DRAFT
ENVIRONMENTAL ASSESSMENT

Haleiwa Road Drainage Improvements

Department of Design and Construction
City and County of Honolulu

December 2017

General Information & Summary Sheet

Project: This Environmental Assessment addresses a proposed drainage improvement project which impacts Haleiwa Road near Kaiaka Bay Beach Park. The proposed improvement intends to alleviate the ponding of storm water runoff which accumulates in the low lying area of the beach park and back up onto Haleiwa Road. The ponded water impedes traffic in the vicinity of Haleiwa Elementary School, the Waialua Fire Station, the First Baptist Church (and Pre-school) of Haleiwa, as well as adjacent businesses and residences. The proposed project consists of an underground drainage system constructed within Kaiaka Bay Beach Park from an existing depression within the park for a distance of approximately 1,200 feet to Kaiaka Bay. The underground drainage system would have an average depth to invert of 6 feet below the present ground level.

Location	Waialua District, O‘ahu, Hawai‘i , City and County of Honolulu
Tax Map Key	6-6-007:007
Project Site	Approximately 10.2 acres (disturbance).
State Land Use District & Zoning	Urban (State Land Use District); P-2 General Preservation (Zoning).
Ownership	City and County of Honolulu.
Neighborhood Board/Council Dist.	Neighborhood Board No. 27 (North Shore); City Council District 2.
Approving Agency	Department of Design and Construction, 650 South King Street, Honolulu, Hawai‘i 96813.
Proposing Agency	Department of Design and Construction, 650 South King Street, Honolulu, Hawai‘i 96813.
Prime Consultant	Gray Hong Nojima & Associates, 201 Merchant Street, Suite 1900, Honolulu, Hawai‘i 96813, Gavin Masaki, PE; Phone: 808-521-0306 extension 110; Fax: 808-531-8018; E-mail: gmasaki@grayhongnojima.com.
Subconsultant	Eugene P. Dashiell, AICP, Environmental Planning, 728 Nunu Street, Kailua, Hawai‘i 96734; Telephone & Fax: (808) 254-4522; E-mail: dashiellplanning@outlook.com.
Anticipated Permits and Approvals	Special Management Area Permit (Major), Shoreline Setback Variance, & Grading Permit (Dept. Planning & Permitting); Conservation District Use Permit (State Department of Land and Natural Resources); NPDES General Permit Coverage (construction stormwater runoff, hydrotesting and construction activity dewatering effluent), WQC dredging/filling per CWA/USACE, State Dept. of Health; USACE Permit Sec 10/1899 R&H and CWA Sec 401/404; CZM Consistency Declaration (DBEDT/HCZMP)

Contents

Page

References

Figures

Tables

Appendices

A. Biological Report
B. Archaeological and Cultural Assessment
B1. Draft Archaeological Inventory Survey
C. Geotechnical Engineering Exploration
D. Drainage Study
E. Correspondence

1 Description of the Proposed Action

1.1 **Technical characteristics.** This section describes the location and purpose of the project and how it would be accomplished.

1.1.1 **Project background.** During heavy rainfall, storm water accumulates in the low lying area of Kaiaka Bay Beach Park, which eventually backs up onto Haleiwa Road. In the absence of a drainage system, the accumulated runoff ponds in this area, until it evaporates, is pumped away, or infiltrates into the ground. The ponded water impedes traffic on Haleiwa Road, and interferes with ingress and egress to the Waialua Fire Station, Kaiaka Bay Beach Park, First Baptist Church (and Preschool) of Haleiwa and adjacent businesses and residences. The ponded water also causes traffic hazards and delays for first responders, and is detrimental to public health and safety. The ponded situation can occur several times a year.

1.1.2 **Location and purpose of the project**. The project site is located along the north shore of O'ahu at Haleiwa. (Figure 1). The project will alleviate the ponded water along Haleiwa Road (Figures 2 & 3, below) and improve public health and safety. The proposed drainage system in Kaiaka Bay Beach Park will remove storm runoff from the existing depression and provide relief to the accumulation of storm runoff on Haleiwa Road which adversely affects the Waialua Fire Station and surrounding properties.

Figure 2. Ponded stormwater on Haleiwa Road between Waialua Fire Station and Kaiaka Bay Beach Park. Image courtesy of First Baptist Church of Haleiwa.

Figure 3. Ponded stormwater along Haleiwa Road and on property of First Baptist Church of Haleiwa. Image curtesy of First Baptist Church of Haleiwa.

1.1.3 **Description of the Project.** The proposed drainage improvements will provide drainage relief to Haleiwa Road by directing runoff into a grated inlet to be constructed within a surface depression of Kaiaka Bay Beach Park. The grated inlet will connect to a 1,200 foot long underground drainage system which will convey the ponded runoff into Kaiaka Bay (Figure 12). The underground drainage system, which will consist of drain pipes, drain structures and a water quality unit, will have an average depth of 6 feet below the existing ground level. The invert (inside bottom) elevation of the drain line outlet to Kaiaka Bay will be located above the mean high tide elevation, so that storm water can free flow into the ocean. An in-line check valve will be installed in the drain line just upstream of the discharge outlet (Figure 13). The check valve flap will not swing open unless the water surface level at Kaiaka Bay is below the outlet. Thus, under extreme storm conditions, if the Kaiaka Bay water level rises above the outlet, the flap valve will not open until the Kaiaka Bay water level subsides. This design element prevents back-flow of water from Kaiaka Bay into the park.

Figure 3A. Depression in Park. High grass grows in the center of the depression in the park where water ponds. In the background is the First Baptist Church Preschool. Foreground is the Kaiaka Bay Beach Park interior road. The drainage system will pass beneath this road.

1.1.4 **Schedule.** Construction of the proposed improvements is scheduled to begin in 2019 with estimated formal completion by 2020. Actual duration of construction may be approximately 6 months.

1.1.5 **Cost.** Total cost of the improvements is estimated not to exceed $4 million.

1.2. **Socio-economic characteristics**. This section discusses the impacts of the proposed project on the community in terms of both social and economic effects.

1.2.1 **Economic impacts on the community at large**. This project will have a beneficial economic impact on the community at large because it will contribute to public health and safety by alleviating the accumulation and ponding of stormwater on Haleiwa Road in the vicinity of Kaiaka Bay Beach Park during and after heavy rain storms. This may facilitate ingress and egress to adjacent businesses, residences, schools, church and Kaiaka Bay Beach Park; however, ponding and flooding may still be expected during heavy rain events.

1.2.2 **Provision of income for the county or state and creation of employment opportunities in areas with high unemployment rates**. The project provides benefits through jobs related to its implementation and to improved traffic conditions generally at this location.

1.2.3 **Targeted segment of the population**. No specific segment of the population is targeted because this project has general public benefit.

1.2.4 **Population density**. The project has no effect on population density because no added housing is proposed.

1.2.5 **Recreational facilities**. The project benefits users of Kaiaka Bay Beach Park by alleviating the accumulation and ponding of storm water on Haleiwa Road in the vicinity of Kaiaka Bay Beach Park. The proposed drainage system will be below ground so that the "with project" condition of the park will be very much as it is at present.

1.2.6 **Child care provisions**. There are no child care provisions in relation to the proposed project.

1.2.7 **Relocations of residences**. No relocation of residences would occur.

1.2.8 **Costs of the proposed project and economic analysis**. The estimated total cost of construction for the proposed improvement is not to exceed $4 million.

1.3 **Environmental characteristics**. This section discusses the potential effects of the proposed project on the physical environment.

1.3.1 **Aesthetics and viewplanes.** The project will not adversely affect aesthetics or viewplanes. The project does not impose any structures above ground level in the park. There is no effect on coastal views from Haleiwa Road.

1.3.2 **Air pollution**. There would be some minor effects during construction and these would be mitigated per county and state rules related to excavation and construction. The contractor would be required to apply dust control measures. There would be no long term effects because the proposed project includes no air pollution sources and would not generate significant differences in traffic from the existing conditions.

1.3.3 **Traffic congestion & bus stops**. The proposed project does not add capacity to the park or to Haleiwa Road. At present, during rainstorms, there may be congested traffic due to the ponding on Haleiwa Road. The proposed improvements will provide some drainage relief and traffic congestion may be reduced; however, ponding and flooding is to be expected during heavy rain events, since this project will not provide any improvements in Haleiwa Road itself. After the project, rainstorm related traffic congestion in this area may be reduced. Public transit buses may be impeded by ponding. Construction of the proposed project takes placed within Kaiaka Bay Beach Park and no work is proposed on Haleiwa Road so there should be no effect on public transit buses or routes.

1.3.4 **Noise levels**. There will be some increase in noise levels during construction of the project. These may occur during normal working hours. Contractor's equipment is required to meet Department of Health noise regulations. If necessary, the contractor will obtain a noise variance or permit from the State Department of Health if required.

1.3.5. **Effects on water quality and the marine environment.** Impacts on water quality and the marine environment are not anticipated to be significant. At present, stormwater runoff from Haleiwa Road flows into Kaiaka Bay Beach Park to an existing depression. Under the proposed project, stormwater will flow in the same way to the same existing depression, but after some retention in that depression, the water level will rise to the level of the intake of the proposed underground drainage system. The drainage system intake is sized to increase the stormwater detention time within the depression, thus allowing sediment to settle before entering the drainage system. A water quality unit will be placed in-line with the drainage system and it will capture most of the trash, debris, sediment and hydrocarbons that manage to enter the intake. Periodic maintenance will remove these materials from the water quality unit.

1.3.6 **Other environmental effects**. The site is located in a coastal high hazard area. No residential uses of this site are proposed. All of Kaiaka Bay Park is in a VE flood zone (Figure 4). The Federal Emergency Management Agency (FEMA) defines the coastal high

hazard areas as “high risk” and the VE flood zone is defined as stated in the following Table below:

Table 1 -- *Coastal High Hazard Areas – High Risk*

Coastal High Hazard Areas (CHHA) represent the area subject to inundation by 1-percent-annual chance flood, extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. Structures located within the CHHA have a 26-percent chance of flooding during the life of a standard 30-year mortgage. Federal floodplain management regulations and mandatory purchase requirements apply in these zones.

ZONE	*DESCRIPTION*
V	*Areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves. Because detailed coastal analyses have not been performed, no BFEs [base flood elevation] or flood depths are shown.*
VE, V1-V30	*Areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. BFEs [base flood elevation] derived from detailed hydraulic coastal analyses are shown within these zones. (Zone VE is used on new and revised maps in place of Zones V1–V30.)*

Source: FEMA

1.3.7. **Drainage.** Drainage along Haleiwa Road will be improved by the implementation of the proposed underground drainage system. The proposed drainage system includes a check valve to prevent backflow from Kaiaka Bay into the park.

2 Description of the Affected Environment

2.1 **Location**. The proposed project is located at Haleiwa Road and Kaiaka Bay Beach Park at Haleiwa on O'ahu's north shore. Tax Map Key: 6-6-007:007. Total land area of the proposed project when completed is approximately 3,500 square feet (approximately 0.08 acres). The area to be disturbed (staging, equipment movement, temporary storage) during construction is approximately 10.2 acres. The area to be graded and trenched (excavated, filled and backfilled) during construction is approximately 0.5 acres.

2.2 **Land ownership and tenancy**. The parcel is owned by the City and County of Honolulu and the City's Department of Parks and Recreation manages the property as Kaiaka Bay Beach Park (Figure 5).

2.3 **County Zoning, State Land Use District**. The proposed project is in the State Urban Land Use District (Figure 6) and is zoned P-2 (Figure 7) by the City and County of Honolulu. It is possible that the proposed drainage system will extend past the boundary of the State Urban Land District into the State Conservation Land Use District and this will be determined when a certified shoreline survey[1] has been completed, if so, a State Conservation District Use Permit may be required.

2.4 **Special Management Area, Coastal Zone Management Consistency, Shoreline Setback Area**. The proposed project is within the boundary of the SMA (Special Management Area) and is subject to regulatory authority of the City and County of Honolulu, Department of Planning and Permitting (Figure 8). The outlet of the proposed project will extend into the shoreline setback area which extends 40 feet inland from the certified shoreline. The project will be subject to review and approval by the Hawai'i Coastal Zone Management (CZM) Program for consistency with CZM objectives as part of the federal requirements imposed by the U.S. Army Corps of Engineers for issuance of their permit.

2.5 **Land, beach and water use**. Kaiaka Bay Beach Park (56 acres) usage was observed during site visits, and park use was discussed with City and County of Honolulu Department of Parks and Recreation and the Haleiwa Elementary School staff. On a daily basis, the park is used for sightseeing, picnicking, sports, and camping. On weekends and holidays, the park is often used by large groups for various events. There is little or no use along the alignment of the proposed underground drainage system because that alignment is very close to the park boundary between the park and Haleiwa Elementary School. Haleiwa Elementary School does use the park and its access to the park is critical under certain emergency evacuation situations when the school must evacuate into the park. The need for this evacuation route was a critical factor in the decision to change the drainage improvements from an open channel to an underground drainage system so as to not impede students and personnel who are evacuating from Haleiwa Elementary School.

[1] A certified shoreline survey expires after one year, so it will be done later in the environmental and project review process.

Figure 3B. Drain alignment. Underground drainage system alignment adjacent to Haleiwa Elementary School Fence. The drain inlet would be in the far background of photo. Direction of water flow (red arrow) would be from the far background to the foreground where the drain would exit to Kaiaka Bay.

2.6 **Land and related water use plans**. Following is a discussion of land and water use plans which are related to the proposed plan.

2.6.1 **City and County of Honolulu.** Drainage improvements described in the proposed plan are intended to conform with planning for development of Waialua District as stated in the North Shore Sustainable Communities Plan:

> *Improve drainage systems in the region to provide adequate protection from flooding and protect the quality of nearshore waters* (p. 4-22).

The proposed project will not provide complete protection from flooding, but it will provide an amount of drainage relief by alleviating the accumulation and ponding of stormwater on Haleiwa Road in the vicinity of Kaiaka Bay Beach Park. During heavy rain events, ponding and flooding maybe expected.

The nearshore water, Kaiaka Bay, is dominated by the outflows from Kiikii and Paukauila Stream. According to water quality sampling on January 15, 2014, Kaiaka Bay has a high level of turbidity and total suspended solids (Appendix A). Although the proposed project does not measurably contribute to the protection of the quality of nearshore waters, it will include a water quality unit which will capture most of the trash, debris, sediment and hydrocarbons that manage to enter the system.

> *Employ retention and detention methods that allow for the gradual release of stormwater. Where feasible, use open spaces, including parking lots, landscaped areas, and parks, to detain or allow ground infiltration of stormwater flows to reduce their volume, runoff rates, and the amounts of sediment and pollutants transported* (p. 4-22).

Because there is little or no slope, stormwater does not run off. Instead it ponds and sometimes backs up into Haleiwa Road. The proposed improvements will relieve the situation by gradually draining some of the accumulated stormwater so that Haleiwa Road and adjacent facilities are less threatened. The discharge from the drainage system to Kaiaka Bay will not improve the coastal water quality and is unlikely to degrade it due to the project's proportionately low volume of discharge in relation to the total volume of streamflow that presently discharges into Kaiaka Bay. To reduce the amount of sediment and pollutants discharged into Kaiaka Bay, the project will include a water quality unit and situating the intake elevation of the drainage system to increase detention time in the design.

2.6.2 **State of Hawai'i.** The proposed improvements are of benefit to persons traversing Haleiwa Road as well as those accessing driveways including those to the Fire Station and the park because there will be less ponding on the road than at present. Thus the proposed improvements are in conformance with the general state objectives to: a) "…assure public access to recreation areas."[2]; b) "Encourage resident quality-of-life improvements through improved mobility opportunities and travel reduction."[3]; c) "Development, implementation, and maintenance of policies and actions which support the steady and balanced growth of the visitor industry."[4]; d) "Physical, social, and economic well-being for individuals and families in Hawaii, that nourishes a sense of community

[2] State of Hawaii, Recreation Functional Plan, 1991, p. 5.
[3] State of Hawaii, Transportation Functional Plan, 1991, p. III-1.
[4] State of Hawaii, Tourism Functional Plan, 1991, p. 12.

responsibility, of caring and of participation in community life."[5] The proposed project is in conformance with State Coastal Zone Management objectives and policies (see following sections 3.5 and 3.6).

2.6.3 **Federal.** There are no federal plans for this location.

2.7 **Flora and Fauna.** The flora of the project area comprises flowering plants and is dominated by alien (non-native) species (Appendix A). A total of 86 plant species were recorded during surveys on January 15, 2014 and October 13, 2017. The vast majority of species recorded are either non-native ornamentals (naturalized species utilized in landscaping) or non-native weedy species. No endemic plant species or plant species that are of particular concern or are listed as threatened or endangered were found in the project area.

Biological surveys (January 15, 2014 and October 13, 2017) in the project area and within Kaiaka Bay encountered the green sea turtle, which is a federally listed threatened species. Other federally endangered species that may occur in the area or within Kaiaka Bay include the Hawaiian monk seal, Hawaiian hoary bat, and Hawaiian Waterbirds. State protected corals, bivalves and *opihi* may also occur in Kaiaka Bay. No impacts are anticipated on any candidate, proposed or listed endangered species or their habitats. During construction, protective species best management practices (BMPs) will be implemented to reduce the chanced of interaction with any endangered, protected or listed species.

2.8 **Coastal Setting and Beach Stability**. The shoreline fronting Kaiaka Bay Beach Park appears relatively stable. It is comprised of hard and less erodible reef material. There are no sandy beaches except at one corner of the park. That beach appears stable and its source is partly sediment which originates upland and is carried via the streams and rivers which empty into Kaiaka Bay. The park is exposed to high surf and storm waves on occasion. However, rapid erosion or severe instability of Kaiaka Bay Beach Park does not seem apparent. Except for the underground drainage system's outlet itself, the project site is located more inland within the park and will not be subject to coastal wave forces. Wing walls are proposed at the drain outlet to direct the discharge away from the beach.

Figure 3C. Shoreline location of drain outlet. Shoreline where drain outlet would be constructed.

[5] State of Hawaii, *The Hawaii State Plan Revised*, 1986, p. 2.

2.9 **Water Quality**. Ocean and Kaiaka Bay water quality is designated Class A by the State Department of Health. Kaiaka Bay itself, where the proposed underground drainage system will discharge is generally highly turbid, a condition resulting from uncontrolled runoff from a large watershed which drains undeveloped and agricultural lands. The proposed project will discharge stormwater runoff from Haleiwa Road which originates from upland overland runoff from undeveloped and agricultural lands. The same stormwater currently discharges into Kaiaka Bay overland from the Anahulu, Kiikii, Paukauila and Waialua watersheds, via Paukauila and Kiikii Streams, and from stormwater conduits in the area (Figure 9).

2.10 **Historical, archeological, traditional and cultural sites**. An archaeological and cultural report is included as Appendix B. There is one historic site within Kaiaka Bay Beach Park (Pohaku Lanai) and a second historic site (Haleiwa Elementary School) borders the park. A third site (Waialua Fire Station) is across Haleiwa Road from the park. A fourth site (Kapukapuakea Heiau) may have been located just northwest of Haleiwa Elementary School. For a map of these sites, refer to Figure 10. The area of potential effect (APE, Figure 10A) is adjacent to Haleiwa Elementary School and may encompass the former location of Kapukapuakea Heiau, however according to the archaeological and cultural report and the archaeological inventory survey (Appendices B & B1), nothing remains of the heiau. No excavations or grading activities will take place in this area as it will primarily be used as a staging area for the contractor, thus the project will not affect the former Kapukapuakea Heiau. The proposed underground placement of the drainage system poses no effect to any of these historic sites. Construction of the proposed project is expected to benefit the both the fire station and the school by reducing the frequency of ponded stormwater runoff on Haleiwa Road.

A subsequent archaeological inventory survey (Appendix B1) uncovered potential subsurface historic properties along the drainage system alignment. The historic properties consists of a subsurface cultural layer and a pre-contact pit feature. To protect the area's historic/cultural resources, an archaeological monitoring plan will be prepared to mitigate adverse impacts to potential subsurface properties during construction.

2.11 **Sensitive habitats or bodies of water adjacent to the proposed project**. The Pacific Ocean and Kaiaka Bay is adjacent to Kaiaka Bay Park. "*Kaiaka – Waialua Bay is listed as a DOH Water Quality Limited Segment due to nonpoint source pollution. State monitoring showed that turbidity and total phosphorous levels in the bay exceeded State Water Quality Standards. Kaiaka – Waialua Bay is approximately 1200 acres in size, and receives drainage from 70,700 acres Kaiaka – Waialua Hydrologic Unit Area*."[6] A TMDL report has not been posted for this water body.

2.12 **Flooding and Tsunami.** According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, the proposed project site is in a VE flood hazard zone (Figure 4). An underground drainage system is an acceptable use in such areas. This coast has endured severe tsunami impacts (Figure 11). The entire project area and up to one mile inland is a tsunami evacuation area. Recorded tsunami elevations for 5 events (1946 through 1964) vary between 8 to 17 feet (except the 1957 event for which

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[6] College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa, *Erosion Control Studies for Agricultural Roads in the Kaiaka – Waialua HUA.*
http://www2.ctahr.hawaii.edu/wq/nps319/oahu/waialua/project95002.htm

there was no effect). Table 2 provides a compilation of flood events impacting the Waialua-Haleiwa Area between 1932 and 1976 and illustrates the continued history of flood and related damages in the general area.

Table 2 -- FLOODING IN WAIALUA-HALEIWA BETWEEN 1932 & 1977

Date	Cause of Flood	Affected Areas	Reported Damages
28-Feb-32	Rain	Waialua-Haleiwa	1 dead, 3 irrigation dams breached, homes inundated in low-lying areas
27-Feb-35	Rain	Waialua-Haleiwa	$700,000 damage on Oahu
2-Mar-39	Rain	Waialua	1 dead, homes damaged in low-lying areas
1-Apr-46	Tsunami	All North Shore especially Kawela Bay, Sunset Beach, Mokuleia	6 dead, 67 homes demolished, 335 homes damaged, railroad track destroyed on Oahu
4-Nov-52	Tsunami	Waialua, Haleiwa, Mokuleia	School, homes damaged
4-Jan-53	High waves	Waialua to Kahuku	24 homes flooded, Kamehameha Highway blocked, $10,000 damage
25-Feb-56	Rain	Waialua to Sunset Beach	$132,000 damage in Waialua-Haleiwa
28-Nov-56	High waves	Haleiwa, Kawailoa, Sunset Beach	11 homes damaged, Kamehameha Highway flooded
9-Mar-57	Tsunami	Mokuleia to Waimea	Severe damages, 100 homes damaged, $140,000 in area
21-Jan-62	Rain	Waialua	Slight damage
27-Mar-64	Tsunami	Haleiwa	Slight damage
23-Dec-64	Rain	Waialua	$115,000 damage in area
1-Feb-69	Rain	Waialua, Haleiwa	Homes damaged, $50,000 damage in area
4-Dec-69	High wave	Haleiwa, Sunset Beach, Mokuleia	2 dead, 11 injured, 90 homes damaged, $300,000 damage in North Shore
24-Nov-70	High wave	Mokuleia to Kaaawa	24 homes damaged, Farrington Highway flooded. $64,000 damage on Oahu from waves
8-Jan-74	High waves	Haleiwa, Kawailoa, Sunset Beach	Several buildings damaged, roads flooded, $40,000 estimated damage
19-Apr-74	Rain	Haleiwa to Kahuku	3 dead at Haleiwa, $1.0 million damage in Waialua-Haleiwa
7-Feb-76	Rain	Waialua, Haleiwa, Mokuleia	Sugar fields damaged, 6 homes damaged, Haleiwa Road flooded, $130,000 estimated damage in area

Source: U.S. Army Engineer District, *Non-structural Summary Report for Flood Damage Reduction*, Waialua-Haleiwa Area, Oahu, Hawaii, September 1976. As quoted and reproduced in: City and County of Honolulu, *Haleiwa Road Drainage Improvement Project, Revised Environmental Impact Statement*, March, 1978, as Appendix A.

2.13 **Soils.** The surface of the park and the project site is primarily composed of sand or silty-sand. Beneath the surface layer the substrate varies and includes sand, lagoonal deposits, clayey and silty sand (alluvial deposits) and ground water. Borings were taken and reported (Appendix C) and the locations are shown in Plate 2 of Appendix C. The following table summarizes the description of soils based on the results reported in Appendix C (pages 6 & 7) and boring numbers are keyed to Plate 2.

TABLE 2A -- SIMPLIFIED SUMMARY OF SUBSURFACE CONDITIONS				
Material	**Boring No. 1** (Depth)	**Boring No. 2** (Depth)	**Boring No. 3** (Depth)	**Boring No. 4** (Depth)
Fill	0 to 1.3 Ft.	0 to 1.5 Ft.	0 to 3.3 Ft.	0 to 10.6 Ft.
Beach/Estuarine Deposit	1.3 to 4.5 Ft.	1.5 to 3.5 Ft.	3.3 to 13.5 Ft.	10.6 to 14.5 Ft.
Lagoonal Deposit	4.5 to 16.5 Ft.	3.5 to 16.5 Ft.	None	None
Coral Formation	None	None	13.5 to 15.0 Ft.	14.5 to 21.5 Ft.
End Depth	16.5 Ft.	16.5 Ft.	15.0 Ft.	21.5 Ft.
Groundwater Depth (During Drilling)	2.4 Ft.	4.7 Ft.	3.8 Ft.	12.1 Ft.
Surface Elevation	3.1 Ft.	6.2 Ft.	8.0 Ft.	12.9 Ft.
Approximate Groundwater Elevation	1.3 Ft.	1.5 Ft.	4.2 Ft.	0.8 Ft.

2.14 **Drainage.** As indicated in Figure 11, Kaiaka Bay Beach Park and the surrounding area are low-lying, somewhat flat, but typically between 5 to 8 feet above mean sea level (MSL). Haleiwa Road is also approximately 5 feet MSL. This large area is poorly drained. As mentioned previously, the proposed project is not intended to drain the entire low-lying area, but instead will relieve a more limited area in the Kaiaka Bay Beach Park. Flooding has been noted in this area for years and has been the subject of previous remedial proposals by the City and County of Honolulu, none of which have been constructed.[7] Following is a description of the ponding problem at the subject location as discussed in an engineering study dated 2003.

> *The land area mauka of the fire station is poorly maintained with an overgrowth of tall grass. Natural springs are located throughout the wetlands area. Lotus fields and taro fields that are located within the wetlands area are*

[7] U.S. Army Engineer District, *Non-structural Summary Report for Flood Damage Reduction, Waialua-Haleiwa Area, Oahu, Hawaii*, September 1976; City and County of Honolulu, Department of Public Works, *Revised Environmental Impact Statement for Haleiwa Road Drainage Improvement Project, Waialua, Oahu, Hawaii*, December 30, 1977; Kim & Shiroma Engineers, Inc, *Haleiwa Road Drainage Improvements at Haleiwa, Oahu, Hawaii*, January 2003.

not properly maintained. The general direction of flow from the spring waters is in a southerly direction toward an existing private drainage ditch to the east of the fire station, which flows to Paukauila Stream. Haleiwa Elementary School, Kaiaka Beach Park and the Kaiaka Beach Subdivision predominantly occupy the area west of the fire station. The ground conditions vary within these sites; however, the land appears to be maintained properly.[8]

In addition, it is also recommended that the City advise the landowner of the private agricultural drainage ditch behind the fire station and its surrounding areas to properly maintain the ditch. Maintenance of the ditch will prevent an overgrowth of vegetation that has previously caused the ditch to overflow and flood the surrounding areas. Proper maintenance will also help to sustain the existing drainage pattern and prevent stormwater from entering Haleiwa Road.[9]

2.15 **Traffic and Access**. There will be temporary and minor effects on traffic and access to Kaiaka Bay Beach Park during construction of the underground drainage system. The effects generally would be the transit of heavy equipment, trucks and supplies. It is unlikely that Haleiwa Road would have lane closures or stoppages due to such traffic. Within the park, the contractor will be required to implement traffic control plans and coordinate work with the Department of Parks and Recreation. The contractor will implement, install and maintain all necessary traffic control measures to facilitate the flow of construction equipment, motor vehicle and pedestrian traffic in the area during construction.

[8] Kim & Shiroma Engineers, Inc, *Haleiwa Road Drainage Improvements at Haleiwa, Oahu, Hawaii*, January 2003, p. 6.

[9] Kim & Shiroma Engineers, 2003, p. 24.

3 Major Impacts and Alternatives Considered

3.1 **Positive impacts**. The primary beneficial impact of the proposed project is that there will be a means to alleviate some of the accumulation and ponding of stormwater on Haleiwa Road in the vicinity of Kaiaka Bay Beach Park. This water which accumulates in the park sometimes backs up onto Haleiwa Road and on surrounding properties particularly during heavy rainfall events. It is important to note that flooding may continue to occur during large storms since this area is an extremely flat and low lying area. However, the proposed improvements are expected reduce the duration of ponding.

- Cars transiting Haleiwa Road are less likely to be exposed hazards caused by ponded water.
- Fire fighters are less likely to be hampered when responding to emergency calls.
- Haleiwa Elementary School and the First Baptist Preschool are less likely to be disrupted.
- Surrounding businesses and residences are less likely to be disrupted by stormwater ponding.

3.2 **Negative impacts**. There are no negative significant impacts of the proposed project.

3.3 **Alternatives considered.** The following is a discussion of the alternatives which were considered during the formulation of the recommended project (Appendix D).[10] Refer to Appendix D for relevant figures depicting the alternatives discussed below.

3.3.1 **No-Action Alternative**. If no improvements are made, ponding will continue along with the adverse effects on public health and safety. Children, teachers and staff in adjacent schools continue to be at risk as will adjacent residences and businesses.

3.3.2 **Alternative 1 – Pump Station.** An electrically powered pump would be installed in the existing depression in Kaiaka Bay Beach Park. The pump would be started by rising waters in the depression and discharged to other areas within the park. Refer to Appendix D (Drainage Study) for a layout of the alternatives.

3.3.3 **Alternative 2 – Infiltration System.** A system of chambers, trenches or drywells would be constructed within Kaiaka Bay Beach Park to disperse stormwater to infiltrate into the ground. Refer to Appendix D (Drainage Study) for a layout of the alternatives.

3.3.4. **Alternative 3 – Underground Drainage System to Existing Agricultural Ditch**. An underground culvert would be constructed from the depression in Kaiaka Bay Beach Park beneath Haleiwa Road to an existing agricultural ditch which is mauka (inland) of Haleiwa Road and which flows to Paukauila Stream and thence to Kaiaka Bay. Refer to Appendix D (Drainage Study) for a layout of the alternatives.

3.3.5. **Alternative 4 – Underground Drainage System to Haleiwa Alii Beach Park** An underground box culvert would be constructed along Haleiwa Road to Alii Beach Park to convey stormwater to an existing grassed ditch fronting Alii Beach Park which conveys runoff to an underground line which discharges to the ocean. Refer to Appendix D (Drainage Study) for a layout of the alternatives.

3.3.6. **Alternative 5 (5A, 5B, 5C) – Underground Drainage System within Kaiaka Bay Beach Park**. Construct a drainage system beginning at the existing depression within

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[10] Gray, Hong, Nojima & Associates, Inc., Haleiwa Road Drainage Improvements, Haleiwa, Oahu, Hawaii, April 2011.

Kaiaka Bay Beach Park to convey stormwater to the ocean at Kaiaka Bay. There are three variations of Alternative 5. Refer to Appendix D (Drainage Study) for a layout of the alternatives.

Alternative 5A– Construct two culverts beneath the Kaiaka Bay Beach Park entry road to drain stormwater from directly from two watersheds within the park to Kaiaka Bay within a concrete drainage channel adjacent to Haleiwa Elementary School. Refer to Appendix D (Drainage Study) for a layout of the alternatives.

Alternative 5B– Construct a culvert beneath the Kaiaka Bay Beach Park entry road to drain stormwater directly from the existing depression only, but with the knowledge that stormwater from an adjacent watershed may flow over the entry road into the depression, storm water would be routed through a concrete drainage channel adjacent to Haleiwa Elementary School as in 5A, above. Refer to Appendix D (Drainage Study) for a layout of the alternatives.

Alternative 5C– Construct a culvert beneath the Kaiaka Bay Beach Park entry road to drain stormwater directly from a watershed which would be connected with a new underground culvert to the existing depression to reduced ponding there, stormwater would be routed through a concrete drainage channel adjacent to Haleiwa Elementary School as in 5A and 5B above. Refer to Appendix D (Drainage Study) for a layout of the alternatives.

See Table 3, below, for a comparison of alternatives.

Table 3 – Comparison of Alternatives				
Alternative	**Effectiveness**	**Construction Cost**	**Maintenance & Operation**	**Under City Authority**
No Action	Not effective	No cost	No cost	Yes
1	Effective	High	High - Routine checking of pumping system and electrical power.	Yes
2	Not effective due to low permeable soil and high ground water level.	High	Medium – Routine checking of chamber system.	Yes
3	Limited effectiveness due to lack of maintenance of agricultural ditch.	High	Medium – Maintenance of agricultural ditch.	No, agriculture ditch is under private authority.
4	Effective	High	Medium – Maintenance of road drainage system.	No, some private property involved.
5A	Effective	Medium to Low	Medium to Low - Maintenance of two culverts	Yes
5B	Effective	Low	Low	Yes
5C	Effective	Medium to Low	Low	Yes

Table 3 Notes:

- *Effective* as used here implies that the specific project objective is to reduce the ponding of stormwater on Haleiwa Road in this area and that such ponding is at the level of a 1 or 2 year design storm only. Flooding from larger storms will not be relieved by any of the alternatives discussed here.

- Alternatives 1 through 4 are more costly to construct and to maintain than Alternatives 5A, 5B or 5C.

- Alternative 2 will not function well due to somewhat impermeable substrate within park.

- Alternative 3 depends on suitable management, maintenance, and cleaning of the privately owned agricultural ditch.

- Alternative 4 is a long culvert which may not have sufficient slope to drain properly, and may impact private property as well.

3.3.7 **Preferred Alternative – 5B.** 5B is the preferred alternative. It is fully under City authority. It offers a level of drainage relief on Haleiwa Road which is equivalent to the other alternatives. It meets the planning objective of this project which is to reduce the ponding on Haleiwa Road. Based on consultation with Haleiwa Elementary School and the Department of Parks & Recreation, the proposed open channel concept as described in Section 3.3.6 was converted into an underground drainage system. Refer to Figure 12 for a depiction of the project showing the "depression", proposed underground drainage system and its approximate alignment within Kaiaka Bay Beach Park.

3.4 **Configuration of Drain Outlet at Shoreline.** The outlet end of the underground drainage system will extend slightly beyond the City's parcel boundary into a State Conservation District so that a Conservation District Use Permit is likely to be required. Construction could possibly require some minor removal of shoreline. Should this occur below the MHW/MHHL (mean high water/mean higher high water levels), the U.S. Army Corps of Engineers would have regulatory jurisdiction. Some minor fill maybe required in the form of grout or poured concrete to secure the end of the drain into the foundation bedrock. Refer to Figure 13 for details.

3.5 **Impacts Relative to the CZM Objectives & Policies and the SMA Guidelines (City & County of Honolulu).** The following table displays the review guidelines in relation to the potential impacts of the proposed project (Table 4).

Table 4 -- Impacts Relative to CZM Objectives & Policies and the SMA Guidelines

Sec.	Review Guideline	Impact of Project
25-3.2(a)(1)	Ensure adequate access.	During construction, the contractor will implement traffic control measures and maintain vehicular and pedestrian access between Haleiwa Road into Kaiaka Bay Beach Park. The post-construction access along Haleiwa Road and to Haleiwa Beach Park and the coastal zone will be the same as the existing condition, because the proposed system will be constructed beneath the park access road.
25-3.2(a)(2)	Ensure public recreation & wildlife preserves.	Project may slightly improve access to an existing public park due to relief provided for stormwater ponding; no adverse effect on wildlife or habitat.
25-3.2(a)(3)	Provide for waste treatment.	The proposed project does not increase waste loads. The park has existing waste treatment facilities and procedures.
25-3.2(a)(4)	Minimize alterations to landforms & vegetation.	There may be minor grading near the drain inlet and outlet. After grading, all bare earth areas will be landscaped.
25-3.2(b)(1)	No substantial cumulative or adverse effect.	There is no significant cumulative or adverse effect. If anything there may be a slight beneficial effect do to the less frequent stormwater ponding events.
25-3.2(b)(2)	Consistent with objectives and policies of Sec. 25-3.1 & guidelines in HRS Sec. 205A-26.	The project benefits public recreation to some extent by slightly improving access and alleviating accumulation and ponding of stormwater in the park. There are no adverse effects.

Table 4 -- Impacts Relative to CZM Objectives & Policies and the SMA Guidelines		
Sec.	**Review Guideline**	**Impact of Project**
25-3.2(b)(3)	Consistent with County Plans.	There is no change in existing land uses or plans related to the park or adjacent land uses. Benefits to drivers along Haleiwa Road in the vicinity of Kaiaka Bay Beach Park include less exposure to hazards caused by ponding. . The North Shore Sustainable Communities Plan states: *Improve drainage systems in the region to provide adequate protection from flooding and protect the quality of nearshore waters.* While the proposed project does not improve drainage overall in this area, nor does it much provide much flood hazard reduction, it does contribute to some alleviation of the constant problem of ponding due to stormwater runoff on Haleiwa Road at this location.
25-3.2(c)(1)	Minimize dredging, filling, estuarine effects.	There is likely to be minor dredging and filling of a small outcrop at the edge of the underground drainage system to provide adequate slope for the pipe to drain and to secure it through use of grout. This is a minimal effect.
25-3.2(c)(2)	No reduction of beach or public recreation area.	No effect on beaches or reduction of public recreation areas is intended, since the drainage system will be located underground and wing walls at the outlet will be constructed to direct discharge away from the beach.
25-3.2(c)(3)	No restrictions on public access to tidal or riverine areas.	The project places no restrictions on public access.
25-3.2(c)(4)	No substantial interference with line of sight towards sea from state highway.	The project itself will be at and below existing ground elevations so there is no effect on lines of sight towards the sea from Haleiwa Road.
25-3.2(c)(5)	No adverse effect on water quality, visibility, fishing, habitat or agricultural lands.	There will be a negligible effect on water quality in Kaiaka Bay due to proportionately low volume of discharge of the proposed project improvements in relation to the existing volume of total stream flow discharging into the bay. Under the existing condition, stormwater ponds in the park and on adjacent areas and is gradually released to the ocean via overland flow, by infiltration, or by evaporation. The origin of the ponded stormwater is from agricultural land upland of Haleiwa Road and the soil erosion and release of sediment from those activities and the consequent downstream impacts on Kaiaka and Wailua Bays are well known in terms of highly visible turbid conditions especially after rainstorms. Stormwater from the proposed drainage system will undergo treatment prior to discharge into Kaiaka Bay. The treatment includes detention time within the park depression and the use of a water quality unit.

3.6 **Impacts Relative to the Coastal Zone Management Objectives & Policies per Act 205A (HRS).** The following table displays the objectives and policies of the State's CZM program, and provides comments concerning the proposed project in relation to those objectives and policies (Table 5).

Table 5 – Coastal Zone Management Policies & Objectives (205A-2)		
	Objective	**Comment**
1	Recreational resources; (A) Provide coastal recreational opportunities accessible to the public	Kaiaka Bay Beach Park is an existing park and the proposed project changes nothing. The project will be underground. Access and opportunities for use may be slightly improved due to less frequent ponding or ponding of shorter durations. During construction the contractor will implement traffic control measures and maintain vehicular and pedestrian access from Haleiwa Road into Kaiaka Bay Beach Park.
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.	An archaeological monitoring plan will be prepared to mitigate adverse impacts to potential subsurface historic properties within the project area. In addition, should burials (or other cultural finds) be encountered during ground disturbance, the construction contractor shall immediately cease all work and notify the appropriate agencies pursuant to applicable law.
3	Scenic and open space resources; (A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources	The proposed project is underground and preserves both open space and the coastal scenic properties of this location.
4	Coastal ecosystems; (A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.	There is a minimal effect because of the concentration of the ponded stormwater at a single discharge point at the mouth of the proposed underground drainage system.
5	Economic uses; (A) Provide public or private facilities and improvements important to the State's economy in suitable locations.	Roads and beach parks are essential to Hawaii's economy. The alleviation of accumulated and ponded stormwater in Kaiaka Bay Beach Park should improve access and usage of Kaiaka Bay Beach Park after storm events.
6	Coastal hazards; (A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.	The proposed project reduces hazards to life property and public safety by alleviating the accumulation and ponding due to stormwater runoff.
7	Managing development; (A) Improve the development review process, communication, and public participation in the management of coastal resources and hazards	The planning process for the proposed project has included extensive coordination with Haleiwa Elementary School which is adjacent to the project site.
8	Public participation; (A) Stimulate public awareness, education, and participation in coastal management.	The planning process initiated many letters to agencies and interested parties asking for their input. There will be a public hearing for the SMA permit application.
9	Beach protection; (A) Protect beaches for public use and recreation	There is a beach near the proposed outlet structure and access to the shoreline is maintained. Wing walls are included as a component of the proposed plan to direct discharge away from this beach.
10	Marine resources; (A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.	Although the proposed project conveys a small proportion of the overall stormwater runoff to Kaiaka Bay and the ocean, the effect will be minimal.

Table 5 – Coastal Zone Management Policies & Objectives (205A)		
	Policy	**Comment**
1	Recreational resources; (A) Improve coordination and funding of coastal recreational planning and management;	The proposed project contributes to coordination of coastal recreational planning and management by fulfilling the planning objective to reduce extended periods of heavy ponding and to improve access to the park.
1B	Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:	The proposed project contributes coastal recreational opportunities by fulfilling the planning objective to reduce extended periods of heavy ponding and to improve access to the park.
i	Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;	The proposed project helps to protect coastal resource recreational activities at Kaiaka Bay Beach Park by fulfilling the planning objective to reduce extended periods of heavy ponding and to improve access to the park.
ii	Requiring replacement of coastal resources having significant recreational value including, but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;	The proposed project does not damage, develop or displace non-coastal dependent coastal resources. Wing walls will be constructed to direct discharge away from the existing beach.
iii	Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;	The proposed project facilitates access by reducing the extended periods of heavy ponding.
iv	Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;	The proposed project contributes to this objective by facilitating access and use opportunities because park land will be less prone to extended periods of heavy ponding.
v	Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;	The proposed project contributes to this objective by facilitating access and usage because park land will be less prone to extended periods of heavy ponding.
vi	Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;	Unfortunately water quality of Kaiaka Bay is degraded with high turbidity levels due to the massive non-point sources upland in the larger watershed where extensive agricultural operations take place. Although proposed project will not resolve this situation, the drainage system will include a water quality unit to provide treatment for any stormwater that enters the system.
vii	Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing;	It is inappropriate for the proposed project to develop new recreational opportunities, but it does facilitate the potential use of the existing park lands by reducing extended periods of heavy ponding.
vii	Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6;	This policy may not apply to the proposed project because the proposed project does not take away shoreline areas from public use.
2	Historic resources; (A) Identify and analyze significant archaeological resources;	The environmental assessment for the proposed project includes an archaeological report which identifies and analyzes the resources.

Table 5 – Coastal Zone Management Policies & Objectives (205A)		
	Policy	**Comment**
	(B) Maximize information retention through preservation of remains and artifacts or salvage operations;	The proposed project during construction will preserve or salvage any remains or artifacts discovered during excavations. There are no remains or artifacts on the land surface of the project footprint based on the field inspection by Cultural Surveys Hawaii.
	(C) Support state goals for protection, restoration, interpretation, and display of historic resources	An archaeological monitoring plan will be prepared to mitigate adverse impacts to potential subsurface historic properties during construction. In addition, should burials (or other cultural finds) be encountered during ground disturbance, the construction contractor shall immediately cease all work and notify the appropriate agencies pursuant to applicable law.
3	Scenic and open space resources; (A) Identify valued scenic resources in the coastal zone management area;	There is a valuable scenic of the park (open space) and of the ocean from Haleiwa Road and the proposed project maintains this view by being constructed below grade.
	(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;	There is a valuable scenic of the park (open space) and of the ocean from Haleiwa Road and the proposed project maintains this view by being constructed below grade.
	(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources;	There is a valuable scenic of the park (open space) and of the ocean from Haleiwa Road and the proposed project maintains this view by being constructed below grade.
	(D) Encourage those developments that are not coastal dependent to locate in inland areas;	Ideally, management of upland agricultural lands would be improved to lessen stormwater runoff, soil erosion and turbidity in runoff waters. The University of Hawaii has studied these problems and suggested some management measures; however, it is up to private land owners to implement such measures.
4	Coastal ecosystems; (A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;	The proposed project has a minimal effect on coastal ecosystems.
	(B) Improve the technical basis for natural resource management;	The planning of the proposed project has incorporated a nearshore aquatic survey of Kaiaka Bay, a geotechnical investigation of subsurface conditions and an engineering study of the hydrologic and hydraulic characteristics of the study area and of potential alternatives to address the problem of extended periods of heavy ponding on Haleiwa Road with a minimal effect on coastal ecosystems.
	(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;	The proposed project has a minimal effect on coastal ecosystems.
	(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs;	The proposed project has a minimal effect on coastal ecosystems.
	(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures;	The proposed project has a minimal effect on coastal ecosystems.

Table 5 – Coastal Zone Management Policies & Objectives (205A)		
	Policy	**Comment**
5	Economic uses; (A) Concentrate coastal dependent development in appropriate areas;	The proposed project is not a "development", rather it is a modification of drainage infrastructure intended to shorten extended periods of heavy ponding at this location.
	(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area;	The proposed project offers some benefit to this policy by facilitating access to the park through reduction of extended periods of heavy ponding.
	(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:	Not applicable to the proposed project which is not a development, but is an improvement to existing infrastructure and facilities.
5C	(i) Use of presently designated locations is not feasible;	Not applicable.
	(ii) Adverse environmental effects are minimized;	Not applicable.
	(iii) The development is important to the State's economy	Not applicable
6	Coastal hazards; (A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;	The environmental assessment for the proposed project describes these hazards and the proposed project is an effort to alleviate the accumulation and ponding of stormwater.
	(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;	Development is present at the study area. The proposed project is an effort to alleviate the accumulation and ponding of stormwater which can adversely affect existing development (park, schools, church, businesses, residences, fire station, and road) during periods of heavy rainfall.
	(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;	The proposed project is not bound by flood insurance requirements. It is unlikely to alter any existing flood insurance requirements because the level of protection will not be great enough to alter the regulatory flood plain.
	(D) Prevent coastal flooding from inland projects;	The focus of the proposed project is to alleviate the accumulation and ponding of stormwater on Haleiwa Road in the vicinity of Kaiaka Bay Bean Park. The proposed improvements will provide an amount of drainage relief, however, ponding and flooding may still be expected during heavy rain events.
7	Managing development; (A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;	Not applicable to the proposed project which is not a development but an improvement to existing infrastructure and facilities.
	(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements;	The proposed project includes applications for several permits and approvals.
	(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process;	The environmental assessment and permit processes for the proposed project include a variety of public information and review opportunities.

Table 5 – Coastal Zone Management Policies & Objectives (205A)		
	Policy	**Comment**
8	Public participation; (A) Promote public involvement in coastal zone management processes;	The environmental assessment and permit processes for the proposed project include a variety of public information and review opportunities.
	(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities;	The environmental assessment and permit processes for the proposed project include a variety of public information and review opportunities. There will be a public meeting associated with the SMA permit.
	(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts;	The environmental assessment and permit processes for the proposed project include a variety of public information and review opportunities. There will be a public meeting associated with the SMA permit.
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;	The outlet of the proposed underground drainage system will extend to a hard reef shoreline which has no sand. Rapid or seasonal erosion of the outlet location does not appear to be the case. Wing walls are included in the project to direct discharge away from the existing beach.
	(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities;	No such private erosion -protection structure is proposed.
	(C) Minimize the construction of public erosion-protection structures seaward of the shoreline;	No such public erosion-protection structure is proposed.
	(D) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor;	Not applicable - the project site is located in a public shoreline area.
	(E) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor;	Not applicable - the project site is located in a public shoreline area.
10	Marine resources; (A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;	The proposed project will “use” marine and coastal resources to discharge ponded stormwater from Haleiwa Road and Kaiaka Bay Beach Park. The quantity of discharge will be minimal compared to the entire discharge from upland watershed farm lands. The proposed “use” is slightly beneficial economically because traffic on Haleiwa Road will be less disrupted due to ponded stormwater, and Kaiaka Bay Beach Park users will find less ponding in the park; there may also be slight benefits to Haleiwa Elementary School, First Baptist Church and Preschool, adjacent residences and businesses, and the fire station. All these benefits are ultimately economic because of reduced time involved and less fuel wasted.
	(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;	The environmental assessment and permit processes for the proposed project include a variety of public information and review opportunities. There will be a public meeting associated with the SMA permit.

Table 5 – Coastal Zone Management Policies & Objectives (205A)		
	Policy	**Comment**
	(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;	In this situation, the interests of the State, as well as the City and County of Honolulu, residents, students, businesses, first responders, and visitors are realized in terms of public health, safety and potentially fewer traffic disturbances and inconveniences along Haleiwa Road.
	(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources;	The planning of the proposed project has incorporated a nearshore aquatic survey of Kaiaka Bay, a geotechnical investigation of subsurface conditions and an engineering study of the hydrologic and hydraulic characteristics of the study area and of potential alternatives to alleviate ponding on Haleiwa Road with a minimal effect on coastal ecosystems.
	(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.	The planning of the proposed project has incorporated a nearshore aquatic survey of Kaiaka Bay, a geotechnical investigation of subsurface conditions and an engineering study of the hydrologic and hydraulic characteristics of the study area and of potential alternatives to alleviate ponding on Haleiwa Road with a minimal effect on coastal ecosystems.

3.7 **Stormwater Impacts.**[11] The Office of State Planning has published guidance to assist reviewers of environmental assessments with regard to the primary, secondary and cumulative effects of a proposed project. The guidance evolved as a reaction to the environmental impact documentation accompanying State Land Use redistricting proposals for large developments and including subdivisions, malls, visitor facilities (hotels, golf courses) and other changes in land uses from agriculture or conservation to urban.

The primary effect of the proposed project is that it would occupy a land area of approximately 3,500 square feet (or approximately 0.08 acres) in surface area. Because the project consists of concrete drainage system installed below existing ground level, permeability of the ground along the length and width of the drainage system could theoretically be impeded slightly.

The secondary and cumulative effect of the proposed project is that over the long-term a relatively small volume of overland flow stormwater runoff will be have been discharged to Kaiaka Bay via the proposed drainage system than would otherwise have occurred in the "without" project. The additional volume of stormwater runoff will be minimal compared to the total volume of streamflow that presently discharges into Kaiaka Bay. Furthermore, the design of the drainage system intake will reduce the additional volume by increasing the detention time within the park thus allowing the stormwater to infiltrate into the ground or evaporate.

[11] Office of State Planning, *Stormwater Impact Assessments*, May 2013.

4 Proposed Mitigation Measures

4.1 **Potential problems and appropriate mitigation including best management practices**. There is a potential problem which might require mitigation and best management practices. The proposed drainage system, while providing benefits to the community by reduction of stormwater ponding on Haleiwa Road, may also discharge (via the proposed drainage system) some turbid stormwater runoff originating in the upland agricultural watersheds. Such water will have flowed downhill and crossed Haleiwa Road into Kaiaka Bay Beach Park and surrounding areas such as the First Baptist Church and Preschool, and residences, businesses and the fire station bordering Haleiwa Road.

The drainage system design will provide treatment to the turbid runoff prior to discharge into Kaiaka Bay. The treatment includes sizing and locating the drain intake to increase stormwater detention time within the existing depression, thus allowing sediment to settle before entering the drainage system. In addition, a water quality unit will be placed in-line with the drainage system to remove most of the trash, debris, sediment and hydrocarbon that manages to enter the intake. The City will maintain the drainage system and remove any material collected in the water quality unit at intervals recommended by the manufacturer.

During construction, and as required by law, the contractor will follow best management practices to minimize noise, dust, and disruption to park users and the adjacent Haleiwa Elementary School.

4.2 **Archaeological Monitoring During Construction.** An archaeological monitoring plan shall be prepared for review by the State Historic Preservation Division (SHPD) and construction in areas where subsurface construction activities shall not commence until approval of the archaeological monitoring plan by SHPD has been received. The monitoring will be carried out on days during subsurface construction activities and at the completion of construction of the entire project a report on the monitoring will be submitted to SHPD.

5 Expected Determination

5.1 **Finding of No Significant Impact (FONSI)**. The proposed improvements will not have a significant effect on the environment, and therefore, preparation of an environmental impact statement is not required. This document constitutes a Notice of Negative Declaration/Finding of No Significant Impact for the proposed project. This determination was based on review and analysis of the "Significance Criteria" in Section 11-200-12 of the Hawai'i Administrative Rules, as documented below.

5.2 **Findings and reasons supporting the determination including justifying evidence.**

5.2.1 *No irrevocable commitment to loss or destruction of any natural or cultural resource would result.* There proposed project is underground and not visible. However, there are areas in which construction activities may encounter potentially significant historic/cultural resources. To protect the area's historic/cultural resources, an archaeological monitoring plan will be prepared to mitigate adverse impacts to potential subsurface historic properties within the project area during construction. Should burials (or other cultural finds) be encountered during ground disturbance, the construction contractor shall immediately cease all work and notify the appropriate agencies pursuant to applicable statutes, rules, and/or regulations

5.2.2 *The proposed project would not curtail the range of beneficial uses of the environment.* The proposed project may slightly enhance the beneficial use of the environment by providing improved accessibility to Kaiaka Bay Beach Park, adjacent schools, the church, residences, businesses and the fire house as well as more reliable passage on Haleiwa Road for vehicles, pedestrians or bicycles.

5.2.3 *The proposed project would not conflict with the state's long-term environmental policies or goals and guidelines.* The state's environmental policies and guidelines as set forth in Chapter 344, Hawai'i Revised Statutes, "State Environmental Policy", encompass two broad policies: conservation of natural resources and enhancement of the quality of life. The proposed project will both conserve and enhance the natural resources of Kaiaka Bay Beach Park, and enhance the recreational experience for both visitors and the local populace by providing more reliable access, and potentially more area for use (areas less prone to extended periods of ponding).

5.2.4 *The proposed project will improve the economic and social welfare of the community and the state.* The proposed improvements add to the benefits available to visitors who may tour around the island. By enhancing the visitor benefits, the general welfare of the state is improved because tourism is a major component of the state's economy. During periods of heavy rains, residents are less likely to be inconvenienced when traveling along Haleiwa Road. Similarly, nearby schools, the church, businesses and the fire station should have improved access if stormwater does not back up onto Haleiwa Road.

5.2.5 *The proposed project would not substantially affect public health*. The proposed improvements will have beneficial effects on public health by improving access for transiting vehicles along Haleiwa Road and less inconvenience for first responders at the fire station.

5.2.6 *No substantial secondary impacts, such as population changes or effects on public facilities, are expected.* The project does not have features which add to population or impose added burdens on public facilities.

5.2.7 *No substantial degradation of environmental quality is expected due to the proposed project.* Construction activities would have potential short-term impacts on ambient environmental quality, although these impacts are expected to be minor. In the long term,

stormwater runoff would not remain in the depression as long as it would have under existing conditions. In both the existing and post-project condition, the overland stormwater runoff which originates from the uplands would eventually find its way to Kaiaka Bay. In the post-project condition, storm water will collect in a detention area to allow sediment to settle before entering the drainage system. The drainage system will include a water quality unit to provide some treatment prior to discharge into Kaiaka Bay. No impacts to endangered species or valuable habitat are anticipated by the proposed project.

5.2.8 *No cumulative effect on the environment or commitment to larger actions will be involved.* The proposed project is not part of any other project or larger action. Its purpose is strictly to reduce the occurrences and duration of ponding after heavy rains.

5.2.9 *No rare, threatened or endangered species or their habitats are affected.* No impacts are anticipated on any candidate, proposed or listed endangered species or their habitats. During construction, protective species best management practices (BMPs) will be implemented to reduce the chanced of interaction with any endangered, protected or listed species.

5.2.10 *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* Construction activities may cause short-term impacts to air, noise and water quality which will be managed through the use of construction best management practices to the maximum extent practicable.

5.2.11 *The proposed project will not detrimentally affect environmentally sensitive areas such as flood plains, tsunami zones, beaches, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters or coastal waters.* The proposed project is in a flood plain and a tsunami zone, but it does not add to or worsen flood/tsunami hazards because it is below ground. It may provide a slight and beneficial flood hazard reduction by a decrease in ponded water on Haleiwa Road and surrounding land uses. It does not impact any beaches. Wing walls are included in the proposed project to divert the discharge away from the beach near the outlet structure. The drainage improvements will be placed above the current mean high tide elevation and a check valve is incorporated into the design to provide a modest level of protection against sea level rise.

5.2.12 *The proposed project will improve scenic vistas and view planes identified in county or state plans or studies.* The proposed improvements to the park would not obstruct seaward views from Haleiwa Road towards the sea shore, but because it is underground it does not improve such vistas.

5.2.13 *There will be no requirement for substantial energy consumption.* Construction of the project and use of the completed project will not require substantial energy consumption once the project is in place.

6 Summary of Consultations and List of Environmental Permits and Approvals Required

The following narrative summarizes the comments from, and responses to, elected officials, individuals, agencies and organizations. Appendix E includes the early consultation mailing list and copies of the early consultation letters. Appendix E also includes letters (and responses to those letters) from those who responded to the early consultation letter. Table 6 (below) describes the environmental permits and approvals required for this project to be constructed.

6.1 Federal

6.1.1 U.S. Army Corps of Engineers. The Corps has regulatory authority for work in navigable waters of the U.S.

Comment: Construction appears to extend into jurisdictional waters of the U.S. If so, permits will be required. Applications should include a marine resource survey, listed/threatened/endangered species, historic sites, and description of staging, access, stockpiling, dewatering areas; and BMP (best management practices) plan.

Response: Our application will include the above items and we acknowledge that construction will require a permit under Section 10 and may require a permit under Section 404.

6.1.2 U.S. Fish and Wildlife Service. The Service has authority per the Endangered Species Act (ESA), and provided guidance for the protection, preservation and restoration of habitat.

Comment: Attention should be given to species immediately adjacent to the proposed terrestrial and submerged project areas including turtles, seabirds, migratory birds, coral reefs, macro-algae beds and rare, native species and habitats. The Service included a set of standard BMPs for reference.

Response: We intend to comply with the Service's concerns.

6.2 State of Hawai'i

6.2.1 Department of Education, Planning Section.

Comment: Request a meeting to discuss disruption of vehicular and pedestrian access to Haleiwa Elementary School. Interruption of school operation is a major concern.

Response: A pre-assessment consultation letter was sent to Haleiwa Elementary School. We subsequently met with a representative from the school to discuss these issues.

6.2.2 Department of Education. Haleiwa Elementary School is adjacent to the proposed project, they could be impacted temporarily by construction and they need a clear path for evacuations into the park.

Comment: The school needs a clear path into the park for access during emergencies; the school has concerns about dust and noise during construction; the school is concerned about security and prefers a clear and unobstructed visual path from the school across the park; the fire department has needed access in the past to fight brush fires adjacent to the school.

Response: The original project concept was an open trapezoidal shaped channel. After discussions with the school, the decision was made to design a fully underground drainage system in order to alleviate most of the school's concerns. The contractor will be re-

quired to meet regulations and laws applicable to construction including noise, dust, operational hours.

6.2.3 Office of State Planning (OSP), Department of Business, Economic Development and Tourism. OSP is responsible to assure that the objectives of the Hawaii State plans are achieved, including compliance with the Coastal Zone Management Act.

Comment: The draft EA should discuss how the proposed project complies with the CZM act and a CZM Consistency Declaration will be required if a USACE permit is required. Also, because the improvement may have nonpoint pollution impacts on coastal waters, the applicant should review the *Hawaii Watershed Guidance* document. The Draft EA should include a discussion of the proposed project's effects consistent with the SMA guidelines and regulations

Response: The above requests have been incorporated into the draft EA.

6.2.4 Department of Land and Natural Resources (DLNR): Land Division, Commission on Water Resource Management (CWRM), Boating and Ocean Recreation (BOR) Division, and Engineering Division. DLNR has oversight responsibility for the Conservation District Use Permits and National Flood Insurance Program (NFIP).

Comment: CWRM (no comment and no objections); Engineering Division (Requests compliance with NFIP, notes project is in a VE zone); BOR (no comments); Land Division/Oahu District (no comment).

Response: Project will comply with NFIP

6.2.5 Historic Preservation Division, The Division is responsible for compliance with the historic preservation acts. Consultation occurred during preparation of the archaeological and cultural report (Appendices B & B1).

Comment: Recommend that subsurface testing be done within the Area of Potential Effect (APE) which is the alignment of the proposed culvert and that the APE be identified. If needed, mitigation plans must be approved prior to commencement of construction or any ground-disturbing actions.

Response: We concur and will comply. Subsurface testing conducted in July 2015. Archaeological Inventory Survey Report submitted to SHPD in July 2016 for review. A revised report was submitted in October 2017.

6.2.6 Department of Health, Office of Environmental Quality. Coordination with the Office of Environmental Quality Control has occurred through use of their guidelines for preparation of this environmental assessment.

6.2.7 Department of Health, Environmental Planning Office (EPO).

Comment: Advised that project must comply with all standard comments applicable to the project; that the project consider "sustainable design"; and in the future consider conducting a Health Risk Assessment.

Response: Standard comments, sustainable design guide, and Health Risk Assessment documents will be reviewed.

6.2.8 Department of Health, Clean Water Branch (CWB). Responsible for regulatory permits such as the Water Quality Certification and the National Pollution Discharge Elimination Permits as well as enforcement of the State's water quality standards.

Comment: The proposed project must comply with: State's antidegradation policy, designated uses, and water quality criteria. Project may require NPDES permits. All discharges must comply with State Water Quality Standards.

Response: We acknowledge the need for project compliance.

6.2.8 Office of Hawaiian Affairs (OHA). In October 2013, a pre-assessment consultation letter was sent to OHA for their review and comment. No comments were received.

6.3 **City and County of Honolulu**

6.3.1 Department of Parks and Recreation (DPR). The Department's Kaiaka Bay Beach Park receives the physical impact of the proposed project.

Comment: DPR will discuss its concerns at a meeting with the Department of Design and Construction and the Department of Facilities Maintenance.

Response: The initial proposal for an open channel has now been revised to a buried box culvert. Temporary alternate access for park patrons will be provided during construction and we will consider fencing only the inlet structure of the culvert.

6.3.2 Department of Transportation Services (DTS). The Department is responsible for issuance of Street Usage Permits for construction work that may require the closure of any City street, traffic lane, or sidewalk, and has concerns that public transit not be disrupted by construction.

Comment: The draft EA should include a traffic assessment that discusses the effects of construction and a street usage permit should be obtained for any work impacting city streets. The neighborhood board and Haleiwa Elementary School should be kept apprised of any work impacting the local street network. The draft EA should discuss any potential effects on public transit buses.

Response: The draft EA will discuss the potential effects on traffic during construction and if there is to be work on Haleiwa Road, a street usage permit will be applied for. The draft EA will discuss public transportation and the potential effects of the proposed project.

6.3.3 Department of Planning and Permitting (DPP). The Department is responsible for the Special Management Area permit regulatory process and for the North Shore Sustainable Communities Plan.

Comment: A Special Management Area (SMA) permit may be required. The draft EA should discuss the North Shore Sustainable Communities Plan and protection of coastal waters. The project should incorporate a foot bridge over the proposed open channel between Haleiwa Elementary School and Kaiaka Bay Beach Park.

Response: An SMA application will be filed. The draft EA includes a discussion of the North Shore Sustainable Communities Plan and protection of coastal waters. The project will involve construction of an underground drainage system, thus, foot bridges will not be necessary.

6.3.4 Board of Water Supply (BWS). BWS is responsible for provision of water throughout Oahu.

Comment: BWS has no facilities in the project area and anticipates no impacts on the BWS system.

Response: Thank you for your comments.

6.3.5 Honolulu Fire Department (HFD). The Department has a station on Haleiwa Road adjacent to the proposed project.

Comment: HFD has determined that there is no significant impact to fire department services.

Response: Thank you for your comments.

6.3.6 Honolulu Police Department (HPD).

Comment: HPD has no concerns at this time.

Response: Thank you for your comments.

6.4 Elected Officials

6.4.1 Councilmember Ernest Martin (from Reed Matsuura, Senior Community Liaison).

Comment: Ponding on Haleiwa Road is a long-standing problem and will the proposed box culvert provide the desired relief?

Response: It is anticipated that the proposed project improvements will provide some drainage relief, however ponding and flooding may still be expected during heavy rain events.

6.5 Private Companies.

6.5.1 Oceanic Time Warner Cable.

Comment: The company has no facilities which would be affected.

Response: Thank you for your comments.

6.5.2 Hawaii Gas.

Comment: The area is clear of gas utility lines.

Response: Thank you for your comments.

6.6 **Organizations and Individuals**

6.6.1 Individuals. Some individuals from the community were consulted during preparation of the cultural assessment as part of this environmental assessment.

6.7 Environmental Permits and Approvals

Table 6 – Environmental Permits and Approvals		
Agency	**Permit**	**Action**
U.S. Army Corps of Engineers	Section 10, Rivers and Harbors Act, 1899	Construction in waters of the U.S.
U.S. Army Corps of Engineers	Section 404/401, Clean Water Act	Dredging and filling in waters of the U.S.
Hawaii Department of Economic Development and Tourism	Coastal Zone Management Consistency Declaration	Required when a U.S. Army Corps of Engineers Permit is enabled.
Hawaii Department of Health	Section 404/401, Clean Water Act, Water Quality Certification	Required when a U.S. Army Corps of Engineers Permit per the Clean Water Act is enabled.
Hawaii Department of Health	National Pollution Discharge Elimination System, Clean Water Act, discharge of stormwater from construction site.	Required when construction sites are one acre or more.
Hawaii Department of Health	National Pollution Discharge Elimination System, Clean Water Act, discharge of treated effluent from construction dewatering.	Required when groundwater must be removed from excavations so that work on the drainage system can be accomplished.
Hawaii Department of Health	National Pollution Discharge Elimination system, Clean Water Act, discharges of hydrotesting waters.	Required for the release of water used to test and disinfect water lines.
Hawaii Department of Land and Natural Resources (DLNR)	Conservation District Use Permit	Required if the discharge end of the proposed drainage system is constructed in the Conservation Land Use District.
Hawaii Department of Land and Natural Resources	Shoreline Certification	DLNR must certify a survey of the shoreline. The certified survey is required for the Special Management Area Permit, Shoreline Setback Variance and Conservation District Use Permit, and is valid for one year.
Honolulu Department of Planning and Permitting	Special Management Area Permit	Required for projects which occur in the Special Management Area.

Table 6 – Environmental Permits and Approvals		
Agency	**Permit**	**Action**
Honolulu Department of Planning and Permitting	Shoreline Setback Variance	Required for projects which will occur within the shoreline setback. In this situation the drainage system will transition through the shoreline setback which is 40 feet inland from the certified shoreline.
Honolulu Department of Planning and Permitting	Grading Permit	Required when earthwork exceeds 50 cubic yards of cut or fill.

6.7.1 Approval of construction documents and permits are required.

6.7.2 Project plans will be reviewed by the Disability and Communication Access Board for conformance with HRS Sec. 103-50. Plans must conform to the current guidelines, best design practices and recommendations from the U.S. Architectural and Transportation Barriers Compliance Board's Regulatory Negotiation Committee Final Report, "Accessibility Guidelines for Outdoor Developed Areas" (September 1999), or more recent guidance if available.

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APPENDIX A
Biological Report

APPENDIX B
Archaeological and Cultural Assessment

APPENDIX B.1
Draft Archaeological Inventory Survey

APPENDIX C
Geotechnical Engineering Exploration

APPENDIX D
Drainage Study

APPENDIX E
Correspondence