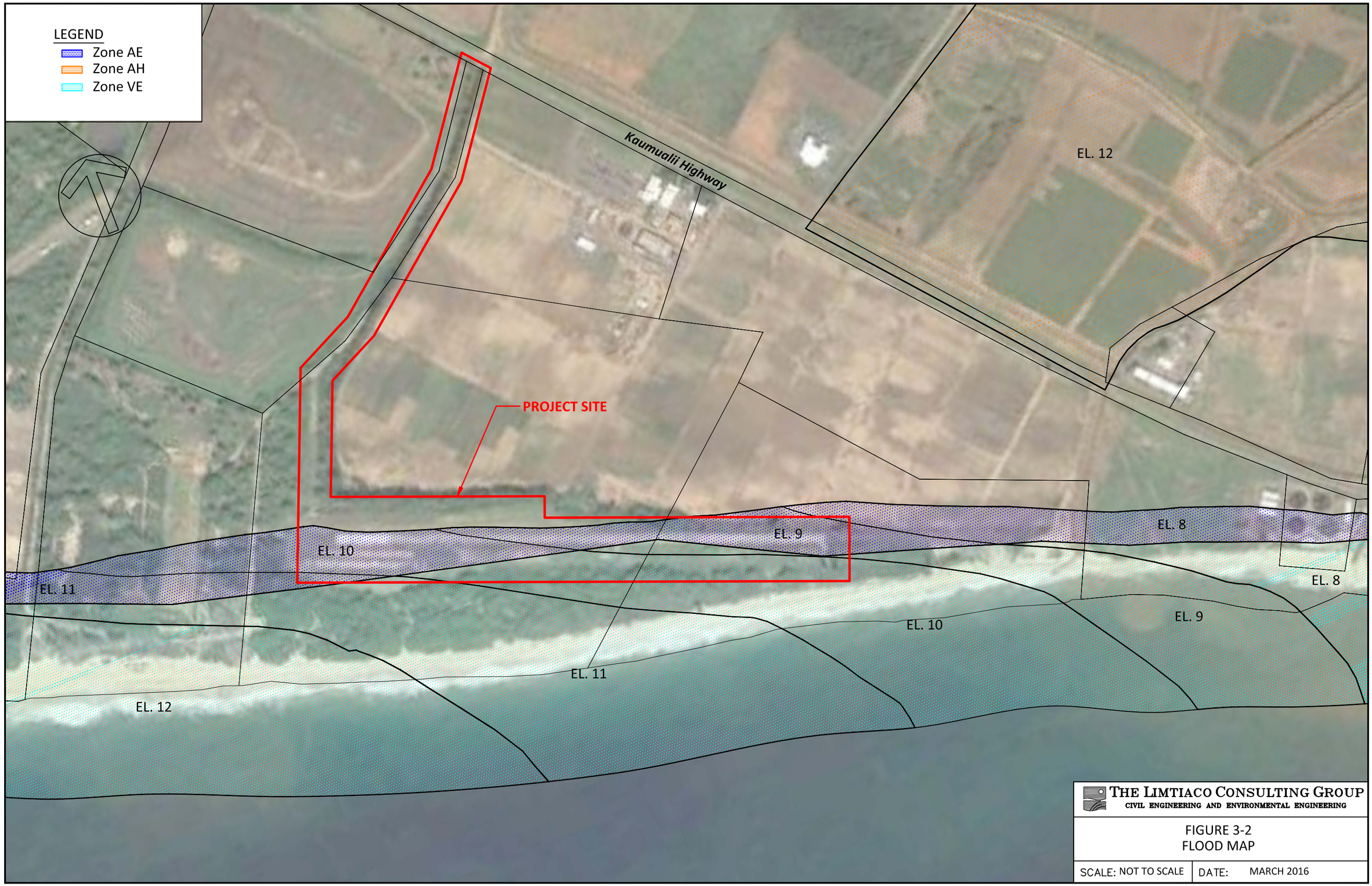

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FIGURE 3-2
FLOOD MAP

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3.8. Floral and Faunal Resources

The Project is located adjacent to the shoreline, and potentially serves as habitat for a number of threatened and endangered seabirds and seaborne mammals.

The Hawaiian petrel (pterodroma sandwichensis) is a Federally-listed endangered seabird that is native to Hawaii. Adult Hawaiian petrels nest during the early spring in underground burrows, entering and leaving their burrows after dark. The female lays a single egg and parents take turns incubating the egg and feeding the chick. In November, fledgling Hawaiian petrels leave their nests for the first time and fly at night to the ocean to forage. Urban lights have been known to disorient the fledging Hawaiian petrels, causing them to fall to the ground or collide with structures, leaving them vulnerable to predators such as cats, dogs, and mongoose (NPS, 2015).

The Newell's shearwater (puffinus auricularis newelli) is a Federally-listed threatened species that nests in burrows on forested mountain slopes from April through November. The Newell's shearwater needs an open downhill flight path from its burrows in order to become airborne and primarily feeds on squid. The shearwater is attracted to light, and increased urbanization has resulted in fledgling shearwater becoming disoriented during their first flight, often striking buildings, trees, or utility wires. Once grounded, the shearwater becomes vulnerable to predators (USFWS, 2012).

The band-rumped storm petrel (oceanodroma castro) is a Federal candidate for listing, and is State listed as an endangered species. The storm petrel nests between May and June. Fledglings leave the nest in October toward the ocean to forage. Urban lighting has been known to disorient fledgling storm petrel, causing them to fall to the ground and leaving them vulnerable to predators (DLNR, 2005).

The Hawaiian stilt (himantopus mexicanus knudseni) is a Federally-listed waterbird that nests in bodies of fresh, brackish, or salt water. The Hawaiian stilt typically feeds in shallow bodies of water separate from its nesting area. The primary causes of decline in the Hawaiian stilt population has been loss of habitat and introduced predators (USFWS [2], 2012).

The Hawaiian common moorhen (gallinule chloropus sandvicencsis) is a Federally-listed endangered species common to freshwater marshes, taro patches, irrigation ditches, reservoirs and wet pastures. They prefer areas of dense vegetation near open water. The Hawaiian moorhen nests year-round, but the most active nesting season is from March through August. The Hawaiian moorhen typically eats mollusks, insects, water plants, and grasses. The primary causes of decline in the Hawaiian moorhen include loss of habitat and introduce predators (USFWS [3], 2012).

The Hawaiian coot (fulica alai) is a Federally-listed endangered species frequently found in fresh and brackish marshes and ponds. The Hawaiian coot nests in aquatic vegetation, and feeds on seeds, leaves, aquatic plants, insects, tadpoles and small fish. The primary causes of decline in the Hawaiian coot include loss of habitat and introduced predators (USFWS [4], 2013).

The Hawaiian duck (anas wyvilliana) is a Federally-listed endangered species endemic to Hawaii that is typically found in lowland wetlands, river valleys, and mountain streams. The Hawaiian duck feeds on mollusks, insects and freshwater vegetation. Their main breeding season is between January and May, with nest established on the ground. The primary causes of decline in the Hawaiian duck include loss of habitat and introduced predators (USFWS [5], 2012).

The Hawaiian "Nene" goose (*Branta sandvicensis*) is a Federally-listed endangered species that is also Hawaii's state bird. Nene are typically found in scrubland, grassland, golf courses, and sparsely vegetated slopes, and open lowland country. Nene have a vegetarian diet consisting of seeds of grasses and herbs, leaves, buds, flowers, and fruits of various plants. The breeding season for the Nene is from August to April. Nene nests are usually well concealed under brush and they typically prefer nesting in the same nest area year after year. The primary causes of decline in the Nene population include predation by introduced animals and possibly by poor available nutrition in their habitat. (USFWS [6], 2012). The DLNR Division of Forestry and Wildlife (DoFAW) indicated in a comment letter dated August 4, 2015, that the Nene has been recently observed in Kekaha Agriculture Association lands on the *mauka* side of Kaumualii Highway (State Route 50).

The Hawaiian hoary bat (lasirus cinereus semotus) is a Federally-listed endangered species that is typically found in elevations ranging from sea level to 7,500 ft. The hoary bat is nocturnal, and feeds on a variety of night-flying insects. The birthing and pup-rearing season of the Hawaiian hoary bat is from June 1 to September 15. The hoary bat will use trees typically 15 ft or greater in height to rear their young. The Office of Hawaiian Affairs (OHA), in their comment letter dated November 5, 2015, stated that Kauai is one of only two islands where hoary bat breeding has been documented. The primary causes of decline in the hoary bat include loss of habitat, pesticides, predation, roost disturbance, and loss of historic tree cover (USFWS [7], 2012).

The green sea turtle (chelonea mydas) is a Federally-listed threatened species generally found in shallow water areas inside reefs, bays, and inlets. Females nest nocturnally, and have a strong fidelity for nesting sites. Major causes of decline in the green sea turtle are hunting, disease, and loss of nesting habitat (USFWS [8], 2015). The DLNR Division of Aquatic Resources (DAR) indicated in a comment letter dated November 2, 2015, that the green sea turtle nests regularly on Kauai,

particularly in the Mana-Barking Sands area. In their comment letter, the DAR stated that hatchling green sea turtles are often disoriented by bright light shining toward the beach since they are positively attracted to lights.

The Hawaiian monk seal (neomonachus schauinslandi) is a Federally-listed endangered species. It is one of only two remaining monk seal species on the planet and is endemic to the Hawaiian archipelago. Monk seals feed in coral reef on lobster, eel, small octopus and reef fishes. They will spend most of their time in the ocean, but will rest on sandy beaches. Mothers will stay with their pups for about five to six weeks, and will not leave their side to feed. They can lose as much as 300 pounds during this period. Factors that continue to threaten the monk seal include competition with fisheries for food, competition with other predators, disease, shark predation, and disease (USFWS [9], 2012).

Panicum niihauense is a Federally-listed endangered species of grass that is endemic to Hawaii, and is typically found on the islands of Niihau and Kauai. They grow in nearshore sand dunes, and are threatened by the use of off-road vehicles and invasive plants. Although the panicum niihauense is not known to occur at the project site, the location is listed as critical habitat for the species (USFWS [10], 2008).

Impacts and Mitigation Measures

The Project proposes installation of stadium lighting and overhead utility lines, both of which have the potential to adversely impact threatened and endangered seabird species.

Fledgling Hawaiian petrel, Newell's shearwater, and band-rumped storm petrel have been known to become disoriented during their first flights due to artificial lighting. Once disoriented, the birds can easily become grounded and vulnerable to predation. To mitigate this potential impact, the Project proposes the use of downcast lighting. Downcast lighting directs light toward the ground, and does not allow large amounts of light to project to areas outside the project site. An example of downcast lighting is given in **Appendix A**. In addition, GIRA has previously coordinated and will continue to coordinate their events with the USFWS to ensure minimal impacts to fledgling seabirds during the fall months. The USFWS comment letter, dated August 6, 2015, states that the use of stadium lighting may increase the risk of seabird fallout if the lighting is operated after sunset during the peak fallout period, which is from September 15 to December 15 of each year. In accordance with USFWS recommendations, GIRA will not operate the stadium lighting during the peak fallout period. GIRA intends to continue their relationship with the USFWS.

The USFWS, in a comment letter dated August 6, 2015, stated that the potential for seabird collision with the stadium lighting should be addressed. USFWS staff was consulted, and it was determined that the height of the stadium lighting will be reduced to a maximum height of 60 ft in order to mitigate the potential for seabird collision.

Artificial lighting also has the potential to disorient adult and hatchling green sea turtles. This could affect their ability to find the ocean. To mitigate this impact, the downcast lighting will be placed on the *makai* side of the drag race strip and will be directed *mauka* (away from the beach). Based on comments from the DAR, all backlighting (i.e., lighting facing toward the beach) has been eliminated from the project. Additionally, no lighting will be constructed within the shoreline setback area. These measures will limit the visibility of artificial light from the beach. Given these mitigation measures, an illumination summary, provided in **Appendix G**, shows that 0.0 foot-candles of light will reach the shoreline area. Additionally, an existing sandy berm and vegetation line between the proposed lighting and the shoreline area should further mitigate any potential adverse impacts on green sea turtles. The existing vegetation line between the proposed lighting and the shoreline area will remain in place, and will not be affected by the proposed project.

Although the scoreboard will use LED lighting, the scoreboard does not pose a threat of potentially significant impacts to seabirds or green sea turtles. LED lighting used by the scoreboard will be of relatively low intensity, intermittent (scores will be shown for a short period before the scoreboard goes “dark”), and will be of a red or amber hue. There is also an existing line of vegetation located between the proposed scoreboard site and the shoreline. The scoreboard will be installed at a maximum height of 24 ft, which is below the top of the adjacent vegetation line. Vegetation will further prevent scoreboard light from reaching the shoreline area.

During preparation of this EA, the USFWS and DoFAW have been consulted on methods to mitigate potential seabird strikes on the proposed overhead electrical lines. Both agencies have recommended construction of overhead electrical lines at a height lower than the top nearby of ironwood trees. Because the treeline is readily visible, it will cause seabirds to fly above the overhead electrical lines and will prevent bird strikes.

Habitat loss is also a primary threat for all species discussed in this section. The Project does not propose conversion of additional land to urban uses, and thus will not cause the destruction of any critical habitat for any species. Temporary construction activities, however, have the potential to disturb endangered species habitat. In particular, vegetation clearing and earth-

disturbing activities during construction have the potential to adversely impact nesting areas.

To mitigate this potential impact, a biological monitor will survey the project site prior to construction to ensure no endangered or threatened species are present in areas to be disturbed. The USFWS will be notified prior to construction and will be provided with the results of this survey. Any nests or broods will be reported to the USFWS and will be protected with establishment of a 100-ft buffer area around the nest. Prior to the initiation of any earth-moving activities, a biological monitor or contractor trained in identification of threatened and endangered species will survey the areas to be affected and ensure that nests or broods will not be adversely affected. Work will be halted within 100 ft of any threatened or endangered species that enters the project site, and will not be resumed until they leave the area on their own accord. A post-construction report, including the results of surveys, locations of documented nests, and other relevant information will be submitted to the USFWS within 30 days of the completion of construction.

Removing, trimming, or otherwise disturbing trees greater than 15 feet tall during the hoary bat birthing and pup rearing season has the potential to impact hoary bats and their pups. The cutting or removing of such trees will not occur between June 1 and September 15 to the extent possible. If disturbance of such trees is necessary between June 1 and September 15, a survey will first be conducted by a knowledgeable wildlife biologist to prevent disturbance of the hoary bat.

Although pinacum niihauense is not found at the project site, nearby sand dunes could potentially serve as habitat for this endangered grass species. To avoid adverse impacts on this critical habitat, no major grading is proposed as part of the Project. The Project will involve small areas of land disturbance for installation of underground electrical lines. Trenched areas will be kept to a minimum, and will be backfilled with native soils so that the soil characteristics at the project site are not disturbed.

Implementation of the mitigation measures outlined in this section will prevent any significant adverse impacts of the Project on listed species.

3.9. Air Quality

Per the requirement of the Clean Air Act (last amended in 1990), the U.S. Environmental Protection Agency has established the National Ambient Air Quality Standards (NAAQS) in order to protect public health and welfare and prevent the significant deterioration of air quality. Additionally, the DOH has established State Ambient Air Quality Standards (SAAQS) to regulate air quality statewide. The State

standards for carbon monoxide and nitrogen dioxide are more stringent than their federal counterparts.

The CAB monitors air quality at selected locations throughout the State. The 2013 ambient air monitoring network consists of 13 State and local air monitoring stations and "special purpose monitoring stations". Currently, there is one State-maintained ambient air quality monitoring station on Kauai. The Niumalu monitoring station is located on a private residential property in Lihue, approximately 1 mile downwind of Nawiliwili Harbor. The location was selected so that it can monitor the impact of cruise ship emissions on nearby communities. The Niumalu monitoring station is located over 20 miles from the project site, thus its data may not be indicative of localized conditions. However, general regional conditions can be inferred from data collected at this station.

The Niumalu monitoring station currently monitors for the volume of $PM_{2.5}$ (particulate matter less than or equal to 2.5 microns in aerodynamic diameter), sulfur dioxide (SO_2), carbon monoxide (CO), and nitrogen dioxide ($NO_{2)}$ (CAB et. al., 2014).

Air quality readings at the Niumalu monitoring station have historically, and continue to remain well below NAAQS and SAAQS.

Impacts and Mitigation Measures

The Project will not result in any long-term impacts on air quality. No mitigation measures for long-term air quality impacts are required.

Short-term impacts on local air quality may occur during construction. Particularly, trenching during installation of the underground utility lines has the potential to release fugitive dust. Operation of construction equipment will also result in exhaust emissions during construction of the Project. These temporary impacts will be of the type and scale typical of small construction projects. The contractor will be responsible for implementing an appropriate dust control plan and will be responsible for complying with all relevant State regulations regarding air quality, as outlined in Chapter 11-60.1, HAR.

3.10. Noise

The project site is located approximately 0.5 miles *makai* of Kaumualii Highway, and just over 0.5 northwest of residential areas in Kekaha. Existing ambient noise at the project site is primarily waves from the nearby shoreline.

Pursuant to Chapter 11-46, HAR on *Community Noise Control*, DOH daytime and nighttime noise limits (expressed in maximum A-weighted decibels [dBA] at the

property line) are 55 dBA at the property line during the daytime (7 a.m. to 10 p.m.) and 45 dBA at the property time during at nighttime (10 p.m. to 7 a.m.). A permit from the DOH, Indoor and Radiological Health Branch (IRHB) is required for noise levels that exceed the maximum permissible sound level for more than ten percent of the time within any twenty minute period, or for impulsive noises ten dBA or more above the maximum permissible sound level.

Impacts and Mitigation Measures

The Project will not result in any long term noise-related impacts. No audible devices will be installed and the Project will not result in permanent increased usage or traffic at the property. No permanent mitigation measures are necessary.

Temporary noise-related impacts may occur during construction. These impacts will be of the type and magnitude typical of construction projects. The contractor must comply with Chapter 11-46, HAR and obtain the appropriate noise-related permits from the IRHB when necessary.

3.11. Archaeological and Cultural Resources

The project site is located in Waimea ahupuaa of the Kona district of Kauai. Generally, the area was traditionally used for taro cultivation. Historical uses of the area include cultivation of tobacco, rice and sugar cane. The date of construction of the race track is unknown; however, aerial photography indicates that the track was constructed between 1950 and 1975.

Because the project site consists primarily of sandy soils, which have been known to produce native Hawaiian burial sites, an archaeological inventory survey (AIS) has been prepared in support of the Project. Preparation of the AIS involved review of traditional and historic land use in the area, research of previous archaeological studies performed in the vicinity of the project site, a surface and subsurface investigation of the project site, and consultation with individuals that may have knowledge of cultural resources in the area. The investigation included subsurface testing at 90 locations (75 trenches and 15 augured pits). Subsurface testing was done at the proposed locations of utility poles, lighting poles, along the length of the proposed utility trench, and near the proposed scoreboard. Test locations are shown on maps in the AIS, which is included in **Appendix H**. The survey found no archaeological materials during its surface or subsurface investigation at the project site and learned of no cultural resources during consultation. The AIS was approved by the SHPD in November 2016.

In addition to preparation of the AIS, agencies, organizations, and individuals who may be knowledgeable of archaeologic, cultural, or historic resources were

consulted during the EA process. **Sections 7, 8 and 9** provide a list of agencies and Native Hawaiian Organizations that were consulted. Comments were received from the SHPD and OHA.

OHA noted concerns about the possibility of subsurface cultural deposits or traditional Hawaiian burials due to sandy soils at the project site and the possibility that customary native practices may occur in the area, though no specific concerns were noted. OHA also requested that SHPD recommend archaeological monitoring of any new ground excavation.

Additionally, OHA requested that this report disclose the project site's designation as Section 5(b) Ceded Lands, and that the State holds these Ceded Lands in corpus trust for Native Hawaiians and the general public.

Impacts and Mitigation Measures

Archaeologists found no historic or archaeological resources during their surface and sub-surface investigation at the project site. As such, no impacts to historic or archaeological resources are anticipated as a result of the Project. Although no historic or archaeological resources were discovered, the AIS recommends archaeological monitoring during ground disturbing activities. Archaeological monitoring is recommended because the project area's environment and indigenous soils/sediments (sand dunes and Jaucus loamy fine sands near the shoreline) are generally conducive to the presence of native Hawaiian burials and subsurface cultural deposits. An Archaeological Monitoring Plan (AMP) has been prepared and was accepted by the SHPD in January 2016. A copy of the AMP is included in **Appendix I**. The contractor will be responsible for carrying out monitoring practices outlined in the AMP during construction.

In the event that any unexpected historic remains or other potentially significant subsurface resources are encountered during the various phases of construction (e.g., excavation and trenching), the contractor will be required to halt construction activities and to immediately notify SHPD and OHA of the discovery. The DLNR will prevent the disturbance or taking of any discovered archaeological, historic or cultural resources to the extent possible by instituting the described mitigation measures and enforcing their implementation by its contractors. Thus, the Project is expected to have no adverse impact on historic or archaeological resources.

No culturally significant resources are known to be present within the project site and no traditional and cultural practices or beliefs are known to occur within the subject property. The Project will support existing uses within the project site and will not result in the expansion or expanded use of the KRP.

Thus, Project actions are expected to have no adverse impacts on any cultural resources or practices at the project site.

3.12. Visual Resources

Photo 3 – View toward the starting line, control tower, bleacher, and pit areas.

The project site is predominantly a large, level area which has been cleared of vegetation. The two-lane drag race strip is the most notably visible structure at the facility. The bleachers, control tower, starting line, and street lights are also visible upon entering the KRP. Trees surround most of the perimeter of the KRP, obstructing views of the facility to and from other properties. The treeline breaks on the southeast end of the drag race strip, where views extend from the Waimea Mountains to the Pacific Ocean. The town of Kekaha is visible from the southern-most tip of the drag race strip. Because the trees surround the majority of KRP, and because there are no large vertical structures at the site, the facility is not visible from most surrounding properties.

The access road to the facility is entered from Kaumualii Highway. The access road is lined on both sides by tall vegetation. As such, there are no notable viewplanes from the access road and the road itself is not visible from neighboring properties.

Impacts and Mitigation Measures

The Project proposes addition of stadium lighting, an LED scoreboard and overhead electrical lines along the drag race strip and access road. The proposed lighting will likely be visible from areas to the southeast of the project site, including Kekaha. However, the lights will be located over a mile from the nearest residential properties and will not have a large visual footprint at this distance. The largest potential impact of the proposed lighting is from the light that would be visible during operation of the facility during the night. The use of downcast lighting is proposed to mitigate this potential impact. The lighting will only be used during events at the KRP, which occur once a month.

The scoreboard will be located in a large grassy are directly adjacent to the drag race strip. A line of vegetation is located between the proposed

scoreboard and the beach on the *makai* side of the track. The scoreboard will be installed at a maximum height of 24 ft, which is below the height of the adjacent vegetation. Views of the scoreboard from adjacent property will be obscured by existing vegetation.

The proposed lighting will not be visible from most adjacent properties since all views to the project site are obstructed by the treeline. Views of the proposed overhead electrical lines will be obstructed by the treeline along the access road.

For these reasons, the Project will not have significant adverse impact on visual resources.

3.13. Socio-Economic Characteristics

3.13.1. Existing Businesses and Surrounding Uses

The project site is located in an agricultural area, with surrounding uses including a shrimp farm, landfill, rifle range, and agriculture. The United States Navy's Pacific Missile Range at Barking Sands is located to the northwest and the town of Kekaha is located to the southeast.

The State of Hawaii, which is the recorded fee owner of all properties neighboring the subject property, was consulted during the EA process. Details regarding this consultation are presented in **Sections 7, 8 and 9**.

Impacts and Mitigation Measures

The Project will not have any long-term impacts on surrounding businesses or uses. There may be an increase in traffic to the property during construction. However, this increase will be only temporary and will not be significant enough to have an adverse impact on surrounding properties.

3.13.2. Police, Fire and Ambulance Service

Police: The Kauai Police Department (KPD) provides police services in Kauai County. The project site is located in the KPD's Waimea District, which has sub-stations located in Waimea and Koloa (KPD, 2015). The Waimea sub-station, at just over 5 miles, is closest station to the project site.

Fire: The Kauai Fire Department (KFD) provides fire protection services for the County of Kauai. The KFD has eight fire stations throughout the island, with the closes to the project site being the Waimea Fire Station (KFD, 2015). The Waimea Fire Station is located just over 5 miles from the project site.

Ambulance: The nearest emergency medical facility, the West Kauai Medical Center, is located 5 miles from the project site in Waimea. American Medical Response provides ambulance services in Kauai County. An ambulance is stationed at the KRP during race events.

Impacts and Mitigation Measures

The Project will not impact the demand for or distribution of any emergency services.

3.14. Infrastructure and Utilities

The following section includes discussions regarding roadways and utility (water, drainage, wastewater and electrical) considerations.

3.14.1. Roadways and Traffic Considerations

The access road to the project site is located along Kaumualii Highway, approximately 2 miles northwest of Kekaha. Kaumualii Highway is a two-lane asphalt-paved highway in the vicinity of the access road. Traffic in the area is light due to the fact that there are no large residential developments northwest of Kekaha.

Impacts and Mitigation Measures

The Project is not expected to have permanent long-term impacts on roadway or traffic conditions. Although the Project is in support of a motor vehicle racing facility, the Project will not cause an increase in the number of events at the KRP.

During construction, materials and equipment will be brought to the site along Kaumualii Highway. This temporary increase of traffic to the project site will be minimal and temporary. Construction of the Project will not result in any road closures or traffic diversion.

Because the Project will result in only minor and temporary impacts during construction, no mitigation measures are proposed. The Project will not result in significant adverse impacts to traffic and roadways.

3.14.2. Solid Waste Management

The solid waste disposal facility nearest the project site is the Kekaha Landfill, which is operated by the DPW. The Kekaha Landfill is located adjacent to the project site in TMK parcel (4)1-2-002:009.

Impacts and Mitigation Measures

The project will not result in any long terms impact to the Kekaha Landfill or other solid waste disposal site. The Project does not result in a long term change to solid waste produced at the project site.

Temporary impacts may occur during construction, due to the increase in solid waste produced during construction activities. The contractor will be required to comply with State regulations for solid waste management, as outlined in Chapter 11-58.1, HAR. In accordance with Chapter 11-58.1, HAR, grubbed material and construction waste shall be disposed of at a solid waste disposal facility that complies with State rules. The open burning of any wastes is prohibited.

The project will result in a temporary increase in waste produced at the facility, which will cease upon completion of construction. Disposal of solid construction waste at an appropriate solid waste disposal facility will not result in significant adverse impacts to the environment.

3.14.3. Utilities

Water: Multiple small-diameter lines are buried at the project site to provide water for minor uses throughout the KRP.

Drainage: There are no drainage utilities at the project site. Stormwater leaves the project site either by sheetflow runoff, evaporation, transpiration, or percolation. Grading at the KRP would direct stormwater runoff toward the drag race strip. Low rainfall totals and highly permeable soils indicate that there is not a need for large drainage infrastructure at the project site.

Wastewater: There are no wastewater utilities at the KRP.

Electrical: The project site does not have an existing connection to the electrical utility. Electricity at the project site is currently provided by the use of portable generators, which are brought to the project site during race events. The portable generators are used to power existing streetlight-style light poles, temporary lighting, electrical equipment, and mechanical equipment used during events. The portable generators are removed from the site at the end of each event.

Impacts and Mitigation Measures

Water: The Project will not have any impact to water utilities.

Drainage: The Project does not involve any grading or change in topography at the project site. Drainage will not be impacted by the Project.

Wastewater: The Project will not have any impact to wastewater utilities.

Electrical: The Project proposes a KRP connection to the KIUC electrical system through overhead lines located along Kaumualii Highway. Overhead electrical lines will be constructed from Kaumualii Highway the KRP along the access road to the facility. The KIUC has been consulted regarding the Project, and has indicated that the KIUC system has sufficient power to accommodate the Project. The overhead lines to the project site will be owned by the KIUC.

Underground conduits will be constructed to distribute power to the proposed stadium lights. The conduits will run parallel to the drag race strip. Appurtenant devices, such as transformers and pullboxes, will be installed along the alignment of the underground electrical conduits.

The KRP connection to KIUC's electrical distribution system is being coordinated with the KIUC. The Project will represent an additional load to the system; however, the load is expected to be minimal since GIRA holds events only once a month.

The electrical connection will allow GIRA to reduce (but not eliminate) its dependence on portable generators to run events. This may reduce the amount of fuel used during events, and reduce exhaust and noise emissions from portable generators. This effect, however, will not be significant since GIRA holds events only once a month on average.

Overall, the Project will not result in significant adverse impacts to electrical utilities. The Project will be coordinated throughout the planning, design and construction processes.

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4. RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

4.1. State Land Use District

The State Land Use Law (Chapter 205, HRS) is intended to preserve, protect, and encourage the development of lands in the State for uses which are best suited to the public health and welfare for Hawaii's people. All lands in the State are classified into four land use districts by the State of Hawaii, Land Use Commission: Urban, Agricultural, Conservation, and Rural. Urban areas are characterized by residential neighborhoods, commercial enterprises, industrial development, and community facilities including public buildings.

The project site is located within the Limited subzone of the Conservation land use district. §13-5-12, HAR outlines the following objectives for the Limited subzone:

§13-5-12 Limited (L) subzone.

(a) The objective of this subzone is to limit uses where natural conditions suggest constraints on human activities.

(b) The (L) subzone shall encompass:

(1) Land susceptible to floods and soil erosion, lands undergoing major erosion damage and requiring corrective attention by the county, state, or federal governments; and

(2) Lands necessary for the protection of the health, safety, and welfare of the public by reason of the land's susceptibility to inundation by tsunami, flooding, volcanic activity or landslides, or which have a general slope of forty percent or more

Comment:
The project site is located in a coastal parcel. The shoreline in the vicinity of the parcel is highly dynamic due to seasonal erosion/accretion. The width of the beach varies throughout the year. To mitigate any impacts due to coastal erosion, no Project improvements will be constructed *makai* the shoreline setback. The shoreline setback line will be approved by the County Planning Department.

Consultation with the OCCL indicates that the Project will be required to obtain a CDUP. Pursuant to §13-5-22, HAR, a "Departmental Permit" will be required. Departmental Permits are approved by the Chairperson of the BLNR. A CDUP application has been submitted to the OCCL for review.

4.2. Hawaii State Plan

The Hawaii State Plan, HRS Chapter 226, outlines broad goals, policies, and objectives to serve as guidelines for the future growth and development of the State. Objectives, policies, and priority guidelines relevant to the Project are as follows:

§226-4 State goals. In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:

(2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.

§226-11 Objectives and policies for the physical environment – land-based, shoreline, and marine resources.

(a) Planning for the State's physical environment with regards to land based, shoreline, and marine resources shall be directed towards achievement of the following objectives:

(1) Prudent use of Hawaii's land-based, shoreline, and marine resources.

(2) Effective protection of Hawaii's unique and fragile environmental resources.

(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:

(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.

(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.

(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.

(8) Pursue compatible relationships among activities, facilities, and natural resources.

(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.

§226-12 Objective and policies for the physical environment – scenic, natural beauty, and historic resources.

(a) Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.

(b) To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:

(1) Promote the preservation and restoration of significant natural and historic resources.
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

§226-13 Objectives and policies for the physical environment – land, air, and water quality.
(a) Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:
(1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.
(b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to:
(7) Encourage urban developments in close proximity to existing services and facilities.

§226-23 Objective and policies or socio-cultural advancement – leisure.
(a) Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.
(b) To achieve the leisure objective, it shall be the policy of this State to:
(2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.
(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.
(5) Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources.

Note: http://www.capitol.hawaii.gov/hrscurrent/ accessed on 5/02/2015

Comment:

The Project will be performed in a manner consistent with the relevant objectives of the Hawaii State Plan, as stated above. The Project will improve a recreational resource and an existing and appropriate facility. The Project will not significantly impact nearby coastal resources or restrict public access to such resources. Endangered and threatened floral and faunal species will be protected with the use of appropriate mitigation measures. Construction

BMPs are proposed for temporary impacts to land, air and water quality that may occur during construction.

4.3. Kauai County General Plan

The General Plan of Kauai County sets forth broad statements of social, economic, environmental, and design objectives and policies which are desired over the long-term. The following policies and objectives are relevant to the Project:

2.1. Community Values

- *Protection, management, and enjoyment of our open spaces, unique natural beauty, rural lifestyle, outdoor recreation and parks.*
- *Access to and along shorelines, waterways and mountains for all. However, access should be controlled where necessary to conserve natural resources and to maintain the quality of public sites for fishing, hunting, recreation and wilderness activities valued by the local community.*

2.2 Vision for Kauai 2020

<u>Coastal Development</u>

Development along the shoreline is designed and landscaped to moderate visual impact. There is a transition zone which allows increased building height with larger setbacks, up to the four-story height limit.

Increased setbacks have reduced the need for seawalls or artificial hardening of the shoreline. Along sandy shorelines, shore protection structures are allowed only in special instances as a last resort.

3.2 Scenic Views

This chapter sets policies relating to land, waters and culture – resources which are the heritage of the people of Kaua'i. Heritage resources are connected to physical features or structures, but they also entail less tangible qualities like cultural meaning, historic significance, and the visual experience of the environment.

The chapter also sets policies for managing human activities to maintain the quality of the environment – particularly the quality of Kaua'i's waters and watersheds. As stated in the Vision, the concepts of ahupua'a and watershed link the mountains, lowlands and ocean as one basic ecological unit. The rainwater running off the land affects the quality of the streams and coastal waters; this in turn affects their ability to support native biota and their usefulness for fishing, swimming, or other activities. Finally, the Chapter addresses the special rights of Native Hawaiians in water and land.

3.2.1 Policy

(a) In developing public facilities and in administering land use regulations, the County shall seek to preserve scenic resources and public views. Public views are those from a public place, such as a park, highway, or along the shoreline.

(b) The County shall observe the following general principles in maintaining scenic resources:

(1) Preserve public views that exhibit a high degree of intactness or vividness.

- *"Intactness" refers to both the integrity of visual patterns and the extent to which the landscape is free from structures or other visually encroaching features.*
- *"Vividness" relates to the memorability of a view, caused by contrasting landforms which create striking and distinctive patterns. (Examples are the silhouette of Mt. Hāʻupu against the horizon, views of Nounou Mountain from the valley and the coast, and the view of Hanalei Valley from the overlook.)*

(2) Preserve the scenic qualities of mountains, hills and other elevated landforms, qualities such as the silhouette against the horizon and the mass and shape of the landform.

(3) Preserve the scenic qualities of lowland/open space features, such as the shoreline, the edge of a coastal bluff, a marsh, a fishpond, or a historic or cultural property. Structures should not impede or intrude upon public views of the feature and should not alter the character of the immediate area around the land feature, historic or cultural property.

3.5 Coastal Lands

Coastal lands have unique qualities and environmental conditions that warrant special consideration in land use planning and regulation. The special nature of coastal lands has been recognized in the federal coastal zone legislation, the Hawaiʻi Coastal Zone Management Act, and the County Special Management Area Rules and Shoreline Setback Rules. Following are key factors that need to be considered when planning for coastal lands:

- *Coastal lands are susceptible to physical change – especially those fronted by sandy beaches. Patterns of weather and oceanographic conditions cause lands to erode and/or accrete, sometimes seasonally, sometimes in cycles, and sometimes chronically over a period of years. Storm events or unusual swells can exaggerate or change conditions. Coastal erosion is normal and should be planned for.*

- *Coastal lands are susceptible to damage from typical winter storms, riverine flooding, tsunami, and hurricane storm surge. The Federal Insurance Rate Maps delineate flood hazard zones and elevations for severe events, defined as those having a one percent chance of occurrence in any given year. Coastal properties on Kaua'i suffered extensive damage from storm surge caused by the 1982 and 1992 hurricanes.*

- *Use of the beach and access to coastal waters are essential for fishing and other traditional food-gathering activities. Hawai'i law guarantees the public use of lands seaward of the shoreline.*

- *Shoreline lands are highly desirable for recreation activities, such as surfing, snorkeling and canoe-paddling. These activities are coastal-dependent, another reason why public access to and along the shoreline is critical.*

- *Unique natural and cultural resources are often found on coastal lands. Natural resources include wetlands, river deltas, native coastal plants, and endangered waterbird habitat. Because the coastal plains were well used by the ancient Hawaiian culture, many heiau, burial sites, and other cultural sites may be found there.*

- *The coast is rich in scenic qualities and unique views. Important public viewpoints include public roads, parks and other public lands, and beaches and other public lands makai of the shoreline. Some of the most vivid views are along the coastline and across embayments, looking toward prominent landforms such as cliffs, headlands or coastal bluffs.*

3.5.1 Policy

(b) When developing public facilities or granting zoning, land use permits, or subdivision for development along the coast, the first priority shall be to preserve and protect sandy beaches.

(1) Strips of land along the shoreline that have been placed in the State Conservation District or in the County Open zoning district are intended to serve as a buffer from coastal erosion. Structures should be sited inland of these coastal buffers on lands that are appropriately zoned.

(2) When development is proposed along a sandy beach, hazards of long-term coastal erosion should be assessed and used to determine appropriate setbacks.

(d) Following are general guidelines for coastal development, including resorts and residential subdivisions, but excepting harbors and other uses which are specifically dependent on locating near the water.

(4) Maintain existing stands of trees or plant trees within the buffer zone, to provide sun and wind protection and to moderate the appearance of large buildings (e.g., Hyatt Regency, Kaua'i Coast Resort at the Beachboy).

(5) Site buildings to preserve view corridors from roads or public places to the ocean and from the ocean mauka.

Note:
http://www.kauai.gov/Government/Departments/PlanningDepartment/TheKauaiGeneralPlan/tabid/130/Default.aspx accessed on 5/02/2015

Comment:
The Project entails improvements to the existing KRP facility and will not detract from existing opens spaces or recreational areas. The Project will be designed such that it does not infringe in the shoreline setback area, and it will not have any impacts to coastal resources or recreational areas. The Project does not involve any shoreline hardening structures. Public access to the shoreline will not be impacted by the Project. Views of the proposed vertical structures (i.e., stadium lighting and overhead electrical lines) will be obstructed by existing landscaping at the project site and the visual impact of the proposed lighting will be mitigated with the use of downcast lighting systems. For these reasons, the Project is consistent with the Kauai County General Plan.

4.4. Kauai County Comprehensive Zoning Ordinance

Most of the Project is within the State Conservation land use district, and are not subject to County ordinance. However, a portion of the facility access road on TMK (4)1-2-002:036 is located within the County Agricultural zoning district. As such, a portion of the proposed overhead electrical line extension is located within the County Agricultural zoning district.

Objectives of the Agricultural zoning district include the following:

(a) To protect the agriculture potential of lands within the County of Kauai to insure a resource base adequate to meet the needs and activities of the present and future.

(b) To assure a reasonable relationship between the availability of agriculture lands for various agriculture uses and the feasibility of those uses.

(c) To limit and control the dispersal of residential and urban uses within agricultural lands.

Comment:
The proposed overhead lines will be located on the existing access road. The road provides access to the KRP and the Kekaha landfill, and has limited potential for agricultural development. As such the Project will not limit the potential for any agricultural uses. The Project supports existing uses at the KRP and will not promote the dispersal of residential and urban uses.

4.5. State Coastal Zone Management Program

The State Coastal Zone Management (CZM) program, established pursuant to Chapter 205A, HRS, as amended, is administered by the State Office of Planning. The program provides for the beneficial use, protection, and development of the State's coastal zone. Relevant objectives and policies as outlined in §205A-2, HRS include the following:

§205A-2 Coastal zone management program; objectives and policies.
- *(b) Objectives*
  - *(1) Recreational resources*
    - *(A) Provide coastal recreational opportunities accessible to the public.*
  - *(2) Historic Resources*
    - *(A) Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.*
  - *(3) Scenic and open space resources:*
    - *(A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.*
  - *(4) Coastal ecosystems;*
    - *(A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.*
  - *(6) Coastal hazards;*
    - *(A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.*
  - *(9) Beach protection;*
    - *(A) Protect beaches for public use and recreation.*
  - *(10) Marine resources;*
    - *(A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.*
- *(c) Policies*
  - *(1) Recreational Resources*

(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal management area by:
(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(3) Scenic and open space resources;
(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources;

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

(6) Coastal hazards;
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program

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

(10) Marine Resources;
(A) Ensure that the use and development of marine and coastal resources area ecologically and environmentally sound and economically beneficial.

Through the CZM program and pursuant to the Chapter 205A, HRS, all counties have enacted ordinances establishing a SMA. Development within the SMA, including most development proposed by the State, requires a SMA permit from the appropriate County. On Kauai, the SMA permit is administered by the County Planning Department. County rules regarding development within the SMA are outlined in the *Special Management Area Rules and Regulations, County of Kauai, State of Hawaii* (Kauai County, 2011)

Comment:
The Project will not restrict public access to any shoreline or recreational areas. The proposed improvements will be located outside of the shoreline setback area, such that they will not be subject to coastal erosion or tidal forces, and will not impact any coastal resources. The Project will comply with

all Federal standards for development within the flood zone. A biological monitor will survey the project site prior to construction to ensure no endangered or threatened species are present in areas to be disturbed. Additionally, downcast lighting is proposed to mitigate potential impacts to fledgling seabirds or nesting turtles. An AIS and AMP have been accepted by SHPD, and archaeological monitoring will be performed during ground-disturbing activities.

5. ALTERNATIVES TO THE PROPOSED ACTION

In addition to the preferred Project, as described in previous sections, several alternatives were considered.

5.1. No-Action Alternative

Under the no-action alternative, proposed lighting and electrical improvements will not be constructed at the KRP. GIRA would likely continue to use the KRP as it has in the past for its monthly race events.

GIRA would continue to use portable-generator powered lighting between the months of March and September, when it holds its events during the evening. The October and November events would continue to be held during daylight hours, with no lighting required. The park would continue to be closed between the months of December and February.

The Project is preferred to the No-Action Alternative because the Project would improve visibility for race participants and spectators during racing events. Increased visibility will improve safety for event participants. Connecting to the KIUC electrical distribution system would reduce the need for portable generators, reducing fuel usage and cost. It will also reduce exhaust and noise emissions from portable generators during events. Additionally the proposed downcast lighting would reduce the amount of light projected toward the shoreline.

5.2. Alternative Site

The Project improvements are tied to the existing KRP facility and there are no other similar facilities on-island. As such, an alternative site option would suggest a new site for the race track facility. Due to the existing site's proximity to the coast line, an alternate site could be located further from the shore and outside of the conservation, flood, and erosion prone areas. However, the Project is preferred to an alternative site because of the prohibitive costs of developing an alternative site. Additionally, the environmental impacts of constructing a new facility would be greater than improving the existing KRP facility.

5.3. Buried Electrical Line Alternative

The Project involves construction of approximately 0.8 miles of new overhead electrical lines. The proposed overhead electrical lines will run from Kaumualii Highway to the entrance of the KRP. The USFWS and DoFAW have commented that the overhead lines pose a potential for seabird collision.

In order to mitigate this potential impact, the proposed overhead electrical lines could be buried. In this alternative, the proposed overhead line (as shown in **Figure**

2.3) would be placed underground. Construction of the buried electrical lines would require 0.9 miles of trenching and installation of concrete-encased 2-inch electrical conduit from Kaumualii Highway to the KRP. The underground electrical conduit would follow roughly the same alignment as the proposed overhead electrical lines. Other aspects of the buried electrical line alternative, such as the downcast stadium lighting, would remain the same as the preferred Project.

The primary benefit of the buried electrical line alternative over the preferred Project would be the elimination of the overhead electrical lines. In the buried electrical line alternative, there would be no potential for seabird collisions with overhead electrical lines.

Temporary construction impacts for the buried electrical line would be greater than temporary construction impacts for the preferred Project. Installation of the buried electrical line will require digging a 0.9 mile trench from Kaumualii Highway to the KRP. The trench would cause a larger area of soil disturbance, which increases the potential for storm water pollution. This is because stormwater can potentially carry loose soil, excess nutrients, and other pollutants to nearby waterbodies. A greater area of ground disturbance also increases the possibility of inadvertent archaeological finds.

Temporary construction impacts for the buried electrical line alternative would be mitigated with temporary stormwater BMPs (as discussed in **Section 3.6**) and archaeological monitoring during construction (as discussed in **Section 3.11**). With proper use of BMPs and archaeological monitoring, the potential for temporary construction impacts would not be significantly greater than those of the preferred alternative.

The cost of the buried electrical line alternative would be significantly greater than installation of the overhead electrical lines proposed in the preferred Project. Installation of the underground electrical line would cost approximately $1.765 million, while installation of overhead electrical line would cost approximately $440,000. An itemized cost estimate is provided in **Appendix J**.

The preferred Project is recommended because the buried electrical line alternative is cost-prohibitive. The primary benefit of the buried electrical line alternative is the elimination of potential for seabird collision with overhead electrical lines. However, based on consultation with the USFWS and DoFAW, the potential for seabird collision can be mitigated by constructing the overhead lines at a height lower than the top of nearby ironwood trees.

5.4. Install Permanent Generators

In lieu of connecting to the KIUC electrical system, the permanent generator alternative proposes to provide power to the KRP with the installation of permanent on-site diesel generators. In addition to installation of the generators, this alternative would involve installation of a concrete pad (on which the generators would sit) and generator housing structure (for noise attenuation and to protect the generators from the elements). Other aspects of the permanent generator alternative, such as the downcast stadium lighting, would be the same as the preferred Project.

The primary benefit of the permanent generator alternative is that overhead electrical lines would not need to be installed to connect the KRP to the KIUC system on Kaumualii Highway. Because installation of permanent generators eliminates the need for overhead lines, this alternative eliminates the risk of seabird collisions.

The cost to install permanent electrical generators, a concrete pad, and equipment housing would be approximately $300,000, which is less than the $440,000 required to install the overhead lines in the preferred Project. An itemized cost estimate is provided in **Appendix J**. However, installation of permanent generators would result in yearly generator maintenance costs. Because installation of permanent generators would entail on-site storage of diesel fuel, regular inspection and maintenance would be particularly important for prevention and detection of fuel leaks. Maintenance costs would not be incurred in the preferred Project, as the KIUC will be responsible for repair and maintenance of the overhead line. Large generators also periodically require overhauls, with typical generator life-cycles lasting around 2,000 hours of use. The life cycle of a permanent generator at the project site would likely be shorter due to its proximity to the ocean. Overhaul costs also would not be incurred in the preferred Project.

Due to the regular maintenance costs and the periodic cost for generator overhaul, the preferred Project is recommended over the permanent generator alternative. The primary benefit of the permanent generator alternative is the elimination of potential for seabird collision with overhead electrical lines. However, based on consultation with the USFWS and DoFAW, the potential for seabird collision can be mitigated by constructing the overhead lines at a height lower than the top of nearby ironwood trees.

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6. REQUIRED PERMITS AND APPROVALS

The following permits and approvals are anticipated for the Project:

6.1. Federal Government of the United States of America

None

6.2. State of Hawaii

Conservation District Use Permit (Department Permit)
National Pollutant Discharge Elimination System Permit

6.3. County of Kauai

Shoreline Setback Application
Special Management Area Use Permit

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7. PRE-ASSESSMENT CONSULTATION

21 agencies, organizations, and individuals (indicated in ***bold-italic***) were consulted during the preparation of the Draft EA. A total of seven of these parties formally replied during the pre-assessment period, as indicated by the "√" below. Six agencies sent unsolicited comments, as indicated by the "X" below.

Federal Agencies

√ ***Department of the Interior, U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office***

National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Regional Office

State of Hawaii

√ ***Department of Health, Clean Air Branch***

√ ***Department of Health, Clean Water Branch***

Department of Health, Environmental Planning Office

Department of Health, Indoor and Radiological Health Branch

Department of Land and Natural Resources

X Department of Land and Natural Resources, Division of Aquatic Resources

X Department of Land and Natural Resources, Division of Boating and Ocean Recreation

X Department of Land and Natural Resources, Division of Forestry and Wildlife

X Department of Land and Natural Resources, Engineering Division

X Department of Land and Natural Resources, Land Division

X Department of Land and Natural Resources, Office of Conservation and Coastal Lands

√ ***Department of Land and Natural Resources, State Historic Preservation Division***

Department of Transportation, Highways Division

√ ***Office of Hawaiian Affairs***

Kauai County

√ ***Division of Public Works, Solid Waste Division***

Kauai Fire Department

√ ***Kauai County Planning Department***

Kauai Police Department.

Office of the County Clerk, Council Services Division

Public Representatives

Representative Dee Morikawa

Senator Ronald D. Kouchi

Native Hawaiian Organizations

Association of Hawaiian Civic Clubs

Friends of Iolani Palace

Hui Malama I Na Kupuna O Hawaii Nei

Kakoo Oiwi

Copies of all comment and response letters are provided in **Appendix K**.

8. DRAFT ENVIRONMENTAL ASSESSMENT CONSULTATION

23 agencies, organizations, and individuals, as well as two (2) libraries (indicated in ***bold-italic***) were consulted during the public review period of the Draft EA. A total of three (3) of these parties formally replied during the Draft EA review period, as indicated by the "√" below. Six (6) agencies sent unsolicited comments, as indicated by the "X" below.

Federal Agencies

√ ***Department of the Interior, U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office***

National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Regional Office

State of Hawaii

Department of Agriculture

Department of Health, Clean Air Branch

√ ***Department of Health, Clean Water Branch***

Department of Health, Environmental Planning Office

Department of Health, Indoor and Radiological Health Branch

X Department of Health, Kauai District Health Office

√ ***Department of Land and Natural Resources***

X Department of Land and Natural Resources, Division of Boating and Ocean Recreation

X Department of Land and Natural Resources, Division of Forestry and Wildlife

X Department of Land and Natural Resources, Engineering Division

Department of Land and Natural Resources, Land Division

X Department of Land and Natural Resources, Land Division, Kauai District

X Department of Land and Natural Resources, Office of Conservation and Coastal Lands

Department of Land and Natural Resources, State Historic Preservation Division

Department of Transportation, Highways Division

Office of Hawaiian Affairs

Kauai County

Division of Public Works, Solid Waste Division

Kauai Fire Department

Kauai County Planning Department

Kauai Police Department.

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Kakoo Oiwi

Public Libraries

Hawaii State Library, Hawaii Documents Center

Waimea Public Library

Copies of all comment and response letters are provided in **Appendix L**. Note that response letters for the Draft EA consultation were combined with response letters for the scoreboard consultation (see **Section 9**).

9. SCOREBOARD CONSULTATION

23 agencies, organizations, and individuals (indicated in ***bold-italic***) were consulted during the public review period of the Draft EA. A total of two (2) of these parties formally replied during the Draft EA review period, as indicated by the "√" below. Six (6) agencies sent unsolicited comments, as indicated by the "X" below.

Federal Agencies

Department of the Interior, U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office

National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Regional Office

State of Hawaii

Department of Agriculture

Department of Health, Clean Air Branch

√ ***Department of Health, Clean Water Branch***

Department of Health, Environmental Planning Office

√ ***Department of Health, Indoor and Radiological Health Branch***

Department of Land and Natural Resources

X *Department of Land and Natural Resources, Division of Aquatic Resources*

X Department of Land and Natural Resources, Division of Boating and Ocean Recreation

X Department of Land and Natural Resources, Engineering Division

√ ***Department of Land and Natural Resources, Land Division***

X Department of Land and Natural Resources, Land Division, Kauai District

Department of Land and Natural Resources, State Historic Preservation Division

Department of Transportation, Highways Division

√ ***Office of Hawaiian Affairs***

Kauai County

Division of Public Works, Solid Waste Division

Kauai Fire Department

Kauai County Planning Department

Kauai Police Department.

Office of the County Clerk, Council Services Division

Public Representatives

Representative Dee Morikawa

Senator Ronald D. Kouchi

Native Hawaiian Organizations

Association of Hawaiian Civic Clubs

Friends of Iolani Palace

Hui Malama I Na Kupuna O Hawaii Nei

Kakoo Oiwi

Copies of all comment and response letters are provided in **Appendix M**. Note that response letters for the scoreboard consultation were combined with response letters for the Draft EA consultation (see **Section 9**).

10. REFERENCES

CAB et. al. State of Hawaii, Department of Health, Environmental Management Division, Clean Air Branch and State of Hawaii, Department of Health, State Laboratories Division, Air Surveillance and Analysis Section. July 1, 2014. *2014 Air Monitoring Network Plan*. March 13, 2014. Accessed: http://health.hawaii.gov/cab/files/2013/05/Air_Monitoring_Network_Plan_2014.pdf

CWRM. State of Hawaii, Department of Land and Natural Resources, Commission on Water Resource Management. August 28, 2008. "Ground Water Hydrologic Unit Map - Island of Kauai." March 13, 2015. Accessed: http://www.state.hi.us/dlnr/cwrm/mapsillustrations/gwhu_oahu.pdf

DLNR. State of Hawaii, Department of Land and Natural Resources. October 1, 2005. *'Ake'ake or Band-rumped Storm-Petrel*. May 1, 2015. Access: http://dlnr.hawaii.gov/wildlife/files/2013/09/Fact-Sheet-band-rumped-storm-petrel.pdf

DOH. State of Hawaii, Department of Health. June, 2014. *Water Quality Standards Map of the Islands of Kauai & Niihau*. March 4, 2015. Accessed: http://health.hawaii.gov/cwb/files/2013/05/WQS_20140708_kauai.pdf

DOH (2). State of Hawaii, Department of Health. September 2, 2014. 2014 *State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117)*. May 3, 2015. Accessed: http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/integrated-report-and-total-maximum-daily-loads/

Kauai County. County of Kauai, State of Hawaii. October, 2011. *Special Management Area Rules and Regulations*. April 20, 2015. Accessed: http://www.kauai.gov/Government/Departments/PlanningDepartment/ZoningandLandUsePermits/ResourceDocuments/tabid/627/Default.aspx

KFD. Kauai Fire Department. 2015. *The County of Kauai Fire Department*. May 2, 2015. Accessed: http://www.kauai.gov/Government/Departments/FireDepartment/tabid/107/Default.aspx

KPD. Kauai Police Department. 2015. *PSB – Waimea District*. May 1, 2015. Accessed: http://www.kauai.gov/tabid/323/Default.aspx

NPS. National Parks Service. May 11, 2015. *'Ua'u – Hawaiian Petrel*. May 11, 2015. Accessed: http://www.nps.gov/havo/learn/nature/uau.htm

NRCS. United States, Department of Agriculture, National Resources Conservation Service. December 06, 2013. *Web Soil Survey*. Accessed: December 23, 2014. Accessed: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

SCS. United States Department of Agriculture, Soil Conservation Service, in cooperation with the University of Hawaii Agricultural Experiment Station. October, 1972. *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.*

UHGD. University of Hawaii, Geography Department. April 2013. *Rainfall Atlas of Hawaii*. May 10, 2015. Accessed: http://rainfall.geography.hawaii.edu/

UHGD (2). University of Hawaii, Geography Department. 2014. *Climate of Hawaii*. May 10, 2015. Accessed: http://climate.geography.hawaii.edu/

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

USFWS. United States Fish and Wildlife Service. September 20, 2012. *Endangered Species in the Pacific Islands, Newell's Shearwater*. May 1, 2015. Accessed: http://www.fws.gov/pacificislands/fauna/newellsshearwater.html

USFWS (2). United States Fish and Wildlife Service. September 20, 2012. *Endangered Species in the Pacific Islands, Hawaiian Stilt*. May 1, 2015. Accessed: http://www.fws.gov/pacificislands/fauna/stilt.html

USFWS (3). United States Fish and Wildlife Service. September 20, 2012. *Endangered Species in the Pacific Islands, Hawaiian Common Moorhen* . May 1, 2015. Accessed: http://www.fws.gov/pacificislands/fauna/HImoorhen.html

USFWS (4). United States Fish and Wildlife Service. June 13, 2013. *Endangered Species in the Pacific Islands, Hawaiian Coot*. May 1, 2015. Accessed: http://www.fws.gov/pacificislands/fauna/HIcoot.html

USFWS (5). United States Fish and Wildlife Service. September 20, 2012. *Endangered Species in the Pacific Islands, Hawaiian Duck*. May 1, 2015. Accessed: http://www.fws.gov/pacificislands/fauna/HIduck.html

USFWS (6). United States Fish and Wildlife Service. September 20, 2012. *Endangered Species in the Pacific Islands, Hawaiian Goose.* January 3, 2015. Accessed: http://www.fws.gov/pacificislands/fauna/HIgoose.html

USFWS (7). United States Fish and Wildlife Service. September 20, 2012. *Endangered Species in the Pacific Islands, Hawaiian Hoary Bat*. May 1, 2015. Accessed: http://www.fws.gov/pacificislands/fauna/HIhoarybat.html

USFWS (8). United States Fish and Wildlife Service. April 10, 2015. *Green Sea Turtle (Chelonia mydas).* May 1, 2015. Accessed: http://www.fws.gov/northflorida/seaturtles/turtle%20factsheets/green-sea-turtle.htm

USFWS (9). United States Fish and Wildlife Service. September 20, 2012. *Endangered Species in the Pacific Islands, Hawaiian Monk Seal*. May 1, 2015. Accessed: http://www.fws.gov/pacificislands/fauna/HImonkseal.html

USFWS (10). United States Fish and Wildlife Service. January 18, 2008. *Panicum niihauense (Lau ‘ehu) 5-Year Review: Summary and Evaluation*. May 1, 2015. Accessed: http://ecos.fws.gov/docs/five_year_review/doc1856.pdf

WRCC. Western Regional Climate Center. 2015. *Climate of Hawaii*. April 20, 2015. Accessed: http://www.wrcc.dri.edu/narratives/hawaii/

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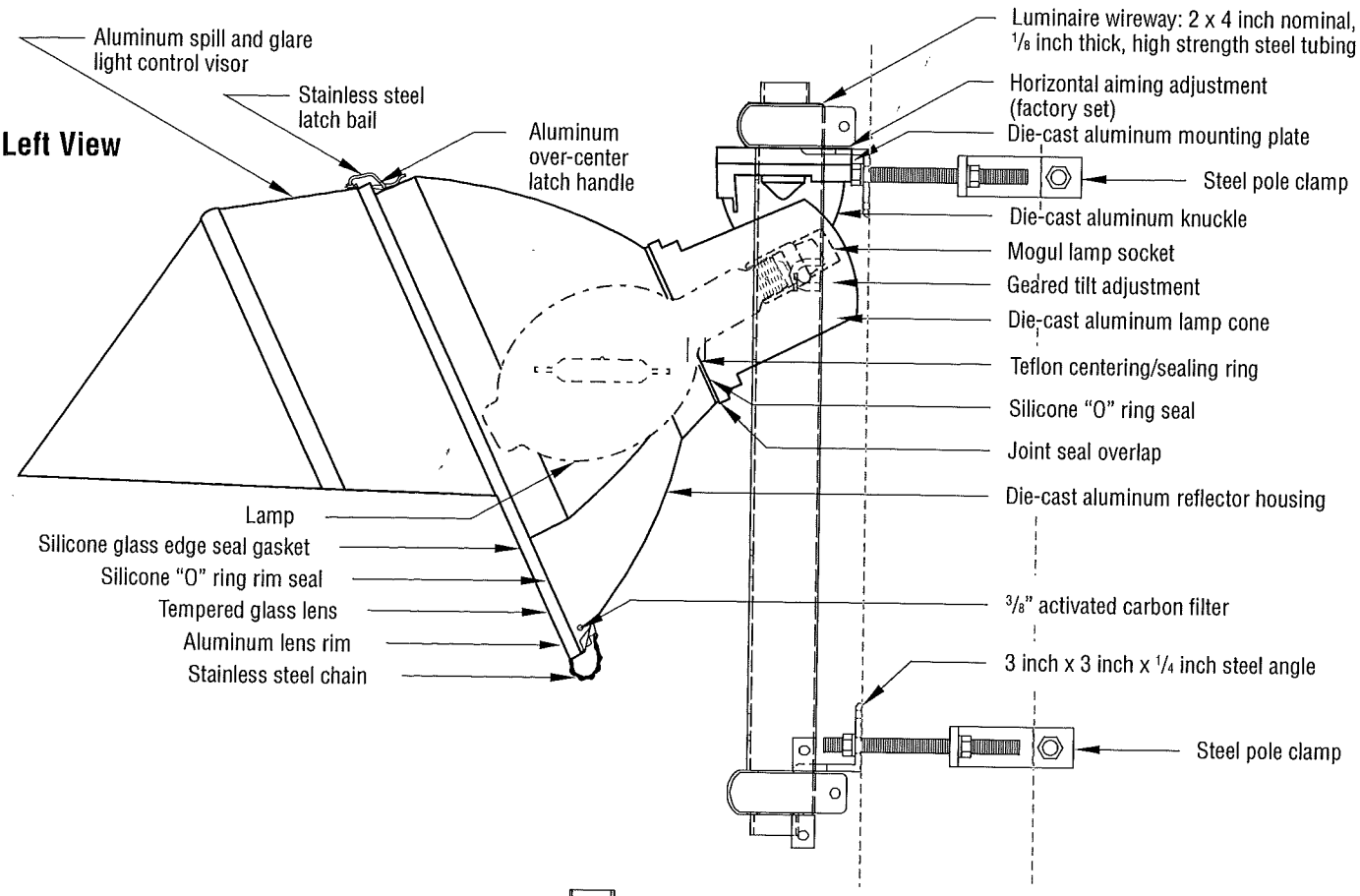
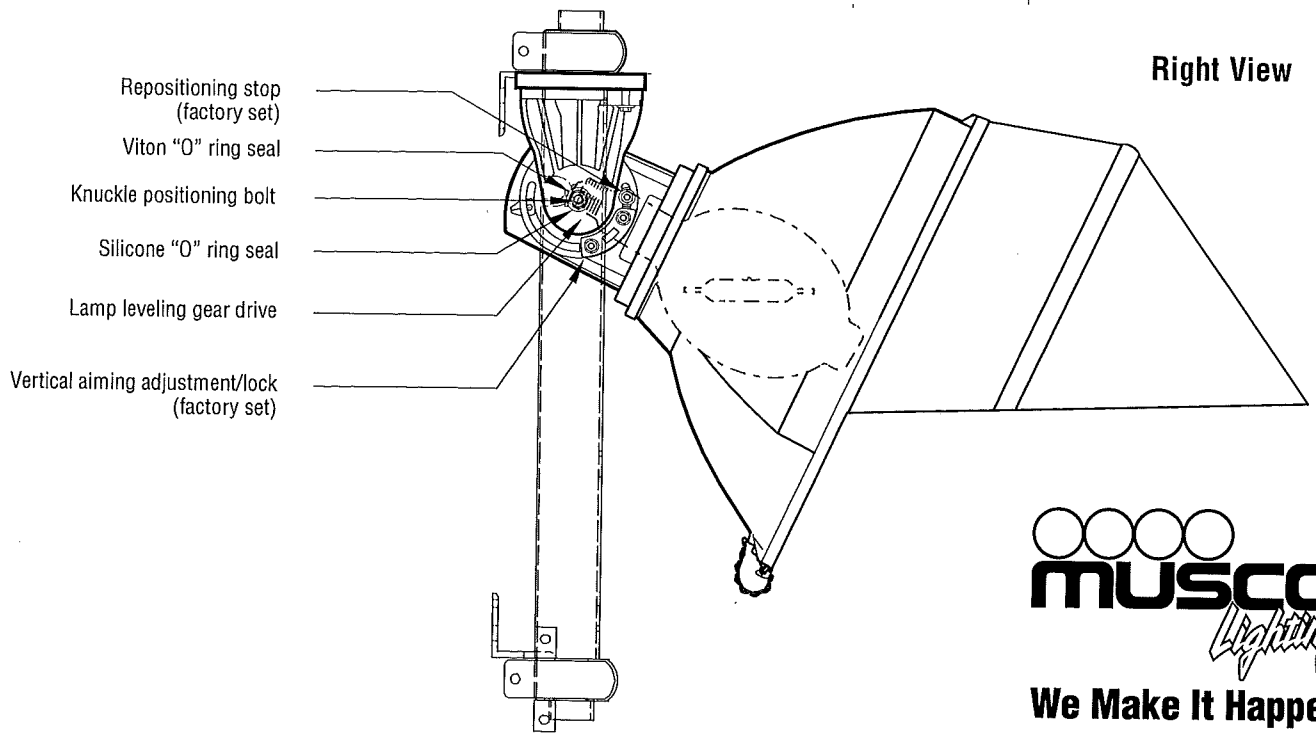
APPENDIX A
DOWNCAST LIGHTING

SportsCluster GREEN™

Luminaire Assembly





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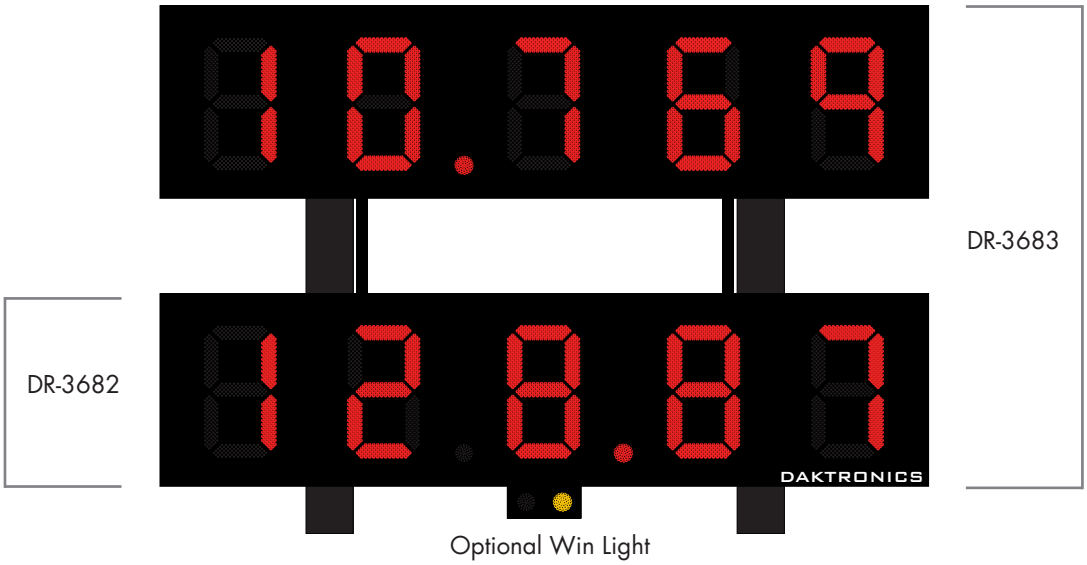
APPENDIX B
EXAMPLE SCOREBOARD CUTSHEETS

DAKTRONICS DR-3683 PRODUCT SPECIFICATIONS



The DR-3682 outdoor LED drag racing display alternates between showing speed in miles per hour (MPH) and elapsed time (ET). The DR-3683 has a DR-3682 as the bottom section, which always shows speed, along with a top section to show elapsed time. Optional win light may be mounted underneath or on top of display to show a true win (amber) or a foul (red). Displays are typically sold in pairs to go on either side of the drag strip. Displays shown with red PanaView® digits. Beam size and placement for illustrative purposes only.

MODEL	DIMENSIONS	UNCRATED WEIGHT	100-240 VAC POWER
DR-3682 (MPH/ET)	4'-0" H x 16'-0" W x 8" D (1.22 m, 4.88 m, 203 mm)	175 lb (79 kg)	600 Watts Max, 6 Amps
DR-3683 (MPH + ET)	8'-0" H x 16'-0" W x 8" D (2.44 m, 4.88 m, 203 mm)	350 lb (159 kg)	
Optional Win Light	8" H x 1'-6.5" W x 5.5" D (203 mm, 470 mm, 140 mm)	10 lb (4.5 kg)	(Power from display)

Note: *Total height shown for DR-3683 does not include a space between the displays, which can be up to 2'-0" (610 mm).*

DIGITS & INDICATORS

- All digits are 36" (914 mm) high. All decimals and optional win light indicators are 4" (102 mm) in diameter.
- Select all red or all amber LED digits. Optional win light includes one red and one amber indicator.
- Display features robust weather-sealed digits (see DD2495646).
- Digits may be dimmed for night viewing.

DISPLAY COLOR

Choose from 150+ colors (from Martin Senour® paint book) at no additional cost.

CONSTRUCTION

Alcoa aluminum alloy 5052 for excellent corrosion resistance

PRODUCT SAFETY APPROVAL

ETL listed to UL 48, tested to CSA standards, and CE labeled

OPERATING TEMPERATURES

- Display: -22° to 122° Fahrenheit (-30° to 50° Celsius)
- Console: 32° to 130° Fahrenheit (0° to 54° Celsius)

WWW.DAKTRONICS.COM E-MAIL: SALES@DAKTRONICS.COM

201 Daktronics Drive, PO Box 5128, Brookings, SD 57006
Phone: 1-800-325-8766 or 605-692-0200 Fax: 605-697-4746

DAKTRONICS

CONTROL CONSOLE	CONTROL OPTIONS
All Sport® 5100	***Wired (standard):*** One-pair shielded cable of 22 AWG minimum is required. A cover plate with mounted connector and standard 2" x 4" x 2" (51 mm x 102 mm x 51 mm) outlet box is provided. Connector mates with signal cable from control console.
	Wireless (optional): 2.4 GHz spread spectrum radio features 64 non-interfering channels and 8 broadcast groups (see SL-04370).

MOUNTING

Hardware to mount display on two beams is included; hardware for more beams is at additional cost. Standard mounting uses I-beam clamps. Optional mounting method using angle brackets is also offered; maximum beam width is 12" (305 mm) and maximum beam depth is 22" (559 mm). Refer to attached drawings for more information on mounting methods.

SERVICE ACCESS

Digit panels and electronics are serviced from the front of the display.

GENERAL INFORMATION

100% solid state electronics are housed in an all aluminum cabinet. Display is shipped in one or two sections. Specifications and pricing are subject to change without notice.

OPTIONS & ACCESSORIES

- Win light
- Optional angle bracket mounting method
- Advertising/identification panels
- Decorative accents
- Electronic message centers and video displays in multiple sizes

ADVERTISING/IDENTIFICATION PANELS

Backlit & Non-Backlit:

1'-6" H x 16'-0" W (457 mm, 4.88 m)
2'-0" H x 16'-0" W (610 mm, 4.88 m)
2'-6" H x 16'-0" W (762 mm, 4.88 m)

For additional non-backlit panel sizes, see SL-03761.

FOR ADDITIONAL INFORMATION

- Installation Specifications: DWG-1157188 (attached)
- Standard I-beam Mounting: DWG-1052565 (attached)
- Optional Pole Mounting: DWG-1048184 (attached)
- Component Locations: DWG-1107413 (attached)

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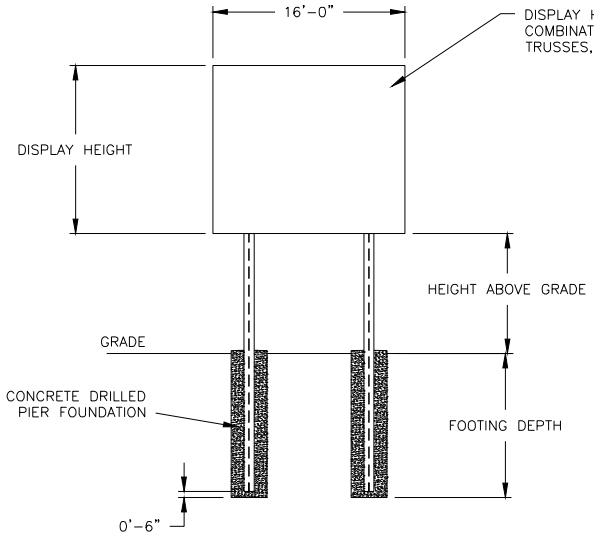
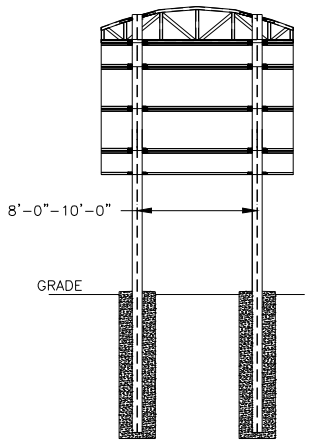
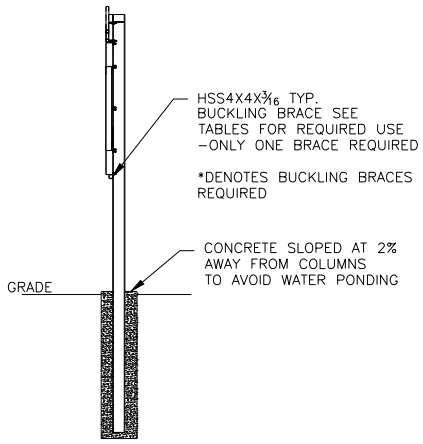


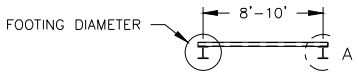
FRONT VIEW



REAR VIEW

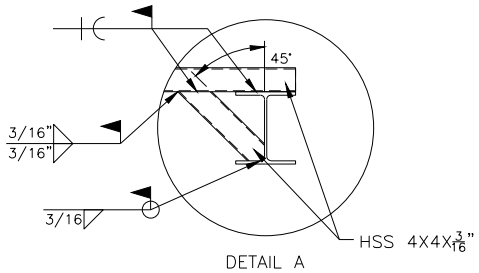


SIDE VIEW



LAYOUT VIEW

COLUMNS & FOOTING ONLY



DETAIL A
SCALE 1:32

TABLE A – MOUNTING

EXPOSURE B

HEIGHT ABOVE GRADE = 10'						HEIGHT ABOVE GRADE = 15'					
DISPLAY HEIGHT (FT)		DESIGN WIND VELOCITY				DISPLAY HEIGHT (FT)		DESIGN WIND VELOCITY			
		115 MPH	130 MPH	150 MPH	170 MPH			115 MPH	130 MPH	150 MPH	170 MPH
6	COLUMN FOOTING	W8X18 2.0'X7.0'	W8X21 2.0'X7.5'	W10X22 3.0'X7.0'	W8X24 2.0'X9.0'	6	COLUMN FOOTING	W8X24 2.0'X8.0'	W12X26 3.0'X7.5'	W8X31 2.0'X9.5'	W10X33 3.0'X9.0'
8	COLUMN FOOTING	W10X22 2.0'X8.0'	W8X24 2.0'X8.5'	W8X28 3.0'X8.5'	W8X31 3.0'X9.0'	8	COLUMN FOOTING	W8X31 3.0'X7.5'	W8X31 2.0'X9.5'	W10X39 3.0'X9.0'	W14X43 3.0'X10.0'
10	COLUMN FOOTING	W12X26 3.0'X7.5'	W12X30 3.0'X8.5'	W10X26* 3.0'X9.0'	W12X26* 3.0'X10.0'	10	COLUMN FOOTING	W12X26* 3.0'X8.5'	W12X30* 3.0'X9.0'	W14X34* 3.0'X10.0'	W12X40* 3.0'X11.0'
12	COLUMN FOOTING	W8X31 2.0'X9.5'	W10X33 3.0'X9.0'	W12X30* 3.0'X10.0'	W14X34* 3.0'X11.0'	12	COLUMN FOOTING	W12X30* 3.0'X9.0'	W14X34* 3.0'X10.0'	W12X40* 3.0'X11.0'	W14X48* 3.0'X12.0'
14	COLUMN FOOTING	W10X26* 3.0'X9.0'	W12X26* 3.0'X10.0'	W14X34* 3.0'X11.0'	W16X36* 3.0'X12.0'	14	COLUMN FOOTING	W14X34* 3.0'X10.0'	W12X40* 3.0'X11.0'	W16X45* 3.0'X12.0'	W18X55* 3.0'X14.0'
16	COLUMN FOOTING	W12X26* 3.0'X9.5'	W14X30* 3.0'X10.5'	W14X38* 3.0'X11.5'	W14X43* 3.0'X13.0'	16	COLUMN FOOTING	W16X36* 3.0'X10.5'	W14X43* 3.0'X11.5'	W21X48* 3.0'X13.0'	W21X55* 3.0'X15.0'

FOOTING DIMENSIONS = DIAMETER X DEPTH
* DENOTES BUCKLING BRACE REQUIRED

EXPOSURE C

HEIGHT ABOVE GRADE = 10'				HEIGHT ABOVE GRADE = 15'			
DISPLAY HEIGHT (FT)		DESIGN WIND VELOCITY		DISPLAY HEIGHT (FT)		DESIGN WIND VELOCITY	
		115 MPH	140 MPH			115 MPH	140 MPH
6	COLUMN FOOTING	W8X21 2.0'X8.0'	W8X24 2.0'X9.0'	6	COLUMN FOOTING	W8X28 2.0'X9.0'	W10X33 3.0'X9.0'
8	COLUMN FOOTING	W8X24 2.0'X9.0'	W8X31 3.0'X9.0'	8	COLUMN FOOTING	W10X33 3.0'X8.5'	W14X43 3.0'X10.0'
10	COLUMN FOOTING	W8X31 2.0'X10.0'	W10X39 3.0'X10.0'	10	COLUMN FOOTING	W12X40 3.0'X9.5'	W10X49 3.0'X11.0'
12	COLUMN FOOTING	W12X26* 3.0'X9.5'	W14X34* 3.0'X11.0'	12	COLUMN FOOTING	W16X36* 3.0'X10.5'	W16X45* 3.0'X12.0'
14	COLUMN FOOTING	W12X30* 3.0'X10.0'	W16X36* 3.0'X12.0'	14	COLUMN FOOTING	W16X40* 3.0'X11.0'	W21X48* 3.0'X13.0'
16	COLUMN FOOTING	W14X34* 3.0'X11.0'	W16X40* 3.0'X13.0'	16	COLUMN FOOTING	W16X45* 3.0'X12.0'	W21X55* 3.0'X14.5'

FOOTING DIMENSIONS = DIAMETER X DEPTH
* DENOTES BUCKLING BRACE REQUIRED

NOTE:
-REFER TO NOTE 7 FOR EXPOSURE CATEGORY DEFINITIONS.

NOTES:

1. FOOTING AND COLUMN SIZES ARE SUGGESTIONS ONLY, PROVIDED TO ASSIST WITH ESTIMATING INSTALLATION COSTS AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES. THE DESIGN MUST BE CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF THE INSTALLATION BEFORE THEY CAN BE USED FOR FABRICATION Or ERECTION.

2. INTERNATIONAL BUILDING CODE 2012 USED IN DESIGN OF COLUMNS AND FOOTINGS WITH, IMPORTANCE FACTOR=1, Kzt=1.0, Kd=0.85, G=0.85. SEISMIC DESIGN WAS NOT CONSIDERED.

3. FOOTING DIMENSIONS ARE BASED ON ASSUMED SOIL CLASS 4 (ALLOWABLE LATERAL BEARING PRESSURE OF 150 psf).

4. STRUCTURAL STEEL IS GRADE A992 (50 ksi) STEEL. CONCRETE SHALL HAVE A MINNIMUM 28 DAY COMPRESSIVE STRENGTH OF 2500 psi.

5. THE AVERAGE DISPLAY WEIGHT FOR A LAYOUT CAN NOT EXCEED 8 PSF.

6. DAKTRONICS INC. IS NOT RESPONSIBLE FOR STRUCTURES DESIGNED AND INSTALLED BY OTHERS.

7. LOCAL BUILDING OFFICIALS SHOULD BE CONTACTED TO DETERMINE THE WIND SPEED AND EXPOSURE CATEGORY FOR THE PROPOSED SIGN LOCATION. THE EXPOSURE CATEGORY C IS DEFINED AS:

EXPOSURE B – URBAN AND SUBURBAN AREAS, OR OTHER TERRAIN WITH NUMEROUS SPACED OBSTRUCTIONS HAVING THE SIZE OF SINGLE-FAMILY DWELLINGS OR LARGER. THESE CONDITIONS MUST PREVAIL FOR A DISTANCE FROM THE SIGN OF AT LEAST 2,600 ft OR 20 TIMES THE SIGN HEIGHT, WHICHEVER IS GREATER

EXPOSURE C – OPEN TERRAIN WITH SCATTERED OBSTRUCTIONS HAVING HEIGHTS GENERALLY LESS THAN 30 FT. THIS CATEGORY INCLUDES FLAT OPEN COUNTRY, GRASSLANDS, AND ALL WATER SURFACES IN HURRICANE PRONE REGIONS.

8. FOR SPECIFIC PRODUCT DETAILS ON WEIGHT, MOUNTING, ETC. REFER TO THE INDIVIDUAL PRODUCT SPECIFICATION SHEETS.

REV	DATE:		BY:	
01	23 JUL 14	UPDATED CLAMPS IN REAR AND SIDE VIEWS AND ADDED 170 MPH WIND SPEC COLUMN	TJT	
REV	DATE:		BY:	

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BROOKINGS, SD 57006
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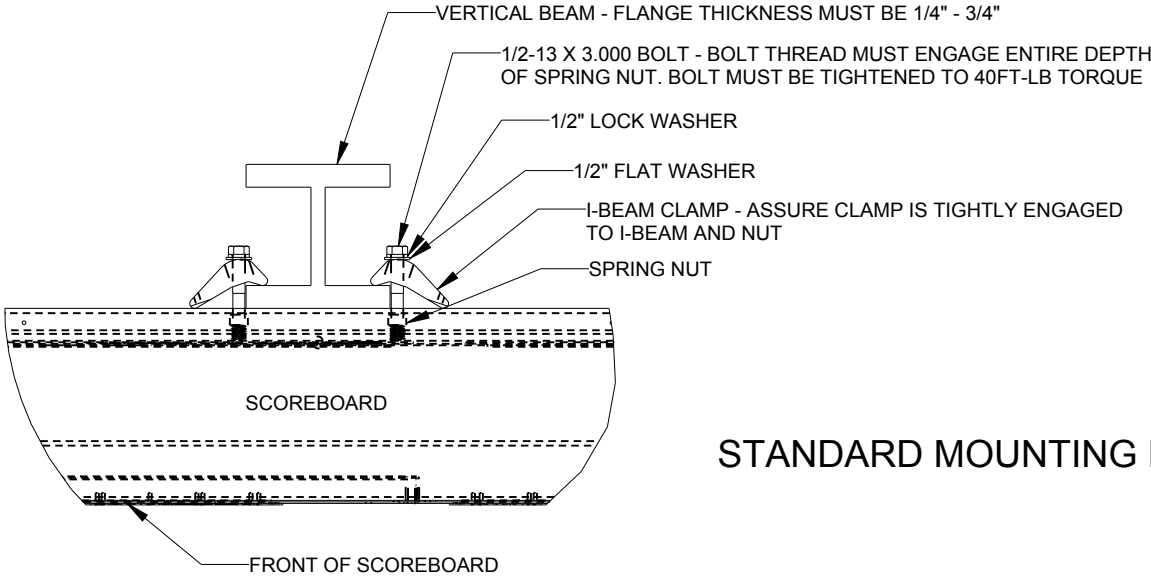
PROJ: OUTDOOR SCOREBOARD INSTALLATION
TITLE: 16' WIDTH SCOREBOARD INSTALLATION SPECS
DESIGN: RSCHWAR | DRAWN: RSCHWAR | DATE: 27 NOV 13
SCALE: 1/16"=1'

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1647	E-10-A	1157188

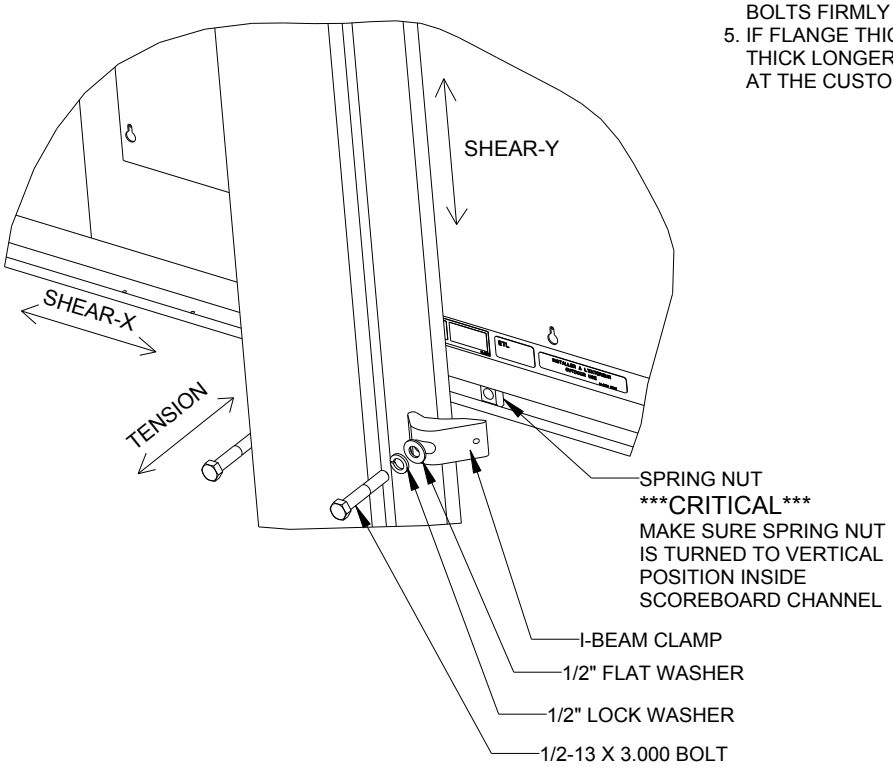


STANDARD MOUNTING METHOD

TOP VIEW

MOUNTING INSTRUCTIONS:

1. PLACE SPRING NUTS INTO SCOREBOARD CHANNEL IN APPROXIMATE LOCATION OF VERTICAL BEAMS
2. LIFT SCOREBOARD INTO POSITION
3. MAKE SURE THE 1/2-13 BOLTS ARE AS CLOSE TO THE I-BEAM FLANGES AS POSSIBLE
4. WHEN SCOREBOARD IS ADJUSTED TO FINAL DESIRED POSITION, TIGHTEN BOLTS FIRMLY
5. IF FLANGE THICKNESS IS MORE THAN 3/4" THICK LONGER BOLTS WILL BE REQUIRED AT THE CUSTOMER'S EXPENSE.



ALLOWABLE CAPACITY PER EACH CLAMP:
SHEAR = 160 LBS
TENSION = 2300 LBS

SHEAR AND TENSION LOAD DIRECTION ARE AS INDICATED ON REAR ISOMETRIC VIEW

EXPLODED REAR ISOMETRIC VIEW

REV 04	DATE: 6 JAN 14	ADDED ALLOWABLE TENSION AND SHEAR CAPACITY DETAILS	BY: JAVA	
REV 03	DATE: 23 OCT 13	CHANGED BOLT TORQUE FROM 30 FT-LB TO 40 FT-LB PER EC-12382	BY: NJM	
REV 02	DATE: 07 MAR 12	ADDED STADNARD MOUNTING METHOD NOTES	BY: KDD	
REV 01	DATE: 21 FEB 12	CHANGED ROCKER TO I-BEAM	BY: KDD	

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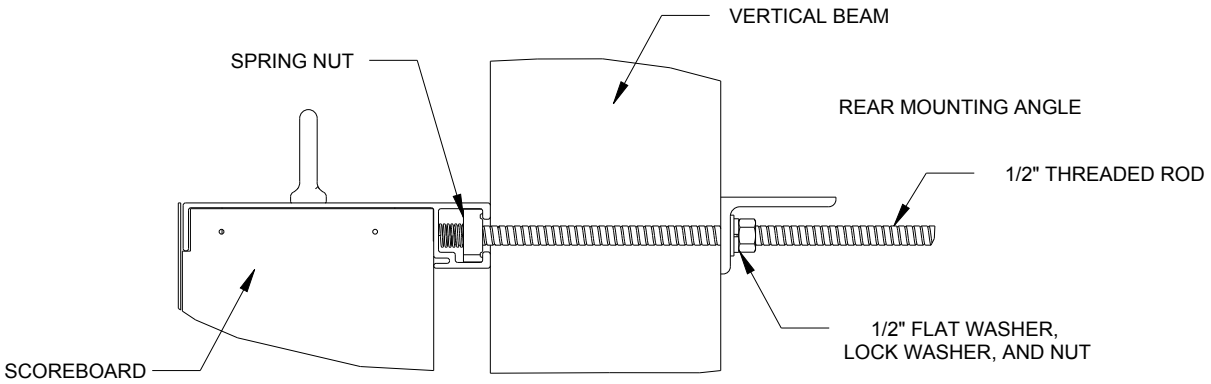
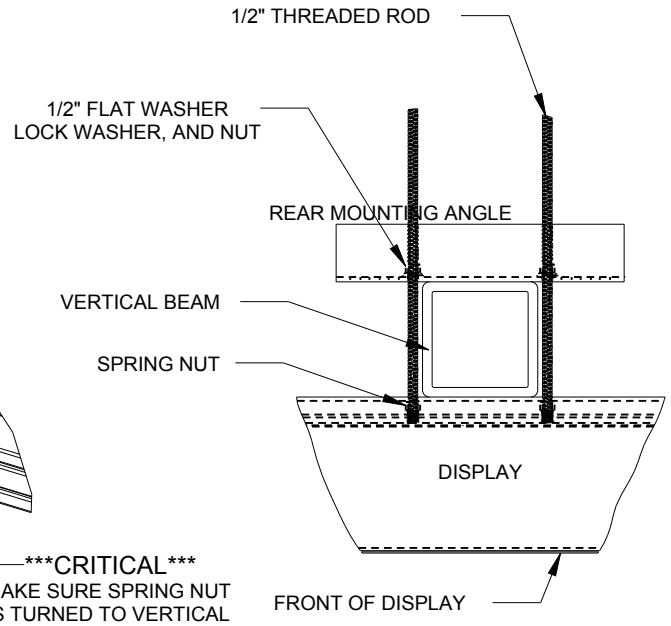
PROJ: OUTDOOR SCOREBOARD
TITLE: P1647; I-BEAM CLAMP MOUNTING
DESIGN: MCARSRU | DRAWN: MCARSRU | DATE: 06-JAN-14
SCALE: 1/8

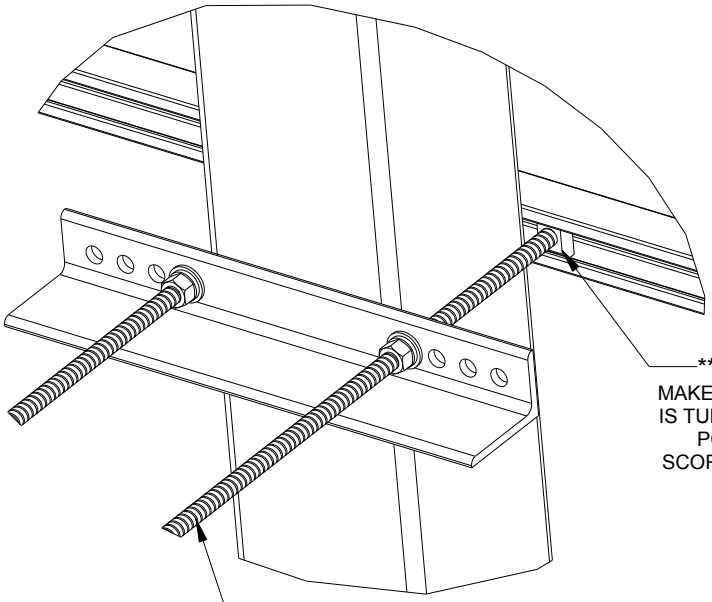
SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	
1 OF 1	04	P 1647	E - 07 - A	1052565



SIDE VIEW



TOP VIEW
SCALE 1/10



REAR ISOMETRIC VIEW

STRUCTURAL NOTES:

- BOLT TORQUE: 30 FT-LB

NOTES:

- THREADED RODS RUN ALONG BOTH SIDES OF BEAM
- RODS DO NOT PASS THROUGH THE FLANGES OF THE BEAM
- NO DRILLING NECESSARY
- MAKE SURE SPRING NUT IS PERPENDICULAR TO CHANNEL OPENING ON SCOREBOARD

REV	DATE:		BY:
03	3 JULY 13	ADDED STRUCTURAL NOTE	TTF
02	20 SEP 12	REMOVED CHAMFER FROM 0M-133259 PER EC-7114	LMG
01	06 OCT 11	REPLACED VERTICAL I-BEAM WITH 6" X 6" SQUARE TUBE	JAVA

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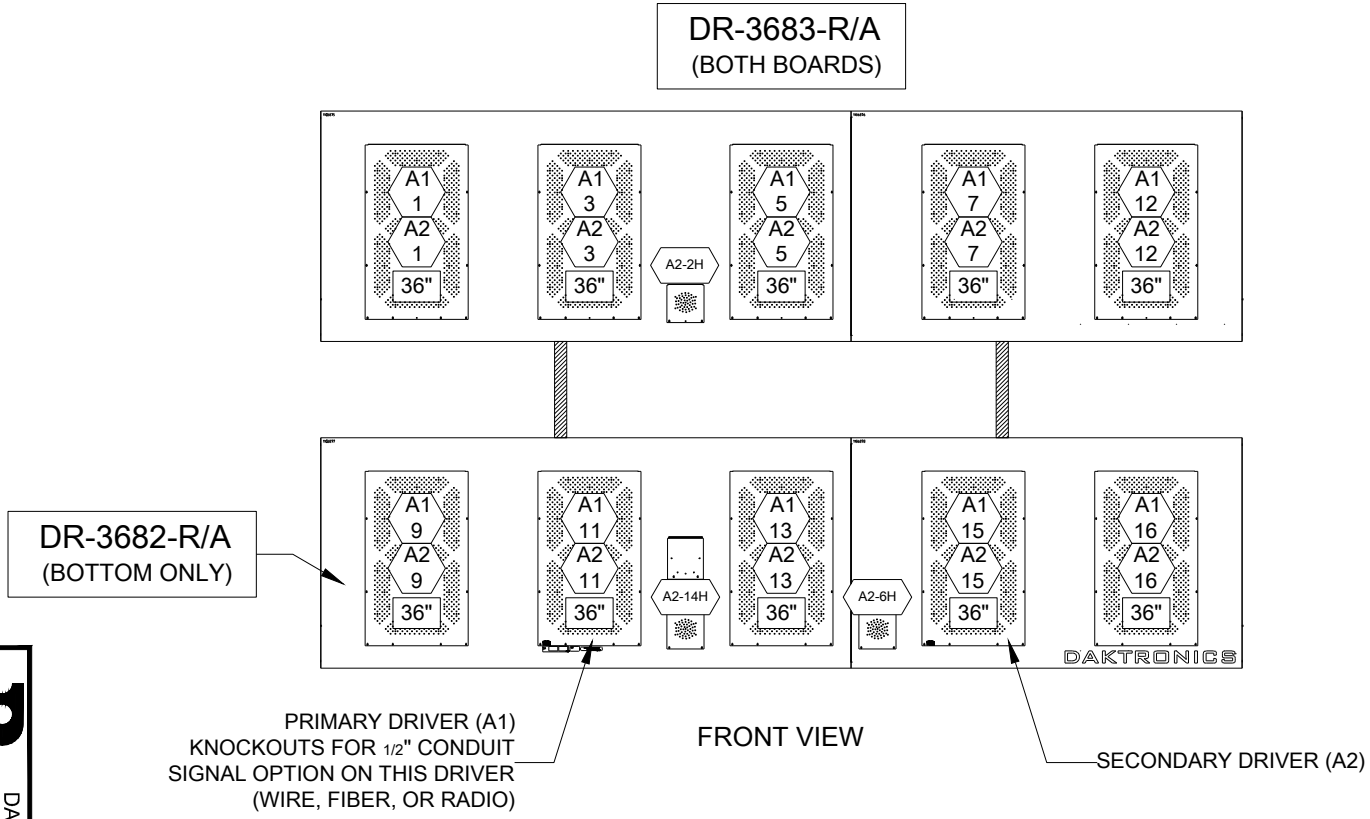
PROJ: OUTDOOR SCOREBOARDS
TITLE: P1647; POLE MOUNTING OPTIONS
DESIGN: DOPPELT | DRAWN: DOPPELT | DATE: 22 MAR 11
SCALE: 1/5

SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	
1 OF 1	03	P1647	E - 10 - A	1048184



NOTES:

A1 1 = LED DRIVER NUMBER & LED DRIVER CONNECTOR WIRED TO THAT DIGIT.

36" = DIGIT SIZE

-BOTH DISPLAY SECTIONS ABOVE SPECIFY LOCATIONS FOR DR-3683

-FOLLOW ONLY THE BOTTOM DISPLAY SECTION FOR DR-3682

REV	DATE:		BY:
02	02 MAR 15	PER EC-17119, REMOVED DETAILS ADDED SIGNAL OPTION NOTE CHANGED MASTER TO PRIMARY	KDB
01	11 SEP 12	ADDED RADIO BRACKET PER EC-7502 UPDATED DIGIT LAYOUT OF TOP SECTION PER EC-7551	KDD

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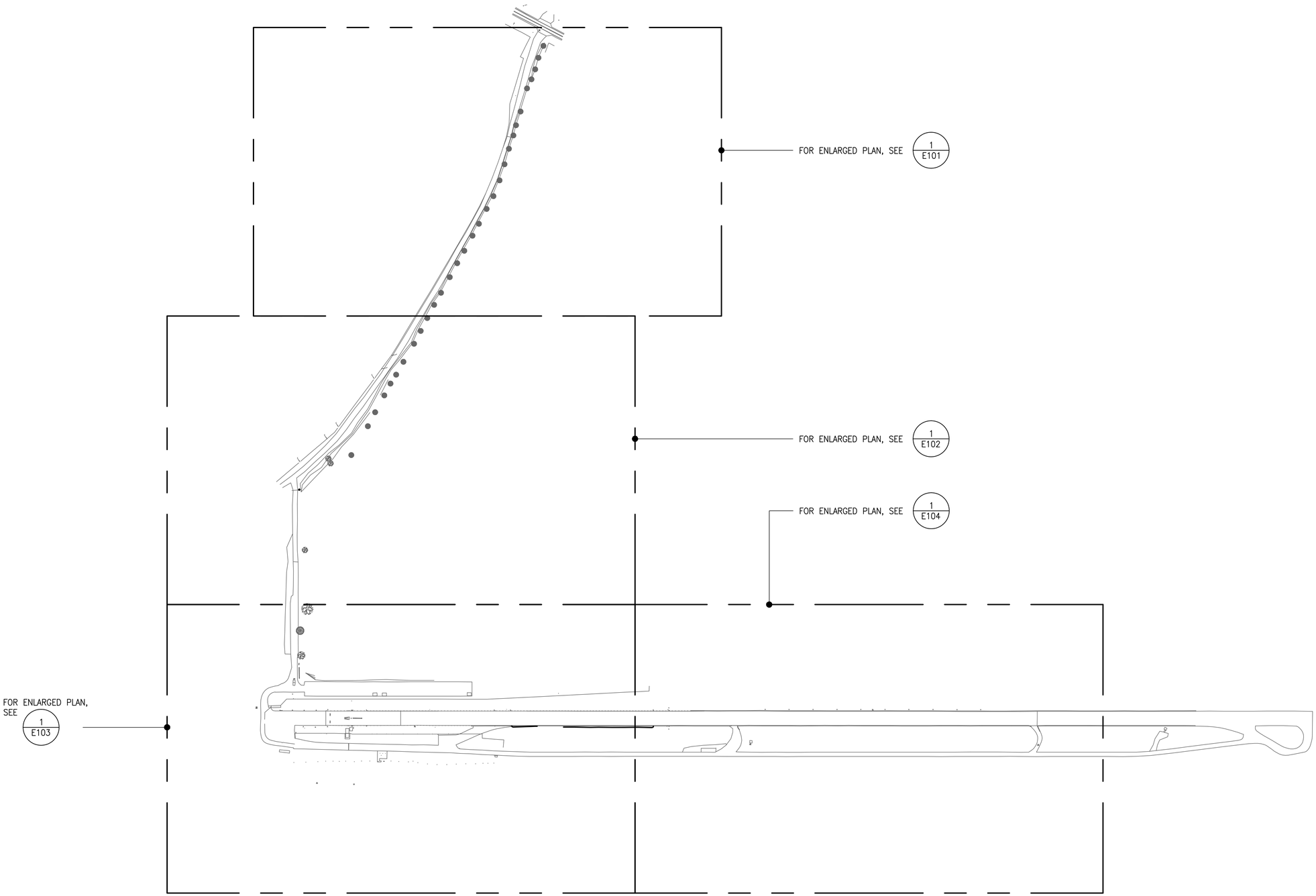
PROJ: OUTDOOR AUTO RACING DISPLAYS
TITLE: COMPONENT LOCATION; DR-3682/3683-R/A
DESIGN: DOPPLET | DRAWN: AHOLTZ | DATE: 24 JULY 12
SCALE: 1=40

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE
1 OF 1	02	P1198	E - 07 - A

1107413

APPENDIX C
ELECTRICAL SITE PLAN



1 E100 **ELECTRICAL SITE PLAN**
SCALE: 1"=60'-0"

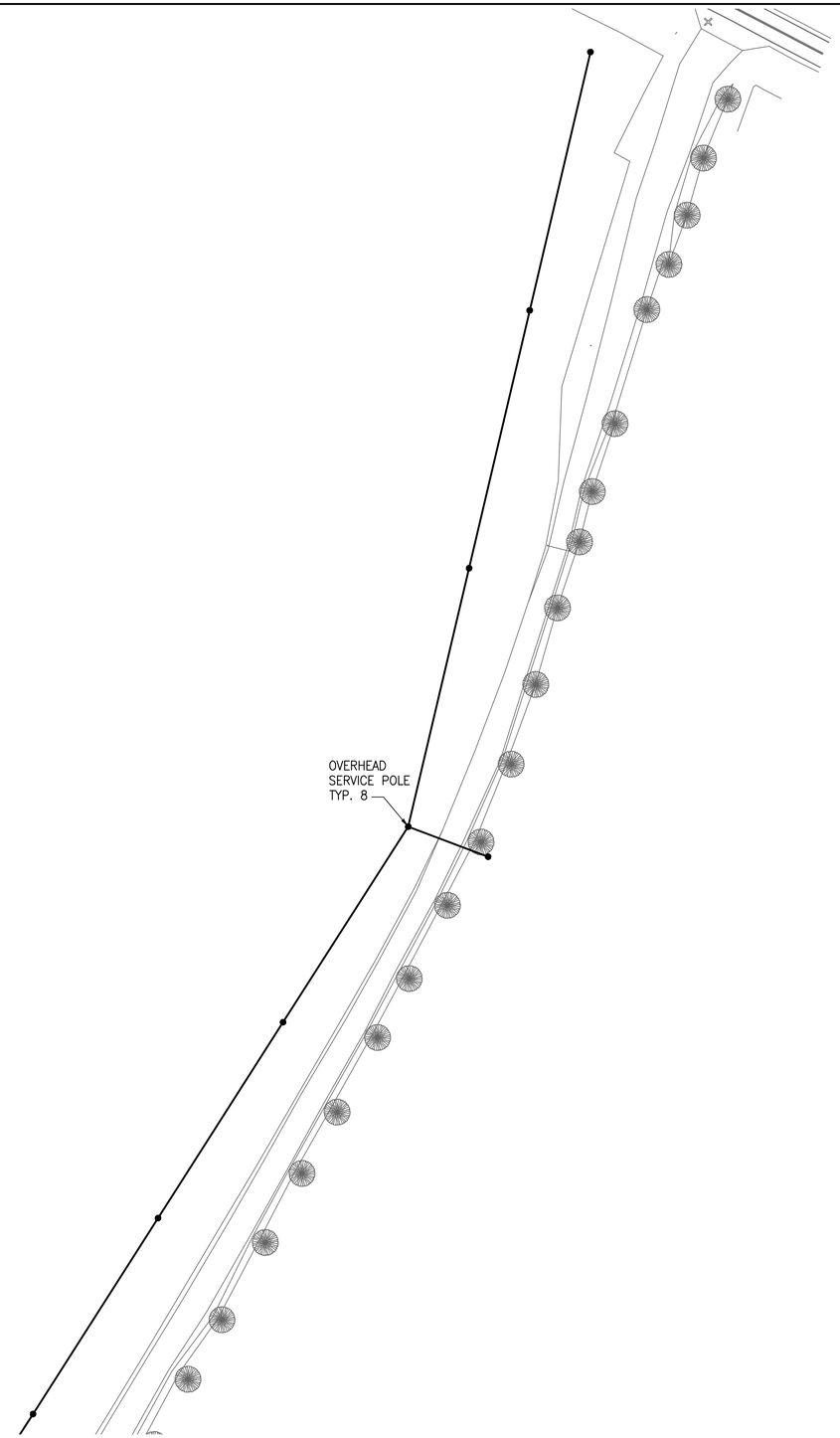
REVISIONS	BY

This work was prepared by me or under my supervision and construction of this project will be under my observation.

InSynergy Engineering LLC
MECHANICAL • ELECTRICAL • FIRE PROTECTION
828 Fort Street Mall Suite 500, Honolulu, Hawaii 96813
Phone: (808) 521-3773 Fax: (808) 521-3993

ELECTRICAL SITE PLAN

Designed	
Drawn	
Checked	
Date	
Job No.	
Sheet	E100
Of	Sheets



1 / E101 **ENLARGED ELECTRICAL PLAN - 1**
SCALE: 1"=60'-0"

N

0 30' 60' 90' 120' 150' 180'
SCALE: 1" = 60'

REVISIONS	BY

This work was prepared by me or under my supervision and construction of this project will be under my observation.

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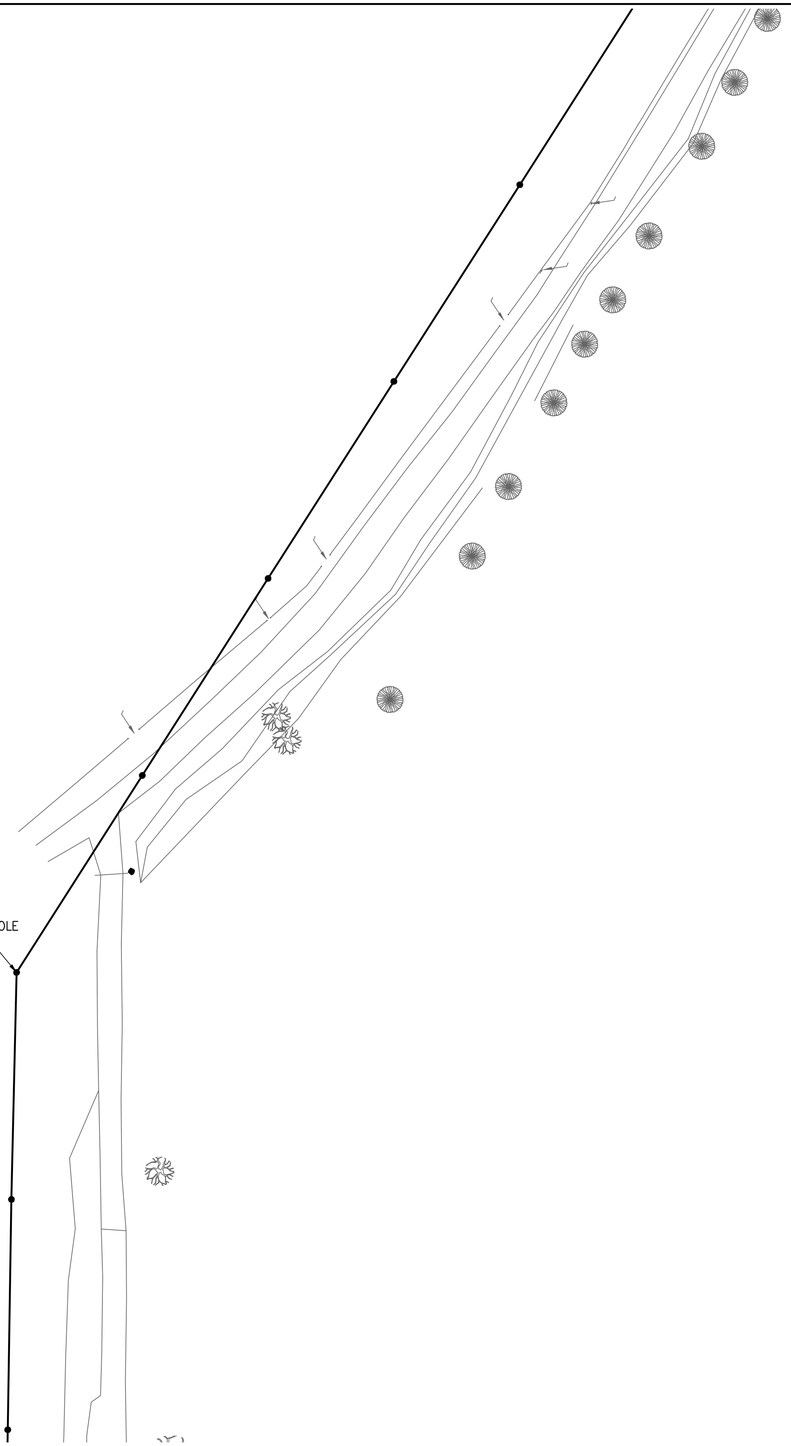
828 Fort Street Mall Suite 500, Honolulu, Hawaii 96813
Phone: (808) 521-3773 Fax: (808) 521-3993

ELECTRICAL SITE PLAN

Designed
Drawn
Checked
Date
Job No.
Sheet
E101
Of Sheets



1 / E102 **ENLARGED ELECTRICAL PLAN - 2**
SCALE: 1"=60'-0"

0 30' 60' 90' 120' 150' 180'
SCALE: 1" = 60'

REVISIONS	BY

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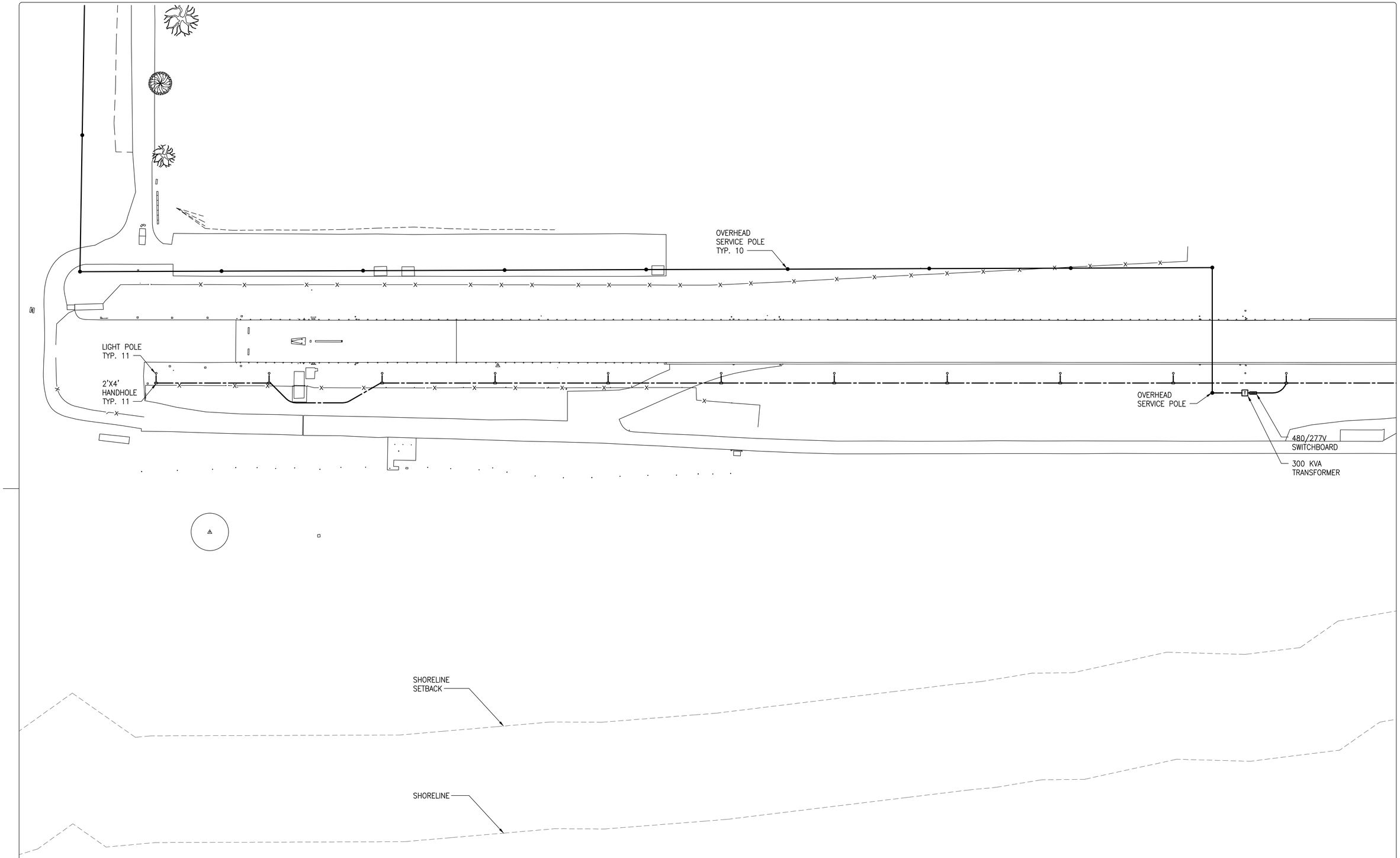
InSynergy Engineering LLC
MECHANICAL • ELECTRICAL • FIRE PROTECTION
828 Fort Street Mall Suite 500, Honolulu, Hawaii 96813
Phone: (808) 521-3773 Fax: (808) 521-3993

ELECTRICAL SITE PLAN

Designed
Drawn
Checked
Date
Job No.
Sheet
E102
Of Sheets



1 / E103 **ENLARGED ELECTRICAL PLAN - 3**
SCALE: 1"=60'-0"

0 30' 60' 90' 120' 150' 180'
SCALE: 1" = 60'

REVISIONS	BY

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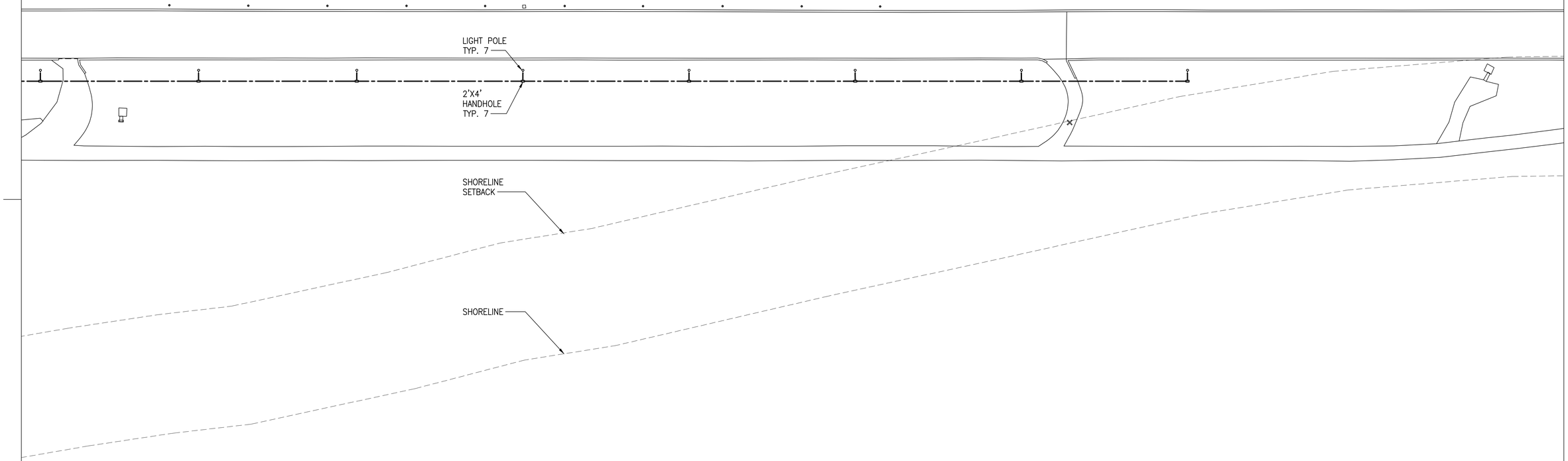
InSynergy Engineering LLC
MECHANICAL • ELECTRICAL • FIRE PROTECTION
828 Fort Street Mall Suite 500, Honolulu, Hawaii 96813
Phone: (808) 521-3773 Fax: (808) 521-3993

ELECTRICAL SITE PLAN

Designed
Drawn
Checked
Date
Job No.
Sheet
E103
Of Sheets



1
E104
ENLARGED ELECTRICAL PLAN - 4
SCALE: 1"=60'-0"

0 30' 60' 90' 120' 150' 180'
SCALE: 1" = 60'

REVISIONS	BY

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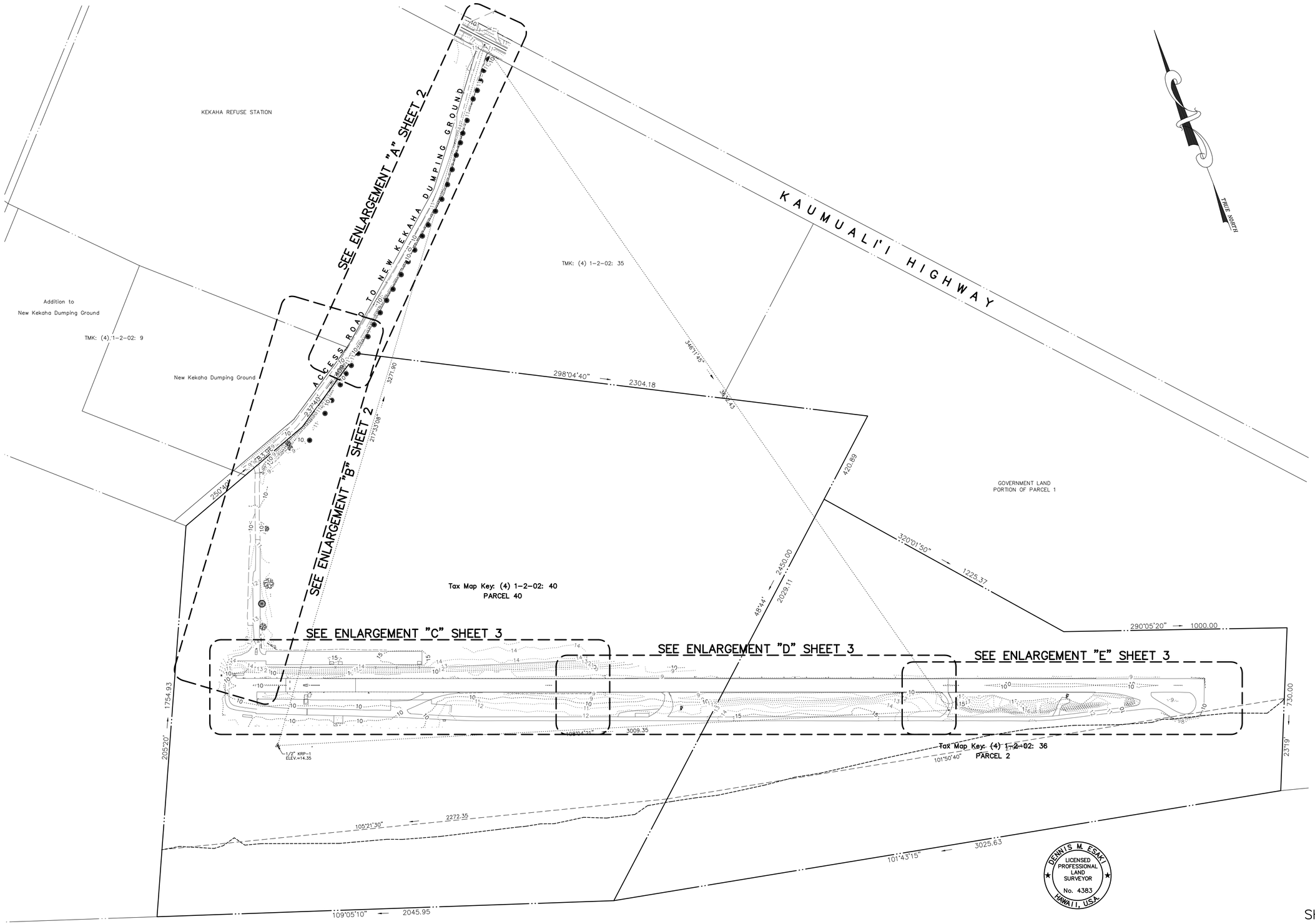
InSynergy Engineering LLC
MECHANICAL • ELECTRICAL • FIRE PROTECTION
828 Fort Street Mall Suite 500, Honolulu, Hawaii 96813
Phone: (808) 521-3773 Fax: (808) 521-3993

ELECTRICAL SITE PLAN

Designed
Drawn
Checked
Date
Job No.
Sheet
E104
Of Sheets

APPENDIX D
TOPOGRAPHIC SURVEY



GRAPHIC SCALE

200 0 100 200 400 800

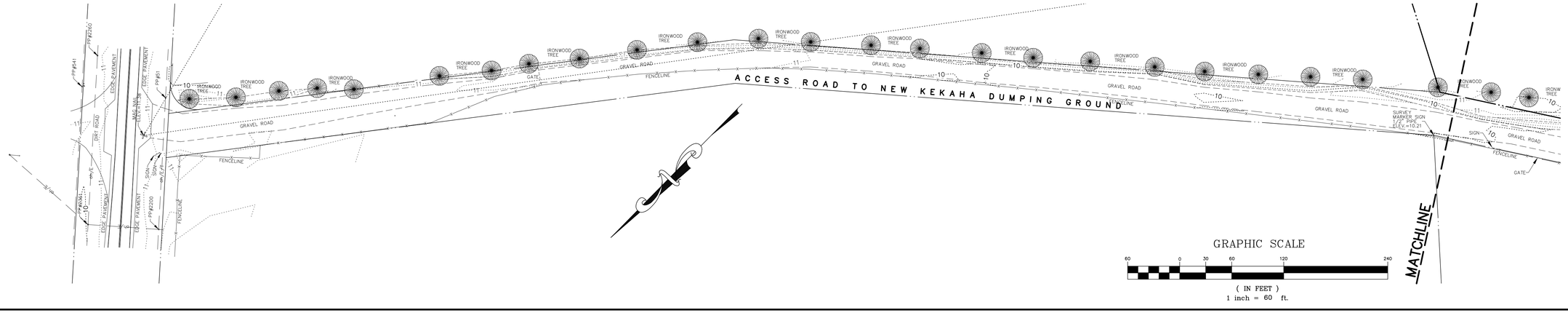
(IN FEET)
1 inch = 200 ft.

NOTE:
Shoreline subject to approval by Department of Land and Natural Resources – Land Division.

THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION

Signature
ESAKI SURVEYING & MAPPING, INC.
EXPIRES: APRIL 30, 2016

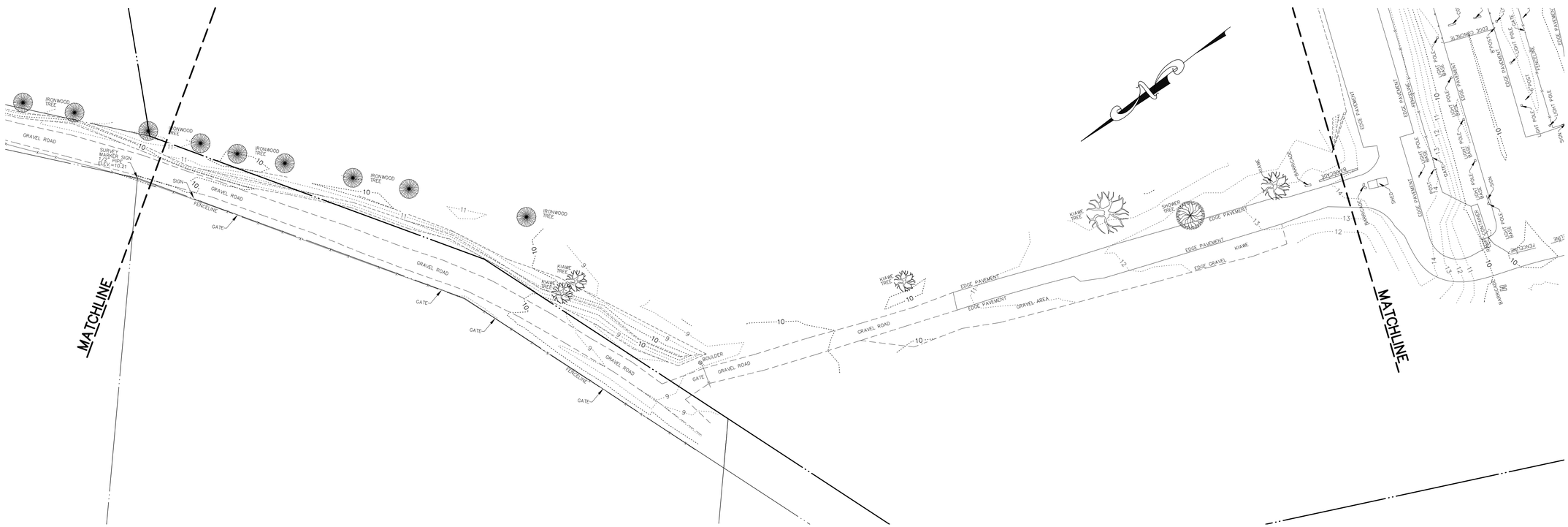
TOPOGRAPHIC MAP
SHOWING MĀNĀ DRAG STRIP
AT KEKAHA, WAIMEA, KAUA'I, HAWAI'I
Tax Map Key: (4) 1-2-02: 36 & 40
Prepared for: Limtiaco Consulting Group
Date: May 7, 2015
SHEET 1 OF 3



GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.



GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

DENNIS M. ESAKI
LICENSED PROFESSIONAL LAND SURVEYOR
No. 4383
HAWAII, U.S.A.

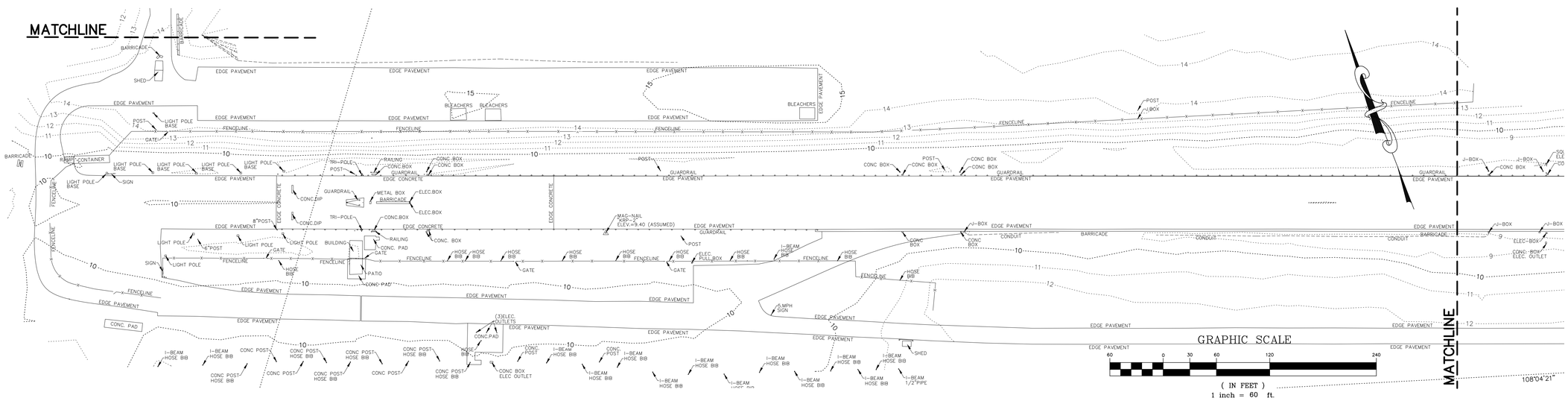
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION

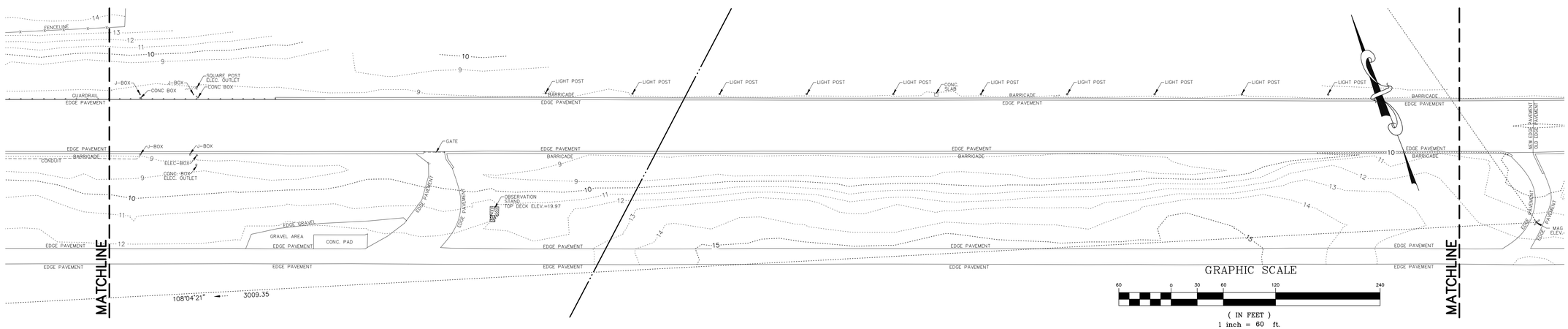
Signature
ESAKI SURVEYING & MAPPING, INC.
EXPIRES: APRIL 30, 2016

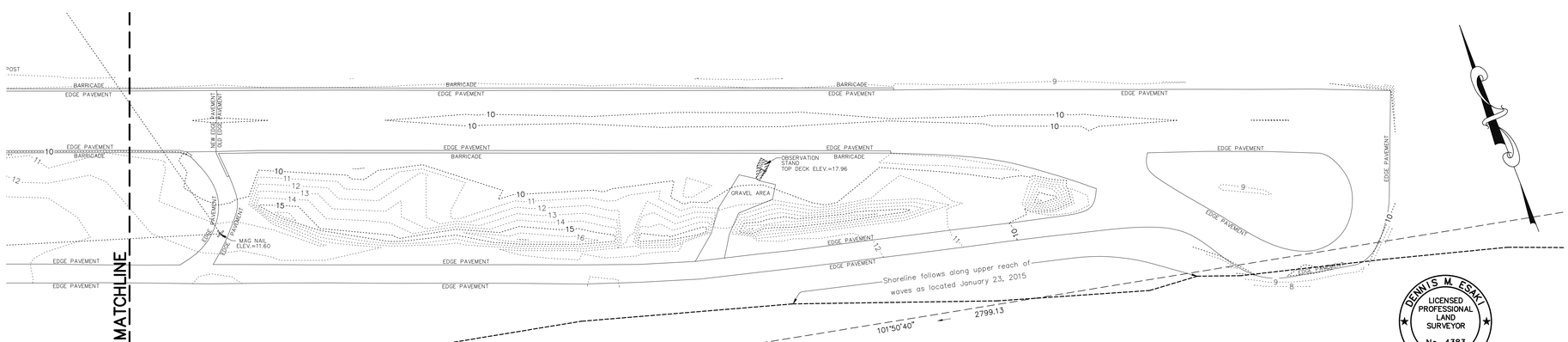
TOPOGRAPHIC MAP
SHOWING MĀNĀ DRAG STRIP

AT KEKAHA, WAIMEA, KAUA'I, HAWAI'I
Tax Map Key: (4) 1–2–02: 36 & 40
Prepared for: Limtiaco Consulting Group
Date: May 7, 2015
SHEET 2 OF 3

NOTE:
Shoreline subject to approval by Department of Land and Natural Resources – Land Division.







GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

NOTE:
Shoreline subject to approval by Department of Land and Natural Resources – Land Division.

DENNIS M. ESAKI
LICENSED PROFESSIONAL LAND SURVEYOR
No. 4383
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Signature
ESAKI SURVEYING & MAPPING, INC.
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APPENDIX E
MANA DRAG RACING STRIP COASTAL ASSESSMENT

Mana Drag Racing Strip
Coastal Assessment

Kekaha, Kauai, Hawaii

April 2015

Prepared for:
The Limtiaco Consulting Group, Inc.
1622 Kanakanui Street
Honolulu, HI 96817

Prepared by:
Sea Engineering, Inc.
Makai Research Pier
41-305 Kalanianaole Hwy
Waimanalo, HI 96795

Job No. 25464

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1. INTRODUCTION

The Mana Drag Racing Strip ("racetrack") is located on the southwest side of the island of Kauai, between Kekaha and Kokole Point. The race track is located along Kekaha Beach, a 2-mile reach connecting Barking Sands beach at Kokole Point on the west to Kekaha to the east. The racetrack shoreline covers approximately 5,000 feet along Kekaha Beach. See Figure 1-1 and Figure 1-2 for location maps and regional views.

State-funded improvements to the racetrack, including more than 2,500 feet of repaving, were completed in 2014. Additional improvements are slated for the racetrack in the present project. These improvements, which include installation of new guardrails and permanent lighting, require an Environmental Assessment (EA). In support of the EA, Sea Engineering has performed a coastal assessment of the project shoreline. This coastal assessment addresses Office of Environmental Quality Control (OEQC) guidelines for assessing shoreline alteration projects. Work tasks included:

- Site visit to investigate shoreline processes and existing conditions.
- Measurement of typical profiles across the shoreline and beach to illustrate typical conditions.
- Description of the oceanographic and coastal setting, using available information.
- Evaluation of possible coastal hazards.
- Description of the shoreline condition and the ongoing shoreline processes, including waves, currents, and sediment movement.
- Historical shoreline analysis of coastal erosion/accretion patterns and shoreline changes at the project site using aerial photographs.
- Discussion of possible coastal impacts of proposed improvements.
- Preparation of a report summarizing the results of the study.

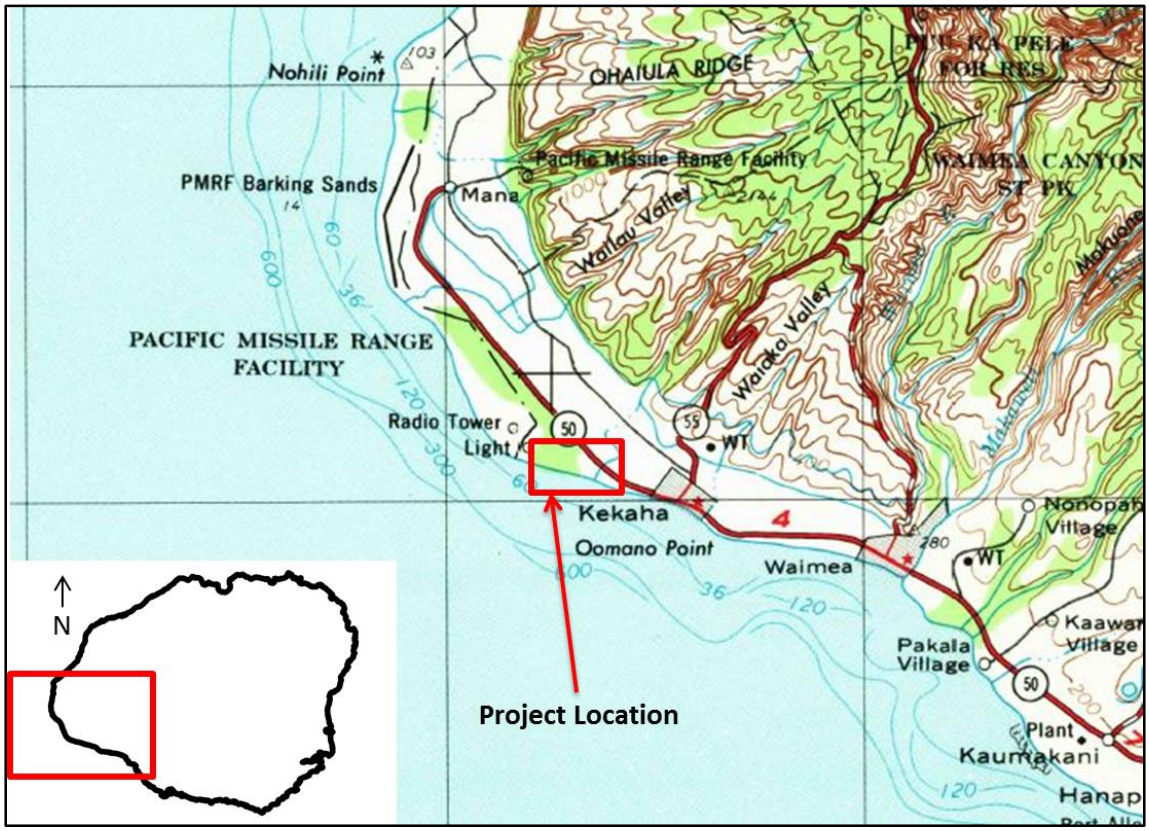


Figure 1-1 Project location on the island of Kauai

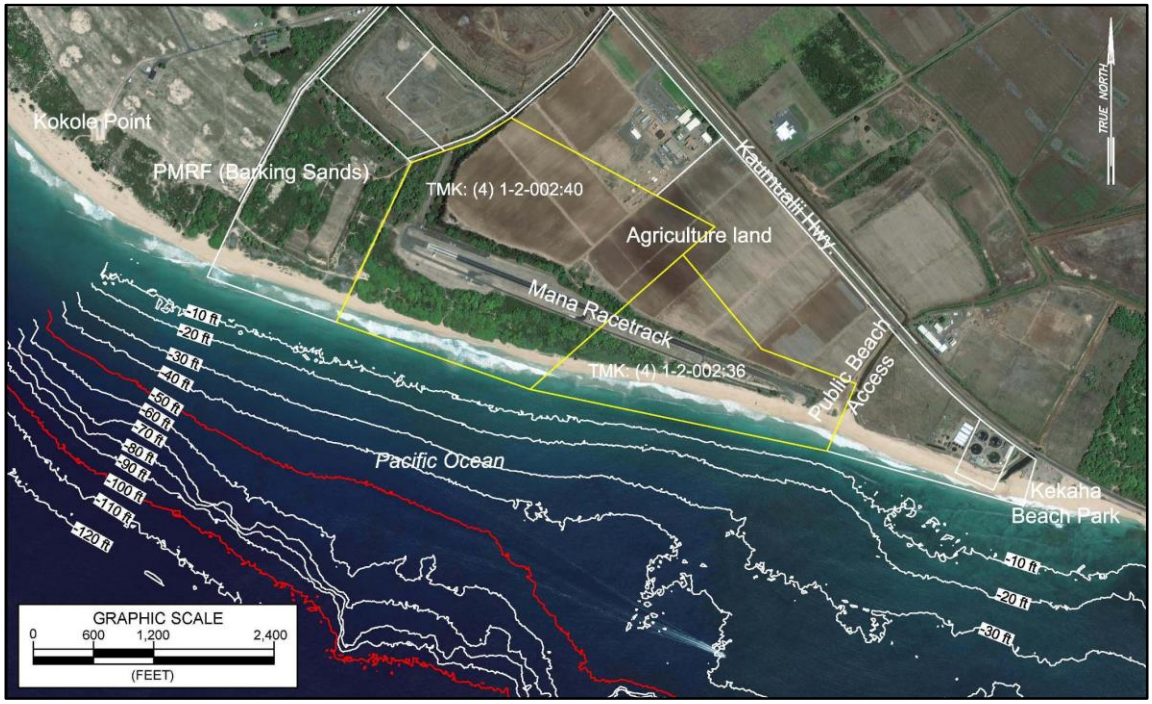


Figure 1-2 Regional view of Mana Racetrack area

2. PROJECT SITE DESCRIPTION

2.1 Regional Description

The Mana racetrack is located on two parcels covering approximately 200 acres along the shoreline of the Mana Coastal Plain. The site is bordered by the Pacific Missile Range Facility (PMRF) to the west and a drainage canal to the east. The racetrack facilities and stationing for location of project features are shown on Figure 2-1. Facilities include more than 4,000 feet of paved track, a pit area, two turnouts, the end-of-track turnaround, and a return road. A spectator area is located inshore of the track. The cars race from west to east. Races are typically held one Saturday per month from March through November. Additional races are held around the July 4th and Labor Day weekends.

Esaki Surveying & Mapping, Inc., performed a shoreline survey January 23, 2015, and a topographic survey of the facility on January 27, 2015. The topographic survey shows that the racetrack is located at an approximate elevation of +10 ft msl and the track is situated between mounds on either side. The mounds have elevation in excess of +15 ft msl. The shoreline consists of a continuous sandy beach, and the shoreline is slightly convex with a bend near Sta. 2300. The backshore between the beach and racetrack is heavily vegetated along most of the site. The vegetated backshore is more than 400 feet wide toward the west end, diminishing to no vegetation at the east end. The backshore was noted to be abundant with the invasive kiawe tree, a particularly thorny tree that made accessing the backshore practically impossible in places. A few paths allowed access through the backshore between the racetrack and the beach. The backshore consisted of a dune system that was evident by the higher elevation of this area, with the dunes running alongshore. Much of the dune system, however, was obscured by the thick vegetation until the eastern end, where the backshore was narrower and the vegetation less dense.

The Pacific Island Ocean Observing System's (PacIOOS) mapping program, Voyager, presents the National Oceanographic and Atmospheric Administration's (NOAA) benthic maps. These maps show both geomorphology extents and biology for the Kekaha area. The offshore area fronting the project site is characterized by sand and "pavement," which refers to low-relief, solid carbonate rock. The nearshore bottom fronting the subject property is characterized on these maps as 'pavement' with patches of 10-50% Turf Algae and 50-90% Turf Algae. The maps indicate that no 'Live Coral Reef' is present in the sand and 'pavement' directly offshore of the project area.

Proposed improvements include installation of permanent lighting along the south side of the track. The location of the proposed improvement are shown in red in Figure 2-1.

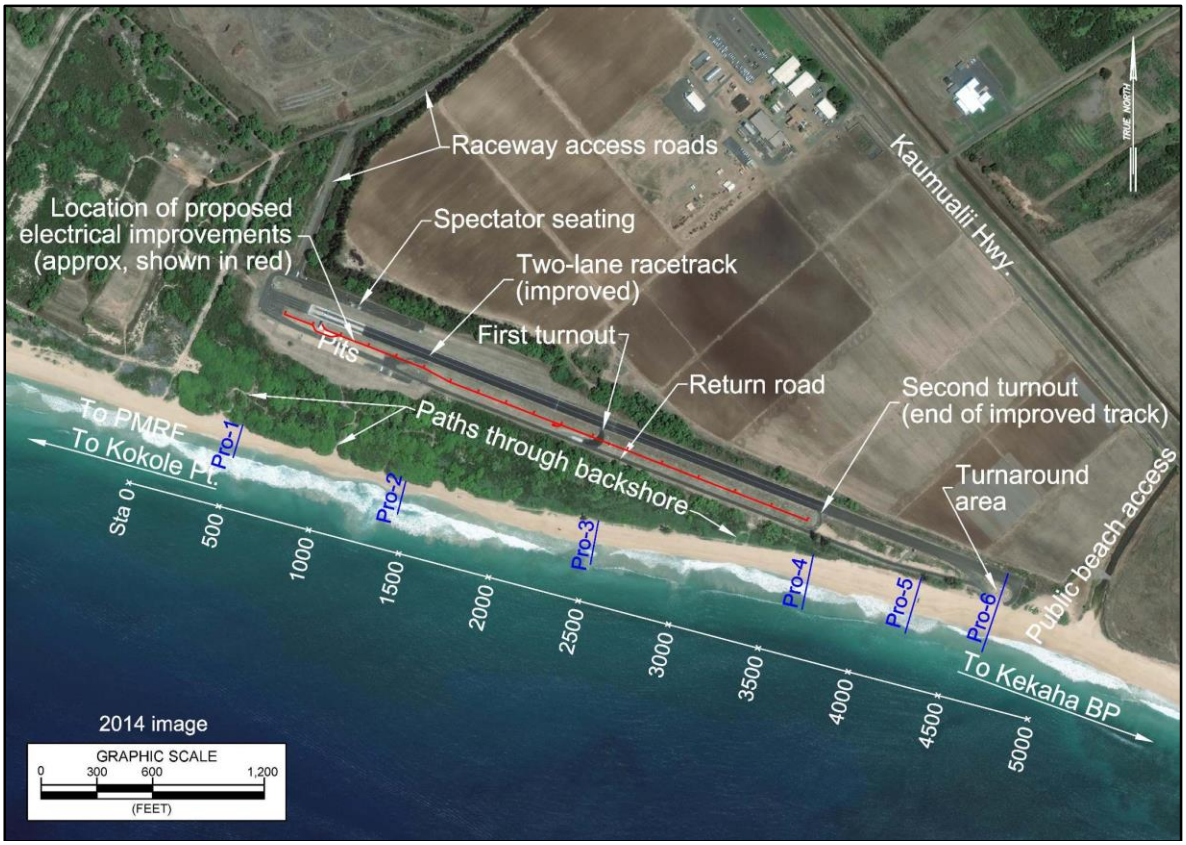


Figure 2-1 Site map of Mana Racetrack, proposed improvements shown in red

2.2 Shoreline Description

Coastal engineers from Sea Engineering, Inc., performed an assessment of the shoreline on March 5, 2015. The weather was partly sunny with side shore breezes that changed from easterly to westerly during the site visit. Tidal elevation rose from about -0.8 ft msl to about +0.5 ft msl over course of the afternoon site visit.

The racetrack shares its western boundary at Sta. 0 with PMRF. The backshore in this area consists primarily of low-lying vegetation, notably kiawe, along with beach naupaka, beach vitex (pohinahina), beach morning glory (pohuehue), seashore rushgrass (akiaki), and other coastal plants (Figure 2-2). The vegetation covers a dune system between the racetrack and the beach throughout much of the project site. The beach had a low scarp located at the extent of wave uprush, most likely from the previous high tide (Figure 2-3). Tire and other tracks, along with pohuehue extending onto the beach, suggested that the wave uprush did not recently reach the vegetation line. This condition, however, changed from about Sta. 250 to Sta. 1000, a reach where signs of wave uprush to or into the vegetation were observed (Figure 2-4 through Figure 2-6). Intermittent cutouts and paths into the vegetation were noted, and the scarp was noted to increase in height from about 18 inches at Sta. 550 to about 24 inches at Sta. 800. A path through the backshore from the beach toward the racetrack was noted at Sta. 1000. The opening at the vegetation line had 24 to 36 inch high scarps on either side, and the scarp on the east side

of the path was noted as becoming populated with akiaki grass and pohuehue (Figure 2-7). Fresh vehicle tracks were noted along the base of the scarp through this area.

Beach profile Pro-1 was measured at Sta. 500. The profile, shown as Figure 2-8, extended from the vegetation line to beyond the beach toe. The vegetation line elevation was +9.7 ft msl and the beach berm was measured to be 58 feet wide measured from the vegetation line to the top of the foreshore slope. An inshore berm/scarp was noted about 30 feet seaward of the vegetation line. The beach foreshore (face) was noted to contain cusps, and the foreshore slope was measured to be 1v:8.5h.

The proposed improvements are set back approximately 640 feet from the vegetation line at Sta. 500.

Figure 2-2 Typical backshore at Sta. 0, consisting of a variety of low-lying coastal vegetation

Figure 2-3 View of beach looking east from Sta. 0

Figure 2-4 View of vegetation line facing west at Sta. 250

Figure 2-5 Recent inundation of vegetation at Sta. 600

Figure 2-6 Typical view of beach facing east at Sta. 800

Figure 2-7 East side of Sta. 1000 becoming populated with akiaki grass

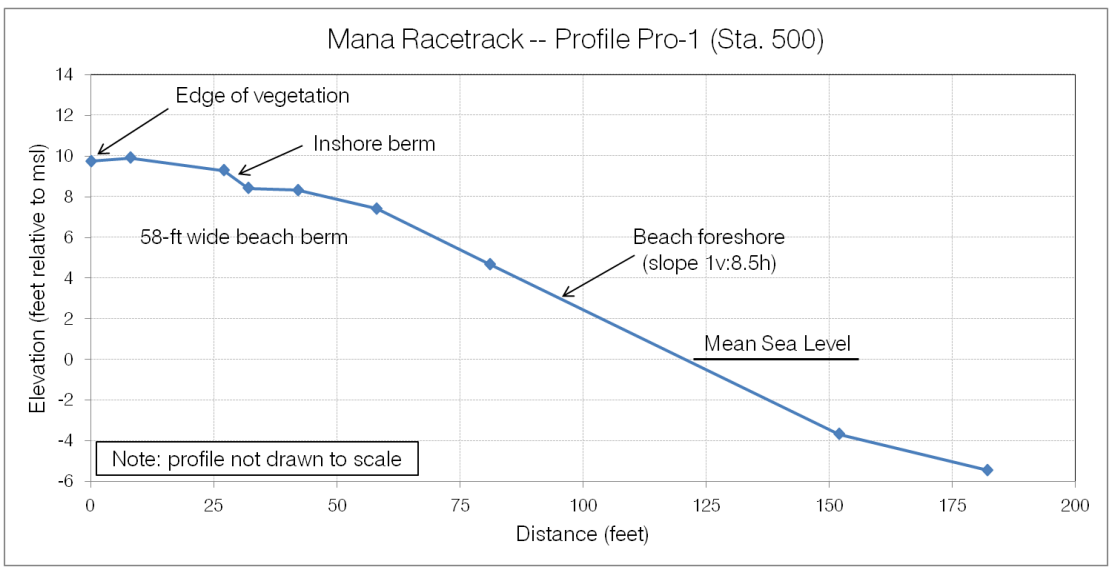


Figure 2-8 Profile Pro-1 at Sta. 500

The scarp height noted around Sta. 1000 decreased to 12 to 18 inches toward Sta. 1200. These general conditions extended to Sta. 1300, where the beach berm was noted to begin increasing in

width. A 12 to 24-inch high erosion scarp was noted about 10 feet into the kiawe between Sta. 1300 and Sta. 1600 (Figure 2-9). Kiawe and akiaki grass were noted in the backshore.

Profile Pro-2, measured at Sta. 1450, showed the scarp in the vegetation to be at elevation +11 ft (Figure 2-10). The beach berm was measured to be 58 feet wide and had a slight trough, likely remaining from the most recent erosion/accretion cycle. The beach foreshore slope was measured to have increased slightly to 1v:7.5h compared to Pro-1.

The proposed improvements are set back approximately 600 feet from the vegetation line at Sta. 1450.

Figure 2-9 Recent wave uprush into vegetation at Sta. 1450

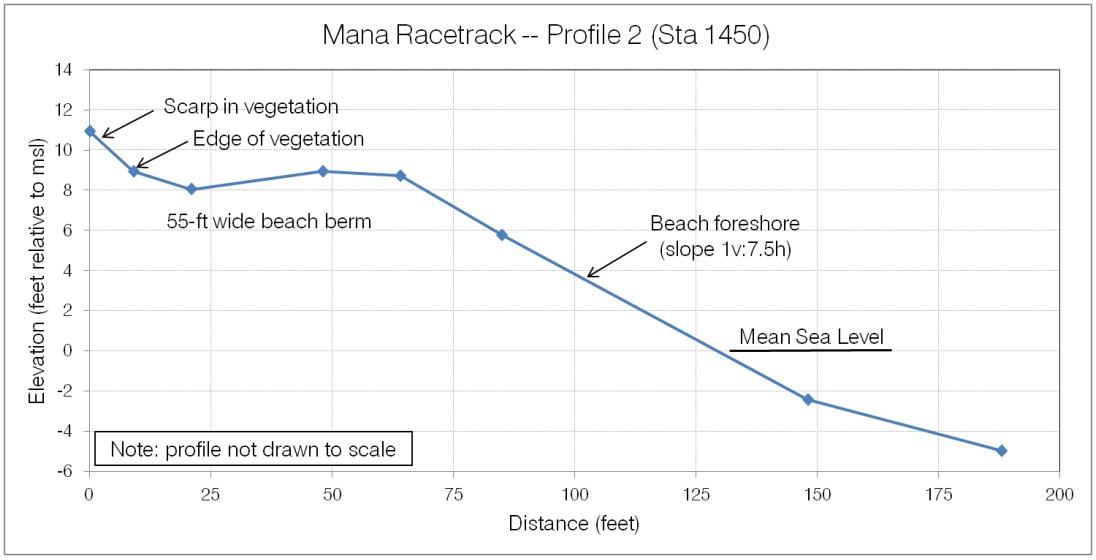


Figure 2-10 Profile Pro-2 at Sta. 1450

Erosion of the dune face became evident, and a small vegetated outcrop at Sta. 1700 had a 4-foot high scarp, the highest seen thus far in the survey (Figure 2-11). Collapsed, dead vegetation was noted on the scarp. While this scarp existed for only a short distance, it was an indicator that the backshore elevation was increasing relative to the beach berm. The backshore began to show a greater diversity of plants, including the abundance of the viney coastal plant pohinahina between Sta. 1800 and Sta. 1900 (Figure 2-12). A strip of vegetated beach berm was observed between Sta. 2000 and Sta. 2000; this strip was composed primarily of pohuehue and pohinahina, and was separated from the backshore vegetation by vehicle tracks (Figure 2-13). The occurrence of vehicle tire tracks suggested that there had been no recent wave inundation in this area.

Profile Pro-3 was measured at Sta. 2500, about 100 feet to the east of an ironwood tree growing near the vegetation line. The elevation of the vegetation line was measured to be +10.7 ft msl, and the beach berm was measured to be 140 feet wide, significantly wider than at the two profiles to the west. Figure (overview) indicates that the widening of the beach began around Sta. 1700. The profile showed the presence of a back berm and trough system. It is likely that the back berm represents the inshore position of the top of the beach foreshore resulting from a period of sand loss. Rapid sand accretion and beach widening could produce the trough, as overtopping would have been insufficient to deposit sand and fill the trough. This is a common feature of highly dynamic beaches.

The top of the beach foreshore had a scarp nearly 3 feet high, and below this scarp, the foreshore slope was measured to be 1v:6h, the steepest of all the profiles. The scarp was likely a transient feature that was produced during the recent low tide.

The proposed improvements are set back approximately 400 from the vegetation line at Sta. 2500.

Figure 2-11 Four-foot high scarp with collapsed, dead vegetation at STA 1700

Figure 2-12 Diverse backshore vegetation, including pohinahina at STA 1800

Figure 2-13 Vegetated strip with recent tire tracks on each side between Sta. 2100 and Sta. 2200

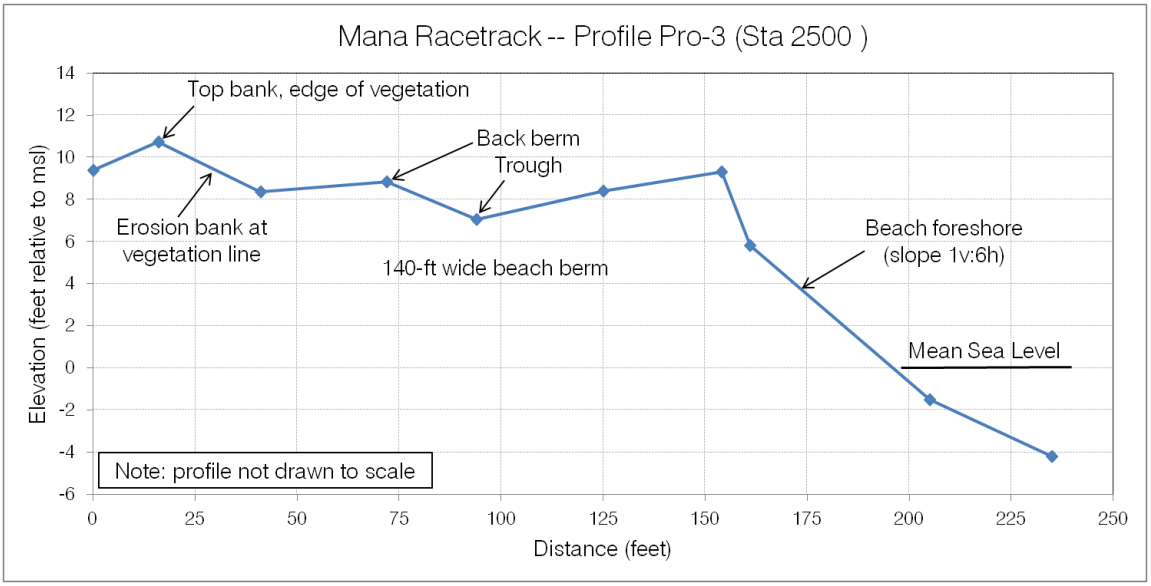


Figure 2-14 Profile Pro-3 at Sta. 2500

The wide beach berm was observed to continue east of Pro-3. The beach was noted to have a slight scarp at the top of the foreshore slope, an inner berm/trough system, and then a berm at the vegetation line. The occurrence of the inner berm/trough system, as well as the many vehicle tracks shown in Figure (Figure 2-15), suggests that this part of the beach has not recently

experienced wave inundation. A 24 to 36-inch high bank at the face of the dune was noted, transitioning into a thickly vegetated bank (Figure 2-16) and further increasing to about 48 inches in height. The areas where the bank was not vegetated appeared to be where paths lead from the beach to the backshore. The backshore was noted to be less densely vegetated and becoming narrower. Streetlights along the racetrack could be seen through an opening in the trees in Figure 2-17.

The height of the scarp at the vegetation line and dune face increased to 5 feet at Sta. 3600 (Figure 2-18), then quickly increased to 8 feet toward the east. A few scattered ironwood trees were noted in the backshore. The beach foreshore was observed to be flatter than toward the west, and the beach berm was again noted to also have many tire tracks.

Profile Pro-4 was measured at Sta. 3650 opposite the second turnout on the racetrack and the end of the improved pavement. The backshore width was about 105 feet measured from the makai side of the return road to the vegetation line. The profile shows the 6-ft high bank at the vegetation line with an elevation of +14 ft msl. The 155-ft wide beach berm contains an inner berm/trough system, with the trough more than two feet lower than the inner berm. The beach foreshore slope was measured to be 1v:8h.

The proposed improvements end at STA 3580, just west of the second turnout. The improvements at that station are approximately 190 feet inshore of the vegetation line.

Figure 2-15 Typical view looking west from Sta. 4100, vehicle tracks on beach

Figure 2-16 Vegetation line at Sta. 3000

Figure 2-17 View toward backshore at Sta. 3300; existing lighting can be seen though gap in trees

Figure 2-18 Five-foot high bank at Sta. 3600

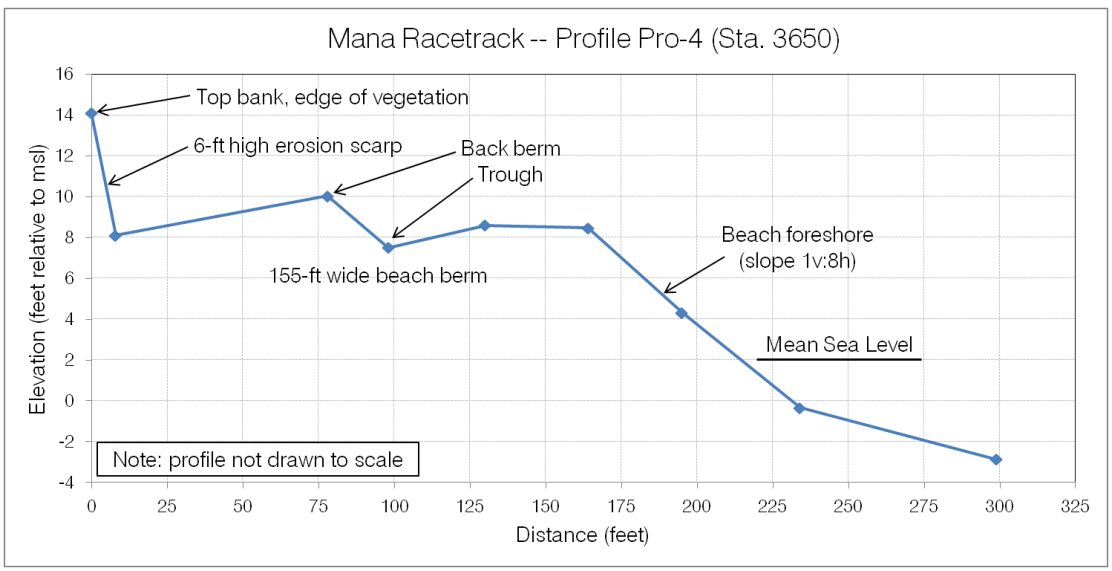


Figure 2-19 Profile Pro-4 at Sta. 3650

The high vegetated bank along the face of the dune continued to the east, where it was estimated to be as high as about 8 feet above the beach at Sta. 4100. The bank at the vegetation line, shown in (Figure 2-20), extended more than six feet above the beach berm to elevation +14 ft msl. The backshore vegetation was noted to be less dense, with a few ironwood trees and some

low-lying plants (Figure 2-21). Profile Pro-5 was measured at Sta. 4225, about 500 feet before the end of the track. The dune adjacent to a nearby ironwood tree was measured to exceed elevation +15 ft. The beach berm contained an inner berm/trough system, and the 120-ft beach berm width was less than at Pro-4. The beach foreshore slope was measured to be 1v:8h as the slope continued to flatten toward the east. Numerous vehicle tracks across the beach berm were again noted.

Figure 2-20 View across beach toward backshore at Sta. 4225

Figure 2-21 View of backshore facing east at Sta. 4225

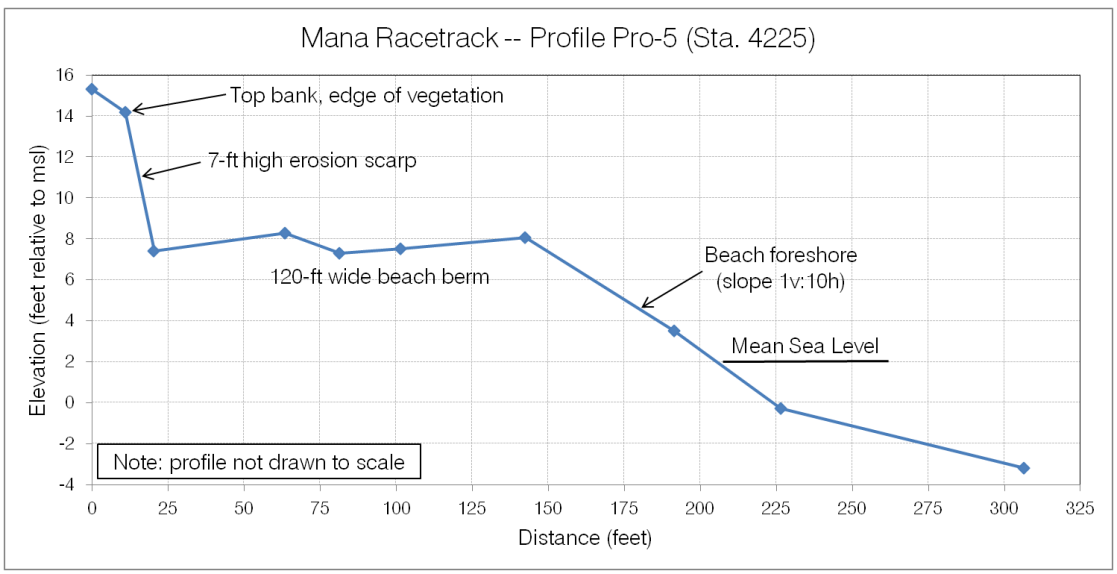


Figure 2-22 Profile Pro-5 at Sta. 4225

The backshore became narrower and the elevation lower approaching the east end of the racetrack. The vegetation became less dense, with the prominent features being several ironwood trees. Between Sta. 4250 and Sta. 4400, the dune face was vegetated with pohinahina which appeared to have been undermined and collapsed from the top of the bank, as the top of

the bank showed dead vegetation hanging down the face (Figure 2-23). The dune face transitioned to sandy for about 180 feet, then to vegetated again, before reaching the exposed, duneless end of the track (Figure 2-24). The pavement was surrounded by plastic road barriers that had been installed a few years ago to prevent vehicle access from the beach. The barriers have reportedly settled following a period of sand loss that also resulted in erosion of the edge of the pavement (Figure 2-25).

Profile Pro-6 was measured across the turnaround at the east end of the racetrack, through the gap in the barriers shown in (Figure 2-25). The turnaround area was measured to be about +9.5 ft msl, with an 18-in scarp at the seaward edge of the pavement. The beach berm was about 100 feet wide and the foreshore slope was measured to be 1v:11h.

Figure 2-23 Ironwoods and vegetated bank between Sta. 4250 and Sta. 4400

Figure 2-24 Beach at east end of racetrack

Figure 2-25 Barriers and eroded pavement at east end of racetrack

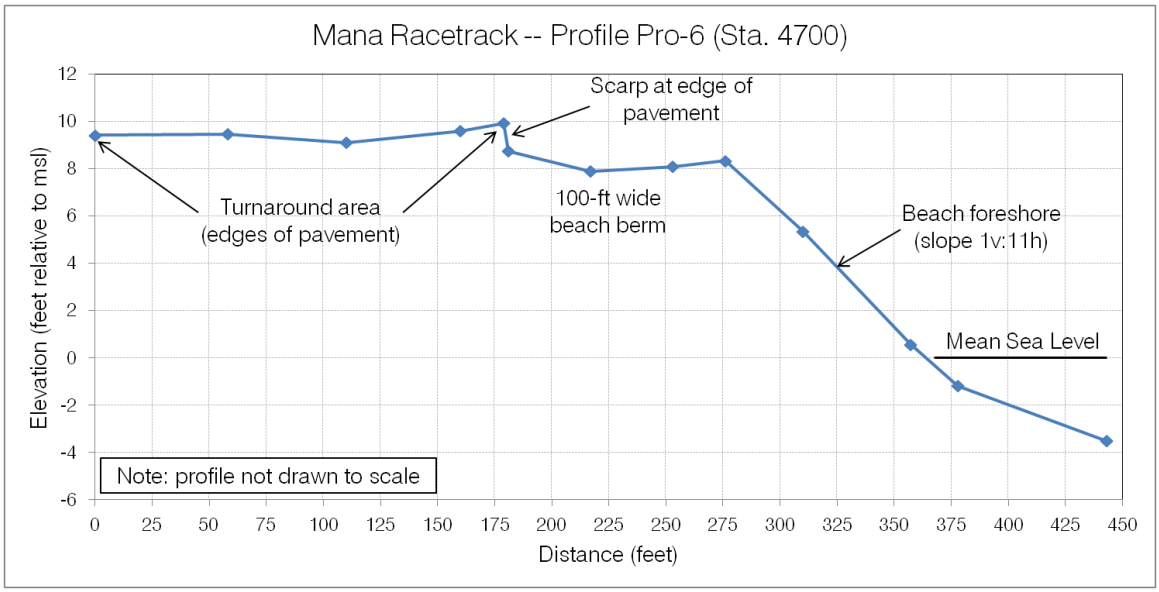


Figure 2-26 Profile Pro-6 at Sta. 4700 (end of paved track)

3. OCEANOGRPAHIC SETTING

3.1 Wind

The prevailing winds throughout the year are the northeasterly trade winds. Their average frequency varies from more than 90% during the summer season to only 50% in January, with an overall annual frequency of 70%. Westerly, or Kona, winds occur primarily during the winter months, generated by low pressure or cold fronts that typically move from west to east past the islands.

Tradewinds are produced by the outflow of air from the Pacific Anticyclone high pressure system, also known as the Pacific High. The center of this system is typically located well north and east of the Hawaiian chain and moves to the north and south seasonally. In the summer months, the center moves to the north, causing the tradewinds to be at their strongest from May through September. In the winter, the center moves to the south, resulting in decreasing tradewind frequency from October through April. During these months, the tradewinds continue to blow; however, their average monthly frequency decreases to 50%.

The project site is on the southwest side of the island of Kauai. The site is exposed to the tradewinds, which blow approximately side-shore from east to west, with the direction at the project site dictated by the island's regional geography. The project site's location on the island can also result in afternoon sea breezes, which are driven by the warming of the island's land mass. As noted on the site visit, these sea breezes blow approximately west to east at the project site, opposite of the tradewinds.

During the winter months, wind patterns of a more transient nature increase in prevalence. Winds from extra-tropical storms can be very strong from almost any direction, depending on the strength and position of the storm. The low pressure systems associated with these storms typically track west to east across the North Pacific, north of the Hawaiian Islands. At Honolulu Airport, wind speeds resulting from these storms have on several occasions exceeded 60 mph. Kona winds are generally from a southerly to southwesterly direction, usually associated with slow moving low pressure systems known as Kona lows situated to the west of the island chain. These storms are often accompanied by heavy rains.

3.2 Waves

The general Hawaiian wave climate can be described by four primary wave types: 1) tradewind waves generated by the prevailing northeast winds; 2) North Pacific swell produced by mid-latitude low pressure systems; 3) southern swell generated by mid-latitude storms of the Southern Hemisphere; 4) Kona storm waves generated by local low pressure storm systems. In addition, the islands are affected by waves generated by nearby tropical storms and hurricanes.

Tradewind waves occur throughout the year, but the other wave types have seasonal distributions. North Pacific swell and Kona storm waves typically occur from October through March during the northern hemisphere winter. Conversely, southern swell typically occurs from April through September during the southern hemisphere winter. Hurricanes and tropical storms are also summer and fall phenomena. The project coastline faces west-southwest and is exposed to North Pacific swell from the west and northwest, South Pacific swell from the south and

southwest, Kona storm waves and oblique tradewind waves. In the event of a hurricane passing just offshore to the south-southwest of the island, large storm wave action can occur even if hurricane movement is away from shoreline.

North Pacific swell waves generally arrive in the winter as results of intense storm activity at mid-latitudes. These waves have high amplitudes and long wavelengths, which create very large waves with considerable energy. Typical deepwater waves have periods of 9 to 16 seconds with wave heights from 5 to 20 feet.

Southern swell is generated by storms in the Southern Hemisphere and is most prevalent during the summer months. These waves are typically long and low, with periods of 12 to 20 seconds and deepwater wave heights of 2 to 6 feet. Southern swell is fairly common, occurring nearly 25 percent of the time during a typical year.

Kona storm waves occur at random intervals during the winter months and approach from the sector south through west. The site can therefore be directly exposed to this wave type. Some winter seasons have several Kona storms; others have none. Wave heights are dependent upon the storm intensity, and deepwater heights can exceed 15 feet.

Tradewind waves result from the strong and steady tradewinds blowing from the northeast quadrant over long fetches of open ocean. Typical deepwater tradewind waves have periods of 5 to 10 seconds and heights of 3 to 10 feet.

3.3 Prevailing Deepwater Waves

A wave hindcast was produced previously for a project at Poipu for the County of Kauai (Sea Engineering, 2013). In that project, wave hindcast data was generated hourly using nested wave generation models and eleven years of meteorological data in an archived database for the years 1997 through 2007. Data were hindcast to a deepwater “virtual buoy” located off the south coast of Kauai. The location of the deepwater site is shown on Figure 3-1.

Figure 3-1 Location of the deepwater virtual buoy (Google Earth image)

The deepwater wave data allow the tabulation of wave parameters before the waves are affected by water depth through the processes of refraction and shoaling. The result is a true representation of the incident wave climate. Figure 3-2 and Figure 3-3 are rose diagrams of hindcast deepwater wave height and period at the virtual buoy shown on Figure 3-1 and are generally representative of the wave environment that would affect the Mana shoreline. The figures show waves arriving from the northeast, southeast, south, and northwest directions, and show blocking patterns from the north, west, and east due to shadowing from the islands of Kauai, Niihau, and Oahu respectively.

The figures show the presence of north and south swell and tradewind waves, and well as a component from the southeast associated with the southern hemisphere tradewind waves.

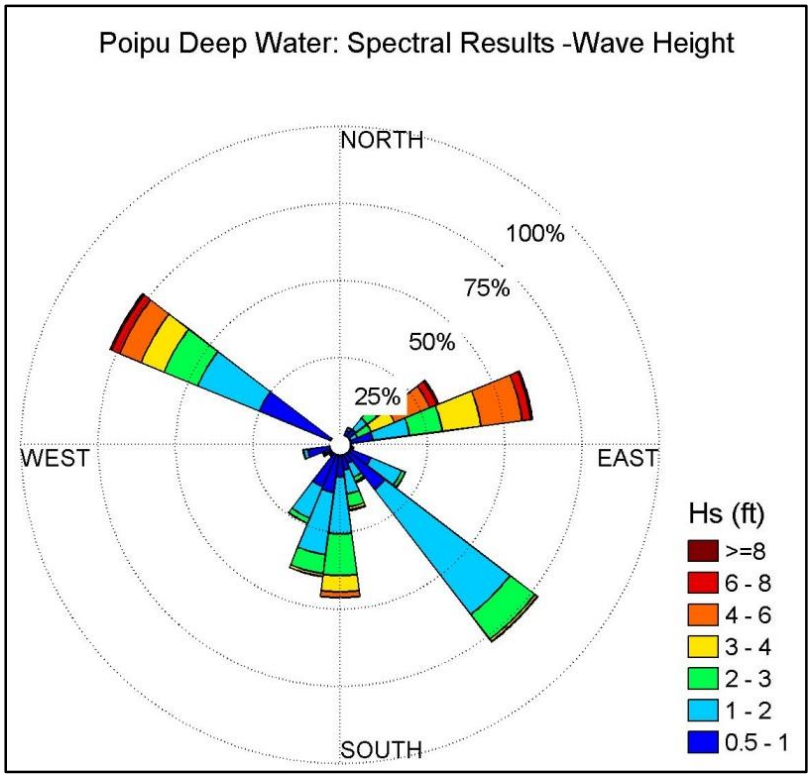


Figure 3-2 Deepwater wave height rose diagram, 1997-2007

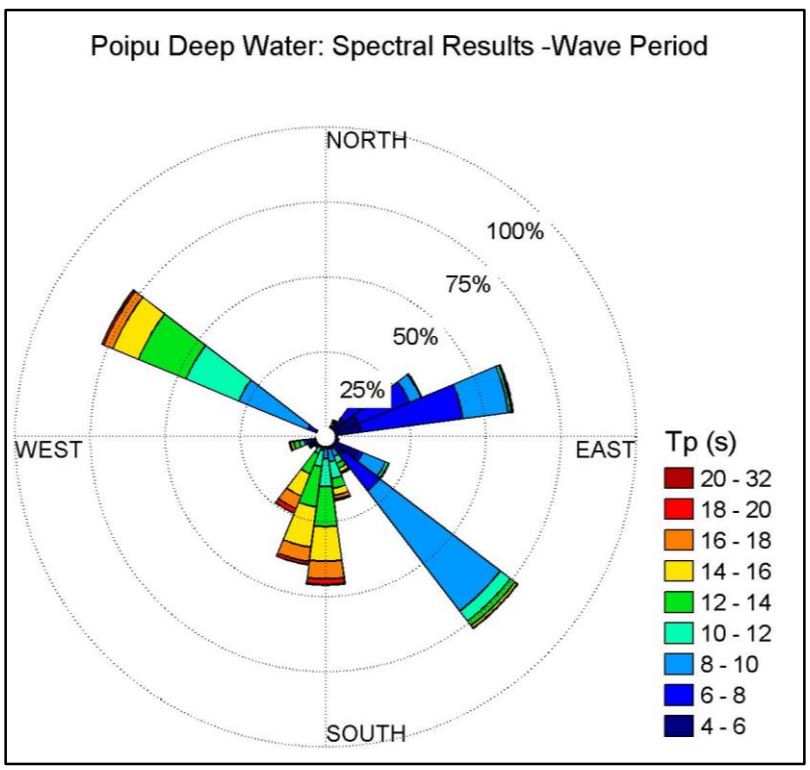


Figure 3-3 Deepwater wave period rose diagram, 1997-2007

3.4 Nearshore Wave Heights

As deepwater waves propagate toward shore, they begin to encounter and be transformed by the ocean bottom. The process of *wave shoaling* generally steepens the wave and increases the wave height. The phenomenon of *wave refraction* will cause wave crests to bend and may locally increase or decrease the wave heights. *Wave breaking* occurs when the wave profile shape becomes too steep to be maintained. This typically occurs when the ratio of wave height to water depth is about 0.8, and is a mechanism for dissipating the wave energy.

Not having a large area of offshore fringing reef, much of the wave energy propagates into the beach before breaking. The waves that reach the shoreline are limited by the water depth, so that larger waves will reach the shoreline during high water level conditions.

3.5 Tides

Hawaii tides are semi-diurnal with pronounced diurnal inequalities (i.e., two high and low tides each 24-hour period with different elevations). Tidal predictions and historical extreme water levels are given by the Center for Operational Oceanographic Products and Services, NOS, NOAA, website. The nearest tide station to Mana is at Port Allen, where the water level data, based on the 1983-2001 tidal epoch, is shown in Table 3-1.

Table 3-1 Water level data for Port Allen, Kauai

Datum	Elevation (ft mllw)	Elevation (ft msl)
Mean Higher High Water	1.8	1.0 ft.
Mean High Water	1.4	0.6 ft.
Mean Tide Level	0.8	0.0 ft.
Mean Low Water	0.2	-0.6 ft.
Mean Lower Low Water	0.0	-0.8 ft.

Hawaii is also subject to periodic extreme tide levels due to large scale oceanic eddies that propagate through the islands. These eddies produce tide levels up to 0.5 to one foot higher than normal for periods of up to several weeks.

3.6 Sea Level Change

The present rate of global mean sea-level change (SLC) is +3.16 mm/yr (NASA, 2014), where a positive number represents a rising sea level. SLC appears to be accelerating compared to the mean of the 20th Century. Factors contributing to the rise in sea level include decreased global ice volume and warming of the oceans. Recent climate research by the Intergovernmental Panel on Climate Change (IPCC) predicts continued or accelerated global warming for the 21st Century and possibly beyond, which will cause a continued or accelerated rise in global mean sea level (USACE, 2011). It is estimated that global sea level rise may reach 1 m (3.3 ft) by the end of this century, and the U.S. Army Corps of Engineers estimates possible sea level rise as high as 1.4 m (4.6 ft).

The U.S. Army Corps of Engineers (USACE, 2011) provides guidance for calculating site-specific SLC in Engineering Circular *EC 1165-2-212, Appendix C*. A wide range of predictions for future SLC rates are shown in the report, and procedures are given to estimate low, intermediate, and high SLC curves following the National Research Council's (NRC) recommendation.

The closest tidal station with SLC projections is at Nawiliwili Harbor. Sea level change values for Nawiliwili using the three NRC scenarios are shown in Table 3-2 and Figure 3-4. Positive numbers indicate a rise in sea level. The intermediate rate is generally accepted as a reasonable prediction for future sea level for shore protection projects. For a project design life of 25 years, the calculations predict a SLC of +0.28 ft (+5 in) between 2015 and 2040. For comparison, the low and high estimates using the same procedure are +0.13 ft (+1.5 in) and +0.78 ft (+9 in) respectively.

Table 3-2 Estimated relative sea level change from 2015 to 2065 at Nawiliwili, HI. Values are given in feet.

Year	USACE Low	USACE Int	USACE High
2015	0.00	0.00	0.00
2017	0.01	0.02	0.05
2020	0.03	0.05	0.12
2025	0.05	0.10	0.26
2030	0.08	0.16	0.41
2035	0.10	0.22	0.59
2040	0.13	0.28	0.78
2045	0.15	0.35	1.00
2050	0.18	0.43	1.23
2055	0.20	0.51	1.48
2060	0.23	0.59	1.74
2065	0.25	0.68	2.03

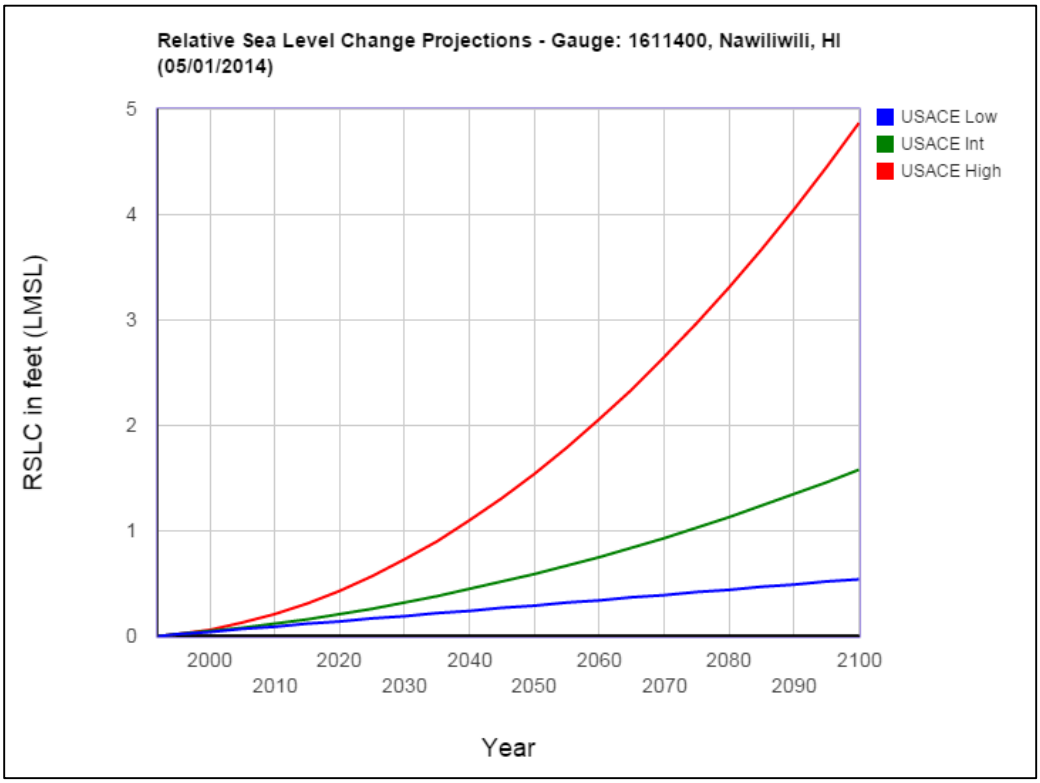


Figure 3-4 Relative sea level change projections for Nawiliwili, Hawaii.

4. SHORELINE HISTORY

The beach fronting the racetrack is a section of the approximate 12 miles of sandy shoreline that extends from Polihale State Park, past the PMRF, and ends at Kekaha. Moberly and Chamberlain (1964) studied beaches throughout Hawaii, including Kekaha Beach Park. They reported that the beach width varies seasonally as a result of changing wave and sediment transport patterns. During their study, the east end of the beach was 200 feet wide in the winter and 50 feet wide in the summer. These seasonal changes occur over a greater length of shoreline. Clark (1990) identified that the shoreline in this area was subject to high surf during the winter and spring months, when swell approaches Kauai from the west and northwest directions. Although the project shoreline is south facing, the rounded shape of the island allows swell to wrap around and impact the shoreline, primarily as shorebreak. This wave pattern drives sand from the north from Polihale State Park toward the south, then around Kokole Point toward Kekaha Beach Park, and this explains the wide beaches measured by Moberly and Chamberlain in the winter. Tradewinds and summer swell can then reverse the sediment transport.

The sediment balance within this cycle is dependent on the relative strength of each successive season's wave climate. An imbalance in the driving forces (i.e., the incident waves) can result in a net transport in either direction. TEOK Investigations (2013) reported that in 2011, the beaches at PMRF had accreted significantly, while Kekaha beaches at the same time had experienced severe erosion. Their hypothesis was that the sediment imbalance was due to two seasons of relatively weak northwest swell, which did not transport sufficient sand to Kekaha. Additionally, they refer to stronger than normal south swell and tradewinds that would result in transport to the west and then north.

To test this hypothesis, TEOK Investigations (2015) initiated a study of the beach dynamics in the vicinity of Mana in November of 2012, measuring beach profiles at six locations from PMRF to Kekaha, including one opposite the west end of the racetrack. For the period of November 2012 through April 2013, they measured a 300 foot beach narrowing at the PMRF transect, while the beach widened by 200 feet at MacArthur Park, located ½ mile from the racetrack toward Kekaha. They also postulated that the minor changes in measured beach width at the transect fronting the Mana racetrack indicated that this area might be an inflection point, past which sand moves without significant gain or loss in beach width. It should be noted that their data was collected over a short period of time and further data would be necessary to confirm this.

4.1 Historical Shoreline Change

A series of historical aerial photographs can be used to show shoreline trends. The University of Hawaii Coastal Geology Group (UH CGG) has undertaken historical analysis of Kauai's shoreline and has produced a shoreline change map for the Kokole Point region based on survey data from 1927 and aerial imagery from 1950 to 2006. Their analyses use the beach toe as the shoreline change reference feature. Sandy shorelines in general, however, are quite dynamic and change in response to incident wave conditions, such as high surf, which can quickly alter the beach width. Figure 4-2 shows the historical shoreline positions as determined by the UH CGG for the years 1927 through 2006.

The UH CGG analyses for the Mana project shoreline are presented as transects numbered 257 through 326 in Figure 4-2 and indicate that the shoreline fronting the west half of the project site has accreted at historical rates of about 0.5 to 1.1 ft/yr, while the shoreline fronting the eastern half eroded at historical rates of between about 1.0 and 1.5 ft/yr.

A 2013 sediment budget study of the Kekaha region of Kauai was completed by the U.S. Army Corps of Engineers (Podoski, 2013). In the project vicinity, the aerial photographs used in the UH CGG study from 1992 and 2006 were used to show the more recent shoreline change. Similarly, the shoreline change rates were updated for this project by adding a shoreline digitized from a 2014 satellite image.

Performing the update to the erosion map, however, highlighted the challenge associated with quantifying the shoreline dynamics of the area. As mentioned previously, the project shoreline is seasonally dynamic, with sand typically moving east during the winter and spring in response to north swell and Kona waves, and west during the summer and fall during periods of south swell and tradewind waves. The erosion maps produced by the UH CGG utilized shorelines from aerial images on the order of a decade apart, and since seasonality is not accounted for in their analyses, it is possible to produce biased results by comparing shorelines from different seasons. This aliasing, or sampling at a lesser rate than the erosion/accretion cycle, can result in the published rates having biases and uncertainties greater than the longterm shoreline change rate.

Furthermore, using the beach toe as the reference feature in this area adds uncertainty, because the frequent occurrence of waves at the shoreline makes identifying the beach toe from aerial images very difficult. In this location, the vegetation line appears to be a better reference feature, due not only to its easy identification, but because of the limited backshore development. In areas of high development, the vegetation in the backshore frequently gets landscaped, with lawns installed and watered, trees removed or added, and permanent structures built that can affect the natural migration of the shoreline. At the Mana racetrack, however, the backshore and dune system are largely unaffected by human activities, with the exception of the east end of the track. For these reasons we feel that the shoreline position is better described by the vegetation line than the beach toe used by the UH CGG.

An investigation of aerial images identified that there was significant vegetation loss recently near the east end of the racetrack. Figure 4-1 presents a series of Google Earth images from February 2, 2011, February 15, 2013, and August 8, 2014. The next earlier image is from 2006, and the vegetation line in that image is consistent with the vegetation line in the February 2, 2011, image, which is therefore taken as the baseline for this comparison. Vegetation line positions digitized from each image are included in the figure. The February 15, 2013, image shows toppled trees lying on the beach near Sta. 4300. The figure also shows sand on the end-of-track turnaround in the February 15, 2013, image. Road barriers were first seen in the December 16, 2013, image (not shown here). The August 8, 2014, image shows further loss of vegetation to the west of Sta. 4200 following the February 15, 2013, image. This condition still existed at the time of the September 20, 2014, aerial image.

A comparison of the vegetation line positions shows that more than 2 acres of vegetation was lost between February 2011 and September 2014, occurring primarily between Sta. 3000 and Sta.

4400 as shown by the cross-hatch pattern. The greatest change in vegetation position was a 95-ft inshore shift at Sta. 3800.

A list of aerial images reviewed in this report is presented in Table 4-1.

Table 4-1 List of aerial image reviewed in this report

Image Date	Source
May 1966	UH CGG
April 1975	UH CGG
July 1987	UH CGG
May 1992	UH CGG
September 18, 1992	UH CGG
2006	UH CGG
February 2, 2011	Google Earth
February 15, 2013	Google Earth
December 16, 2013	Google Earth
August 18, 2014	Google Earth
September 20, 2014	Digital Globe/MapMart

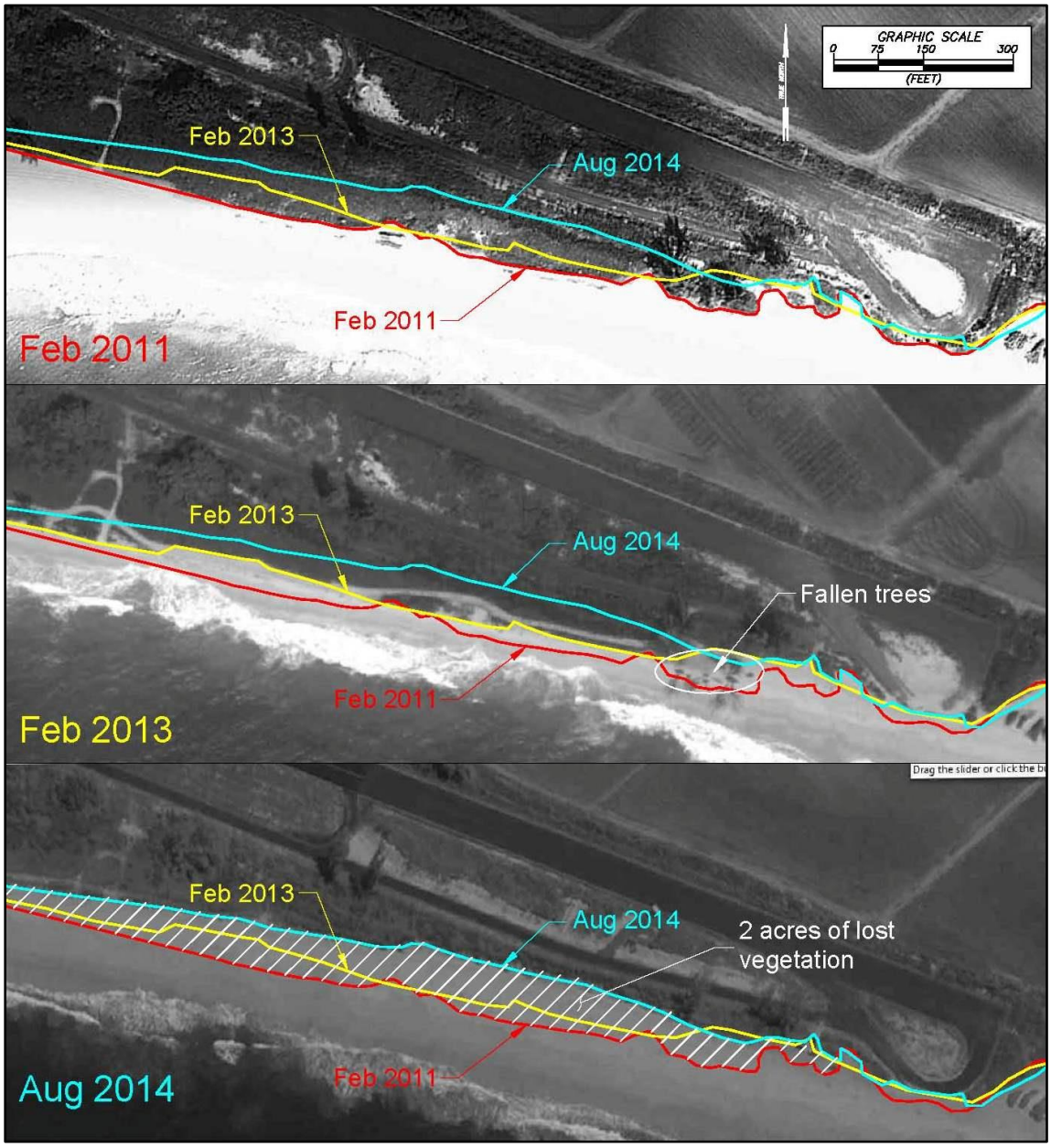


Figure 4-1 Google Earth images and vegetation lines from February 2, 2011 (top), February 15, 2013 (middle), and August 13, 2014 (bottom)

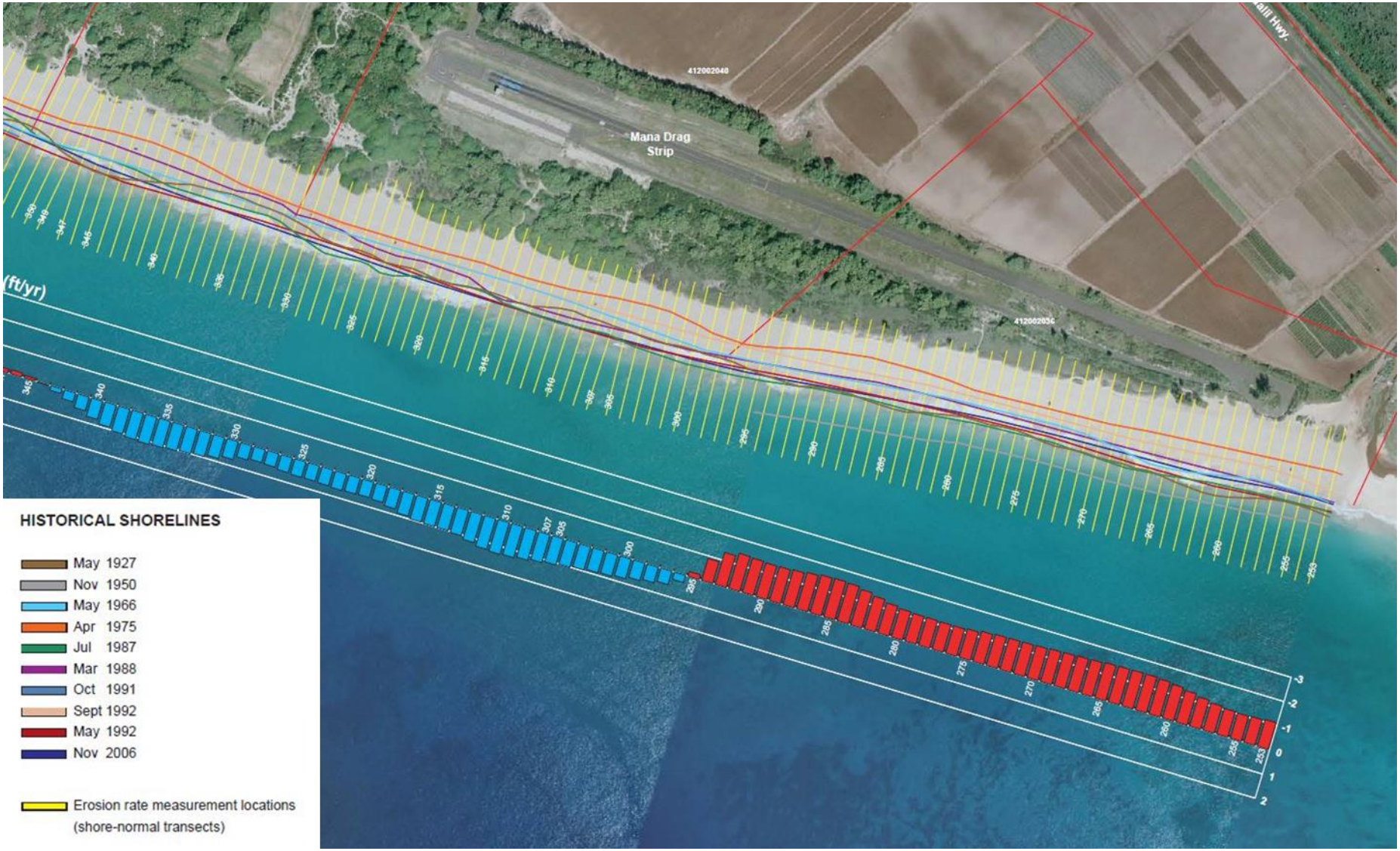


Figure 4-2 Historical shoreline change analysis (UH Coastal Geology Group). Yellow lines indicate transect locations spaced 66 ft apart. Red bar graph indicates annual erosion rate calculated for each transect location. White lines through bar graph represent 1ft/yr erosion/accretion rate increments.

5. COASTAL HAZARDS

5.1 Hurricanes

Tropical cyclones originate over warm ocean waters, and they are considered to have reached hurricane strength when they generate sustained wind speeds over 64 knots (74 mph). Hurricanes form near the equator, and in the central North Pacific usually move toward the west or northwest. During the primary hurricane season of July through September, hurricanes generally form off the west coast of Mexico and move westward across the Central Pacific. These storms typically pass south of the Hawaiian Islands, and sometimes have a northward curvature near the islands. Late season hurricanes follow a somewhat different track, forming south of Hawaii and moving north toward the islands. Three hurricanes have actually passed through the Hawaiian islands in the past 25 years: Hurricanes Iwa in 1982 and Iniki in 1992, both passing near or over the island of Kauai, as well as Hurricane Iselle in 2014, which passed over the island of Hawaii. These storms caused high surf and wave damage on the south and west shores of all the islands.

In the case of Hurricane Iniki, the eye of the storm passed very close to the town of Waimea and the Mana Plain. Runup reportedly reached elevations of +29 ft in the town of Poipu on the southeast shore of the island. Kennedy et al. (2012) compared measured inundation debris lines with model results for locations on Oahu and Kauai, including the town of Kekaha. Figure 5-1 shows the results for the Kekaha area, with the subject property located near the western edge of the figure. Measured debris lines are shown with the blue dashes; SWAN and ADCIRC modeled inundation is shown in the red filled in areas and the black stars display the SWAN, ADCIRC and Boussinesq inundation model levels. For complex topography and wave group representation, the SWAN, ADCIRC, and Boussinesq model suite was shown to better approximate inundation, as measured by the debris lines. The predicted inundation is inland enough to flood the racetrack at the west side of Figure 5-1. This correlates with the post-storm satellite image, taken one week after Hurricane Iniki, showing sand displaced from coastal inundation inland onto the race track (Figure 5-2). If a storm of equal or greater size were to make landfall in that area, the racetrack would be expected to experience significant flooding, primarily on the east end.

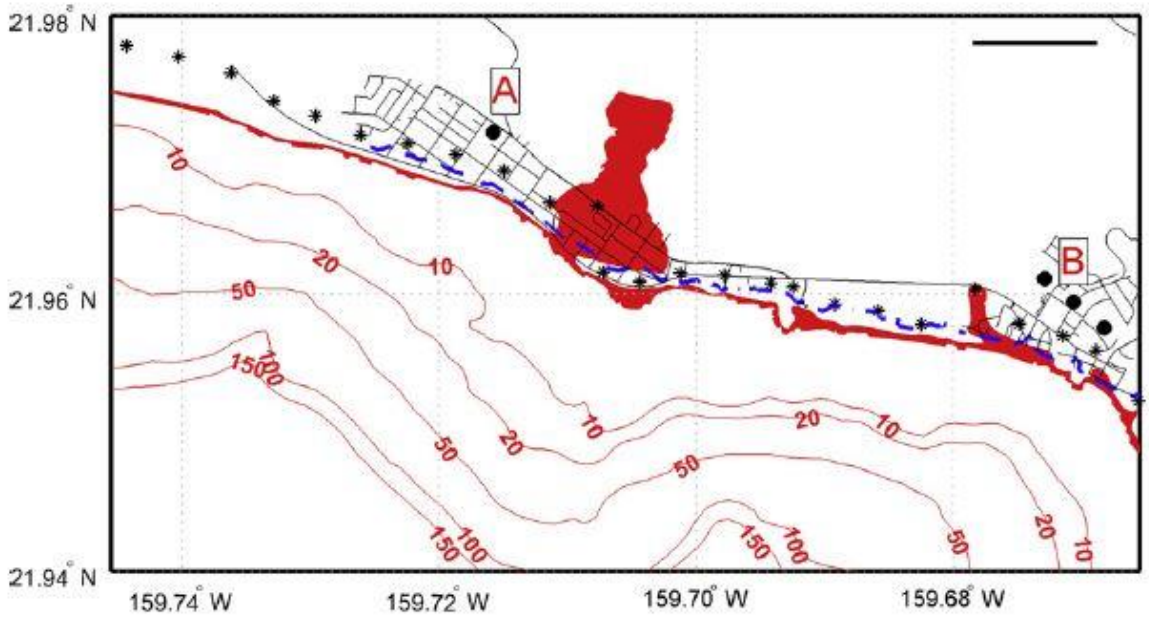


Figure 5-1 Hurricane Iniki comparisons between measured and modeled inundation. Measured Debris Lines (blue dashed lines); Modeled SWAN + ADCIRC + Boussinesq Runup (black stars); SWAN + ADCIRC inundation (red filled-in area) (Kennedy et al., 2012)

Figure 5-2 Comparison of pre and post-Hurricane Iniki

5.2 Still Water Level Rise

Storms and large waves produce storm surge and wave setup that results in elevated water levels at the shoreline. During prevailing, annual conditions this water level rise can be on the order of a foot above the tide level. However, during extreme events, the still water level rise can be significantly greater. During Hurricane Iniki, water level in Port Allen rose by as much as 4.4 feet above the predicted tide level.

5.3 Tsunami

Loomis (1976) presented runup elevations for tsunamis that have affected the Hawaiian Islands. Table 5-1 shows the tsunami runup elevations that were measured at Kekaha Beach Park near the project site. Runup elevations are relative to mean sea level. The 1946 and 1957 tsunamis were generated in the Aleutian Islands, while the 1960 tsunami was generated near Chile. Based on these historical tsunamis, a tsunami of similar size may cause minor overtopping and inundation.

Table 5-1 Tsunami Runup Elevations, Kekaha Beach Park

Tsunami	Source	Runup elevation (feet)
1946	Aleutian Islands	9
1957	Aleutian Islands	6
1960	Chile	5.5

5.4 Flood Insurance Rating

The National Flood Insurance Program, administered by the Federal Emergency Management Agency (FEMA) produces maps identifying flood hazards and risks. Figure 5-3 shows the flood hazard map for the project properties, (4)1-2-002:036 and (4)1-2-002:040. The map indicates that the properties are rated as Flood Zone VE, AE and X. Zone X is an area determined to be outside of the 0.2% annual chance floodplain. Zone AE is the coastal flood zone corresponding to the 1% annual chance of flood with corresponding base flood elevation. The two properties have base flood elevations of 8, 9, 10, and 11 feet in this zone. Zone VE is the coastal flood zone corresponding to the 1% annual chance of flood with corresponding base flood elevation and additional velocity hazards due to storm waves. The two properties have base flood elevations of 9, 10, 11, and 12 feet in this zone.

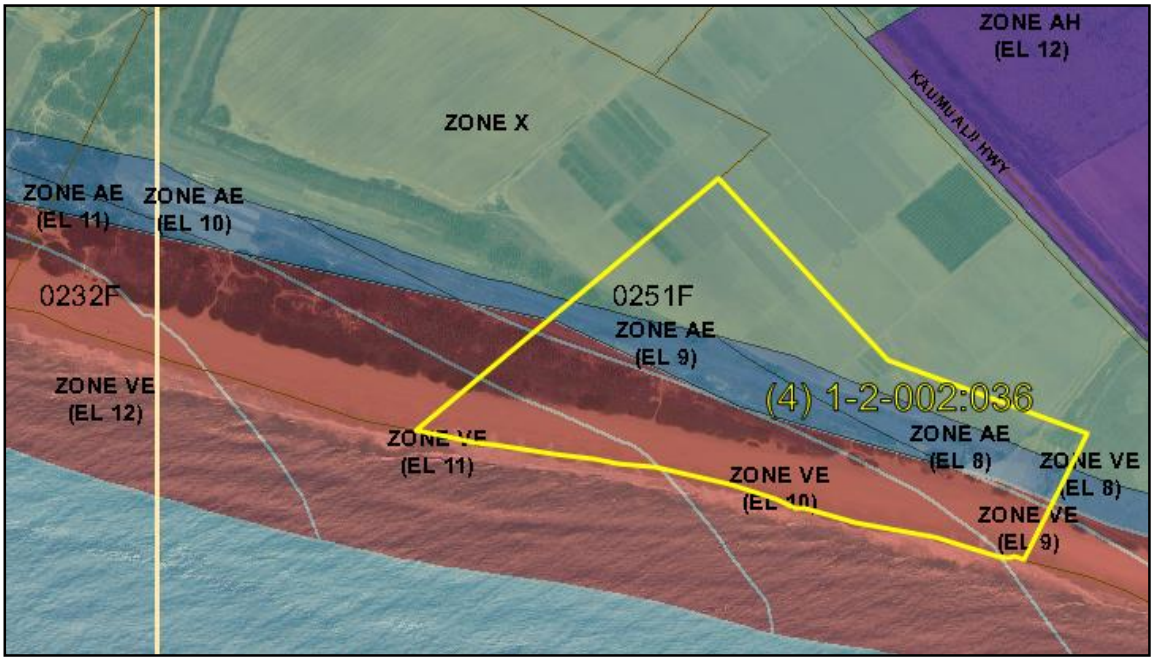


Figure 5-3 Flood hazard designation for the project site (the eastern parcel is outlined in yellow)

6. CONCLUSIONS

A site visit was conducted on March 5, 2015, to assess the existing shoreline conditions at the Mana racetrack. The site visit found that the backshore was wide on the west end of the site, becoming progressively narrower toward the east. Recent wave overtopping to or slightly into the vegetation was noted along the west project shoreline, though the backshore in that area is more than 300 feet wide and there was no threat to facilities. The beach widened substantially along the eastern half of the project shoreline. There was no evidence that there had been recent beach overtopping; however, erosion of the dune face at the vegetation line was noted, with banks as high as 8 feet above the beach.

The beach fronting the project site is highly dynamic, with the potential to have large swings in width. Northwest swell and Kona storm waves typically transport sand to the east, while south swell and tradewind waves transport sand west. While this sediment transport is seasonally cyclical, imbalances can occur, and periods of extended shorebreak can reduce the beach width quickly.

Longterm shoreline change rates produced by the University of Hawaii Coastal Geology Group (UH CGG) indicate that the eastern half of the project shoreline has experienced longterm erosion. While the historical rates may not represent the extent of change during a seasonal event, they do show that the eastern end is susceptible to erosion. This was confirmed by the site visit, which showed eroded dune faces through this area, and by comparing vegetation line positions in a series of recent Google Earth images. Additionally, susceptibility of the eastern end of the racetrack to inundation was highlighted by the comparison of pre and post-Hurricane Iniki aerial images.

Figure 6-1 shows the approximate location of electrical improvements proposed for the racetrack. The improvements are located on the makai side of the racetrack. The eastern end of the improvements is about 190 feet inshore of the vegetation line. The figure also shows the inland extent of inundation from Hurricane Iniki in 1992 as determined from the September 18, 1992, aerial image. About 340 linear feet of proposed improvements are located in this inundation zone.

The following are key project conclusions:

- Proposed project improvements are sufficiently distant from the shoreline that they are not expected to impact coastal processes.
- The turnaround area has been damaged by erosion and will likely be threatened again, as the sand transport has a strong seasonal component.
- Coastal hazards include storm inundation that in the case of Hurricane Iniki extended past the east end of the proposed improvements. Given the loss of vegetation and dunes along the eastern portion of the project shoreline, a hurricane of similar magnitude to Hurricane Iniki would be expected to produce similar or greater inundation.

Figure 6-1 Location of proposed electrical improvements relative to the Hurricane Iniki inundation line

7. REFERENCES

Clark, J.R.K. 1990. *Beaches of Kauai and Niihau*. University of Hawaii Press. 114 pages.

Fletcher, C.H., B.M. Richmond, G.M Barnes, and T.A. Schroeder. 1995. "Marine Flooding on the Coast of Kauai during Hurricane Iniki: Hindcasting Inundation Components and Delineating Washover. *J. Coastal Research*, 11 (1), 188–204.

Loomis, Harold G., 1976, *Tsunami Wave Runup Heights in Hawaii*, Hawaii Institute of Geophysics report number HIG-76-5, University of Hawaii.

Moberly, R. and T. Chamberlain. 1964. *Hawaiian Beach Systems*. Hawaii Institute of Geophysics report number HIG-64-2.

Sea Engineering, Inc., 1990, *Windward Oahu Hurricane Vulnerability Study – Determination of Coastal Inundation Limits*, prepared for the State of Hawaii, Civil Defense and the U.S. Army Corps of Engineers, Honolulu Engineer District.

University of Hawaii Coastal Geology Group.. 2010. http://www.soest.hawaii.edu/coasts/kauaicounty/KCounty.html.

Pacific Islands Integrated Ocean Observing System. http://oos.soest.hawaii.edu/pacioos/voyager/. Retrieved March 23, 2015.

Kennedy, A.B., J.J. Westerink, J.M. Smith, M.E. Hope, M. Hartman, A.A. Taflanidis, S. Tanaka, H. Westerink, K.F. Cheung, T. Smith, M. Hamann, M. Minamide, A. Ota, and C. Dawson. 2012. "Tropical Cyclone Inundation Potential on the Hawaiian Islands of Oahu and Kauai." *Ocean Modelling*, 52-53 (2012): 54-68.

National Aeronautics and Space Administration. 2014. "Global Climate Change" website. http://climate.nasa.gov/. Retrieved December 15, 2104.

National Oceanic and Atmospheric Administration. 2014. "NOAA Tides & Currents" website. http://tidesandcurrents.noaa.gov/datums.html?id=1619910. Retrieved December 15, 2014.

Podoski, J. H., editor. 2013. *Hawaii Regional Sediment Management: Regional sediment budget for the Kekaha Region of Kauai*. Coastal and Hydraulics Engineering Technical Note ERDC/CHL CHETN-XIV-32. Vicksburg, MS: US Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory (ERDC-CHL). Prepared by Sea Engineering, Inc., Waimanalo, HI. http://chl.erdc.usace.army.mil/library/publications/chetn/pdf/chetn-xiv-32.pdf

Sea Engineering, Inc. 1986. *Hurricane Vulnerability Study for Kauai, Vicinity of Waimea and Kekaha, Storm Wave Runup and Inundation.* Prepared for the U.S. Army Corps of Engineers, Pacific Division.

Sea Engineering, Inc. 1993a. *Hurricane Iniki Coastal Inundation Modeling.* Prepared for the U.S. Army Corps of Engineers, Pacific Division.

Sea Engineering, Inc. 1993b. *Leeward Oahu Hurricane Vulnerability Study, Determination of Coastal Inundation Limits.* Prepared for the State of Hawaii Department of Defense, the U.S. Army Corps of Engineers, Pacific Division, and Federal Emergency Management Agency, Region IX.

Sea Engineering, Inc. 2000. *Kauai Island Hurricane Vulnerability Study, Determination of Coastal Inundation Limits.* Prepared for the State of Hawaii Department of Defense, the U.S. Army Corps of Engineers, Pacific Division, and Federal Emergency Management Agency, Region IX.

Sea Engineering, Inc. 2013. *Poipu Beach Park Shoreline Restoration Study*. Prepared for the County of Kauai, Dept. of Parks and Recreation.

TEOK Investigations. "Kauai Beach Dynamics." http://www.teok.com/kauai-beach-dynamics/. Retrieved March 23, 2015.

TEOK Investigations. 2013. "PMRF/Kekaha Shoreline Survey, Kauai. Project Summary—Feb. 5, 2013." http://teok.com/wp-content/uploads/2013/03/PMRF-Kekaha-Shoreline-Survey.pdf. Retrieved March 23, 2015.

U.S. Army Corps of Engineers. 2011. "Sea-Level Change Considerations For Civil Works Programs." EC 1165-2-212, October 1, 2011.

U.S. Army Corps of Engineers. 2015. "Responses to Climate Change" website. http://www.corpsclimate.us/ccaceslcurves.cfm. Retrieved March 23, 2015.

APPENDIX F
FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NUMBER 1500020251F

NOTES TO USERS

p is for use in administering the National Flood Insurance Program. It t necessarily identify all areas subject to flooding, particularly from local sources of small size. The **community map repository** should be d for possible updated or additional flood hazard information.

n more detailed information in areas where **Base Flood Elevations** and/or **floodways** have been determined, users are encouraged to consult d Profiles and Floodway Data and/or Summary of Stillwater Elevations ontained within the Flood Insurance Study (FIS) report that accompanies M. Users should be aware that BFEs shown on the FIRM represent whole-foot elevations. These BFEs are intended for flood insurance urposes only and should not be used as the sole source of flood n information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of tion and/or floodplain management.

Base Flood Elevations shown on this map apply only landward of al Tidal Datum. Users of this FIRM should be aware that coastal flood s are also provided in the Summary of Stillwater Elevations tables in the urance Study report for this jurisdiction. Elevations shown in the Summary ater Elevations tables should be used for construction and/or floodplain nent purposes when they are higher than the elevations shown on this

ies of the **floodways** were computed at cross sections and interpolated cross sections. The floodways were based on hydraulic considerations ard to requirements of the National Flood Insurance Program. Floodway nd other pertinent floodway data are provided in the Flood Insurance port for this jurisdiction.

areas not in Special Flood Hazard Areas may be protected by **flood structures**. Refer to Section 2.4 "Flood Protection Measures" of the surance Study report for information on flood control structures for this on.

jection used in the preparation of this map was Universal Transverse r (UTM) Zone 4. The **horizontal datum** was NAD 83, GRS80 spheroid. es in datum, spheroid, projection or UTM zones used in the production of r adjacent jurisdictions may result in slight positional differences in map across jurisdiction boundaries. These differences do not affect the of this FIRM.

evations on this map are referenced to the Local Tidal Datum. These flood ns must be compared to structure and ground elevations referenced to e **vertical datum**. For information regarding conversion between the Geodetic Vertical Datum of 1929 and the North American Vertical of 1988, visit the National Geodetic Survey website at w.ngs.noaa.gov or contact the National Geodetic Survey at address:

rmation Services
NGS12
Geodetic Survey
#9202
st-West Highway
ring, Maryland 20910-3282
0-3242

n current elevation, description, and/or location information for **bench** shown on this map, please contact the Information Services Branch National Geodetic Survey at **(301) 713-3242**, or visit its website at w.ngs.noaa.gov.

ap information shown on this FIRM was derived from mosaicked 2-foot esolution satellite imagery that meets 1:12,000 scale horizontal accuracy s provided by Digital Globe and the United States Department of re Natural Resources Conservation Service. This information was between July 2002 and January 2004.

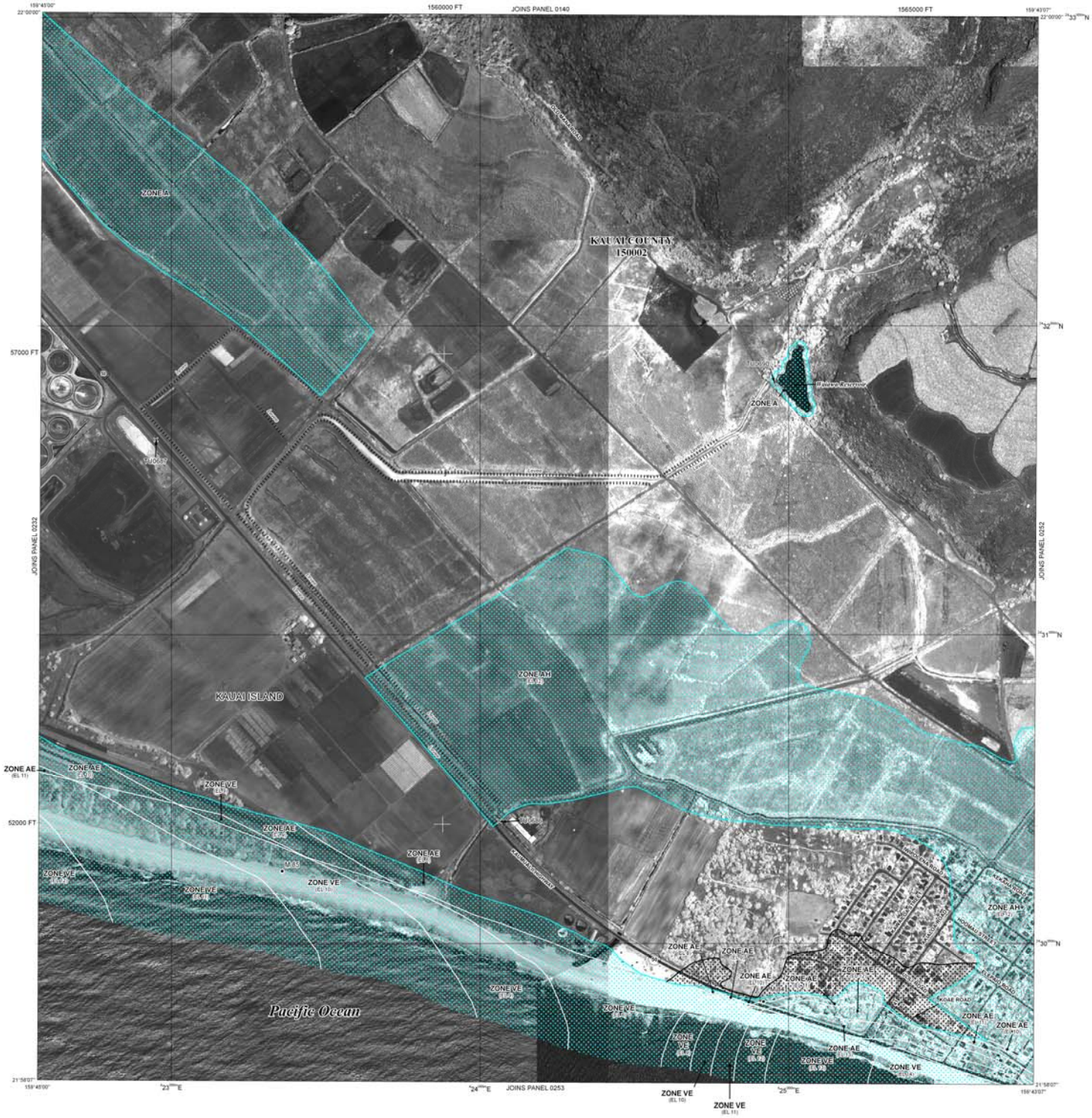
p reflects more detailed and up-to-date **stream channel configurations** se shown on the previous FIRM for this jurisdiction. The floodplains and s that were transferred from the previous FIRM may have been adjusted m to these new stream channel configurations. As a result, the Flood and Floodway Data tables in the Flood Insurance Study Report (which authoritative hydraulic data) may reflect stream channel distances that n what is shown on this map.

te limits shown on this map are based on the best data available at the ublication. Because changes due to annexations or de-annexations may curred after this map was published, map users should contact appropriate ity officials to verify current corporate limit locations.

efer to the separately printed **Map Index** for an overview map showing t of map panels for this jurisdiction.

the **FEMA Map Information eXchange** at 1-877-336-2627 for information ble products associated with this FIRM. Available products may include ly issued Letters of Map Change, a Flood Insurance Study report, and/or ersions of this map. The FEMA Map Information eXchange may also be by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

ve **questions about this map** or questions concerning the National Flood e Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or FEMA website at www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDA BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that ha chance of being equaled or exceeded in any given year. The Special Flood Hazard Are area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard Zones: A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); depths determined. For areas of alluvial fan flooding, velocit determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual flood by a flood control system that was subsequently decertified. indicates that the former flood control system is being restored to protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Feder protection system under construction; no Base Flood El determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be k of encroachment so that the 1% annual chance flood can be carried without substantial in in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flo average depths of less than 1 foot or with drainage areas les 1 square mile; and areas protected by levees from 1% annual chanc

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Area

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zone boundary dividing Special Flood Hazard Areas of differe Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; e in feet*

* Referenced to the LOCAL TIDAL DATUM

A — A — Cross section line

B — B — Transect line

87°07'45", 32°22'30" — Geographic coordinates referenced to the North Ame Datum of 1983 (NAD 83), Western Hemisphere

4000'000"N — 1000-meter Universal Transverse Mercator grid values, zo 4N

600000 FT — 5000-foot grid values: Hawaii State Plane coordinate syst zone 4 (FIPSZONE 5104), Transverse Mercator projection

DX5510 × — Bench mark (see explanation in Notes to Users section o FIRM panel)

● M1.5 — River Mile

MAP REPOSITORY
Department of Public Works, Engineering Division, 3021 Umi Street, Lihue, Hawaii 9
(Maps available for reference only, not for distribution.)

INITIAL NFIP MAP DATE
December 20, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS
December 20, 1977

FLOOD INSURANCE RATE MAP EFFECTIVE
November 4, 1981

FLOOD INSURANCE RATE MAP REVISIONS
March 4, 1987 - September 30, 1995 – October 18, 2002 – September 16, 2005 – November for description of revisions, see Notice to Flood Insurance Study Users page in the Flood Insurance Study report.

To determine if flood insurance is available in this community, contact your Ins agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0251F

FIRM

FLOOD INSURANCE RATE

KAUAI COUNTY,
HAWAII

PANEL 251 OF 500

(SEE MAP INDEX FOR FIRM PANEL LA

CONTAINS

COMMUNITY	NUMBER	PANEL
KAUAI COUNTY	150002	0251

Notice to User: The **Map Number** shown below used when placing map orders; the **Community** shown above should be used on insurance applicat subject community.

MAP NU
150002

MAP RE
NOVEMBER 26

Federal Emergency Management A

APPENDIX G
ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
1	A1	70'	-1'	69'	1500W MZ	5/1*	6	0
3	A7-A9	70'	1'	71'	1500W MZ	5	5	0
7	A10-A11 A2-A6	70'	-	70'	1500W MZ	5	5	0
1	A12	70'	-	70'	1500W MZ	4	4	0
2	A13, A18	70'	1'	71'	1500W MZ	4	4	0
3	A14, A16 A19	70'	3'	73'	1500W MZ	4	4	0
1	A15	70'	2'	72'	1500W MZ	4	4	0
1	A17	70'	3.5'	73.5'	1500W MZ	4	4	0
19	TOTALS					88	88	0

* This structure utilizes a back-to-back mounting configuration

MY PROJECT

Name: **Mana Dragstrip**
Location: Waimea,HI

GRID SUMMARY

Name: **Shoreline Area Spill Grid**
Spacing: 50.0' x 50.0'
Height: 3.0' above grade

CONSTANT ILLUMINATION

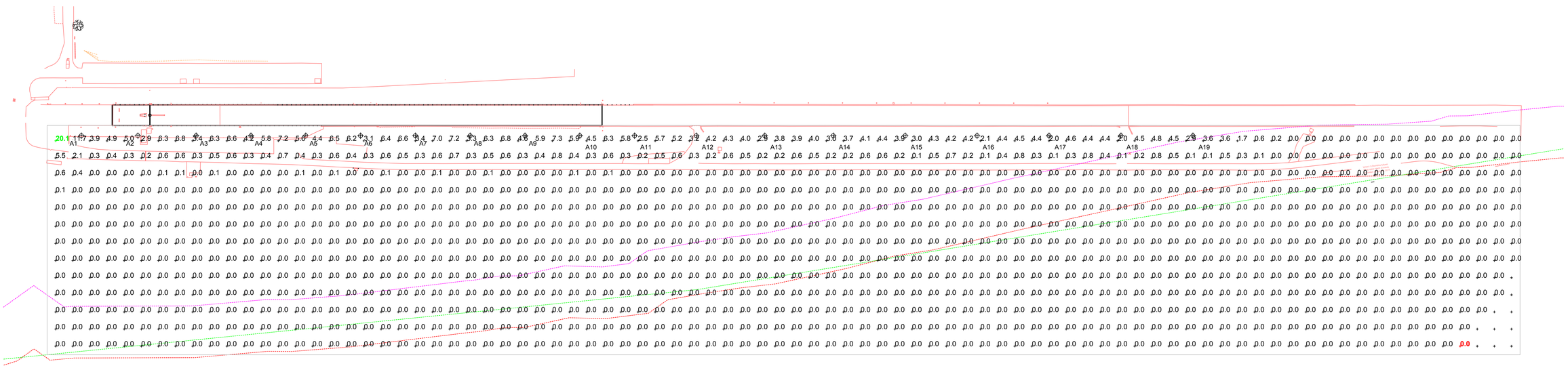
SUMMARY	HORIZONTAL FOOTCANDLES
	Entire Grid
Scan Average:	**0.35**
Maximum:	20
Minimum:	0
Avg / Min:	26971.53
Max / Min:	**1554211.63**
UG (adjacent pts):	28.76
CU:	0.08
No. of Points:	1118
LUMINAIRE INFORMATION	
Luminaire Type:	Green Generation
Design Usage Hours:	5,000 hours
Design Lumens:	134,000
Avg Lamp Tilt Factor:	1.000
No. of Luminaires:	88
Avg KW:	137.63 (149.6 max)

Guaranteed Performance: The CONSTANT ILLUMINATION described above is guaranteed for the design usage hours of the system.

Field Measurements: Illumination measured in accordance with IESNA LM-5-04 and CIBSE LG4. Individual values may vary. See the Warranty document for details.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume +/- 3% nominal voltage at line side of the ballast and structures located within 3 feet (1m) of design locations.



NOTES: This grid shows spill light levels on the shoreline area from 107 fixtures aimed to the track. Grid spacing is 50' x 50'.

SCALE IN FEET 1 : 150
0' 150' 300'

Pole location(s) ✚ dimensions are relative to 0,0 reference point(s) ⊗

ENGINEERED DESIGN

By: Cory Kitzman
File # / Date: 163877D2 11-Sep-15

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APPENDIX H
FINAL REPORT, ARCHAEOLOGICAL INVENTORY SURVEY AND TESTING IN SUPPORT OF LIGHTING AND ELECTRICAL IMPROVEMENTS AT THE MANA DRAG RACING STRIP, WAIMEA AHUPUAA, KONA DISTRICT, ISLAND OF KAUAI, HAWAII

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

November 16, 2015

Adrian Chang
Department of Land and Natural Resources
Engineering Division
Via email:
Adrian.N.Chang@hawaii.gov

LOG NO: 2015.03747
DOC NO: 1511MN11
Archaeology

Dear Mr. Chang:

SUBJECT: **Chapter 6E-8 Historic Preservation Review**
Revised Archaeological Inventory Survey Report – Mānā Drag Racing Strip Improvements
Waimea Ahupuaʻa, Kona District, Island of Kauaʻi
TMK: (4) 1-2-002: 009, 036, 040

Thank you for requesting our review of the revised draft report entitled "*Archaeological Inventory Survey and Testing in Support of Lighting and Electrical Improvements at the Mānā Drag Racing Strip, Waimea Ahupuaʻa, Kona District, Island of Kauaʻi, Hawaiʻi TMK (4) 1-2-002:009, 036, &040;*" S. Collins, S. Clark, K. Shiroma, M. Mintmier, J. Walden, November 2015. We originally received the report in our Kapolei office on July 30, 2015 and requested minor revisions in a letter dated October 30, 2015 (*Log No. 2015.02965, Doc No. 1510MN19*). We received the revised version electronically on November 3, 2015.

At the request of Limtiaco Consulting Group, Inc., the Garden Isle Racing Association, and the Department of Land and Natural Resources (DLNR) Engineering Division, Pacific Consulting Services, Inc. (PCSI) conducted an Archaeological Inventory Survey (AIS) of the subject TMKs in advance of electrical and lighting improvements at the Mānā Drag Racing Strip in Kekaha. The landowner the Department of Land and Natural Resources (DLNR) and the project acreage is 19.67 acres. The project is state-funded and will bring power to the racing strip from Kaumualiʻi Highway (along an access road). The plans include the installation of 26 utility poles and 20 light poles as well as a pad-mounted transformer and underground electrical conduits, to service the strip with stadium-type lighting.

In consultation with the State Historic Preservation Division (SHPD), PCSI developed a survey strategy that included pedestrian survey, as well as a total of 90 auger holes and test trenches along the proposed utility corridors. No archaeological materials or features were identified during the survey, and the AIS is termed an Archaeological Assessment (AA) due to negative findings. Despite negative findings, PCSI recommends archaeological monitoring within the project area due to the predominance of the soil type Jaucas sand (Js), which often contains subsurface cultural material, and/or human remains. We concur with this recommendation.

The AIS contains the requested revisions and is approved, in accordance with HAR§13-276. Please send one hard copy of the report, clearly marked FINAL, along with a text-searchable CD to the Kapolei office. Please send one hard copy of the final report to the Kauaʻi section. Please contact Kauaʻi Lead Archaeologist Mary Jane Naone at (808) 271-4940 or Maryjane.Naone@hawaii.gov for questions regarding this letter. Mahalo for your assistance in preserving significant historic and cultural properties.

Aloha,

Mary Jane Naone

Mary Jane Naone
Kauaʻi Lead Archaeologist

Mr. Chang
November 16, 2015

cc.
Sara Collins, Principal Investigator
Pacific Consulting Services, Inc.
Sara.Collins@pcsihawaii.com

Steve Clark, Archaeologist
Pacific Consulting Services, Inc.
Steve.Clark@pcsihawaii.com

Kyle Kaneshiro, Project Manager
The Limtiaco Consulting Group, Inc.
kyle@tlcghawaii.com

Tony Ricci, President
Garden Isle Racing Association
atmkauai@aol.com

FINAL REPORT

Archaeological Inventory Survey and Testing in Support of Lighting and Electrical Improvements at the Mānā Drag Racing Strip, Waimea Ahupuaʻa, Kona District, Island of Kauaʻi, Hawaiʻi

TMKs: (4) 1-2-002: 009, 036, & 040

Prepared for:

The Limtiaco Consulting Group, Inc.
1622 Kanakanui Street
Honolulu, Hawaii 96817

November 2015

PACIFIC CONSULTING SERVICES, INC.

720 Iwilei Road, Suite 424, Honolulu Hawaii 96817

FINAL REPORT
Archaeological Inventory Survey and Testing
in Support of Lighting and Electrical Improvements at the Mānā Drag Racing Strip
Waimea Ahupuaʻa, Kona District, Island of Kauaʻi, Hawaiʻi
TMK (4) 1-2-02: 009, 036, & 040

Prepared by
Stephan D. Clark, B.S.
Katharine A. Shiroma, B.A.
Melanie A. Mintmier, Ph.D.
Jackie Walden, B.A.

Sara Collins, Ph.D.
Principal Investigator

Prepared For:
The Limtiaco Consulting Group, Inc.
1622 Kanakanui Street
Honolulu, HI 96817

Prepared by
Pacific Consulting Services, Inc.
720 Iwilei Road, Suite 424
Honolulu, HI 96817

November 2015

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INTRODUCTION

At the request of The Limtiaco Consulting Group, Inc. (Limtiaco), Pacific Consulting Services, Inc. (PCSI) has conducted an Archaeological Assessment (Archaeological Inventory Survey with negative findings) in support of proposed lighting improvements to the Mānā Drag Racing Strip (MDRS) on Kaua‘i Island, Hawai‘i (Figure 1). This report has been prepared in compliance with Hawaii Revised Statutes (HRS), Chapter 6E, and Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13 (State Historic Preservation Division Rules), Chapter 276 (*Rules Governing Standards for Archaeological Inventory Surveys and Reports).* The proponents of this project include the Limtiaco Consulting Group, Inc., the Garden Isle Raceway Association, and the Engineering Division of the Department of Land and Natural Resources. The DLNR, Engineering Division is funding the project.

PROJECT AREA LOCATION AND DESCRIPTION

The MDRS project area is located on the leeward side of Kaua‘i, within Waimea Ahupua‘a (a traditional Hawaiian land division unit) in Kona District. It is located just south of Kaumuali‘i Highway (Hwy 50) and south and east of the Pacific Missile Range Facility (PMRF) (see Figure 1). The MDRS project acreage is 19.67 acres. Tax map keys (TMKs) for the parcels in which the project area is located are as follows: (4) 1-2-02: 009, 036, and 040. The landowner is the State of Hawaii, Department of Land and Natural Resources (DLNR).

The purpose of this State-funded project is to bring electricity and lighting to the Mānā Drag Racing Strip (MDRS). The Kaua‘i Island Utility Cooperative (KIUC) will bring power to the track from Kaumuali‘i Highway (along an access road) and install a new pad-mounted transformer (XFMR). New stadium-type lighting along the south side of the MDRS will illuminate the drag racing strip.

This work will include the installation of approximately 26 utility poles (for overhead power lines) along the right side of the access road, and along the north side (*mauka*-inland or toward the mountains) of the MDRS for approximately half of the racing strip’s length. The utility poles will be installed every 150.0 to 200.0 feet (ft or 45.7 to 61.0 meters [m]). No conduit trenches are required for the overhead power lines. The trenches for the utility poles, however, will be 5.0 to 10.0 ft (1.5 to 3.0 m) deep.

A maximum of 20 light poles (for overhead stadium-type lights) will be installed along the south side of the drag racing strip, with associated underground electrical conduits between each light pole. The light poles will be installed every 150.0 to 200.0 ft, and approximately 2,250 linear ft (686.0 m) of subsurface electrical conduit will be installed between the light poles along the racing strip. Trenches for the electrical conduit will be approximately 2.0 ft (0.60 m) deep.

In addition to the utility poles, light poles, and underground electrical conduit trenches, approximately 125 linear ft (38.1 m) of concrete duct bank, 3.0 ft (0.90 m) deep, will cross the track on the west end of the MDRS near the burn-out box. Trenches for the installation of electrical pull boxes/handholes and a pad-mounted XFMR will also be provided for the installation of the electrical and lighting system.

ENVIRONMENTAL SETTING

The project area is situated on the southern end of the Mānā Plain, a flat sandy plain consisting of alluvium, beach and dune sands, lagoon clays, and marls (calcium carbonate-rich soil with varying amounts of silt and clay). Over the years, heavy disturbances have occurred on the plain as a result of agricultural modifications, military construction, and vegetation clearing (Drolet 1997a, 1997b, 1997c).

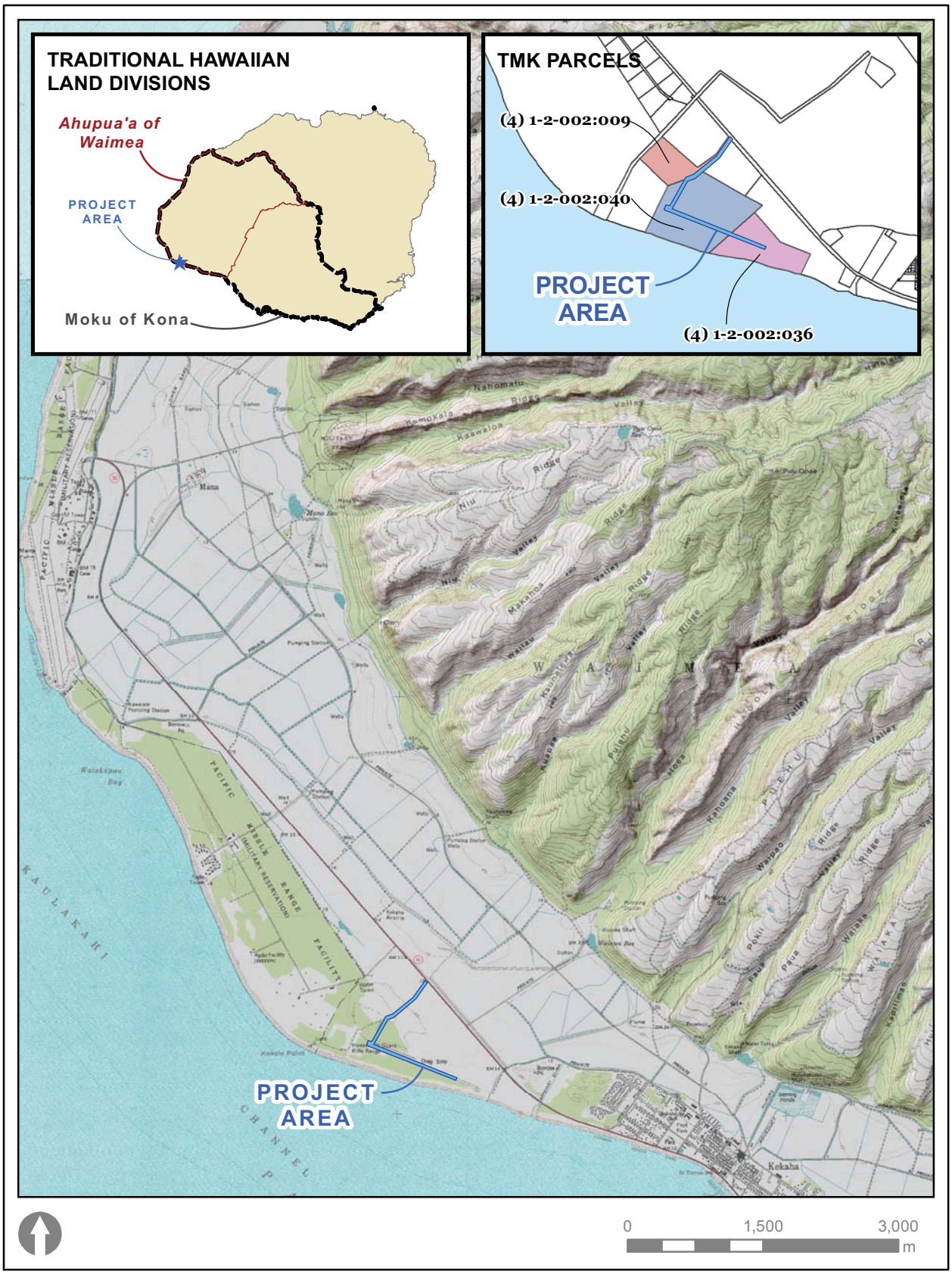


Figure 1. Location of the Mānā Drag Strip Project Area on an Enlarged 1:24000 U.S.G.S. Quadrangle Map, Kekaha (2012).

TOPOGRAPHY, GEOLOGY, & SOIL FORMATION

Kaua‘i, one of the older Hawaiian Islands, is 33 miles (mi) long and 25 mi wide (553 square mi) (Pukui et al.1974). The island consists of a variety of climates and variations in topography. Bennett (1931) states that the western portion of Kaua‘i consists of the Mānā Plain (dry and sandy) and the wet Waimea valley, the southern and eastern portions have ample rainfall, while the northwest Nāpali area consists of high bluffs and rocky coasts.

The Mānā Plain is a low-lying landform on the western, leeward coast, and includes an extensive wetland area a short distance from shore. Soils in the project area consist of Beaches (BS), coarse sand, Fill Land (Fd), silty clay, and Jaucas (JfB) loamy fine sand (USDA 2012) (Figure 2). Beaches are comprised mostly of light-colored sands derived from coral and seashells; these soils are used for recreation and resort development. Fill lands consists of areas mostly filled with bagasse (the fibrous by-product of sugar production) and slurry from sugar mills. This type of fill land tends to be found in low lying areas along the coast and is used mostly for sugarcane agriculture. Jaucas sands are excessively drained, calcareous soils that occur on coastal plains. These soils develop in wind- and water-deposited coral sands; the slope range is 0 - 8 percent. These soils occur on old beaches and sand dunes, and are used for pasture, recreational areas, wildlife habitat, and sugarcane (Foote et al. 1972).

RAINFALL AND HYDROLOGY

Despite receiving only 19.7 inches per year (Giambelluca et al. (2013), the Mānā Plain includes extensive wetlands. This is because the nearby Mount Wai‘ale‘ale area averages more than 449.0 inches per year, causing considerable flow into the streams of Waimea Valley and down into the wetlands of the Mānā Plain.

VEGETATION

Vegetation in this area consists of exotic grasses, *kiawe* (*Prosopis pallida*), *koa haole* (*Leucaena leucocephala*), and the native *naupaka* (*Scaevola taccada*) (Wagner et al. 1990).

HISTORICAL BACKGROUND

This section provides background information that focuses on the Mānā Plain, where the project area is located. Background information includes legends explaining the meaning associated with the Mānā Plain; traditional land use by Hawaiians; historical land use (roughly the 1800s); and 20th century land use (1900s). Research methods included the investigation of archaeological reports, books on place names in Hawai‘i, and historical books and articles.

Before presenting this background review, it is important to note the meanings of two relevant place names: Kekaha and Waimea (the *ahupua‘a* in which Kekaha is located). Kekaha literally means “the place” (Pukui et al. 1974:106). Perhaps a rather ambiguous literal meaning – “the place”; no doubt it possessed some critical referent (and likely still does today). Waimea, on the other hand, literally means “reddish water” (Pukui et al. 1974:226), a more obvious moniker.

LEGENDARY HISTORY

A thorough search of literary sources found no mention of the place name “Kekaha,” although the Mānā Plain is associated with several traditional stories. One story describes the Mānā Plain as the place where the older sister of Pele, Na-maka-o-Kaha‘i (the eyes of Kaha‘i), introduced *kauna‘oa* dodder (*Cuscuta sandwichiana),* a plant with small yellow to yellowish orange flowers used for making *lei* (garland of flowers) and medicines (Pukui et al. 1974; Wagner et al. 1990).

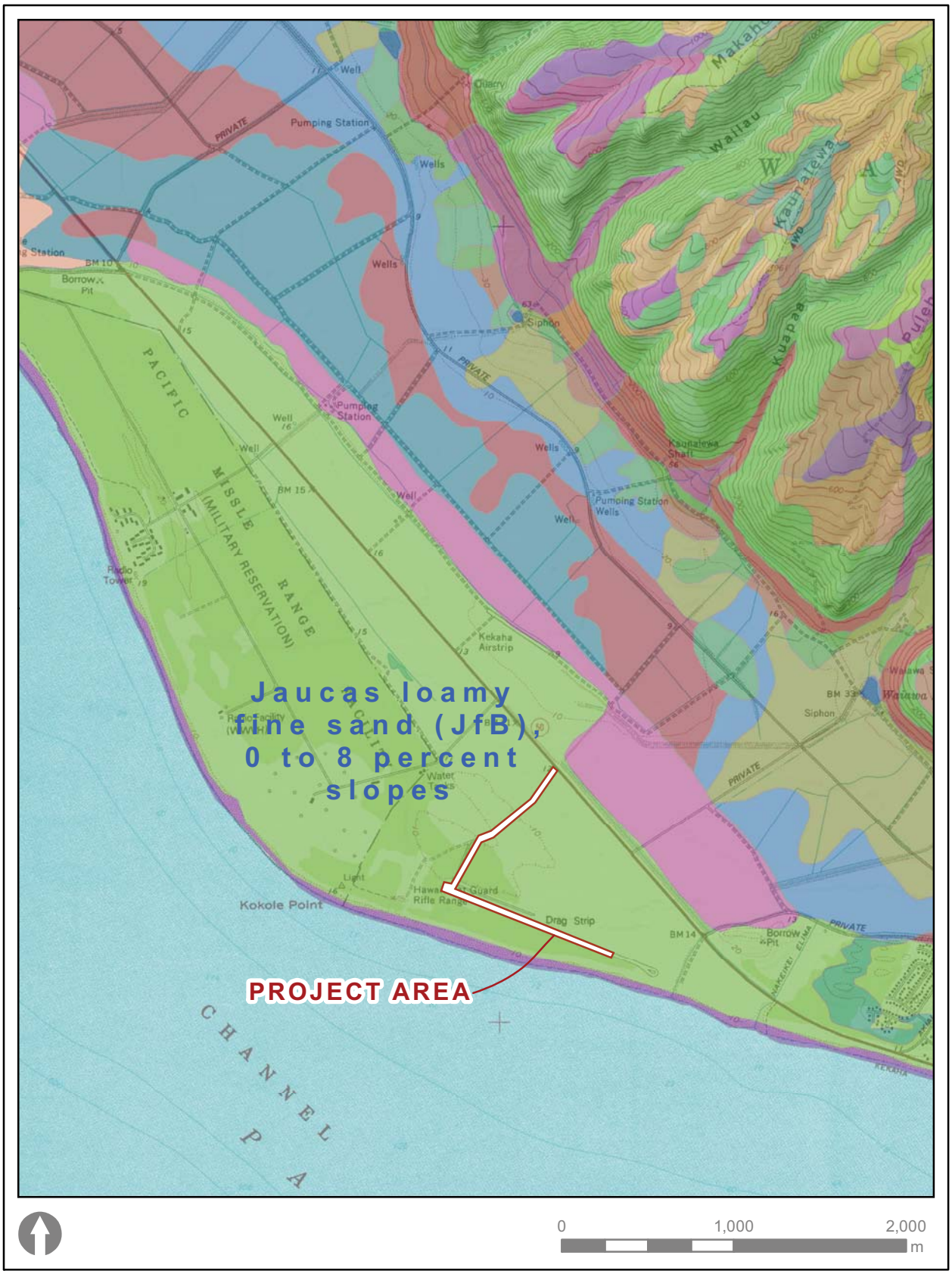


Figure 2. Soils in the Mana Drag Strip Project Area.

Another legend explains that Ke-one-kani-o-Nohili, the traditional place name for Barking Sands, was known in the Waimea district as the sounding sand of Nohili (Pukui et al. 1974). Wichman (1998) describes the legend of a fisherman, Nohili, who lived near the beach with nine dogs. When he canoed out to sea he tethered the dogs, tying three each to three sturdy pegs. After an exhausting fishing trip during a bad storm, he forgot to untie the dogs. He awoke the next day, to find the dogs gone. In place of the three sturdy pegs he found three small mounds of sand. When he stepped on a mound, he heard a low bark. Nohili thought that his dogs had been buried, so he began to dig. To his dismay he only discovered more sand. The fisherman finally gave up, and every day since when he crossed the beach, he could hear the low barking of dogs.

TRADITIONAL LAND USE

Traditional land use within the Mānā wetlands lands consists primarily of taro cultivation. Handy and Handy (1972) and Pukui (1983) describe the unusual way that taro was cultivated in these fresh water marshes:

> Within memory of living residents wet taro was grown in the swampy ground at the northern end of the Mana marsh, and there is a tradition that formerly taro was grown on "rafts" which were floated on the marshes themselves (Handy and Handy 1972:411).
>
> A few hundred yards east of Limahuli Stream there is a swampy area where taro was grown in a unique way that was practiced only here and in the marshes of the Mana and Waiʻeli, west of Kekaha. Swamp was piled up on rafts that were partly submerged, probably resting on the soft bottom of the swamp, and in the earth on these rafts wet taro was planted (Handy and Handy 1972:419).
>
> Mānā, i ka puʻe kalo hoʻoneʻeneʻe a ka wai. *Mānā, where the mounded taro moves in the water.* Refers to Mānā, Kauaʻi. In ancient days there were five patches at Kolo, Mānā, in which deep water mound-planting was done for taro… The farmers built rafts of sticks and rushes, then dived into the water. They worked the bases of the taro mounds free and lifted them carefully, so as not to disturb the soil, to the rafts where they were secured. The weight of the mounds submerged the rafts but permitted the taro stalks to grow above water just as they did before the flood came. The rafts were tied together to form a large, floating field of taro (Pukui 1983: 232-233).

It is important to mention that this rare agricultural technique is not limited to the island of Kauaʻi. For example, a similar technique was practiced in Mexico, in the Chalco and Xochimilco lakebeds, known as *chinampas* (floating gardens). *Chinampa* agriculture dates back approximately to the 12th and 14th centuries. In general, *chinampas* are rectangular fields measuring 2 to 4 m wide and 20 to 40 m long, surrounded on three or four sides by canals. This type of agriculture helped maintain soil fertility, soil moisture, and year-round cultivation (Popper 2010).

The marshy lands of the Mānā Plain formed a suitable habitat for a variety of animals, including fish, shellfish, and a diversity of birds, as well as an assortment of vegetation, making this area rich in natural resources. The diverse environment of Waimea Ahupuaʻa also served to provide early populations with a variety of food resources and habitation settings. In 1789 Captain George Dixon described Kekaha's dryland cultivation of sweet potatoes, gourds, and coconuts (Handy and Handy 1972).

HISTORICAL LAND USE

The Organic Acts of 1845 and 1846 initiated the Māhele, which introduced private property rights by authorizing the sale of Hawaiian lands in fee simple.

> The old feudal arrangement of joint and undivided ownership had given place to the system of individual allodial tenures, and aliens had been admitted to the enjoyment of the same rights as Hawaiian subjects in the ownership and use of land (Kuykendall 1967:298).

After a search of Māhele records and historic maps, it was determined that there were less than 27 Land Commission Awards (LCAs) granted in Waimea Ahupuaʻa. None of the LCAs were situated near the project area.

The land tenure in Mānā and Kekaha changed after the Māhele. In the 1850s, Archibald Archer and his partner were granted a 30-acre lease on lands in Pokoiʻi, Kekaha, and Mānā. Archer and his partner attempted to grow tobacco, but were unsuccessful. Shortly thereafter, Kamehameha IV appointed Norwegian immigrant Valdemar Knudsen as the local manager of the Crown Lands in the Waimea area (Figure 3). Under Knudsen's direction, the Mānā Plain began producing rice and sugar cane.

In 1898, Kekaha Sugar Company was formed, beginning the expansion of sugar production (Condé and Best 1973:141). The marshy lands on the Mānā Plain were drained and converted into agricultural lands for the Kekaha Sugar Company (Handy and Handy 1972). In the early days, all water for irrigation was pumped from springs located around Kekaha. As early as 1881, G. N. Wilcox began conducting surveys to bring water from the mountains, and in 1884 H. P. Faye drilled artesian wells on the Mānā Plain. Sugar workers completed the building of irrigation ditches and dug artesian wells in order to bring water to arid lands. As a result, 2,000 to 3,235 acres were reclaimed by 1931 and used for growing sugar cane (Saito and Campbell 1986).

TWENTIETH CENTURY LAND USE

In 1910, the Kekaha Sugar Company had built 15 miles of railroad tracks and had two locomotives. Sugar cane was transported by flume from the *mauka* (inland) fields to collection points on the railway. The nine-roller mill at the factory produced 80 tons of sugar a day and the sugar bags were sent by rail to the steamship landing at Waimea (Saito and Campbell 1986:3). By the 1930s, Kekaha's agricultural lands comprised over 7,000 acres and had always been leased from the government. The lease required renegotiations every 15 to 35 years, depending on the terms of the existing lease.

By the 1940s, the Kekaha Sugar Company had transitioned to mechanical harvesting of sugar, and by 1947 trucks had replaced the railway system. During World War II, due to a shortage of manpower, schools in Waimea and Kekaha provided work-for-victory teams of students to help on the plantation. Other war work included The Red Cross, Kauai Volunteers, the United States Organization USO (United States Organization), and truck farming. At the end of the war, in 1945, the International Longshore and Warehouse Union (ILWU), Local 149 Unit 9, was formed at Kekaha Sugar Company (Saito and Campbell 1986:3).

The Kekaka Sugar Company used lands in the current project area for pasture and holding pens for cattle and horses owned by the sugar company. In later years, the land became a dumping area for bagasse (Ching 1982:2). In 2000, the Kekaha Sugar Mill closed.

Currently, the project area is owned by the State of Hawaii, DLNR, and is leased to the Garden Isle Racing Association. Figure 4 presents two aerial photographs (University of Hawaii 2013), taken in 1950 and 1975. In the 1950 aerial photograph the Mānā Drag Racing Strip is not present. The photograph shows agricultural fields in the vicinity of the drag racing strip. The drag strip, however, is clearly visible in the 1975 aerial photo in Figure 4. According to Mr. Tony Ricci, President of the Garden Isle Racing Association, construction of the Mānā Drag Racing

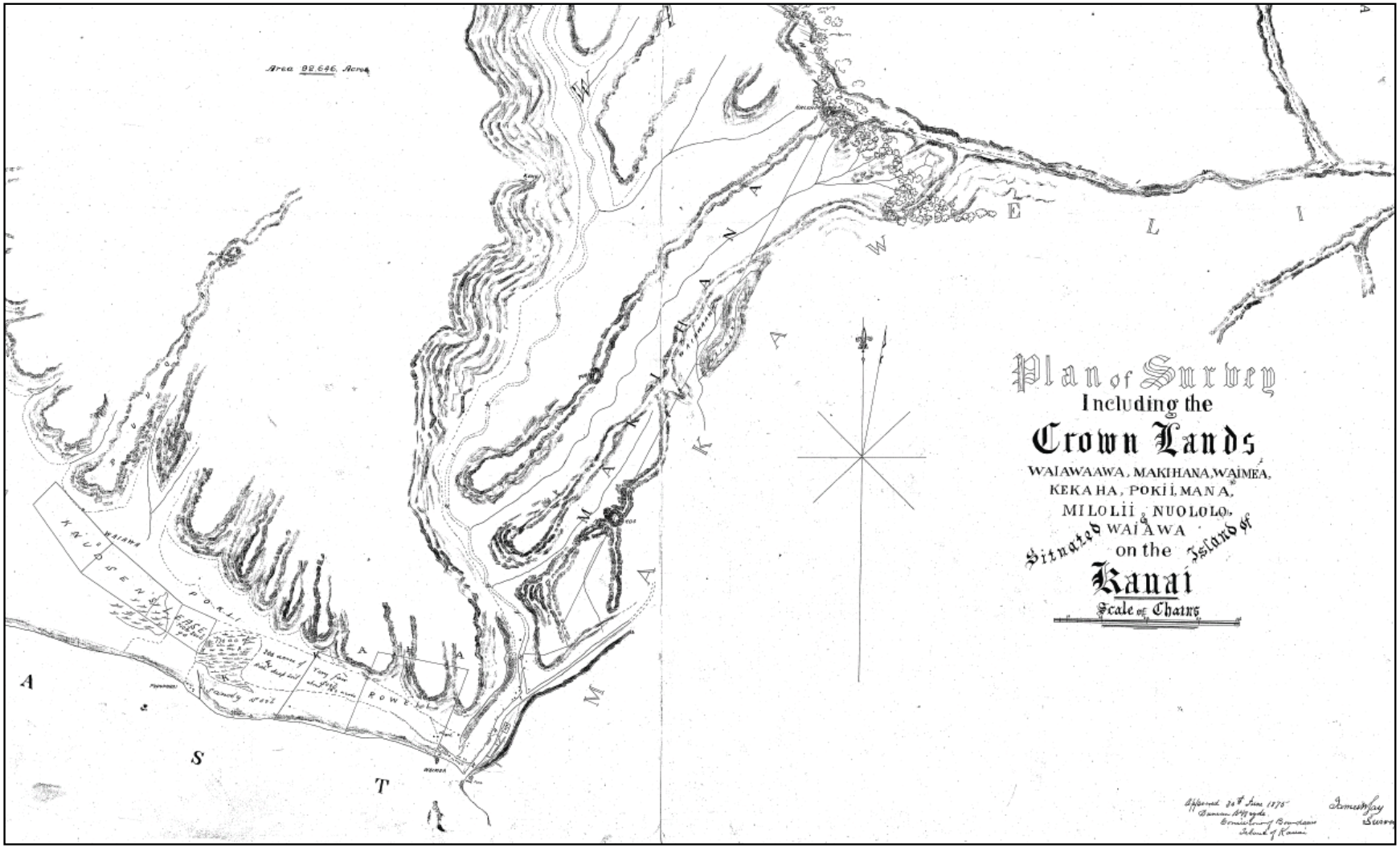
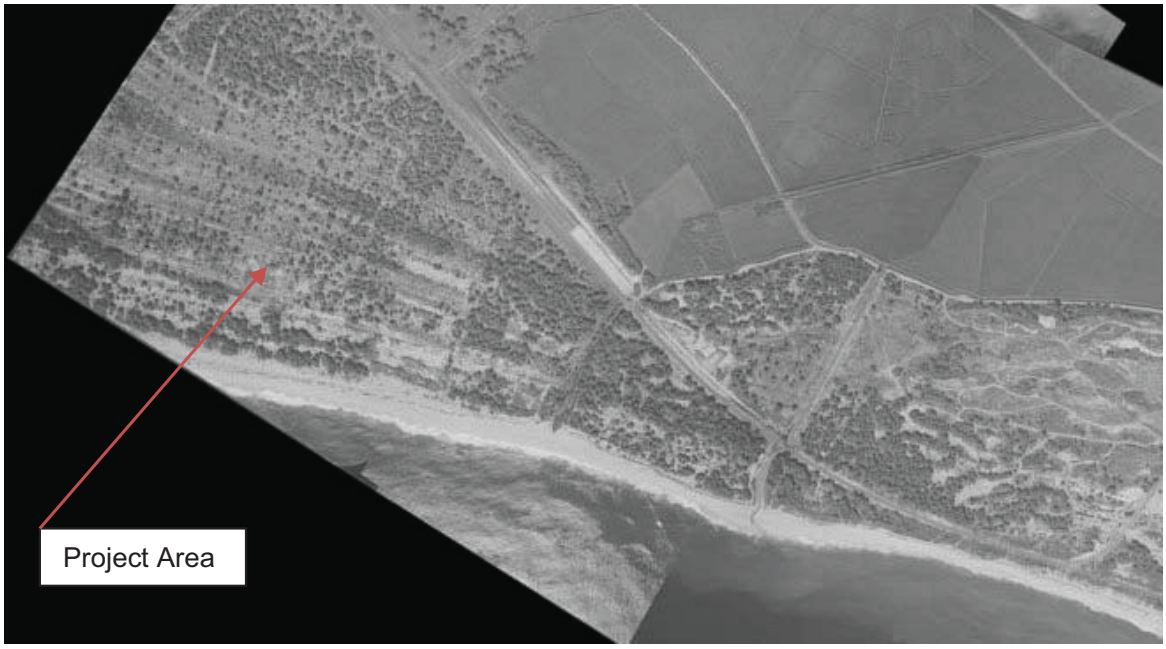
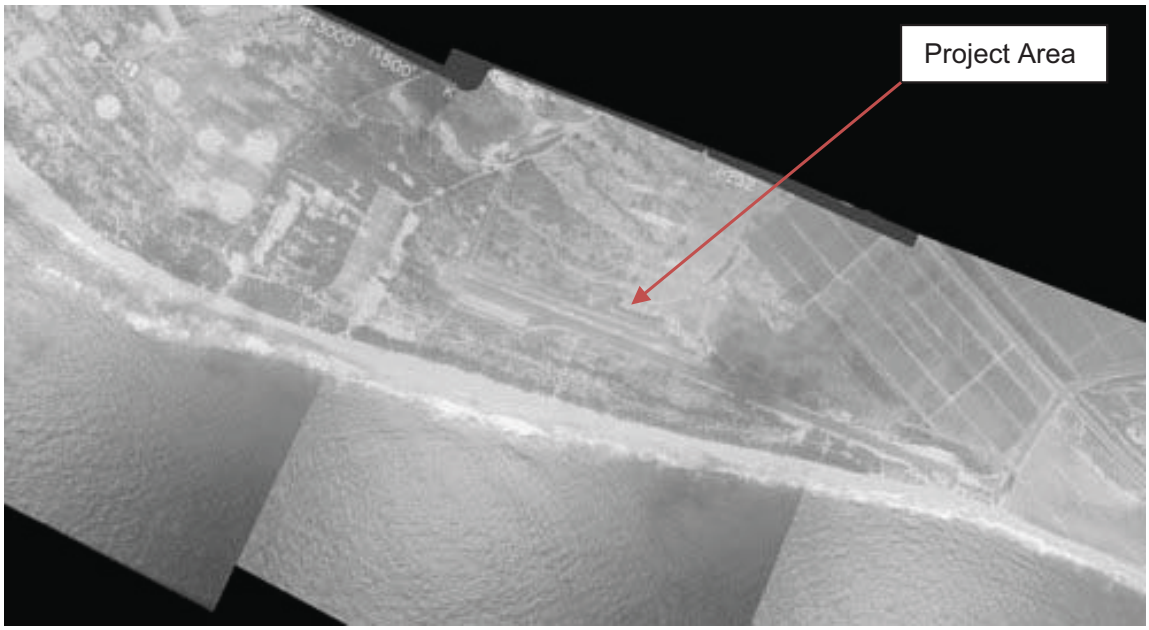


Figure 3. 1874 Map Showing Crown Lands Leased to Knudsen (State of Hawaii Land Division Survey 2014).



1950 Photograph



1975 Photograph

Figure 4. Aerial Photographs Illustrating Land Use in the Project Area in 1950 and 1975 (University of Hawaii).

Strip began in 1969 and was completed in 1971 (Personal communication from Tony Ricci; March 13, 2015). Based on the 1971 completion date provided by Mr. Ricci's, the Mānā Drag Racing Strip is approximately 44 years old.

PREVIOUS ARCHAEOLOGICAL STUDIES

There have been several previous archaeological studies conducted near or within portions of the current project area, namely Ching (1982), McMahon (1988), Folk and Hammatt (1993), and Watanabe et al. (2014a). Table 1 shows relevant previously recorded archaeological sites. These studies are summarized in this section and are geographically represented on Figure 5.

Table 1. Previous Archaeological Studies within 500m of the Project Area.

Reference	TMK/Location	Nature of Study	SIHP Sites	Summary of Results
Ching 1982	(4) 1-2-002:001, 009, 040	Archaeological Reconnaissance	None	No archaeological sites or artifacts were discovered.
McMahon 1988	(4) 1-2-002:040	Field Check	None	No archaeological sites or artifacts were discovered. Recommend Monitoring
Folk and Hammatt 1993	(4) 1-2-002:009	Archaeological Inventory Survey	None	No archaeological or historic sites or artifacts were discovered.
Watanabe et al. 2014a	(4) 1-2-002: 001, 009, 035, 036, 040	Archaeological Monitoring	None	No archaeological or historic sites or artifacts were discovered.

Ching (1982) conducted an archaeological reconnaissance for the proposed Kaua'i central sanitary landfill project in Kekaha. No archaeological sites or artifacts were encountered during his study. Ching indicated that the lands in his project area were modified in the 1930s by the sugar plantation and others, and that a large fishpond was drained for sugar cane agriculture. Possible archaeological sites expected were fishing shrines, fishing shelters, and burials, but none of these site types were encountered. Burials were expected in sand dunes that have not been too disturbed or modified, but the sand dunes were out of project area (Ching 1982:2). The author recommended that no further archaeological studies were required in his project area.

McMahon (1988) conducted a field check of 132 acres of land that were densely covered with California grasses and *koa hoale* (*Leucaena leucocephala*), as well as being riddled with modern trash. Due to the dense vegetation, the field check had an inconclusive finding. The surface coral sands in beach areas were visible and the possibility for burials seemed to be high. The author recommended monitoring for activities near the coastal area.

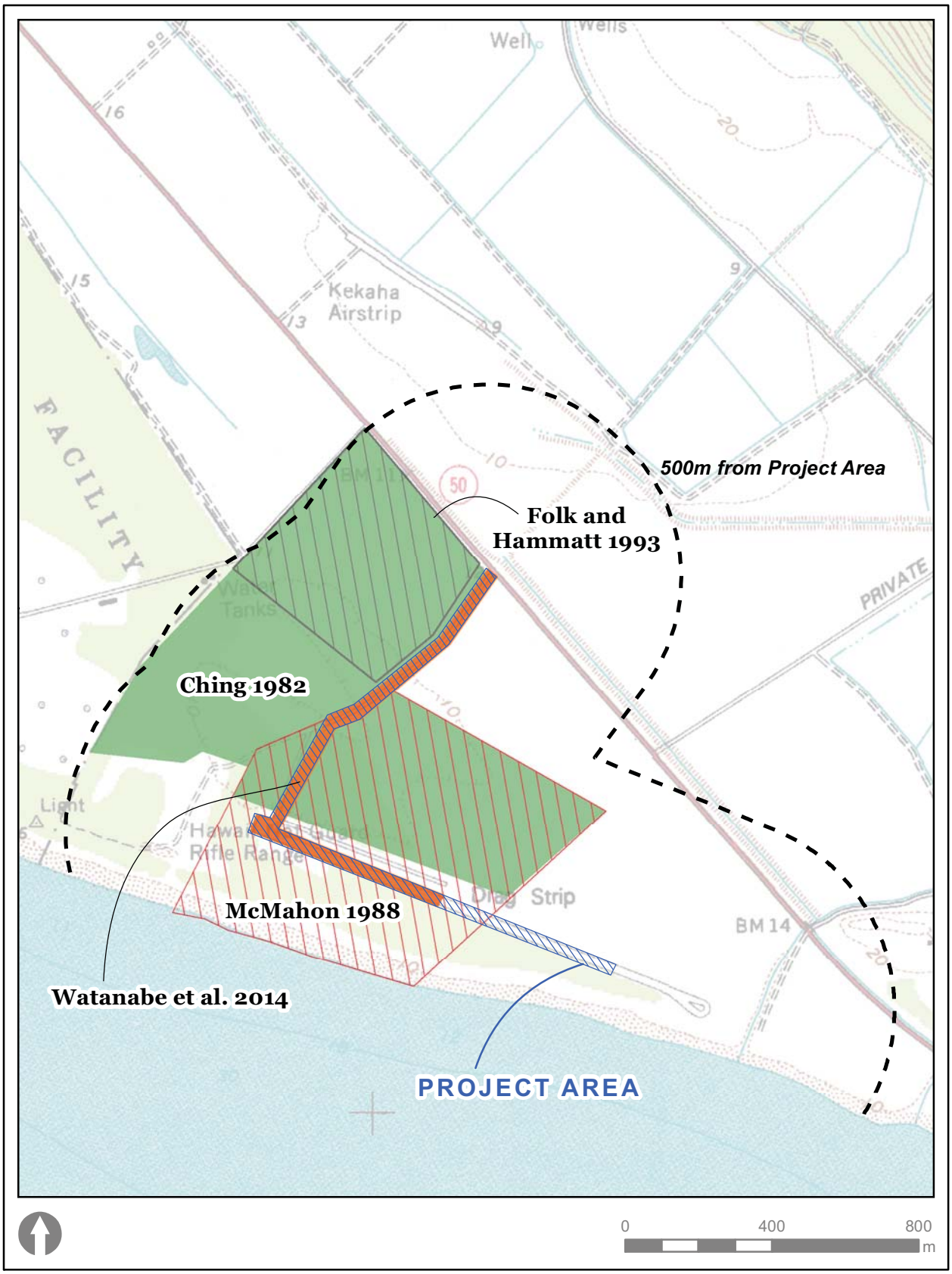


Figure 5. Locations of Previous Archaeological Studies within 500m of the Mana Drag Strip Project Area.

Folk and Hammatt (1993) conducted an archaeological inventory survey for the Kekaha Phase II Landfill Site. Excavation of 55 trenches was conducted with a backhoe; the trenches were a minimum of 10 feet in length and had varied depths. Two features constructed in the 1950s ran though the project area: a low linear mound and an irrigation canal. The low linear mound occurred after the removal of sand from the dunes. No significant historic or cultural artifacts or archaeological sites were discovered during Folk and Hammatt's survey. No further archaeological study for this project was recommended.

Watanabe et al. (2014a) conducted archaeological monitoring for improvements to the drag strip. Their project area overlays a significant portion of the current project area (see Figure 5). Ground disturbing activities were limited to relatively shallow depths--30.0 to 38.0 centimeters below surface (cmbs) and exposed two fill layers and one in situ layer. No significant historic or cultural artifacts or archaeological sites were discovered during monitoring. However, because of the shallowness of the ground-disturbing activities, the commonality of Hawaiian burials in sand dunes, and nearby cultural deposits around 50.0 to 75.0 cmbs, Watanabe et al (2014) strongly recommended archaeological monitoring for any future ground disturbing activities deep enough to penetrate the Jaucas dune sand deposit in the project area.

PREVIOUS ARCHAEOLOGICAL STUDIES IN THE SOUTHERN PORTION OF THE PMRF

Numerous archaeological studies have been conducted north of the current project area, within, and near, the Pacific Missile Range Facility (PMRF). For detailed information regarding previous investigations at PMRF see Carson (2007), Drolet (1997a, 1997b, 1997c, 1999), Gonzalez et al. (1990), McGerty and Spear (1997), SEARCH (2014), and Sweeny (1994). Table 2 lists the relevant previously recorded historic properties and traditional cultural properties (TCP) in the PMRF. Figure 6 illustrates the locations of the previous archaeological studies and known historic properties in the PMRF.

Table 2. Historic Properties and Traditional Cultural Properties in the Project Area.

SIHP* Site Number [50-30-05-] / Place Name	Topographic Location	Site Description	Site Function	Reference
1834	Barking Sands Dune	Burials (boundaries not determined)	Burial	Bennett (1931);Drolet et al. 1996; Tomonari-Tuggle and Yoklavich (2005)
2002	Barking Sands	Fence posts / grate / barbed wire	Enclosure (1)	SEARCH (2014)
2003	Barking Sands Dune	Trash Deposit	Dump / Beach Encampment	Wulzen and Jensen (1995); Tomonari-Tuggle and Yoklavich (2005)
2011	Barking Sands	Wooden Structure / Trash Deposit	Housing Complex	SEARCH (2014)
4016	Barking Sands Dune	Fire Pit	Habitation	Sweeny (1994); Tomonari-Tuggle and Yoklavich (2005)

Table 2. Historic Properties and Traditional Cultural Properties in the Project Area.

SIHP* Site Number [50-30-05-] / Place Name	Topographic Location	Site Description	Site Function	Reference
0721/ Kawaiʻeli	Barking Sands	Marsh / Fishpond / Ditch	Habitation / Agriculture	SEARCH (2014); Tomonari-Tuggle and Yoklavich (2005)
Waiokapuaʻa	Barking Sands	Beach / Bay / Point	NA	SEARCH (2014)
Waiolono	Barking Sands	Beach	NA	SEARCH (2014)
Kokele	Barking Sands	Point	NA	SEARCH (2014)
2272	Barking Sands	Two historical concrete brick and mortar structures	Military Defensive Infrastructure	Clark et al. (2015)

*Statewide Inventory of Historic Places

Site 1834, recorded as a Pre-Contact - traditional Hawaiian site, was reported to be a 10-acre burial site, found by base personnel in 1987 along the beach, just north of Waiokapua Bay (see Figure 6) (Drolet et al. 1996; Search 2014:154). The report of human remains has not been confirmed by archaeological investigation (SEARCH 2014: 154; Tomonari-Tuggle and Yoklavich 2005).

Site 2002 has been recorded as a possible World War II-era or post- World War II-era fence associated with nearby housing. This site includes 5 metal barbed wire fence posts, 1 metal grate, and 1 loose bundle of barbed wire (SEARCH 2014:168).

Site 2003 has been classified as a plantation period trash deposit. This site consists of deteriorated metal / wood / rubber associated with automobiles, appliances, and miscellaneous household items. The trash deposit is located east of the SE corner of “Hale Kai” officer’s cottage (SEARCH 2014:165; Wulzen and Jensen 1995:B-4). Site 2011 includes surface ruins of a possible World War II-era or post- World War II-era training structure (Fe. A) and a recent trash deposit (Fe. B) (SEARCH 2014:169).

Site 4016, a Pre-Contact traditional Hawaiian site, is a fire pit exposed at 85 centimeters below surface in a 27-m-long backhoe trench. It is located on the north side of Waiokapua Bay. The fire pit occurred at the interface of two layers, neither of which contained evidence of cultural use. A charcoal sample from the fire pit yielded a radiocarbon date ranging from the twelfth to the fourteenth century (SEARCH 2014:153; Sweeney 1994:33-34).

Site 0721/Kawaiʻele is recorded as a traditional Hawaiian archaeological site, a TCP, and a Plantation-period archaeological site. Kawaiʻele is the name of a beach, point of land, fishing grounds, ditch, and swamp located in south-central PMRF-Barking Sands. This TCP is associated with numerous legends and traditions associated with mirages seen in this area. Kawaiʻele Pond was used as a fishpond in the early historic period and presumably in the pre-Contact era. Kawaiʻele Ditch as it exists today is a late nineteenth century construct with twentieth century alterations. It has also been said that an original form of the ditch was constructed by the *menehune*, (a legendary race of small people who worked at night building fishponds, roads, and temples) (SEARCH 2014:162).

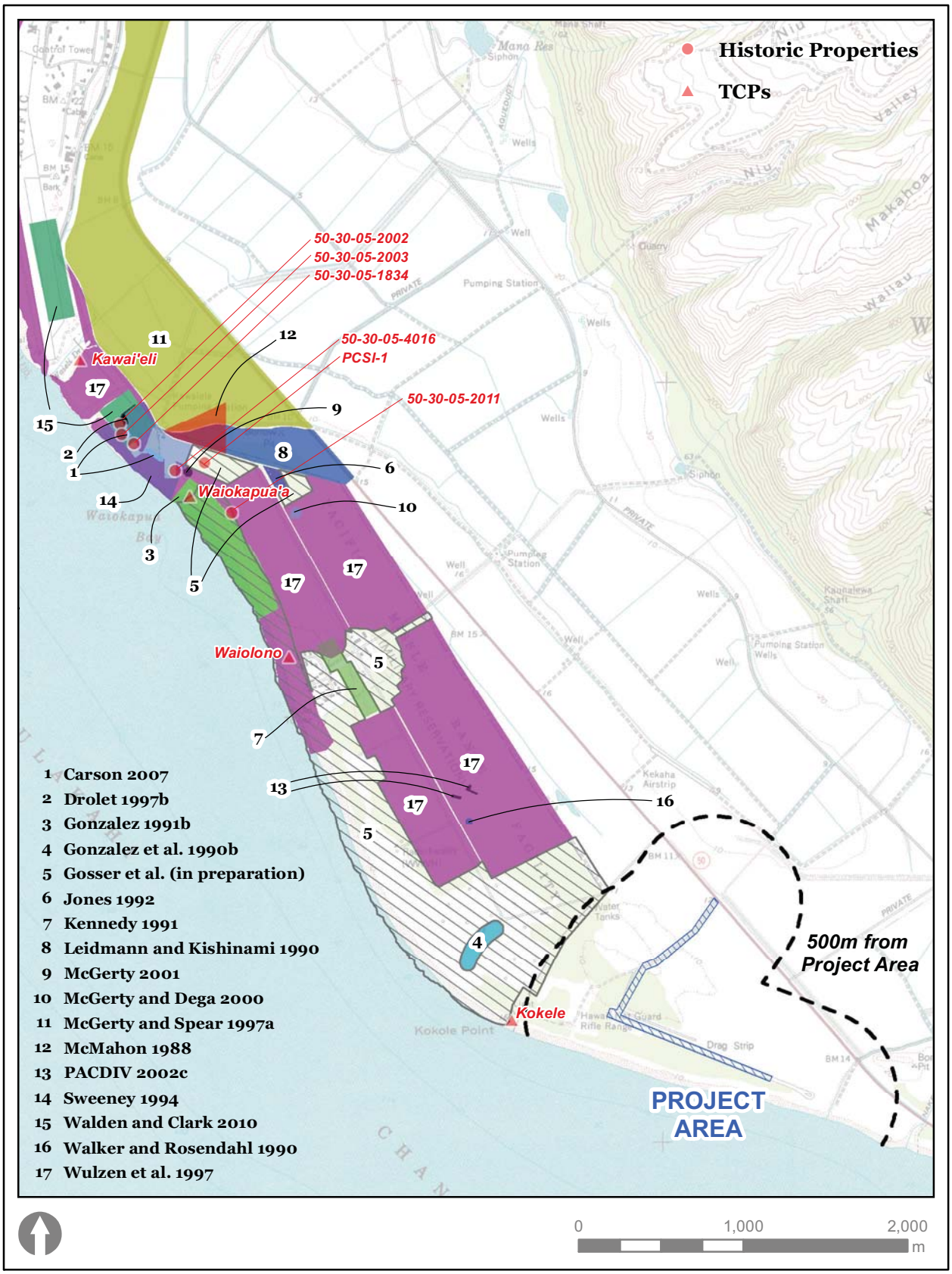


Figure 6. Locations of Previous Archaeological Studies, Known Historic Properties, and TCPs in the Southern Portion of the Pacific Missile Range Facility (PMRF).

Waiokapua‘a, a TCP, is known as a beach/bay/point located in the southern portion of PMRF. There are no known traditions and the literal translation is “water of the pig” (Flores and Kaohi 1992:22; SEARCH 2014:160).

Waiolono, a TCP, is recognized as a beach and a point of land located in the southern portion of PMRF. The beach is known for having “tapa tearing sand crabs” and the marshy inland area (Limaloa), which is fed by a fresh water spring, is known for mirages. The literal translation for this area is “water of Lono” (Flores and Kaohi 1992:22; SEARCH 2014:160).

Kokele, a TCP, is a point located at the southern boundary of PMRF. There are no known traditions recorded for this area. The literal translation is “any food crop stunted by weeds or drought” (Flores and Kaohi 1992:18; SEARCH 2014:160).

Clark et al. (2015) recently completed Archaeological Inventory Survey fieldwork, including surface survey, test excavations (21 shovel test units and 40 backhoe trench units), and controlled excavation (three units placed at a newly documented site). One World War II era site, Site 50-30-05-2272, was recorded, and consisted of two concrete block and mortar surface structures, both of which have a “key-hole” shape. They likely date to the World War II period and functioned as anti-aircraft gun positions at the southern end of the airship. Three controlled excavations at the site recovered sparse historic material, including nails, asphalt and tar fragments, and metal machine gun casing links. No subsurface cultural deposits were found during shovel testing and backhoe trenching.

McMahon (1988) conducted an archaeological reconnaissance inspection of a heavily vegetated 132-acre parcel at PMRF-Barking Sands. Modern rubbish, trash dumping, and an auto salvage yard were identified. It was recommended that SHPD be notified about any land clearing activities and archaeological monitoring in the area (SEARCH 2014:117).

Gonzalez et al. (1990) conducted archaeological survey and testing of two parcels in the southern portion of the current project area. Gonzalez et al. (1990) identified a 1950s-1960s domestic trash scatter and two large-mammal bone scatters in disturbed contexts. Four large mammal bones were found in a 10 m-wide area in a disturbed context within the Kokole Point Launch Facility; they were mapped and reburied. Limited testing in the area identified a possible cultural deposit 50-75 cmbs (SEARCH 2014:117).

Leidmann and Kishinami (1990) conducted an archaeological reconnaissance survey (three transects) and subsurface testing (10 backhoe trenches) of a proposed sand borrow site at Kawaiele, PMRF-Barking Sands. During this survey, Leidmann and Kishinami identified a modern refuse scatter and common avifaunal and marine shell remains. No archaeological sites, features, or cultural deposits were identified. Archaeological monitoring during sand mining was recommended (SEARCH 2014:117).

Walker and Rosendahl (1990) conducted an archaeological survey of three 1-acre areas within PMRF-Barking Sands. No archaeological sites were found within the Barking Sands project areas (SEARCH 2014:118).

Gonzalez (1991) surveyed 4 areas in PMRF-Barking Sands: Areas A and B in the Nohili Dune area; Area C approximately 1 km south of the mouth of Nohili Ditch; and Area D about 1.1 km to 1.6 kilometers (km) south of Kawaiele Ditch in Major’s Bay. No archaeological sites, features or cultural deposits were identified (SEARCH 2014:118).

Kennedy (1991) conducted an archaeological survey and subsurface testing (31 backhoe trenches) of a 15.6-acre section within the southern portion of PMRF-Barking Sands. Kennedy identified a historic ditch, military ordnance, and a modern fire pit; no significant archaeological sites, features, or deposits were identified (SEARCH 2014:118).

Jones (1992) conducted an archaeological survey and subsurface testing (18 backhoe trenches) of a 6-acre area on the north side of Sidewinder Road at PMRF-Barking Sands. No archaeological sites, features or cultural deposits were identified; recent military use was represented by occasional bottle scatters (SEARCH 2014:119).

Sweeney (1994) conducted archaeological survey and testing (10 backhoe trenches, 9 auger cores, and 4 shovel cuts in an eroding sand bank) in two areas near Major's Bay within the southern section of PMRF-Barking Sands. During this survey, a single fire pit (Site 4016) was identified in a charcoal lens 85 cm below surface in Trench 7. The charcoal sample from the fire pit yielded a radiocarbon date of 770 ± 60 years Before Present (B.P.); representing the earliest dated evidence of human activity along southwest coast of Kaua'i (SEARCH 2014:121).

Drolet (1997a) conducted archaeological monitoring of clearing, grubbing, and 5 backhoe trenches for two 20 m-x-20 m parcels for beach cottages and a waterline trench for Beach Cottages 7 and 8 along the beach front in the central portion of PMRF-Barking Sands. No archaeological sites, features or cultural deposits were identified (SEARCH 2014:122).

McGerty and Spear (1997) conducted an archaeological reconnaissance survey of a parcel immediately adjacent to PMRF-Barking Sands and oral history interviews of six individuals about plantation-period use of the area. No archaeological sites, features or cultural deposits were identified; however oral history data for Mānā Plain, including PMRF-Barking Sands was collected (SEARCH 2014:122).

Wulzen et al. (1997) conducted an archaeological reconnaissance survey of roughly 990 acres of unimproved land at PMRF-Barking Sands. During this survey, 53 sites containing 78 features, including 2 previously recorded sites, were identified. Eight of the sites were identified as traditional Hawaiian; the remaining 45 have been identified as War II and Cold War era sites (SEARCH 2014:123).

McGerty and Dega (2000) conducted an archaeological survey of a 940 square meters area and testing excavation of 4 backhoe trenches within the south-central portion of PMRF-Barking Sands. No archaeological sites, features or cultural deposits were identified (SEARCH 2014:125).

McGerty (2001) conducted a cultural resources assessment in order to identify historic properties listed or properties eligible for the National Register of Historic Properties (NRHP) within the northern portion of the current project area. No NHRP listed or eligible historic properties were identified (SEARCH 2014:125).

The Pacific Division, Naval Facilities Engineering Command (PACDIV 2002) conducted an archaeological subsurface survey and testing (4 backhoe trenches, 13 shovel test pits) of an area north of the Nohili Ditch (Site 05-1830) to identify the eastern extent of Site 05-1829 and the potential of human burials within PMRF Barking Sands. This survey identified buried traditional Hawaiian cultural features (possible fire or refuse pits, postmold) and two cultural layers associated with Site 1829; future avoidance and establishment of a safety perimeter were recommended (SEARCH 2014:126).

Carson (2007) conducted archaeological testing (10 backhoe trenches) in two locations for proposed construction of new cottages and a new duplex cabin at Major's Bay, PMRF Barking Sands. No archaeological sites, features or cultural deposits were identified (SEARCH 2014:127).

Walden and Clark (2010) conducted archaeological monitoring (35 backhoe trenches) in two areas in the central portion of PMRF Barking Sands; Area 1 is in the easement east of runway and west of Nohili Road, and Area 2 includes sections along the east and west sides of

Major's Bay Road. No archaeological sites, features or cultural deposits were identified; however three possible buried A-horizons were documented (SEARCH 2014:128).

RESEARCH DESIGN

The primary objective of the AIS is to determine the presence or absence of subsurface historic properties present within the project area. If historic properties are discovered, the objective will include collecting sufficient information to determine temporal placement, function, and NRHP eligibility.

Based on previous archaeological projects conducted within the project area (Watanabe et al. 2014), it is unlikely that pre-Contact period historic properties will be discovered. However, if pre-Contact or traditional historic properties are discovered, data will be collected to address the following questions:

1. If above-ground pre-Contact features are recorded, can they be positively associated with previously recorded sites? Is there sufficient stratigraphic association to provide a relative chronological sequence between above-ground features and subsurface deposits? Can a feature function be determined based on known architectural types?
2. If subsurface pre-Contact deposits are recorded, can they be positively associated with previously recorded sites in terms of horizontal extent and recovered artifactual materials? Are there sufficient carbon data (charcoal) from subsurface features to accurately date the deposit? Are the dates compatible with dates from other sites?
3. Can the recovered pre-Contact artifacts and midden be brought to bear on the life ways or socioeconomic patterns of the inhabitants? How do these patterns compare to data recovered from other sites in the region?

Additionally, based on the results of recent AIS fieldwork in southern portions of the PMRF (Clark et al. 2015), less than a quarter mile away (to the north), PCSI archaeologists were interested in testing a working hypothesis—that there is a pattern that reflects an absence of subsurface cultural deposits in this vicinity, that starts south of Majors Bay road, extends to southernmost portions of the PMRF and possibly further south along the coast, including coastal areas of the towns of Waimea and Kekaha. The subsurface testing program for the MDRS project area outlined here would provide an opportunity to test this hypothesis in this portion of coastal Waimea Ahupuaʻa. It is important to note that we acknowledge the limitations of the excavation strategy employed by Clark et al. (2015) in southern portions of the PMRF, upon which our working hypothesis is based, as well as what may be considered constraints put on the number and location of test locales in the MDRS project area.

CONSULTATION FOR THE ARCHAEOLOGICAL INVENTORY SURVEY

In March and April 2015, separate consultations in support of the Archaeological Inventory Survey (AIS) for the project included conversations with several knowledgeable individuals on Kauaʻi. The AIS consultation efforts included conversations with Ms. Alethea Kaohi of West Kauaʻi Technology & Visitors Center in Waimea as well Mr. Kunane Aipoalani and Ms. Debbie Ruiz, both of whom work at the PMRF just north of the Mānā Drag Racing Strip project area. Ms. Kaohi stated that the former place name for lands in the vicinity of the Mānā Drag Racing Strip was "Limaloa." She said that she was not aware of any burial finds in the current project area. Neither Mr. Aipoalani nor Ms. Ruiz had heard of any accounts about Native Hawaiians formerly living or burying their dead in the vicinity of the current project area. Furthermore, they did not have any information regarding Traditional Cultural Properties or traditional practices associated with the area.

METHODS AND PROCEDURES

The Archaeological Assessment (AA) field work was conducted between March 16 and April 9, 2015. A pedestrian survey was conducted by Steve Clark, B.S. and Paul Titchenal, M.A. Subsurface testing across the project area was conducted by Paul Titchenal, M.A., Katharine Shiroma, B.A., Tae Watanabe, B.A., Yvette Osborne, B.S., and Steve Clark. The project's Principal Investigator is Sara Collins, Ph.D., R.P.A.

FIELD METHODS

Presented below are the field methods utilized during the AA. These included a pedestrian survey and subsurface testing. The pedestrian survey was conducted first, and completed prior to subsurface testing.

Systematic Pedestrian Survey

Systematic pedestrian survey is the regularized, methodical coverage of an area. The project area was relatively level and ground visibility was excellent. Because of the excellent ground visibility, the systematic pedestrian survey was undertaken by walking linear transects spaced approximately 5.0 m apart, and covered 100% of the project area, including the access road, the grassy area on the north side of the MDSR, the grassy area south of the MDSR, and the grassy area between the MDSR and the turn off road immediately south of the MDSR. The survey was undertaken in the areas scheduled for utility/light pole installations and conduit trenches, as well as immediately adjacent to these areas.

Subsurface Testing

Subsurface testing was conducted using a TB145 Takeuchi tracked mini- excavator to excavate holes (using an attached auger) and trenches (using an attached bucket). The project AIS Work Plan (AISWP-Watanabe et al. 2014b) originally called for the excavation of approximately 80 backhoe trenches. Prior to subsurface testing, and in consultation with Dr. Mary Jane Naone of SHPD, it was agreed that utility poles along the access road could be excavated with a 2.0 foot-diameter (0.60 meters) auger (attached to the mini-excavator) to minimize disturbance of the newly paved access road. The agreed-upon condition for this change to the subsurface testing approach was that if archaeological materials or subsurface features were encountered during excavation of the auger holes, the auger hole would be expanded with a trench (excavated using a backhoe bucket attached to the mini-excavator) to facilitate documentation of any archaeological materials/features.

The auger holes, designated as Trenches 1 through 15 (TR1-15), were excavated in locales where utility poles are scheduled to be installed along the west side of the access road leading into the MDRS. Figure 7 presents overview photographs of the mini-excavator with the attached auger. The backhoe trenches, designated as TR16-90, were excavated in locales were pull boxes are scheduled (TR16), where additional utility poles are scheduled to be installed along the north side of the MDRS (TR17-24), where light poles and conduit trenches are to be installed along the south side of, and adjacent to, the MDRS (TR25-82, and TR87), and the area between the MDRS and the turn-off road (TR83-86, TR87-90). Figure 8 presents overview photographs of the mini-excavator using the backhoe bucket.

Prior to each auger and backhoe excavation, photographs were taken of the excavation location, and the orientation of the backhoe trench's long axis was documented in degrees Magnetic North (MN). Each auger and backhoe excavation was monitored by one to two archaeologists to ensure that the excavation was halted if subsurface archaeological materials

TB145 Takeuchi mini excavator before augering; view to north.

Augering at TR3 along access road into the MDRS; view to north.

Figure 7. Overview Photographs of Auger Testing along the Access Road to the Mānā Drag Racing Strip.

TB145 Takeuchi mini-excavator before trenching at TR86; view to east.

Excavating TR44 south and adjacent to the MDRS; view to south.

Figure 8. Overview Photographs of Backhoe Testing in the Mānā Drag Racing Strip Project Area.

or features were encountered. The locations of auger hole backhoe trenches were recorded using a Garmin (model GPSMAP 64st)

After each excavation was completed, at least one side and one end of the excavation were faced and cleaned with a trowel to facilitate examination of the stratigraphic sequence in order to determine the presence/absence of buried surface layers (buried A Horizons) containing archaeological materials and/or features. A representative profile for each excavation was drawn to scale and photographed. Soil samples of stratigraphic layers were collected to aid in stratigraphic descriptions.

Stratigraphic layers identified in the excavations were designated using Roman numerals in order of stratigraphic position (with Layer I being the uppermost layer). In locales where somewhat different stratigraphic layers were present in the same stratigraphic position, these layers were designated using Roman numerals with an appended lowercase alphabetic suffix (e.g., Layer Ia; Layer Ib, Layer IIa, Layer IIIa).

Soils were described using United States Department of Agriculture Soil Conservation Service standards and a field manual for soil descriptions (Schoeneberger et al. 1998). Soil characteristics described include color (Munsell 2000), texture, consistence, roots, cementation, and lower boundary topography.

Laboratory Analysis

Soil samples of stratigraphic layers identified during subsurface testing were collected and sent to PCSI"s Archaeology Laboratory in Honolulu. In the laboratory, samples from all layers were retested for color and texture. Selected soil samples were examined using a petrographic microscope with a maximum magnification of 10x to more closely examine the composition of the sediments.

Samples of all layers were also tested for the presence of carbonates in the sediments. This was performed by filling an eye-dropper with dilute hydrochloric acid or HCl (10 molar or 10% HCl) and dropping several drops on a small sediment sample. If sediments contain carbonates (in the form of coral sands, marine shell, or bone), the carbonates will effervesce (form bubbles), The varying degrees of effervescence, based on Schoeneberger et al. (1998:2-65), include the following:

1. Non-effervescent: no bubbles form
2. Very slightly effervescent: few bubbles form
3. Slightly effervescent: numerous bubbles form
4. Strongly effervescent: bubbles form a low foam
5. Violently effervescent: bubbles form a thick foam

PEDESTRIAN SURVEY RESULTS

A pedestrian surface survey was conducted within the MDRS project area prior to subsurface testing. To facilitate survey coverage and presentation of data, the project area has been subdivided into four sections. These include:

- Section 1—the access road leading into the MDRS from Highway 50 (Kaumualiʻi Hwy). Although utility poles are scheduled to be installed only along the north shoulder of this road, both road shoulders were surveyed. Maximum measurements of Section 1 are 2,739 ft long by 55 ft wide (835 by 17 m) or 3.46 acres (1.4 hectares [ha]). Figure 9 presents overview photographs of portions of the access road in Section 1.

- Section 2-- the area north of the MDRS. The western portion of this area is paved with asphalt while the eastern portion is planted in grass. Sand dunes are present. Additional utility poles and an electrical pull box are scheduled for this area. Maximum measurements of Section 2 are 1,486 ft long by 124.6 ft wide (453 by 38 m) or 4.2 acres (1.7 ha). Figure 10 presents overview photographs of the area north of the MDRS in Section 2.

- Section 3-- the area south and adjacent to the MDRS. This area contains dune sands covered with grass and shrubs. Proposed stadium lighting interconnected with conduits are scheduled to be installed in this area. Maximum measurements of Section 3 are 3,250 ft long by 105 ft wide (991 by 32 m) or 7.8 acres (3.17 ha). Figure 11 presents overview photographs of the area south of the MDRS in Section 3.

- Section 4-- the area south of the turn-off road and the MDRS. This area also contains dune sands covered with grass and shrubs and is closest to the shoreline. Electrical hardware, including service panels, lighting panels, and pad-mounted XFMRs (transformer pads) are scheduled to be installed here. Maximum measurements of Section 4 are (3,247 ft by 105 ft wide (990 by 32 m) or 7.8 acres (3.17 ha). Figure 12 presents overview photographs of the area south of the turn-off road and the MDRS in Section 4.

The total acreage covered by the pedestrian survey covered was approximately 23.29 acres, approximately 3.62 acres more than the project area size (19.67 acres). Figure 13 shows the location of Section 1 of the MDRS project area, and Figure 14 shows the locations of Sections 2 through 4.

No surface archaeological structures or cultural material scatters were encountered during the surface pedestrian survey. While walking survey transects, it was noted that the project area had in the past undergone fairly extensive grading and development associated with construction of the MDRS. Along the northern boundary of Section 2, the presence of many abandoned tires and other debris was noted.

Access road leading to the MDRS near TR4 locale; view to north.

On shoulder of access road at TR15 locale; view to north.

Figure 9. Project Area Overview Photographs of Access Road leading to the Mānā Drag Racing Strip.

Near west end of area north of the MDRS at TR17 locale; view to west.

Near east end of area north of the MDRS at TR21 locale; view to northwest.

Figure 10. Project Area Overview Photographs of Area North of the Mānā Drag Racing Strip.

Near west end of area south of the MDRS at TR32 locale; view to east.

Near east end of area south of the MDRS at TR67 locale; view to east.

Figure 11. Project Area Overview Photographs of Area South and Adjacent to the Mānā Drag Racing Strip.

Near east end of area south of the turn-off road at TR84 locale; view to east.

Near west end of area south of the turn-off road at TR90 locale; view to east.

Figure 12. Project Area Overview Photographs of Area South of the Turn-off Road at the Mānā Drag Racing Strip.

Figure 13. Section 1 of the Mānā Drag Racing Strip Project Area Showing Locations of Trenches 1 through 15.

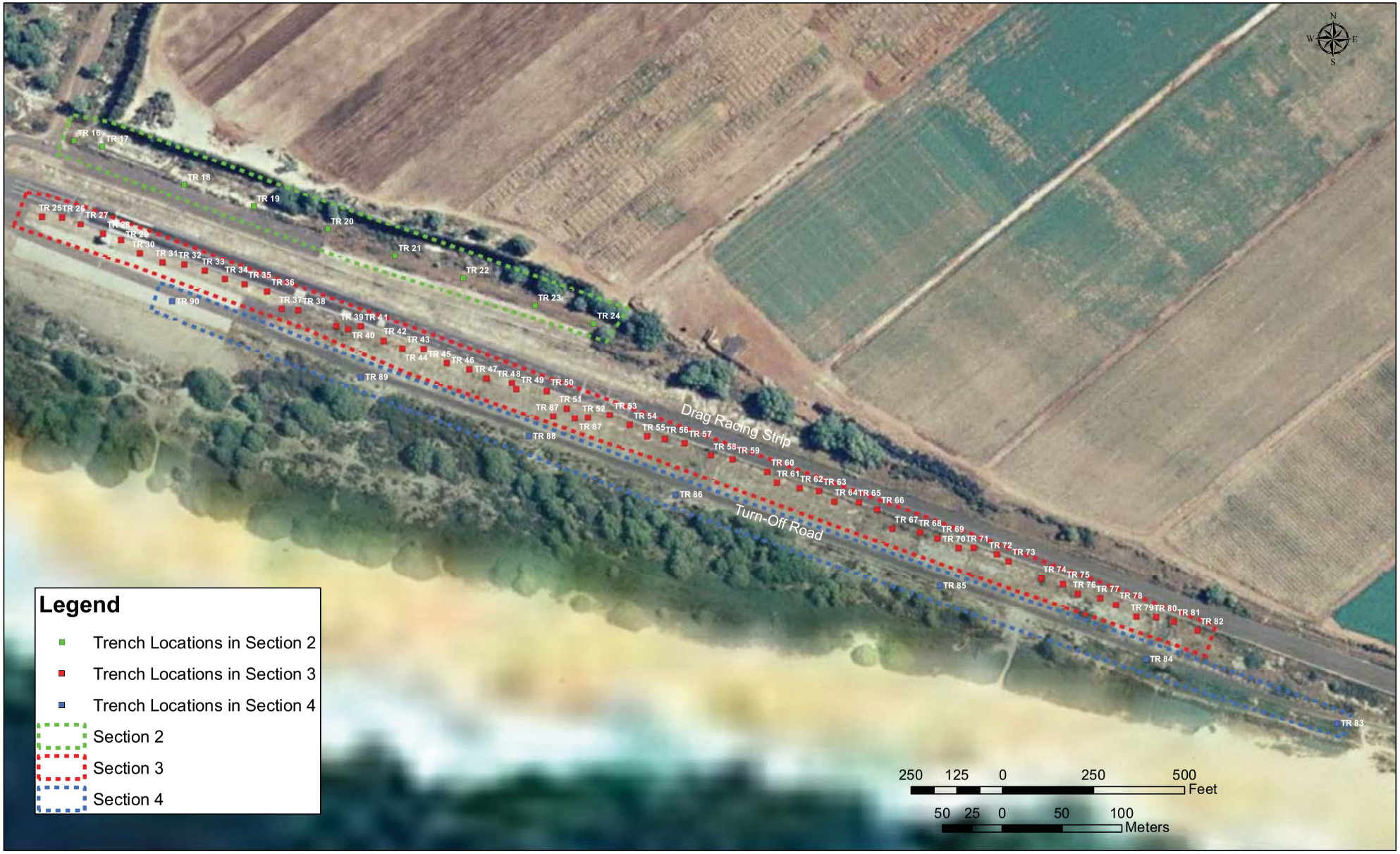


Figure 14. Sections 2 through 4 of the Mānā Drag Racing Strip Project Area Showing Locations of Trenches 16 through 90.

SUBSURFACE TESTING RESULTS

No subsurface archaeological materials or features, including human burials, were encountered during the subsurface testing program in the MDRS. The testing program included 10 more excavation locales than suggested in the project's Archaeological Inventory Survey Work Plan, which called for 80 test locales (Watanabe et al. 2014b:16).

A total of 90 locales were subjected to subsurface testing for the MDRS AIS. Table 3 summarizes the testing locations by project area section (Sections 1-4). Figure 13 shows the location of the 15 auger holes, designated as TR1-TR15, in Section 1, and Figure 14 shows the locations of the 75 backhoe trenches, designated as TR16-90, in Sections 2-4 of the MDRS project area.

Table 3. Summary of Subsurface Testing in the Mānā Drag Racing Strip Project Area.

Section No.	Section Location	Number of Tests	Excavation Designations
1	Along access road	15	TR1-TR15
2	North of MDRS	9	TR16-TR24
3	South and adjacent to the MDRS	59	TR25-TR82, TR87
4	South of turn-off road	7	TR83-TR86, TR88-TR90
	Total	**90**	

Proposed utility pole locations were tested at TR1-TR15, TR17-TR24, and TR87. Trench 1 through TR15 were excavated by auger along the shoulder of the access road in Section 1 (see Figure 13). Trench 17 through TR24 were excavated by backhoe in Section 2- north of the drag strip, as was TR87 in Section 3, south of the MDRS (see Figure 14).

Proposed stadium light locations and conduit trenches were tested by backhoe at TR25-TR82 in Section 3 in the grassy area south and adjacent to the MDRS (see Figure 14). Trench 16, as well as TR83-86 and TR88-90 were excavated by backhoe in proposed locations of electrical hardware (pull boxes, service panels and pad mounted XFMRs in the grassy area south of the turn-off road (see Figure 14).

Because no archaeological materials/features (traditional or historic) were found during excavations, the results of the subsurface testing will focus on the stratigraphy and stratigraphic sequences identified and documented in the 15 auger holes (TR1-15), and in the 75 backhoe trenches (TR16-90).

PROJECT AREA STRATIGRAPHY

A total of 13 stratigraphic layers were identified in the 90 test excavations across the MDRS project area. These include Layers Ia, Ib, Ic, IIa, IIb, IIc, IId, IIe, IIIa, IIIb, IV, V, and VI. Table 4 presents detailed stratigraphic layer descriptions for the 13 layers, preliminary interpretations, and the horizontal distribution of the layers based on the trenches in which the layers were identified.

Of these 13 layers identified, three (3) have a fairly widespread distribution. These include (1) Layer Ia dark brown, loamy fine to medium sands (the contemporary surface layer that supports vegetation growth), (2) Layer IIa reddish brown pebbly, sandy loam to sandy silt, and (3) Layer VI very fine to fine sands found at the base of all excavations. To facilitate the presentation of the stratigraphic data, the stratigraphy will be presented by project area section (Sections 1 through 4), beginning with Section 1.

Table 4. Summary of Stratigraphic Layers Identified in the MDRS Project Area.

Layer	Interpretation	Description	Distribution
Layer Ia	In situ stratigraphic layer; modern A Horizon supporting existing vegetation	1.0-23.0 cm thick; dark brown (7.5YR 3/3, moist), loamy fine to medium sand; contains decomposed organic materials and less than 5%, by volume, angular basalt pebbles; soft, very friable, nonsticky to very slightly sticky, nonplastic; common, fine to medium, interstitial roots; strongly effervescent with dilute HCl; clear, wavy lower boundary; non-cultural. A Horizon	TR9-29,TR31, TR34,TR35, TR37-90
Layer Ib	Terrigenous sediments with coral sand; base course layer for access road; cultural fill	6.0-20.0 cm thick; angular basalt pebbles and gravel in a dark brown (7.5YR 3/3, moist) sandy loam matrix. Hard, very firm, nonsticky, nonplastic; common, fine to medium, interstitial roots; strongly effervescent with dilute HCl; abrupt, smooth lower boundary; base course cultural fill with no artifacts or faunal materials	TR1-8
Layer Ic	Terrigenous sediments mixed with aeolian sediments (fine to medium coral sands); possible cultural fill	10.0-15.0 cm thick; brown (7.5YR 4/4, moist) to reddish brown (5YR 4/4, moist), sandy silt; contains less than 2%, by volume, angular basalt pebbles; soft, very friable, nonsticky, nonplastic; few, very fine to medium interstitial roots; moderately effervescent with dilute HCl; clear, smooth lower boundary; non-cultural.	TR30,TR32, TR33,TR35, TR36
Layer IIa	Terrigenous sediments mixed with aeolian sediments (very fine to fine coral sands); possible cultural fill	5.0-50.0 cm thick; reddish brown (5YR 4/4, dry), pebbly, sandy loam to sandy silt; contains 2-5%, by volume, angular basalt pebbles; slightly hard, friable, very slightly sticky, very slightly plastic; few, fine to medium, interstitial roots; strongly effervescent with dilute HCl; clear, wavy boundary; non-cultural.	TR25-TR29, TR31,TR34, TR37-TR39, TR47-TR56, TR59-TR63, TR65-TR66, TR68,TR69, TR71,TR72, TR74,TR89, TR90
Layer IIb	Terrigenous sediments mixed with aeolian sediments (fine coral sands);cultural fill underlying access road	20.0-40.0 cm thick; dark brown (7.5YR 3/4, moist), sandy silts and silty sands; contains approximately 5%, by volume, fine to course, subangular basalt and limestone gravel; slightly hard, firm, very slightly sticky; nonplastic; few, fine to medium, interstitial roots; strongly effervescent with dilute HCl; abrupt, smooth lower boundary; non-cultural; cultural fill?	TR1-TR10, TR12-TR16, TR21-TR24
Layer IIc	Possible in situ aeolian sediments; possibly disturbed	14.0-90.0 cm thick; pink (7.5YR 7/4, moist), fine to medium sand; loose, nonsticky, nonplastic; no roots; strongly effervescent with dilute HCl; abrupt, smooth lower boundary; non-cultural.	TR11,TR40-TR46,TR57, TR58,TR64, TR75-TR79, TR82
Layer IId	Terrigenous sediments mixed with aeolian sediments	19.0-23.0 cm thick; dark brown (7.5YR 3/4, moist), pebbly, cobbly, sandy clay loam with approximately 20%, by volume angular	TR17

Table 4. Summary of Stratigraphic Layers Identified in the MDRS Project Area.

Layer	Interpretation	Description	Distribution
	and limestone gravels; cultural fill?	basalt and limestone pebbles and gravels; hard, firm, moderately sticky, plastic; moderate, fine, interstitial roots; strongly effervescent with dilute HCl; clear, smooth lower boundary; non-cultural. FILL	
Layer IIe	Terrigenous sediments mixed with aeolian sediments; cultural fill?	12.0-27.0 cm thick; brown (7.5YR 4/4, moist), silty sand with approximately 2%, by volume, angular basalt pebbles and gravels; soft, friable, nonsticky, nonplastic; moderate, fine, interstitial and tubular roots; moderately effervescent with dilute HCl; clear, smooth lower boundary; non-cultural.	TR18-TR20
Layer IIIa	Terrigenous sediments mixed with aeolian sediments; cultural fill?	4.0-34.0 cm thick; reddish brown (5YR 4/4, dry), sandy loam with less than 2%, by volume, angular basalt pebbles and gravels; slightly hard, friable, very slightly sticky, very slightly plastic; few, fine to medium, interstitial roots; strongly effervescent with dilute HCl; clear, wavy boundary; non-cultural.	TR1,TR11, TR17,TR40-TR46,TR57, TR58,TR64, TR75-TR79
Layer IIIb	Possible in situ aeolian sediments; possibly disturbed	10.0-43.0 cm thick; pinkish gray (7.5YR 7/2, moist), very fine to fine sand with less than 5%, by volume, angular limestone gravel; loose, nonsticky, nonplastic; common, fine, interstitial roots; strongly effervescent with dilute HCl; gradual, smooth boundary; non-cultural.	TR48-TR50, TR53,TR54, TR62,TR63
Layer IV	Possible in situ aeolian sediments; possibly disturbed	20.0-23.0 cm thick; pink (7.5YR 7/4, moist) very fine sand; loose, nonsticky, nonplastic; common, fine interstitial roots; violently effervescent with dilute HCl; clear, smooth lower boundary; non-cultural.	TR45
Layer V	Terrigenous sediments mixed with aeolian sediments; cultural fill?	8.0-10.0 cm thick; reddish brown (5YR 4/4, moist), silty clay with less than 2%, by volume, angular basalt pebbles and gravels; compact, sticky, plastic; few, fine interstitial roots; very slightly effervescent with dilute HCl; clear, smooth boundary; non-cultural.	TR45
Layer VI	In situ aeolian sediments	30.0-150+ cm thick; pink (7.5YR 7/4, moist) very fine to fine sand; loose, nonsticky, nonplastic; weakly to strongly cemented in various locales; few, medium, interstitial roots; violently effervescent with dilute HCl; lower boundary not reached; non-cultural.	All trenches

Stratigraphy in Section 1-the Access Road.

Test locales along the access road in Section 1, including TR1-TR15, were excavated in approximate locations of proposed utility poles bringing electrical power to the MDRS. These 15 locales were excavated with an auger attached to the mini-excavator. The holes consistently

measured approximately 2.0 ft (0.70 m) in diameter with base of excavation (BOE) ranging from 95 to 150 cmbs. Auger holes were placed approximately 61 m apart (200 ft) and as close to the boundary fence (along the north side of the access road) as possible. Figure 13 shows the locations of TR1-15, and Table 5 summarizes these excavations.

A total of five stratigraphic layers were identified during auger testing in Section 1 along the access road leading to the MDRS. These include Layers Ia, Ib, IIb, IIc, and VI. Figure 15 presents the stratigraphic profiles documented in TR1-15 and provides preliminary stratigraphic layer correlations. A brief discussion of the stratigraphic layers identified in TR1-15 in Section 1 is presented below.

Table 5. Summary of Excavations in Section 1 along the Access Road.

Auger Hole Designation	Auger Hole Diameter (m)[1]	Layers Identified	BOE[3] (cmbs)[4]	Test Locale
TR1	0.70	Ib, IIb,IIIa, VI[2]	150	Utility Pole 1
TR2	0.70	Ib, IIb, VI	110	Utility Pole 2
TR3	0.70	Ib, IIb, VI	110	Utility Pole 3
TR4	0.70	Ib, IIb, VI	120	Utility Pole 4
TR5	0.70	Ib, IIb, VI	110	Utility Pole 5
TR6	0.70	Ib, IIb, VI	125	Utility Pole 6
TR7	0.70	Ib, IIb, VI	120	Utility Pole 7
TR8	0.70	Ib, IIb, Displaced VI, Recent feature	90	Utility Pole 8
TR9	0.70	Ia, IIb, VI	110	Utility Pole 9
TR10	0.70	Ia, IIb, VI	120	Utility Pole 10
TR11	0.70	Ia, IIc, IIIa, VI	120	Utility Pole 11
TR12	0.70	Ia, IIb, VI	110	Utility Pole 12
TR13	0.70	Ia, IIb, VI	130	Utility Pole 13
TR14	0.70	Ia, IIb, VI	95	Utility Pole 14
TR15	0.70	Ia, IIb, VI	115	Utility Pole 15

[1]m = meters; [2]last layer listed is BOE layer; [3]BOE = base of excavation; [4]cmbs = centimeters below surface

Layer Ia

Layer Ia is one of two layers found in the first stratigraphic position along the access road in Section 1. Layer Ia deposits in the access road area consisted of dark brown (7.5YR 3/3) loamy fine to medium sand with little organic material. No archaeological materials or features were encountered in Layer Ia along the access road. Layer Ia soils were present in sparsely to moderately vegetated areas.

The sands present in this layer are calcareous. Samples of Layer Ia effervesced strongly with dilute HCl. Examination of Layer Ia samples under a 10X microscope indicates that the sands consist primarily of small fragments of coral and marine shell. Little textural variation was observed in Layer Ia deposits. Loamy fine sand and loamy fine to medium sand textures were both documented in this layer. The dominant color observed in Layer Ia deposits was dark brown (7.5YR 4/4). Colors including strong brown (7.5YR 4/6) and dark brown to very dark grayish brown (10YR 3/2.5) were also was observed in Layer Ia loamy fine sands in Section 1.

Layer Ia was identified in seven (7) of the auger holes along in central and southern portions of the access road in TR9-15 (see Table 4; see Figure 15). In these trenches Layer Ia

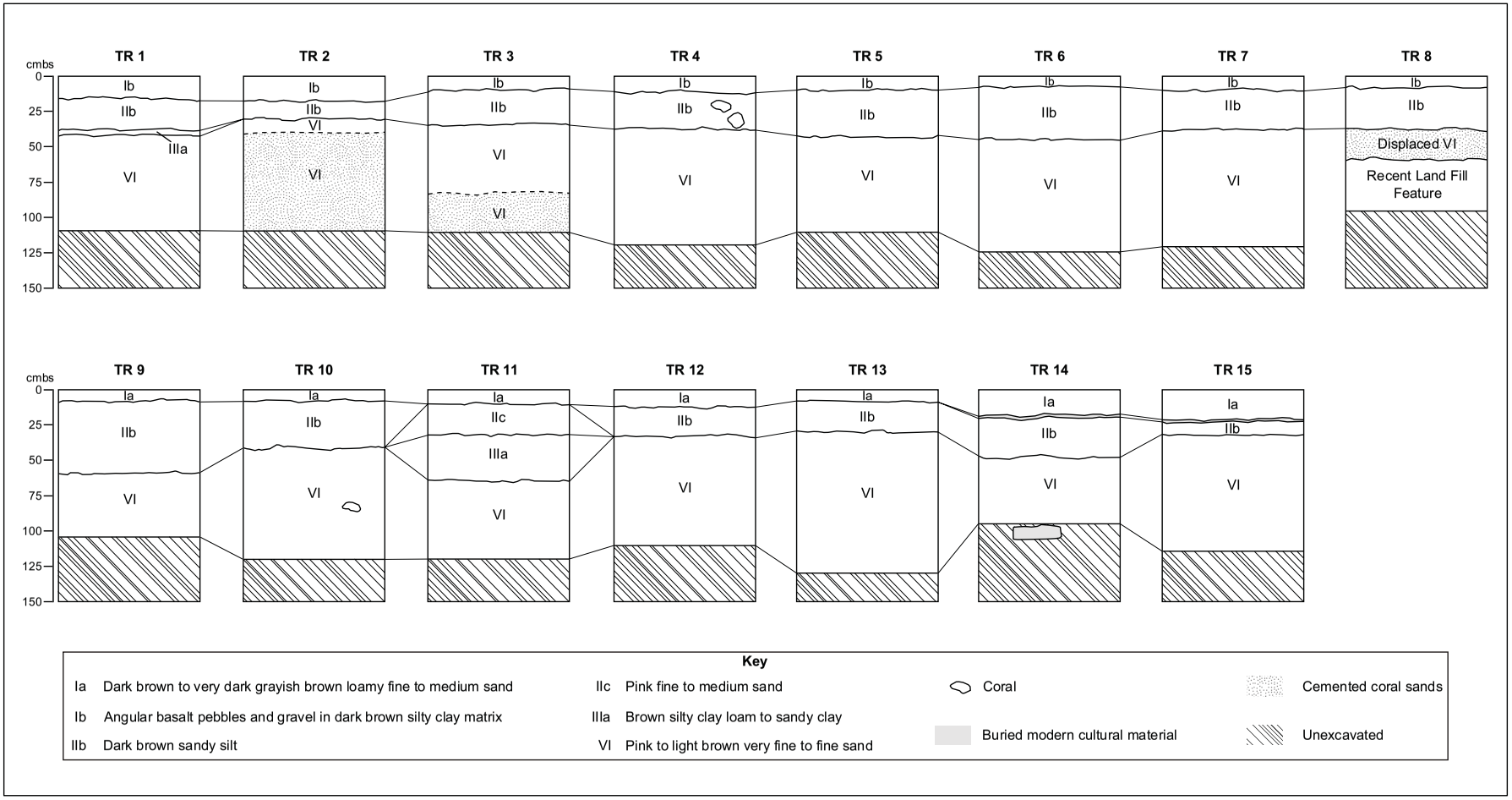


Figure 15. Stratigraphic Profiles and Correlations in Trenches 1 through 15 in Section 1 along the Access Road to the Mānā Drag Racing Strip Project Area.

ranges in thickness from 5 to 23 cm, with an average thickness of 15 cm. Maximum thickness of Layer Ia deposits were identified in TR15 (23 cm) and TR14 (20 cm) at and near the end of the access road. Minimum Layer Ia thicknesses (5 cm) were documented in TR9 and TR10 in south central portions of the road. Layer Ia was found directly overlaying Layers IIb, IIc, IIIa, and VI (see Figure 15).

Layer Ib

Layer Ib is the second of two layers found in the first stratigraphic position along the access road in Section 1. Layer Ib consisted primarily of angular basalt pebbles and gravel in dark brown (7.5YR 3/3) silty clay matrix. There was little to no textural and color variation observed in the Layer Ib deposits. No archaeological materials or features were encountered in Layer Ib.

Layer Ib was identified in TR1 through TR8 (see Table 4; see Figure 15), and ranged in thickness from 6 to 20 cm with an average thickness of 15 cm. Layer Ib reached a maximum thickness (20 cm) in TR2, and a minimum thickness (6 cm) in TR6. Layer Ib was found directly overlying Layer IIb, IIIa, and VI.

Layer IIb

Layer IIb is one of two layers found in the second stratigraphic position along the access road in Section 1. With the exception of TR11, Layer IIb it was identified in all auger holes along the access road (see Table 4). No archaeological materials or features were encountered in Layer IIb along the access road.

Layer IIb soils range in thickness from 10 to 52 cm with an average thickness of 25 cm. Maximum thickness of Layer IIb deposits were identified in TR9 (52 cm). Minimum Layer IIb thickness (10 cm) was documented in TR15 (10 cm).

The texture of Layer IIb consisted primarily of sandy silt with approximately 5%, by volume, fine to course, subangular basalt and limestone gravel. The sands present in Layer IIb are calcareous and effervesced strongly with dilute HCl. The two predominant colors documented for Layer IIb include brown (7.5YR 4/4) and dark brown (7.5YR 3/4). Layer IIb was found directly overlying Layers IIIa and VI, and directly underlying Layers Ia and Ib (see Figure 15).

Layer IIc

Layer IIc is one of two layers found in the second stratigraphic position along the access road in Section 1. It was found only in TR11 (see Table 4; see Figure 15). No archaeological materials or features were encountered in Layer IIb along the access road.

Layer IIc consists of pink (7.5YR 7/4) fine to medium sand, and ranges in thickness from 25 to 26cm. It directly overlies Layer IIIa and Layer VI and directly underlies Layer Ia.

Layer IIIa

Layer IIIa was documented in the third stratigraphic position in TR1 and TR11 along the access road in Section 1 (see Table 4). No archaeological materials or features were encountered in Layer IIIa along the access road.

Layer IIIa soils range in thickness from 4 to 5 cm in TR1 and from 32 to 34 cm in TR11. The color and texture of Layer IIIa varied from brown (7.5YR 5/4) silty clay loam in TR1 to brown (7.5YR 4/3) sandy clay in TR11. The sands present in Layer IIIa are calcareous and effervesced strongly with dilute HCl. Layer IIIa was found directly underlying Layers IIb and IIc, and directly overlying Layer VI (see Figure 15).

Layer VI

Layer VI was found in the third and fourth stratigraphic positions in Section 1, TR1-15. No archaeological materials or features were encountered in Layer VI.

Layer VI was identified in all auger holes (TR1-15) in Section 1, (see Table 4; see Figure 15), and consists of the very fine to fine sands found at the base of all excavations (the lower boundary of Layer VI sands was not reached in any of the excavations). While the base of Layer VI coral sands was not reached, exposed portions ranged in thickness from 45+ to 105+ cm across Section 1, with an average thickness of 70+ cm. Maximum Layer VI thickness was identified in TR13 (105+ cm). Minimum Layer VI thickness was documented in TR2 (45+ cm).

The texture of Layer VI consists primarily of very fine to medium coral sand. Strong cementation was present in Layer VI in TR2, excluding the upper 10 cm (see Figure 15). Strong cementation was also documented in lower proveniences of Layer VI in TR3 (see Figure 15). Layer VI sands in TR1 were weakly cemented. The dominant soil color documented in Layer VI is light brown (7.5YR 6/4). Other color variations documented in Layer VI include reddish yellow (7.5YR 6/6) and pink (7.5YR 7/4). Layer VI was found underlying Layers IIb, IIc, and IIIa in Section 1.

Stratigraphic Sequences Documented in Section 1-Along the Access Road

Examination of TR1-15 along the access road in Section 1 of the project area revealed four variations in the stratigraphic sequence (see Table 5). Based on field documentation and observations, variations in the stratigraphic sequences are primarily due to:

1. Variation in surface deposits on the shoulder of the access road
2. The isolated presence of Layer IIIa in TR1
3. Layer VI coral sands are present in the third and fourth stratigraphic positions
4. The presence of buried modern cultural material present between Layers Ia and IIb in TR14 and 15,
5. The presence of a recent land fill feature underlying Layer VI in TR8.

The four stratigraphic sequence variants identified in Section 1 include:

Variant 1: Layers Ib/IIb/IIIa/VI; TR1

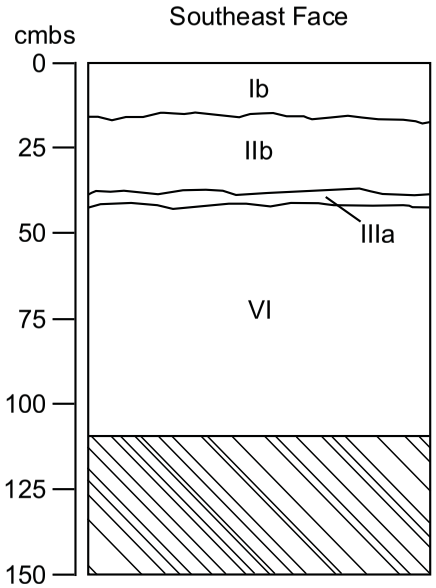
Variant 2: Layers Ib/IIb/VI; TR2-TR7,

Variant 3: Layers Ia/IIb/VI: TR9, TR10, TR12-15

Variant 4: Layers Ia/IIc/IIIa/VI: TR11

The Variant 1 sequence (Layers Ib/IIb/IIIa/VI) was found only in TR1 near the intersection of Highway 50 and the access road to the MDRS. It consists of a surface base course gravel layer (Layer Ib) overlying a dark brown sandy silt (Layer IIb). Layer IIb directly overlies the brown silty clay loams of Layer IIIa, and Layer VI pink coral sands underlies Layer IIIa. As noted above, Layer IIIa was found only in TR1. Figure 16 presents a profile drawing and a photograph of the Variant 1 sequence on the southeast face of TR1 in Section 1.

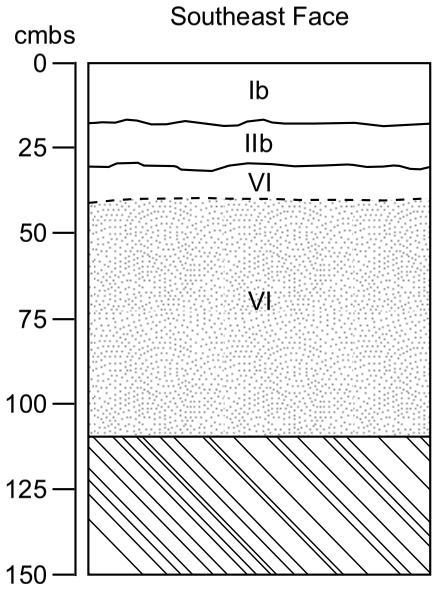
The Variant 2 sequence (Layers Ib/IIb/VI) was found in TR2-TR7 near the intersection of Highway 50 and the access road to the MDRS. This stratigraphic sequence is quite similar to the Variant 1 sequence above, but does not contain Layer IIIa. The Variant 2 sequence consists of a base course gravel layer (Layer Ib) overlaying a dark brown sandy silt (Layer IIb). Layer IIb directly overlies the very fine to medium coral sands of Layer VI. Figure 17 presents a



Photograph of Base of Excavation; view to southeast

Key	
Ib	Angular basalt pebbles and gravel in dark brown silty clay matrix
IIb	Dark brown sandy silt
IIIa	Brown silty clay loam
VI	Pink very fine to fine sand
	Unexcavated

Figure 16. Stratigraphic Profile Drawing and Photograph of Trench 1, Section 1, Showing the Variant 1 Stratigraphic Sequence.



Photograph of Base of Excavation; view to southeast

Key

Ib	Angular basalt pebbles and gravel in dark brown silty clay matrix
IIb	Dark brown sandy silt
VI	Light brown very fine to fine sand
	Cemented coral sands
	Unexcavated

Figure 17. Stratigraphic Profile Drawing and Photograph of Trench 2, Section 1, Showing the Variant 2 Stratigraphic Sequence.

profile drawing and a photograph of the Variant 2 stratigraphic sequence documented on the southeast face of TR2.

The Variant 3 sequence (Layers Ia/IIb/VI) was found in TR9, TR10, and TR12-15 along the access road to the MDRS. The difference between the Variant 2 and Variant 3 stratigraphic sequences is that the Variant 3 sequence contains Layer Ia instead of Layer Ib. The Variant 3 sequence consists of loamy fine to medium sand (Layer Ia) overlying sandy silt (IIb). The coral sands of Layer VI underlie Layer IIb. Figure 18 presents a profile drawing and a photograph of the Variant 3 stratigraphic sequence on the southeast face of TR13.

The Variant 4 sequence (Layers Ia/IIc/IIIa/VI) was found only in TR11 along the access road to the MDRS. This is the only sequence in Section 1 that contains Layer IIc. The Variant 4 sequence consists of loamy fine to medium sand (Layer Ia) overlying fine to medium sand (Layer IIc) and sandy clay (Layer IIIa) which overlies fine to medium sand (Layer VI). Figure 19 presents a profile drawing and a photograph of the Variant 4 stratigraphic sequence on the east face of TR11.

The locale in which TR8 was excavated does not exhibit any of the four variant stratigraphic sequences observed in Section 1. This is due to the fact that the stratigraphic sequence in the TR8 locale has been disturbed and impacted by what appears to be a land fill excavation event. In TR8, Layers Ib and IIb appear to be intact. Layer VI, which directly underlies Layer IIb, has been displaced, and is not in situ. This is based on evidence of a probable modern excavation event directly underlying Layer VI. Figure 20 presents a profile drawing and a photograph of the disturbed stratigraphic sequence and the modern excavation event on the north face of TR8.

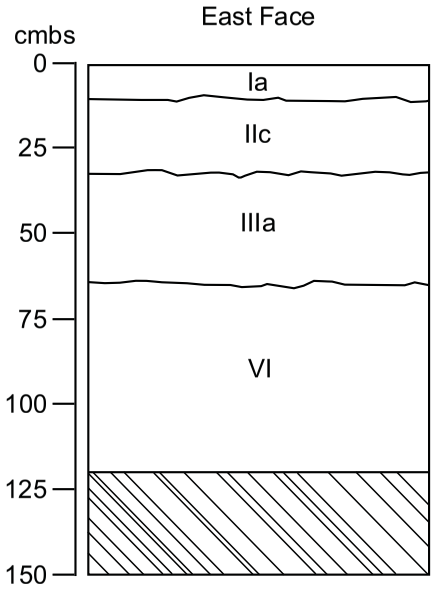
The modern excavation event is likely associated with the land fill on the adjacent property. Recent trash present in this modern land fill feature includes silt fence materials, a cotton shirt, a rubber tire fragment, ceramic fragments, rusted metal items, and glass fragments.

Other auger holes in Section 1 also encountered land fill materials. Silt fence material was encountered in TR14 and TR15 at the lower boundary of Layer Ia (see Figure 15).

Stratigraphy in Section 2-the Area North of the MDRS.

Test locales in Section 2, including TR16-TR24, were excavated in approximate locations for an additional eight (8) proposed utility poles (TR17-24) and one electrical pull box (TR16). Figure 14 shows the locations of TR16-TR24, and Table 6 summarizes these excavations. These trenches were excavated with a backhoe, were situated approximately from 25 to 76 m apart, and positioned in a roughly linear pattern along the north edge of the asphalt in the west portion of Section 2. The test locales continued east and were situated near the tree line in central and eastern portions of Section 2. The backhoe trenches in Section 2 ranged from 2.0 by 1.1 m to 3.2 by 1.2 m in size (see Table 6), and ranged in depth from 135 to 155 cmbs.

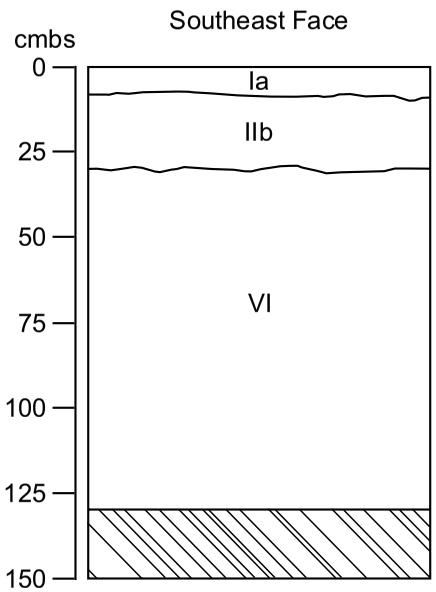
A total of six stratigraphic layers were identified during testing along the access road leading to the MDRS. These include Layers Ia, IIb, IId, IIe, IIIa, and VI. Figure 21 presents the stratigraphic profiles documented in TR16-TR24 and provides preliminary stratigraphic layer correlations. A brief discussion of the stratigraphic layers identified in Section 2 north of the MDRS is presented below.



Photograph of Base of Excavation; view to east

Key	
Ia	Strong brown loamy fine sand
IIc	Pink fine to medium sand
IIIa	Brown sandy clay
VI	Pink fine to medium sand
	Unexcavated

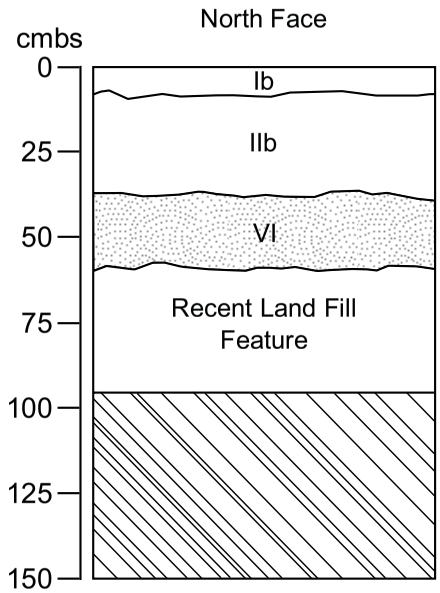
Figure 18. Stratigraphic Profile Drawing and Photograph of Trench 11, Section 1, Showing the Variant 3 Stratigraphic Sequence.



Photograph of Base of Excavation; view to southeast

Key	
Ia	Dark brown to very dark grayish brown loamy fine to medium sand
IIb	Brown sandy silt
VI	Light brown very fine to fine sand
	Unexcavated

Figure 19. Stratigraphic Profile Drawing and Photograph of Trench 13, Section 1, Showing the Variant 4 Stratigraphic Sequence.



Photograph of Base of Excavation; view to north

Key

Ib	Angular basalt pebbles and gravel in brown silty clay matrix
IIb	Brown sandy silt
VI	Reddish yellow fine sand
	Displaced cemented coral sands
	Unexcavated

Figure 20. Stratigraphic Profile Drawing and Photograph of Trench 8, Section 1, Showing Disturbed Stratigraphic Sequence with Recent Land Fill Feature.

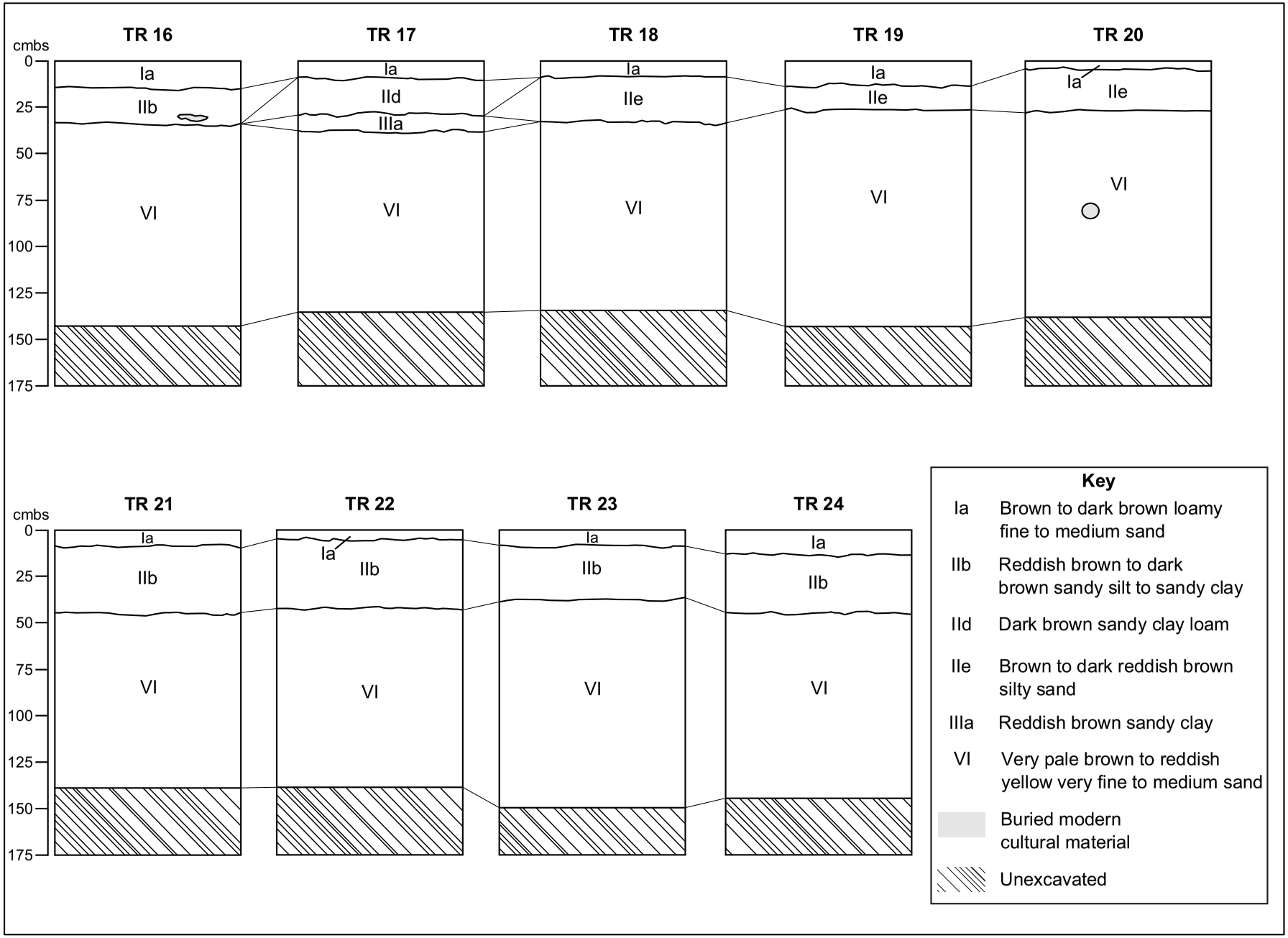


Figure 21. Stratigraphic Profiles and Correlations in Trenches 16 through 24 in Section 2 North of the Mānā Drag Racing Strip Project Area.

Table 6. Summary of Excavations in Section 2 North of the MDRS.

Backhoe Trench Designation	Trench Size (m[1])	Layers Identified	BOE[3] (cmbs[4])	Test Locale
TR16	2.3 x 1.0	Ia, IIb, VI[2]	140	Electrical pull box
TR17	2.0 x 1.1	Ia, IId, IIIa, VI	135	Utility Pole 17
TR18	2.5 x 1.3	Ia, IIe, VI	135	Utility Pole 18
TR19	2.0 x 1.1	Ia, IIe, VI	143	Utility Pole 19
TR20	3.2 x 1.2	Ia, IIe, VI	137	Utility Pole 20
TR21	2.3 x 1.1	Ia, IIb, VI	140	Utility Pole 21
TR22	2.3 x 1.1	Ia, IIb, VI	138	Utility Pole 22
TR23	2.3 x 1.1	Ia, IIb, VI	150	Utility Pole 23
TR24	2.3 x 1.1	Ia, IIb, VI	155	Utility Pole 24

[1]m = meters; [2]last layer listed is BOE layer; [3]BOE = base of excavation; [4]cmbs = centimeters below surface

Layer Ia

Layer Ia is the only surface layer identified in the first stratigraphic position in the Section 2 trenches--TR16-TR24 (see Table 6; see Figure 21). Layer Ia deposits in the area north of the MDRS consist of dark brown loamy fine sands, and were identified in areas with vegetation. No archaeological materials or features were encountered in Layer Ia in Section 2.

Little textural variation was present in Layer Ia deposits in Section 2. The texture of Layer Ia deposits consisted of both loamy fine sands and loamy fine to medium sands. The sands present in Layer Ia are calcareous, similar to Layer Ia deposits in Section 1. Samples of Layer Ia in Section 2 effervesced strongly with dilute HCl. Organic materials were present in Layer Ia. Dark brown (7.5YR 3/3 and 7.5YR 3/2), the predominant color, and brown (10YR 5/3), were the two colors observed in Layer Ia deposits.

Layer Ia was identified in all of the trench excavations in Section 2, the area north of the MDRS (see Table 6; see Figure 21). These soils range in thickness from 5 to 15 cm, with an average thickness of 9 cm. Maximum thickness of Layer Ia deposits (15 cm) was identified in TR16 and TR24. A minimum Layer Ia thickness of 5 cm was documented in TR20 and TR22.

Layer IIb

Layer IIb is one of three layers found in the second stratigraphic position in Section 2 north of the MDRS (see Table 6). Layer IIb consists primarily of dark brown sandy silt in Section 2. No pre-Contact Hawaiian materials or features were found in Layer IIb. A piece of modern plastic, however, was found in Layer IIb in TR16 at 27 cmbs (see Figure 21).

Little textural variation was present in Layer IIb deposits in Section 2. Layer IIb texture consisted primarily of sandy silt with less than 5%, by volume, angular basalt and limestone pebbles and gravel. The sands present in Layer IIb are calcareous. Samples of Layer IIb in Section 2 effervesced strongly with dilute HCl. A textural variation consisting of sandy clay with 5%, by volume, basalt and limestone pebbles and gravel was documented in TR16. The predominant color documented for Layer IIb was dark brown (7.5YR 4/4). Other color variations documented in Layer IIb included reddish brown (5YR 4/4).

Layer IIb was identified in five trenches in Section 2--TR16 and TR21-TR24. These soils range in thickness from 20 to 40 cm with an average thickness of 32 cm. Maximum thickness of Layer IIb deposits were identified in TR21 and TR22 (40 cm) while a minimum Layer IIb thickness of 20 cm was identified in TR16. Layer IIb was found directly underlying Layer Ia, and directly overlying Layer VI.

Layer IId

Layer IId is the second of three layers found in the second stratigraphic position in Section 2 north of the MDRS. No archaeological materials or features were encountered in Layer IId.

The Layer IId matrix consisted of a dark brown (7.5YR 3/4) pebbly, cobbly, sandy clay loam with approximately 20%, by volume, angular basalt and limestone pebbles and gravels. The sands present in Layer IIb are calcareous. Samples of Layer IIb in Section 2 effervesced strongly with dilute HCl.

Layer IId was identified only in TR17 located (see Figure 21; see Table 6). MDRS in the bleacher area. It ranged in thickness from 19 to 23 cm. Layer IId directly underlies Layer Ia and directly overlies Layer IIIa.

Layer IIe

Layer IIe is the third of three layers found in the second stratigraphic position in Section 2 north of the MDRS. No archaeological materials or features were encountered in Layer IIe.

There was little color and textural variation observed in the Layer IIe matrix. This layer consisted of primarily of brown (7.5YR 4/4) silty sand with approximately 2%, by volume, angular basalt pebbles and gravel. The other color variation was dark reddish brown (5YR 3/4). The sands present in Layer IIb are calcareous. Samples of Layer IIb in Section 2 effervesced moderately with dilute HCl.

Layer IIe was identified in three trenches in Section 2-- TR18-TR20. This layer ranges in thickness from 12 to 27 cm across this project area with an average thickness of 20 cm. Maximum thickness of Layer IIe deposits was recorded were TR18 (27 cm), while a minimum Layer IIe thickness of 12 cm was recorded in TR19. Layer IIe was found directly underlying Layer Ia and directly overlying Layer VI (see Figure 21).

Layer IIIa

Layer IIIa was found in the third stratigraphic position in Section 2. No archaeological materials or features were encountered in Layer IIIa.

The Layer IIIa matrix consisted of a reddish brown (5YR 4/4) sandy clay with less than 2%, by volume, angular basalt pebbles and gravel. The sands present in Layer IIIa are calcareous. Samples of Layer IIIa in Section 2 effervesced strongly with dilute HCl.

Like Layer IId, Layer IIIa was identified only in TR17 in Section 2. This layer ranges in thickness from 17 to 20 cm. Layer IIIa was found directly underlying Layer IId and directly overlying Layer VI (see Figure 21).

Layer VI

Layer VI was found in both the third and fourth stratigraphic positions in Section 2, and was also found at the base of all backhoe trench excavations in this section. No pre-Contact Hawaiian archaeological materials or features were found in Layer VI. A rusted aluminum can, however, was found in Layer VI in TR20 at 75 cmbs in Layer VI (see Figure 21).

Layer VI sediments varied in texture and color across Section 2. The predominant texture of Layer VI was very fine to fine sands, with documented variations including fine sand, very fine sand, and fine to medium sand. Like Layer VI sands in Section 1, Layer VI sands in Section 2 are calcareous (coral sands). Samples of Layer VI in Section 2 effervesced strongly with dilute HCl. Unlike Layer VI deposits in Section 1, no cementation was observed in Layer VI sands in Section 2. The predominant soil color documented in Layer VI is reddish yellow

(7.5YR 6/6). Other color variations documented in Layer VI include yellowish brown (10YR 5/6), light brown (7.5YR 6/3), and very pale brown (10YR 7/4).

Although the base of Layer VI was not reached in Section 2 excavations, Layer VI in TR16-TR24 ranged in thickness from 95 – 120 cm across Section 2, with an average thickness of 105 m. Maximum thickness of Layer VI deposits was recorded at TR19 (120+ cm), while a minimum Layer VI thickness of 95+ cm was recorded in TR21. Layer VI was found directly underlying Layers Ia, IIb, IIe, and IIIa (see Figure 21) in Section 2.

Stratigraphic Sequences Documented in Section 2- North of the MDRS

Examination of TR16-24 in Section 2 north of the MDRS revealed 3 stratigraphic sequence variants (see Table 6). Based on field documentation, variations in documented stratigraphic sequences are primarily due to the presence of three different layers in the second stratigraphic position (Layers IIb, IId, and IIe) and on the presence of Layer IIIa.

The three stratigraphic sequence variants in Section 2 include:

Variant 1: Layers Ia/IIb/VI; TR16, TR21-24

Variant 2: Layers Ia/IId/IIIa/VI; TR17

Variant 3: Layers Ia/IIe/VI: TR18-20

The Variant 1 stratigraphic sequence (Layers Ia/IIb/VI) was found in five trenches in Section 2, including TR16 and TR21-24. This sequence was identified in Section 1 as the Variant 3 stratigraphic sequence. It consists of a dark brown loamy fine to medium sand (Layer Ia-A Horizon) overlying dark brown sandy silt (Layer IIb). Layer IIb directly overlies the reddish yellow very fine to fine sands of Layer VI. Figure 22 presents a profile drawing and photograph of the Variant 1 stratigraphic sequence on the southeast face of TR16 Section 2.

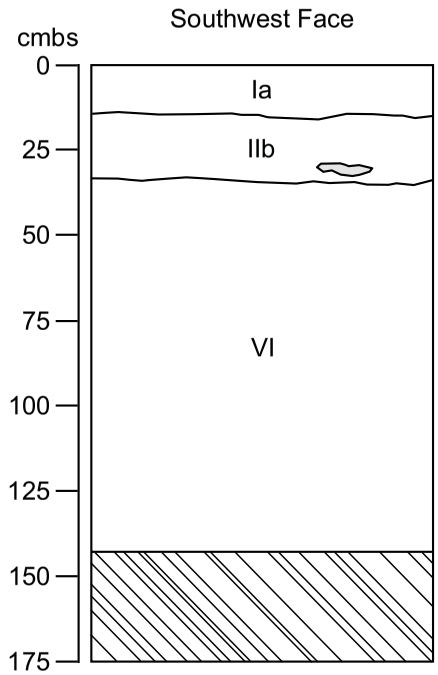
The Variant 2 stratigraphic sequence (Layers Ia/IId/IIIa/VI) was found only in TR17 in Section 2. It consists of a dark brown loamy fine to medium sand (Layer Ia-A Horizon) overlaying the dark brown pebbly, cobbly, sandy clay loam sediments of Layer IId. Layer IId directly overlies the reddish brown sandy clay deposits of Layer IIIa, which directly overlie the light brown fine to medium sands of Layer VI. Figure 23 presents a profile drawing and photograph of the Variant 2 stratigraphic sequence on the south face of TR17 in Section 2.

The Variant 3 sequence (Layers Ia/IIe/VI) was found in three trenches in Section 2, including TR18-20. It consists of a dark brown loamy fine to medium sand layer (Layer Ia-A Horizon) overlying brown silty sand sediments of Layer IIe. Layer IIe directly overlies the light brown to very pale brown, very fine to fine coral sands of Layer VI. Figure 24 presents a profile drawing and photograph of the Variant 3 stratigraphic sequence on the south face of TR17 in Section 2.

Stratigraphy in Section 3-the Area South and Adjacent to the MDRS.

A total of 59 test locales were conducted in Section 3 of the MDRS project area, Designated as TR25-TR82 and TR87, these trenches were excavated in approximate locations for stadium light poles, electrical conduit lines, and one utility pole (TR87). Figure 14 shows the locations of TR25-TR82 and TR87 in Section 3, and Table 7 summarizes these excavations.

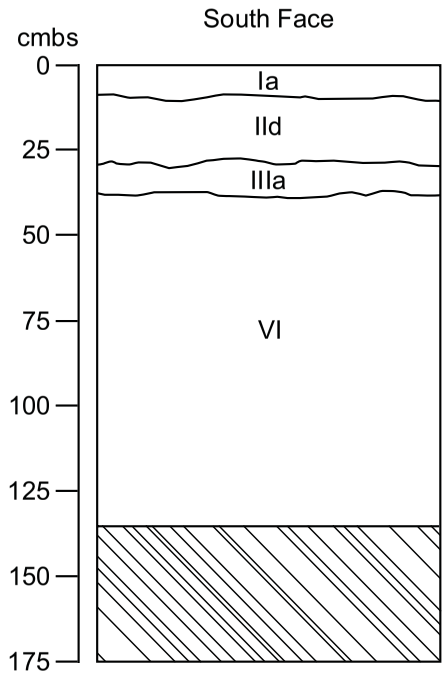
These trenches were excavated with a backhoe south of and adjacent to the MDRS. Trenches were situated in a roughly linear, and narrowly scattered pattern in Section 3 parallel to the western portion of the MDRS (see Figure 14). Twenty (20) backhoe trenches were excavated in Section 3 to sample proposed light pole locales, and the remaining 39 trenches

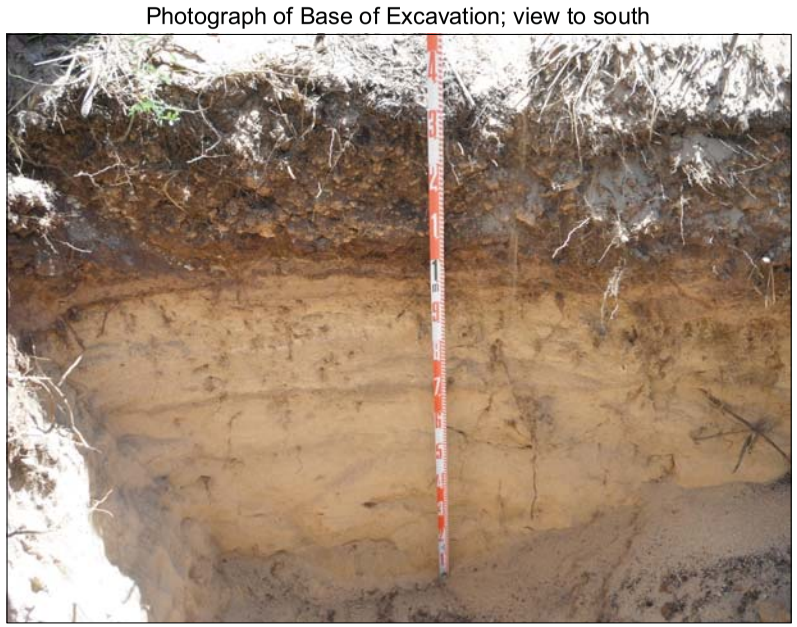


Photograph of Base of Excavation; view to southwest

Key	
Ia	Dark brown loamy fine to medium sand
IIb	Reddish brown sandy clay
VI	Yellowish brown very fine sand
	Plastic
	Unexcavated

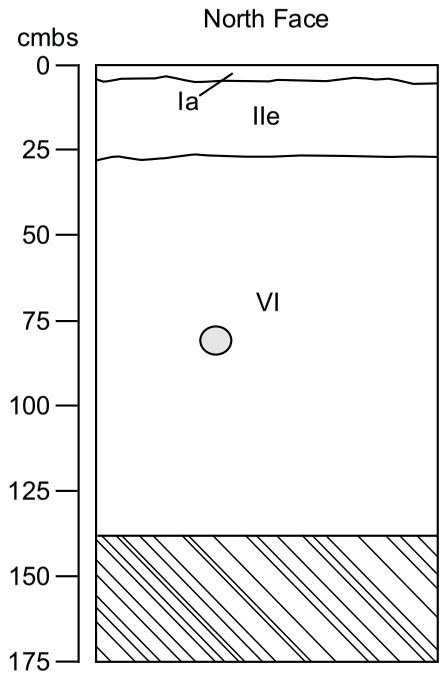
Figure 22. Stratigraphic Profile Drawing and Photograph of Trench16, Section 2, Showing the Variant 1 Stratigraphic Sequence.





Key	
Ia	Dark brown loamy fine to medium sand
IId	Dark brown sandy clay loam
IIIa	Reddish brown sandy clay
VI	Light brown fine to medium sand
	Unexcavated

Figure 23. Stratigraphic Profile Drawing and Photograph of Trench 17, Section 2, Showing the Variant 2 Stratigraphic Sequence.



Key

Ia	Dark brown loamy fine sand
IIe	Dark reddish brown silty sand
VI	Very pale brown fine sand
◯	Rusted aluminum can
▨	Unexcavated

Figure 24. Stratigraphic Profile Drawing and Photograph of Trench 20, Section 2, Showing the Variant 3 Stratigraphic Sequence.

Table 7. Summary of Excavations in Section 3, South and Adjacent to the MDRS.

Backhoe Trench	Size (m[1]) LxW or Dia.	Layers Identified	Depth at BOE[3] (cmbs[4])	Test Locale
TR25	2.0 x 1.0	Ia, IIa, VI[2]	150	Light Pole 1
TR26	2.0 x 1.0	Ia, IIa, VI	135	Conduit trench
TR27	2.8 x 1.0	Ia, IIa, VI	135	Conduit trench
TR28	2.8 x 1.0	Ia, IIa, VI	140	Light Pole 2
TR29	2.4 x 1.1	Ia, IIa, VI	140	Conduit trench
TR30	3.0 x 1.1	Ic, VI	140	Conduit trench
TR31	2.6 x 1.1	Ia, IIa, VI	130	Light Pole 3
TR32	2.5 x 1.0	Ic, VI	140	Conduit trench
TR33	2.5 x 1.2	Ic, VI	135	Conduit trench
TR34	2.2 x 1.0	Ia, IIa, VI	135	Light Pole 4
TR35	2.7 x 1.0	Ic, VI	150	Conduit trench
TR36	2.8 x 1.2	Ic, VI	140	Conduit trench
TR37	2.8 x 1.0	Ia, IIa, VI	150	Light Pole 5
TR38	2.5 x 1.0	Ia, IIa, VI	150	Conduit trench
TR39	2.5 x 1.0	Ia, IIa, VI	150	Conduit trench
TR40	2.3 x 1.0	Ia, IIc, IIIa, VI	140	Light Pole 6
TR41	2.6 x 1.0	Ia, IIc, IIIa, VI	135	Conduit trench
TR42	2.6 x 1.0	Ia, IIc, IIIa, VI	130	Conduit trench
TR43	2.6 x 1.0	Ia, IIc, IIIa, VI	140	Light Pole 7
TR44	2.5 x 1.0	Ia, IIc, IIIa, VI	130	Conduit trench
TR45	2.9 x 1.0	Ia, IIc, IIIa, IV, V, VI	140	Conduit trench
TR46	2.4 x 1.0	Ia, IIc, IIIa, VI	130	Light Pole 8
TR47	2.8 x 1.0	Ia, IIa, VI	130	Conduit trench
TR48	2.5 x 1.0	Ia, IIa, IIIb, VI	130	Conduit trench
TR49	2.4 x 1.0	Ia, IIa, IIIb, VI	135	Light Pole 9
TR50	2.4 x 1.0	Ia, IIa, IIIb, VI	145	Conduit trench
TR51	2.5 x 1.0	Ia, IIa, VI	140	Conduit trench
TR52	2.5 x 1.0	Ia, IIa, VI	135	Light Pole 10
TR53	2.6 x 1.0	Ia, IIa, IIIb, VI	140	Conduit trench
TR54	2.7 x 1.0	Ia, IIa, IIIb, VI	150	Conduit trench
TR55	2.6 x 1.0	Ia, IIa, VI	135	Light Pole 11
TR56	2.5 x 1.0	Ia, IIa, VI	140	Conduit trench
TR57	2.4 x 1.0	Ia, IIc, IIIa, VI	155	Conduit trench
TR58	2.6 x 1.0	Ia, IIc, IIIa, VI	135	Light Pole 12
TR59	2.6 x 1.0	Ia, IIa, VI	130	Conduit trench
TR60	2.8 x 1.0	Ia, IIa, VI	160	Conduit trench
TR61	2.6 x 1.0	Ia, IIa, VI	150	Light Pole 13
TR62	2.8 x 1.0	Ia, IIa, IIIb, VI	150	Conduit trench
TR63	2.9 x 1.0	Ia, IIa, IIIb, VI	145	Conduit trench
TR64	2.9 x 1.0	Ia, IIc, IIIa, VI	140	Light Pole 14
TR65	2.8 x 1.0	Ia, IIa, VI	130	Conduit trench
TR66	2.9 x 1.0	Ia, IIa, VI	150	Conduit trench
TR67	2.6 x 1.0	Ia, VI	155	Light Pole 15
TR68	2.7 x 1.0	Ia, IIa, VI	150	Conduit trench
TR69	2.5 x 1.0	Ia, IIa, VI	135	Conduit trench
TR70	2.6 x 1.0	Ia, VI	130	Light Pole 16
TR71	2.5 x 1.0	Ia, IIa, VI	130	Conduit trench
TR72	2.6 x 1.0	Ia, IIa, VI	150	Conduit trench

Table 7. Summary of Excavations in Section 3, South and Adjacent to the MDRS.

Backhoe Trench	Size (m[1]) LxW or Dia.	Layers Identified	Depth at BOE[3] (cmbs[4])	Test Locale
TR73	2.5 x 1.0	Ia, VI	130	Light Pole 17
TR74	2.5 x 1.0	Ia, IIa, VI	145	Conduit trench
TR75	2.3 x 1.0	Ia, IIc, IIIa, VI	155	Conduit trench
TR76	2.6 x 1.0	Ia, IIc, IIIa, VI	140	Light Pole 18
TR77	2.5 x 1.0	Ia, IIc, IIIa, VI	140	Conduit trench
TR78	2.4 x 1.0	Ia, IIc, IIIa, VI	130	Conduit trench
TR79	2.4 x 1.0	Ia, IIc, IIIa, VI	130	Light Pole 19
TR80	3.0 x 1.0	Ia, VI	140	Conduit trench
TR81	2.6 x 1.0	Asphalt, VI	135	Conduit trench
TR82	2.5 x 1.0	Ia, IIc, VI	130	Light Pole 20
TR87	2.6 x 1.0	Ia, VI	155	Utility Pole

[1]m = meters; [2]last layer listed is BOE layer; [3]BOE = base of excavation; [4]cmbs = centimeters below surface

were excavated to sample conduit trench locations (see Table 7). Trenches in Section 3 were situated from 12 to 32 m apart, ranged from 2.0 by 1.0 m to 3.0 by 1.1 m in size (see Table 7), and ranged in depth from 130 to 160 cmbs.

A total of nine (9) stratigraphic layers were identified during subsurface testing in Section 3 of the MDRS project area. These include Layers Ia, Ic, IIa, IIc, IIIa, IIIb, IV, V, and VI, and are described in detail in Table 4. Figures 25, 26, 27, and 28 present the stratigraphic profiles documented in TR25-TR40 (Figure 25), TR41-TR56 (Figure 26), TR57-TR72 (Figure 27) and TR73-TR82 and TR87 (Figure 28), and provide preliminary stratigraphic layer correlations. A brief discussion of the stratigraphic layers identified in Section 3 south and adjacent to the MDRS is presented below.

Layer Ia

Layer Ia is one of two surface layers identified in the first stratigraphic position in the Section 3 trenches (see Table 7; see Figures 25-28). Layer Ia deposits in Section 3 consist primarily of dark brown loamy fine sands, and were identified in areas with vegetation. No archaeological materials or features were encountered in Layer Ia in Section 3.

Little textural variation was present in Layer Ia deposits in Section 3. The texture of Layer Ia deposits was primarily loamy fine sand; loamy fine to medium sand was also documented. The sands present in Layer Ia are calcareous, similar to Layer Ia deposits in other sections of the project area. Samples of Layer Ia in Section 3 effervesced strongly with dilute HCl. Organic materials were present in Layer Ia. Soil color variations in Layer Ia included dark brown (7.5YR 3/3 and 7.5YR 3/2), the predominant color, dark reddish brown (5YR 4/2), light brown (7.5YR 6/4), and brown (7.5YR 4/4 and 7.5YR 4/3).

Layer Ia was identified in all but five trenches (TR30, TR32-TR33, and TR35-TR36) in Section 3 (see Table 7; see Figures 25-28). This soil ranges in thickness from 3 to 15 cm, with an average thickness of 9 cm. Maximum thickness of Layer Ia deposits (15 cm) was identified in TR82. Minimum Layer Ia thicknesses of 3 cm were documented in numerous trenches including TRs27, 31, 38, 51-56, 60, 61, 63, 64, 68, 71, 72, 79, and 87. Layer Ia was found directly overlying Layers IIa, IIc, IIIa, and VI in Section 3.

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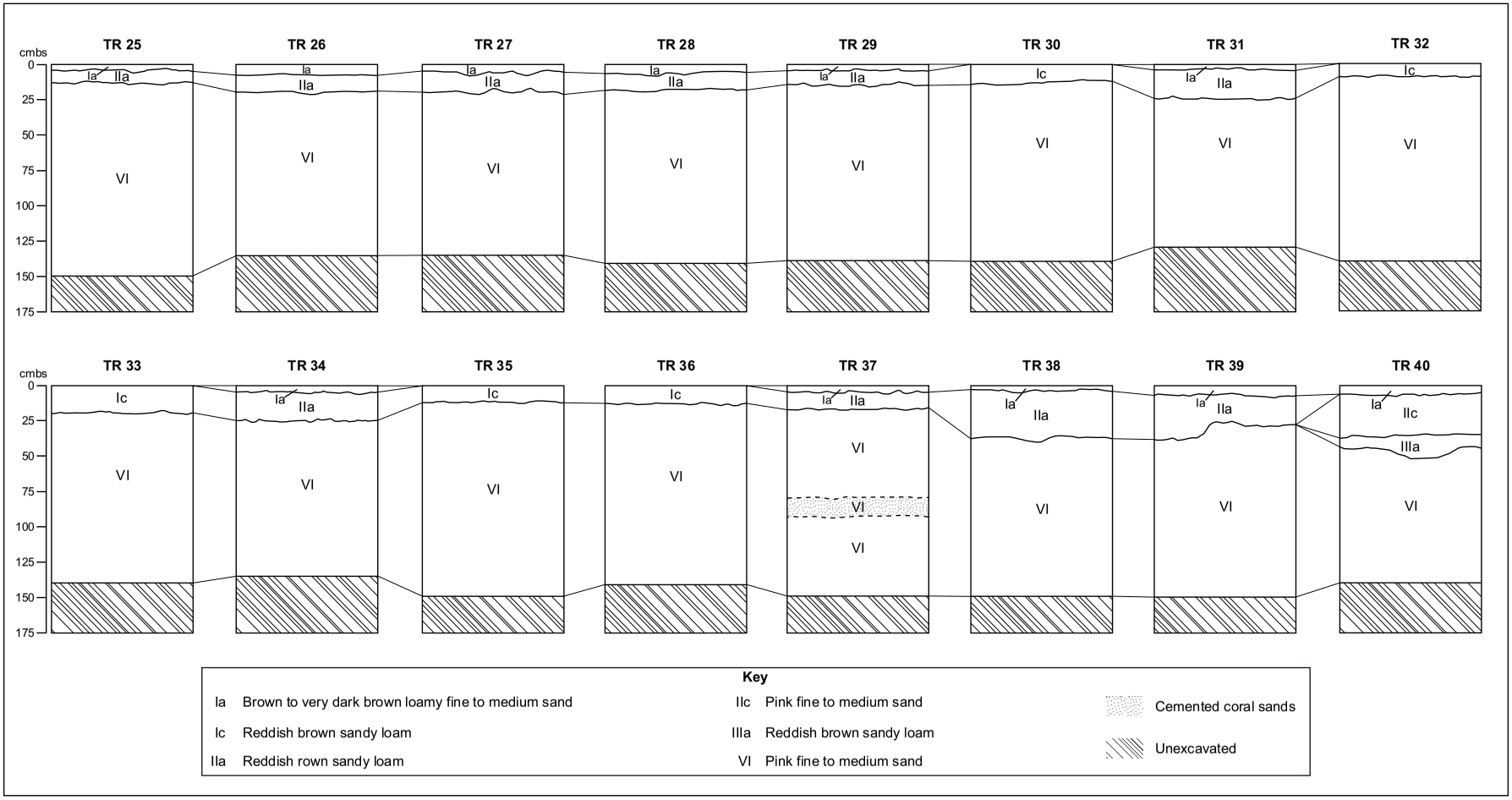


Figure 25. Stratigraphic Profiles and Correlations in Trenches 25 through 40 in Section 3 of the Mānā Drag Racing Strip Project Area.

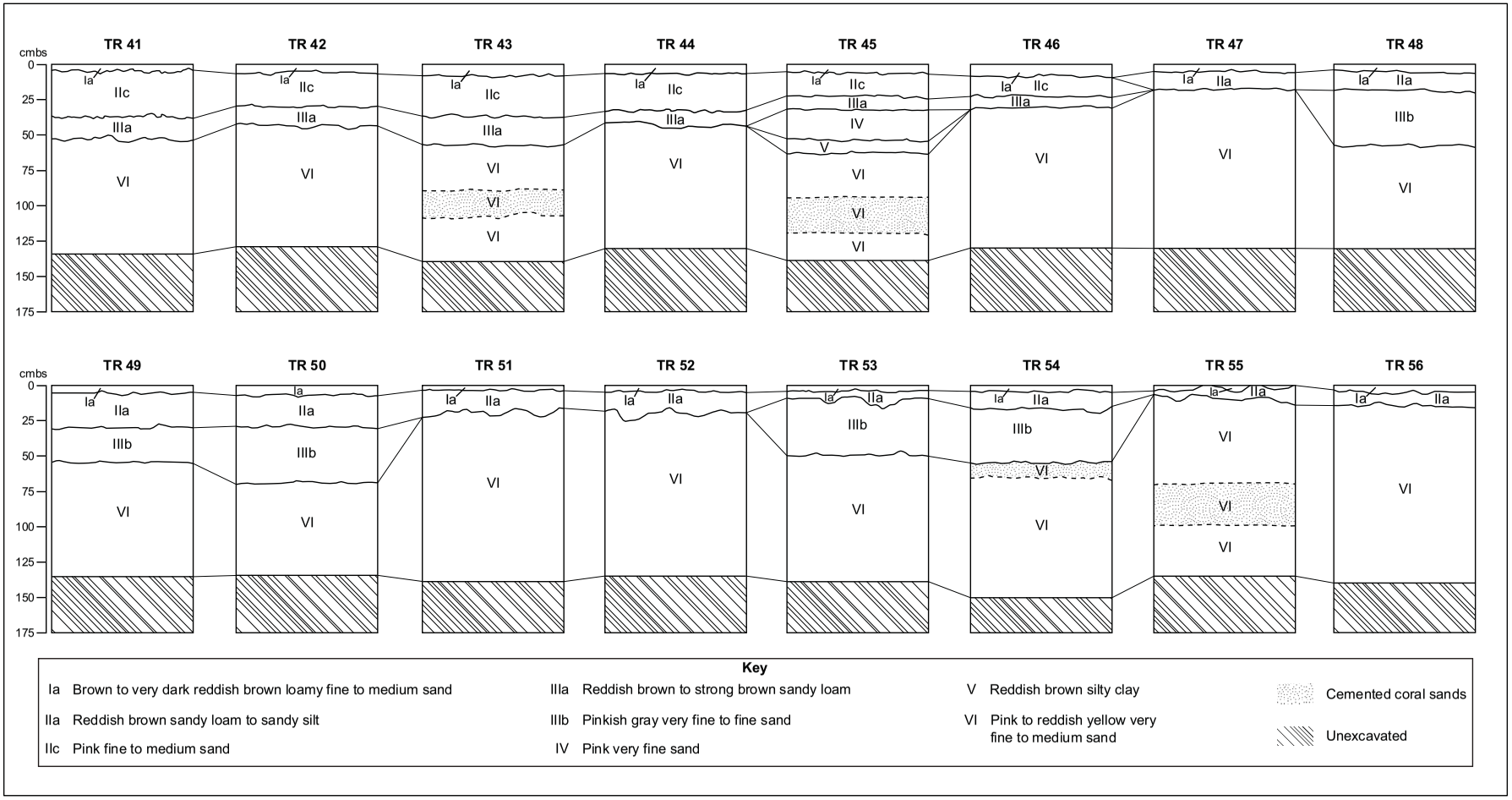


Figure 26. Stratigraphic Profiles and Correlations in Trenches 41 through 56 in Section 3 of the Mānā Drag Racing Strip Project Area.

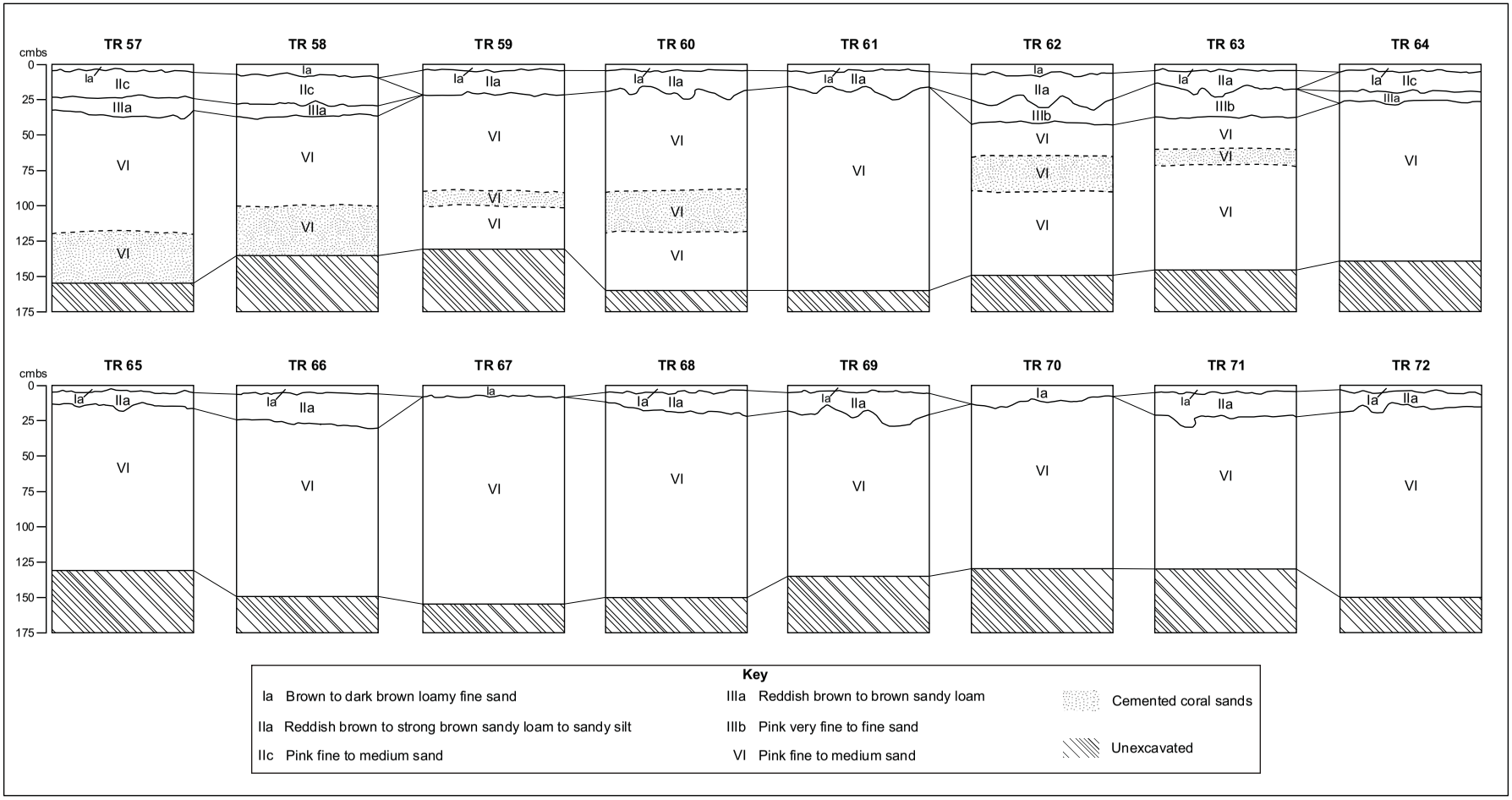


Figure 27. Stratigraphic Profiles and Correlations in Trenches 57 through 72 in Section 3 of the Mānā Drag Racing Strip Project Area.

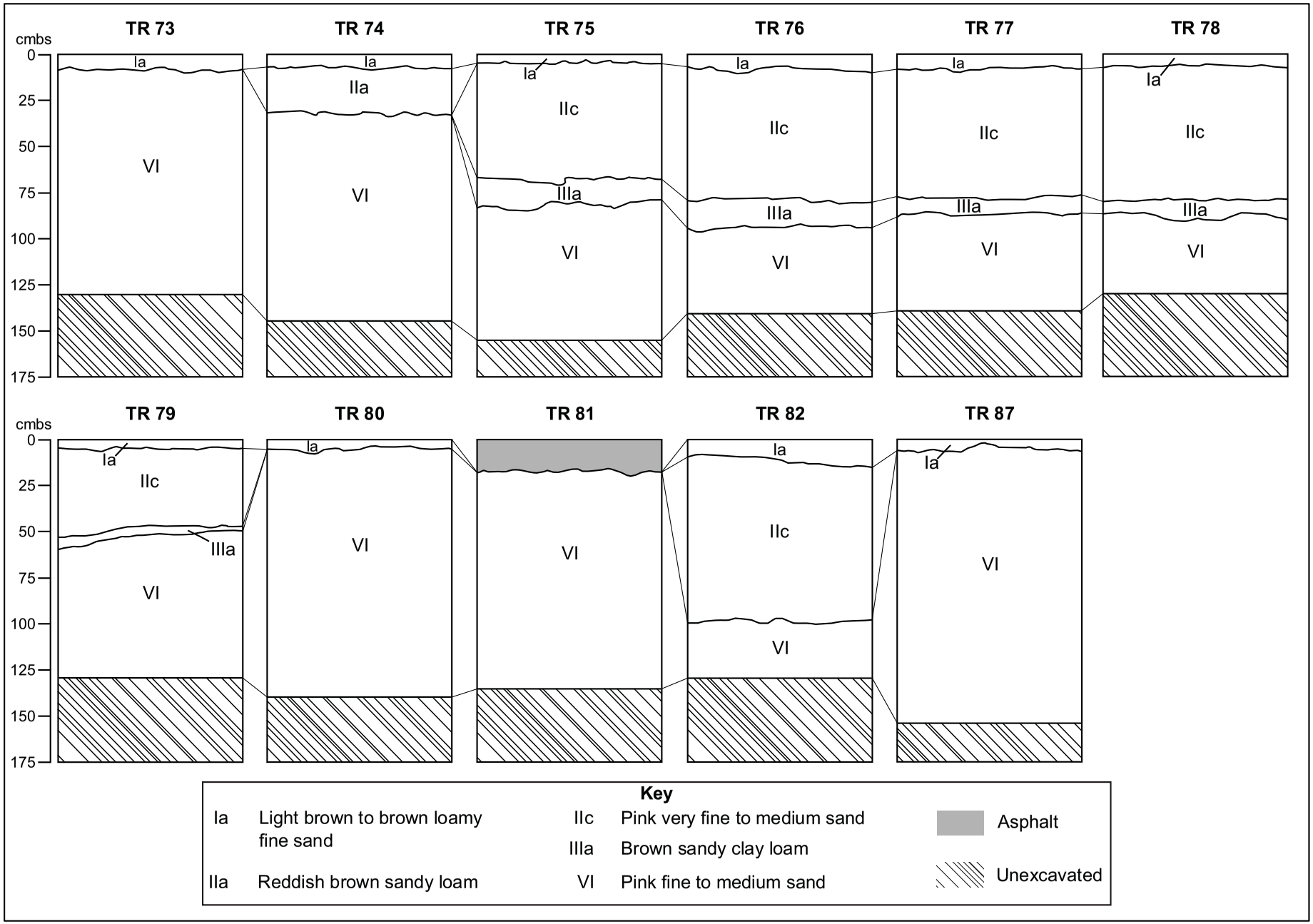


Figure 28. Stratigraphic Profiles and Correlations in Trenches 73 through 82 and 87 in Section 3 of the Mānā Drag Racing Strip Project Area.

Layer Ic

Layer Ic is the second of two surface layers identified in the first stratigraphic position in Section 3 trenches (see Table 7; see Figure 25). Layer Ic deposits in Section 3 consist primarily of reddish brown sandy loam with less than 2%, by volume, angular basalt pebbles, and were identified in areas with vegetation. No archaeological materials or features were encountered in Layer Ic in Section 3.

No textural or color variations were observed in Layer Ic deposits in Section 3. The sands present in Layer Ic sandy loams are calcareous. Samples of Layer Ic in Section 3 effervesced moderately with dilute HCl. Organic materials were present in Layer Ic.

Layer Ic was identified in five trenches in Section 3, including TR30, TR32-TR33, and TR35-TR36 (see Table 7; see Figures 25). This layer ranges in thickness from 10 to 15 cm, with an average thickness of 9 cm. Maximum thickness of Layer Ic deposits (20 cm) was identified in TR33. Minimum Layer Ic thicknesses of 10 cm were documented in two trenches--TR32 and TR35. Layer Ic was found directly overlying Layer VI in Section 3.

Layer IIa

Layer IIa is the first of two layers identified in the second stratigraphic position in Section 3, south and adjacent to the MDRS (see Table 7). Layer IIa deposits consist of reddish brown sandy loam. No pre-Contact Hawaiian materials or features were found in Layer IIa.

Little textural variation was present in Layer IIa deposits in Section 3. Layer IIa texture consisted primarily of a sandy loam with 2-5%, by volume, angular basalt pebbles. The sands present in Layer IIa are calcareous. Samples of Layer IIa in Section 3 effervesced strongly with dilute HCl. A textural variation consisting of sandy silt with approximately 5%, by volume, basalt pebbles was documented in five trenches, including TR48-TR50, TR53-TR54. The predominant color documented for Layer IIa was reddish brown (5YR 4/4, 5YR). One other color variation documented in Layer IIa included strong brown (7.5YR 4/6) in TR62.

Layer IIa was identified in the majority (32) of backhoe trenches in Section 3 (see Table 7; see Figures 25-28). These soils range in thickness from 8 to 35 cm with an average thickness of 21 cm. Maximum thickness of Layer IIa deposits were identified in TR38 (35 cm) while a minimum Layer IIb thickness of 8 cm was identified in TR25. Layer IIa was found directly underlying Layer Ia, and directly overlying Layers IIIb and VI.

Layer IIc

Layer IIc is the second of two layers identified in the second stratigraphic position in Section 3. No archaeological materials or features were found in Layer IIc.

The Layer IIc matrix consists primarily of pink (7.5YR 3/4) fine to medium sand, and is quite similar in color and texture to Layer VI deposits. The sands present in Layer IIc are calcareous. Samples of Layer IIb in Section 2 effervesced strongly with dilute HCl. Textural variations in Layer IIc include fine to medium sand, medium sand, very fine sand, and very fine to fine sand. There was no color variation observed in Layer IIc deposits in Section 3.

Layer IIc was identified in 16 trenches in Section 3 (see Table 7; see Figures 25-28). These soils range in thickness from 14 to 90 cm with an average thickness of 41 cm. Maximum thickness of Layer IIc deposits were identified in TR82 (90 cm) while minimum Layer IIc thicknesses of 14 cm were identified in TR45, TR46, and TR64. Layer IIc directly underlies Layer Ia and directly overlies Layers IIIa and VI.

Layer IIIa

Layer IIIa is the first of two layers found in the third stratigraphic position in Section 3. No archaeological materials or features were encountered in Layer IIIa.

The Layer IIIa matrix consists primarily of reddish brown (5YR 4/4) sandy loam with less than 2%, by volume, angular basalt pebbles and gravels. Color and textural variations in Layer IIIa include strong brown (7.5YR 4/6) loamy sand, brown (7.5YR 4/4) and reddish brown (5YR 4/4) sandy clays, and brown (7.5YR 4/3) sandy clay loam. The sands present in Layer IIIa are calcareous. Samples of Layer IIIa in Section 2 effervesced strongly with dilute HCl.

Layer IIIa was identified in 15 trenches in Section 3, including TR40-46, TR57, TR58, TR64, and TR75-79(see Table 7; see Figures 25-28). These soils range in thickness from 5 to 23 cm, and have an average thickness of 11 cm. Maximum thickness of Layer IIIa deposits were identified in TR43 (23 cm) while minimum Layer IIIa thicknesses of 5 cm were identified in TR58, TR64, and TR79. Layer IIIa directly underlies Layer IIc and directly overlies Layers IV (TR45 only) and VI.

Layer IIIb

Layer IIIb is the second of two layers found in the third stratigraphic position in Section 3 (see Table 7; see Figures 26 and 27). No archaeological materials or features were encountered in Layer IIIb

The Layer IIIb matrix consists primarily of pinkish gray (7.5YR 7/2, moist), very fine to fine sand with less than 5%, by volume, angular limestone gravel. The only color and textural variation observed in Layer IIIb pinkish gray very fine to fine sands included pink (7.5YR 7/3) fine sands with limestone gravels. The sands and gravels present in Layer IIIb are calcareous. Samples of Layer IIIb in Section 3 effervesced strongly with dilute HCl.

Layer IIIb was identified in seven trenches in Section 3, including TR48-50 TR53-TR54, and TR62-TR63. These soils range in thickness from 10 to 43 cm, and have an average thickness of 33 cm. Maximum thickness of Layer IIIb deposits were identified in TR48 (43 cm) while minimum Layer IIIb thicknesses of 10 to 15 cm were identified in TR62 and TR63. Layer IIIb directly underlies Layer IIa and directly overlies Layer VI.

Layer IV

Layer IV was found only in TR45 in Section 3. In this trench, it was found in the fourth stratigraphic position. No archaeological materials or features were encountered in Layer IV.

The Layer IV matrix consisted of a pink (7.5YR 7/4) very fine sands. These sands are calcareous. Samples of Layer IV in Section 3 effervesced strongly with dilute HCl. Layer IV ranges in thickness from 20 to 23 cm. In TR45, Layer IV was found directly underlying Layer IIIa and directly overlying Layer V (see Figure 26).

Layer V

Like Layer IV, Layer V was found only in TR45 in Section 3. In this trench, Layer V was found in the fifth stratigraphic position. No archaeological materials or features were encountered in Layer V.

The Layer V matrix consisted of reddish brown (5YR 4/4) silty clay. There is a small percentage of coral sand present in Layer V; samples of Layer V effervesced very slightly with dilute HCl. Layer V ranges in thickness from 8 to 10 cm. Layer V was found directly underlying Layer IV and directly overlying Layer VI (see Figure 26).

Layer VI

Layer VI was found at the base of excavations in all trenches in Section 3; it was found in the sixth stratigraphic position in TR45. No pre-Contact Hawaiian archaeological materials or features were found in Layer VI (see Table 7; see Figures 25-28).

Layer VI sediments varied in texture and color across Section 3. The predominant color and texture of Layer VI is pink (7.5YR 7/4) very fine to fine sands, with recorded textural variations including fine to medium sand, very fine to medium sand, fine sand, and very fine sand. Like Layer VI sands in other portions of the MDRS project area, Layer VI sands in Section 3 are calcareous (coral sands). Samples of Layer VI in Section 3 effervesced strongly with dilute HCl. Only one other color variation was documented in Layer VI sands in Section 3. This included Layer VI reddish yellow (7.5YR 7/6) very fine sands in TR45.

Layer VI sands exhibited strong cementation intermittently across Section 3. Strongly cemented Layer VI sands were observed in the following trenches:

- TR37 (15 cm-thick cemented zone from 80 to 95 cmbs)
- TR43 (20 cm-thick cemented zone from 90 to 110 cmbs)
- TR45 (25 cm-thick cemented zone from 95 to 120 cmbs)
- TR54 (10 cm-thick cemented zone from 55 to 65 cmbs at top of layer)
- TR55 (30 cm-thick zone from 70 to 100 cmbs)
- TR57 (cemented zone in lower proveniences from 120 to BOE [155 cmbs])
- TR58 (cemented zone in lower proveniences from 100 to BOE [135 cmbs])
- TR59 (10 cm-thick zone from 90 to 100 cmbs)
- TR60 (30 cm-thick zone from 90 to 120 cmbs)
- TR62 and TR63 (25 cm-thick zone from 65 to 90 cmbs)

Although the base of Layer VI was not reached in Section 3 excavations, exposed portions of Layer VI ranged in thickness from 30+ to 150+ cm across Section 3, with an average thickness of 107+ cm. Maximum thickness of Layer VI deposits was recorded at TR87 (150+ cm), while a minimum Layer VI thickness of 30+ cm was recorded in TR82. Layer VI was found directly underlying Layers Ia, Ic, IIa, IIc, IIIa, IIIb, and V (see Figures 25-28) in Section 3.

Stratigraphic Sequences Documented in Section 3-South and Adjacent to the MDRS

Examination of the 59 backhoe trenches in Section 3 (TR25-82 and TR87) revealed seven (7) stratigraphic sequence variants (see Table 7). Based on field documentation, variations in documented stratigraphic sequences are primarily due to the presence of two layers in the first stratigraphic position (Layers Ia and Ic), the presence of two layers in the second stratigraphic position (Layers IIa and IIc), the presence of two layers in the third stratigraphic position (Layers IIIa and IIIb) and on the presence of six layers in TR45.

The seven stratigraphic sequence variants and the trenches in which they were identified in Section 3 include:

Variant 1: Layers Ia/IIa/VI; TR25-TR29, TR31, TR34, TR37-TR39, TR47, TR51, TR52, TR55, TR56, TR59-TR61, TR65-TR66, TR68-TR69, TR71-TR72, TR74, TR82

Variant 2: Layers Ic/VI; TR30, TR32-TR33, TR35-TR36

Variant 3: Layers Ia/IIc/IIIa/VI: TR40-TR44, TR46, TR57-TR58, TR64, TR75-TR79

Variant 4: Layers Ia/IIc/VI: TR82

Variant 5: Layers Ia/IIc/IIIa/IV/V/VI: TR45

Variant 6: Layers Ia/IIa/IIIb/VI: TR48, TR49-TR50, TR53-TR54, TR62-TR63

Variant 7: Layers Ia/VI: TR67, TR70, TR73, TR80, TR87

The Variant 1 stratigraphic sequence (Layers Ia/IIa/VI) was identified in 26 trenches in Section 3 (see above). It consists of a dark brown loamy fine to medium sand (Layer Ia-A Horizon) overlying reddish brown sandy loam deposits of Layer IIa. Layer IIa directly overlies the pink very fine to fine sands of Layer VI. Figures 29-32 present profile drawings and photographs of the Variant 1 stratigraphic sequences observed on the south face of TR27, the south face of TR34, the north face of TR47, and the east face of TR68, respectively.

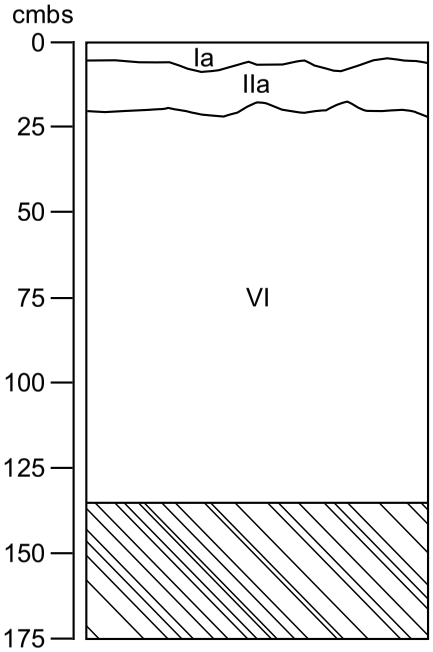
The Variant 2 stratigraphic sequence (Layers Ic/VI) consists of two layers, and was found in five trenches in Section 3 including TR30, TR32-TR33, and TR35-TR36. It consists of the reddish brown sandy loam of Layer Ic (a probable A Horizon) directly overlying the pink very fine to fine sands of Layer VI. Figure 33 presents a profile drawing and photograph of the Variant 2 stratigraphic sequence observed on the east face of TR30.

The Variant 3 sequence (Layers Ia/IIc/IIIa/VI) consists of four layers, and was found in 14 trenches in Section 3, including TR40-TR44, TR46, TR57-TR58, TR64, TR75-TR79. This sequence was identified in Section 1 as the Variant 4 stratigraphic sequence. In Section 3, this sequence consists of a dark brown loamy fine to medium sand layer (Layer Ia-A Horizon) overlying pink fine to medium coral sands of Layer IIc. Layer IIc directly overlies Layer IIIa reddish brown sandy loam, and Layer IIIa directly overlies the pink, very fine to fine coral sands of Layer VI. Figures 34-37 present profile drawings and photographs of the Variant 3 stratigraphic sequences observed on the east face of TR40, the south face of TR46, the east face of TR57, and the east face of TR77, respectively.

The Variant 4 stratigraphic sequence (Layers Ia/Ic/VI) consists of three layers, and was found only in TR82 in Section 3. It consists of the dark brown loamy fine to medium sands of Layer Ia (A Horizon) directly overlying the pink fine to medium coral sands of Layer IIc. Layer IIc directly overlies the pink, very fine to fine coral sands of Layer VI. Figure 38 presents a profile drawing and photograph of the Variant 4 stratigraphic sequence observed on the south face of TR82.

The Variant 5 stratigraphic sequence (Layers Ia/IIc/IIIa/IV/V/VI) consists of six layers, and was found only in TR45 in Section 3. This was the only test locale that revealed six stratigraphic layers. The sequence consists of the dark brown loamy fine to medium sands of Layer Ia (A Horizon) directly overlying the pink fine to medium coral sands of Layer IIc. Layer IIc directly overlies Layer IIIa reddish brown sandy loam, and Layer IIIa directly overlies Layer IV pink very fine sands. Layer IV directly overlies Layer V reddish brown silty clay, and Layer V overlies the pink, very fine to fine coral sands of Layer VI. Figure 39 presents a profile drawing and photograph of the Variant 5 stratigraphic sequence observed on the east face of TR45.

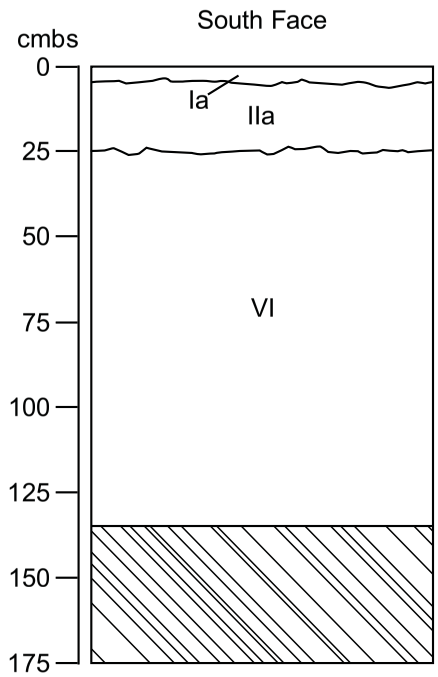
The Variant 6 stratigraphic sequence (Layers Ia/IIa/IIIb/VI) consists of four layers, and was found in 7 trenches in Section 3, including TR48, TR49-TR50, TR53-TR54, TR62-TR63. This sequence consists of a dark brown loamy fine to medium sand layer (Layer Ia-A Horizon) overlying the reddish brown sandy loam deposits of Layer IIa. Layer IIa directly overlies Layer IIIb pinkish gray very fine to fine sands, and Layer IIIa directly overlies the pink, very fine to fine coral sands of Layer VI. Figures 40 presents the profile drawing and photograph of the Variant 6 stratigraphic sequences observed on the east face of TR48.



Photograph of Base of Excavation; view to south

Key	
Ia	Brown loamy fine to medium sand
IIa	Reddish brown sandy loam
VI	Pink fine to medium sand
	Unexcavated

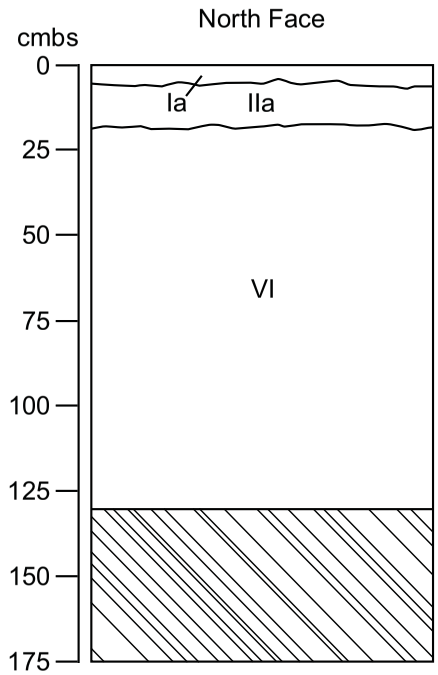
Figure 29. Stratigraphic Profile Drawing and Photograph of Trench 27, Section 3, Showing the Variant 1 Stratigraphic Sequence.



Photograph of Base of Excavation; view to south

Key	
Ia	Brown loamy fine to medium sand
IIa	Reddish brown sandy loam
VI	Pink fine to medium sand
	Unexcavated

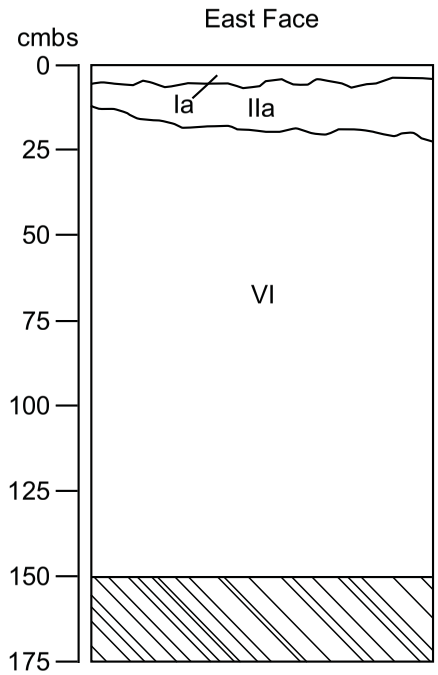
Figure 30. Stratigraphic Profile Drawing and Photograph of Trench 34, Section 3, Showing the Variant 1 Stratigraphic Sequence.



Photograph of Base of Excavation; view to north

Key	
Ia	Brown loamy fine sand
IIa	Reddish brown sandy loam
VI	Pink fine sand
	Unexcavated

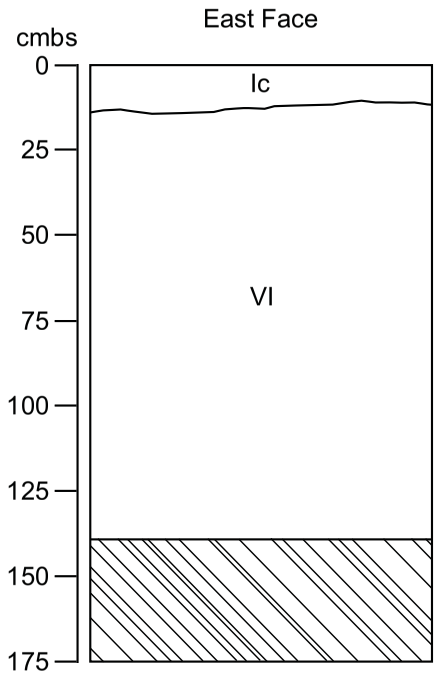
Figure 31. Stratigraphic Profile Drawing and Photograph of Trench 47, Section 3, Showing the Variant 1 Stratigraphic Sequence.



Photograph of Base of Excavation; view to east

Key	
Ia	Brown loamy fine sand
IIa	Reddish brown sandy loam
VI	Pink fine sand
	Unexcavated

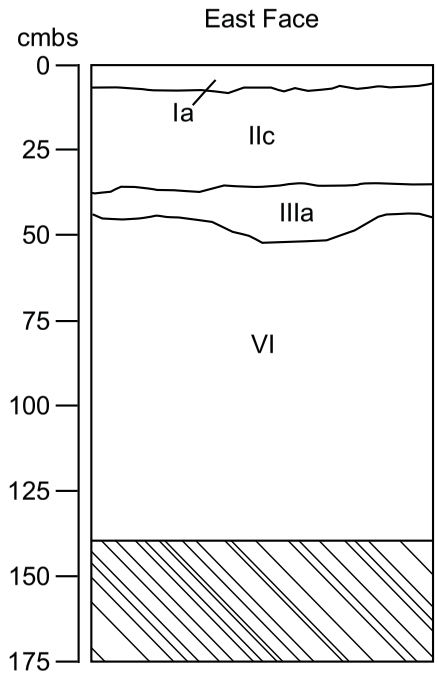
Figure 32. Stratigraphic Profile Drawing and Photograph of Trench 68, Section 3, Showing the Variant 1 Stratigraphic Sequence.



Photograph of Base of Excavation; view to east

Key	
Ic	Reddish brown sandy loam
VI	Pink fine to medium sand
	Unexcavated

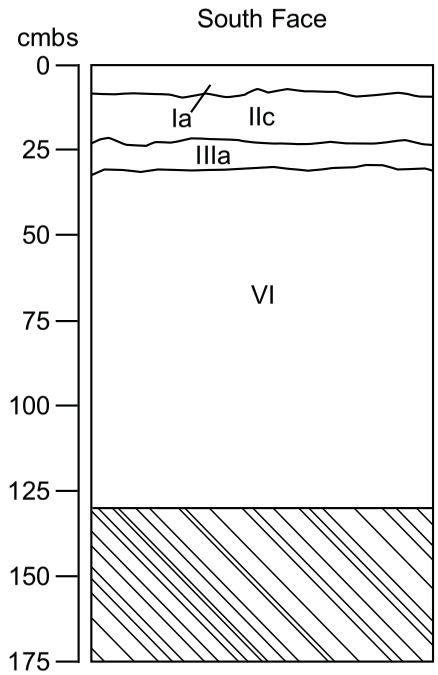
Figure 33. Stratigraphic Profile Drawing and Photograph of Trench 30, Section 3, Showing the Variant 2 Stratigraphic Sequence.



Photograph of Base of Excavation; view to east

Key	
Ia	Dark brown loamy fine to medium sand
IIc	Pink fine to medium sand
IIIa	Reddish brown sandy loam
VI	Pink fine sand
	Unexcavated

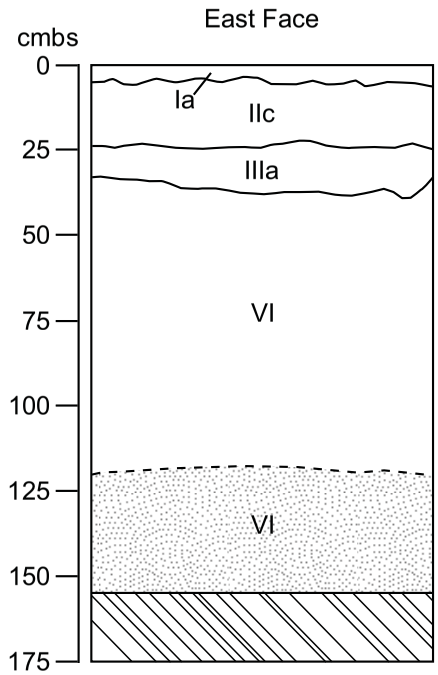
Figure 34. Stratigraphic Profile Drawing and Photograph of Trench 40, Section 3, Showing the Variant 3 Stratigraphic Sequence.



Photograph of Base of Excavation; view to south

Key	
Ia	Dark brown loamy fine sand
IIc	Pink fine to medium sand
IIIa	Strong brown loamy sand
VI	Pink very fine sand
	Unexcavated

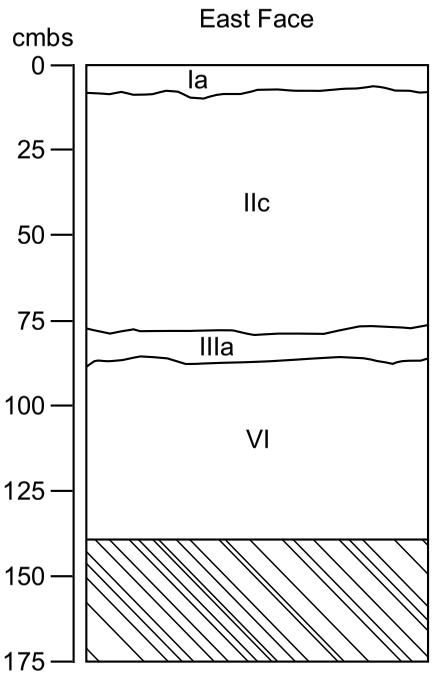
Figure 35. Stratigraphic Profile Drawing and Photograph of Trench 46, Section 3, Showing the Variant 3 Stratigrahic Sequence.



Photograph of Base of Excavation; view to east

Key	
Ia	Brown loamy fine sand
IIc	Pink fine sand
IIIa	Reddish brown sandy loam
VI	Pink fine sand
	Cemented coral sands
	Unexcavated

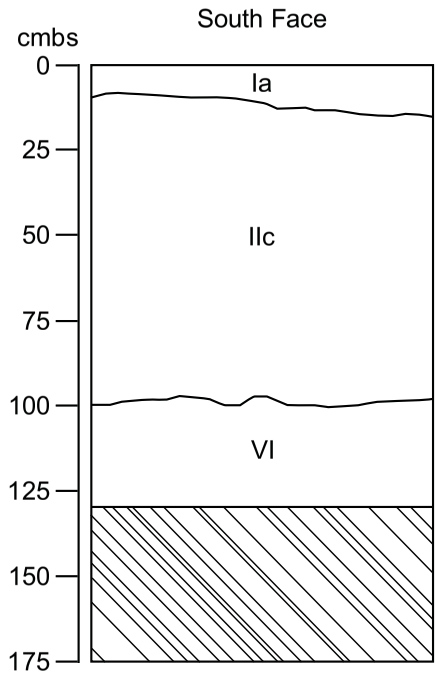
Figure 36. Stratigraphic Profile Drawing and Photograph of Trench 57, Section 3, Showing the Variant 3 Stratigraphic Sequence.



Photograph of Base of Excavation; view to east

Key	
Ia	Light brown loamy fine sand
IIc	Pink very fine sand
IIIa	Brown sandy clay loam
VI	Pink fine to medium sand
	Unexcavated

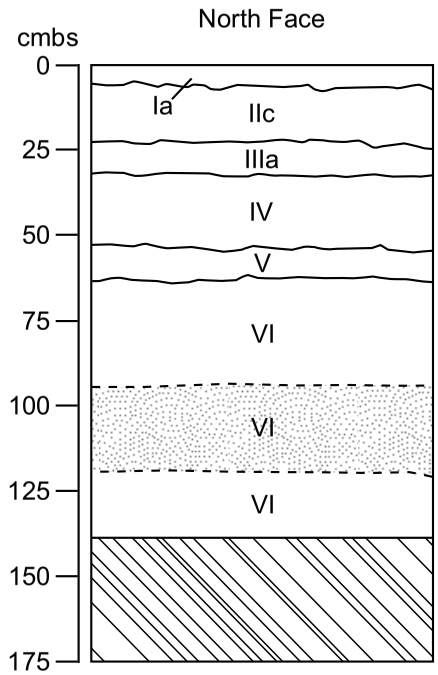
Figure 37. Stratigraphic Profile Drawing and Photograph of Trench 77, Section 3, Showing the Variant 3 Stratigraphic Sequence.



Photograph of Base of Excavation; view to south

Key	
Ia	Light brown loamy fine sand
IIc	Pink very fine sand
VI	Pink fine sand
	Unexcavated

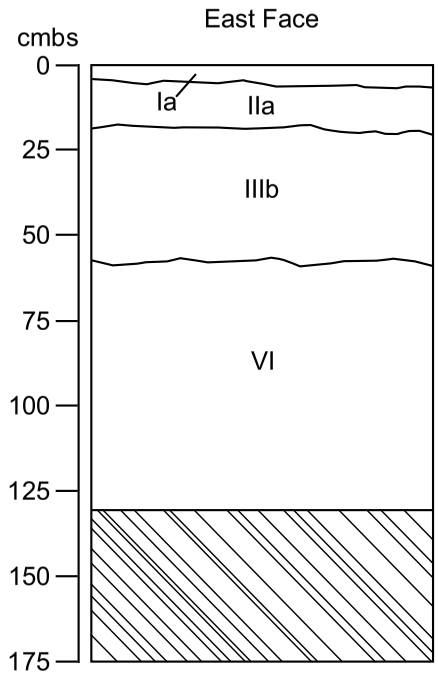
Figure 38. Stratigraphic Profile Drawing and Photograph of Trench 82, Section 3, Showing the Variant 4 Stratigraphic Sequence.



Key

Ia	Dark brown loamy fine sand
IIc	Pink fine to medium sand
IIIa	Strong brown loamy sand
IV	Pink very fine sand
V	Reddish brown silty clay
VI	Reddish yellow very fine sand
	Cemented coral sands
	Unexcavated

Figure 39. Stratigraphic Profile Drawing and Photograph of Trench 45, Section 3, Showing the Variant 5 Stratigraphic Sequence.



Photograph of Base of Excavation; view to east

Key	
Ia	Brown loamy fine sand
IIa	Reddish brown sandy silt
IIIb	Pinkish gray very fine to fine sand
VI	Pink fine to medium sand
	Unexcavated

Figure 40. Stratigraphic Profile Drawing and Photograph of Trench 48, Section 3, Showing the Variant 6 Stratigraphic Sequence.

The Variant 7 stratigraphic sequence (Layers Ia/VI) consists of two layers, and was found in six trenches in Section 3 including TR67, TR70, TR73, TR80, TR81, and TR87. It consists of the dark brown loamy fine to medium sands of Layer Ia (A Horizon) directly overlying the pink very fine to fine sands of Layer VI. Figure 41 presents a profile drawing and photograph of the Variant 7 stratigraphic sequence observed on the east face of TR70.

One trench in Section 3, TR81, was excavated through the edge of the second asphalt turn-off road (see Figure 14). The exposed profile revealed approximately 17 cm of asphalt directly overlying Layer VI pink very fine to fine coral sands (see Figure 28). Based on the presence of Layer Ia deposits revealed in nearby trenches (TR79, TR80, and TR82), it is suspected that Layer Ia was present in the TR81 locale prior to the construction of this asphalt road. Trench 81, therefore, is included in trenches with the Layer Ia/VI stratigraphic sequence.

Stratigraphy of Section 4- the Area South of the Turn-Off Road

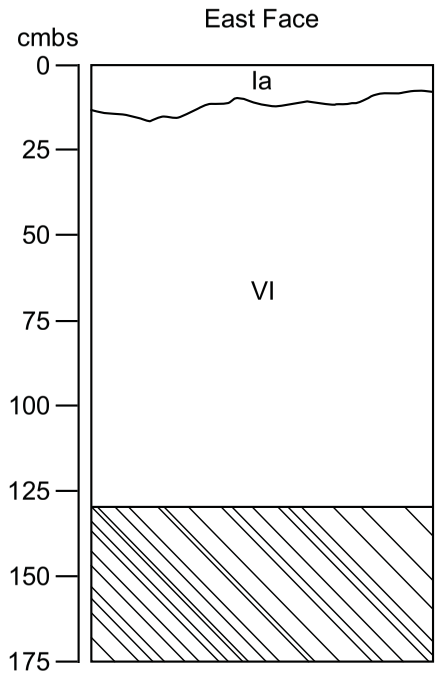
Test locales in Section 4, including TR83-86 and TR88-90, were excavated to test the proposed locations of a series of electrical panels to be installed south of the asphalt turn-off road which is south of the MDRS. Figure 14 shows the location of Section 4 and TR83-86 and TR87-90, and Table 8 summarizes these excavations. These trenches were excavated with a backhoe, were situated from 135 to 235 m apart, and positioned in a roughly linear pattern along the south edge of the asphalt turn off road *makai* (seaward) of the MDRS. The backhoe trenches in Section 4 measured 2.3 by 1.0 m (see Table 8), and ranged in depth from 130 to 140 cmbs.

A total of three stratigraphic layers were identified during testing in Section 4 of the MDRS project area. These include Layers Ia, IIa, and VI. Figure 42 presents the stratigraphic profiles documented in TR83-86 and TR87-90 and provides preliminary stratigraphic layer correlations. A brief discussion of the stratigraphic layers identified in Section 4 is presented below.

Table 8. Summary of Excavations in Section 4 South of the MDRS.

Backhoe Trench	Size (m[1]) LxW or Dia.	Layers Identified	Depth at BOE[3] (cmbs[4])	Test Locale
TR83	2.3 x 1.0	Ia, VI[2]	140	Electrical Panel 1
TR84	2.3 x 1.0	Ia, VI	130	Electrical Panel 2
TR85	2.2 x 1.0	Ia, VI	130	Electrical Panel 3
TR86	2.3 x 1.0	Ia, VI	130	Electrical Panel 4
TR88	2.3 x 1.0	Ia, VI	130	Electrical Panel 5
TR89	2.3 x 1.0	Ia, IIa, VI	135	Electrical Panel 6
TR90	2.4 x 1.0	Ia, IIa, VI	130	Electrical Panel 7

[1]m = meters; [2]last layer listed is BOE layer; [3]BOE = base of excavation; [4]cmbs = centimeters below surface



Photograph of Base of Excavation; view to east

Key	
Ia	Brown loamy fine sand
VI	Pink fine to medium sand
	Unexcavated

Figure 41. Stratigraphic Profile Drawing and Photograph of Trench 70, Section 3, Showing the Variant 7 Stratigraphic Sequence.

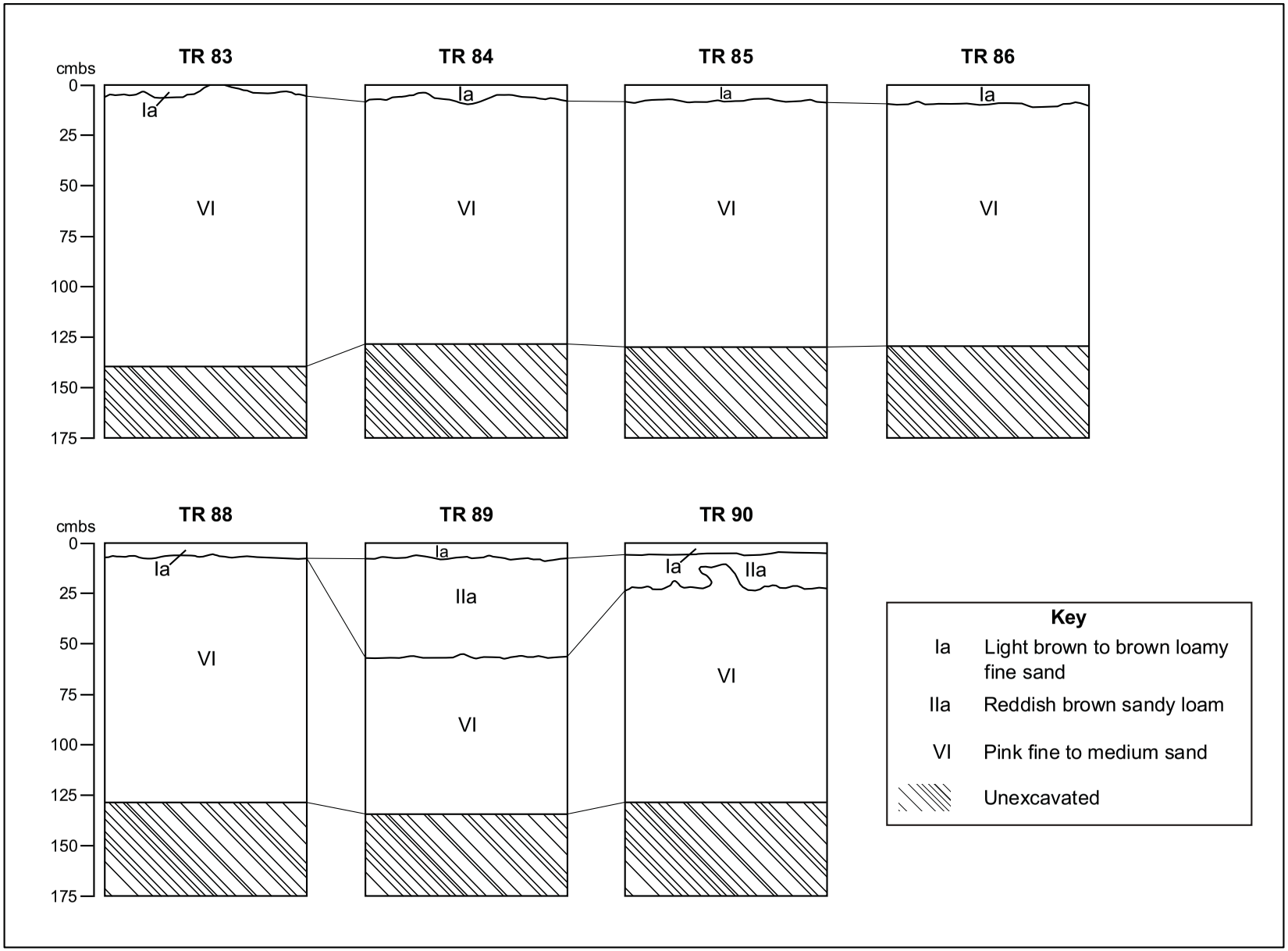


Figure 42. Stratigraphic Profiles and Correlations in Trenches 83 through 86, and 88 through 90 in Section 4 of the Mānā Drag Racing Strip Project Area.

Layer Ia

Layer Ia is the only layer found in the first stratigraphic position in Section 4 (see Table 8; see Figure 42). These soils were identified in areas with vegetation. No archaeological materials or features were encountered in Layer Ia.

Layer Ia was identified in all of the trench excavations in Section 4. located between the MDRS and the turn-off access road, TR83-86 and TR88-TR90 (see Table 15). These soils range in thickness from 1 – 10 cm, with an average thickness of 9 cm. Backhoe trenches where the thickest Layer Ia deposits were recorded include TR84 (10 cm) and TR86 (10 cm). Layer Ia was the thinnest in TR83 (1 cm).

Little texture and color variations were present in Layer Ia deposits in Section 4. The primary color and texture documented for Layer Ia deposits was dark brown (7.5YR 6/4) loamy fine sand. The sands present in Layer Ia are calcareous, and samples of Layer Ia in Section 4 effervesced strongly with dilute HCl. Organic materials were present in Layer Ia. The other color variation in Layer Ia included brown (7.5YR 4/4) loamy find sands.

Layer Ia was identified in all Section 4 backhoe trenches (see Table 8; see Figure 42). These soils range in thickness from 1 to 10 cm, with an average thickness of 9 cm. Maximum thickness of Layer Ia deposits (10 cm) was identified in TR84 and TR86. Minimum Layer Ia thickness of 1 cm was documented in TR83. Layer Ia was found directly overlying Layers IIa and VI.

Layer IIa

Layer IIa is the only layer in Section 4 found the second stratigraphic position (see Table 8; see Figure 42). No pre-Contact Hawaiian archaeological materials or features were encountered in Layer IIa.

No texture or color variations were present in Layer IIa deposits in Section 4. Layer IIa deposits consist of reddish brown (5YR 4/4) sandy loam with 2-5%, by volume, angular basalt pebbles. The sands present in Layer IIa are calcareous. Samples of Layer IIa in Section 4 effervesced strongly with dilute HCl.

Layer IIa was identified only in TR89 and TR90 in Section 4 (see Table 8; see Figure 42). These soils range in thickness from 5 to 50 cm with an average thickness of 32 cm. Maximum thickness of Layer IIa deposits were identified in TR89 (50 cm) while a minimum Layer IIa thickness of 5 cm was identified in TR90. Layer IIa was found directly underlying Layer Ia, and directly overlying Layer VI in Section 4.

Layer VI

Layer VI was found at the base of excavations in all trenches in Section 4. No pre-Contact Hawaiian archaeological materials or features were found in Layer VI.

Little texture variation in Layer VI sediments was observed in Section 4. Layer VI consisted primarily of pink (7.5YR 7/4) fine to medium sands, with a textural variation of very fine sands observed in TR89 and TR90. Like Layer VI sands in other portions of the MDRS project area, Layer VI sands in Section 4 are calcareous (coral sands). Samples of Layer VI in Section 4 effervesced strongly with dilute HCl. No cementation was observed in Layer VI sands in Section 4.

Although the base of Layer VI was not reached in Section 4 excavations, exposed portions of Layer VI ranged in thickness from 77+ to 140+ cm across Section 4, with an average thickness of 115+ cm. Maximum thickness of Layer VI deposits was recorded at TR83 (140+

cm), while a minimum Layer VI thickness of 77+ cm was recorded in TR89. Layer VI was found directly underlying Layers Ia and IIa (see Figures 42) in Section 4.

Stratigraphic Sequences Documented in Section 4-South of the Turn-Off Road

Examination of the 7 backhoe trenches in Section 4 (TR83-TR86; TR88-TR90), south of the turn-off road, revealed two (2) stratigraphic sequence variants (see Table 8; see Figure 42). Based on field documentation, variations in documented stratigraphic sequences are primarily due to the discontinuous presence of Layer IIa deposits in the stratigraphic sequences.

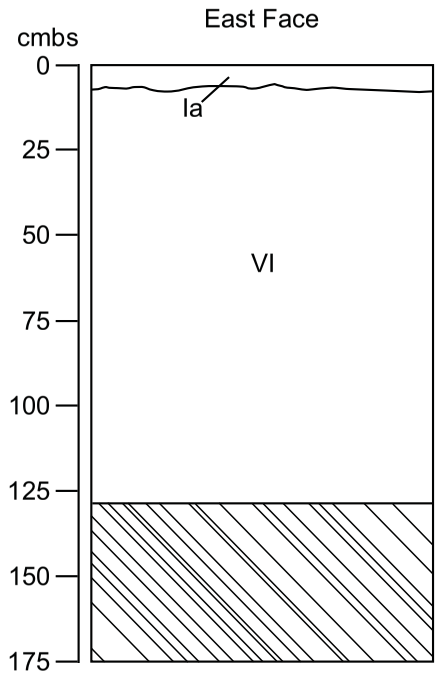
The two stratigraphic sequence variants in Section 4 include:

Variant 1: Layers Ia/VI; TR83-86, TR88

Variant 2: Layers Ia/IIa/VI; TR89-90

The Variant 1 sequence (Layers Ia/VI) consists of two layers, and was found in TR83-86 and TR88 in Section 4. It consists of dark brown loamy fine sands of Layer Ia (A Horizon) directly overlying the pink fine to medium sands (Layer VI). Figure 43 presents a photograph of the Variant 1 sequence on the east face of TR88.

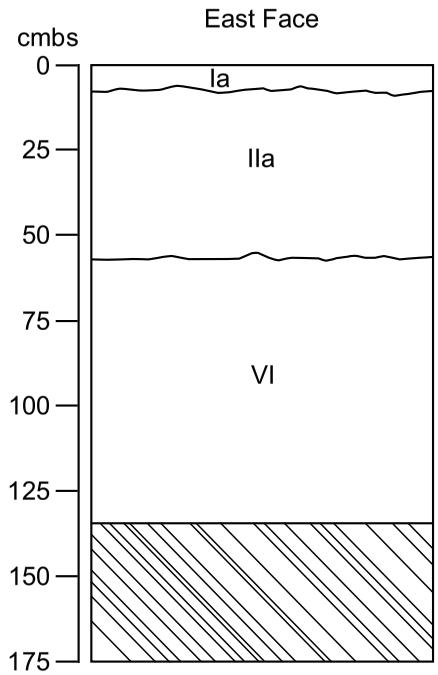
The Variant 2 sequence (Layers Ia/IIa/VI) consists of three layers, and was found in TR89-90. It consists of dark brown loamy fine sands of Layer Ia (A Horizon) directly overlying Layer IIa reddish brown sandy loam. Layer IIa directly overlies the pink fine sands of Layer VI). Figure 44 presents a photograph of the Variant 2 sequence on the east face of TR89.



Photograph of Base of Excavation; view to east

Key	
Ia	Light brown loamy fine sand
VI	Pink fine to medium sand
	Unexcavated

Figure 43. Stratigraphic Profile Drawing and Photograph of Trench 88, Section 4, Showing the Variant 1 Stratigraphic Sequence.



Photograph of Base of Excavation; view to east

Key	
Ia	Brown loamy fine sand
IIa	Reddish brown sandy loam
VI	Pink fine sand
	Unexcavated

Figure 44. Stratigraphic Profile Drawing and Photograph of Trench 89, Section 4, Showing the Variant 2 Stratigraphic Sequence.

SUMMARY AND INTERPRETATIVE DISCUSSION

Under contract to Limtiaco, PCSI conducted an Archaeological Assessment (AA) in support of proposed lighting improvements to the Mānā Drag Racing Strip (MDRS) in Waimea Ahupuaʻa, District of Kona, Kauaʻi Island, Hawaiʻi (see Figure 1). Because of the negative findings of the AIS pedestrian survey and subsurface testing, this report is being submitted as an AA report.

Background research revealed that no previous archaeological investigations have been conducted in the MDRS project area. Knowledgeable individuals (all local residents) with whom PCSI consulted for this project, including Ms. Alethea Kaohi, Mr. Kunane Aipoalani, and Ms. Debbie Ruiz, were not aware of any burial finds in the project area, nor had they heard of any accounts of native Hawaiian settlements, burial grounds, or TCPs present in the vicinity of the MDRS project area. Ms. Kaohi, however, did provide the former place name "Limaloa" for the lands in the vicinity of the MDRS.

PCSI conducted an archaeological pedestrian survey and subsurface testing in the MDRS project area (see Figures 13 and 14). The 19.67-acre MDRS project area is located on the dry western end of Kauaʻi, along the coastal fringe of the Mānā Plain in Waimea Ahupuaʻa, Kona District. The fieldwork was conducted between March 16 and April 9, 2015, in four areas, designated as Sections 1 through 4 of the MDRS project area. These include:

- Section 1—the access road leading into the MDRS;
- Section 2—the area north of the MDRS;
- Section 3—the area south and adjacent to the MDRS;
- Section 4—the area south of the turn-off road

A summary and interpretive discussion of the pedestrian survey and subsurface testing results is presented.

PEDESTRIAN SURFACE SURVEY

Approximately 23 acres of the MDRS project area were covered by pedestrian survey; including the areas within the Section 1-4 polygons on Figures 13 and 14, as well as all grassy areas surrounding the MDRS.

No surface archaeological structures or cultural material scatters were encountered during the surface pedestrian survey. While walking survey transects, it was noted that the project area had in the past undergone fairly extensive grading and development associated with construction of the MDRS.

SUBSURFACE TESTING RESULTS

A total of 90 test units (TR1-90) were excavated in the MDRS project area, including 15 in Section 1 that were excavated using an auger (TR1-15). The remainder of the trenches were excavated by backhoe (see Table 3), including nine (9) trenches in Section 2 (TR16-24), 59 trenches in Section 3 (TR25-82 and TR87), and seven (7) trenches in Section 4 (TR83-86 and TR88-TR90).

The primary purpose of subsurface testing program in the MDRS project area was to determine the presence/absence and horizontal and vertical extent of any subsurface historic properties present, including archaeological materials and subsurface features. No subsurface archaeological materials or features, including human burials, were encountered during the

subsurface testing program in the MDRS. Due to the negative findings of the subsurface testing, this discussion focuses on the stratigraphic information obtained during the testing.

STRATIGRAPHY

A total of 13 stratigraphic layers were identified in the 90 test excavations across the MDRS project area. These include Layers Ia, Ib, Ic, IIa, IIb, IIc, IId, IIe, IIIa, IIIb, IV, V, and VI (see Table 4). Of these 13 layers identified, three (3) have a fairly widespread distribution. These include Layer Ia dark brown, loamy fine to medium sands (the contemporary surface layer that supports vegetation growth), Layer IIa reddish brown pebbly, sandy loam to sandy silt, and Layer VI very fine to fine sands found at the base of all excavations. Fourteen field observations concerning these stratigraphic layers are presented below:

1. Layers Ia dark brown loamy fine to medium sands were found in the first stratigraphic position in 78 trench excavations, including TR9-TR15 along the access road in Section 1, all trenches in Section 2 (TR16-TR24), all but five trenches in Section 3 (TR25-TR29, TR31, TR34-TR35, TR37-82, and TR87), and all trenches (TR83-86, TR88-TR90) in Section 4 (see Table 4; see Figures 15, 21, 25-28, and 42).
2. Layer Ib angular basalt pebbles and gravel in a dark brown sandy loam matrix was found in the first stratigraphic position in TR1-TR8 along the access road in Section 1 (see Table 4; see Figure 15).
3. Layer Ic brown to reddish brown sandy silts were found in the first stratigraphic position in five trenches (TR30, TR32-TR33, and TR35-TR36) in Section 2 (see Table 4; see Figure 25).
4. Layer IIa reddish brown sandy silts were found in the second stratigraphic position in 33 trenches in Sections 2 through 4 of the MDRS project area, including TR25-TR29, TR31, TR34, TR37-TR39, TR47-TR56, TR59-TR63, TR65-TR66, TR68-TR69, TR71-TR72, TR74, and TR89-TR90 (see Table 4; see Figures 25, 26, 27, 28, and 42). Layer IIa was not present in trenches in Section 1.
5. Layer IIb dark brown sandy silts and silty sands were found in the second stratigraphic position in 19 trenches in Sections 1 and 2 (TR1-10, TR12-16, TR21-24). It was not found in trenches in Sections 3 and 4 (see Table 4; see Figures 15 and 21).
6. Layer IIc pink fine to medium coral sands were found in the second stratigraphic position in 17 trenches in Sections 1, 2, and 3 in the MDRS project area, including TR11, TR40-TR46, TR57, TR58, TR64, and TR75-TR79. It was not found in Section 4 (see Table 4; see Figures 15, 25, 26, 27 and 28).
7. Layer IId dark brown pebbly, cobbly sandy clay loams were found in the second stratigraphic position in TR17 only in Section 2 (see Table 4; see Figure 21).
8. Layer IIe brown silty sands were found in the second stratigraphic position in three trenches in Section 2, including TR18-TR20 (see Table 4; see Figure 21).
9. Layer IIIa reddish brown sandy loams were found in the third stratigraphic position in 17 trenches in Sections 1 through 3, including TR1, TR11, TR17, TR40-TR46, TR57, TR58, TR64, and TR75-TR79 (see Table 4; see Figures 15, 21, 25, , 26, 27 and 28).
10. Layer IIIb pinkish gray very fine to fine sands were found in third stratigraphic position in three trenches in Section 3, including TR48-TR50 (see Table 4; see Figure 26).
11. Layer IV pink very fine coral sands were found in the fourth stratigraphic position in TR45 only (see Table 4; see Figure 26).

12. Layer V reddish brown silty clays were found in the fifth stratigraphic position in TR45 only (see Table 4; see Figure 26).
13. Layer VI pink very fine to medium coral sands were found in the second, third, fourth, and sixth stratigraphic positions depending on the presence/absence of Layers IIa-IId and Layers IIIa and IIIb.
14. Layer VI exhibited bands or zones of strong cementation in zones in 15 trenches in Sections 1 and 3 (see Table)

The presence of coral sand layers was anticipated prior to the implementation of the subsurface testing program. As indicated in the Work Plan (Watanabe et al. 2014), the project area is characterized by a long coastal dune system extending from Polihale State Park in the north to the town of Kekaha in the south. South of Nohili Point, at PMRF, the dune system levels into a sandy plain extending several hundred meters inland from the coast. Loose sand deposits and the frequent loss of vegetation along the dune system contribute to increased wind erosion and shifting sand deposits. In the flat, sandy plain area, heavy disturbances have occurred resulting from military construction and extensive vegetation clearing (Drolet 1997a, 1997b, 1997c, and 1999).

Based on Foote et al. (1972: 49; Map 5), the soils in the MDRS project area are Jaucas loamy fine sands (Jfb-see Figure 2), which are excessively drained, calcareous soils that occur on coastal plains. These soils develop in wind- and water-deposited coral sands. The topographic slope range for these soils is 0 - 8 percent; these soils occur on old beaches and in sand dunes (Foote et al. 1972: 49).

Layers Ia, Ib, and Ic

Layers Ia, Ib, and Ic are all surface deposits found in the first stratigraphic position. According to Foote et al. (1972:49), the surface layers associated with the Jaucas Series soils consist primarily of sands, but in some places, they consist of fine sands and loamy sands. In some places A Horizons are darkened by organic materials or alluvium (Foote et al. 1972: 49), especially where vegetation occurs. An A Horizon is a surface layer (or subsurface layer) containing mineral constituents as well as the maximal organic accumulation in the profile (U.S.D.A. Soil Survey Staff 1951: 178).

The dark brown loamy fine to medium sands of Layer Ia were found in areas of vegetation growth and are interpreted as a contemporary A Horizon soil that formed in situ in coral sands and in terrigenous alluvial sediments. This interpretation is based on its stratigraphic position as well as on its color and texture. Layer Ia is a mixture of terrigenous and marine sediments (coral sands) and organic materials. The coral sand grains in this layer are visible and strongly effervesce with dilute HCl. The presence of coral sands is seen as the result of aeolian transport and deposition forces from the shoreline where the source of the coral sands is located. Where Layer Ia directly overlies Layer IIc or Layer VI coral sands, Layer Ia has developed in dune sand. Where Layer Ia directly overlies Layer IIa, IIb, IId, or IIe, Layer Ia has developed in terrigenous alluvium. The dark brown color of Layer Ia sediments also reflects the presence of organic materials.

Layer Ib is a surface layer found only in TR1-TR8 (see Figure 13). This layer consists of angular basalt pebbles and gravel in a dark brown sandy loam matrix, and is interpreted as a base course layer for the access road into the MDRS. This interpretation is based on Layer Ib's stratigraphic position, its presence along the shoulder of the access road, and the fact that the primary component of this layer is angular basalt pebbles, a common component of base course layers associated with roads in Hawaii.

Layer Ic brown to reddish brown sandy silts were also found in areas of vegetation growth; the preferred interpretation of this deposit is that it is relatively recent (within the last several decades) imported top soil in which A Horizon developed has occurred. This interpretation is based on Layer Ic's stratigraphic position, on its color and texture, and the presence of terrigenous sediments. The dark reddish brown sandy silts contain a small percentage (less than 2%) angular basalt pebbles in the terrigenous sediments that are quite different to the Jaucas Sands soils present here—they are likely the result of cultural deposition.

An alternative explanation for the presence of Layer Ic brown to reddish brown sandy silts (with angular basalt gravel) is that these deposits could have been naturally transported to this area through alluvial (stream overflow) or colluvial (sheet wash) depositional forces. The limited horizontal distribution of Layer Ic (found only in five trenches in Section 3--TR30, TR32-TR33, and TR35-TR36) and the absence of nearby streams tends to argue against this alternative interpretation.

Layers IIa, IIb, IIc, IId, and IIe

Layers IIa through IIe were all found in the second stratigraphic position across the MDRS project area. Their presence is discontinuous across the MDRS project area. Where Layer II deposits are found, they directly underlie Layer I deposits. Similar to Layer Ic, Layers IIa, IIb, IId, and IIe all contain a mixture of reddish brown, brown, and dark brown terrigenous sediments, with varying percentages of angular basalt gravel, and coral sands. In contrast to these terrigeneous sediments/coral sands, Layer IIc consists chiefly of fine to medium coral sands with no terrigenous sediments.

Layer IIa reddish brown pebbly sandy loams and sandy silts were found only in Sections 3 and 4. When examining Figures 25 through 28 and Figure 42, it can be seen that the frequency of the presence of Layer IIa diminishes in eastern portions of Section 3 and south of the turn-off road in Section 4. Where Layer IIa is present in Sections 3 and 4, it directly overlies very fine to fine coral sand deposits of Layer IIIb or Layer VI (see Figures 25 through 28 and Figure 42).

Layer IIb was found in Section 1 (except in TR11, TR12-TR15) along the access road in Section 1, at the west end of Section 2 (TR16) and at the east end of Section 2 (TR21-24). In TR16, a piece of modern plastic was found within Layer IIb deposits. With two exceptions (TR1 and TR8), where Layer IIb is present in Section 1, it directly overlies Layer VI very fine to fine coral sands. In TR1 Layer IIb directly overlies Layer IIIa, and in TR8 Layer IIb directly overlies displaced Layer VI cemented sands (see Figure 15). This suggests that the deposition of Layer IIb post-dates the modern feature discovered in TR8 (see Figure 20).

Layer IId dark brown sandy clay loams were found only in TR17 in Section 2 and contained approximately 20%, by volume, angular basalt and limestone pebbles and gravels. In TR17, Layer IId directly overlies Layer IIIa reddish brown sandy loam.

Layer IIe brown silty sands were found in three trenches in Section 2 (TR18-20), and contained approximately 2%, by volume, angular basalt pebbles and gravels. In these trenches, Layer IIe directly overlies Layer VI very fine to fine coral sands.

The preferred interpretation of Layers IIa, IIb, IId, and IIe is that these deposits are relatively recent (within the last several decades) and consist primarily of imported cultural fills. This interpretation is based on their limited distribution across the MDRS project area, the darker colors (reddish brown, dark brown, and brown), the texture of these finer sediments (sandy loam, sandy silt, and silty sands), and the presence of varying percentages of basalt (and limestone) pebbles and gravels. These four layers contain terrigenous sediments that are

quite different to the Jaucas loamy fine sands described here by Foote et al. (1972)—their presence is likely the result of cultural deposition (i.e., imported cultural fills).

An alternative explanation for the presence of Layers IIa, IIb, IId, and IIe is that these deposits could have been naturally transported to this area through alluvial (stream overflow) or colluvial (sheet wash) depositional forces. The discontinuous presence of these layers and the absence of nearby streams tends to argue against this alternative interpretation

Layer IIc consists of pink fine to medium coral sands, and is interpreted as probable C Horizon whose sediments were probably transported to the project area via aeolian (wind) forces from the shoreline. This interpretation is based on the color and texture of the coral sands. Layer IIc is present in one trench in Section 1 (TR11) and 15 trenches in Section 3. With one exception, where Layer IIc deposits occur in Sections 1 and 3, they directly overlie Layer IIIa reddish brown sandy loams. The exception to this pattern was found in TR82 where Layer IIc fine to medium coral sands directly overlies Layer VI pink very fine to fine coral sands.

Layers IIIa and IIIb

Layers IIIa and IIIb were both found in the third stratigraphic position. Their presence is discontinuous across the MDRS project area. Where Layer III deposits are found, they directly underlie Layer II deposits. Similar to Layers Ic, IIa, IIb, IId, and IIe, Layer IIIa contains a mixture of terrigenous sediments and coral sands. And similar to Layer IIc, Layer IIIb consists chiefly of very fine to fine coral sands.

Layer IIIa reddish brown sandy loams have a relatively limited distribution in Sections 1, 2, and 3. In Section 1, it was found in TR1 and TR11 (see Figure 15). In Section 2, it was found only in TR17 (see Figure 21). In Section 3, it was found in 15 trenches, including TR40-TR46, TR57, TR58, TR64, and TR75-TR79 (see Figure 25-27). When examining Figures 25 through 27, it can be seen that the frequency of the presence of Layer IIIa diminishes in eastern portions of Section 3. Where Layer IIa is present in Section 1, it directly overlies Layer VI very fine to fine coral sands. In Section 3, Layer IIIa directly Layer IV in TR45 and Layer VI in the remaining trenches (see Figures 25-27).

Like Layers Layers Ic, IIa, IIb, IId, and IIe, there are two possible explanations for the deposition of Layer IIIa deposits. First, Layer IIIa could be a cultural fill, possibly associated with construction of the MDRS. This interpretation is based on Layer IIIa's stratigraphic position, on its color and texture, and the presence of terrigenous sediments. The terrigenous reddish brown sandy loams of Layer IIIa contain a less than 2% angular basalt pebbles and gravels, and are quite different from the Jaucas Sands soils present in the MDRS project area.

A second explanation for the presence of Layer IIIa is that these deposits could have been naturally transported to this area through alluvial (stream overflow) or colluvial (sheet wash) depositional forces. The discontinuous presence of these layers and the absence of nearby streams tends to argue against this alternative interpretation.

Layer IIIb consists of pinkish gray very fine to fine coral sands, and is interpreted as a probable C Horizon whose sediments were transported to the project area via aeolian (wind) forces from the shoreline. This interpretation is based on the color and texture of the coral sands. Layer IIIb is present in seven trenches in Section 3, including TR48-TR50, TR53,TR54, TR62,TR63 (see Figures 26 and 27). Layer IIIb coral sand deposits are found directly underlying Layer IIa reddish brown sand loams and directly overlying Layer VI pink very fine to fine coral sands.

Layers IV and V

Layers IV and V were found only in TR45 in Section 3 of the MDRS project area and were found in the fourth and fifth stratigraphic positions, respectively (see Figure 25).

Layers IV is a very fine coral sand layer that directly underlies Layer IIIa, which consist of terrigenous sediments mixed with coral sand. Layer IV is interpreted as probable C Horizon whose sediments were transported to the project area via aeolian (wind) forces from the shoreline. This interpretation is based on the color and texture of the coral sands. Layer IV directly overlies Layer V, which also consists of a mixture of terrigenous sediments and coral sands.

Layer V is a reddish brown silty clay with approximately 2%, by volume, angular basalt pebbles and gravel. Layer V is interpreted as a cultural fill, similar to Layers IIa, IIb, IId, IIe, and IIIa.

Layer VI

Layer VI is found in the second, third, fourth and sixth stratigraphic positions across the MDRS project area. This is the only stratigraphic layer found in all 90 test locales, and consists of both loosely consolidated coral sands and bands (or zones) of strongly cemented coral sands.

Layer VI is interpreted as a C Horizon as noted by Foote et al. (1972: 49) for Jaucas Series soils. This interpretation is based on the color and texture of the sands, on its presence at the base of all excavations (underlying all other layers) in the MDRS project area, and on the presence of loosely consolidated and cemented coral sands. As defined by the U.S.D.A. Soil Survey Staff (1951: 180), a C Horizon is a layer of unconsolidated material, relatively little affected by the influence of organisms and presumed to be similar in chemical, physical, and mineralogical composition to the material from which at least a portion of the overlying soil profile has developed. According to Allen et al. (1987:38), unconsolidated gravity-borne or water-borne sediments, as well as wind-borne sediments, are considered C Horizons by most researchers.

The formation of Layer VI is believed to be the result of a series of aeolian depositional events—time periods when strong winds picked up very fine to very coarse coral sand grains located on the beach and transported them to the level plain located immediately inland from the shoreline. It is likely that the cemented zones in Layer VI were formed by the same depositional events as the unconsolidated portions of this layer. It is believed that the cemented zones in Layer VI occurred after the deposition of this layer.

Strongly cemented sands were intermittently present in Section 1, including TR2 and TR3; TR1 had weakly cemented sands. In Section 3 strongly cemented sands were observed in 11 trenches, including TR37, TR43, TR45, TR54-TR55, TR57-TR58-TR60, and TR62-TR63. The top depth of cemented sands across the MDRS project area ranged from 55 to 90 cmbs; the base of cementation ranged from 65 to 155 cmbs.

It is not known how long it took the coral sands in Layer VI to be “cemented.” It should be noted that these sands are not lithified, although excavations into the cemented sand layers resulted in the removal of large, very hard, and relatively flat chunks of sand.

According to the US Department of Agriculture’s *Soil Survey Manual*, cementation of soil material refers to a brittle hard consistence caused by some cementing substance such as calcium carbonate (USDA Soil Survey Staff 1951: 234). Although some layers cemented with calcium carbonate soften with wetting, usually the cementation is not altered by moistening or wetting. Cementation may be either continuous or discontinuous within a given soil horizon.

The cementation observed in Layer VI was discontinuous across the MDRS project area. These cemented coral sands were not tested with wetting or a hammer to determine whether the cementation in the layers should be described as “strongly cemented” or “indurated.” The term “strongly cemented” refers to the cemented mass that does not soften under prolonged wetting, and is brittle and harder than can be broken in the hand but is easily broken with a hammer (USDA Soil Survey Staff 1951:234). The term “indurated” refers to a very strongly cemented mass that does not soften under prolonged wetting, and is so extremely hard that for breakage a sharp blow with a hammer is required; the hammer generally rings as a result of the blow (USDA Soil Survey Staff 1951: 234). The cemented sands of Layer VI appeared to be difficult to excavate with the backhoe. Without wetting and hammer tests, however, it cannot be stated with certainty that the cementation can be described as “indurated,” Therefore the term “strongly cemented” was used to describe the cementation in these layers.

As discussed in Clark et al. (2015: 109), according to Fairbridge (1968:72), cemented dune sands (also called “eolianite”) and a variety of cemented swamp and alluvial deposits may be closely associated with the formation of “beachrock.” Beachrock is beach sand consolidated in place by interstitial cement, chiefly calcium carbonate (Fairbridge 1968:71). There seems to be little agreement by researchers regarding how cementation takes place, what type of “cement” is involved (with respect to non-calcareous sediments), what type of water is involved (salt, brackish, fresh), or how long it takes for cementation to occur (Fairbridge 1968:71-73). There is agreement that cementation of sands takes place underground, probably in or near the top of the water-saturated zone of the beach. It has also been noted that, in recently exposed beachrock, the upper surface of the cemented zone appears to be relatively flat, cross-cutting the stratification of the sand at about the level of the water table in the nearby beach (Russell 1962:1-16). The lower surface of the cemented zone can also be abrupt and flat (Kuenen 1933:126).

While Mitardis (1963:10) has shown that beachrock in Greece takes a very long time to form, as much as 3,500 years, it is not certain how long beachrock takes to form on Pacific Islands. Cemented sands at the MDRS (and the southern portions of the PMRF) are probably not as old as 2,000 to 3,000 years old, because they may not be truly lithified yet; they are considered to be quite old, possibly older than human occupation in Hawaii.

Elsewhere in the Pacific, the thickness of cemented sand zones can vary from less than half a meter to nearly three meters (Vaughn 1914:63). The thickness of cemented sands in the MDRS project area range from 10 to 70+ cm, with an average thickness of approximately 28 cms.

Because it is likely that cementation of Layer VI sands predate the Hawaiian occupation of Kauai, wherever cementation occurs in the MDRS, it is likely that subsurface archaeological deposits will not be found in within or below these cemented zones.

Stratigraphic Sequences in the MDRS Project Area

In order to determine the number of stratigraphic sequences present, the stratigraphic sequences identified in excavations in Sections 1 through 4 of the MDRS project area were examined (see Figures 15, 21, 25-28, and 42) and duplicate sequences from the four sections were combined. Based on this examination, a total of twelve (12) different stratigraphic sequences were identified during the subsurface testing across the MDRS project area. Based on field documentation and observations, variations in documented stratigraphic sequences are primarily due to:

1. The presence of three different surface layers

2. The presence of six terrigenous sediment layers mixed with coral sand in the second and third and fifth stratigraphic positions, including Layers IIa, IIb, IId, IIe, IIIa, and V
3. The presence of three coral sand layers (IIc, IIIb, IV, and VI) underlying and/or overlying the terrigenous sediment layers

Table 9 below identifies the 12 stratigraphic sequences identified in the MDRS project area and provides location information.

Table 9. Twelve Stratigraphic Sequences Identified in the MDRS Project Area.

Section No., Variant Sequence No.	Layers Present in Stratigraphic Sequence	Associated Trenches
Section 1, Variant 1	Ib/IIb/IIIa/VI	TR1
Section 1, Variant 2	Ib/IIb/VI	TR2-TR7
Section 1, Variant 3 Section 2, Variant 1	Ia/IIb/VI	TR9, TR10, TR12-15, TR16, TR21-TR24
Section 1, Variant 4 Section 3, Variant 3	Ia/IIc/IIIa/VI	TR11, TR40-TR44, TR46, TR57-TR58, TR64, TR75-TR79
Section 2, Variant 2	Ia/IId/IIIa/VI	TR17
Section 2, Variant 3	Ia/IIe/VI	TR18-20
Section 3, Variant 1 Section 4, Variant 2	Ia/IIa/VI	TR25-TR29, TR31, TR34, TR37-TR39, TR47, TR51, TR52, TR55, TR56, TR59-TR61, TR65-TR66, TR68-TR69, TR71-TR72, TR74, TR82, TR88-TR90
Section 3, Variant 2	Ic/VI	TR30, TR32-TR33, TR35-TR36
Section 3, Variant 4	Ia/IIc/VI	TR82
Section 3, Variant 5	Ia/IIc/IIIa/IV/V/VI	TR45
Section 3, Variant 6	Ia/IIa/IIIb/VI	TR48, TR49-TR50, TR53-TR54, TR62-TR63
Section 3, Variant 7	Ia/VI	TR67, TR70, TR73, TR80, TR81*, TR87, TR83-TR86

What stands out in the documented stratigraphic sequences in the MDRS project area is the discontinuous presence of a series of terrigenous sediment layers found directly overlying or underlying coral sand layers. These layers, including Layers IIa, IIb, IId, IIe, IIIa, and V, are all interpreted as cultural fills associated with construction and use of the MDRS. While similar terrigenous sediments were observed in the agricultural fields north of the Kaumualiʻi Highway, it is not certain these agricultural fields are the source of terrigenous sediments in these layers.

A noteworthy characteristic of the stratigraphic sequences identified in the MDRS project area is the absence of buried A Horizons in the project area. According to Allen et al. (1987:38), recognizable cultural layers are A Horizons by virtue of their organic component and because they were partially or entirely deposited by humans (i.e. they are anthropic). Thus, subsurface soil layers with archaeological materials and features are considered to be buried anthropic A Horizons. Buried surface layers that do not contain archaeological materials and features are simply buried A Horizons.

The twelve variant stratigraphic sequences can be simplified into a composite stratigraphic sequence for the MDRS project area. Table 10 presents this composite stratigraphic sequence.

Table 10. Composite Stratigraphic Sequence for the MDRS Project Area.

Stratigraphic Position	Layers	Description
First	Ia/Ib/Ic	Layer Ia: loamy fine to medium sand; A Horizon. Layer Ib: terrigenous angular basalt pebbles/gravel in sandy loam matrix; base course for access road Layer Ic: terrigenous sandy silt fine sands, imported top soil
Second	IIa/IIb/IIc/IId/IIe	Layer IIa: terrigenous pebbly sandy loam to loamy silt; possible cultural fill. Layer IIb: terrigenous sandy silts and silty sands; possible cultural fill Layer IIc: Aeolian fine to medium coral sand; possible in situ Aeolian deposition Layer IId: terrigenous pebbly, gravelly sandy clay loam; possible cultural fill Layer IIe: terrigenous silty sand; possible cultural fill
Third	III/IIIa/IIIb	Layer IIIa: terrigenous sandy loam; possible cultural fill Layer IIIb: Aeolian very fine to fine coral sands; possible in situ C Horizon
Fourth	IV	Aeolian very fine coral sands; possible in situ C Horizon.
Fifth	V	Terrigenous silty clay; possible cultural fill
Sixth	VI	Loosely consolidated and cemented, very fine to fine coral sands; C Horizon.

Research Questions

Based on previous archaeological projects conducted within the project area (Watanabe et al. 2014b), it was believed that it was unlikely that pre-Contact historic properties would be discovered during fieldwork. However, if pre-Contact or traditional historic properties were discovered, data would be collected to address the following questions:

4. *If above-ground pre-Contact features are recorded, can they be positively associated with previously recorded sites? Is there sufficient stratigraphic association to provide a relative chronological sequence between above-ground features and subsurface deposits? Can a feature function be determined based on known architectural types?*
5. *If subsurface pre-Contact deposits are recorded, can they be positively associated with previously recorded sites in terms of horizontal extent and recovered artifactual materials? Are there sufficient carbon data (charcoal) from subsurface features to accurately date the deposit? Are the dates compatible with dates from other sites?*
6. *Can the recovered pre-Contact artifacts and midden be brought to bear on the life ways or socioeconomic patterns of the inhabitants? How do these patterns compare to data recovered from other sites in the region?*

Because no pre-Contact archaeological sites were encountered during fieldwork, the three research questions presented above cannot be addressed.

In addition to the above questions, PCSI archaeologists were interested in determining if the absence of pre-Contact subsurface archaeological materials or features observed in

southern portions of the PMRF (Clark et al. 2015) would continue into the MDRS project area. It seems that the negative findings of archaeological investigations in the MDRS may suggest that a pattern of no subsurface pre-Contact archaeological sites is emerging for the area beginning at the southern PMRF and extending to the MDRS project area, and possibly beyond to Kekaha.

However, Clark et al. (2015: 16) noted that there were constraints to the field testing strategy in southern portions of the PMRF that may inhibit drawing a conclusion about a possible pattern of negative findings in the southern PMRF. Constraints to the field testing strategy at PMRF were related to health and safety concerns as well as avoiding areas where subsurface utilities or conduits were present, and areas where wedge-tail shearwaters were nesting. These constraints precluded testing in several areas.

In addition, there was agreement between PCSI's Principal Investigator and Project Manager that the 40 backhoe trenches and 21 shovel test probes excavated represented too small a sample size (with respect to the 325-acre project area) to be certain that no subsurface archaeological layers/features were present in the southern portion of the PMRF. PCSI could not be certain that the areas that were not tested did not contain subsurface archaeological materials and features.

In the MDRS project area, PCSI did not experience the kinds of constraints to the testing strategy that were present during testing in the southern portion of the PMRF. In fact, in the MDRS project area, a greater number of test trenches were excavated (90 trenches) in a smaller project area size (19.67 acres). The trenches excavated in the MDRS project area were also situated much closer together. Thus, the negative findings in the MDRS appear to be more reliable. It is likely that no pre-Contact cultural layers will be present within cemented sand layers identified in the southern portion of the PMRF and in the MDRS project areas.

RECOMMENDATIONS

Although no pre-Contact subsurface archaeological materials or features (including human burials) were encountered during the pedestrian survey and subsurface testing at 90 locales in the MDRS project area, the project area's environment and indigenous soils/sediments (sand dunes with Jaucas loamy fine sands near the shoreline) are generally conducive to the presence of native Hawaiian burials and subsurface cultural deposits. Due to the environmental factors mentioned, it is still possible that native Hawaiian burials and subsurface archaeological materials and features are present in the MDRS project area. Therefore, archaeological monitoring is recommended during ground disturbing activities associated with lighting improvements at the MDRS, particularly in Sections 2, 3, and 4.

REFERENCES

Allen, Jane (Editor), Mary Riford, Thecla M. Bennett, Gail M. Murakami, and Marion Kelly
1987 Five Upland ʻIli: Archaeological and Historical Investigations in the Kāneʻohe Interchange, Interstate Highway H-3, Island of Oʻahu. Departmental Report Series 87-1. Honolulu: Bernice Pauahi Bishop Museum, Department of Anthropology.

Bennett, Wendell Clark
1931 *Archaeology of Kauai.* Bishop Museum Bulletin 80. Bishop Museum, Honolulu.

Carson, Mike T.
2007 *Archaeological Subsurface Testing at Locations of Proposed Cottages and Duplex Cabin at Major's Bay, Pacific Missile Range Facility, Barking Sands, Kauaʻi Island, State of Hawaiʻi.* Prepared by International Archaeological Research Institute, Inc., Honolulu.

Ching, Francis
1982 *Archaeological Reconnaissance of Three (3) Sites for Proposed Kauaʻi Central Sanitary Landfill Project, Kekaha and Kipu, Kona Kauaʻi Island and Kumukumu Kona, Kauaʻi Island.* Archaeological Research Center, Lawai.

Clark, Stephan D., Dennis C. Gosser, Keola Nakamura, and Richard Nees
2015 Archaeological Survey and Testing in the Southern Portion of Pacific Missile Range Facility, Barking Sands, Kauaʻi, Hawaiʻi. Prepared for the Department of the Navy, Naval Facilities Engineering Command, Pacific, by Pacific Consulting Services, Inc., Honolulu.

Condé, Jesse C., and Gerald M Best
1973 *Sugar Trains Narrow Gauge Rail of Hawaii.* Glenwood Publisher, Felton, California.

Drolet, Robert, James Landrum, and Ann K. Yoklavich
1996 *Cultural Resources Management Overview Survey, Pacific Missile Range Facility, Hawaiian Area, Kauaʻi, Hawaiʻi*. Ogden Environmental and Energy Services Co., Inc., Honolulu. Prepared for Department of the Navy, Pacific Division, Naval Faculties Engineering Command, Pearl Harbor.

Drolet, Robert
1997a *Archaeological Monitoring and Testing of Proposed Beach Cottage Constructions at Pacific Missile Range Facility, Barking Sands, Kona District, Kauaʻi, Hawaiʻi.* Prepared for the Department of the Navy, Naval Facilities Engineering Command by Ogden Environmental and Energy Services Co., Inc. Honolulu.

1997b *Archaeological Testing of Aircraft Parking Apron, MILCON P-047) Pacific Missile Range Facility (PACMISRANFAC), Barking Sands, Kauaʻi, Hawaiʻi*. Prepared for the Department of the Navy, Naval Facilities Engineering Command by Ogden Environmental and Energy Services Co., Inc., Honolulu.

1997c *Final Report, Archaeological Monitoring at the Site of Project P-047, Aircraft Parking Apron, Pacific Missile Range Facility (PACMISRANFAC), Kauaʻi, Hawaiʻi.* Ogden Environmental and Energy Services Co, Inc., Honolulu.

1999 *Final Report, Archaeological Survey and Testing at the Nohili Site (50-30-05-1829 and 50-30-05-1830), Pacific Missile Range Facility (PACMISRANFAC), in Conjunction with the Department of Defense Legacy Resource Management Program: Demonstration Project No.894, Kauaʻi, Hawaii*. Ogden Environmental & Energy Services Co, Inc., Honolulu.

Drolet, Robert, and James Powell
1997 *Archaeological Testing of Aircraft Parking Apron, MILCON P-047) Pacific Missile Range Facility (PACMISRANFAC), Barking Sands, Kaua'i, Hawai'i.* Prepared for the Department of the Navy, Naval Facilities Engineering Command by Ogden Environmental and Energy Services, Co., Inc., Honolulu.

Fairbridge, Rhodes, W. (Editor)
1968 *The Encyclopedia of Geomorphology*. Encyclopedia of Earth Sciences Series, Volume III. New York: Reinhold Book Corporation.

Flores, Kalani, and Aletha G. Kaohi
1992 *Hawaiian Cultural and Historical Survey of Nohili, Mana, Kona District Island of Kaua'i, State of Hawai'i.* Prepared for Advanced Sciences, Inc., San Diego, California. Hawai'i Pono'i, 'Ele'ele, Kaua'i, Hawai'i.

Folk, William H., and Hallett H. Hammatt
1993 *Archaeological Inventory Survey and Subsurface Testing at the Kekaha Phase II Landfill Site*. Cultural Surveys Hawaii, Inc., Kailua.

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens
1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. US Dept of Agriculture Soil Conservation Service in Cooperation with the University of Hawaii Agricultural Experiment Station.* U.S. Government Printing Office, Washington D.C.

Giambelluca ,Thomas W., Qi Chen, Abby G. Frazier, Jonathan P. Price, Yi-Leng Chen, Pao-Shin Chu, John K. Eischeid, and Donna M. Delparte
2013 "The Rainfall Atlas of Hawai'i." *Bull. Amer. Meteor. Soc*. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.Available online at http://rainfall.geography.hawaii.edu. Accessed 4/20/2015.

Gonzalez, Tirzo, Judy Berryman, and David J. Welch
1990 *Archaeological Survey and Testing: Department of Energy, Kauai Test Facility, Barking Sands, Kauai, Hawaii, Prepared as Supplement for the Kauai Test Facility Environmental Assessment.* Prepared for Sandia National Laboratories, Albuquerque, New Mexico. Advanced Sciences, Inc., San Diego, and International Archaeological Research Institute, Inc., Honolulu.

Gonzalez, Tirzo
1991 *Archaeological surface examination of four areas within PMRF and DOE/KTF that might be impacted by Strategic Target Systems related activities, Pacific Missile Range Facility (PMRF) and Department of Energy Kauai Test Facility (DOE/KTF), Barking Sands, Kauai.* Advanced Sciences, Inc., San Diego.

Handy, E.S.C., and E.G. Handy
1972 *Native Planters in Old Hawaii: Their Life, Lore, and Environment.* Bishop Museum Bulletin 233. Bishop Museum, Honolulu.

Jones, Bruce A.
1992 *Archaeological Survey and Subsurface Testing for the Tactical Control Squadron Forward Air Control Post Project, Pacific Missile Range Facility, Barking Sands, Kaua'i, Hawai'i.* Prepared for Belt, Collins, and Associates, Inc., Honolulu. International Archaeological Research Institute, Inc., Honolulu.

Kennedy, Joseph
1991 *Archaeological Subsurface Testing Results for the Proposed Family Housing Project Area, Pacific Missile Range Facility, Barking Sands, Island of Kauai,* TMK 1-2-02:13, Por. 25, Revised October 1991. Prepared for the US Navy and Belt Collins Associates, Honolulu. Archaeological Consultants of Hawaii, Inc., Haleiwa.

Kuenen, P.H.
1933 "Geology of Coral Reefs," in "*The Snellius-expedition in the Eastern Part of the Netherlands East-Indies.* 1929-1930." Vol.5, Part 2, Leiden: E.J. Brill.

Kuykendall, Ralph S.
1967 *The Hawaiian Kingdom, Volumes I-III.* University of Hawaii Press, Honolulu.

Leidmann, H.H. and C.H. Kishinami
1990 *Archaeological/Paeleontological Survey of the Kawaiele Dunes, Kawaiele, Waimea, Kaua'i Island* TMK:1-2-02:1.

McGerty, LeAnn and Michael Dega
2001 *MSSTIC/UESA Building Inventory Survey, Pacific Missile Range Facility, Barking Sands, Island of Kaua'i, Hawai'i. Prepared for ITT Industries, Kekaha, Kaua'i, Hawai'i.* Scientific Consultant Services, Inc., Honolulu.

McGerty, LeAnn, and Robert L. Spear
1997 *An Inventory Survey with Oral Histories of a Parcel of Land on the Plain of Mānā, West of Kekaha in the Ahupua'a of Waimea, District of Kona, Island of Kaua'i.* Prepared for Controlled Environmental Aquaculture Technology, Inc. by Scientific Consultant Services, Inc., Honolulu.

McMahon, Nancy
1988 Field Check. Memorandum on file at State Historic Preservation Department. Kapolei.

Mitardis, G. G.
1963 "On the Beach Rock of Southeastern Greece." *Geological Society of Greece*, Bulletin 5, pp1-19.

Munsell
2000 Munsell Soil Color Charts. Gretag Macbeth, New Windsor, New York.

Pacific Geotechnical Engineers, Inc.
2012 *Geotechnical Consultation, Mana Drag Strip, Rehabilitation of Pavement, Kauai Raceway Park, Kekaha, Kauai, Hawaii.* Prepared for the Limtiaco Consulting Group, INC. Pacific Geotechnical Engineers, Inc., Honolulu.

Popper, Virginia
2010 *Investigating Chinampa Farming.* http://www.sscnet.ucla.edu/ioa/backdirt/Fallwinter00/farming.html; Accessed July 21, 2010.

Pukui, Mary Kawena
1983 *'Olelo No'eau, Hawaiian Proverbs & Poetical Sayings.* Bishop Museum Special Publication 71. Bishop Museum Press, Honolulu.

Pukui, Mary Kawena, Samuel H. Elbert, and Esther T. Mookini
1974 *Places Names of Hawaii. Revised & Expanded Edition.* Honolulu: University of Hawaii Press.

Russell, R.J.
1962 "Origin of Beach Rock," *Z. Geomorh*., N.F. (6), pp 1-16.

Saito, Deborah, and Susan Campbell
1986 *Register of the Kekaha Sugar Company 1880-1946.* http://www2.hawaii.edu/~speccoll/p_kekaha.pdf; Accessed April 2013.

SEARCH (Southeastern Archaeological Research, Inc.)
2014 *Final Report Integrated Cultural Resources Management Plan for the Pacific Missile Range Facility Kaua'i Island, State of Hawai'i FY 2012-2017*. SEARCH, Honolulu.

Schoeneberger, P.J., Wysocki, D.A., Benham, E.C., and Broderson, W.D.
1998 *Field book for describing and sampling soils.* Natural Resources Conservation Service , USDA, National Soil Survey Center, Lincoln NE.

Sweeney, Maria T.K.
1994 *Archaeological Inventory Survey Pacific Missile Range Facility, Majors Bay Area, Kaua'i, Hawai'i*. International Archaeological Research Institute, Inc., Honolulu.

Tomonari-Tuggle, M.J., and Ann Yoklavich
2005 Final Integrated Cultural Resources Management Plan for the Pacific Missile Range Facility (PMRF), Island of Kaua'i, State of Hawai'i. International Archaeological Research Institute, Inc., Honolulu.

U. S. Department of Agriculture (USDA) Soil Survey Staff
1951 *Soil Survey Manual*. U. S. Government Printing Office, Washington D.C.

United States Department of Agriculture
2012 Natural Resources Conservation Services' (NRCS) Web Soil Survey. Electronic document, http://websoilsurvey.nrcs.usda.gov. Accessed April 2012.

University of Hawaii
2013 School of Ocean and Earth Science and Technology. Electronic document, http://www.soest.hawaii.edu/coasts/erosion/mosaics.php?sArea=kekaha Accessed April 2013.

Vaughn, T.W.
1914 "The Building of the Marquesas and Tortugas Atolls." *Carnegie Inst. Publ.* (182), pp 55-67.

Walden, Jackie, and Stephan D. Clark
2010 *Final Archaeological Monitoring in Support of the Base Protection Lab Construction for Sensor Sites, Pacific Missile Range Facility (PMRF), Barking Sands, Waimea Ahupua'a Island of Kaua'i, State of Hawai'i,* TMKs (4) 1-2-02:13, 26. Prepared for the Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor by Pacific Consulting Services, Inc., Honolulu.

Walden, Jackie, and Sara L. Collins
2013 *Archaeological Monitoring Plan in Support of Improvements to the Western Portion of the Mana Drag Racing Strip in Kekaha, Waimea Ahupua'a, Kona District, Island of Kaua'i.* Prepared for the Limtiaco Consulting Group. Pacific Consulting Services, Inc., Honolulu.

Wagner, Warren L., Derral R. Herbst, and S. H. Sohmer
1990 *Manual of the Flowering Plants of Hawai'i*. 2 vols. University of Hawaii and Bishop Museum Presses, Honolulu.

Walker, Alan T., and Paul H. Rosendahl
1990 *Archaeological Inventory Survey, USN Radio Telescope Project Area, Land of Waimea, Waimea District, Island of Kauai.* Prepared for Helber, Hastert & Kimura Planners, Honolulu. Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai‘i.

Watanabe, Tae, Jackie Walden, Stephan D. Clark, Melanie Mintmier, and Sara Collins
2014a *Archaeological Monitoring Report in Support of Improvements to the Western Portion of the Mānā Drag Racing Strip in Kekaha, Waimea Ahupua‘a, Kona District, Island of Kaua‘i*. Prepared for the Limtiaco Consulting Group by Pacific Consulting Services, Inc., Honolulu.

2014b Work Plan for Archaeological Survey and Testing in Support of Lighting and Electrical Improvements at the Mānā Drag Racing Strip in Kekaha, Waimea Ahupua‘a, Kona District, Island of Kaua‘i. Prepared for the Limtiaco Consulting Group. Pacific Consulting Services, Inc., Honolulu.

Wichman, Frederick B.
1998 *Kaua‘i: Ancient Place-Names and Their Stories.* University of Hawaii Press, Honolulu.

Wulzen, Warren, Peter M. Jensen, and Paul H. Rosendahl
1997 *Final Report: Archaeological Reconnaissance Survey Pacific Missile Range Facility Barking Sands and Makaha Ridge, Land of Waimea, Waimea District, Island of Kaua‘i.* Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Paul H. Rosendahl, Ph.D., Inc., Hilo.

Yoklavich, Ann K., Robert Drolet, and Patricia Drolet

1992 *Preliminary Report Cultural Resources Management Overview Survey Pacific Missile Range Facility, Hawaiian Area, Kaua‘i, Hawai‘i.* Ogden Environmental and Energy Services Co., Inc. Honolulu.

APPENDIX I
ADDENDUM: ARCHAEOLOGICAL MONITORING PLAN IN SUPPORT OF LIGHTING AND ELECTRICAL IMPROVEMENTS TO THE MANA DRAG RACING STRIP IN KEKAHA, WAIMEA AHUPUAA, KONA DISTRICT, ISLAND OF KAUAI.

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

January 20, 2016

Adrian Chang
Department of Land and Natural Resources
Engineering Division
Via email:
Adrian.N.Chang@hawaii.gov

LOG NO: 2015.04419
DOC NO: 1061MN13
Archaeology

Dear Mr. Chang:

SUBJECT: **Chapter 6E-8 Historic Preservation Review**
Addendum AMP for Mānā Drag Racing Strip Improvements
Waimea Ahupuaʻa, Kona District, Island of Kauaʻi
TMK: (4) 1-2-002: 009, 036, 040

Thank you for requesting our review of the addendum to the Archaeological Monitoring Plan (AMP) entitled "*Archaeological Monitoring Plan in Support of Improvements to the Western Portion of the Mānā Drag Racing Strip in Kekaha, Waimea Ahupuaʻa, Kona District, Island of Kauaʻi, Hawaiʻi TMK (4) 1-2-002:009, 036, &040;*" J. Walden and S. Collins, 2013. We received the addendum in our Kapolei office on December 30, 2015.

At the request of Limtiaco Consulting Group, Inc., the Garden Isle Racing Association, and the Department of Land and Natural Resources (DLNR) Engineering Division, Pacific Consulting Services, Inc. (PCSI) conducted an Archaeological Inventory Survey (AIS) of the subject TMKs in advance of electrical and lighting improvements at the Mānā Drag Racing Strip in Kekaha (S. Collins, S. Clark, K. Shiroma, M. Mintmier, J. Walden, 2015). The landowner the Department of Land and Natural Resources (DLNR) and the project acreage is 19.67 acres. The project is state-funded and will bring power to the racing strip from Kaumualiʻi Highway (along an access road). The plans include the installation of 26 utility poles and 20 light poles as well as a pad-mounted transformer and underground electrical conduits, to service the strip with stadium-type lighting.

An AMP for improvements to a 5.7 acre area of the strip was approved by the State Historic Preservation Division (SHPD) in a letter dated June 7, 2013 (*Log No. 2013.3446, Doc No. 1306SL01*). PCSI has amended the 2013 AMP to include a revised scope of work, discuss the findings of the recent AIS, and to provide specific provisions for the project. **The addendum to the AMP contains the required provisions outline in Hawaii Administrative Rules §13-279 and is approved.**

Please send one hard copy of the report, clearly marked FINAL, along with a text-searchable CD to the Kapolei office. Please send one hard copy of the final report to the Kauaʻi section. Please contact Kauaʻi Lead Archaeologist Mary Jane Naone at (808) 271-4940 or Maryjane.Naone@hawaii.gov for questions regarding this letter. Mahalo for your assistance in preserving significant historic and cultural properties.

Aloha,

Mary Jane Naone

Mary Jane Naone
Kauaʻi Lead Archaeologist

Mr. Chang
January 20, 2016

cc.
Sara Collins, Principal Investigator
Pacific Consulting Services, Inc.
Sara.Collins@pcsihawaii.com

Steve Clark, Archaeologist
Pacific Consulting Services, Inc.
Steve.Clark@pcsihawaii.com

Kyle Kaneshiro, Project Manager
The Limtiaco Consulting Group, Inc.
kyle@tlcghawaii.com

Tony Ricci, President
Garden Isle Racing Association
atmkauai@aol.com

PACIFIC CONSULTING SERVICES, INC.

720 Iwilei Road, Suite 424, Honolulu, Hawaii 96817
www.pcsihawaii.com telephone 808.546.5557

January 21, 2016

Dr. Mary Jane Naone
State Historic Preservation Division
P.O Box 1729
Lihue, Kauai, Hawaii 96766

Subject: ADDENDUM: *Archaeological Monitoring Plan in Support of Lighting and Electrical Improvements to the Mānā Drag Racing Strip in Kekaha, Waimea Ahupuaʻa, Kona District, Island of Kauaʻi. TMKs (4) 1-2-002: 009, 036, 040.*

Dr. Naone,

At the request of The Limtiaco Consulting Group, Inc. (Limtiaco), Pacific Consulting Services, Inc. (PCSI) has prepared this Addendum to the Archaeological Monitoring Plan (AMP) in Support of Lighting and Electrical Improvements to the Mānā Drag Racing Strip (MDRS) in Kekaha, Waimea Ahupuaʻa, Kona District, Island of Kauaʻi (Walden and Collins 2013). The location of the project area is presented in Figure 1. This AMP Addendum addresses proposed work for lighting improvements in the project area. A brief description of the project's scope of work is provided below, along with a summary of the results of archaeological inventory survey recently conducted in the project area (Clark et al. 2015). A description of the natural environment, cultural and historical background, and a discussion of archaeological investigations conducted prior to 2013 are presented in detail in the original AMP (see Walden and Collins 2013). The monitoring procedures to be employed during ground-disturbing work for lighting improvements will follow those described in the AMP (see Walden and Collins 2013), which was previously approved by the SHPD and prepared in compliance with Hawaii Revised Statutes (HRS), Chapter 6E, and Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13 (State Historic Preservation Division Rules), Chapter 279 (Rules Governing Standards for Archaeological Monitoring Studies and Reports), and Chapter 275 (Rules Governing Procedures for Historic Preservation Review for Governmental Projects Covered Under Sections 6E-42, HRS).

PROJECT LOCATION AND DESCRIPTION

The MDRS project area is located on the leeward side of Kauaʻi in Waimea Ahupuaʻa (a traditional Hawaiian land division unit), Kona District. It is situated just south of Kaumualiʻi Highway (Hwy 50) and southeast of the Pacific Missile Range Facility (PMRF) (see Figure 1). It consists of two sections, a dirt access road and an asphalt drag strip, which total 5.7 acres (2.31 hectares [ha]). Tax map keys (TMKs) for the parcels in which the project area is located are as follows: (4) 1-2-002: 009, 036, and 040. The landowner is the State of Hawaii, Department of Land and Natural Resources (DLNR). DLNR is providing funding for this project.

SCOPE OF WORK

The purpose of this state-funded project is to bring electricity and lighting to the MDRS. The Kaua‘i Island Utility Cooperative (KIUC) will bring power to the track from Kaumuali‘i Highway and install a new pad-mounted transformer (XFMR). New stadium-type lighting along the south side of the MDRS will illuminate the drag racing strip.

Work addressed in the AMP included re-leveling of roads, installation of electrical conduits, reconstruction of launch pad and burnout box, and replacing guardrails in the west portion of the MDRS. This Addendum covers excavations for utility poles, light poles, trenching for electrical conduits and duct lines, excavations for electrical handholes/pull boxes, and excavations for a pad-mounted XFMR and a pad mounted switchboard. Each of these additional activities to be monitored are described below.

Twenty-five (25) utility poles will be installed for overhead power. The utility poles will be installed every 150.0 to 200.0 feet (ft) (45.7 to 61.0 meters [m]) beginning on the west side of the access road at Kaumuali‘i Highway. The utility line will continue south along the west side of the access road to the north side of the MDRS. At the MDRS the line will continue for approximately half of the racing strip’s length along the north side, or approximately 1500.0 ft (457.0 m). Two-foot diameter holes will be excavated to a depth of 10 ft (3.0 m) for installation of the utility poles. No conduit trenches are required for the overhead power lines.

Nineteen (19) light poles for overhead stadium-type lights will be installed along the south side of the drag racing strip. Associated underground electrical conduits and duct lines will be installed between 17 electrical handholes (EHHs) (EHH-1 through EHH-20) every 150.0 to 200.0 ft for approximately 2,250 linear ft (686.0 m). The excavations for the EHHs will be shallow and involve laying 6 inches of crusher for placement of each EHH. The light poles will be adjacent to each EHH. Approximately 500.0 ft of subsurface electrical conduits and duct lines will also be installed on the north side of the MDRS between four EHHs (EHH-21 through EHH-23). No lighting poles will be installed at this time at these four EHHs. Trenches for the electrical conduits and duct lines will be approximately 3.75 ft (1.14 m) deep. Excavations for the light poles will involve drilling to approximately 14.0 ft (4.27 m) deep.

Shallow excavations will also we carried out for a pad-mounted XFMR (approximately 9 inches in depth) and a pad mounted switchboard (approximately 5 inches in depth).

RECENT ARCHAEOLOGICAL INVESTIGATIONS IN THE PROJECT AREA

In addition to the previous archaeological studies described in the project AMP (see Walden and Collins 2013), PCSI conducted an archaeological inventory survey (AIS) in the current study area in 2015 (Clark et al. 2015). The AIS involved pedestrian survey of 23.29 acres (9.43 ha), the mechanical excavation of 75 trenches, and auguring at 15 locales. The locations of the 90 test excavations (labeled TR 1 through TR 90) are displayed in Figures 2 and 3. No surficial or subsurface archaeological materials or features, including human burials, were encountered.

Data recording involved detailed documentation of soil stratigraphy throughout the project area. Results indicate a discontinuous presence of a series of terrigenous sediment layers found directly overlying or underlying coral sand layers, and an absence of buried A Horizons (Clark et al. 2015:85). The project area’s environment and indigenous soils/sediments (sand dunes with Jaucas loamy fine sands near the shoreline) are generally conducive to the presence of native Hawaiian burials and subsurface cultural deposits. It was concluded that due to environmental factors, it is still possible that native Hawaiian burials and subsurface

archaeological materials and features are present in the MDRS project area. Therefore, archaeological monitoring was recommended during ground disturbing activities associated with lighting improvements at the MDRS.

EXTENT OF ADDITIONAL MONITORING

The archaeologist(s) will conduct on-site monitoring of all ground-disturbing activities that penetrate to the coral sand layers present within the project area. The activities covered in this AMP Addendum are detailed in Table 1, and include excavations for utility poles, light poles, electrical conduit and duct line trenches, electrical pull boxes/handholes, a pad-mounted XFMR, and a pad-mounted switchboard. The locations of monitoring for these excavations are displayed on design plans in Figures 4–12. No excavations will occur in areas not previously disturbed by the construction of the road and race track. All monitoring conducted as part of this AMP Addendum will be carried out in accordance with the stipulations, methods, and procedures described in the AMP, which SHPD approved on June 7, 2013 (LOG NO: 2013.3446, DOC NO: 1306SL01).

Table 1. Proposed Additional Ground-Disturbing Activities For Mānā Drag Racing Strip Project, Waimea Ahupuaʻa.

PROPOSED ACTIVITY	ESTIMATED EXCAVATION DEPTH	ON-CALL/ON-SITE MONITORING NECESSARY
Utility pole installation	10.0 ft (3.0 m)	On-site
Light pole installation	14.0 ft (4.27 m)	On-site
Electrical conduit and duct line	3.75 ft (1.14 m)	On-site
Electrical pull boxes/handholes	.5 ft (.15)	On-site
Pad-mounted XFMR	.83 ft (.25 m)	On-site

PRE-CONSTRUCTION CONFERENCE

Before ground-disturbing work begins for the project, the on-site archaeologist will explain to the entire construction crew what materials may be encountered and the procedures to follow if archaeological materials are found, as well as the role of the archaeological monitor. At this time it will be made clear that the archaeological monitor must be on-site for ground-disturbing activities that penetrate below grade and that the archaeologist has the authority to stop work ***immediately***, if necessary.

HALTING OF EXCAVATION ACTIVITY

The monitoring archaeologist has the authority to halt construction in the vicinity of any find so that the provisions of this AMP can be carried out. The consulting archaeological firm will make it clear to the construction personnel that the archaeologist has the authority to halt work when it is deemed appropriate.

MONITORING METHODS

The archaeological monitor will closely observe excavations and examine soils as they are removed. After excavations, trench faces will be examined for cultural material and subsurface features, as will postholes as possible (the depth of visual observation may be impeded by the diameter of the posthole). If any archaeological materials are encountered during the monitoring of ground-disturbing activities, work will be stopped immediately in that area and the monitoring archaeologist will investigate the nature of the discovery. Photographs of excavations and the stratigraphic sequences will be documented and included in the report even if no historically significant sites are documented during the field work.

The archaeological monitor will compile daily monitoring logs. These logs will minimally include a description of daily activities, sites or features recorded, personnel on-site, and problems encountered and corrective action taken. Monthly reports will be filed with the SHPD detailing any new sites or features identified, if necessary and appropriate.

TREATMENT OF HISTORIC SITES AND DEPOSITS

If an intact cultural layer, living surface, structural components (e.g., foundations), archaeological subsurface features (e.g., hearths, pits, postholes, etc.), artifacts, charcoal or midden deposits or trash pits are encountered, then the following actions will be taken:

- Selected, sorted charcoal samples will be collected for the possibility of radiocarbon analysis (particularly if the charcoal appears in a prehistoric context).
- Bulk samples of midden (faunal/floral material) if present will be collected.
- All prehistoric artifacts will be collected.
- All historic artifacts will be collected unless large trash or refuse pits are encountered, in which case a representative sample of diagnostic artifacts will be collected, such as bottle and ceramic bases containing maker's marks.
- Standard documentation will be carried out, including to-scale maps, profiles, photographs, detailed soil and provenience descriptions, and interpretation.

TREATMENT OF HUMAN REMAINS

If human remains are identified, work will immediately stop in that locale, and the SHPD/Department of Land and Natural Resources (DLNR) will be notified immediately of the find. No further work will take place in that locale—including screening of back dirt, cleaning and/or excavation of the burial area, or exploratory work of any kind—unless explicitly requested by the SHPD.

Any human skeletal remains identified during monitoring shall be treated as an inadvertent discovery and be dealt with in accordance with Chapter 6E-43 of the Hawaii Revised Statutes (HRS) and HAR § 13-300-40. The SHPD/DLNR, in consultation with the Kaua'i County Honolulu and the Kaua'i Island Burial Council (KIBC), will determine whether to preserve in place or relocate. If SHPD makes a determination for removal of the human remains, the consulting archaeologist will remove and treat the human remains in accordance with HAR § 13-300-40.

LABORATORY WORK

Laboratory work will be conducted in accordance with HAR Chapter 13-279 and will follow the SHPD *Rules Governing Standards for Archaeological Monitoring Studies and Reports* (HAR § 13-279-4). Artifacts will be cataloged and analyzed, along with any samples of midden materials that have been collected. Charcoal and other datable materials will be submitted for dating analysis, provided samples were collected in situ from prehistoric contexts that show no signs of intermixing with historic materials; e.g., charcoal obtained from distinct fire features in solely pre-Contact deposits.

REPORT PREPARATION

Following completion of fieldwork, an end of field report and a draft Archaeological Monitoring Report compliant with HAR Chapter 13-279 will be prepared and submitted to the SHPD/DLNR for review. The consulting archaeological firm will submit a final report after receiving any comments on the draft report. Should burials and/or human remains be identified, other letters, memos, and/or reports may be requested by the SHPD, and will be provided in accordance with applicable statutes and regulations, and as contractual obligations permit.

DISPOSITION OF MATERIALS

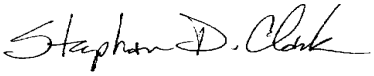
All field records, maps, photographs, and related documents and archaeological materials will be temporarily curated at the consulting archaeologist's firm or with the landowner for curation. Final disposition of these records and related materials will be determined in consultation with the Kaua‘i County and the SHPD.

SUMMARY

This Addendum to the *Archaeological Monitoring Plan in Support of Improvements to the Western Portion of the Mānā Drag Racing Strip in Kekaha, Waimea Ahupua‘a, Kona District, Island of Kaua‘i* (Walden and Collins 2013) addresses archaeological monitoring for proposed lighting improvements. Ground-disturbing activities include excavations for utility poles, light poles, electrical conduit and ductlines, electrical pull boxes/handholes, and excavations for a pad-mounted XFMR and a switchboard. These activities are within the boundaries of the AIS carried out in 2015 (Clark et al. 2015) and within the project area boundaries covered in the SHPD-approved AMP (Walden and Collins 2013). Anticipated findings are consistent with those described in the AMP, which include pre-Contact and/or historic subsurface cultural deposits, including human burials.

Please contact me by email at steve.clark@pcsihawaii.com, or by phone at 222-0407 if you have any questions or concerns.

Sincerely,



Stephan D. Clark
Manager, Cultural Resources
Pacific Consulting Services, Inc.
Honolulu

References

Clark, Stephan D., Katherine A. Shiroma, Melanie A. Mintmier, and Jackie Walden
2015 *Archaeological Inventory Survey and Testing in Support of Lighting and Electrical Improvements at the Mānā Drag Racing Strip Waimea Ahupuaʻa, Kona District, Island of Kauaʻi, Hawaiʻi, TMK (4) 1-2-02: 009, 036, & 040.* Prepared for the Limtiaco Consulting Group. Pacific Consulting Services, Inc., Honolulu.

U.S.G.S. Kekaha Quadrangle
1991 USGS 7.5-minute topographic map of Kauai, Kekaha quadrangle.USGS Information Services, Denver, Colorado. Available online at http://magis.manoa.hawaii.edu/maps/digital/quads.html. Accessed 28 December 2015.

Walden, Jackie and Sara L. Collins
2013 *Archaeological Monitoring Plan in Support of Improvements to the Western Portion of the Mana Drag Racing Strip in Kekaha, Waimea Ahupuaʻa, Kona District, Island of Kauaʻi.* Prepared for the Limtiaco Consulting Group. Pacific Consulting Services, Inc., Honolulu.

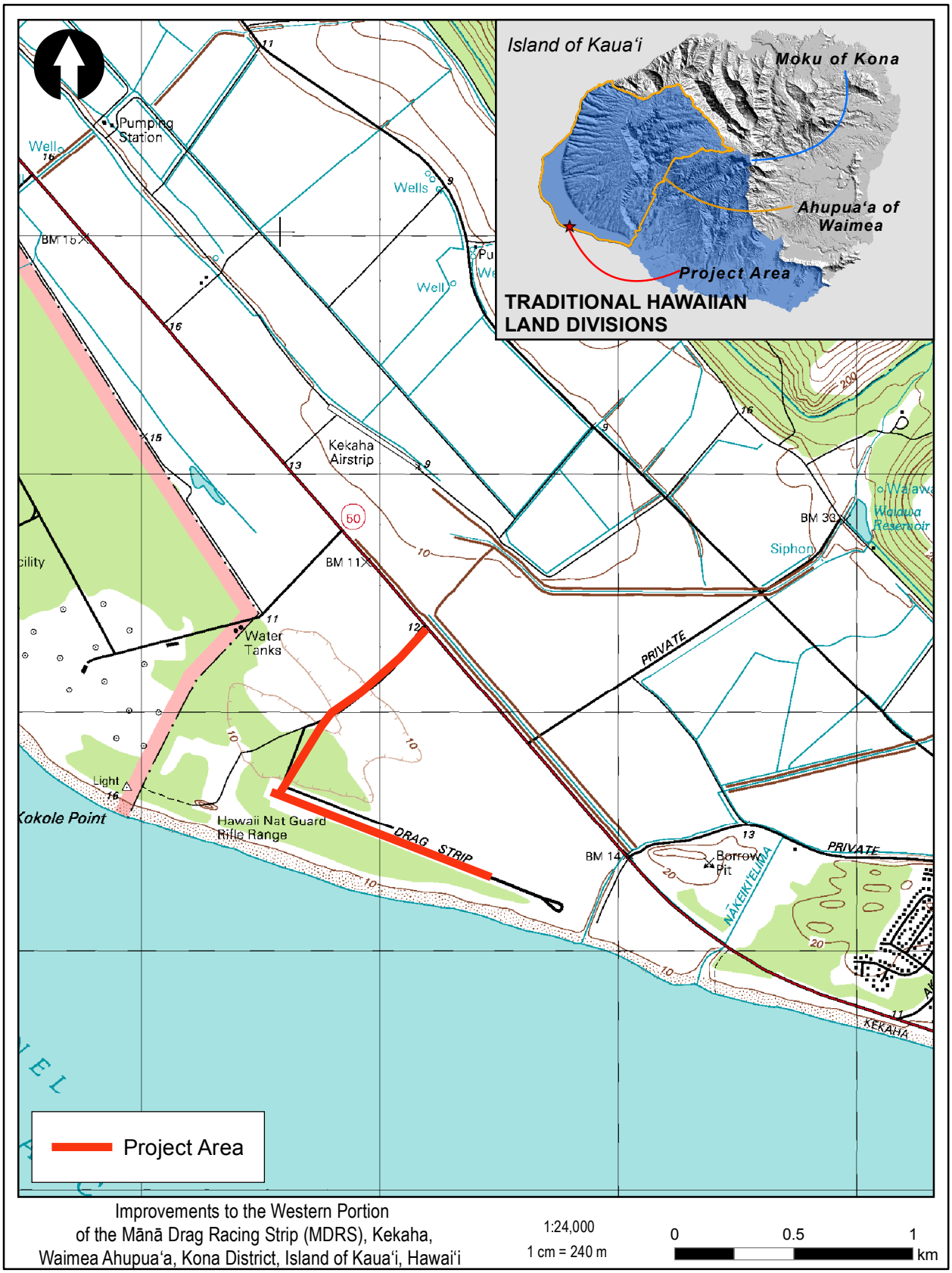


Figure 1. Project Area Location on 7.5-Minute Series USGS Kekaha (1991).

Figure 2. Access Road for the Mānā Drag Racing Strip Project Area Showing Locations of Test Excavations TR 1 through TR 15.

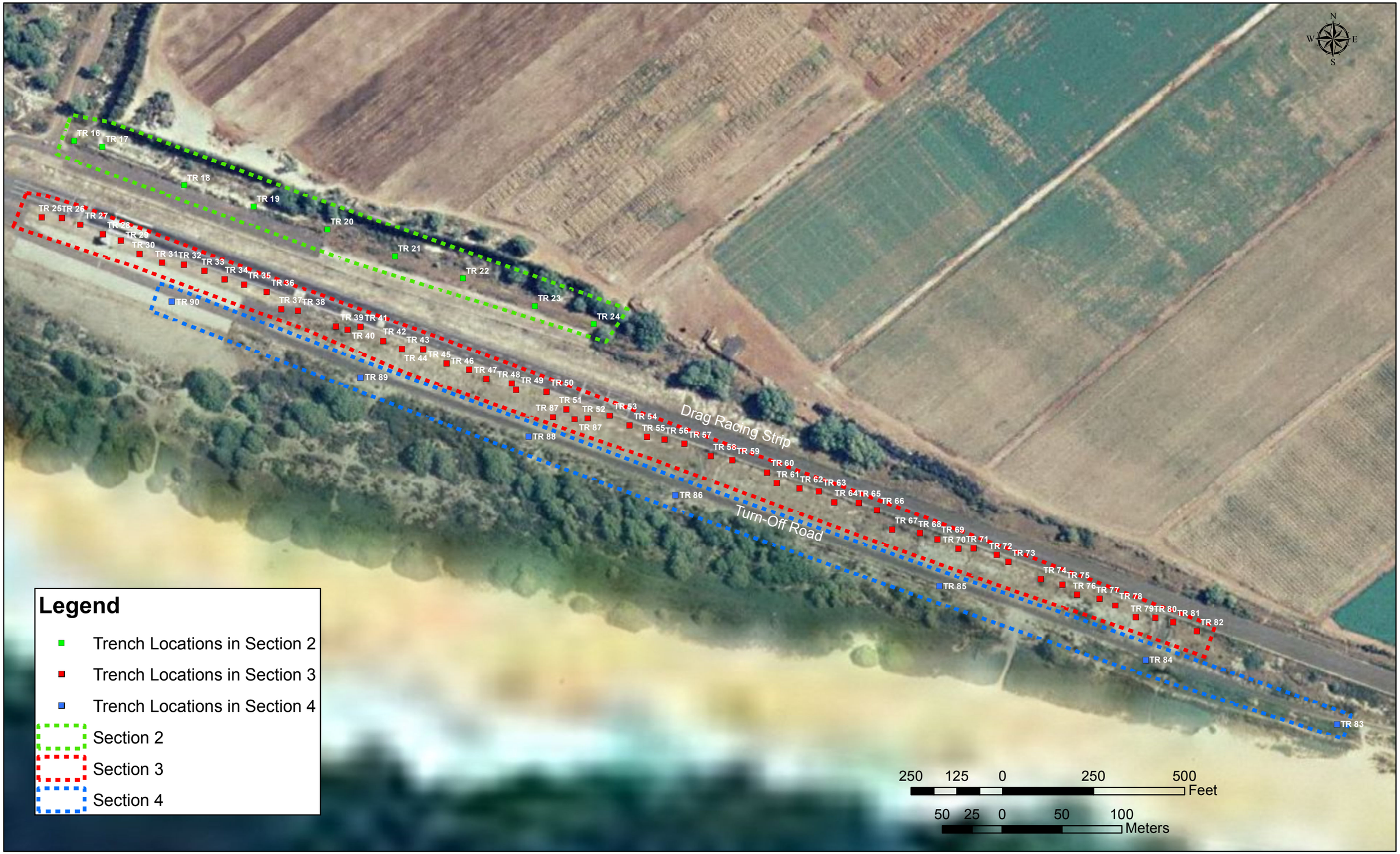


Figure 3. Sections 2 through 4 of the Mānā Drag Racing Strip Project Area Showing Locations of Test Excavations TR 16 through TR 90.

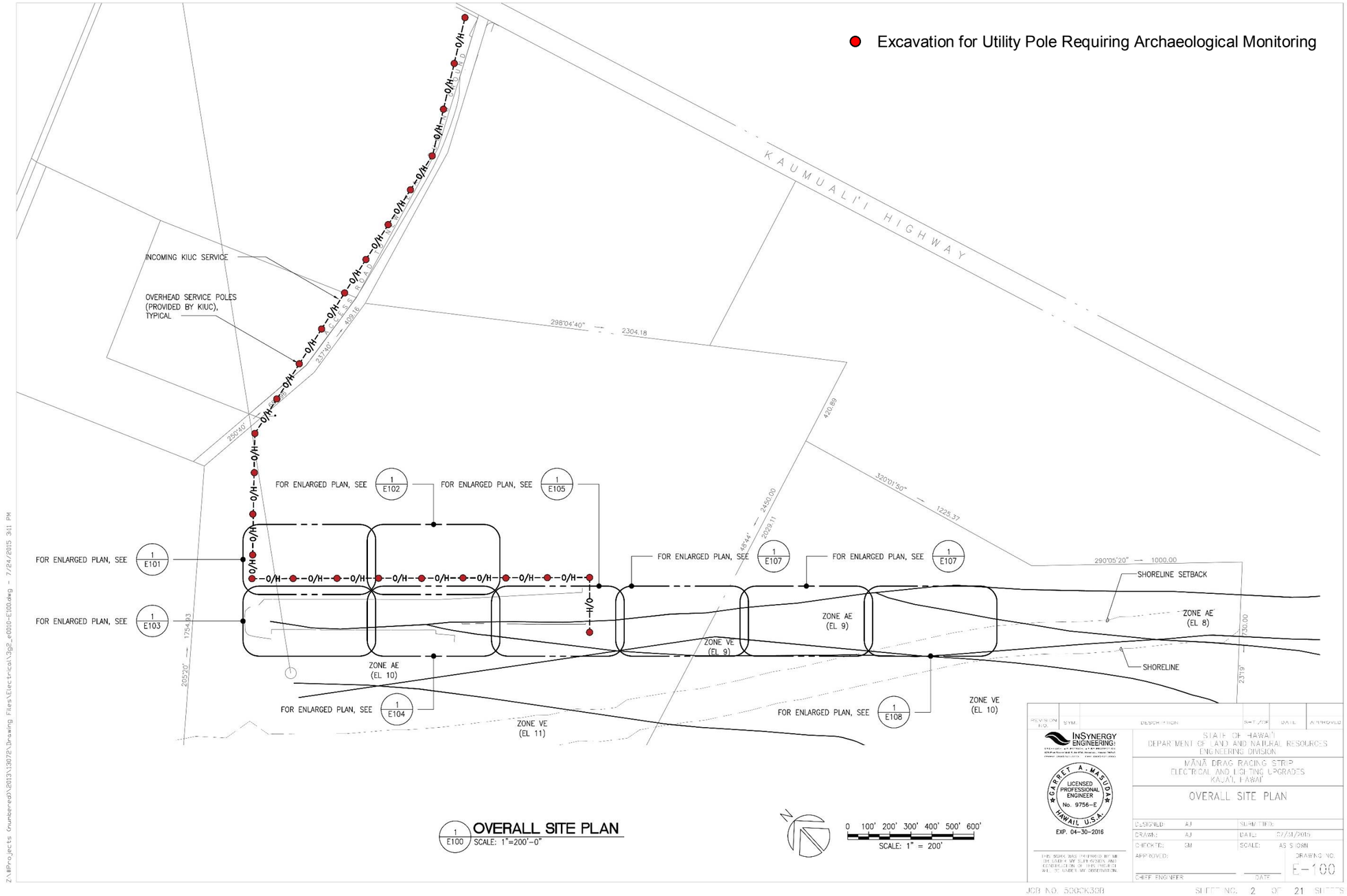


Figure 4. Locations of Utility Pole Excavations Requiring Archaeological Monitoring.

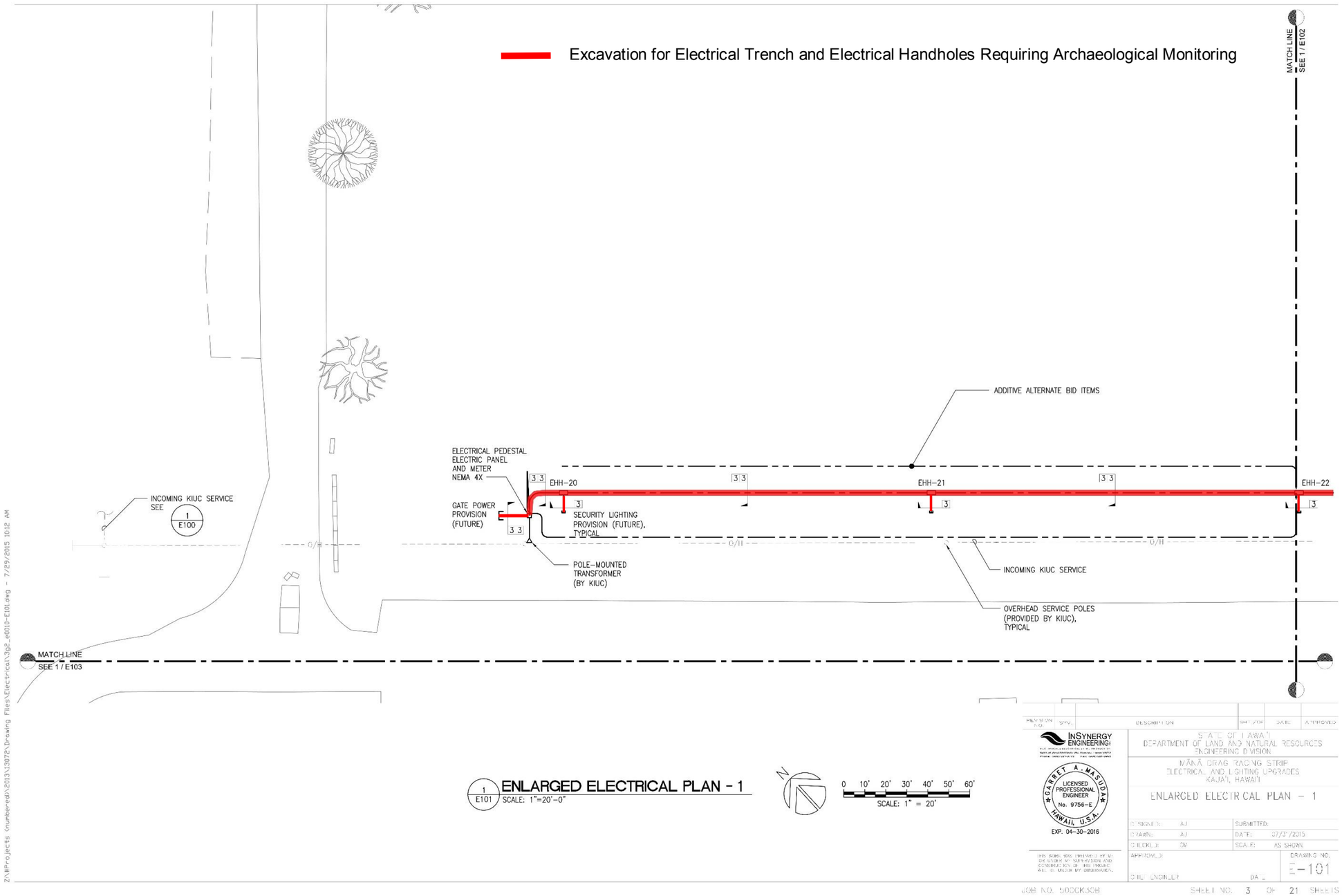


Figure 5. Locations of Lighting Excavations Requiring Archaeological Monitoring.

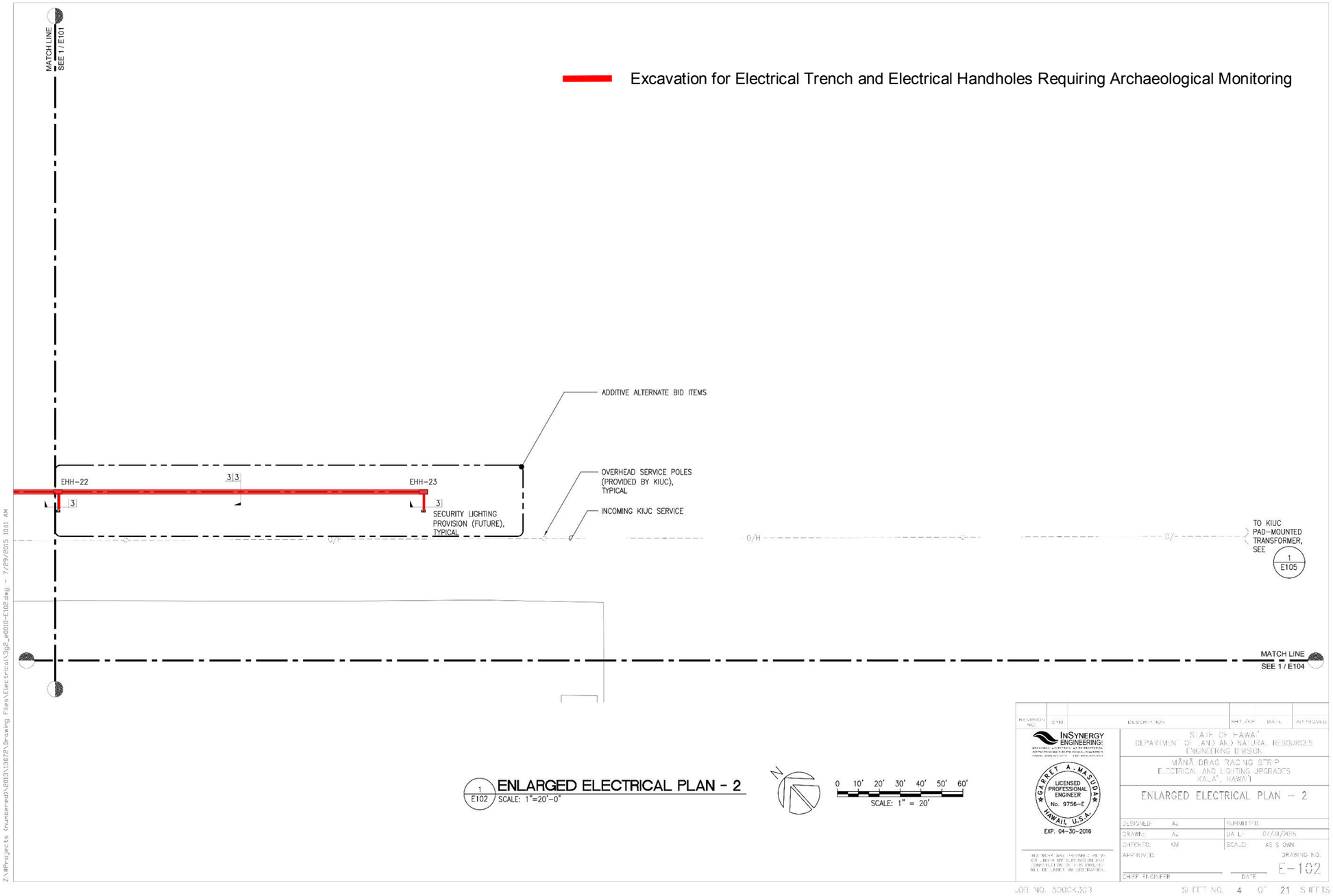


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Figure 6. Locations of Lighting Excavations Requiring Archaeological Monitoring.

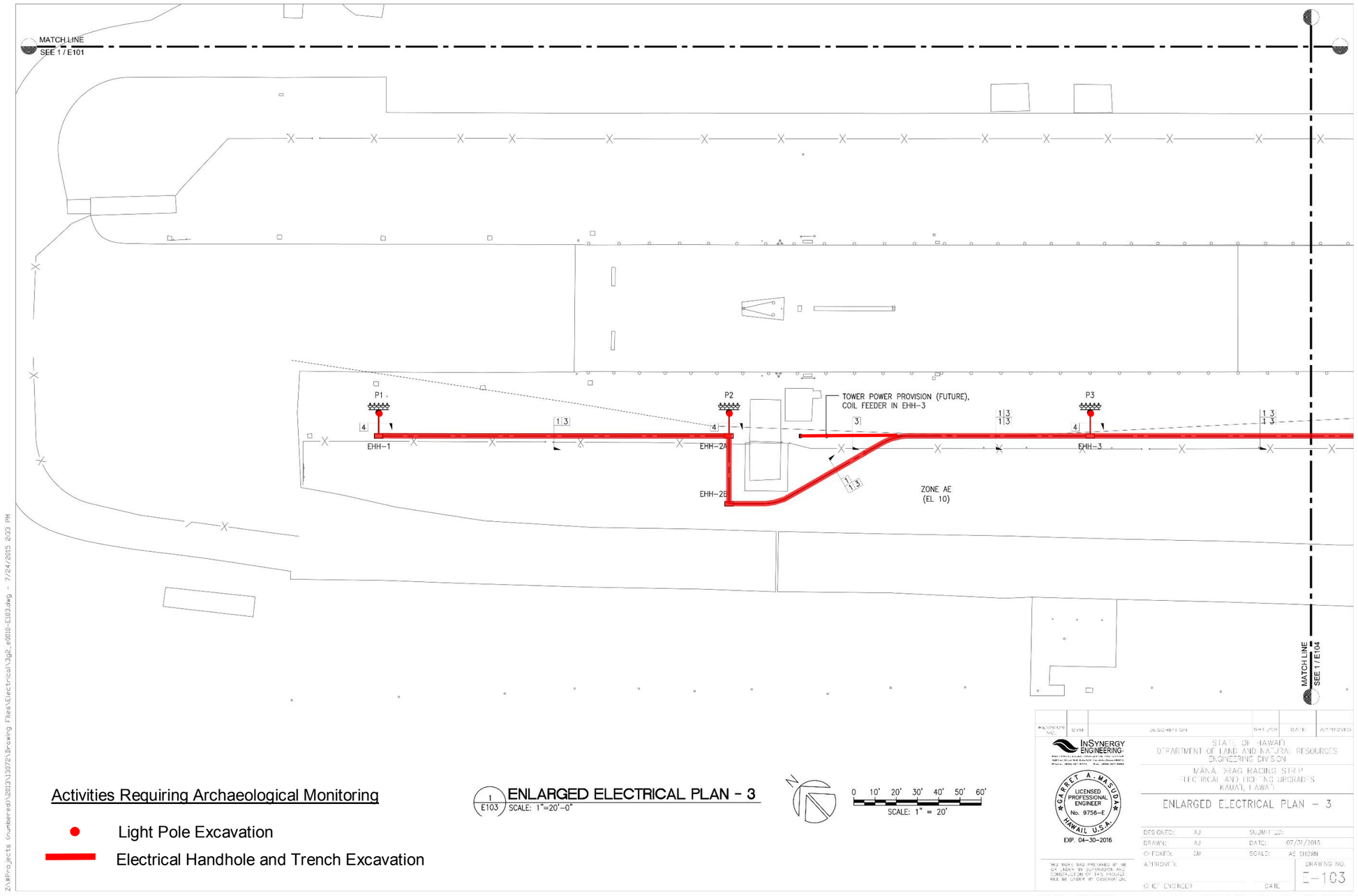

Figure 7. Locations of Lighting Excavations Requiring Archaeological Monitoring.

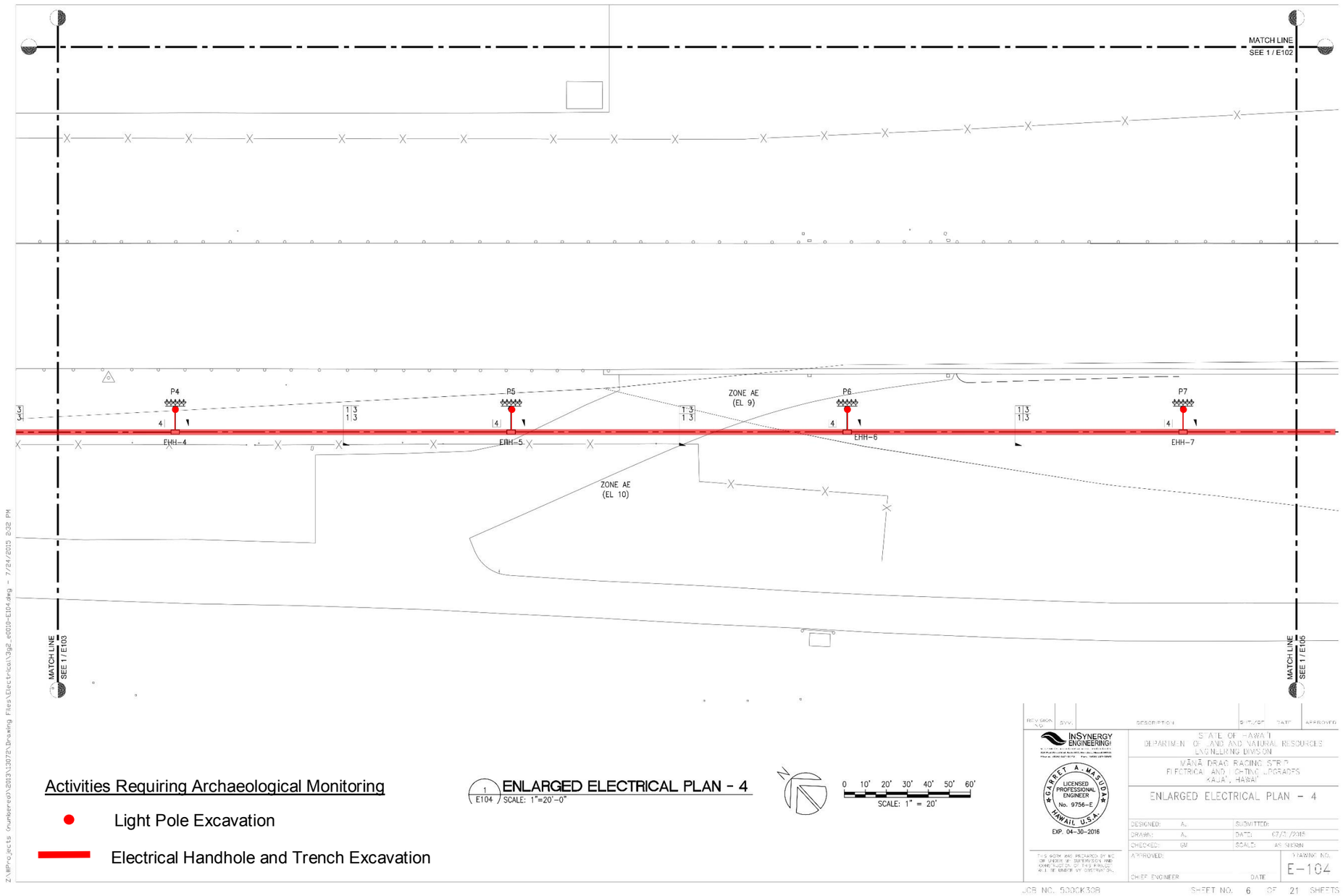

Figure 8. Locations of Lighting Excavations Requiring Archaeological Monitoring.

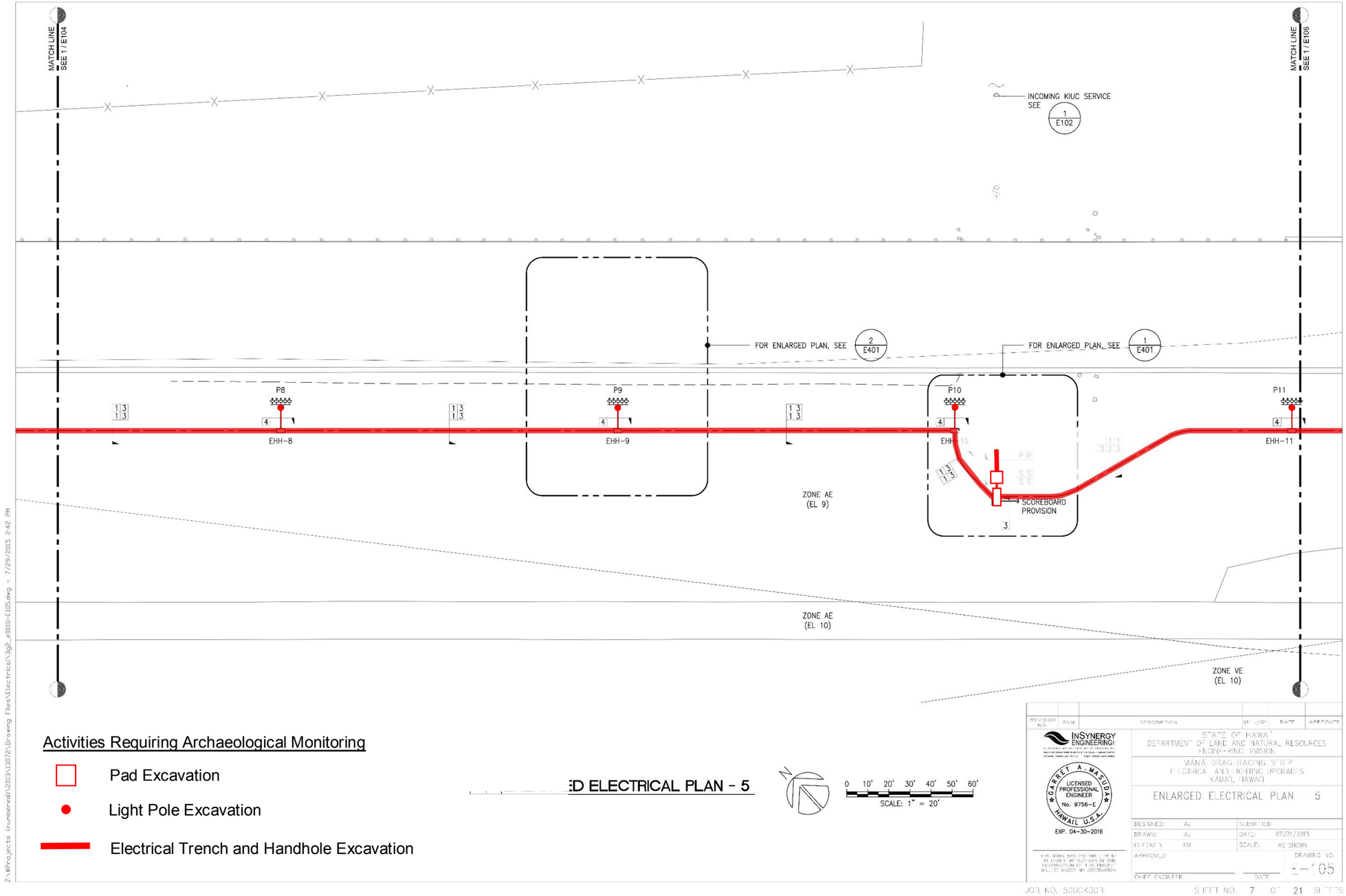

Figure 9. Locations of Lighting and Pad Excavations Requiring Archaeological Monitoring.

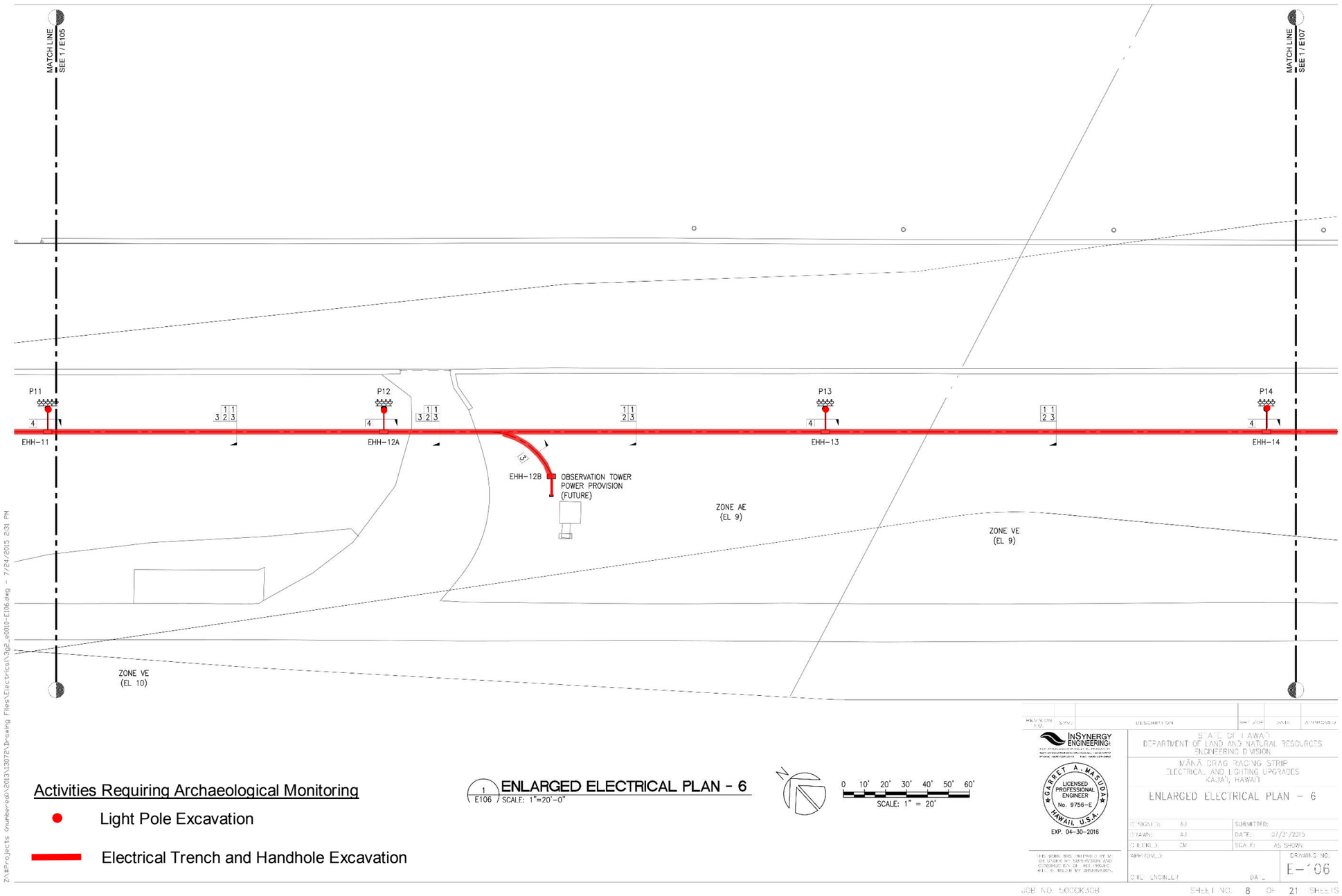

Figure 10. Locations of Lighting Excavations Requiring Archaeological Monitoring.

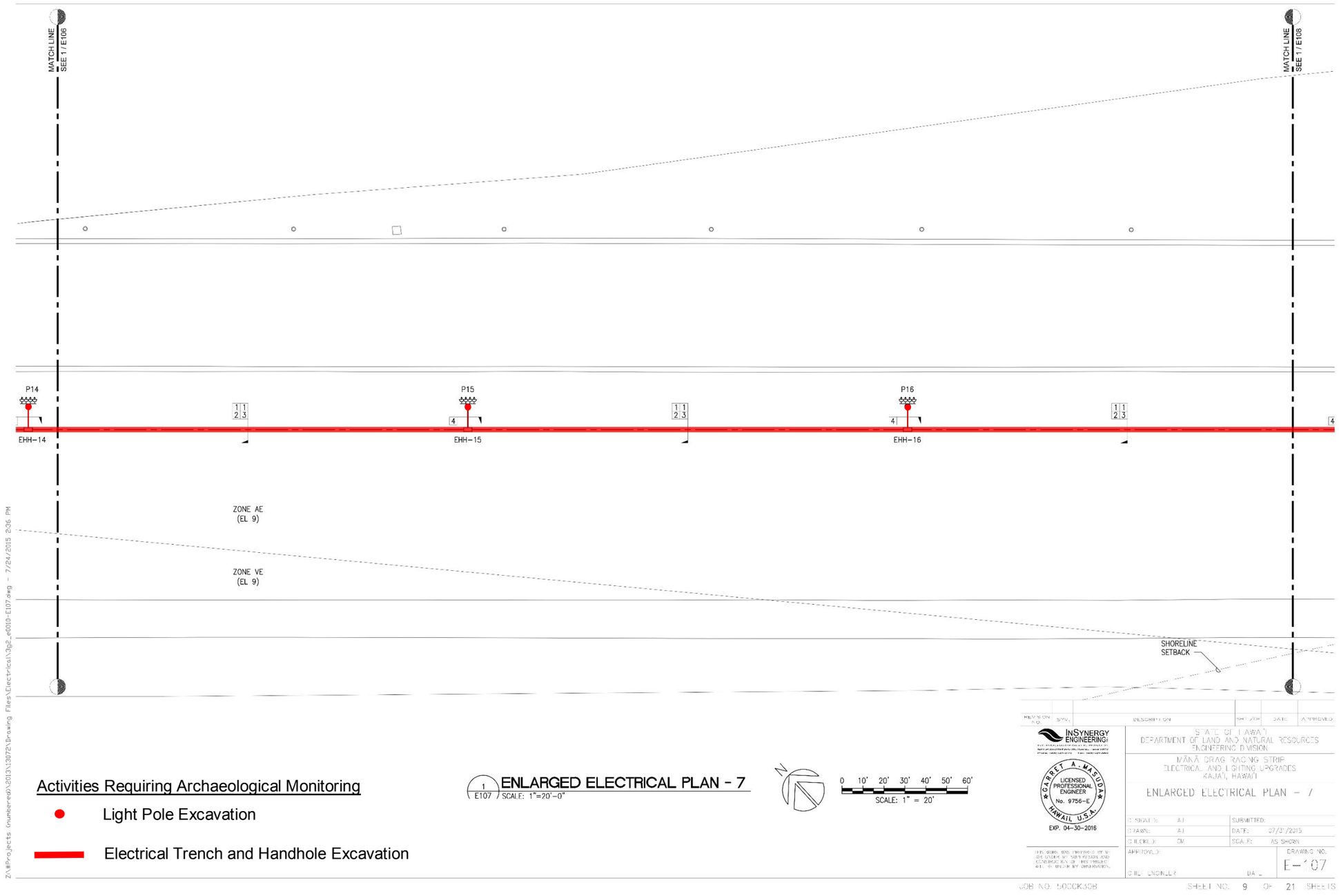

Figure 11. Locations of Lighting Excavations Requiring Archaeological Monitoring.

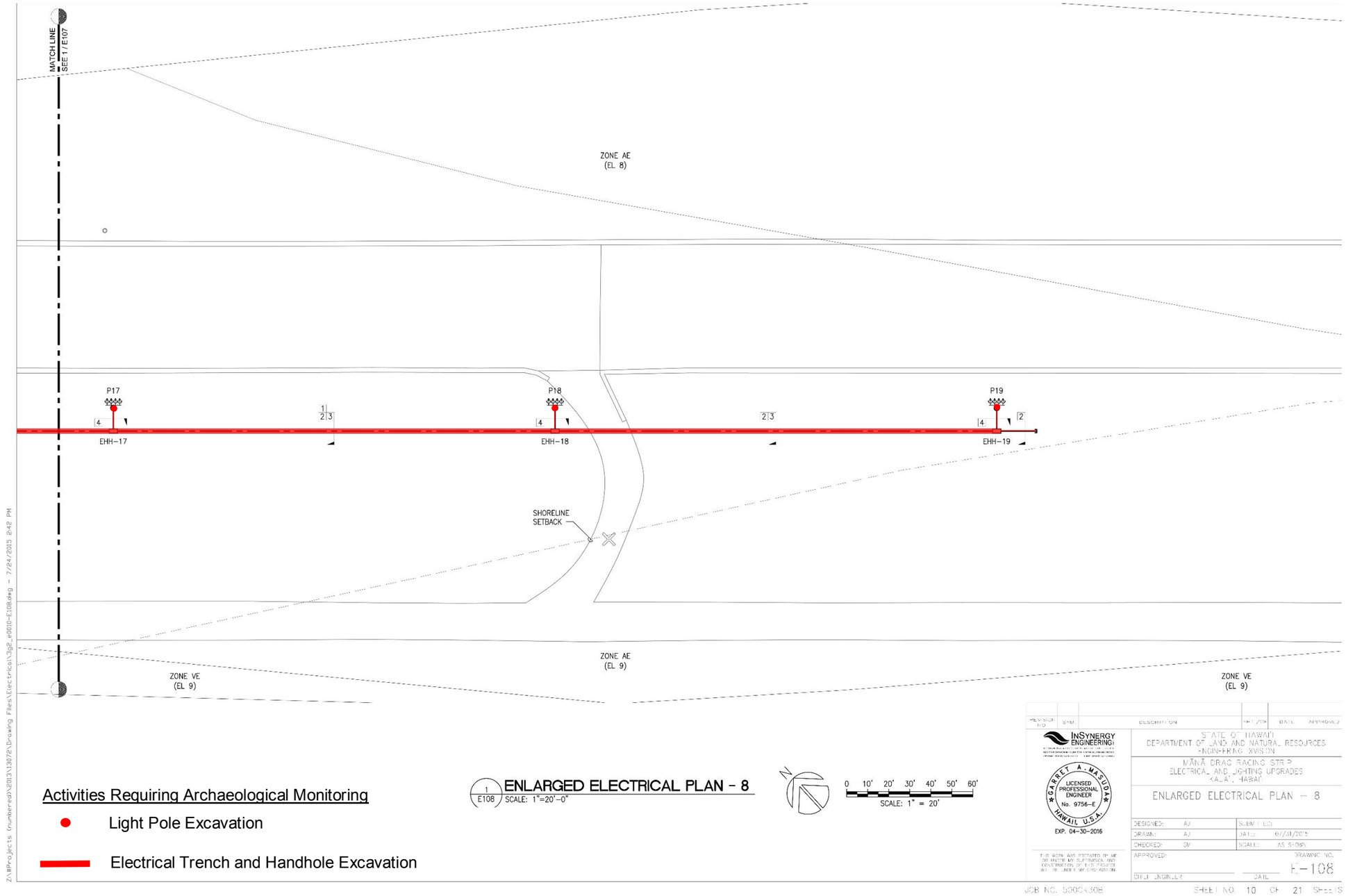

Figure 12. Locations of Lighting Excavations Requiring Archaeological Monitoring.

APPENDIX J
ALTERNATIVE COST ESTIMATES

Alternative Cost Estimte

Preferred Alternative (Overhead Elecrical Line)

DESCRIPTION	***QTY***			***UNIT PRICE***	***TOTAL***
Wire and installation	4826.35	LF		$50.00	$241,317.50
Utility Pole Installation	25	ea		$5,000.00	$125,000.00
Undergroudn Service Fee	1	ea		$40,000.00	$40,000.00
Transofrmer Pad	1	ea		$3,500.00	$3,500.00
Transformer Equipment and Setup	1	ea		$30,000.00	$30,000.00
				Total	$439,817.50

Alternative Cost Estimate
Buried Electrical Line Alternative

DESCRIPTION	***QTY***			***UNIT PRICE***	***TOTAL***
Pole Riser	1	ea		$2,500.00	$2,500.00
2 - 2" Conduit encased in Concrete	4826.35	LF		$250.00	$1,206,587.50
Excavation and Backfill for Electrical Work (not including fill material)	1072.522	cy		$300.00	$321,756.67
Structural Fill	804.3917	cy		$200.00	$160,878.33
Undergroudn Service Fee	1	ea		$40,000.00	$40,000.00
Transofrmer Pad	1	ea		$3,500.00	$3,500.00
Transformer Equipment and Setup	1	ea		$30,000.00	$30,000.00
				Total	$1,765,222.50

Alternative Cost Estimate
Install Permanent Generators

DESCRIPTION	***QTY***			***UNIT PRICE***	***TOTAL***
Generator (Diesel with incorporated fuel tank)	1	ea		$100,000.00	$100,000.00
Equipment Pad and Housing	1	ea		$200,000.00	$200,000.00
Generator Servicing	12	month		$2,500.00	$30,000.00
				Total	$330,000.00

APPENDIX K
PRE-ASSESSMENT CONSULTATION

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 21, 2014

Kristi Young, Deputy Field Supervisor
U.S. Department of the Interior
Fish & Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd.
Honolulu, Hawaii 96850

Subject: Pre-Consultation for Environmental Assessment
Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

SAMPLE

Dear Ms. Young,

On behalf of the State Department of Land and Natural Resources (DLNR), Engineering Division, we wish to inform you that the DLNR plans construction of electrical and lighting upgrades at the Mana Drag Race Strip in Kekaha, Kauai (see enclosed Figures 1 and 2). The facility is located on State land, and is operated by the Garden Isle Racing Association (GIRA). The Mana Drag Race Strip provides a gathering place where racing enthusiasts may safely race motorcycles, dragsters, and muscle and sport cars in an organized forum.

The State funded project proposes to bring power and lighting to the Mana Drag Race Strip. To do this, the Kauai Island Utility Commission (KIUC) will bring power to the track from Kuhio Highway along an access road and install a new pad mounted transformer. New stadium-type lighting will be installed along the south side (*makai*) of the Mana Drag Race Strip to illuminate the track. Figure 3 shows the proposed improvements.

This work will include the installation of approximately 26 utility poles and overhead power lines along the west side of the access road, and along the north side (*mauka*) of the Mana Drag Race Strip for approximately half the length of the track. The utility poles will be installed every 150 to 200 feet.

A total of 18 light poles (for overhead stadium-type lights) will be installed along the makai side of the race track, with associated underground electrical conduits between the light poles. The light poles will be installed every 150 to 200 feet. Approximately 2,250 linear feet of subsurface electrical conduit will be installed between the light poles, parallel to the race track. Trenches for the electrical conduit will be approximately 2 feet deep. The proposed light fixtures will be downcast to mitigate potential effects on shorebirds.

In addition to the utility poles, light poles, and underground electrical conduit trenches, approximately 125 linear feet of concrete duct bank will cross the track on the west end of the Mana Drag Race Strip near the burnout box. Trenches for the installation of electrical pull

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(808) 596-7790 • tlcghawaii.com

boxes/handholes and a pad mounted transformer will also be provided for the installation of the electrical lighting system.

An Environmental Assessment (EA) will be prepared for this project pursuant to Chapter 343, Hawaii Revised Statutes. We are currently soliciting comments you may have regarding the proposed project for inclusion in the forthcoming EA. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the enclosed figures and submit your written comments to the address below by December 31, 2014.

Please send comments to:

Kyle Kaneshiro, P.E. LEED AP, Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

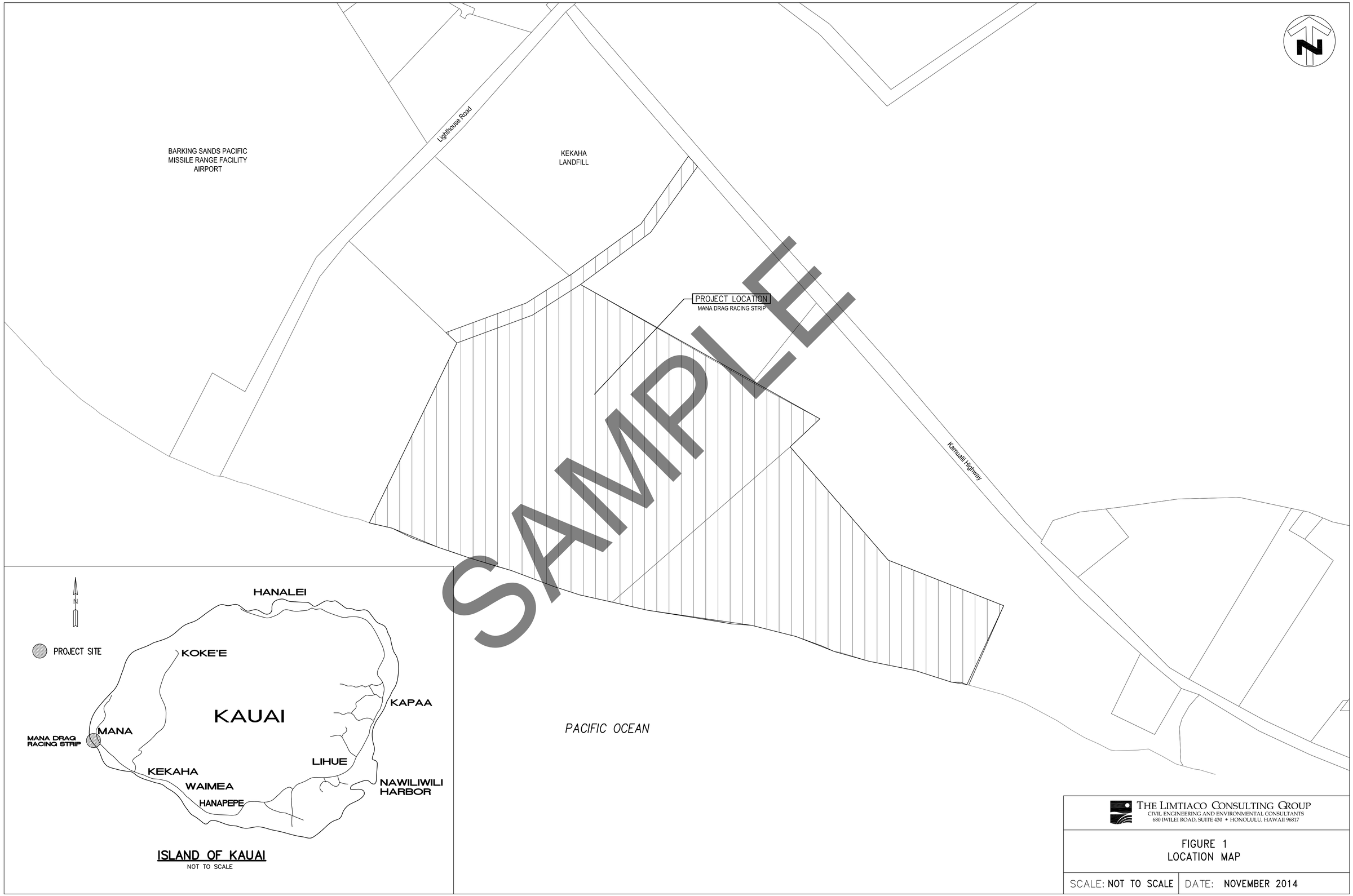
Thank you for your interest and participation in the environmental review process. You will be notified when the Draft EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

Enc(s)
cc: Adrian Chang, DLNR

SAMPLE


BARKING SANDS PACIFIC
MISSILE RANGE FACILITY
AIRPORT
Lighthouse Road
KEKAHA
LANDFILL
PROJECT LOCATION
MANA DRAG RACING STRIP
Kaumualii Highway
PACIFIC OCEAN
HANALEI
KOKE'E
KAUAI
KAPAA
MANA
MANA DRAG
RACING STRIP
LIHUE
KEKAHA
WAIMEA
HANAPEPE
NAWILIWILI
HARBOR
PROJECT SITE
ISLAND OF KAUAI
NOT TO SCALE
THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS
680 IWILEI ROAD, SUITE 430 • HONOLULU, HAWAII 96817
FIGURE 1
LOCATION MAP
SCALE: NOT TO SCALE
DATE: NOVEMBER 2014

SAMPLE

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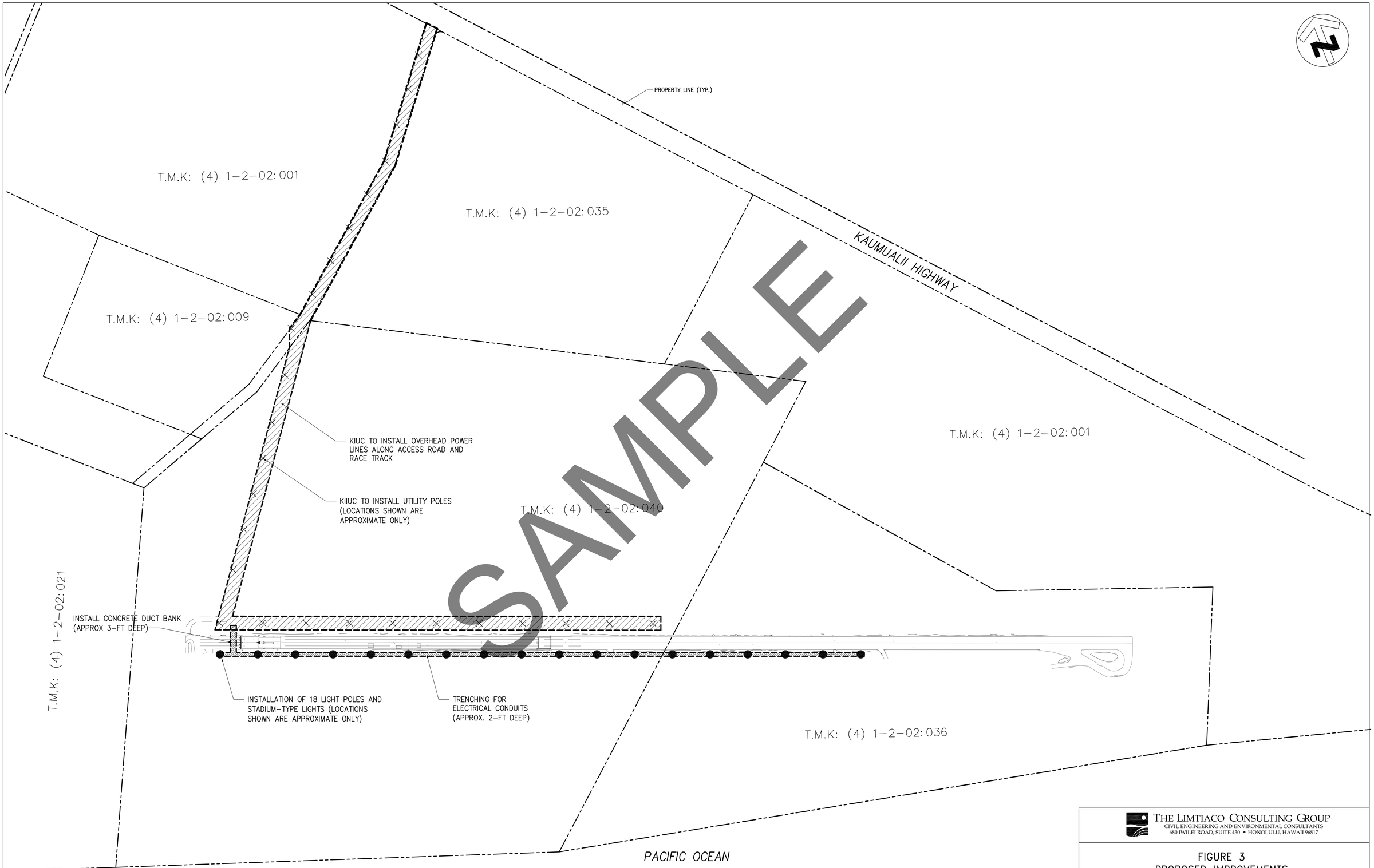
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS
680 IWILEI ROAD, SUITE 430 • HONOLULU, HAWAII 96817

FIGURE 2
AERIAL VIEW

SCALE: NOT TO SCALE | DATE: NOVEMBER 2014



THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS
680 IWILEI ROAD, SUITE 430 • HONOLULU, HAWAII 96817

FIGURE 3
PROPOSED IMPROVEMENTS

SCALE: NOT TO SCALE | DATE: NOVEMBER 2014

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
2015-TA-0078

Kyle Kaneshiro, P.E. LEED AP
Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

DEC 22 2014

Subject: Technical Assistance for the Draft Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades, Kauai

Dear Mr. Kaneshiro:

The U.S. Fish and Wildlife Service (Service) received your letter, dated November 21, 2014, requesting our comments on the proposed Mana Drag Race Strip Electrical and Lighting Upgrades on the island of Kauai, as a pre-consultation for the associated draft Environmental Assessment (EA). The State of Hawaii Department of Land and Natural Resources (DLNR) Engineering Division proposes to install power and new lighting at the Mana Drag Race Strip. The existing facilities are currently operated by the Garden Isle Racing Association (GIRA). The proposed project involves the installation of approximately 26 utility poles at spacing of 150 to 200 feet between poles and overhead powerlines which would span the west side of the access road and half the length of the north side of the race strip. New overhead stadium-type lighting will be installed along the south side of the race strip at spacing of 150 to 200 feet between light poles. Approximately 2,250 linear feet of subsurface electrical conduit will be installed in trenches between light poles. The trenches will be approximately two feet deep. A concrete duct bank, approximately 125 linear feet, will be installed across the west end of the race strip. The electrical lighting system upgrades will also include trenches for electrical pull boxes / hand holes and a pad mounted transformer. The property is located on State of Hawaii land at TMK (4) 1-2-002: 036 & 040. The following comments are in accordance with the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C 1531 *et seq.*).

We reviewed the information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, as it pertains to federally listed species and designated critical habitat. The following species are known to occur or transit through the proposed project area:

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the endangered Hawaiian black-necked stilt (*Himantopus mexicanus knudseni)*, Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*) (hereafter collectively referred to as Hawaiian waterbirds); the endangered Hawaiian goose (*Branta sandvicensis*); the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus)*; the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the threatened Newell's shearwater (*Puffinus auricularis newelli*), and a candidate for listing the band-rumped storm-petrel (*Oceanodroma castro*) (hereafter collectively referred to as seabirds); and the threatened green sea turtle (*Chelonia mydas*). The proposed project area is also within designated critical habitat (currently unoccupied) for the endangered *Panicum niihauense.*

Additionally, the endangered Hawaiian monk seal (*Monachus schauinslandi*) may use beach habitat in the proposed project area. The National Marine Fisheries Service (NMFS) is the Federal agency that consults on potential impacts to monk seals, both in their on-shore and ocean habitats. Therefore, we did not review the proposed project for potential project impacts to monk seals. We recommend that you contact NMFS regarding the presence of monk seals in the area and potential impacts to the species from the project.

To aid in the drafting of your EA we provide the following recommendations to avoid and minimize project impacts to listed species, candidate species, and critical habitat.

Hawaiian Goose
In order to avoid impacts to Hawaiian geese, we recommend a biologist familiar with the nesting behavior of the Hawaiian goose survey the area prior to the initiation of any work, or after any subsequent delay in work of three or more days (during which birds may attempt nesting). If a nest is discovered, work should cease immediately and our office should be contacted for further guidance. Furthermore, all on-site project personnel should be apprised that Hawaiian geese may be in the vicinity of the project at any time during the year. If a Hawaiian goose (or geese) appears within 100 feet of ongoing work, all activity should be temporarily suspended until the Hawaiian goose (or geese) leaves the area of its own accord.

Hawaiian Hoary Bat
The Hawaiian hoary bat roosts in both exotic and native woody vegetation and, while foraging, will leave young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the breeding season, there is a risk that young bats could inadvertently be harmed or killed. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15). Site clearing should be timed to avoid disturbance to Hawaiian hoary bats in the project area.

Seabirds
Seabirds, including the Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel fly at night and are attracted to artificially-lighted areas resulting in disorientation and subsequent fallout due to exhaustion. Seabirds are also susceptible to collision with objects that protrude above the vegetation layer, such as utility lines, guy-wires, and communication towers.

Additionally, once grounded, they are vulnerable to predators and are often struck by vehicles along roadways. Construction activities should only occur during daylight hours. Any increase in the use of nighttime lighting, particularly during peak fallout period (September 15 through December 15), could result in additional seabird injury or mortality. The draft EA should address all potential impacts to listed seabirds and outline conservation measures to minimize these impacts.

You state in your November 21, 2014 letter that 18 light poles for overhead stadium-type lighting will be installed along the south side of the race strip. We understand the proposed light fixtures will be downcast, however, to further minimize impacts to seabirds, we recommend the lighting in the project area be fully shielded or full cut-off luminary fixtures, such that the bulb can only be seen from below using the lowest wattage bulbs possible. Additional information on the light fixtures, their height and wattage, and operational use are necessary to assess potential impacts to seabirds. Your draft EA should examine potential impacts to the Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel that may occur as a result of construction and the operational use of stadium lighting. In addition to this information, the draft EA should analyze other measures to avoid potential impacts to seabirds due to seabird fallout (e.g., not operating or turning on stadium lights during the peak fallout period).

You also state that 26 utility poles and overhead power lines will need to be installed along the west side of the access road, and along the north side of the race strip. These utility poles and overhead lines may constitute a collision hazard for seabirds as they traverse between the ocean and their breeding colonies. Additional information on the proposed height of the powerlines in relation to the vegetation layer and surrounding buildings in the area is necessary to assess the potential impacts to seabirds. We suggest the draft EA provide this additional informational as well as determine whether undergrounding utility lines in this area may be feasible to avoid impacts to seabirds. If it is not feasible to underground power lines or install power lines at or the below the vegetation layer, other measures to minimize the potential for seabird collision should be analyzed in the draft EA (e.g., vertical versus horizontal arrays, etc.).

Hawaiian Waterbirds

Our records indicate there is a high probability that Hawaiian waterbirds may occur in the vicinity of the proposed project. We recommend you incorporate the following measures into your project description in the draft environmental assessment to avoid and minimize impacts to Hawaiian waterbirds:

- A biological monitor should conduct Hawaiian waterbird and nest surveys at the proposed project site prior to project initiation.
- Any documented nests or broods within the project vicinity should be reported to the Service within 48 hours.
- A 100-foot buffer should be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer.
- The Service should be notified immediately prior to project initiation and provided with the results of pre-construction Hawaiian waterbird surveys.

- A biological monitor(s) should be present on the project site during all construction or earth moving activities to ensure that Hawaiian waterbirds and nests are not adversely impacted.
- If a listed Hawaiian waterbird is observed within the project site, or flies into the site while activities are occurring, the biological monitor should halt all activities within 100 feet of the individual(s). Work should not resume until the Hawaiian waterbird(s) leave the area on their own accord.
- A post-construction report should be submitted to the Service with 30 days of the completion of the project. The report should include the results of Hawaiian waterbird surveys, the location and outcome of documented nests, and any other relevant information.

Sea Turtles
Artificial lighting can disorient adult sea turtles and hatchlings by affecting their ability to find the ocean. To minimize potential impacts to sea turtles that may utilize beaches in the project vicinity, no light from the proposed project should be visible from the beach. We recommend installation of shielded lighting at construction sites near beaches and around shoreline developments. Shielded lights reduce the direct and ambient lighting of beach habitats within and adjacent to the project site. Effective light shields should be completely opaque, sufficiently large, and positioned so that light from the shielded source does not reach the beach. Projects should also be designed to minimize adverse impacts to basking or nesting sea turtles from off-leash pets, mammalian predators, and human disturbance.

Panicum niihauesnse
Portions of the beach dune area in the vicinity of the proposed project are designated critical habitat for an endangered grass, *Panicum niihauense*. The species is impacted by off-road vehicles that modify habitat and most likely destroy individual plants and invasive introduced plant species that modify dune habitat of and compete with *Panicum niihauense*. These invasive plant species include *Chloris barbata* (swollen fingergrass), *Leucaena leucocephala* (haole koa), *Prosopis pallida* (kiawe), *Atriplex semicoccata* (Australian saltbush), and *Verbesina enceliodes* (golden crown-beard). The endangered grass occurs on the State of Hawaii Polihale State Park. There have been no observations of this endangered plant species in the critical habitat within the project area. The Service recommends that your draft EA address any project components that have the potential to impact the critical habitat and minimize potential disturbance.

Implementation of these measures will minimize impacts but does not ensure that take of listed species associated with this proposed action will be fully avoided. Under the ESA, take is defined to mean "...to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct." Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering.

If it is determined that the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with the ESA compliance. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the appropriate State of Hawaii department should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats, and defines measures to minimize and mitigate those adverse effects.

We appreciate your efforts to conserve endangered species. Please contact Adam Griesemer, Endangered Species Biologist (phone: 808-285-8261, email: adam_griesemer@fws.gov) should you have any questions pertaining to this response.

Sincerely,

Aaron Nadig
Assistant Field Supervisor:
Oahu, Kauai, NWHI, Am.Samoa

Cc: Adrian Chang, DLNR

THE LIMTIACO CONSULTING GROUP

June 2, 2015

Aaron Nadig, Assistant Field Supervisor
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850
Attn: Adam Griesemer

Subject: Pre-Consultation for Environmental Assessment
Response to Comments for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Nadig,

Thank you for your comment letter dated December 22, 2014 regarding consultation for the State of Hawaii, Department of Land and Natural Resources (DLNR) *Mana Drag Race Strip Electrical and Lighting Upgrades* project. We have the following response to U.S. Fish and Wildlife Service (USFWS) comments:

> Thank you for your comments regarding the possible presence of threatened and endangered species and/or their critical habitat within the project site including the following: Hawaiian black-necked stilt, Hawaiian moorhen, Hawaiian coot, Hawaiian duck, Hawaiian goose, Hawaiian hoary bat, Hawaiian petrel, Newell's shearwater, band-rumped storm petrel, green sea turtle, Hawaiian monk seal, and Panicum niihauense.
>
> The Draft Environmental Assessment (EA) will address that fledgling Hawaiian petrel, Newell's shearwater, and band-rumped storm petrel have been known to become disoriented during their first flights due to artificial lighting. Once disoriented, the birds can easily become grounded and vulnerable to predation. To mitigate this potential impact, the Project proposes the use of downcast lighting. Downcast lighting directs light toward the ground, and does not allow large amounts of light to project to areas outside the project site. Additionally, the Garden Isle Racing Association (GIRA) has previously coordinated and will continue to coordinate their monthly race events with the USFWS to ensure minimal impacts to fledgling seabirds, particularly during the fall months.
>
> The Draft EA will acknowledge that artificial lighting also has the potential to disorient adult and hatchling green sea turtles, which could potentially affect their ability to find their way to the ocean. To mitigate this impact, the downcast lighting will be placed on the makai side of the drag race strip and will be directed mauka (away from the beach). Additionally, no lighting will be constructed within the shoreline setback area. These measures will limit the visibility of artificial light from the beach, and will mitigate any potential adverse impacts on green sea turtles. Existing sand dunes and vegetation

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located between the project site and the shoreline will further mitigate the potential impacts of artificial lighting on the shoreline area.

Overhead electrical lines will be constructed at a height lower than the top nearby of ironwood trees. Because the treeline is readily visible, it will cause seabirds to fly above the overhead electrical lines and will mitigate bird strikes.

The Draft EA will acknowledge that temporary construction activities have the potential to disturb endangered species habitat. In particular, vegetation clearing and earth-disturbing activities during construction have the potential to adversely impact nesting areas. To mitigate this potential impact, a biological monitor will survey the project site prior to construction to ensure no endangered or threatened species are present in areas to be disturbed. The USFWS will be notified prior to construction and will be provided with the results of this survey. Any nests or broods will be reported to the USFWS and will be protected with establishment of a 100-foot buffer area around the nest. Prior to the initiation of any earth-moving activities, a biological monitor or contractor trained in identification of threatened and endangered species will survey the areas to be affected and ensure that nests or broods will not be adversely affected. Work will be halted within 100 feet of any threatened or endangered species that enters the project site, and will not be resumed until they leave the area on their own accord. A post-construction report, including the results of surveys, locations of documented nests, and other relevant information will be submitted to the USFWS within 30 days of the completion of construction.

Thank you for your interest and participation in the environmental review process. You will be notified when the Draft EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal

cc: Adrian Chang, DLNR

DAVID Y. IGE
GOVERNOR OF HAWAII

KEITH YAMAMOTO
ACTING DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
File:

14-936A CAB

December 16, 2014

Mr. Kyle H. Kaneshiro, P.E., LEED AP
Principal
The Limtiaco Consulting Group, Inc.
1622 Kanakanui Street
Honolulu, Hawaii 96817

Dear Mr. Kaneshiro:

SUBJECT: **Pre-Consultation for Environmental Assessment**
Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys: (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

The project should address any potential dust concerns from construction. The activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust.

We encourage the contractor to implement a dust control plan, which does not require approval by the Department of Health, to comply with the fugitive dust regulations. The dust control measures include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing dust from shoulders and access roads;
e) Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling dust from debris being hauled away from the project site. Also, controlling dust from daily operations of material being processed, stockpiled, and hauled to and from the facility.

If you have any questions, please contact Mr. Barry Ching of the Clean Air Branch at 586-4200.

Sincerely,

NOLAN S. HIRAI, P.E.
Manager, Clean Air Branch

BC:rg

THE LIMTIACO CONSULTING GROUP

June 2, 2015

Nolan Hirai, P.E., Manager
Department of Health
Clean Air Branch
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Pre-Consultation for Environmental Assessment
Response to Comments for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Hirai,

Thank you for your comment letter dated December 16, 2014 regarding consultation for the State of Hawaii, Department of Land and Natural Resources (DLNR) *Mana Drag Race Strip Electrical and Lighting Upgrades* project. We have the following response to Clean Air Branch (CAB) comments:

> We acknowledge that the project may result in temporary impacts to air quality due to ground disturbing activities during construction. The contractor will be responsible for implementing an appropriate dust control plan and will be responsible for complying with all relevant State regulations regarding air quality.

Thank you for your interest and participation in the environmental review process. You will be notified when the Draft Environmental Assessment is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR

1632 KANAKANUI STREET HONOLULU, HAWAII 96817
(808) 596-7790 tlcghawaii.com

DAVID Y. IGE
GOVERNOR OF HAWAII

KEITH YAMAMOTO
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

12049PJF.14

December 24, 2014

Mr. Kyle H. Kaneshiro, P.E., LEED AP
Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, Hawaii 96817

Dear Mr. Kaneshiro:

SUBJECT: Pre-Consultation for Environmental Assessment
Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Kekaha, Island of Kauai, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated November 21, 2014, requesting comments on the subject document. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. Your applicant may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/10/CWB_Oct22.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. National Pollutant Discharge Elimination System (NPDES) permit coverage is required for pollutant discharges into State surface waters and for certain situations involving storm water (HAR, Chapter 11-55).

a. Discharges into Class 2 or Class A State waters can be covered under an NPDES general permit only if all of the NPDES general permit requirements are met. Please see the DOH-CWB website (http://health.hawaii.gov/cwb/) for the NPDES general permits and instructions to request coverage.

b. All other discharges into State surface waters and discharges into Class 1 or Class AA State waters require an NPDES individual permit. To request NPDES individual permit coverage, please see the DOH-CWB forms website located at: http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/forms/.

c. NPDES permit coverage for storm water associated with construction activities is required if your project will result in the disturbance of one (1) acre or more of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. NPDES permit coverage is required before the start of the construction activities.

   Land disturbance includes, but is not limited to clearing, grading, grubbing, uprooting of vegetation, demolition (even if leaving foundation slab), staging, stockpiling, excavation into pavement areas which go down to the base course, and storage areas (including areas on the roadway to park equipment if these areas are blocked off from public usage, grassed areas, or bare ground).

3. If the project involves work in, over, or under waters of the United States, it is highly recommend that your applicant contact the Army Corp of Engineers, Regulatory Branch (Tel: 438-9258) regarding their permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (Emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Darryl Lum for AW

ALEC WONG, P.E., CHIEF
Clean Water Branch

JF:bk

THE LIMTIACO CONSULTING GROUP

June 2, 2015

Alec Wong, P.E., Chief
Department of Health
Clean Water Branch
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Pre-Consultation for Environmental Assessment
Response to Comments for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Wong,

Thank you for your comment letter dated December 24, 2014 regarding consultation for the State of Hawaii, Department of Land and Natural Resources (DLNR) *Mana Drag Race Strip Electrical and Lighting Upgrades* project. We have the following response to Clean Water Branch (CWB) comments:

1. We acknowledge that any project and its potential impacts must meet the anti-degradation policy, designated uses, and water quality criteria outlined in the State of Hawaii (State) Water Quality Standards (Chapter 11-54, Hawaii Administrative Rules). The receiving water for the project is the Pacific Ocean, which is designated a Class A marine water in the vicinity of the project site.

   The project may result in minor and temporary water quality impacts of the type and scale typical of minor construction projects which include limited amounts of ground disturbance. Appropriate construction best management practices (BMPs) will be employed to minimize water pollution and soil erosion into State waters.

   The project will conform with the general policy of water quality anti-degradation (§11-54-1.1, Hawaii Administrative Rules) and will not endanger the designated uses of nearby waterbodies (§11-54-3, Hawaii Administrative Rules). Implementation of construction BMPs will mitigate possible impacts to the water quality criteria (§11-54-4, Hawaii Administrative Rules).

2. We acknowledge that a National Pollutant Discharge Elimination System (NPDES) permit must be obtained for pollutant discharges into surface waters of the State, including for certain situations involving storm water. The project involves over 1 acre of land, and will obtain an NPDES permit for storm water runoff related to construction activities.

3. The proposed project does not involve work in, over, or under Waters of the United States. If it is later found that such work is required, we understand that additional

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(808) 596 7790 thghawaii.com

permit requirements may be triggered pursuant to Section 401 and 404 of the Clean Water Act and Section, Rivers and Harbors Act. If such work is required, we will consult with the United States Army Corps of Engineers.

4. We acknowledge that all discharges related to the project must comply with the State water quality standards, regardless of whether or not a CWB permit is required. We understand that noncompliance may be subject to penalties of $25,000 per day per violation.

Thank you for your interest and participation in the environmental review process. You will be notified when the Draft Environmental Assessment is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal

cc: Adrian Chang, DLNR

DAVID Y. IGE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

JESSE K. SOUKI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 30, 2014

Kyle Kaneshiro, Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

Dear Mr. Kaneshiro,

SUBJECT: Pre-Consultation for Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (1) Land Division – Kauai District; (2) Division of Boating & Ocean Recreation; (3) Division of Aquatic Resources; (4) Office of Conservation & Coastal Lands; and (5) Engineering Division. No other comments were received as of our suspense date. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 26, 2014

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__ Div. of State Parks
__ Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

RECEIVED
LAND DIVISION
2014 DEC -4 PM 1:01
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Consultation for Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Keys (4) 1-2-002: 036 & 040, Kekaha, Kauai, Hawaii
APPLICANT: State Department of Land and Natural Resources, Engineering Division by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by December 29, 2014. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

(X) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: _____
Print Name: MARVIN MIKASA
Date: 12/2/14

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

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HONOLULU, HAWAII 96809

November 26, 2014

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LAND DIVISION
2014 DEC -5 AM 9:53
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__ Div. of State Parks
__ Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Consultation for Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Keys (4) 1-2-002: 036 & 040, Kekaha, Kauai, Hawaii
APPLICANT: State Department of Land and Natural Resources, Engineering Division by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by December 29, 2014. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed: Edward R. Underwood
Print Name: Edward R. Underwood
Date: 12/1/14

NOV20 1:49PM 2-0300R DIV

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

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HONOLULU, HAWAII 96809

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AQUATIC RESOURCES

DAR #5036

November 26, 2014

MEMORANDUM

RECEIVED
2014 DEC 15 AM 10:00
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII
LAND DIVISION
JKM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__ Div. of State Parks
__ Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Consultation for Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Keys (4) 1-2-002: 036 & 040, Kekaha, Kauai, Hawaii
APPLICANT: State Department of Land and Natural Resources, Engineering Division by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by December 29, 2014. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: _____
Print Name: Jesse Souki
Date: 12/4/04

DAVID Y. IGE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

JESSE K. SOUKI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

Date: 12/2/2014
DAR # 5036

MEMORANDUM

TO: William Aila Jr., Chairperson

DATE: _____

FROM: Michael Fujimoto, Aquatic Biologist

SUBJECT: Pre-Consultation for EA, Proposed Mana Drag Strip Electrical and Lighting Upgrades

Comment	Date Request	Receipt	Referral	Due Date
	11/26/2014	11/26/2014	12/1/2014	12/29/2014

Requested by: Kyle Kaneshiro, The Limtiaco Consulting Group

Summary of Proposed Project

Title: Pre-Consultation for Environmental Assessment Proposed Mana Drag Race Strip Electrical and Lighting Upgrades

Project by: The Limtiaco Consulting Group, on behalf of DLNR Engineering Division

Location: Kekaha, Kauai, HI

Brief Description: The Department of Land and Natural Resources is planning to construct electrical and lighting upgrades at the Mana Drag Race Strip in Kekaha, Kauai. The proposed work will include the installation of approximately 26 utility poles and overhead power lines along the west side of the access road and along the north side (mauka) of the drag strip. In addition a total of 18 light poles for overhead lighting will be installed.

Comments: All of the proposed work will be conducted on fast land. After reviewing the information provided by the applicant for the proposed construction and upgrade activities for the Mana Drag Strip, DAR does not foresee any adverse effects on aquatic resources in the area.

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plans, DAR requests the opportunity to review and comment on those changes.

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KA-15-94

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AND COASTAL LANDS
2014 NOV 28 A 9:39

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NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 26, 2014

MEMORANDUM

FROM
~~TO:~~

DLNR Agencies:
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__ Div. of State Parks
__ Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

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LAND DIVISION
2014 DEC 17 PM 1:39
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

TO: ~~FROM:~~ Russell Y. Tsuji, Land Administrator

SUBJECT: Pre-Consultation for Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project

LOCATION: Tax Map Keys (4) 1-2-002: 036 & 040, Kekaha, Kauai, Hawaii

APPLICANT: State Department of Land and Natural Resources, Engineering Division by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by December 29, 2014. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed:
Print Name: ALEX J. ROY
Date: 12/17/2014

DAVID Y. IGE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

JESSE K. SOUKI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

REF: OCCL: AJR

COR: KA-15-94

Kyle Kaneshiro
c/o The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

DEC 17 2014

SUBJECT: **PRE-CONSULTATION FOR ENVIRONMENTAL ASSESSMENT; PROPOSED MANA DRAG RACE STRIP ELECTRICAL AND LIGHTING PROJECT**
KEKAHA, WAIMEA DISTRICT, ISLAND OF KAUA'I
TMKs: (4) 1-2-002:036 & 040

Dear Mr. Kaneshiro,

This letter is in reference to a pre-consultation request by the State of Hawaii Department of Land and Natural Resources Engineering Division for the proposed construction of electrical and lighting upgrades at the existing Mana Drag Race Strip. For reference, the majority of the proposed project will be located within the State Land Use Conservation District *Limited* Subzone with a small portion contained within an existing access road right of way (i.e., located in the Agricultural District.

This State funded project proposes to bring power and lighting to the Garden Isle Racing Association (GIRA) Mana Drag Race Strip (MDRS) which is located on State owned lands. In order to complete this proposed use the Kauai Island Utility Commission (KIUC) will bring power lines and poles to the track from Kūhiō Highway, along the existing access road to a new constructed pad-mounted transformer. New, stadium-type lighting will be installed along the south side of the existing track and will include the installation of approximately 26 new utility poles, and 18 new light poles with associated underground utility conduits. Additional work includes the construction of approximately 2,250 linear feet of subsurface electrical conduit, and trenching to accommodate the new conduit line.

After reviewing the submitted material and information the OCCL has determined that:

1. The installation of new electrical and lighting appurtenances, trenching and construction at the existing *Mana Drag Race Strip* is an identified land use in the Conservation District Limited Subzone pursuant to Hawaii Administrative Rules (HAR) §13-5-22, P-8 **STRUCTURES AND LAND USES, EXISTING,** (C-1) *Moderate alteration of existing*

structures, facilities, uses, and equipment. In order to apply for this use the applicant will be required to submit a complete Conservation District Use Application (CDUA) and all associated information to apply for a *Departmental Permit*;

2. Pursuant to HAR §13-5-40, *Hearings*, this project *will not* require a public hearing;

3. In conformance with §343, Hawaii Revised Statutes (HRS), as amended, and HAR, §11-200-8, this proposed project will require the filing of an Environmental Assessment (EA); and

4. The project is located within the County of Kaua'i Special Management Area (SMA) therefore an SMA approval or determination from the County of Kaua'i Planning Department will be required as part of the application process.

Should you have any questions regarding this letter or the CDUA process, please contact Alex J. Roy, M.Sc. of the Office of Conservation and Coastal Lands staff at 808-587-0316 or via email at alex.j.roy@hawaii.gov

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

CC: *Kaua'i Board Member*
KDLO
DOFAW
Engineering

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 26, 2014

MEMORANDUM

TO: FP

DLNR Agencies:
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__ Div. of State Parks
__ Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

RECEIVED
LAND DIVISION
2014 DEC 23 PM 3:5
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Consultation for Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Keys (4) 1-2-002: 036 & 040, Kekaha, Kauai, Hawaii
APPLICANT: State Department of Land and Natural Resources, Engineering Division by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by December 29, 2014. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: Carty S. Chang, Chief Engineer
Print Name: Carty S. Chang, Chief Engineer
Date: 12/23/14

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/ Russell Y. Tsuji
REF: Pre-Consultation for EA for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Kekaha
Kauai.007

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zones VE, AE, and X. The National Flood Insurance Program regulates developments within Zones VE and AE as indicated in bold letters below, but not Zone X.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

(X) Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.

( ) Mr. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Planning.

(X) Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

( ) Other: _____

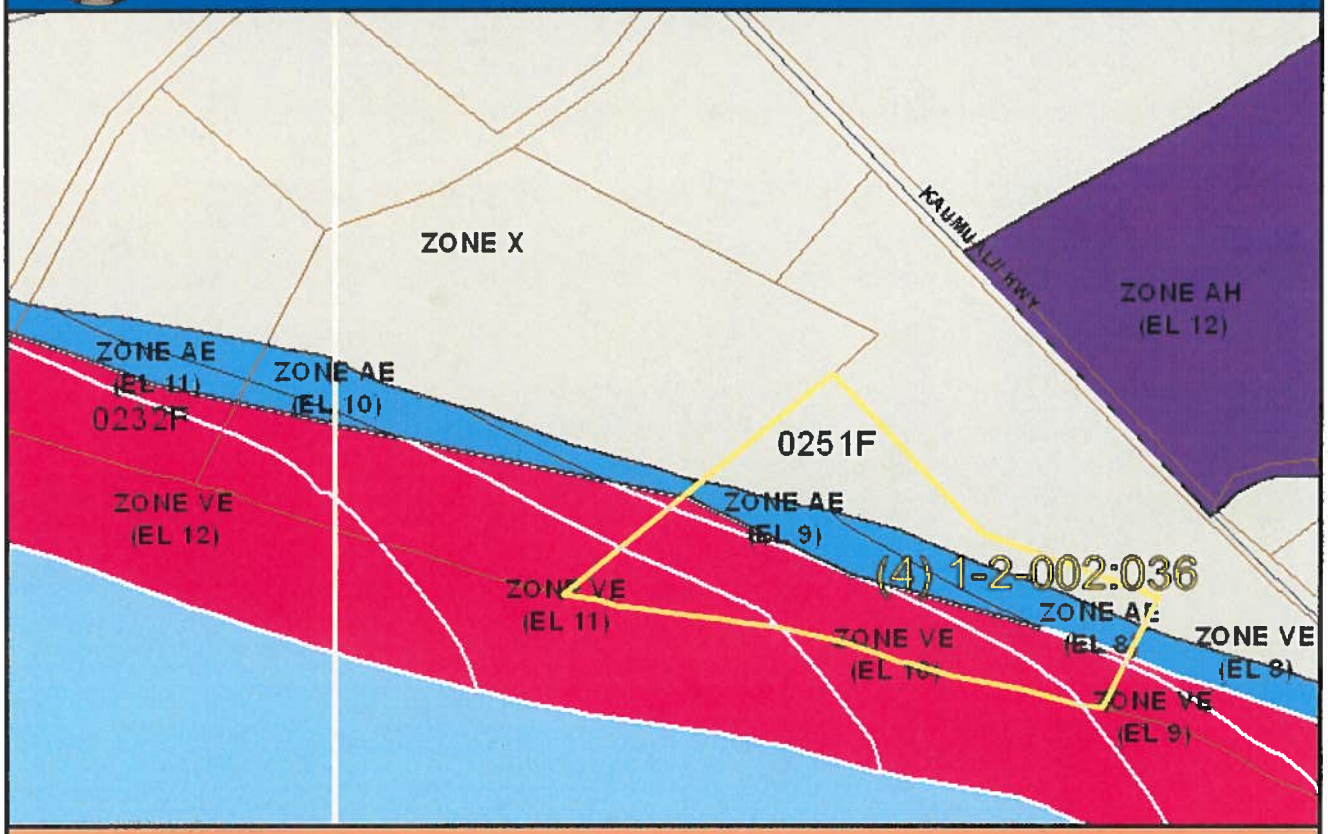
Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: Chris S. Takahuge
for CARTY S. CHANG, CHIEF ENGINEER

Date: 12/23/14

State of Hawaii

FLOOD HAZARD ASSESSMENT REPORT



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD ZONE DEFINITIONS

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water-surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- **Zone A:** No BFE determined.
- **Zone AE:** BFE determined.
- **Zone AH:** Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- **Zone AO:** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- **Zone V:** Coastal flood zone with velocity hazard (wave action); no BFE determined.
- **Zone VE:** Coastal flood zone with velocity hazard (wave action); BFE determined.
- **Zone AEF:** Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA – An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- **Zone XS (X shaded):** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- **Zone X:** Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- **Zone D:** Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

PROPERTY INFORMATION

COUNTY:	KAUAI
TMK NO:	(4) 1-2-002-036
PARCEL ADDRESS:	
FIRM INDEX DATE:	NOVEMBER 26, 2010
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL(S):	1500020251F
PANEL EFFECTIVE DATE:	NOVEMBER 26, 2010

PARCEL DATA FROM:	JANUARY 2012
IMAGERY DATA FROM:	MAY 2005

IMPORTANT PHONE NUMBERS

County NFIP Coordinator	
County of Kauai	
Stanford Iwamoto, P.E.	(808) 241-4896
State NFIP Coordinator	
Carol Tyau-Beam, P.E., CFM	(808) 587-0267

Disclaimer: The Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use of the information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR from any liability, which may arise from its use.

If this map has been identified as 'PRELIMINARY' or 'UNOFFICIAL', please note that it is being provided for informational purposes and is not to be used for official/legal decisions, regulatory compliance, or flood insurance rating. Contact your county NFIP coordinator for flood zone determinations to be used for compliance with local floodplain management regulations.

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
INTERIM DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 9, 2015

Kyle Kaneshiro, Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

via email: kyle@tlcghawaii.com

Dear Mr. Kaneshiro,

SUBJECT: Pre-Consultation for Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments sent to you dated December 30, 2014, enclosed are additional comments from the Division of Division of Forestry & Wildlife on the subject matter. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 26, 2014

MEMORANDUM

RECEIVED
LAND DIVISION
2014 DEC 26 AM 10:05
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Consultation for Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Keys (4) 1-2-002: 036 & 040, Kekaha, Kauai, Hawaii
APPLICANT: State Department of Land and Natural Resources, Engineering Division by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by December 29, 2014. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: _____
Print Name: LISA HADWAY
Date: 12/23/14

DAVID Y. IGE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

JESSE K. SOUKI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 17, 2014

TO: Russell Y. Tsuji, Administrator
Land Division

FROM: Lisa J. Hadway, Administrator
Division of Forestry and Wildlife

SUBJECT: Comments on Pre-Consultation for Environmental Assessment, Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project

The Division of Forestry and Wildlife (DOFAW) has received your November 26, 2014 memo and appreciates the opportunity to comment on the Pre-Consultation for an Environmental Assessment on the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project on the island of Kaua'i. It is our understanding that the proposed action includes installation of approximately 26 utility poles and overhead power lines and 18 light poles with overhead stadium-type lights with downcast fixtures.

DOFAW is concerned that the project components and activities have the potential to adversely impact three threatened and endangered seabirds on Kaua'i including the Hawaiian petrel (*Pterodroma sandwichensis,* federal and state-listed endangered), Newell's shearwater (*Puffinus newelli,* federal and state-listed threatened), and Band-rumped storm petrel (*Oceanodroma castro,* state-listed endangered).

Collision of seabirds with utility lines has been documented in Kaua'i since the 1970s. Furthermore, DOFAW has been working on new techniques in monitoring seabird collision with utility lines on the island of Kaua'i, which has provided additional evidence that utility line collision is a considerable threat to our threatened and endangered seabirds.

Additionally, artificial lighting can adversely impact seabirds by causing disorientation which may result in collision with manmade artifacts such as power lines, buildings, fences and vehicles. Fledgling seabirds are especially affected by artificial lighting during the fledging period (September – December). Young seabirds attracted to artificial lighting may become grounded due to exhaustion from circling these light sources. Unable to take-off these birds become vulnerable to predation from predators such as mongoose, cats, pigs, and dogs. DOFAW acknowledges that proposed stadium lighting will be downcast and recommends a meeting with DOFAW to ensure that effective avoidance measures are in place to prevent these adverse impacts to native seabirds.

DOFAW, in coordination with the US Fish and Wildlife Service, has been developing a Habitat Conservation Program, to address island-wide incidental take of listed seabirds from impacts associated with light attraction and collision with utility lines. The development of this program and eventual approval will allow for projects that are unable to avoid impacts to listed seabirds due to light attraction and utility line collision to move forward under the provisions of our state endangered species statute, HRS Chapter 195D. DOFAW recommends a meeting be arranged to determine if and how this project may fit into the Habitat Conservation Program in development.

DOFAW appreciates the opportunity to provide comments on this project and request that Land Division continue to seek input from DOFAW on impacts to wildlife.

If you have any questions, please contact Ms. Afsheen Siddiqi, Conservation Initiatives Coordinator, at 808-587-0010.

THE LIMTIACO CONSULTING GROUP

June 2, 2015

Russel Y. Tsuji, Administrator
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawaii 96809
Attn: Steve Molmen

Subject: Pre-Consultation for Environmental Assessment
Response to Comments for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Tsuji,

Thank you for your comment letters dated December 30, 2014 and January 9, 2015, which contained comments from the (1) Land Division – Kauai District, (2) Division of Boating and Recreation, (3) Division of Aquatic Resources, (4) Office of Conservation and Coastal Lands, (5) Engineering Division and (6) Division of Forestry and Wildlife. We have the following responses to comments.

Land Division – Kauai District
We acknowledge that the Land Division – Kauai District does not have any objections to the proposed project.

Division of Boating and Ocean Recreation
We acknowledge that the Division of Boating and Ocean Recreation does not have any comments on the proposed project.

Division of Aquatic Resources
We acknowledge that the Division of Aquatic Resources does not foresee any adverse effects on aquatic resources due to the proposed project.

Office of Conservation and Coastal Lands
We acknowledge that much of the project area is located within the Limited Subzone of the Conservation State Land Use District. Thank you for your determination that based on the information we have provided, the Office of Conservation and Coastal Lands considers the project to fall under "Moderate alteration of existing structures, facilities, uses, and equipment". We understand that the proposed project will require a Departmental Permit pursuant to Chapter 13-5, Hawaii Administrative Rules. Thank you for your determination that this project will not require public hearing.

We understand the project requires preparation of an Environmental Assessment pursuant to Chapter 343, Hawaii Revised Statutes. We are currently in the process of preparing the

1622 KANAKANUI STREET HONOLULU, HAWAII 96817
(808) 596-7790 tlcghawaii.com

Draft Environmental Assessment, and will notify you when it has been published for public review.

We understand that the project is located in the Special Management Area (SMA), and intend to pursue a SMA Major from Kauai County.

Engineering Division
We acknowledge that the project site is located within Flood Zones AE and VE. The proposed improvements will be designed in accordance with all Federal, State and local regulations regarding development within flood hazard districts.

Division of Forestry and Wildlife
Thank you for your comments regarding project components and activities that have the potential to adversely impact the Hawaiian petrel (*Pterodroma sandwichensis*), Newell's shearwater (*Puffinus newelli*), and Band-rumped storm petrel (*Oceanodroma castro*). We understand that the collision of seabirds with utility lines has been documented since the 1970s, and that artificial lighting can cause the disorientation and grounding of fledgling seabirds.

Overhead electrical lines will only be installed where there is an existing tree line. The overhead lines will be installed at a height lower than the existing tree line to minimize potential for seabird collision.

Thank you for your comment that artificial lighting can adversely impact seabirds. Our Draft Environmental Assessment will include your recommendation that stadium lighting shall be downcast to minimize any potential impacts to seabirds.

We will review any available information regarding the draft Habitat Conservation Program addressing the island-wide incidental take of listed seabirds from impacts associated with light attraction and collision with utility lines. Any relevant information will be included in the Draft Environmental Assessment.

In the past, the Garden Isle Racing Association has scheduled their events in collaboration with the U.S. Fish and Wildlife Service to mitigate the effects of artificial lighting on seabirds and their fledgling. This coordination will continue in the future.

Based on discussions with Division of Forestry and Wildlife staff, the Draft Environmental Assessment will recommend that stadium lighting be faced away from the shoreline. Facing the lighting away from the shoreline will prevent unnecessary light contamination on the shoreline, which has the potential to disorient sea turtles and their hatchlings.

To mitigate potential construction impacts, a biological monitor will survey the project site prior to construction to ensure no endangered or threatened species are present in areas to be disturbed. The U.S. Fish and Wildlife Service (USFWS) will be notified prior to construction and will be provided with the results of this survey. Any nests or broods will be reported to the USFWS and will be protected with establishment of a 100-foot buffer area around the nest. Prior to the initiation of any earth-moving activities, a biological monitor or contractor trained in identification of threatened and endangered species will survey the

areas to be affected and ensure that nests or broods will not be adversely affected. Work will be halted within 100 feet of any threatened or endangered species that enters the project site, and will not be resumed until they leave the area on their own accord. A post-construction report, including the results of surveys, locations of documented nests, and other relevant information will be submitted to the USFWS within 30 days of the completion of construction.

Thank you for your interest and participation in the environmental review process. You will be notified when the Draft Environmental Assessment is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal

cc: Adrian Chang, DLNR, Engineering Division
Marvin Mikasa, DLNR Land Division – Kauai District
Edward Underwood, DLNR Division of Boating and Ocean Recreation
Michael Fujimoto, DLNR Division of Aquatic Resources
Samuel J. Lemmo, DLNR Office of Conservation and Coastal Lands
Lisa Hadway, DLNR Division of Forestry and Wildlife

David Ige
GOVERNOR OF HAWAII

WILLIAM J. AILA
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

JESSE K. SOUKI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

601 Kamokila Boulevard, Suite 555
Kapolei, HI 96806

December 26, 2014

Kyle Kaneshiro, P.E., Principal
The Limtiaco Consulting Group
622 Kanakanui Street
Honolulu, Hawaii 96817

RCVD

LOG NO: 2014.05580
DOC NO: 1412MN29
Archaeology

Dear Mr. Kaneshiro:

SUBJECT: **Chapter 6E-8 Historic Preservation Review -**
Mānā Drag Racing Strip Electrical and Lighting Upgrades Project
Waimea Ahupua'a Kona District, Island of Kaua'i
TMK: (4) 1-2-002: 001, 009, 035, 036, 040

Mahalo for your letter initiating pre-consultation for the environmental assessment for the proposed Mana Drag Racing Strip electrical and lighting upgrades. We received your letter and attached map and photograph on November 25, 2014. An Environmental Assessment (EA) is being prepared for this project pursuant to Chapter 343 of the Hawaii Revised Statutes, and Limtiaco Consulting Group is soliciting comments for inclusion within the forthcoming EA.

Mahalo for considering potential impacts of the project on cultural and historic resources, in accordance with the Hawaii Administrative Rules (HAR) §13-275. We have approved the archaeological inventory survey (AIS) work plan provided by Pacific Consulting Services, Inc. (*Work Plan for Archaeological Survey and Testing in Support of Lighting and Electrical Improvements at the Mānā Drag Racing Strip in Kekaha, Waimea Ahupua'a, Kona District, Island of Kaua'i, Hawai'i. TMK: (4) 1-2-002:001, 009, 035, 036, 040* T. Watanabe, J. Walden, S. Clark, M. Mintmier, and S. Collins; *Log No. 2014.05153, Doc No. 1412MN15*). We received the work plan on November 28, 2014.

At the request of The Limtiaco Consulting Group, Inc., Pacific Consulting Services, Inc (PCSI) will conduct an archaeological inventory survey in support of improvements to the Mānā drag racing strip, located along the coast in Kekaha. The project is state-funded and the land is owned by the Department of Land and Natural Resources (DLNR). The project proposes installation of electricity and lighting to the drag racing strip. The work includes routing electricity via an access road from Kuhio Highway to the strip, installation of a new pad-mounted transformer (XFMR), installation of approximately 26 utility poles (for overheard power lines) to bring electricity to the strip, 18 light poles along the south side of the strip, including underground electrical conduit trenches, and approximately 125 linear feet of concrete duct bank, as well as trenches for the installation of the electrical pull boxes/handholes and the pad mounded XFMR. The project area is primarily underlain with Jaucas loamy fine sand (JfB), Beach coarse sand (BS) and Fill Land silty clay (Fd) (USDA 2012). Previous archaeological work within the project area has yielded sparse or negative findings. However, archaeological work conducted north of the project area, within the Pacific Missile Range Facility (PMRF) Barking Sands, has identified numerous sites, including pre-Contact Hawaiian sites, traditional cultural properties (TCPs), and historic and World War II (WWII) sites.

In addition to 100% pedestrian survey, Pacific Consulting Services, Inc. (PCSI) will conduct subsurface testing via the excavation of 80 backhoe trenches, placed throughout the project area. Prior to excavation, PCSI will tone for utility lines to avoid impacting existing subsurface utility lines. The trenches will be approximately 2 meters^2, and 1.3-1.5 meters deep, and will follow the design plans for installation of the utility lines and light poles. The Archaeological Inventory Survey will follow the guidelines pursuant to HAR§13-276 for documentation, laboratory and archival work.

The Archaeological Inventory Survey (AIS) will determine if historic properties are present in the project area and may be affected by the project. Once the AIS is complete, we look forward working with the Limtiaco Consulting Group and DLNR to determine the best strategy for mitigating potential effects to historic properties. Mahalo for early consultation on this project. Please contact the Kaua'i archaeologist Mary Jane Naone at (808) 271-4940 or Maryjane.naone@hawaii.gov if you have questions regarding this letter.

Aloha,

Theresa K. Donham
Archaeology Branch Chief

THE LIMTIACO CONSULTING GROUP

June 2, 2015

Theresa K. Donham, Archaeology Branch Chief
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Boulevard, Suite 555
Kapolei, Hawaii 96806
Attn: Mary Jane Naone

Subject: Pre-Consultation for Environmental Assessment
Response to Comments for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Ms. Donham,

Thank you for your comment letter dated December 26, 2014 regarding consultation for the State of Hawaii, Department of Land and Natural Resources (DLNR) *Mana Drag Race Strip Electrical and Lighting Upgrades* project. We have the following response to State Historic Preservation Division (SHPD) comments:

> Surface and sub-surface survey work at the project site has been completed by Pacific Consulting Services, Inc. (PCSI), and an "End of Field Report" has been submitted to the SHPD by PCSI. The survey found no archaeological materials during and learned of no cultural resources at the project site. An archaeological inventory survey (AIS) is being prepared by PCSI. Once completed, the AIS will be submitted to the SHPD for review and approval. Due to the lack of resources discovered at the project site, we anticipate no significant adverse impacts on archaeological, historic, or cultural resources as a result of the proposed project. We will continue to coordinate with your office to determine whether archaeological monitoring should be performed during construction.

Thank you for your interest and participation in the environmental review process. You will be notified when the Draft Environmental Assessment is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR, Engineering Division

1622 KANAKANUI STREET HONOLULU, HAWAII 96817
(808) 596-7790 tlcghawaii.com

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAI'I 96817

HRD14/7320

December 30, 2014

Kyle Kaneshiro, P.E. LEED AP, Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

Re: Pre-Consultation on Environmental Assessment
Mānā Drag Race Strip Electrical and Lighting Upgrades Project
Waimea Ahupua'a, Kona Moku, Kaua'i
Tax Map Key: (4) 1-2-002:036, 040

Aloha e Kyle Kaneshiro:

The Office of Hawaiian Affairs (OHA) is in receipt of your November 21, 2014 letter, pre-consultation on a draft environmental assessment (DEA), seeking comments for the proposed Mānā Drag Race Strip Electrical and Lighting Upgrades Project ("the project"). According to your letter, the project proposes to bring power and lighting to the Mānā Drag Race Strip ("the strip"). Kaua'i Island Utility Commission will bring power to the track from Kuhio Highway and install a new pad-mounted transformer. New stadium-type lighting will be installed along the south side of the strip to illuminate the track.

According to your letter, the State-funded project proposes the installation of about 26 utility poles and overhead power lines on the mauka or north side of the strip, 15 to 200 feet apart. On the makai side of the strip, a total of 18 light poles, for overhead stadium-type lights, will be installed. Between the light poles, about 2,250 linear feet of subsurface electrical conduit trenches will be dug about two feet deep. To protect the negative effects to the Shearwater seabirds, the light fixtures will be properly downcast.

In addition to proposed work mentioned above, approximately 125 linear feet of concrete duct bank will cross the track on the west end of the strip. Trenches for the installation of electrical pull boxes and a pad-mounted transformer will also be set for the installation of the lighting system.

OHA has concerns about the impacts that subsurface disturbance for this project may have on traditional and customary native practices that may occur at this project site and neighboring areas. The project area is located on the makai side of Kaumuali'i Highway, down to the ocean, and the project parallels the sandy coast of Waimea. OHA notes that because burials in sand deposits that extended inland from the coast were a traditional Hawaiian burial practice, the possibility of encountering traditional Hawaiian burials and cultural deposits is great. In a recent project review on an adjacent parcel, Kaua'i State Historic Preservation previously reviewed and identified this general area as a place where human remains have been previously found.[1] OHA requests that the State Historic Preservation Division recommend archaeological monitoring of any new ground excavation.

The projects land area is designated as Section 5(b) Ceded Lands, which hold a considerable amount of sentimental, historical, and legal significance for Native Hawaiians and OHA. These lands were illegally taken from the Hawaiian Kingdom after the 1893 overthrow and later transferred ("ceded") by the United States government to the State of Hawai'i upon statehood. Today, the state holds the Ceded Lands corpus in trust for Native Hawaiians and the general public. We ask that the Ceded Lands status of the property be indicated in all documents for this project that are subject to public review.

OHA will rely on the project's plan to continue consultation with, and seek the input of, cultural practitioners, community members, and family descendants in this district and the ahupua'a of Waimea, who best know the area.

OHA does request assurances that should iwi kūpuna or Native Hawaiian cultural or traditional deposits be identified during ground altering activities related to this project, all work will immediately cease and the appropriate agencies, including OHA, will be contacted pursuant to applicable law.

Thank you for initiating consultation and providing an opportunity to comment. Should you have any questions, please contact Kathryn Keala at 594-0272 or kathyk@oha.org.

'O wau iho nō me ka 'oia 'i'o,

Kamana'opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer

KMC:kk

C: Kaliko Santos, Kaua'i Community Outreach Coordinator

[1] Board of Land and Natural Resources Meeting, Item D-7 (Exhibit B), May 14, 2004.

THE LIMTIACO CONSULTING GROUP

June 2, 2015

Kamana'opono M. Crabbe, Ph.D., Chief Executive Officer
Office of Hawaiian Affairs
560 North Nimitz Highway, Ste. 200
Honolulu, Hawaii 96817
Attn: Kathryn Keala

Subject: Pre-Consultation for Environmental Assessment
Response to Comments for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Crabbe,

Thank you for your comment letter dated December 30, 2014 regarding consultation for the State of Hawaii, Department of Land and Natural Resources (DLNR) *Mana Drag Race Strip Electrical and Lighting Upgrades* project. We have the following response to Office of Hawaiian Affairs (OHA) comments:

> Thank you for providing your concerns regarding potential impacts that subsurface activities may pose to cultural and archaeological resources at the project site. We acknowledge that sand deposits extending inland from the coast were sites for traditional Hawaiian burial practices, and that subsurface activities associated with the project could potentially encounter traditional Hawaiian burials and cultural deposits.
>
> Due to the possibility of encountering archaeological, cultural, and/or historic resources at the project site, an archaeological inventory survey (AIS) is being prepared for the project. Preparation of the AIS involves review of traditional and historic land use in the area, research of previous archaeological studies performed in the vicinity of the project site, a surface and subsurface investigation of the project site, and consultation with individuals that may have knowledge of cultural resources in the area. The survey found no archaeological materials during its surface or subsurface investigation at the project site and learned of no cultural resources during consultation. The AIS is in the process of being finalized, and it will be submitted to the State Historic Preservation Division (SHPD) for review and approval. Archaeological monitoring may be performed during construction of the project, dependent on comments received from SHPD upon completion of their review of the AIS. If archaeological monitoring is required, an archaeological monitoring plan will be submitted to the SHPD for approval prior to construction.
>
> The Environmental Assessment (EA) will acknowledge the project site's status as Section 5(b) ceded lands.

1622 KANAKANUI STREET HONOLULU, HAWAII 96817
(808) 596-7790 tlcghawaii.com

Thank you for your interest and participation in the environmental review process. You will be notified when the Draft EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle.k@limtiaco.com

cc: Adrian Chang, DLNR

Bernard P. Carvalho, Jr.
Mayor

Nadine K. Nakamura
Managing Director

Larry Dill, P.E.
County Engineer

Lyle Tabata
Deputy County Engineer

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

11/28/14

Kyle H. Kaneshiro, P.E., LEED AP
The Limitaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

Subject: Pre-Consultation for Environmental Assessment
Comments on Mānā Drag Race Strip Electrical and Lighting Upgrades

Dear Mr. Kaneshiro,

The Department of Public Works Solid Waste Division has received your letter dated November 21, 2014 which provides a summary of the State Department of Land and Natural Resources' (DLNR) proposed power and lighting upgrades to Mānā Drag Race Strip. Per your request, we have developed preliminary input on the project for your consideration.

The installation of utility poles will require some clearing and grubbing. Please be informed that the County of Kaua'i has restrictions on the disposal of green waste, outlined in Ordinance 902. We have attached a notice on the Ordinance enforcement policy which provides detail on acceptable facilities to divert green waste and other restricted materials.

Looking at the proposal, it appears there is a significant amount of electrical conduit that will be installed in the subsurface. Please note that recycled glass crushed to 3/8 inch minus is available locally and may be an appropriate aggregate for this installation. We recommend that DLNR investigate the possibility of using crushed recycled glass in your project.

If you have questions, please contact our Solid Waste Programs Coordinator, Allison Fraley at (808) 241-4837.

Sincerely,

TROY TANIGAWA, P.E.
Environmental Services
Management Engineer

Concur:

LARRY DILL, P.E.
County Engineer

An Equal Opportunity Employer

BERNARD P. CARVALHO, JR.
Mayor

GARY K. HEU
Managing Director

COUNTY OF KAUA'I

Enforcement policy on landfill disposal in effect

Loads exceeding 10% by volume for any of the following materials shall not be accepted at the landfill: corrugated cardboard, ferrous and non-ferrous metal, or green waste. Policy applies to loads from business, industrial, governmental, institutional, and nonresidential sources. 10% limit applies to each material type and is not cumulative.

A bill amending section 21-7.3 of the Kaua'i County Code relating to prohibited materials at the Kekaha Landfill was signed into law in August 2010. Restrictions on commercially generated cardboard, metals and green waste have been in place for a long time, and the policy is being actively enforced to preserve landfill space.

Businesses that have not yet developed recycling programs for their operations are encouraged to contact the County Recycling Office at 241-4837 or check the county website at: www.kauai.gov/recycling.

Below is information on diverting prohibited materials:

Cardboard is accepted for recycling free of charge at the Kaua'i Resource Center located on Ahukini Road in Līhu'e. The center is open Monday, Tuesday, Thursday, Friday, and Saturday from 7:30 am to 4:15 pm, and is closed for lunch from 11 to 11:45 am. Large loads of cardboard can be taken for a fee to the Garden Isle Disposal (GID) facility located on Ni'umalu Road. For information about GID's recycling operation, call 245-2372.

Metal Puhi Metals Recycling accepts ferrous and non-ferrous metals. Call Resource Recovery Solutions at 245-6919 for information. Reynold's Recycling on Wilcox Street in Līhu'e accepts non-ferrous metal. Call Reynold's at 245-7233 for redemption values.

Green waste can be brought to Kaua'i Nursery in Puhi. Tipping fees of $10 per cubic yard will apply. For further information, call 245-7747. Green waste is also accepted at Heart and Soul Organics in Moloa'a. Tipping fees of $10 per cubic yard will apply. Call 823-1007 for more information.

Additional information about Ordinance 902, which restricts commercially generated loads at the Kekaha Landfill, can be obtained by going to the county website, www.kauai.gov/landfillbans or by calling 241-4837.

THE LIMTIACO CONSULTING GROUP

June 2, 2015

Troy Tanigawa, P.E.
County of Kauai
Department of Public Works
4444 Rice Street, Ste. 275
Lihue, Hawaii 96766
Attn: Allison Fraley

Subject: Pre-Consultation for Environmental Assessment
Response to Comments for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Tanigawa,

Thank you for your comment letter dated November 28, 2014 regarding consultation for the State of Hawaii, Department of Land and Natural Resources (DLNR) *Mana Drag Race Strip Electrical and Lighting Upgrades* project. We have the following response to Department of Public Works comments:

> While the project will attempt to minimize the need for clearing and grubbing, we acknowledge that, in accordance with Ordinance 902 of the County of Kauai, loads exceeding 10% by volume of green waste will not be accepted at landfill. Thank you for informing us that green waste can be taken to the Kauai Nursery in Puhi for a tipping fee of $10 per cubic yard. The possibility of using recycled crushed glass as aggregate for installation of subsurface electrical conduit will be explored during design.

Thank you for your interest and participation in the environmental review process. You will be notified when the Draft Environmental Assessment is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR

Bernard P. Carvalho, Jr.
Mayor

Nadine K. Nakamura
Managing Director

Michael A. Dahilig
Director of Planning

Dee M. Crowell
Deputy Director of Planning

PLANNING DEPARTMENT
County of Kaua'i, State of Hawai'i
4444 Rice Street, Suite A-473, Līhu'e, Hawai'i 96766
TEL (808) 241-4050 FAX (808) 241-6699

DEC 23 2014

Mr. Kyle Kaneshiro
THE LIMTIACO CONSULTING GROUP
1622 Kanakanui Street
Honolulu, Hawai'i 96817

Subject: Pre-Consultation for Environmental Assessment
Proposed Mana Drag Strip Electrical and Lighting Upgrades Project
Tax Map Key: (4) 1-2-002:036 & 040
Kekaha, Kaua'i, Hawai'i

Dear Mr. Kaneshiro,

Concerning the above referenced project, the County of Kaua'i, Planning Department has the following comments:

1. Pursuant to Section 8-1.4(e) of the Kaua'i County Code (K.C.C) which states:

   "Nothing in this chapter shall regulate the placement, design and construction of utility poles, towers and transmission lines by a public utility company as defined in Section 269-1, H.R.S., provided, that the poles and towers shall be no higher than twenty (20) feet above the height limits for structures applicable in the Use District in which the poles and towers are constructed."

2. The applicant is informed that the subject property is located within the Special Management Area (SMA). Further developments on the subject parcels shall require plans to be submitted to the Planning Department for review and approval. The Applicant is made cognizant that any new "Development", as defined in Section 1.4 of the County of Kaua'i SMA Rules and Regulations may require an SMA Permit and if so, the Applicant is subject to all applicable requirements/conditions of the SMA Permit.

3. The Applicant shall consult with the Planning Department to determine whether the proposal is subject to the requirements of Ordinance No. 979, Section 8-27 of the Kaua'i County Code (1987) as amended, pertaining to shoreline setback and coastal protection.

4. The Applicant shall consult with the United States Fish and Wildlife Service in order to minimize adverse impacts on the Federally Listed Threatened Species, Newell's Shearwater and other seabirds. In addition, all external lighting shall be only of the following type: downward facing lights. Spotlights aimed upward or spotlighting of structures, landscaping, or the ocean shall be prohibited.

5. The Applicant shall be made aware that additional requirements may be imposed during zoning permit review.

Thank you for the opportunity to comment and should you have any questions, please contact Kenneth A. Estes of my staff at 808.241.4050.

for MICHAEL A. DAHILIG
Director of Planning

THE LIMTIACO CONSULTING GROUP

June 2, 2015

Michael A. Dahilig, Director
County of Kauai
Planning Department
4444 Rice Street, Ste. A473
Lihue, Hawaii 96766
Attn: Kenneth A. Estes

Subject: Pre-Consultation for Environmental Assessment
Response to Comments for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Dahilig,

Thank you for your comment letter dated December 23, 2014 regarding consultation for the State of Hawaii, Department of Land and Natural Resources (DLNR) *Mana Drag Race Strip Electrical and Lighting Upgrades* project. We have the following response to Planning Department comments:

1. We acknowledge that the Kauai County Code does not regulate installation of utility poles and transmission lines by public utilities, as defined in §269-1, Hawaii Revised Statutes, provided that the poles shall be no higher than 20 feet above the height limits for structures applicable in the Use District in which the poles are constructed. The proposed project includes installation of overhead electrical lines by the Kauai Island Utility Initiative, a public utility as defined in §269-1, Hawaii Revised Statutes. Installation of these electrical lines will not be regulated under the Kauai County Code.

2. We acknowledge that the project is located within the Special Management Area, and is subject to the *Special Management Area Rules and Regulations, County of Kauai – State of Hawaii* ("Rules"). We have determined that the project qualifies as Development, as defined in Section 1.4 of the Rules. At this point, the DLNR intends to pursue a Special Management Area Use Permit for the proposed improvements.

3. The project is located in a shoreline parcel, and is subject to shoreline setback requirements of Ordinance No. 979, Section 8-27 of the Kauai County Code. A shoreline survey has been approved, and we are currently in the process of receiving a shoreline certification from the State of Hawaii, Department of Land and Natural Resources. Once a certified shoreline has been obtained, a shoreline setback application will be submitted to the Planning Department to determine the location of the shoreline setback line. The project will be designed such that no development occurs within the shoreline setback area. No shoreline setback variance will be required for the project.

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(808) 596-7790 tlcghawaii.com

4. The United States Fish and Wildlife Service, State Division of Forestry and Wildlife, and State Division of Aquatic Resources were consulted during preparation of the Draft Environmental Assessment (EA). The Draft EA will propose measures to mitigate impacts to threatened and endangered species or their critical habitat that may occur within the project site. All proposed lighting will be downcast and directed away from the shoreline.

5. Thank you for informing us that additional requirements may be imposed during zoning permit review.

Thank you for your interest and participation in the environmental review process. You will be notified when the Draft EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal

cc: Adrian Chang, DLNR

APPENDIX L
DRAFT ENVIRONMENTAL ASSESSMENT CONSULTATION

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2015

Mr. Aaron Nadig, Assistant Field Supervisor
U.S. Department of the Interior
Fish & Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd.
Honolulu, Hawaii 96850

Re: Draft Environmental Assessment for the
Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Key (4) 1-2-002:036 & 040
Mana, Kauai, Hawaii

SAMPLE

Dear Mr. Nadig,

On behalf of the Department of Land and Natural Resources (DLNR), Engineering Division, we wish to inform you that we are currently soliciting comments on the Draft Environmental Assessment (DEA) for the *Mana Drag Race Strip Electrical and Lighting Upgrades Project*.

Enclosed for your review is one (1) CD copy of the DEA and Anticipated Finding of No Significant Impact (AFONSI). The DEA may also be downloaded from the OEQC's online library at http://oeqc.doh.hawaii.gov/. Hard copies of the DEA are available for review at the Hawaii State Library and Waimea Public Library.

Pursuant to Chapter 343, Hawaii Revised Statutes and Chapter 11-200, Hawaii Administrative Rules, the we will be accepting comments for the statutorily required 30-day public comment and review period. Please provide your comments within 30 days of your receipt of this letter to the addresses provided below.

Please send comments to:

Kyle Kaneshiro, P.E. LEED AP, Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

Thank you for your interest and participation in the environmental review process. If you would like additional copies of the DEA or have any questions, please contact Kyle Kaneshiro or myself at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Jason S. Nakata
Staff Engineer

SAMPLE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
2015-TA-0357

08-10-15A07:57 RCVD

AUG 0 6 2015

Mr. Kyle Kaneshiro, P.E. LEED AP
Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

Subject: Comments on the Draft Environmental Assessment, Mana Drag Race Strip Electrical and Lighting Upgrades, Kauai

Dear Mr. Kaneshiro:

The U.S. Fish and Wildlife Service (Service) received your letter, dated July 8, 2015, requesting our comments on the draft Environmental Assessment (EA) for the Mana Drag Race Strip Electrical and Lighting Upgrades project on the island of Kauai. The State of Hawaii Department of Land and Natural Resources (DLNR) Engineering Division proposes to install power and new lighting at the Mana Drag Race Strip. The existing facilities are currently operated by the Garden Isle Racing Association (GIRA). The proposed project involves the installation of approximately 0.8 miles of new overhead electrical lines and 26 utility poles at a maximum spacing of 200 feet between poles. The overhead powerlines will span the access road, turn east to run parallel to the drag strip on its north side, and then cross to the south side of the race strip at approximately the halfway point of the track. New overhead stadium-type lighting on approximately 19 poles will be installed along the south side of the race strip. The lighting will draw power from electrical lines installed in an underground conduit parallel to the race track. The electrical lighting system upgrades will also electrical meters, pull boxes, and transformers. The property is located on State of Hawaii land at TMK (4) 1-2-002: 036 & 040.

We provided comments during early development of this project in December 2014 (Service File: 2015-TA-0078). In our letter, we recommended measures to avoid and minimize impacts to the following federally listed and candidate species: the endangered Hawaiian black-necked stilt (*Himantopus mexicanus knudseni)*, Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*) (hereafter collectively referred to as Hawaiian waterbirds); the endangered Hawaiian goose (*Branta sandvicensis*); the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus)*; the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the threatened Newell's shearwater (*Puffinus auricularis newelli*), and a candidate for listing the band-rumped storm-petrel (*Oceanodroma castro*) (hereafter collectively referred to as seabirds); and the threatened green sea turtle (*Chelonia mydas*). We also recommended the draft EA address all potential impacts to these species, outline measures to

minimize these impacts, and address any potential disturbance to designated critical habitat (currently unoccupied) for the endangered *Panicum niihauense*. You responded to our comments in a letter, dated June 2, 2015, which acknowledged the potential for activities associated with the proposed project to impact these species and provided information on proposed measures to avoid and minimize impacts.

In response to your recent letter, dated July 8, 2015, we offer the following comments to assist you in revising the draft EA. We appreciate the opportunity to continue to provide technical assistance throughout the planning process so that impacts to trust resources can be avoided through project design, construction, and operation. Our comments are provided under the authorities of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C 1531 *et seq.*).

According to the draft EA, the stadium-type lighting will be downcast and shielded to minimize potential impacts to seabirds due to fallout. In addition, the draft EA states that lighting will not be used during the months of October through February. Please be aware that although the stadium-type lighting will be shielded, a risk of seabird fallout (i.e., take) may remain due to the intensity of the fixtures when lights are on after sunset during September 15 to October 1 of the calendar year. To further minimize potential impacts to seabirds, the stadium-type lighting should not be used during the peak fallout period (September 15 through December 15).

The draft EA also states that utility poles and overhead electrical lines will be constructed below the adjacent ironwood treeline to minimize potential impacts to seabirds due to collision with utility structures. The final EA should also address the potential impacts to seabirds from collision with the stadium-type lighting and provide measures to minimize potential impacts. Additional information on the height of the lighting structures in relation to the adjacent vegetation is necessary to assess potential impacts to seabirds.

To minimize potential impacts to sea turtles, the draft EA states that the downcast, shielded lighting will be placed on the south side of the race strip with lighting directed away from the beach. The draft EA also states that existing sand dunes and vegetation will further limit visibility of artificial light from the beach. The Service recommends that no light from the lighting associated with the project be visible from the beach. We suggest the final EA determine if proposed lighting will be visible from the beach and if it is necessary and feasible to plant additional coastal vegetation or manage existing vegetation to fully shield the beach from lighting associated with the project.

The draft EA overlooks measures to minimize potential impacts to Hawaiian hoary bat. We recommend that woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15). The final EA should address all potential impacts to Hawaiian hoary bats and outline measures to minimize these impacts.

The Service acknowledges that the draft EA incorporates into the project description many relevant measures to avoid and minimize potential impacts to Hawaiian waterbirds and the Hawaiian goose. We also acknowledge the draft EA states that no major grading is proposed and the project will not disturb critical habitat for *Panicum niihauense*.

Under the ESA, take is defined to mean "...to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct." Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering.

If it is determined that the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with the ESA compliance. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the appropriate State of Hawaii department should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats, and defines measures to minimize and mitigate those adverse effects.

We hope this information assists you in developing a comprehensive and thorough final EA. We appreciate your efforts to conserve endangered species. Please contact Adam Griesemer, Endangered Species Biologist (phone: 808-285-8261, email: adam_griesemer@fws.gov) should you have any questions pertaining to this response.

Sincerely,

Aaron Nadig
Island Team Manager
Oahu, Kauai, Northwester Hawaiian
Islands and American Samoa

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

December 30, 2015

Aaron Nadig, Island Team Manager
U.S. Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850
Attn: Adam Griesemer

Subject: Draft Environmental Assessment
Response to Your Comment Letter Dated August 6, 2015 for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Nadig,

Thank you for your letter dated August 6, 2015 regarding the *Draft Environmental Assessment, Mana Drag Race Strip Electrical and Lighting Upgrades*. We have the following response to U.S. Fish and Wildlife Service (USFWS) comments.

We acknowledge that, although the proposed stadium-type lighting will be shielded, a risk of seabird fallout may remain due to the intensity of the fixtures when lights are on after sunset during the period from September 15 through December 15 of the calendar year. We acknowledge the USFWS comment that, to minimize potential impacts to seabirds, the stadium-type lighting should not be used during the peak fallout period (September 15 through December 15). The Final Environmental Assessment (EA) will state that the lighting should not be used during the peak fallout period, from September 15 through December 15 of each calendar year.

We acknowledge the risk of potential impacts of seabirds with lighting structures. Based on phone and email conversations with USFWS staff, it was agreed that the proposed lighting should have a maximum height of 60 feet in order to mitigate the potential for seabird collision. The lighting will be of monopole design and will not involve the use of guy wires.

We acknowledge the USFWS recommendation that no light from the proposed project should be visible from the beach to minimize potential impacts to sea turtles. Existing dunes and vegetation located between the proposed lighting and the shoreline will help to mitigate any impacts to sea turtles. Additionally, the proposed stadium lighting will not involve the use of any backlighting (toward the shoreline). An illumination summary will be included with the Final EA showing that, given the downcast nature of the lighting and the fact that no backlighting will be used, 0.0 foot-candles of light will be visible from the shoreline area.

We acknowledge USFWS recommendation that woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1

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(808) 596-7790 tlcghawaii.com

through September 15) to mitigate potential impacts on the Hawaiian hoary bat. Although there are large trees located along the perimeter of the project area, proposed structures (utility poles, light poles and transformers) will be constructed in areas that are already clear of large vegetation. As such, no woody plants greater than 15 feet tall will be disturbed as part of the proposed project. Nevertheless, the Final EA will include the recommendation that woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed during the period from June 1 through September 15. The Final EA will recommend that a survey should be conducted by a knowledgeable wildlife biologist if trees must be cut or removed during the birthing and pupping season.

Thank you for your interest and participation in the environmental review process. You will be notified when the Final EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR, Engineering Division

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
DOH/CWB

07026PNN.15

July 20, 2015

07-24-15 A09:23 RCVD

Mr. Kyle Kaneshiro, P.E., LEED AP
Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, Hawaii 96817

Dear Mr. Kaneshiro:

SUBJECT: Comments on the Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project Mana, Island of Kauai, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the subject document and has no comments at this time. The DOH-CWB provided comments on the Pre-Consultation for Environmental Assessment for this project (Letter No. 12049PJF.14, dated December 24, 2014).

Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/CWB-standardcomment.pdf.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

NN:ay

DAVID Y. IGE
GOVERNOR OF HAWAII

'15 AUG 03 PM 02:03 ENGINEERING

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

07044PJF.15

July 29, 2015

Mr. Adrian Chang
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Chang:

SUBJECT: Draft Environmental Assessment (DEA) for Mana Drag Race Strip Electrical and Lighting Upgrades Waimea, Island of Kauai, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated June 25, 2015, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects

natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb/, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

JF:ay

c: DOH-EPO [via e-mail only]

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

December 30, 2015

Alec Wong, P.E., Chief
Department of Health
Clean Water Branch
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Draft Environmental Assessment
Response to Your Comment Letter Dated August 6, 2015 for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Wong,

Thank you for your letter dated July 29, 2015 regarding the *Draft Environmental Assessment, Mana Drag Race Strip Electrical and Lighting Upgrades*. We have the following response to Clean Water Branch (CWB) comments.

1. We acknowledge that any project and its potential impacts must meet the anti-degradation policy, designated uses, and water quality criteria outlined in the State of Hawaii (State) Water Quality Standards (Chapter 11-54, Hawaii Administrative Rules). The receiving water for the project is the Pacific Ocean, which is designated a Class A marine water in the vicinity of the project site.

   The project may result in minor and temporary water quality impacts of the type and scale typical of minor construction projects which include limited amounts of ground disturbance. Appropriate construction best management practices (BMPs) will be employed to minimize water pollution and soil erosion into State waters.

   The project will conform with the general policy of water quality anti-degradation (§11-54-1.1, Hawaii Administrative Rules) and will not endanger the designated uses of nearby waterbodies (§11-54-3, Hawaii Administrative Rules). Implementation of construction BMPs will mitigate possible impacts to the water quality criteria (§11-54-4, Hawaii Administrative Rules).

2. We acknowledge that a National Pollutant Discharge Elimination System (NPDES) permit must be obtained for pollutant discharges into surface waters of the State, including for certain situations involving storm water. The project involves over 1 acre of land, and will obtain an NPDES permit for storm water runoff related to construction activities.

3. The proposed project does not involve work in, over, or under Waters of the United States. If it is later found that such work is required, we understand that additional permit requirements may be triggered pursuant to Section 401 and 404 of the Clean Water Act

1622 KANAKANUI STREET HONOLULU, HAWAII 96817
(808) 596 7790 tlcghawaii.com

and Section 10, Rivers and Harbors Act. If such work is required, we will consult with the United States Army Corps of Engineers.

4. We acknowledge that all discharges related to the project must comply with the State water quality standards, regardless of whether or not a CWB permit is required. We understand that noncompliance may be subject to penalties of $25,000 per day per violation.

5. We concur with the CWB position regarding the importance of measures to protect, restore and sustain water quality and beneficial uses of State waters.

   a. We recognize that storm water is an asset that sustains and protects natural ecosystems and beneficial uses of State waters. Opportunities to implement low impact development and bioengineering are limited since the scope of the project is limited to the installation of lighting and electrical utilities.

   b. Statements regarding conservation of natural resources and improvement of water quality will be incorporated into the Final EA.

   c. Storm water BMPs will be incorporated into the project as required by federal, state, and county laws, regulations and ordinances.

   d. Opportunities to implement green building practices and bioengineering of existing drainage systems are limited since the project scope is limited to the installation of lighting and electrical utilities and there is no existing storm water infrastructure at the project site.

Thank you for your interest and participation in the environmental review process. You will be notified when the Final EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR, Engineering Division

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
KAUAI DISTRICT HEALTH OFFICE
3040 UMI STREET
LIHUE, HAWAII 96766

DILEEP G. BAL, M.D., M.S., M.P.H.
DISTRICT HEALTH OFFICER

July 10, 2015

07-15-15P02:13 RCVD

Mr. Kyle Kaneshiro
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu HI, 96817

Dear Mr. Kaneshiro,

SUBJECT: **Draft Environmental Assessment**
Project: **Mana Drag Strip**
Applicant: Department of Land and Natural Resources

Based on our review, we offer the following environmental health concerns for your consideration, which needs to be addressed:

1. Noise will be generated during the clearing and construction phases of this project. The applicable maximum permissible sound levels as stated in Title 11, Hawaii Administrative Rules (HAR), Chapter 11-46, "Community Noise Control", shall not be exceeded, unless a noise permit is obtained from the Hawaii State Department of Health (DOH).

2. The Department of Health, Clean Water Branch (CWB) has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with HAR, Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

   I. Any project and its potential impacts to State waters must meet the following criteria:

      a.. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

II. Please call the Army Corps of Engineers at (808) 438-9258 to see if this project requires a Department of the Army (DA) permit. Permits may be required for work performed in, over, and under navigable waters of the United States. Projects requiring a DA permit also require a Section 401 Water Quality Certification (WQC) from our office.

III. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

a. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi).

b. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the start of the construction activities.**

c. Treated effluent from leaking underground storage tank remedial activities.

d. Once through cooling water less than one (1) million gallons per day.

e. Hydrotesting water.

f. Construction dewatering effluent.

g. Treated effluent from petroleum bulk stations and terminals.

h. Treated effluent from well drilling activities.

i. Treated effluent from recycled water distribution systems.

j. Storm water from a small municipal separate storm sewer system.

k. Circulation water from decorative ponds or tanks.

3. You must submit a separate NOI form for each type of discharge at least 30 days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 before to the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

4. For types of wastewater not listed in Item 3 above or wastewater discharging into Class 1 or Class AA waters, you must obtain an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

5. You must also submit a copy of the NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the CWB that SHPD has or is in the process of evaluating your project. Please submit a copy of your request for review by SHPD or SHPD's determination letter for the project along with your NOI or NPDES permit application, as applicable.

6. Please, note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54 and/or permitting requirements, specified in HAR, Chapter 11-55 may be subject to penalties of $25,000 per day per violation.

   If you have any questions, please visit our website at http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

7. Temporary fugitive dust emissions could be emitted when the project site is prepared for construction and when construction activities occur. In accordance with Title 11, HAR, Chapter 11-60.1, "Air Pollution Control", effective air pollution control measures shall be provided to minimize or prevent any fugitive dust emissions caused by the construction work from impacting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures include but are not limited to the use of water wagons, sprinkler systems, dust fences, etc.

8. In accordance with Title 11, HAR, Chapter 11-58.1, "Solid Waste Management Control", the grubbed material and construction waste that is generated by the project shall be disposed of at a solid waste disposal facility that complies with the DOH. The open burning of any of these wastes on or off site is prohibited.

Should you have any questions, please call me at 241-3323.

Sincerely,

Gerald N. Takamura, Chief
District Environmental Health Program Kaua'i

GNT: DTT

C: EPO

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

December 30, 2015

Gerald N. Takamura, Chief
Department of Health
Kauai District Health Office
3040 Umi Street
Lihue, Hawaii 96766

Subject: Draft Environmental Assessment
Response to Your Comment Letter Dated July 10, 2015 for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Takamura,

Thank you for your letter dated July 10, 2015 regarding the *Draft Environmental Assessment, Mana Drag Race Strip Electrical and Lighting Upgrades*. We have the following response to Kauai District Health Office (KDHO) comments.

1. The construction contractor will be required to comply with Chapter 11-46, Hawaii Administrative Rules "Community Noise Control".

2. We have the following responses to Clean Water Branch comments:

   I. We acknowledge that any project and its potential impacts must meet the anti-degradation policy, designated uses, and water quality criteria outlined in the State of Hawaii (State) Water Quality Standards (Chapter 11-54, Hawaii Administrative Rules). The receiving water for the project is the Pacific Ocean, which is designated a Class A marine water in the vicinity of the project site.

   The project may result in minor and temporary water quality impacts of the type and scale typical of minor construction projects which include limited amounts of ground disturbance. Appropriate construction best management practices (BMPs) will be employed to minimize water pollution and soil erosion into State waters.

   The project will conform with the general policy of water quality anti-degradation (§11-54-1.1, Hawaii Administrative Rules) and will not endanger the designated uses of nearby waterbodies (§11-54-3, Hawaii Administrative Rules). Implementation of construction BMPs will mitigate possible impacts to the water quality criteria (§11-54-4, Hawaii Administrative Rules).

   II. The proposed project does not involve work in, over, or under Waters of the United States. If it is later found that such work is required, we understand that additional permit requirements may be triggered pursuant to Section 401 and 404 of the Clean

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(808) 596-7790 tlcghawaii.com

Water Act and Section 10, Rivers and Harbors Act. If such work is required, we will consult with the United States Army Corps of Engineers.

III. We acknowledge that a National Pollutant Discharge Elimination System (NPDES) permit must be obtained for pollutant discharges into surface waters of the State, including for certain situations involving storm water. The project involves over 1 acre of land, and will obtain an NPDES permit for storm water runoff related to construction activities.

3. We acknowledge that a separate NOI must be submitted for each type of discharge at least 30 days prior to the start of construction activity.

4. We acknowledge that, for types of wastewater that do not qualify for coverage under a General NPDES permit or for wastewater discharged into Class 1 or Class AA waters, and NPDES individual permit must be obtained. We understand that an application for an NDPES individual permit must be submitted at least 180 days before the commencement of the discharge.

5. An Archaeological Inventory Survey has been completed and approved by the State Historic Preservation Division (SHPD). An archaeological monitoring plan will be completed and submitted to the SHPD for review and approval prior to the start of construction. A SHPD determination letter for the project will be submitted along with the NOI or NPDES permit application, as applicable.

6. We acknowledge that all discharges related to the project must comply with the State water quality standards, regardless of whether or not a CWB permit is required. We understand that noncompliance may be subject to penalties of $25,000 per day per violation.

7. The construction contractor will be required to comply with Chapter 11-60.1, Hawaii Administrative Rules "Air Pollution Control". The construction contractor will be responsible for implementing an appropriate dust control plan.

8. The construction contractor will be required to comply with Chapter 11-58.1, Hawaii Administrative Rules "Solid Waste Management Control". We acknowledge that grubbed material and construction waste that is generated by the project shall be disposed of at a solid waste disposal facility that complies with Department of Health regulations. We acknowledge that the open burning of any of these wastes on or off site is prohibited.

Thank you for your interest and participation in the environmental review process. You will be notified when the Final EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR, Engineering Division

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 5, 2015

The Limtiaco Consulting Group, Inc.
Attention: Kyle Kaneshiro, Principal
1622 Kanakanui Street
Honolulu, Hawaii 96817

via email: kyle@tlcghawaii.com

Dear Mr. Kaneshiro,

SUBJECT: Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (1) Land Division – Kauai District; (2) Division of Forestry & Wildlife; (3) Engineering Division; (4) Division of Boating & Ocean Recreation; and (5) Office of Conservation & Coastal Lands. No other comments were received as of our suspense date. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION
2015 JUL 24 PM 2:38
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 14, 2015

MEMORANDUM

RECEIVED
LAND DIVISION
2015 JUL 24 PM 1:47
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FROM: KDLO Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Key (4) 1-2-002:036 and 040; Mana, Kauai, Hawaii
APPLICANT: Department of Land and Natural Resources, Engineering Division, by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments
4. Click on the subject file "Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Linda Kawakami at (808) 587-0371 or Linda.Kawakami@hawaii.gov)

Please submit any comments by August 5, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

(X) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: Marvin Mikasa
Print Name: MARVIN MIKASA
Date: July 21, 2015

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 14, 2015

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Key (4) 1-2-002:036 and 040; Mana, Kauai, Hawaii
APPLICANT: Department of Land and Natural Resources, Engineering Division, by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments
4. Click on the subject file "Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Linda Kawakami at (808) 587-0371 or Linda.Kawakami@hawaii.gov)

Please submit any comments by August 5, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: _____
Print Name: Thomas Kaiakapu
Date: 08/04/15

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
3060 Eiwa Street, Room 306
Lihue, Kauai, HI 96766

August 4, 2015

TO: Russell Y. Tsuji, Land Administrator

FR: Galen K. Kawakami, Kauai Branch Manager

RE: Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project, Kekaha, Kauai, Hawai'i

We received your letter dated July 14, 2015 requesting for our comments on the DEA Electrical and Lighting Upgrade Project at the Mana Drag Race Strip on the island of Kauai. Our comments are below:

It should be noted that the Hawaiian goose (*Branta sandvicensis*) has been recently observed in the Kekaha Agriculture Association lands on the mauka side of Kaumualii Highway 50. Therefore, it is recommended that this species be added to Section 3-8 Flora and Fauna Resources on page 3-11. Impacts and Mitigation measures would be the same as for the other listed wildlife species on page 3-14, paragraph 3.

The Hawaiian hoary bat (*Lasiurus cinerus semotus*) is noted in Section 3-8 on page 3-11, however, it should also mention that the birthing and pup rearing season is from June to September 15. They will use trees that are greater than 15 feet or 4.6 meters tall in height to raise their young. If the cutting or removal of these trees greater than 15 feet tall is needed, it is recommended that it be accomplished between September 16 and May 31. If trees must be cut or removed within the birthing and pupping season, it is recommended that a survey be conducted by a knowledgeable wildlife biologist.

If you have questions or require additional information, please contact Mr. Thomas Ka'iakapu at 808-274-3433.

Sincerely,

for Galen K. Kawakami
Kauai Branch Manager

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
LAND DIVISION
2015 AUG -3 AM 11:13
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII
'15 JUL-14 PM 2:34 ENGINEERING

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 14, 2015

MEMORANDUM

~~TO:~~ FR:

DLNR Agencies:
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

~~FROM:~~ TO: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Key (4) 1-2-002:036 and 040; Mana, Kauai, Hawaii
APPLICANT: Department of Land and Natural Resources, Engineering Division, by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments
4. Click on the subject file "Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Linda Kawakami at (808) 587-0371 or Linda.Kawakami@hawaii.gov)

Please submit any comments by August 5, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
(✓) We have no additional comments.
( ) Comments are attached.

Signed: [signature]
Print Name: Carty S. Chang, Chief Engineer
Date: 7/31/15

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2015 JUL 21 PM 3:16
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

July 14, 2015

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Key (4) 1-2-002:036 and 040; Mana, Kauai, Hawaii
APPLICANT: Department of Land and Natural Resources, Engineering Division, by its consultant The Limtiaco Consulting Group

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Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed: Edward R. Underwood
Print Name: Edward R. Underwood
Date: 7/20/15

JUL15'15PM 1:02BOR ADM

KA-16-10

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2015 JUL 15 A 7:54

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 14, 2015

MEMORANDUM

RECEIVED
LAND DIVISION
2015 JUL 21 PM 3:15
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

~~TO:~~ FROM

DLNR Agencies:
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

TO:

~~FROM:~~ Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project
LOCATION: Tax Map Key (4) 1-2-002:036 and 040; Mana, Kauai, Hawaii
APPLICANT: Department of Land and Natural Resources, Engineering Division, by its consultant The Limtiaco Consulting Group

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2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments
4. Click on the subject file "Draft Environmental Assessment for the Mana Drag Race Strip Electrical and Lighting Upgrades Project", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Linda Kawakami at (808) 587-0371 or Linda.Kawakami@hawaii.gov)

Please submit any comments by August 5, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: _____
Print Name: ALEX ROY
Date: 7/21/2015

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

REF: OCCL: AJR

COR: KA-16-10

JUL 21 2015

MEMORANDUM

TO: Russell Y. Tsuji, Administrator
DLNR – Land Division

FROM: Samuel J. Lemmo, Administrator
DLNR – Office of Conservation and Coastal Lands

RE: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE MANA DRAG STRIP ELECTRICAL AND LIGHTING UPGRADES PROJECT
Mana, Waimea District, Island of Kaua'i
TMKs: (4) 1-2-002:036 & 040

Dear Mr. Tsuji,

The Office of Conservation and Coastal Lands (OCCL) is in receipt of your memorandum dated *July 15, 2015* regarding a Draft Environmental Assessment (DEA) for a proposed upgrade to the existing Mana Drag Strip. For reference the majority of the project area is located within the State Land Use (SLU) Conservation District *Limited* Subzone.

A more complete "Alternatives Analysis" needs to be included in the EA. The alternatives that should be discussed in detail are:

1. *Improving the use of portable generators, or permanent generators; and*
2. *The use of underground utility conduits instead of overhead lines/power poles.*

If you have any questions regarding this correspondence please contact Alex J. Roy, M.Sc. of our Office of Conservation and Coastal Lands staff at 808-587-0316.

Thank you.

CC: *KDLO*
DOFAW
County of Kaua'i – Planning Department
DAR
Engineering

DAVID Y. IGE
GOVERNOR OF HAWAII

15 JUL 22 AM08:41 ENGINEERING

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

REF: OCCL: AJR

COR: KA-16-10
JUL 21 2015

MEMORANDUM

TO: Russell Y. Tsuji, Administrator
DLNR – Land Division

FROM: Samuel J. Lemmo, Administrator
DLNR – Office of Conservation and Coastal Lands

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Mana, Waimea District, Island of Kaua'i
TMKs: (4) 1-2-002:036 & 040

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A more complete "Alternatives Analysis" needs to be included in the EA. The alternatives that should be discussed in detail are:

1. *Improving the use of portable generators, or permanent generators; and*
2. *The use of underground utility conduits instead of overhead lines/power poles.*

If you have any questions regarding this correspondence please contact Alex J. Roy, M.Sc. of our Office of Conservation and Coastal Lands staff at 808-587-0316.

Thank you.

CC: KDLO
DOFAW
County of Kaua'i – Planning Department
DAR
Engineering

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

December 30, 2015

Russell Y. Tsuji, Administrator
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawaii 96809
Attn: Steve Molmen

Subject: Draft Environmental Assessment
Response to Your Comment Letters Dated August 5, 2015 & November 12, 2015
for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Tsuji,

Thank you for your comment letters dated August 5, 2015 and November 12, 2015, which contained comments from the (1) Division of Aquatic Resources, (2) Division of Boating and Ocean Recreation, (3) Office of Conservation and Coastal Lands, (4) Engineering Division, (5) Division of Forestry and Wildlife, and (6) Land Division – Kauai District Office. We have the following responses to comments.

Division of Aquatic Resources

Thank you for your comments regarding project's potential impacts on the threatened green sea turtle (*Chelonia mydas*). We acknowledge that the green sea turtle nests regularly on beaches throughout Kauai, including in the Mana-Barking Sands area. We understand that green sea turtle hatchlings may be disoriented by bright light shining directly or indirectly on the beach since they are positively attracted to lights. The proposed stadium lighting is only proposed for installation along the makai side of the drag race strip such that all light will be directed away from the shoreline. Additionally, the proposed stadium lighting will not involve the use of any backlighting (toward the shoreline). An illumination summary will be included with the Final EA showing that, given the downcast nature of the lighting and the fact that no backlighting will be used, 0.0 foot-candles of light will be visible from the shoreline area. An existing sandy berm and vegetation line between the proposed lighting and the shoreline should further mitigate any potential impacts of the proposed project on green sea turtles.

Division of Boating and Ocean Recreation

We acknowledge that the Division of Boating and Ocean Recreation does not have any comments regarding the proposed project.

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(808) 596 7790 tlcghawaii.com

Office of Conservation and Coastal Lands
Thank you for providing additional alternatives for consideration in the Final EA. The Final EA will include analysis of using improved portable generators or installation of permanent generators. The use of underground utility conduits instead of overhead lines/power poles will also be considered.

Engineering Division
We acknowledge that, according to the Flood Insurance Rate Map (FIRM), the proposed project is located in Flood Zone AE, and that the National Flood Insurance Program (NFIP) regulates development within Zone AE. We understand that the project must comply with the rules and regulations of the NFIP presented in Title 44 of the Code of Federal Regulations (44 CFR), whenever development within a Special Flood Hazard Area is undertaken.

Division of Forestry and Wildlife
Thank you your comment that the Hawaiian goose (*Branta sandvicensis*) has been recently observed in the Kekaha Agriculture Association lands on the mauka side of Kaumualii Highway (Route 50). Discussion regarding the Hawaiian goose will be added to the Final Environmental Assessment. We acknowledge that impacts and mitigation measures for the Hawaiian goose would be the same as for the other listed wildlife species on page 3-14, paragraph 3 of the Draft EA.

The Final EA will mention that the birthing and pup-rearing season for the Hawaiian hoary bat (*Lasiurus cinerus semotus*) is from June 1 through September 15. We acknowledge that woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season. Although there are large trees located along the perimeter of the project area, proposed structures (utility poles, light poles and transformers) will be constructed in areas that are already clear of large vegetation. As such, no woody plants greater than 15 feet tall will be disturbed as part of the proposed project. Nevertheless, the Final EA will include the recommendation that woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed during the period from June 1 through September 15. The Final EA will recommend that a survey should be conducted by a knowledgeable wildlife biologist if trees must be cut or removed during the birthing and pupping season.

Land Division – Kauai District Office
We acknowledge that the Land Division – Kauai District Office does not have any objections to the proposed project.

Thank you for your interest and participation in the environmental review process. You will be notified when the Final Environmental Assessment is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR, Engineering Division
Marvin Mikasa, DLNR Land Division – Kauai District Office
Edward Underwood, DLNR Division of Boating and Ocean Recreation
Bruce Anderson, DLNR Division of Aquatic Resources
Samuel J. Lemmo, DLNR Office of Conservation and Coastal Lands
Galen K. Kawakami, DLNR Division of Forestry and Wildlife – Kauai Branch

APPENDIX M
SCOREBOARD CONSULTATION

THE LIMTIACO CONSULTING GROUP

October 12, 2014

Mr. Aaron Nadig, Assistant Field Supervisor
U.S. Department of the Interior
Fish & Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd.
Honolulu, Hawaii 96850

Subject: Environmental Assessment Consultation for
Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Addition of Scoreboard to Final Environmental Assessment
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Nadig,

On behalf of the State of Hawaii (State) Department of Land and Natural Resources (DLNR) we wish to inform you that the purchase of an LED scoreboard will be added to the scope of the *Mana Drag Race Strip Electrical and Lighting Upgrades* project.

The Draft Environmental Assessment (EA) for the project was published in the July 8, 2015 edition of the Environmental Notice and the 30-day comment period for the Draft EA completed on August 7, 2015. Because the scoreboard was not included in the Draft EA, we are soliciting your comments regarding the scoreboard for inclusion in the Final EA. The following describes the addition of the scoreboard to the scope of the project.

Scoreboard Description

In addition to the proposed improvements described in the *Draft Environmental Assessment, Mana Drag Race Strip Electrical and Lighting Upgrades*, the project proposes addition of an LED scoreboard at the quarter-mile point of the race track.

The make and model of the scoreboard will not be known until after the Environmental Assessment process is completed; the scoreboard will be purchased by the contractor after the construction contract is awarded. However, it will be similar to the scoreboard shown in the enclosed cut-sheet for the Daktronics DR-3683.

The scoreboard display will consist of LED digits. The scoreboard's LED lighting will be similar in style to variable-message boards used for construction and traffic control. The Daktronics DR-3683 scoreboard runs at 600 Watts (W) max; typical LED variable-message displays operate between 150W and 400W, depending on size. Cut-sheets for LED variable-message signs from Aldridge Traffic Systems are attached for reference. When running at max Wattage, brightness of the scoreboard can be thought of as roughly equivalent to the brightness of between two and four variable-message boards. It should be noted that the Daktronics DR-3683 is equipped with a dimmer, allowing the scoreboard to be operated at lower power at night.

SAMPLE

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(808) 596-7790 tlcghawaii.com

The sample specifications show the scoreboard to measure 8 feet (ft) high by 16 ft wide. While the exact dimensions may vary based on the make and model chosen by the contractor, the sample provided will be representative of the scoreboard purchased as part of the project. The scoreboard may also be elevated and mounted above grade.

The scoreboard will be installed on the makai side of the drag race strip approximately ¼ mile from the starting line (see enclosed figure). The scoreboard will be installed roughly 30° from perpendicular to the drag race strip, so that it is facing the spectator area. The scoreboard will be powered by the same power distribution system that will power the proposed lighting improvements.

The scoreboard will be located on Tax Map Key parcel (4)1-2-002:040. The parcel is located within the Limited subzone of the State Conservation land use district. The County of Kauai (County) does not appoint zoning designations for areas within the State Conservation land use district. The scoreboard will be located within the County Special Management Area, and is subject to the *Special Management Area Rules and Regulations of the County of Kauai.*

The scoreboard will be located approximately 450 ft from the certified shoreline, which was issued by the DLNR on August 17, 2015. The scoreboard will be located outside of the County Shoreline Setback Area. According to the Federal Emergency Management Agency Flood Insurance Rate Map, Community Pane Number 1500020251F (revised November 26, 2010), the scoreboard will be located within Flood Zone AE with a flood elevation of 9 ft.

SAMPLE

Impacts and Mitigation Measures

The scoreboard will not have impacts on the climate, geology and soils, topography, groundwater, surface waters, air quality, noise, archaeological and cultural resources, socio-economic characteristics, and infrastructure and utility outside of the general project impacts discussed in the Draft EA.

The proceeding impacts and mitigation measures are in addition to any impacts and mitigation measures for the overall project, which were discussed in the Draft EA. They will be added to the Final EA.

Shoreline

The scoreboard will be located in a grassy area adjacent to the existing drag race strip; the scoreboard will not be located near any sandy beach. The scoreboard will be located outside of the County Shoreline Setback Area. Because it is located sufficiently distant from the shoreline (450 ft), is not located on a sandy beach, and is outside of the County Shoreline Setback Area, the proposed scoreboard will not have any impact on shoreline processes.

Flood Hazard

The scoreboard will be located in Flood Zone AE, which is considered to have a 1% annual chance of flooding. The proposed scoreboard improvements will be designed in accordance with standards for development within the flood zone, as outlined in the

County Comprehensive Zoning Ordinance (CZO). No occupied structures are proposed and electrical equipment that may be susceptible to flood hazard will be located above the flood elevation of 9 ft. These measures will mitigate any potential adverse impacts from flood hazards.

Floral and Faunal Resources

The scoreboard will be located in an area that potentially serves as habitat for a number of threatened and endangered species. Based on consultation with the U.S. Fish and Wildlife Service and the State Division of Forestry and Wildlife, the project has potential to impact the Hawaiian goose (Branta sandvicensis), Hawaiian petrel (*Pterodroma sandwichensis*), Newell's shearwater (*Puffinus auricularis newelli*), band-rumped storm petrel (*Oceanodroma castro*), Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian common moorhen (*Gallinule chloropus sandvicencsis*), Hawaiian coot (*Fulica alai*), Hawaiian duck (*Ana wyvilliana*), Hawaiian hoary bat (*Lasirus cinereus semotus*), green sea turtle (*chelonea mydas*), Hawaiian monk seal (*Neomonachus schauinslandi*), and Panicum niihauense.

Fledgling Hawaiian petrel, Newell's shearwater, and band-rumped storm petrel have been known to become disoriented during their first flights due to artificial lighting. These night-flying seabirds mistake artificial lighting for moonlight and have been known to fly circles around artificial lighting until becoming exhausted or striking a structure. Once grounded, the fledgling seabirds fall prey to cats or mongoose. As discussed in the scoreboard description above, the scoreboard will consist of LED digits. Light given off by the scoreboard when operating at maximum wattage will be comparable to the light given off by two to four variable-message boards of the type used for construction or traffic control. The LED will be red or amber in color to mitigate potential impacts to seabirds. The scoreboard will not be continuously lit; upon completion of a heat scores will be displayed for a number of seconds and the scoreboard go dark. LED lighting also has a small beam angle than when compared to halogen or incandescent lighting. The use of LED lighting will limit the amount of light from the scoreboard that will spill into surrounding areas. Finally, the Garden Isle Racing Association does not hold nighttime events between September 15 and December 15. These measures will mitigate the possibility of seabirds becoming disoriented due to light from the scoreboard.

The Hawaiian hoary bat roosts in woody vegetation and leave their young unattended in nursery trees and shrubs while foraging. Disturbance, removal, or trimming of woody bats during birthing and pup rearing season (June 1 through September 15) has the potential to impact the Hawaiian hoary bat. The location of the proposed scoreboard is grassy and contains no tall trees or shrubs (see Photos 1 and 2); no tall woody trees or shrubs will be disturbed due to the proposed scoreboard. As such, addition of the scoreboard will not have any significant impact on the Hawaiian hoary bat.

Artificial lighting has the potential to disorient sea turtles and their hatchlings, affecting their ability to find their way to the ocean. As discussed above, the LED lighting used by the scoreboard will be of relatively low intensity, intermittent, and of a red or amber hue. There is also an existing line of vegetation located between the location of the proposed scoreboard and the shoreline (see Photo 2). The scoreboard will be installed at a

SAMPLE

maximum height of 24 feet, which is lower than the vegetation line between the scoreboard and the shoreline. The vegetation will prevent light from reaching the shoreline area. These measures will ensure that the scoreboard does not have any significant impact on sea turtles and their hatchlings.

Addition of the scoreboard will not result in potential impacts to the Hawaiian stilt, Hawaiian common moorhen, Hawaiian coot, Hawaiian duck, Hawaiian monk seal, and Panicum niihauense outside of the potential impacts already addressed in the Draft EA.

Implementation of the measures outlined above, in addition to the mitigation measures discussed in the Draft EA, will prevent any significant adverse impacts of the scoreboard on threatened or endangered species.

Visual Resources

The scoreboard will be located in a large grassy area directly adjacent to the drag race strip. A line of vegetation is located between the proposed scoreboard and the beach on the *makai* side of the track. Trees also line the mauka perimeter of the facility, obscuring view of the facility from neighboring properties (see Photo 3). The scoreboard will be installed at a maximum height of 24 ft or lower, which is below the height of the adjacent vegetation. Views of the scoreboard from adjacent properties will be obscured by existing vegetation. The scoreboard will not have a significant impact on visual resources.

Determination

Implementation of the mitigation measures stated above, along with mitigation measures discussed in the Draft EA, purchase of the scoreboard will not change the Anticipated Finding of No Significant Impact as published in the Draft EA.

Request for Comments

We are currently soliciting comments you may have regarding addition of the scoreboard purchase to the proposed project. If you have already submitted comments for the Draft EA, you do not have to resend them as they are currently being addressed. This request for comments is specific to the scoreboard only. Please submit your comments to the address below by November 12, 2015.

Please send comments to:

Kyle Kaneshiro, P.E. LEED AP, Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

Your comments will be addressed and incorporated into the Final EA.

SAMPLE

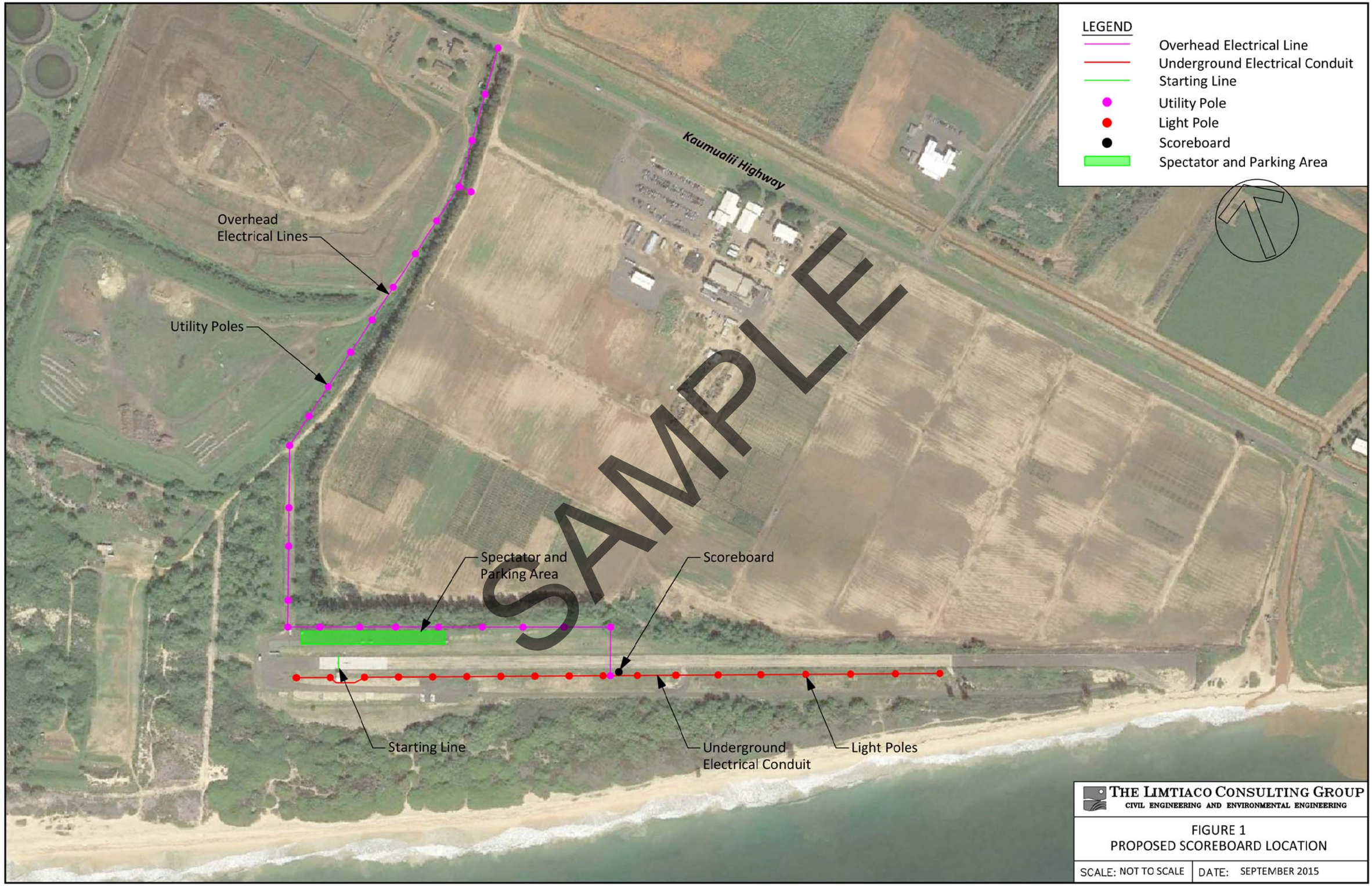
Thank you for your interest and participation in the environmental review process. You will be notified when the Final EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal

Enc(s)
cc: Adrian Chang, DLNR

SAMPLE



THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL ENGINEERING

FIGURE 1
PROPOSED SCOREBOARD LOCATION

SCALE: NOT TO SCALE | DATE: SEPTEMBER 2015

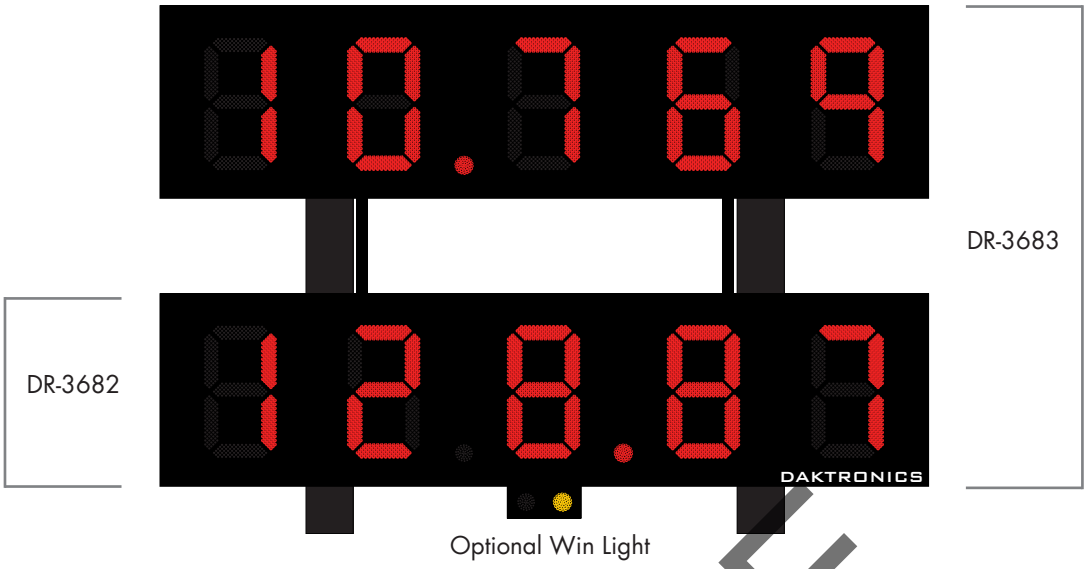
Photo 1: Approximate Location of Future Scoreboard 1

Photo 2: Approximate Location of Future Scoreboard 2

SAMPLE

Photo 3: Approximate Location of Future Scoreboard 1

DAKTRONICS DR-3683 PRODUCT SPECIFICATIONS



The DR-3682 outdoor LED drag racing display alternates between showing speed in miles per hour (MPH) and elapsed time (ET). The DR-3683 has a DR-3682 as the bottom section, which always shows speed, along with a top section to show elapsed time. Optional win light may be mounted underneath or on top of display to show a true win (amber) or a foul (red). Displays are typically sold in pairs to go on either side of the drag strip. Displays shown with red PanaView® digits. Beam size and placement for illustrative purposes only.

MODEL	DIMENSIONS	UNCRATED WEIGHT	100-240 VAC POWER
DR-3682 (MPH/ET)	4'-0" H x 16'-0" W x 8" D (1.22 m, 4.88 m, 203 mm)	175 lb (79 kg)	600 Watts Max, 6 Amps
DR-3683 (MPH + ET)	8'-0" H x 16'-0" W x 8" D (2.44 m, 4.88 m, 203 mm)	350 lb (159 kg)	
Optional Win Light	8" H x 1'-6.5" W x 5.5" D (203 mm, 470 mm, 140 mm)	10 lb (4.5 kg)	(Power from display)

Note: *Total height shown for DR-3683 does not include a space between the displays, which can be up to 2'-0" (610 mm).*

SAMPLE

DIGITS & INDICATORS

- All digits are 36" (914 mm) high. All decimals and optional win light indicators are 4" (102 mm) in diameter.
- Select all red or all amber LED digits. Optional win light includes one red and one amber indicator.
- Display features robust weather-sealed digits (see DD2495646).
- Digits may be dimmed for night viewing.

DISPLAY COLOR

Choose from 150+ colors (from Martin Senour® paint book) at no additional cost.

CONSTRUCTION

Alcoa aluminum alloy 5052 for excellent corrosion resistance

PRODUCT SAFETY APPROVAL

ETL listed to UL 48, tested to CSA standards, and CE labeled

OPERATING TEMPERATURES

- Display: -22° to 122° Fahrenheit (-30° to 50° Celsius)
- Console: 32° to 130° Fahrenheit (0° to 54° Celsius)

WWW.DAKTRONICS.COM E-MAIL: SALES@DAKTRONICS.COM

201 Daktronics Drive, PO Box 5128, Brookings, SD 57006
Phone: 1-800-325-8766 or 605-692-0200 Fax: 605-697-4746

DAKTRONICS

CONTROL CONSOLE	CONTROL OPTIONS
All Sport® 5100	***Wired (standard):*** One-pair shielded cable of 22 AWG minimum is required. A cover plate with mounted connector and standard 2" x 4" x 2" (51 mm x 102 mm x 51 mm) outlet box is provided. Connector mates with signal cable from control console.
	Wireless (optional): 2.4 GHz spread spectrum radio features 64 non-interfering channels and 8 broadcast groups (see SL-04370).

MOUNTING
Hardware to mount display on two beams is included; hardware for more beams is at additional cost. Standard mounting uses I-beam clamps. Optional mounting method using angle brackets is also offered; maximum beam width is 12" (305 mm) and maximum beam depth is 22" (559 mm). Refer to attached drawings for more information on mounting methods.

SERVICE ACCESS
Digit panels and electronics are serviced from the front of the display.

GENERAL INFORMATION
100% solid state electronics are housed in an all aluminum cabinet. Display is shipped in one or two sections. Specifications and pricing are subject to change without notice.

OPTIONS & ACCESSORIES
- Win light
- Optional angle bracket mounting method
- Advertising/identification panels
- Decorative accents
- Electronic message centers and video displays in multiple sizes

ADVERTISING/IDENTIFICATION PANELS
Backlit & Non-Backlit:
1'-6" H x 16'-0" W (457 mm, 4.88 m)
2'-0" H x 16'-0" W (610 mm, 4.88 m)
2'-6" H x 16'-0" W (762 mm, 4.88 m)

For additional non-backlit panel sizes, see SL-03761.

FOR ADDITIONAL INFORMATION
- Installation Specifications: DWG-1157188 (attached)
- Standard I-beam Mounting: DWG-1052565 (attached)
- Optional Pole Mounting: DWG-1048184 (attached)
- Component Locations: DWG-1107413 (attached)

SAMPLE

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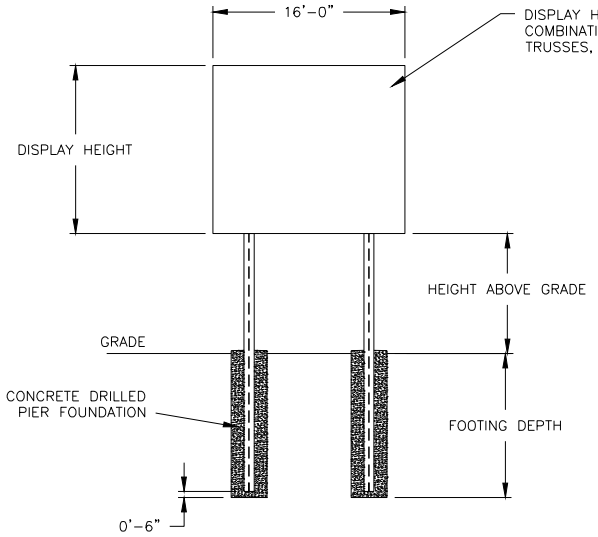
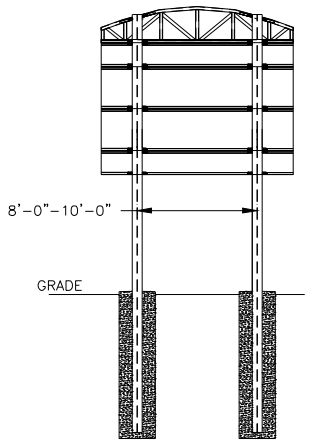
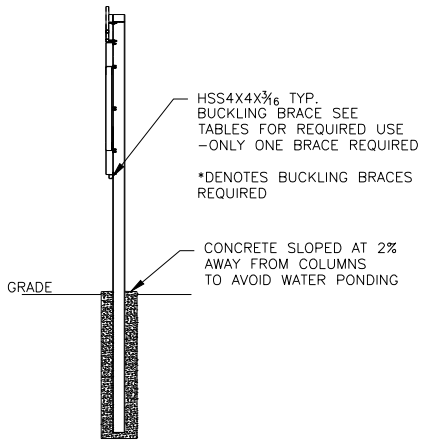
DAKTRONICS®



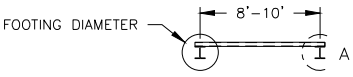
FRONT VIEW



REAR VIEW

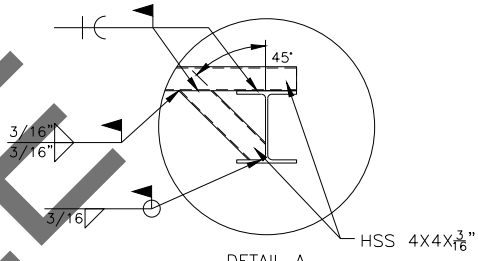


SIDE VIEW



LAYOUT VIEW

COLUMNS & FOOTING ONLY



DETAIL A
SCALE 1:32

TABLE A – MOUNTING

EXPOSURE B

HEIGHT ABOVE GRADE = 10'					
DISPLAY HEIGHT (FT)		DESIGN WIND VELOCITY			
		115 MPH	130 MPH	150 MPH	170 MPH
6	COLUMN	W8X18	W8X21	W10X22	W8X24
	FOOTING	2.0'X7.0'	2.0'X7.5'	3.0'X7.0'	2.0'X9.0'
8	COLUMN	W10X22	W8X24	W8X28	W8X31
	FOOTING	2.0'X8.0'	2.0'X8.5'	3.0'X8.5'	3.0'X9.0'
10	COLUMN	W12X26	W12X30	W10X26*	W12X26*
	FOOTING	3.0'X7.5'	3.0'X8.5'	3.0'X9.0'	3.0'X10.0'
12	COLUMN	W8X31	W10X33	W12X30*	W14X34*
	FOOTING	2.0'X9.5'	3.0'X9.0'	3.0'X10.0'	3.0'X11.0'
14	COLUMN	W10X26*	W12X26*	W14X34*	W16X36*
	FOOTING	3.0'X9.0'	3.0'X10.0'	3.0'X11.0'	3.0'X12.0'
16	COLUMN	W12X26*	W14X30*	W14X38*	W14X43*
	FOOTING	3.0'X9.5'	3.0'X10.5'	3.0'X11.5'	3.0'X13.0'

HEIGHT ABOVE GRADE = 15'					
DISPLAY HEIGHT (FT)		DESIGN WIND VELOCITY			
		115 MPH	130 MPH	150 MPH	170 MPH
6	COLUMN	W8X24	W12X26	W8X31	W10X33
	FOOTING	2.0'X8.0'	3.0'X7.5'	2.0'X9.5'	3.0'X9.0'
8	COLUMN	W8X31	W8X31	W10X39	W14X43
	FOOTING	3.0'X7.5'	2.0'X9.5'	3.0'X9.0'	3.0'X10.0'
10	COLUMN	W12X26*	W12X30*	W14X34*	W12X40*
	FOOTING	3.0'X8.5'	3.0'X9.0'	3.0'X10.0'	3.0'X11.0'
12	COLUMN	W12X30*	W14X34*	W12X40*	W14X48*
	FOOTING	3.0'X9.0'	3.0'X10.0'	3.0'X11.0'	3.0'X12.0'
14	COLUMN	W14X34*	W12X40*	W16X45*	W18X55*
	FOOTING	3.0'X10.0'	3.0'X11.0'	3.0'X12.0'	3.0'X14.0'
16	COLUMN	W16X36*	W14X43*	W21X48*	W21X55*
	FOOTING	3.0'X10.5'	3.0'X11.5'	3.0'X13.0'	3.0'X15.0'

FOOTING DIMENSIONS = DIAMETER X DEPTH
* DENOTES BUCKLING BRACE REQUIRED

EXPOSURE C

HEIGHT ABOVE GRADE = 10'			
DISPLAY HEIGHT (FT)		DESIGN WIND VELOCITY	
		115 MPH	140 MPH
6	COLUMN	W8X21	W8X24
	FOOTING	2.0'X8.0'	2.0'X9.0'
8	COLUMN	W8X24	W8X31
	FOOTING	2.0'X9.0'	3.0'X9.0'
10	COLUMN	W8X31	W10X39
	FOOTING	2.0'X10.0'	3.0'X10.0'
12	COLUMN	W12X26*	W14X34*
	FOOTING	3.0'X9.5'	3.0'X11.0'
14	COLUMN	W12X30*	W16X36*
	FOOTING	3.0'X10.0'	3.0'X12.0'
16	COLUMN	W14X34*	W16X40*
	FOOTING	3.0'X11.0'	3.0'X13.0'

HEIGHT ABOVE GRADE = 15'			
DISPLAY HEIGHT (FT)		DESIGN WIND VELOCITY	
		115 MPH	140 MPH
6	COLUMN	W8X28	W10X33
	FOOTING	2.0'X9.0'	3.0'X9.0'
8	COLUMN	W10X33	W14X43
	FOOTING	3.0'X8.5'	3.0'X10.0'
10	COLUMN	W12X40	W10X49
	FOOTING	3.0'X9.5'	3.0'X11.0'
12	COLUMN	W16X36*	W16X45*
	FOOTING	3.0'X10.5'	3.0'X12.0'
14	COLUMN	W16X40*	W21X48*
	FOOTING	3.0'X11.0'	3.0'X13.0'
16	COLUMN	W16X45*	W21X55*
	FOOTING	3.0'X12.0'	3.0'X14.5'

FOOTING DIMENSIONS = DIAMETER X DEPTH
* DENOTES BUCKLING BRACE REQUIRED

NOTE:
-REFER TO NOTE 7 FOR EXPOSURE CATEGORY DEFINITIONS.

NOTES:

1. FOOTING AND COLUMN SIZES ARE SUGGESTIONS ONLY, PROVIDED TO ASSIST WITH ESTIMATING INSTALLATION COSTS AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES. THE DESIGN MUST BE CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF THE INSTALLATION BEFORE THEY CAN BE USED FOR FABRICATION Or ERECTION.

2. INTERNATIONAL BUILDING CODE 2012 USED IN DESIGN OF COLUMNS AND FOOTINGS WITH, IMPORTANCE FACTOR=1, Kzt=1.0, Kd=0.85, G=0.85. SEISMIC DESIGN WAS NOT CONSIDERED.

3. FOOTING DIMENSIONS ARE BASED ON ASSUMED SOIL CLASS 4 (ALLOWABLE LATERAL BEARING PRESSURE OF 150 psf).

4. STRUCTURAL STEEL IS GRADE A992 (50 ksi) STEEL. CONCRETE SHALL HAVE A MINNIMUM 28 DAY COMPRESSIVE STRENGTH OF 2500 psi.

5. THE AVERAGE DISPLAY WEIGHT FOR A LAYOUT CAN NOT EXCEED 8 PSF.

6. DAKTRONICS INC. IS NOT RESPONSIBLE FOR STRUCTURES DESIGNED AND INSTALLED BY OTHERS.

7. LOCAL BUILDING OFFICIALS SHOULD BE CONTACTED TO DETERMINE THE WIND SPEED AND EXPOSURE CATEGORY FOR THE PROPOSED SIGN LOCATION. THE EXPOSURE CATEGORY C IS DEFINED AS:

EXPOSURE B – URBAN AND SUBURBAN AREAS, OR OTHER TERRAIN WITH NUMEROUS SPACED OBSTRUCTIONS HAVING THE SIZE OF SINGLE-FAMILY DWELLINGS OR LARGER. THESE CONDITIONS MUST PREVAIL FOR A DISTANCE FROM THE SIGN OF AT LEAST 2,600 ft OR 20 TIMES THE SIGN HEIGHT, WHICHEVER IS GREATER

EXPOSURE C – OPEN TERRAIN WITH SCATTERED OBSTRUCTIONS HAVING HEIGHTS GENERALLY LESS THAN 30 FT. THIS CATEGORY INCLUDES FLAT OPEN COUNTRY, GRASSLANDS, AND ALL WATER SURFACES IN HURRICANE PRONE REGIONS.

8. FOR SPECIFIC PRODUCT DETAILS ON WEIGHT, MOUNTING, ETC. REFER TO THE INDIVIDUAL PRODUCT SPECIFICATION SHEETS.

SAMPLE

REV	DATE:		BY:	
01	23 JUL 14	UPDATED CLAMPS IN REAR AND SIDE VIEWS AND ADDED 170 MPH WIND SPEC COLUMN	TJT	
REV	DATE:		BY:	

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BROOKINGS, SD 57006
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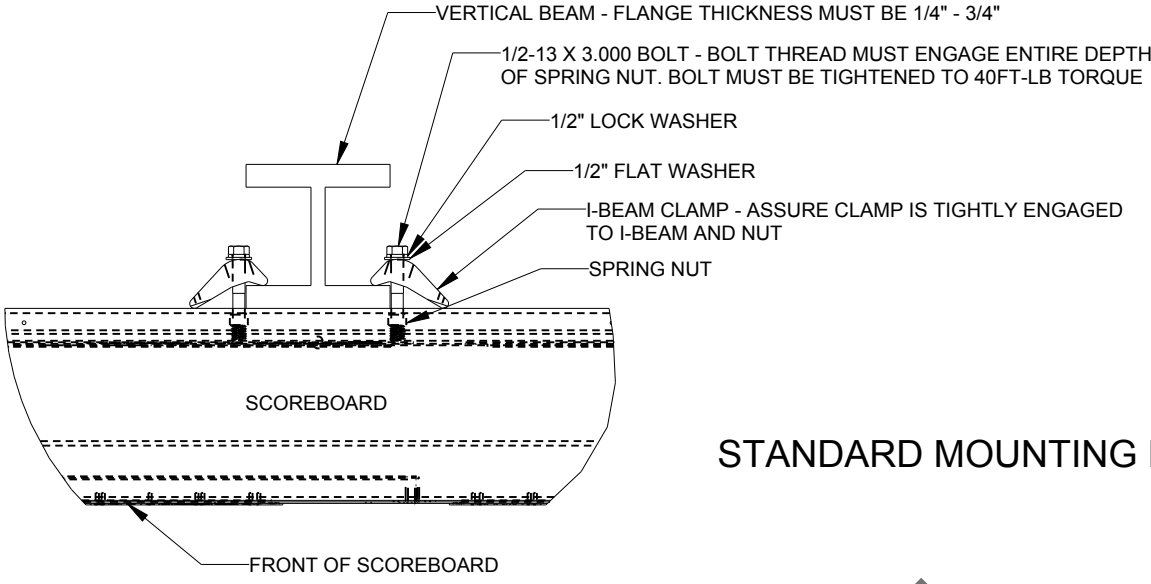
PROJ: OUTDOOR SCOREBOARD INSTALLATION
TITLE: 16' WIDTH SCOREBOARD INSTALLATION SPECS
DESIGN: RSCHWAR | DRAWN: RSCHWAR | DATE: 27 NOV 13
SCALE: 1/16"=1'

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1647	E-10-A	1157188

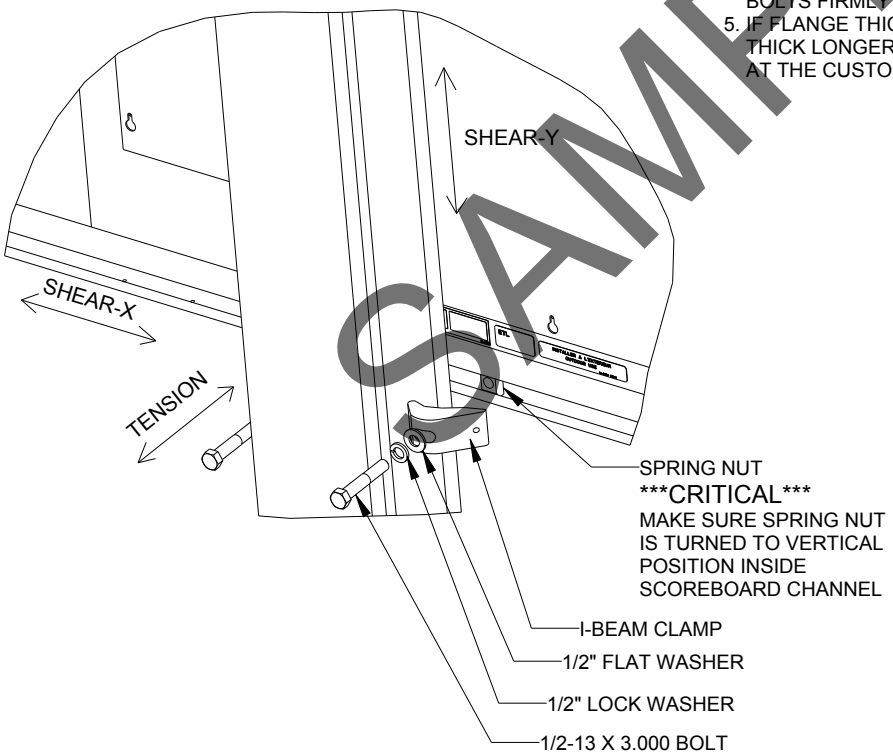


STANDARD MOUNTING METHOD

TOP VIEW

MOUNTING INSTRUCTIONS:
1. PLACE SPRING NUTS INTO SCOREBOARD CHANNEL IN APPROXIMATE LOCATION OF VERTICAL BEAMS
2. LIFT SCOREBOARD INTO POSITION
3. MAKE SURE THE 1/2-13 BOLTS ARE AS CLOSE TO THE I-BEAM FLANGES AS POSSIBLE
4. WHEN SCOREBOARD IS ADJUSTED TO FINAL DESIRED POSITION, TIGHTEN BOLTS FIRMLY
5. IF FLANGE THICKNESS IS MORE THAN 3/4" THICK LONGER BOLTS WILL BE REQUIRED AT THE CUSTOMER'S EXPENSE.

SAMPLE



ALLOWABLE CAPACITY PER EACH CLAMP:
SHEAR = 160 LBS
TENSION = 2300 LBS

SHEAR AND TENSION LOAD DIRECTION ARE AS INDICATED ON REAR ISOMETRIC VIEW

EXPLODED REAR ISOMETRIC VIEW

REV 04	DATE: 6 JAN 14	ADDED ALLOWABLE TENSION AND SHEAR CAPACITY DETAILS	BY: JAVA	
REV 03	DATE: 23 OCT 13	CHANGED BOLT TORQUE FROM 30 FT-LB TO 40 FT-LB PER EC-12382	BY: NJM	
REV 02	DATE: 07 MAR 12	ADDED STADNARD MOUNTING METHOD NOTES	BY: KDD	
REV 01	DATE: 21 FEB 12	CHANGED ROCKER TO I-BEAM	BY: KDD	

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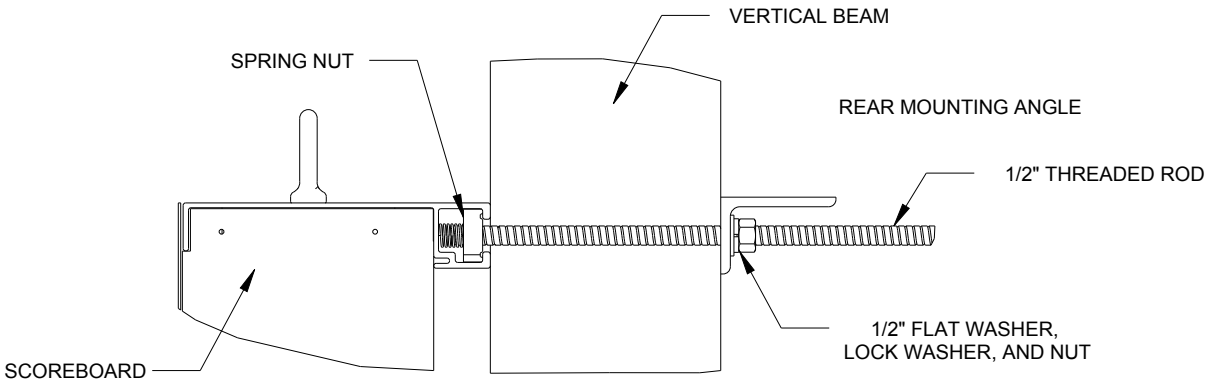
PROJ: OUTDOOR SCOREBOARD
TITLE: P1647; I-BEAM CLAMP MOUNTING

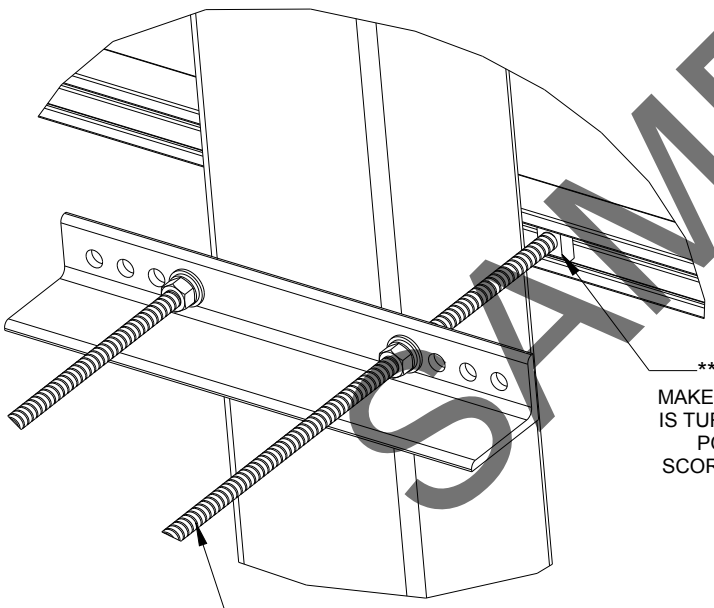
DESIGN:	DRAWN:	DATE:
MCARSRU	MCARSRU	06-JAN-14

SCALE: 1/8

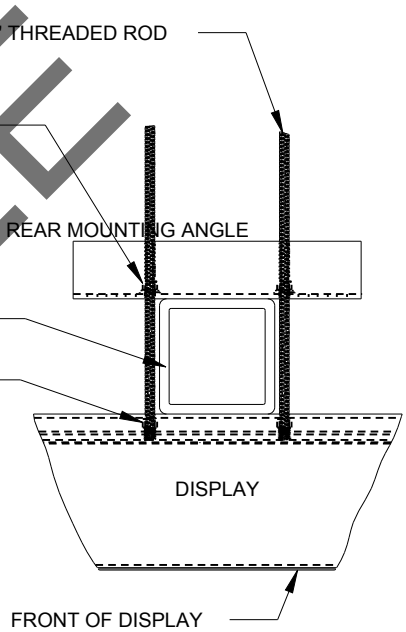
SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	
1 OF 1	04	P 1647	E - 07 - A	1052565



SIDE VIEW



REAR ISOMETRIC VIEW



TOP VIEW
SCALE 1/10

SAMPLE

STRUCTURAL NOTES:

- BOLT TORQUE: 30 FT-LB

NOTES:

- THREADED RODS RUN ALONG BOTH SIDES OF BEAM
- RODS DO NOT PASS THROUGH THE FLANGES OF THE BEAM
- NO DRILLING NECESSARY
- MAKE SURE SPRING NUT IS PERPENDICULAR TO CHANNEL OPENING ON SCOREBOARD

REV	DATE:		BY:	
03	3 JULY 13	ADDED STRUCTURAL NOTE	TTF	
02	20 SEP 12	REMOVED CHAMFER FROM 0M-133259 PER EC-7114	LMG	
01	06 OCT 11	REPLACED VERTICAL I-BEAM WITH 6" X 6" SQUARE TUBE	JAVA	

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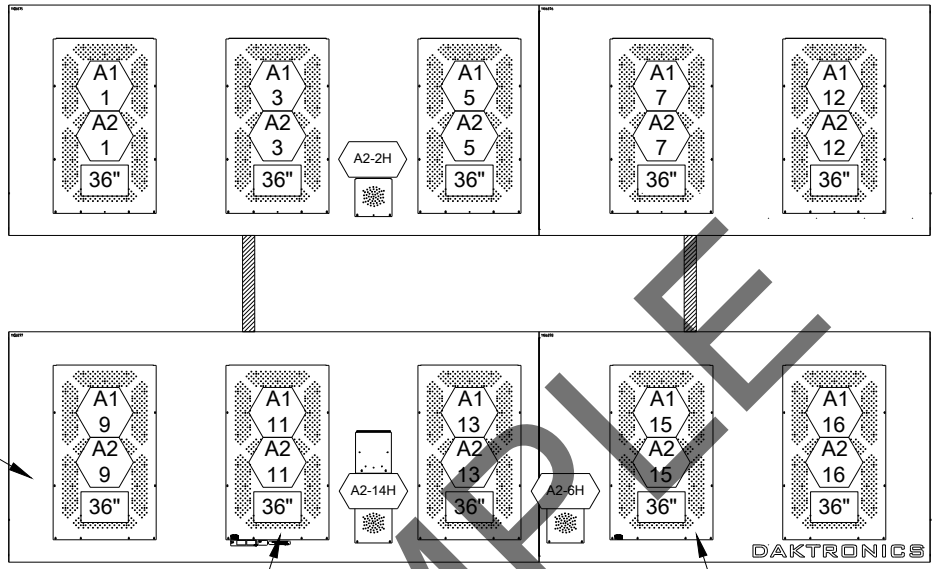
PROJ: OUTDOOR SCOREBOARDS
TITLE: P1647; POLE MOUNTING OPTIONS
DESIGN: DOPPELT | DRAWN: DOPPELT | DATE: 22 MAR 11
SCALE: 1/5

SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	
1 OF 1	03	P1647	E - 10 - A	1048184

DR-3683-R/A
(BOTH BOARDS)



DR-3682-R/A
(BOTTOM ONLY)

PRIMARY DRIVER (A1)
KNOCKOUTS FOR 1/2" CONDUIT
SIGNAL OPTION ON THIS DRIVER
(WIRE, FIBER, OR RADIO)

FRONT VIEW

SECONDARY DRIVER (A2)

SAMPLE

NOTES:

A1 / 1 = LED DRIVER NUMBER & LED DRIVER CONNECTOR WIRED TO THAT DIGIT.

36" = DIGIT SIZE

-BOTH DISPLAY SECTIONS ABOVE SPECIFY LOCATIONS FOR DR-3683

-FOLLOW ONLY THE BOTTOM DISPLAY SECTION FOR DR-3682

REV	DATE:		BY:
02	02 MAR 15	PER EC-17119, REMOVED DETAILS ADDED SIGNAL OPTION NOTE CHANGED MASTER TO PRIMARY	KDB
01	11 SEP 12	ADDED RADIO BRACKET PER EC-7502 UPDATED DIGIT LAYOUT OF TOP SECTION PER EC-7551	KDD

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PROJ: OUTDOOR AUTO RACING DISPLAYS
TITLE: COMPONENT LOCATION; DR-3682/3683-R/A
DESIGN: DOPPLET
DRAWN: AHOLTZ
DATE: 24 JULY 12
SCALE: 1=40

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE
1 OF 1	02	P1198	E - 07 - A

1107413

VARIABLE MESSAGE SIGN VMS 'B' SIZE

ATS Variable Message Sign B – is a trailer-mounted self-powered VMS board with remote messaging and radar speed display capabilities. The VMS can display multi-message full graphics in various font styles. It utilizes high brightness LED technology for superior visibility in all light conditions.

FEATURES

- Fully Solar powered with backup battery
- Designed to AS 4852.2-2009
- Rotatable mechanical tilt solar panels
- Full Matrix Display, 1 to 4 lines of text, graphics & animation
- High Quality Amber LED display
- Non-glare UV polycarbonate screen
- Graphical programming interface for instant message preview
- Hydraulic sign-lifting mechanism
- Fully galvanized trailer
- Lockable storage compartment
- Matt black panel frame with reinforced front
- Rotatable display sign panel
- Automatic display dimming

Controller and Programming

- Multiple programming options: SMS, RS232 direct serial connection, Mini PC with touch screen
- Windows compatible programmer
- Large storage: can store up to 100 pre-defined images and individual messages with various page sizes

Optional Extras

- Radar includes fully integrated "Speed-Display" features
- Mini-PC for on-site programming
- Security Wheel Locks

CATALOGUE NO. DESCRIPTION

CATALOGUE NO.	DESCRIPTION
AVMS-B	ATS Variable Message Sign B Trailer STD
AVMS-BC	ATS Variable Message Sign B Trailer AS Compliant

SPECIFICATIONS

MODEL	TYPE B
Display Type (mm)	LED Full Matrix
Display Size (mm)	2030 x 1400
Display Viewing Area (mm)	1830 x 1200
Pixel Matrix	48 x 28
Size of LEDs (mm)	5
Enclosure	IP54, front access

POWER

Batteries	2 x 12 Volt Deep-Cycle-200Ah
Battery Rating Voltage	12 Volts
Solar Panels	2 x 75 watts

SAMPLE

BESTPRACTICE CERTIFICATION ISO9001 QUALITY MANAGEMENT SYSTEM

NATA WORLD RECOGNISED ACCREDITATION A/N 10378

VMS 'C' SIZE

ATS Variable Message Sign C – is a trailer-mounted self-powered VMS board with remote messaging and radar speed display capabilities. The VMS can display multi-message full graphics in various font styles. It utilizes high brightness LED technology for superior visibility in all light conditions.

FEATURES

- Fully Solar powered with backup battery
- Designed to AS 4852.2-2009
- Rotatable mechanical tilt solar panels
- Full Matrix Display, 1 to 4 lines of text, graphics & animation
- High Quality Amber LED display
- Non-glare UV polycarbonate screen
- Graphical programming interface for instant message preview
- Hydraulic sign lifting mechanism
- Fully galvanized trailer
- Lockable storage compartment
- Matt black panel frame with reinforced front
- Rotatable display sign panel
- Automatic display dimming

Controller and Programming

- Multiple programming options: SMS, RS232 direct serial connection, Mini PC with touch screen
- Windows compatible programmer
- Large storage: can store up to 100 pre-defined images and individual messages with various page sizes

Optional Extras

- Radar includes fully integrated "Speed-Display" features
- Mini-PC for on-site programming
- Security Wheel Locks

CATALOGUE NO.	DESCRIPTION
AVMS-C	ATS Variable Message Sign C Trailer STD
AVMS-CC	ATS Variable Message Sign C Trailer AS Compliant

SPECIFICATIONS

MODEL	TYPE C
Display Type (mm)	LED Full Matrix
Display Size (mm)	2700 x 1800
Display Viewing Area (mm)	2440 x 1600
Pixel Matrix	48 x 28
Size of LEDs (mm)	5
Enclosure	IP54, front access

POWER

Batteries	3 x 12 Volt Deep-Cycle-200Ah
Battery Rating Voltage	12 Volts
Solar Panels	2 x 125 watts

SAMPLE

BESTPRACTICE CERTIFICATION ISO9001 QUALITY MANAGEMENT SYSTEM

NATA WORLD RECOGNISED ACCREDITATION A/N 10378

VARIABLE MESSAGE SIGN VMS 'C' SIZE (COLOUR)

ATS Variable Message Sign C – is a trailer-mounted self powered VMS board with remote messaging and radar speed display capabilities. The VMS can display multi-message full graphics in various font styles. It utilizes high brightness LED technology for superior visibility in all light conditions.

FEATURES

- Fully Solar powered with backup battery
- Designed to AS 4852.2-2009
- Rotatable mechanical tilt solar panels
- Full Matrix Display, 1 to 4 lines of text, graphics & animation and auto fit font
- High Quality 5 colour LED display (Yellow, Red, Green, White, Blue)
- Non-glare UV polycarbonate screen
- Graphical programming interface for instant message preview
- Hydraulic sign lifting mechanism
- Fully galvanized trailer
- Lockable storage compartment
- Burnt orange panel frame with reinforced front
- Rotatable display sign panel
- Fault reporting
- Automatic display dimming
- Security locable wheels

Controller and Programming

- Multiple programming options: SMS, RS23, Mini PC with touch screen, GPRS
- Windows compatible programming
- Large storage: can store over 100 predefined images and individual messages with various page sizes

Optional Extras

- Radar includes fully integrated "Speed-Display" features
- Mini-PC for on-site programming

CATALOGUE NO.	DESCRIPTION
AVMS-C5	ATS Variable Message Sign C 5 Colour Trailer STD
AVMS-C5C	ATS Variable Message Sign C 5 Colour Trailer AS Compliant

BESTPRACTICE CERTIFICATION ISO9001 QUALITY MANAGEMENT SYSTEM

NATA WORLD RECOGNISED ACCREDITATION A/N 10378

SPECIFICATIONS

MODEL	TYPE C
Display Type (mm)	LED Full Matrix 5 Colour
Visible Approach Speed	110 km/h
Display Viewing Area (mm)	2400 x 1600
Pixel Matrix	48 x 28 / 50mm Pitch
Size of LEDs (mm)	5
Enclosure	IP65 front access

POWER

Batteries	4 x 12 Volt 130Ah Maintenance Free
Battery Rating Voltage	12 Volts
Solar Panels	3 x 130W 12V

SAMPLE

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
DOH/CWB

10044PNN.15

October 22, 2015

10-23-15 P03:05 RCVD

Mr. Kyle Kaneshiro, P.E., LEED AP
Principal
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, Hawaii 96817

Dear Mr. Kaneshiro:

SUBJECT: Comments on the Environmental Assessment Consultation for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment Tax Map Keys (4) 1-2-002: 036 & 040 Kekaha, Island of Kauai, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the subject document and has no comments at this time. The DOH-CWB provided comments on the Draft Environmental Assessment (DEA) for this project (Letter No. 07044PJF.15, dated July 29, 2015).

Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/CWB-standardcomment.pdf.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

NN:ay

c: EPO [via e-mail Noella.Narimatsu@doh.hawaii.gov only]

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

December 30, 2015

Alec Wong, P.E., Chief
Department of Health
Clean Water Branch
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Draft Environmental Assessment
Response to Your Comment Letter Dated August 6, 2015 for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Wong,

Thank you for your letter dated July 29, 2015 regarding the *Draft Environmental Assessment, Mana Drag Race Strip Electrical and Lighting Upgrades*. We have the following response to Clean Water Branch (CWB) comments.

1. We acknowledge that any project and its potential impacts must meet the anti-degradation policy, designated uses, and water quality criteria outlined in the State of Hawaii (State) Water Quality Standards (Chapter 11-54, Hawaii Administrative Rules). The receiving water for the project is the Pacific Ocean, which is designated a Class A marine water in the vicinity of the project site.

   The project may result in minor and temporary water quality impacts of the type and scale typical of minor construction projects which include limited amounts of ground disturbance. Appropriate construction best management practices (BMPs) will be employed to minimize water pollution and soil erosion into State waters.

   The project will conform with the general policy of water quality anti-degradation (§11-54-1.1, Hawaii Administrative Rules) and will not endanger the designated uses of nearby waterbodies (§11-54-3, Hawaii Administrative Rules). Implementation of construction BMPs will mitigate possible impacts to the water quality criteria (§11-54-4, Hawaii Administrative Rules).

2. We acknowledge that a National Pollutant Discharge Elimination System (NPDES) permit must be obtained for pollutant discharges into surface waters of the State, including for certain situations involving storm water. The project involves over 1 acre of land, and will obtain an NPDES permit for storm water runoff related to construction activities.

3. The proposed project does not involve work in, over, or under Waters of the United States. If it is later found that such work is required, we understand that additional permit requirements may be triggered pursuant to Section 401 and 404 of the Clean Water Act

1622 KANAKANUI STREET HONOLULU, HAWAII 96817
(808) 596 7790 tlcghawaii.com

and Section 10, Rivers and Harbors Act. If such work is required, we will consult with the United States Army Corps of Engineers.

4. We acknowledge that all discharges related to the project must comply with the State water quality standards, regardless of whether or not a CWB permit is required. We understand that noncompliance may be subject to penalties of $25,000 per day per violation.

5. We concur with the CWB position regarding the importance of measures to protect, restore and sustain water quality and beneficial uses of State waters.

   a. We recognize that storm water is an asset that sustains and protects natural ecosystems and beneficial uses of State waters. Opportunities to implement low impact development and bioengineering are limited since the scope of the project is limited to the installation of lighting and electrical utilities.

   b. Statements regarding conservation of natural resources and improvement of water quality will be incorporated into the Final EA.

   c. Storm water BMPs will be incorporated into the project as required by federal, state, and county laws, regulations and ordinances.

   d. Opportunities to implement green building practices and bioengineering of existing drainage systems are limited since the project scope is limited to the installation of lighting and electrical utilities and there is no existing storm water infrastructure at the project site.

Thank you for your interest and participation in the environmental review process. You will be notified when the Final EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR, Engineering Division

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

10-23-15P03:05 RCVD

October 20, 2015

Mr. Kyle Kaneshiro
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

Dear Mr. Kaneshiro:

This correspondence is in response to your request for comments to the Environmental Assessment Consultation for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment, Tax Map Key (4) 1-2-002: 036 & 040 located at Kekaha, Kauai, Hawaii.

Project activities shall comply with the following Administrative Rules of the Department of Health:

- Chapter 11-46 Community Noise Control

Should you have any questions, please contact me at (808) 586-4701.

Sincerely,

for Jeffrey M. Eckerd
Program Manager
Indoor and Radiological Health Branch

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

December 30, 2015

Jeffrey M. Eckerd, Program Manager
Department of Health
Indoor and Radiological Health Branch
P.O. Box 3378
Honolulu, Hawaii 96817

Subject: Draft Environmental Assessment
Response to Your Comment Letter Dated October 20, 2015 for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Eckerd,

Thank you for your letter dated October 20, 2015 regarding the *Draft Environmental Assessment, Mana Drag Race Strip Electrical and Lighting Upgrades*. We have the following response to Indoor and Radiological Branch (IRHB) comments.

The construction contractor will be required to comply with Chapter 11-46, Hawaii Administrative Rules "Community Noise Control".

Thank you for your interest and participation in the environmental review process. You will be notified when the Final EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR, Engineering Division

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 12, 2015

The Limtiaco Consulting Group, Inc.
Attention: Kyle Kaneshiro, Principal
1622 Kanakanui Street
Honolulu, Hawaii 96817

via email: kyle@tlcghawaii.com

Dear Mr. Kaneshiro,

SUBJECT: Environmental Assessment Consultation for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (1) Land Division – Kauai District; (2) Division of Boating & Ocean Recreation; (3) Division of Aquatic Resources; and (4) Engineering Division. No other comments were received as of our suspense date. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2015 OCT 29 AM 11:10
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

October 21, 2015

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Assessment Consultation for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment
LOCATION: Tax Map Keys (4) 1-2-002: 036 and 040; Kekaha, Kauai, Hawaii
APPLICANT: Department of Land and Natural Resources, Engineering Division, by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments
4. Click on the subject file "Environmental Assessment Consultation for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Linda Kawakami at (808) 587-0371 or Linda.Kawakami@hawaii.gov)

Please submit any comments by November 9, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

(X) We have no objections.
( ) We have no comments.
( ) Comments are attached.

DLNR KDLO RCVD
OCT 26 '15
PM12:38:42

Signed: Marvin Nikasa
Print Name: MARVIN NIKASA
Date: OCT. 27, 2015

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 21, 2015

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

RECEIVED
LAND DIVISION
2015 OCT 27 AM 11:05
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Assessment Consultation for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment
LOCATION: Tax Map Keys (4) 1-2-002: 036 and 040; Kekaha, Kauai, Hawaii
APPLICANT: Department of Land and Natural Resources, Engineering Division, by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
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Please submit any comments by November 9, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: [signature]
Print Name: Edward R Underwood
Date: 10/22/15

OCT22'15PM12:16BOR ADM

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
OCT 22 2015
AQUATIC RESOURCES

DAR #5191

October 21, 2015

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
___Div. of State Parks
___Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

2015 NOV -5 AM 10:58
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
RECEIVED LAND DIVISION
JKV
DH

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Assessment Consultation for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment
LOCATION: Tax Map Keys (4) 1-2-002: 036 and 040; Kekaha, Kauai, Hawaii
APPLICANT: Department of Land and Natural Resources, Engineering Division, by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments
4. Click on the subject file "Environmental Assessment Consultation for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Linda Kawakami at (808) 587-0371 or Linda.Kawakami@hawaii.gov)

Please submit any comments by November 9, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: Bruce S. Anderson
Print Name: Bruce S. Anderson, DAR Administrator
Date: Nov. 4, 2015

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: November 2, 2015
DAR #5191

MEMORANDUM

TO: Bruce S. Anderson, DAR Administrator

DATE: Nov. 4, 2015

FROM: Donald E. Heacock, Aquatic Biologist

SUBJECT: EA Mana Drag Race Strip Lighting Upgrade: request for Conservation District Use Permit, Shoreline Setback Determination, Special Management Area Permit, and a National Pollution Discharge Elimination System Permit

Comment	Date Request	Receipt	Referral	Due Date
	10-21-15	10-22-15	10-23-15	11-9-15

Requested by: Russell Y. Tsuji, Land Administrator

Summary of Proposed Project:
Currently, the Garden Island Racing Assoc. (GIRA) uses portable generators and temporary lighting at the Kauai Raceway Park (KRP) in Mana, Kauai, and they are now requesting permanent electrical power and lighting. DLNR Engineering and the GIRA propose the installation permanent electrical connection with Kauai Island Utility Co., overhead power transmission lines from Kaumuali'i highway to the KRP and 19 stadium-style pole lighting along the length of the drag strip

Title: Mana Drag Race Strip proposed Lighting upgrade and

Project by: DLNR Engineering (Adrian Chang), the Garden Island Racing Association (GIRA) and the Limtiaco Consulting Group

Location: Waimea (Mana), Kauai

Brief Description: The DLNR Engineering and the GIRA propose installation of permanent electrical hookup with Kauai Island Utilities Co. (KIUC), overhead transmission lines from Kaumuali'i Hwy to Kauai Raceway Park (KRP) and 19 stadium-style pole lighting along the length of the drag strip to improve lighting and driver safety. They state that lighting will be downcast to mitigate potential impacts to seabirds.

Comments: Threatened green sea turtles (honu), *Chelonia mydas*, nest regularly on Kauai, particularly in the Mana-Barking Sands area. In 2013 over 100 honu nests were observed on 20 beaches (including

Mana), and well over 1,000 hatchlings were documented. Hatchling honu are often disoriented by bright light shining towards the beach since they are positively attracted to lights. Therefore, no proposed lighting should be allowed to shine directly or indirectly on the beach. Also, it may be necessary towards the south-east end of the drag strip, which is very close to the vegetation line and close to the beach, to place the stadium-style lighting only on the south (makai) side of the raceway to focus lighting away from the beach. Additionally, the U.S. Fish & Wildlife Service recommends "yellow lighting" that cannot be seen by honu, thereby reducing or eliminating disorientation due to artificial light pollution, and increasing survival of hatchlings.

Finally, placing the overhead electrical lines underground may be desirable to mitigate for seabird strike if our DOFAW recommends such action.

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

DAVID Y. IGE
GOVERNOR OF HAWAII

'15 OCT 22 PM03:05 ENGINEERING

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 21, 2015

RECEIVED
LAND DIVISION
2015 NOV -9 AM 11:03
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FRR',

TO:

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Environmental Assessment Consultation for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment

LOCATION: Tax Map Keys (4) 1-2-002: 036 and 040; Kekaha, Kauai, Hawaii

APPLICANT: Department of Land and Natural Resources, Engineering Division, by its consultant The Limtiaco Consulting Group

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments
4. Click on the subject file "Environmental Assessment Consultation for Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to Final Environmental Assessment", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Linda Kawakami at (808) 587-0371 or Linda.Kawakami@hawaii.gov)

Please submit any comments by November 9, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: _____
Print Name: Carty S. Chang, Chief Engineer
Date: 11/9/15

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/ Russell Y. Tsuji
REF: EA Consultation for Proposed Mana Drag Strip Electrical and Lighting Upgrades Project, Addition of Scoreboard to FEA
Kauai.017

COMMENTS

(X) **We confirm that the scoreboard, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone AE. The National Flood Insurance Program regulates developments within Zone AE as indicated in bold letters below.**

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone ___.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

(X) **Please note that the scoreboard site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.**

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Carter Romero (Acting) at (808) 961-8943 of the County of Hawaii, Department of Public Works.

( ) Mr. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Planning.

(X) **Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.**

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 11/6/15

Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	KAUAI
TMK NO:	(4) 1-2-002:040
WATERSHED:	HOEA
PARCEL ADDRESS:	KAUMUALII HWY KEKAHA, HI 96752

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 26, 2010
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL - EFFECTIVE DATE:	1500020232F - NOVEMBER 26, 2010 1500020251F - NOVEMBER 26, 2010

THIS PROPERTY IS WITHIN A TSUNAMI EVACUTION ZONE: YES
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
FOR MORE INFO, VISIT: http://dlnreng.hawaii.gov/dam/

0 400 800 ft

Disclaimer: The Hawaii Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use, accuracy, completeness, and timeliness of any information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR, its officers, and employees from any liability which may arise from its use of its data or information.

If this map has been identified as 'PRELIMINARY', please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
(Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also know as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
	Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase apply, but coverage is available in participating communities.

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

December 30, 2015

Russell Y. Tsuji, Administrator
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawaii 96809
Attn: Steve Molmen

Subject: Draft Environmental Assessment
Response to Your Comment Letters Dated August 5, 2015 & November 12, 2015
for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kauai, Hawaii

Dear Mr. Tsuji,

Thank you for your comment letters dated August 5, 2015 and November 12, 2015, which contained comments from the (1) Division of Aquatic Resources, (2) Division of Boating and Ocean Recreation, (3) Office of Conservation and Coastal Lands, (4) Engineering Division, (5) Division of Forestry and Wildlife, and (6) Land Division – Kauai District Office. We have the following responses to comments.

Division of Aquatic Resources

Thank you for your comments regarding project's potential impacts on the threatened green sea turtle (*Chelonia mydas*). We acknowledge that the green sea turtle nests regularly on beaches throughout Kauai, including in the Mana-Barking Sands area. We understand that green sea turtle hatchlings may be disoriented by bright light shining directly or indirectly on the beach since they are positively attracted to lights. The proposed stadium lighting is only proposed for installation along the makai side of the drag race strip such that all light will be directed away from the shoreline. Additionally, the proposed stadium lighting will not involve the use of any backlighting (toward the shoreline). An illumination summary will be included with the Final EA showing that, given the downcast nature of the lighting and the fact that no backlighting will be used, 0.0 foot-candles of light will be visible from the shoreline area. An existing sandy berm and vegetation line between the proposed lighting and the shoreline should further mitigate any potential impacts of the proposed project on green sea turtles.

Division of Boating and Ocean Recreation

We acknowledge that the Division of Boating and Ocean Recreation does not have any comments regarding the proposed project.

1622 KANAKANUI STREET HONOLULU, HAWAII 96817
(808) 596 7790 tlcghawaii.com

Office of Conservation and Coastal Lands
Thank you for providing additional alternatives for consideration in the Final EA. The Final EA will include analysis of using improved portable generators or installation of permanent generators. The use of underground utility conduits instead of overhead lines/power poles will also be considered.

Engineering Division
We acknowledge that, according to the Flood Insurance Rate Map (FIRM), the proposed project is located in Flood Zone AE, and that the National Flood Insurance Program (NFIP) regulates development within Zone AE. We understand that the project must comply with the rules and regulations of the NFIP presented in Title 44 of the Code of Federal Regulations (44 CFR), whenever development within a Special Flood Hazard Area is undertaken.

Division of Forestry and Wildlife
Thank you your comment that the Hawaiian goose (*Branta sandvicensis*) has been recently observed in the Kekaha Agriculture Association lands on the mauka side of Kaumualii Highway (Route 50). Discussion regarding the Hawaiian goose will be added to the Final Environmental Assessment. We acknowledge that impacts and mitigation measures for the Hawaiian goose would be the same as for the other listed wildlife species on page 3-14, paragraph 3 of the Draft EA.

The Final EA will mention that the birthing and pup-rearing season for the Hawaiian hoary bat (*Lasiurus cinerus semotus*) is from June 1 through September 15. We acknowledge that woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season. Although there are large trees located along the perimeter of the project area, proposed structures (utility poles, light poles and transformers) will be constructed in areas that are already clear of large vegetation. As such, no woody plants greater than 15 feet tall will be disturbed as part of the proposed project. Nevertheless, the Final EA will include the recommendation that woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed during the period from June 1 through September 15. The Final EA will recommend that a survey should be conducted by a knowledgeable wildlife biologist if trees must be cut or removed during the birthing and pupping season.

Land Division – Kauai District Office
We acknowledge that the Land Division – Kauai District Office does not have any objections to the proposed project.

Thank you for your interest and participation in the environmental review process. You will be notified when the Final Environmental Assessment is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR, Engineering Division
Marvin Mikasa, DLNR Land Division – Kauai District Office
Edward Underwood, DLNR Division of Boating and Ocean Recreation
Bruce Anderson, DLNR Division of Aquatic Resources
Samuel J. Lemmo, DLNR Office of Conservation and Coastal Lands
Galen K. Kawakami, DLNR Division of Forestry and Wildlife – Kauai Branch

PHONE (808) 594-1888

FAX (808) 594-1938

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAI'I 96817

12-15004-A95508PAIN

HRD14/7320D

November 5, 2015

Kyle Kaneshiro, P.E. LEED AP, Principal
The Limtiaco Consulting Group
828 Fort Street Mall, Suite 600
Honolulu, HI 96813

Re: Environmental Assessment
Mānā Drag Race Strip Electrical and Lighting Upgrades Project
Addition of Scoreboard to Final Environmental Assessment
Waimea Ahupua'a, Kona Moku, Kaua'i Mokupuni
Tax Map Key: (4) 1-2-002:036, 040

Aloha e Kyle Kaneshiro:

The Office of Hawaiian Affairs (OHA) is in receipt of your October 12, 2015 letter, seeking comments on the addition of an LED scoreboard to the proposed Mānā Drag Race Strip Electrical and Lighting Upgrades Project (project).

According to your letter, an LED scoreboard is being added to the scope for the proposed project; the scoreboard will be positioned in an area on the mākai side of the track that will not impact archaeological and cultural resources, socio-economic characteristics, geology and soils, and infrastructure. OHA has concerns about the statement, that the scoreboard "will not impact archaeological and cultural resources." Without any testing or trenching of the area, it would be premature to state that there will be no impacts because the scope of work for the scoreboard addition was not included in your letter. In our previous pre-consultation letter dated December 30, 2014, OHA noted that burials in sand deposits that extended inland from the coast were a traditional Hawaiian burial practice and there is a high possibility of encountering traditional Hawaiian burials and cultural deposits. In an adjacent parcel to the project, Kaua'i State Historic Preservation identified the area as a place where human remains had been found. Once again, OHA requests that the State Historic Preservation Division recommend archaeological monitoring of any new ground excavation.

Your letter notes the LED will be red or amber in color to mitigate potential impacts to seabirds, including the Hawaiian petrel and the Newell's shearwater. The location of the scoreboard will be away from tall trees and shrubs to protect the Hawaiian hoary bat, 'ōpe'ape'a. According to an article in the U.S. Fish & Wildlife Service, Endangered Species in the Pacific Islands (September 20, 2012) the 'ōpe'ape'a was listed as an endangered species on October 13, 1970 under the Federal Endangered Species Act and on the State of Hawaii's Endangered Species List. Kaua'i is only one of two islands where breeding has been documented.

As mentioned in our previous letter, OHA does request assurances that should iwi kūpuna or Native Hawaiian cultural deposits be identified during ground altering activities related to this project, all work will immediately cease and the appropriate agencies, including OHA, will be contacted pursuant to applicable law.

Thank you for the opportunity to comment on the additional project information. Should you have any questions, please contact Kathryn Keala at 594-0272 or kathyk@oha.org.

'O wau iho nō me ka 'oia'i'o,

Kamana'opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer

KC:kk

C: Kaliko Santos – Kaua'i Community Outreach Coordinator *(via e-mail)*

**Please address replies and similar, future correspondence to our agency:*
Dr. Kamana'opono Crabbe
Attn: OHA Compliance Enforcement
560 N. Nimitz Hwy, Ste. 200
Honolulu, HI 96817

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

December 30, 2015

Kamana'opono M. Crabbe, Ph.D., CEO
560 N. Nimitz Hwy, Ste. 200
Honolulu, Hawaii 96817
Attn: OHA Compliance Enforcement

Subject: Draft Environmental Assessment
Response to Your Comment Letter Dated August 6, 2015 for the Proposed Mana Drag Race Strip Electrical and Lighting Upgrades Project
Tax Map Keys (4) 1-2-002: 036 & 040
Kekaha, Kaua'i, Hawai'i

Dear Dr. Crabbe,

Thank you for your letter dated November 5, 2015 regarding the *Draft Environmental Assessment, Mana Drag Race Strip Electrical and Lighting Upgrades*. We have the following response to Office of Hawaiian Affairs (OHA) comments.

We acknowledge that burials in sand deposits that extended inland from the coast were a traditional Hawaiian burial practice, and that human remains have been found in parcels adjacent to the project parcel. We understand your concern that there is a high possibility of encountering traditional Hawaiian burials and cultural deposits.

In November 2015, an Archaeological Inventory Survey (AIS) was completed to assess potential impacts the project may have on cultural or archaeological resources. The AIS included a pedestrian survey and subsurface testing and the project site. Subsurface testing included a total of 90 test excavations, including 59 test trenches along the makai side of the Mana Drag Race Strip. Several test trenches were located in the vicinity of the proposed scoreboard. No resources were discovered during the surface and subsurface investigation of the project site. Nonetheless, archaeological monitoring will be performed during construction of the proposed project. An archaeological monitoring plan will be submitted to the State Historic Preservation Division for review and approval prior to the start of construction. The construction contractor will be instructed to contact the OHA's Kauai office at (808) 241-3506 in the event that Iwi or other cultural deposits are discovered during construction.

Thank you for your additional information regarding the Hawaiian hoary bat ('ōpe'ape'a). The Final EA will include the statement that Kaua'i is one of two islands where breeding of 'ōpe'ape'a has been documented.

1622 KANAKANUI STREET HONOLULU, HAWAII 96817
(808) 596-7790 tlcghawaii.com

Thank you for your interest and participation in the environmental review process. You will be notified when the Final EA is completed and available for public review. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Kyle H. Kaneshiro, P.E., LEED AP
Principal
kyle@tlcghawaii.com

cc: Adrian Chang, DLNR, Engineering Division