STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Office of Conservation and Coastal Lands
Honolulu, Hawaii

File No: OA-3305
180-Day Exp. Date: Dec. 20, 2006

December 8, 2006

Board of Land and
Natural Resources
State of Hawaii
Honolulu, Hawaii

REGARDING:	Conservation District Use Application for an After-the-Fact Seawall and Drainage Outlet
APPLICANT:	Ke'ehi Memorial Organization 2685 N. Nimitz Hwy Honolulu, Hawaii 96819
AGENT:	Cappy Fasi, Project Manager
LANDOWNER:	State of Hawaii
LOCATION:	Ke'ehi Lagoon, Honolulu, Hawaii
TMK:	(1) 1-1-03:4 (Seaward)
AREA OF PARCEL/ USE:	11 Acres 3,100 square feet
SUBZONE:	Resource Subzone

DESCRIPTION OF AREA/CURRENT USE:

The project site is located on the shoreline within the Ke'ehi Lagoon, Honolulu, Hawaii (**Exhibits 1-3**). The project site is located within the Resource Subzone of the State Land Use Conservation District (**Exhibit 4**). The site is within the aviation easement for the Honolulu International Airport.

The site is situated between the City and County of Honolulu's Ke'ehi Lagoon Beach Park to the west, Moanalua Stream to the east, and Nimitz Highway to the north. The wall was built to stabilize

the shoreline fronting the Ke'ehi Lagoon Memorial (KLM) facilities. The existing facilities include meeting halls, pavilions, picnic shelters, chapels, maintenance structures, and caretaker's residence. The KLM facilities are managed by the Ke'ehi Memorial Management Committee (KLMMC), and their purpose is three fold: 1) To honor the memory of U.S. soldiers; 2) to contribute to the community; and 3) to be self sustaining. The KLM site falls under the jurisdiction of the Division of State Parks, but is currently subject to a perpetual lease to the Disabled American Veterans Hawaii Department (DAVHD). The KLM facilities are not within the State Land Use Conservation District. Only the wall and drainage outlet are the subject of this Conservation District Use Application.

The area once consisted of mangroves and other shallow submerged areas that were filled to create fast land. There is no naturally occurring beach at this site or adjoining properties. There is an artificial sand beach at the nearby Ke'ehi Lagoon Beach Park. Some of the sand from this park has migrated to the base of the aforementioned seawall.

Access to the area occurs through the KMO site or along the front of the wall. According to the applicant, fishers are accustomed to parking on the KMO site to access the shoreline. To further accommodate safe access, KMO built stairs leading down to the beach from a paved walkway from the parking lot.

PROPOSED USE:

The KMO is seeking after-the-fact approval for a seawall and drainage outlet. The wall was constructed in 2004 and the drainage outlet in 2001, without the authorization of the Department. A violation was adjudicated before the Board of Land and Natural Resources (BLNR) in January 2006. The BLNR fined KMO $2,000 and also directed them to submit an after-the-fact application for the unauthorized improvements (**Exhibit 5**).

The unauthorized seawall is 430 feet in length. The wall is up to seven (7) feet high on is makai face and finished with a 2-foot wide concrete cap. The wall is a cement-rubble-masonry structure. According to a report submitted by Oceanit, this is an appropriate shore protection method for an eroding landfill embankment. They further indicate the wall should not cause an increase in flooding on the vegetated opposite bank because the stream has sufficient width. Oceanit further notes that the structure should have no detrimental effect on beach process at Ke'ehi Lagoon Beach Park (**Exhibit 6**).

The drainage channel is 10 feet wide and 30 feet long, sloping towards Moanalua Stream. According to Oceanit, the channel was constructed in a low area where rainfall runoff water collects. The channel is surrounded by coastal vegetation. Oceanit believes that the drainage structure does not impact any coastal processes.

SUMMARY OF COMMENTS:

The application was referred to the following agencies for review and comment:

State of Hawaii - Department of Land and Natural Resources - Oahu District Land Agent, Historic Preservation Division, State Parks Division; Department of Health; City and County of Honolulu; Office of Hawaiian Affairs; Department of Transportation, Airports Division.

Staff has summarized substantive responses as follows:

DEPARTMENT OF LAND AND NATURAL RESOURCES

State Historic Preservation Division (SHPD): SHPD notes that if they had been afforded the opportunity to comment on the permits regarding construction of these features, they would have required some form of proactive mitigation (e.g., an archaeological inventory survey and/or archeological monitoring during constructions), depending on the exact nature of the proposed undertaking. For these reasons, they are unable to offer their concurrence for the after-the-fact permit.

OFFICE OF ENVIRONMENTAL QUALITY CONTROL (OEQC)

The OEQC noted that cultural impacts needed to be addressed in the final EA, pursuant to Act 50, 2000 Session Laws of Hawaii. OEQC noted that even in urban settings, cultural impacts must be addressed. For example they noted that persons are known to gather kauna'oa, 'ilimia, 'uhaloa, noni, or ki on the grassy slopes and ramps of the H-1 freeway and some state highways on the neighbor islands. Certain landmarks and physical features are used by Hawaiian navigators for sailing, and the lines of sight from landmarks to the coast by fisherman to locate certain fishing spots. Blocking these features might constitute an adverse cultural impact.

In addition, OEQC notes that the landscaping may include invasive plant species. They request that the applicant consult with the Division of Forestry and Wildlife or go to the Hawaii Ecosystems at Risk website.

DEPARTMENT OF TRANSPORTATION, AIRPORTS DIVISION

The Airports Division has no objections for the after-the-fact seawall and drainage improvements. The Airports Division does have concerns over the proposed day health and child day care facilities that would be developed in the Urban District. They indicate that the proposed facility is located approximately on the 65 DNL noise contour of the Honolulu International Airport 203 Noise Exposure Map and will be subjected to single-event noise from aircraft approaching or departing the airport. They recommend that sound attenuation to reduce interior noise levels be incorporated into

the design and construction of the proposed facility.

Response to Comments

State Historic Preservation Division (SHPD)

All work has been completed on the wall and drainage outlet. HPD chose not to comment on this after-the-fact application. Although the majority of the KMO facility is located with the State Land Use Urban District, staff will recommend that the KMO or their representative(s) consult with SHPD prior to any ground altering work within the KMO facility.

Office of Environmental Quality Control (OEQC)

The applicant revised the EA and indicated that they had contacted several organizations to help determine if any cultural resources or cultural practices would be impacted by the project. These organizations include Kamehameha Schools, Damon Estate, neighborhood boards, and Kaumakapili Church. The applicant indicated that there is no knowledge of any cultural practices currently being conducted on the site.

Department of Transportation, Airports Division

The existing or proposed meeting facilities for the KMO are not within the Conservation District. Nevertheless, the applicant noted that the project architects are aware of the proximity of the proposed project to the 65 DNL noise contour. They will address sound attenuation in the design of the facility.

ANALYSIS:

Following review and acceptance for processing, the applicant was notified, by letter dated June 28, 2006, that:

1. The proposed use is considered an identified use within the Conservation District pursuant to Section 13-5-23 (L-3), of the Administrative Rules related to Erosion Control. The final decision as to whether to grant or deny the permits lies with the Board of Land and Natural Resources;

2. No public hearing will be required since the use is not of a commercial nature; and

3. In conformance with Title 11, Chapter 200, of the Administrative Rules, the applicant anticipates a finding of no significant impact to the environment (FONSI) for the proposed project. The Department of Land and Natural Resources declared a FONSI for the project on

October 18, 2006[1]. The Final Environmental Assessment has been published in the November 8, 2006 Environmental Notice.

The following discussion evaluates the merits of the proposed land use by applying the criteria established in Section 13-5-30, HAR.

1. The proposed land use is consistent with the purpose of the Conservation District.

The objective of the Conservation District is to conserve, protect and preserve the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare.

According to the consultants for the KMO, prior to construction of the wall, erosion of the embankment exposed some landfill material, including wires and sharp rubble from construction debris. They note that the wall has a positive effect on the shoreline environment by preventing the materials from entering the beach and nearshore waters.

They further note that there is no naturally occurring beach on the KMO site and the present wall does not impact the artificial nourishment of the adjacent Keehi Lagoon Beach Park.

In addition they note that the coastal engineering analysis found no adverse impact of the wall or drainage channel on shoreline or other coastal or stream resources.

2. The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur.

The objective of the Resource (R) subzone is "to develop, with proper management, areas to ensure sustained use of the natural resources of those areas. Staff has determined that the uses are not inconsistent with the purpose of the R subzone in this case.

3. The proposed land use complies with provisions and guidelines contained in Chapter 205A, HRS, entitled "Coastal Zone Management," where applicable.

Staff believes the proposal complies with the other provisions and guidelines contained in the Coastal Zone Management statute (Chapter 205A).

1. OCCL used the EA for the seawall and drainage outlet. Although the EA included a number of other structures within the KMO site, these facilities are under the jurisdiction of the City and County of Honolulu, Department of Planning and Permitting (DPP). OCCL solicited comments from the DPP because KMO will need to obtain County approvals for their facilities within the Special Management Area. OCCL received no reply.

It is a Coastal Zone Management policy to "prohibit construction of private erosion-protection structures seaward of the shoreline, except where they result in improved aesthetic and engineering solutions to erosion and do not interfere with existing recreational and waterline activities." The wall that was constructed at KMO was constructed within an inland lagoon and it does not interfere with existing recreational or waterline activities, and in this situation may represent an acceptable engineering solution.

4. The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.

There are no known significant habitats of rare, endangered or threatened bird or animal life in the area

Staff believes the proposed project will not contribute to significant storm water runoff or siltation, or the discharge of other pollutants or wastewater that could adversely impact the environmental quality of the near-shore and marine environment, since the structure will reduce bank erosion.

5. The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.

The wall and drain outlet are located within a brackish inlet, several miles from the open ocean.

6. The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable.

The structure will have minimal impact on the open space characteristics of the lagoon.

7. Subdivision of land will not be utilized to increase the intensity of land uses in the conservation district.

The proposed project does not involve the subdivision of land in the conservation district.

8. The proposed land use will not be materially detrimental to the public health, safety and welfare.

Staff believes that the subject improvements will not create a public nuisance or be detrimental to the general public. The subject wall and drain are located within non-recreational beach nor near a natural sandy beach or dune system. In addition, the subject wall should have no impact on the adjacent Keehi Lagoon Beach Park.

DISCUSSION:

In 1999, the Board of Land and Natural Resources (BLNR) adopted the Hawaii Coastal Erosion Management Plan (COEMAP) and approved specific criteria to guide DLNR staff in the prosecution of cases involving unauthorized shoreline structures. In assessing cases involving unauthorized shoreline structures, specific criteria are as follows:

1. Protect/preserve/enhance public shoreline access;
2. Protect/preserve/enhance public beach areas;
3. Protect adjacent properties;
4. Protect property and important facilities/structures from erosion damages; and
5. **Implement a "no tolerance" policy for recent or new unauthorized shoreline structures.**

The Department considers each case based on its specific circumstances/history. For instance, the age of the unauthorized structure, the quality of the surrounding beach resources, the nature of the surrounding development, and the risk to life and limb are all evaluated to help formulate a position with respect to the disposition of the matter.

When staff presented this matter to the BLNR as a violation, staff recommended that KMO be required to remove the structures in compliance with the BLNR's "no tolerance" policy. The wall had been constructed subsequent to the establishment, by the BLNR of the policy, and was therefore subject to its criteria. In lieu of summary removal, the BLNR opted to fine KMO and to have the matter further reviewed via a Conservation District Use Application. Staff has reviewed the matter and concludes as follows.

Impact on Coastal Lands

The structures are not thought to have a negative impact on the sandy beach and to adjacent down drift properties due to the existing conditions present at the site. The primary concern with shoreline structures is the "locking up" of sediment resources that would normally be delivered to the beach through natural erosion. In this case, there is minimal to no sand in the littoral system and the area behind the seawalls is composed of dirt fill and would serve no practical benefit to allow this material to erode to the beach. In addition, the quality of the shoreline recreational resource is low due to the muddy nature of the stream mouth environment, diminished water quality, mangrove riverbank and limited recreational opportunities. Due to these factors, staff has no objections to the granting of an after-the-fact CDUP for the wall and drain, as it is believed that removal of the structures will serve no public purpose and would likely result in environmental harm. This recommendation in no way condones the practice of constructing illegal seawalls, or modifies our policy of no tolerance.

Staff therefore recommends:

RECOMMENDATION:

Based on the preceding analysis, staff recommends that the Board of Land and Natural Resources (Board) APPROVE this application, subject to the following conditions:

1. The applicant shall comply with all applicable statutes, ordinances, rules, and regulations of the federal, state and county governments, and applicable parts of this chapter;

2. The applicant, its successors and assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury or death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors and agents under this permit or relating to or connected with the granting of this permit;

3. The applicant shall comply with all applicable Department of Health administrative rules;

4. All mitigation measures set forth in the application materials and in the final environmental assessment for this project are hereby incorporated as conditions of the permit;

5. The applicant understands and agrees that this permit does not convey any vested rights or exclusive privilege;

6. In issuing this permit, the Department and Board have relied on the information and data that the applicant has provided in connection with this permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Department may, in addition, institute appropriate legal proceedings;

7. Where any polluted run-off, interference, nuisance, or harm may be caused, or hazard established by the use, the applicant shall be required to take measures to minimize or eliminate the polluted run-off, interference, nuisance, harm, or hazard;

8. The applicant acknowledges that the approved work shall not hamper, impede or otherwise limit the exercise of traditional, customary or religious practices in the immediate area, to the extent such practices are provided for by the Constitution of the State of Hawaii, and by Hawaii statutory and case law;

9. The applicant consult and obtain the approval of the State Historic Preservation Division prior to any ground disturbance activities within the KMO facilities and site;

10. The applicant shall obtain the appropriate land disposition from the Department of Land and Natural Resources, Oahu District Land Office;

11. The applicant understands that if an appeal to the Final Environmental Assessment (FEA) is filed within the thirty (30) day appeal period for the FEA, the Board's approval is temporarily stayed until the end of the appeal;

12. Other terms and conditions as may be prescribed by the Chairperson; and

13. That failure to comply with any of these conditions shall render this Conservation District Use Permit null and void.

Respectfully submitted,

SAMUEL LEMMO
Administrator

Approved for submittal:

for PETER T. YOUNG, Chairperson
Board of Land and Natural Resources

Attachments

Exhibit 1. Location Map

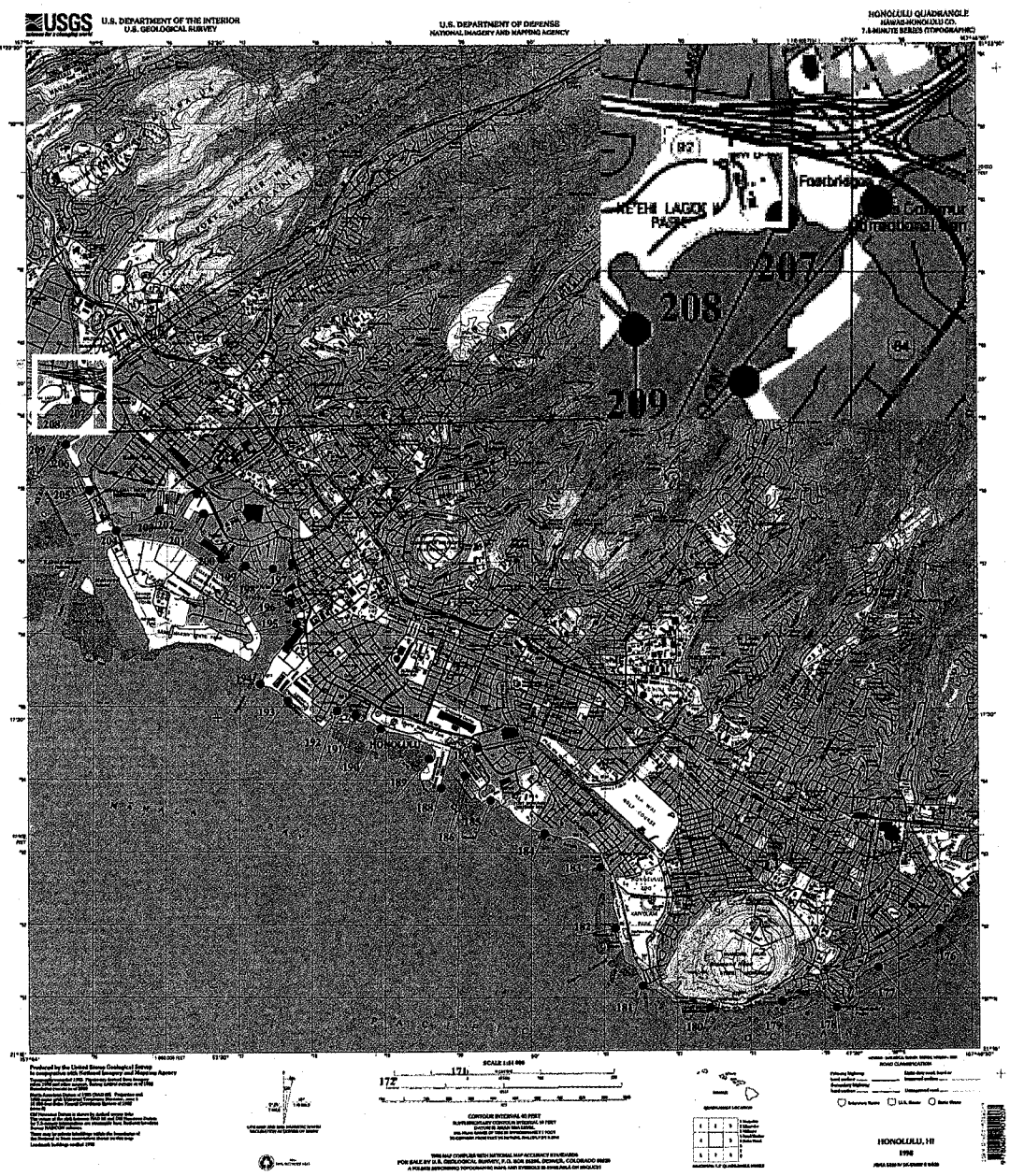


EXHIBIT 1

Exhibit 2. Site Map

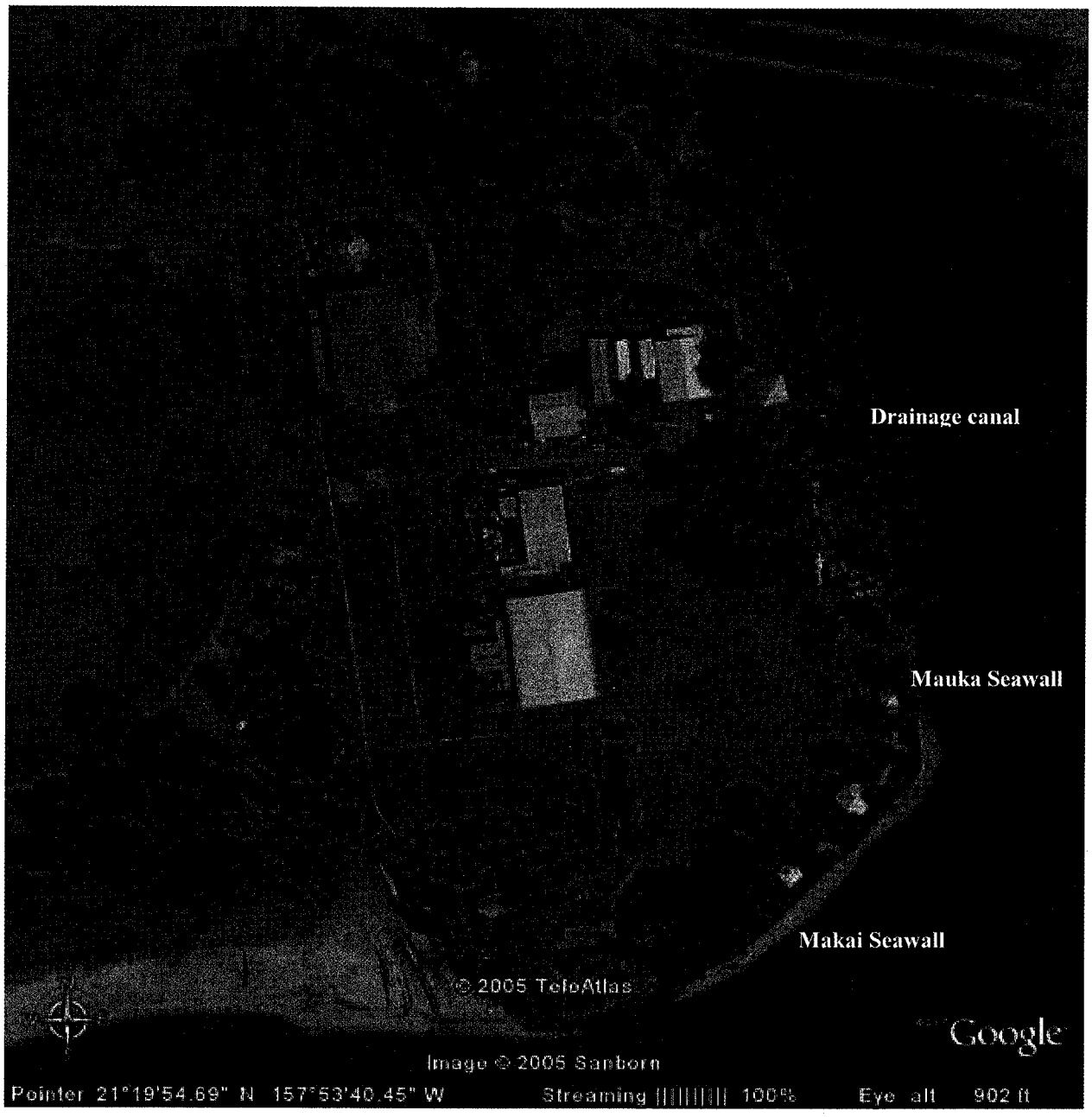


EXHIBIT 2

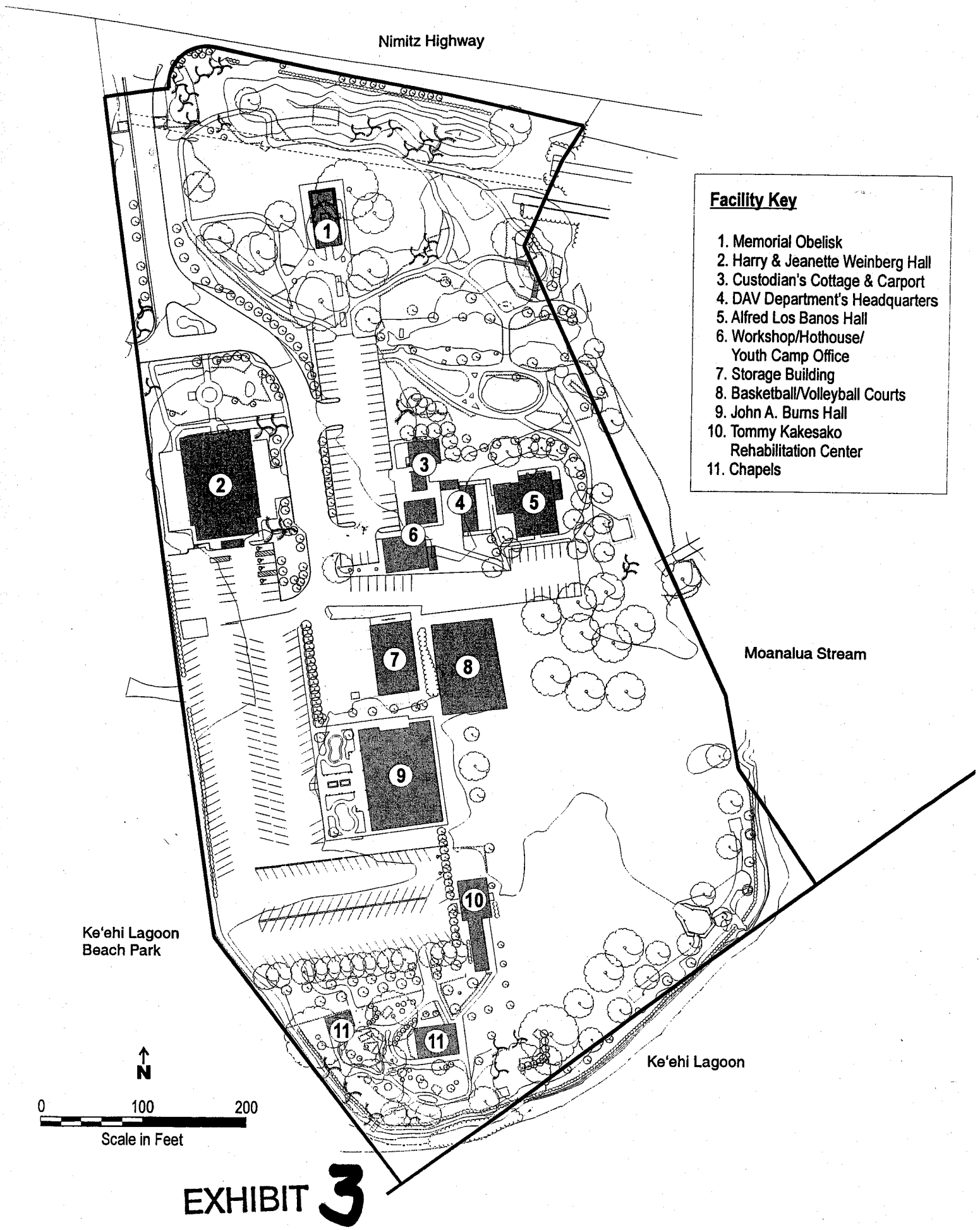

Nimitz Highway
Facility Key
1. Memorial Obelisk
2. Harry & Jeanette Weinberg Hall
3. Custodian's Cottage & Carport
4. DAV Department's Headquarters
5. Alfred Los Banos Hall
6. Workshop/Hothouse/ Youth Camp Office
7. Storage Building
8. Basketball/Volleyball Courts
9. John A. Burns Hall
10. Tommy Kakesako Rehabilitation Center
11. Chapels
Moanalua Stream
Ke'ehi Lagoon Beach Park
Ke'ehi Lagoon
N
0
100
200
Scale in Feet

EXHIBIT 3

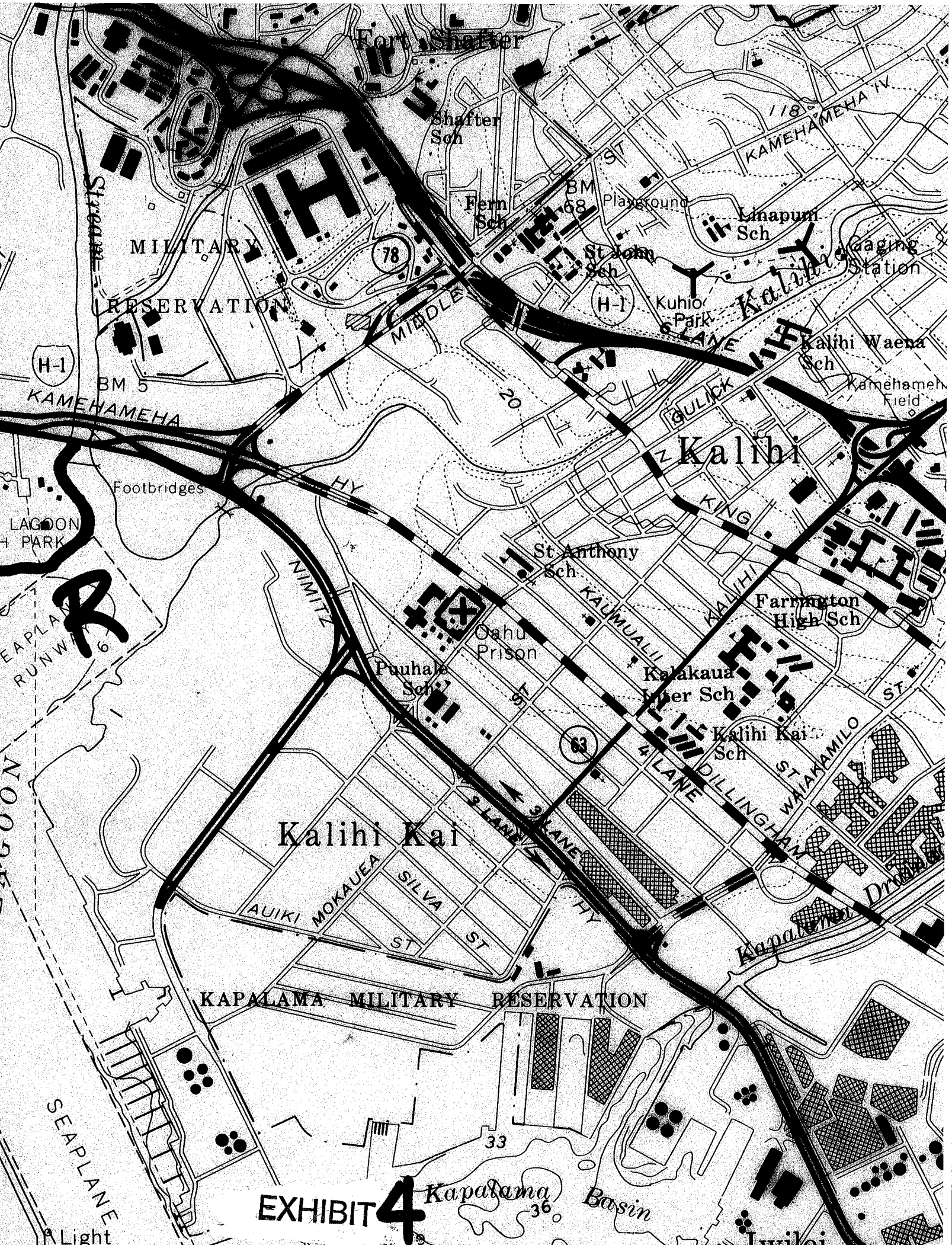

Fort Shafter
Shafter Sch
KAMEHAMEHA HY
118
ST
BM 68
Playground
Fern Sch
Linapuni Sch
MILITARY
RESERVATION
78
St John Sch
Gaging Station
H-1
Kuhio Park
6 LANE
Kalihi
MIDDLE
Kalihi Waena Sch
Kamehameha Field
BM 5
KAMEHAMEHA
20
GULICK
Kalihi
Footbridges
HY
KING
LAGOON
PARK
St Anthony Sch
NIMITZ
KAUMUALII
KALIHI
Farrington High Sch
Oahu Prison
Puuhale Sch
Kalakaua Inter Sch
ST
63
Kalihi Kai Sch
4 LANE
DILLINGHAM
WAIAKAMILO
ST
3 LANE
Kalihi Kai
AUIKI
MOKAUEA
SILVA
ST
ST
HY
Kapalama Drain
KAPALAMA MILITARY RESERVATION
SEAPLANE
33
Kapalama Basin
36
Light
Iwilei

EXHIBIT 4

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR - LAND

DEAN NAKANO
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

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2006 FEB 2 A 8:
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII
FEB - 2 2006

REF:OCCL:DE

File No.: Enf:OA-06-4

February 1, 2006

Mrs. Cappy Fasi
C/O Keehi Memorial Organization
2056 Lanihuli Dr.
Honolulu, Hawaii 96822

Dear Mrs Fasi:

SUBJECT: Alleged Unauthorized Construction of Shoreline Structure(s) at Keehi War Memorial, Keehi Lagoon, Oahu TMK: (1) 1-1-003:004

This is to inform you that on Friday, January 13, 2006, the Board of Land and Natural Resources (BLNR) found you to be in violation of the provisions of Title 13-5 Hawaii Administrative Rules, and Chapter 183C, Hawaii Revised Statutes by failing to obtain the appropriate approvals for the construction of shoreline structures on the subject parcel TMK: (1) 1-1-003:004, and is subject to the following:

1. That the owner pay a fine of $2,000 to the *State of Hawaii*, for violation of the provisions of Title 13-5 Hawaii Administrative Rules, and Chapter 183C, Hawaii Revised Statutes;

2. That upon payment of the fine, within six (6) months of the date of the Board's action, the alleged shall submit an After-The-Fact (ATF) Conservation District Use Application (CDUA) with the DLNR for continued use of the seawall and/or subdivision and process it diligently thereafter;

3. If the CDUA is not filed within six (6) months, fines of $2,000 per day shall accrue on the landowner until these conditions are met; and

4. That in the event of failure of the alleged to comply with the items above, the matter shall be turned over to the Attorney General for disposition, including all administrative costs.

EXHIBIT 5

Please acknowledge receipt of this letter, with the above noted conditions, in the space provided below. Please sign two copies. Retain one and return the other within thirty (30) days. You may submit payment with this receipt payable to *State of Hawaii*
addressed to:

The Office of Conservation and Coastal Lands
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

Once the payment is received you may proceed with an application for an After The Fact CDUA with planning staff of our office. Should you have any questions on any of these matters, please feel free to contact Dolan Eversole of our Office of Conservation and Coastal Lands staff at 587-0321.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

Receipt acknowledged:

Mrs. Cappy Fasi

Date 2.3.06

CC: Oahu Board Member
Land Division
City and County of Honolulu Department of Planning and Permitting
Chairperson's Office

oceanit®
innovation through engineering & scientific excellence

Coastal Engineering Evaluation

DAV Ke`ehi Lagoon Memorial

Prepared for:

Ke`ehi Lagoon Memorial
2685 N. Nimitz Highway

Prepared by:

Oceanit®

1001 Bishop Street
2970 ASB Tower
Honolulu, HI 96813

May 2005

EXHIBIT 6

DISABLED AMERICAN VETERANS
KE`EHI LAGOON MEMORIAL
COASTAL ENGINEERING EVALUATION

I. INTRODUCTION

Volunteers have constructed a number of memorials, pavilions, barbeques, and other structures at the Disabled American Veterans Ke`ehi Lagoon Memorial. The memorial honors WWII veterans from Hawaii, primarily Japanese-Americans who fought in the European Theater with great distinction. Some of the structures were built along the shoreline in the 40-foot setback zone. This report is an evaluation of the effect the structures might have on coastal processes and the potential hazards to the structures from the coastal environment.

II. SITE DESCRIPTION

The memorial site is located at the north end of Ke`ehi Lagoon at the mouth of Moanalua Stream as shown in Photos 1 and 2. The property is bordered on the northwest by Nimitz Highway and the H-1 Freeway and on the south by Ke`ehi Lagoon Beach Park. Total land area is approximately 11 acres. A partial topographic survey map of the southern portion of the memorial is attached (Figure 1). Imata and Associates, Inc. made the survey.

The memorial site is sheltered from ocean waves by the configuration of Ke'ehi Lagoon and the distance across the lagoon. A bathymetric map of the nearby lagoon waters shows that depths are shallow ranging from 6 to 11 feet near the memorial shoreline (Figure 2). Part of the memorial site along the shoreline and stream bank is in Special Flood Hazard Area Zone AE subject to 100-year floods from Moanalua Stream with a base elevation of 4 feet. Other parts are in Zone X, which are areas of a 500-year flood or areas of a 100-year flood with depths less than 1 foot (see Figure 3). Moanalua Stream overflowed its banks near H-1 Freeway and Middle Street after heavy rain as recently as December 2003. However, the occupants of the memorial have not seen any stream flooding since they took over the site in 1959. The flood maps do not indicate any flooding due to wave action. The site is not in a tsunami evacuation area.

A seawall protects part of the memorial shoreline. At locations where there is no seawall or heavy vegetation, some bank erosion is seen. This erosion appears to be caused by runoff. There are drainage problems at the site, and a concrete drainage culvert was built to help alleviate the situation. The soil at the memorial is landfill from construction of Nimitz Highway and contains a lot of debris. The seawall was built to protect the site from stream bank and coastal erosion.

There is a very narrow beach outside the seawall that continues on to Ke`ehi Lagoon Beach Park. The sand on the narrow beach probably comes from the man-made beach at the Beach Park. The beach at the park was constructed

many years ago and is eroding (Photo 3). Oceanit observed sand transport by small wind-driven waves toward the memorial. The fact that some sand remains on the beach indicates that erosion rates are probably slow.

III. STRUCTURES IN THE SETBACK AREA

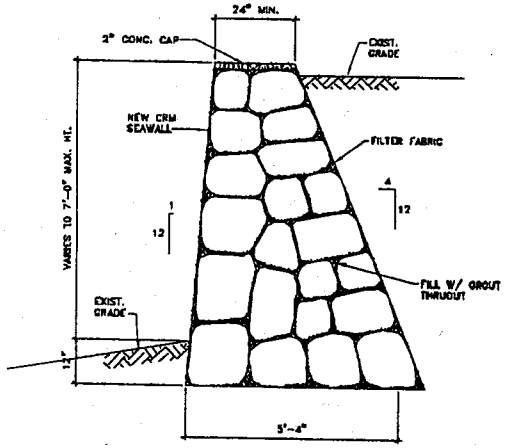
There are a number of structures that were built in the setback area on the Moanalua Stream side of the property. The setback is generally defined in the City and County of Honolulu as 40 feet inland from and parallel to the certified shoreline. The certified shoreline is measured by a registered surveyor and certified by the State of Hawaii Department of Land and Natural Resources. The structures within the setback at the memorial site include a CRM seawall, a concrete drainage channel, three picnic pavilions, and three brick barbeques. The approximate location of the setback line is shown on the attached structure drawings.

CRM Seawall

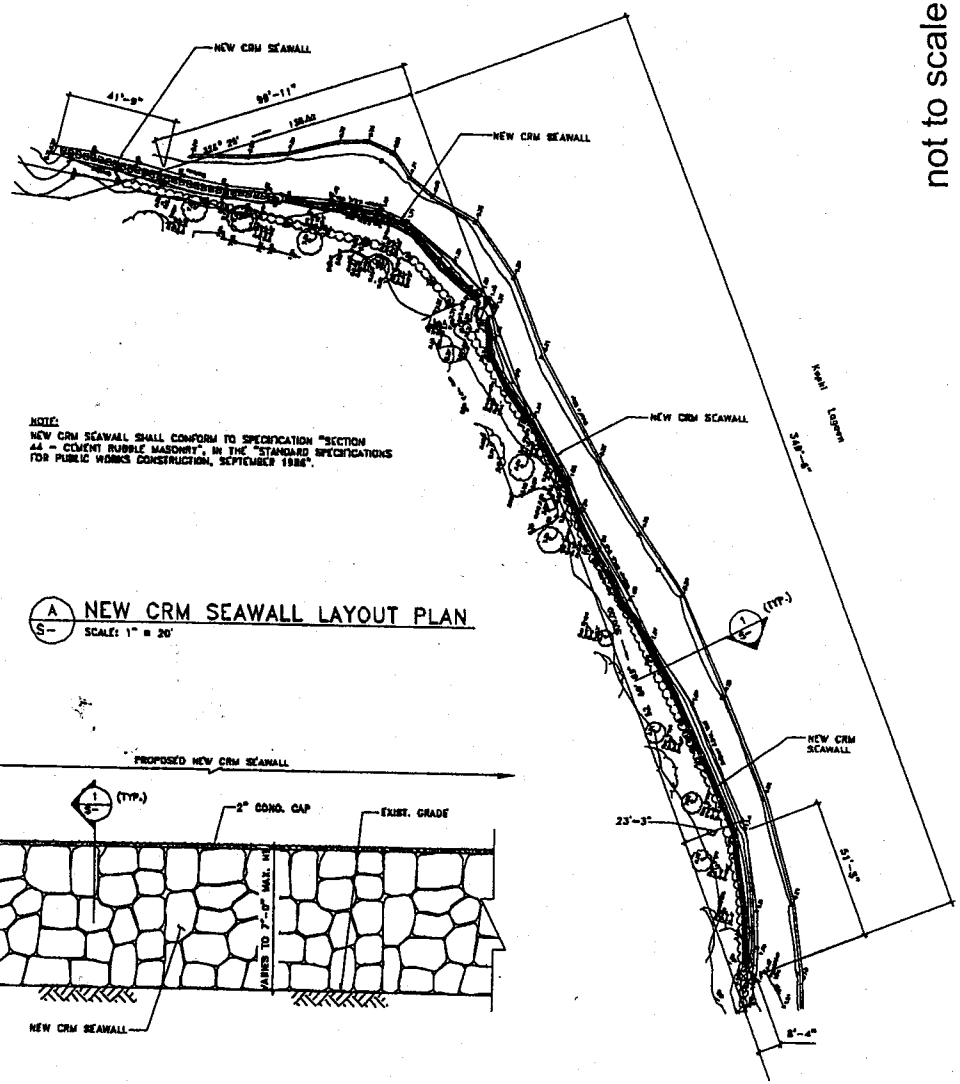
The seawall design and location are shown in Figure 4 "Keehi Lagoon Memorial Selected Improvements" produced by structural engineer Arnold Okubo, P.E. Photo 4 shows the constructed wall. A cement-rubble-masonry (CRM) seawall is an appropriate shore protection method for an eroding landfill embankment. Although there is a beach at the Ke`ehi Lagoon Beach Park to the south, the wall should have no detrimental effects on beach processes. The wall should actually have a positive effect by reducing the amount of eroded landfill that might be carried onto the beach. The results should be a cleaner beach and better water quality for beach users. The Moanalua Stream channel is wide enough such that the seawall should not cause increased flooding on the vegetated opposite bank. Much of the wall faces the lagoon. There is a drainage culvert at the north end on the wall. There should probably be another culvert at the south end so that potential flood waters can run off the property without causing further bank erosion.

Pavilions and Barbeques

The locations of three pavilions and two barbeques are shown in Figure 5 "Pavilion and Barbeque Locations." This figure was adapted from a survey map produced by Imata and Associates, Inc. Figures 6 and 7 show drawings of the pavilions - two 12X12 feet square and one 28-foot diameter hexagon. Photo 5 shows a pavilion with a barbeque in the background. Figure 8 and Photo 6 show the third brick barbeque. Oceanit inspected these structures and the connecting sidewalk and discussed their construction with on-site personnel. The pavilions and sidewalk appear to be professionally constructed. It is Oceanit's opinion that none of the pavilions, sidewalks, or barbeques will have any effect on coastal processes or coastal flooding. Without the seawall, these structures might eventually be subject to damage by erosion, but proper maintenance of the wall



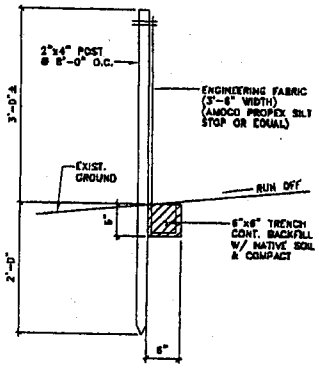
1 S- TYPICAL CRM SEAWALL SECTION
SCALE: 3/4" = 1'-0"



NOTE:
NEW CRM SEAWALL SHALL CONFORM TO SPECIFICATION "SECTION 44 - CEMENT RUBBLE MASONRY", IN THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986".

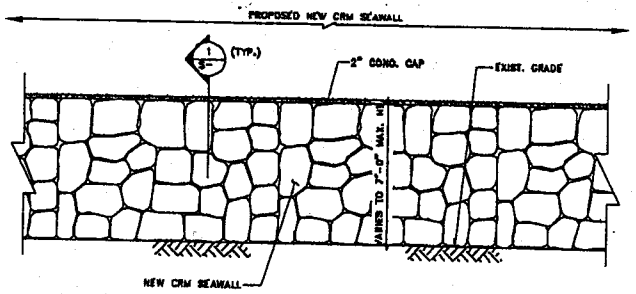
A S- NEW CRM SEAWALL LAYOUT PLAN
SCALE: 1" = 20'

not to scale



NOTE:
SILT FENCE OR OTHER TEMPORARY MEASURES TO BE PROVIDED TO PROTECT WATER WAY.

2 S- TYPICAL SILT FENCE DETAIL
NOT TO SCALE



B S- TYPICAL PARTIAL ELEVATION
SCALE: 3/8" = 1'-0"

REV. NO.	DESCRIPTION	DATE

KEEHI LAGOON MEMORIAL SELECTED IMPROVEMENTS
2685 N. NIMITZ HWY.
HONOLULU, HI

CRM SEAWALL

NEW CRM SEAWALL LAYOUT PLAN, SECTION, DETAIL, & ELEVATION

JOB NO.
DESIGNED BY: ATO
DRAWN BY: RA/SC
CHECKED BY: ATO
DATE:
SHEET NUMBER
OF SHEETS

EXHIBIT

Subject Structure(s)

Photo #3 – Concrete Drainage Channel

Ke'ehi Lagoon Memorial

Photo #7 – Sea Revetment (makai, Keehi Lagoon on left)

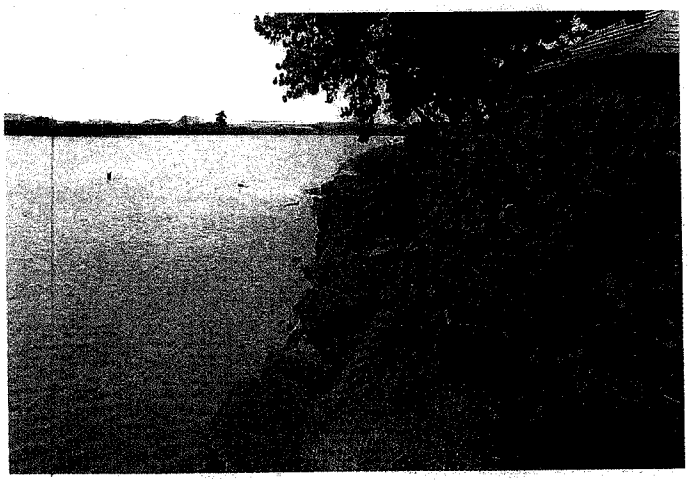


Photo #4 – Sea Revetment (mauka)

Photo #8 – Sea Revetment (makai, Keehi Lagoon on left)