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EXECUTIVE CHAMBERS

HONOLULU

BENJAMIN J. CAYETANO
GOVERNOR

February 1, 1995

TO: Michael D. Wilson, Director
Department of Land and Natural Resources

SUBJECT: Recommendation for Acceptance - Final Environmental Impact Statement for the Waikiki War Memorial Park and Natatorium, Honolulu, Oahu

I am pleased to accept the Final Environmental Impact Statement for the Waikiki War Memorial Park and Natatorium as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. This environmental impact statement will be a useful tool in the process of deciding if the action described therein should be allowed to proceed. My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws and does not constitute an endorsement of the proposed action.

When the decision is made regarding the proposed action itself, I expect the appropriate legislative bodies and governmental agencies to consider if the societal benefits justify the economic, social and environmental impacts which will likely occur. These impacts are adequately described in the statement which, together with the comments made by reviewers, provides useful analysis of the proposed action.

Benjamin J. Cayetano

BENJAMIN J. CAYETANO

c: Lawrence Miike

1995 - ● Oahu - FEIS - Waikiki War Memorial

FINAL ENVIRONMENTAL IMPACT STATEMENT

for the

WAIKIKI WAR MEMORIAL PARK AND NATATORIUM

Honolulu, Oahu, Hawaii

JANUARY 1995

State of Hawaii
Department of Land and Natural Resources
Division of Water and Land Development

DIVISION OF WATER AND LAND DEVELOPMENT
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII

This Environmental Document is Submitted
Pursuant to Chapter 343, HRS

FINAL ENVIRONMENTAL IMPACT STATEMENT
WAIKIKI WAR MEMORIAL PARK AND NATATORIUM
Honolulu, Oahu, Hawaii

PROPOSING AGENCY:

Division of Water and Land Development
Department of Land and Natural Resources
P.O. Box 373
Honolulu, Hawaii 96809

ACCEPTING AGENCY:

Governor, State of Hawaii

Keith W. Ahue
Chairperson
Board of Land and Natural Resources

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WAIKIKI WAR MEMORIAL PARK & NATATORIUM RESTORATION ENVIRONMENTAL ASSESSMENT/EIS OUTLINE

WAIKIKI WAR MEMORIAL PARK & NATATORIUM RESTORATION
ENVIRONMENTAL ASSESSMENT/EIS OUTLINE

WAIKIKI WAR MEMORIAL PARK AND NATATORIUM
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CHAPTER 1 - INTRODUCTION AND SUMMARY

1.1 Project Summary

Proposing Agency: State of Hawaii
Department of Land and Natural Resources
Division of Water and Land Development
P.O. Box 621
Honolulu, Hawaii 96809

Project Location: TMK No. 3-1-31:3
Waikiki War Memorial Park and Natatorium
Kapiolani Park, Oahu, Hawaii

Proposed Action: The State of Hawaii intends to restore the Waikiki War Memorial Park and Natatorium to its original function as an oceanfront salt water pool and park area, open to the public. Complete Restoration includes replicating the ornate facade at the entrance, reconstructing the pool walls and deck, and redesigning the pool's flushing scheme.

The Natatorium was constructed in 1927, and closed to public use in 1979. It had become a safety hazard and was padlocked in 1980. The facility was failing structurally despite several repair attempts. An analysis of the water quality indicated the pool was unsafe for swimmers. Although inadequate design decisions and construction techniques were found to be the initial causes of the difficulties experienced by the Natatorium, these problems were compounded by a general pattern of neglect over many years.

Throughout the years, however, the Waikiki War Memorial Park and Natatorium with its grandeur size and ornate facade has remained a monument to the 101 members of the U.S. Armed Service from Hawaii who were killed in World War I.

The park complex is listed on both the National and the Hawaii Register of Historic Places, as site number 80-14-9701. It is in the Urban State Land Use District and the County's P-2 General Preservation Zone. Its 5.347 acres are a part of the Diamond Head Special District and Kapiolani Park.

1.2 Purpose and Objectives

Complete restoration of the Waikiki War Memorial Park and Natatorium will bring back the significance of the 'living memorial,' eliminate a safety hazard, and enable the public to once again enjoy use of the facility.

The results of the 1989 User Survey, the recommended use program and the concerns of the City and County of Honolulu Department of Parks and Recreation, especially provide clear guidelines for the proposed action. As the manager of the facility (pursuant to Ordinance No. 90-1), the Department of Parks and Recreation's concerns with liability, public safety issues and also operation and maintenance costs narrowed the range of potential uses at the site. Daytime activities, which include public recreational swimming and events requiring only minimal support facilities and special equipment, can be accommodated. Examples are water safety and learn-to-swim programs. Support facilities for large events and nighttime activities cannot be accommodated within the existing site or surrounding area.

The Complete Restoration action is compatible with the Department's concerns. A natural flushing scheme designed to use the coastal process alongside the facility will not require a pumping system. Thus, it will have little or no equipment operation and maintenance costs. All required handicap accessibility standards are met.

The Complete Restoration action does not exactly replicate the Natatorium's original design (i.e., there is no diving tower or reflecting pools). However, it does restore its use as a saltwater pool, its structural integrity and overall appearance while correcting some of the design and construction features that caused the facility's deteriorated state.

1.3 Alternatives Considered

A Partial Restoration Alternative has been investigated, which converts the saltwater pool into a public beach yet maintains the site's prominent features such as the Memorial Arch, the stone monument and surrounding park area.

The construction costs for the Complete Restoration action are only slightly higher than the Partial Restoration Alternative at $12,300,000 and $11,150,000, respectively. However, operations and maintenance costs for the two vary. Average annual operation and maintenance costs are $318,000 for Complete Restoration and $91,000 for the Partial Restoration Alternative.

The construction schedule for the Complete Restoration action would cover 30-1/2 months. The Partial Restoration Alternative would cover 20 months.

The other alternative considered is the "No Action" alternative. The park area would be maintained for public use as at present. The Natatorium itself would continue to deteriorate while remaining fenced and locked. Serious concerns of public health and safety would not be addressed.

1.4 Summary of Impacts and Mitigative Measures

The full restoration will modify the existing coastal circulation. The water which currently flows around the Natatorium will be redirected through the pool. This will be done by the construction of openings in the existing seawall and the addition of two small groins. The active circulation of coastal water through the pool will maintain the same water quality in the pool as in the adjoining coastal waters. This will mitigate any impacts on the coastal water quality. To mitigate the impact on the existing littoral drift and beach profiles, the size of the groins will be kept to a minimum. The openings will be located to prevent movement of sand from the beach into the pool.

The reconstruction of the pool and the modifications will impact portions of the reef and existing substrate. The construction will also likely generate turbidity plumes. To mitigate the impact of the pool construction, the dredging and reconstruction of the pool interior will be carried out prior to construction of the pool openings. To control the extent of the turbidity plumes and associated sedimentation, the following mitigation measures will be used:

- Use of silt curtains.
- Limiting the duration of in-water construction.
- Limiting the periods when in-water construction is carried out.
- Disposing of all dredge spoils on land.
- Scheduling of site work during periods of minimal rainfall.
- Scheduling of dredging during periods of low tide.

- Replanting of lands denuded of vegetation as quickly as possible to control erosion.
- Prevention of construction materials, petroleum products and debris from falling, blowing or leaching into the aquatic environment.

The restored facility will likely result in additional traffic competing for the existing parking. This will cause an increase in the carbon monoxide emission and increase the congestion in the area. To mitigate the impacts of the additional traffic the following measures will be used:

- Encourage use of City bus service. There is a bus stop on Kalakaua Avenue, fronting the Natatorium.
- Encourage use of the facility in conjunction with other activities at Kapiolani Park (e.g., picnic at the park).
- Establish off-site parking and shuttle people to the Natatorium on weekends (e.g., off-site parking at Kapiolani Community College and shuttle service between Kapiolani Community College and Kapiolani Park).

A new pad-mounted transformer will be added to the site. To mitigate the visual impact of the new transformer, landscaping will be placed around the transformer. The transformer site will also be shielded from view by an existing banyan tree.

New exterior lighting will be added for safety and security, and to illuminate the memorial arches and monument. To mitigate the impacts caused by the new exterior lights, the number of fixtures will be minimized by careful control of the light distribution and light levels. The lighting will be focused to prevent light spillage. The existing floodlight poles will be removed and not replaced. Lighting sufficient for nighttime activities will not be provided although empty conduits to accommodate possible additional lighting in the future will be provided.

1.5 Summary of Unresolved Issues

While the already accomplished planning and design of the fully restored Waikiki War Memorial and Natatorium provides general parameters for the operation of the facility, the City and County of Honolulu will determine the specifics of its operation and use.

1.6 Necessary Permits and Approvals

- o Department of the Army Permit for Activities in Waterways - U.S. Army Corps of Engineers, Operations Branch.
- o Water Quality Certification - State Department of Health, Environmental Management Division.
- o Historic Site Review - State Department of Land and Natural Resources, Historic Preservation Office.
- o Conservation District Use Application - State Department of Land and Natural Resources, Office of Conservation and Environmental Affairs.
- o Review per HRS 103-50 for accessibility compliance.
- o Conservation District Use Application - State Development of Land and Natural Resources, Office of Conservation and Environmental Affairs.
- o Coastal Zone Management Program: Federal Consistency - Office of State Planning.

- Coastal Zone Management Program: Federal Consistency - Office of State Planning.
- Special Management Area Use Permit - Honolulu City Council.
- Shoreline Setback Variance - City and County of Honolulu, Department of Land Utilization.
- Special District Permit - City and County of Honolulu, Department of Land Utilization.
- Building Permit - City and County of Honolulu, Building Department.
- Zoning Waivers for Public Uses - City and County of Honolulu, Department of Land Utilization.

CHAPTER 2 - PROJECT DESCRIPTION

2.1 Location

The Waikiki War Memorial Park and Natatorium is situated near the edge of Waikiki within the boundaries of Kapiolani Park on Kalakaua Avenue. (See Exhibit 1, Project Location and Exhibit 2, Project Vicinity.) Kapiolani Park contains approximately 170 acres of open space dedicated to providing "a resort and place of innocent refreshment for all who wish to evade the dust of the town streets" as expressed by King Kalakaua in 1877.

The Natatorium projects seaward from the beach edge and occupies approximately 103,800 square feet. The Kaimana Beach Hotel is located at the Diamond Head (southeast) boundary of the Natatorium area and the Waikiki Aquarium borders the Ewa (northeast) end.

2.2 Project Characteristics

2.2.1 Description of the Natatorium

The Natatorium is constructed of reinforced concrete placed on the coral reef. Its main feature is an open-air 100 by 36 meter natural (i.e., sand) bottom swimming pool connected to the coastal sea water through a series of concrete pipes. In the park area, a stone monument with an inscribed plaque is a part of the War Memorial. Tall coconut palms and two large banyan trees accent the grassy open space which includes a driveway with limited parking.

The Natatorium pool is surrounded on four sides by a twenty-foot wide concrete deck. The deck is an elevated cast-in-place slab and beam system supported on concrete piles. On the three makai ocean sides it is protected by a concrete seawall. The facility contains bleachers which are also constructed of cast-in-place concrete slab and beams. The bleachers enclose the fourth, mauka (mountain) side. The bleachers rise 13 levels to a height of 20 ft. 10 in. and provide seating for approximately 2,500 people. The bleachers are comprised of four sections and are divided into two parts by a central entry space.

The Beaux-Arts style main entry, with its triumphal arch flanked by two lesser round arches, is the major historical design feature of the Natatorium. A pair of ionic pilasters support the triumphal arch's entablature which has the words, "The War Memorial", inscribed in its frieze, with an American eagle perched at each corner, and the Hawaiian motto and seal in the center. The triumphal arch itself has a paneled ceiling decorated with hexagonal floral designs. Flanking the triumphal arch and above the two lower arches is a medallion with floral patterns and a woman's face in the center in relief. The ocean and mountain sides of the entry are similar.

The bleachers' rear walls extend approximately 100 feet to the sides of the main entrance. Below the bleachers are the locker rooms, which are located behind the centered, round, arched arcades of seven bays each. The round arched windows correspond to the arcade openings and provide the locker rooms with ventilation and illumination. A pair of simple pilasters flank the arcade and support large concrete urns which project above the bleacher walls. A flagpole with a ball finial is located above the second and sixth openings of each arcade. The bays on either side of the arcade contain office and restroom spaces and are distinguished by rectangular grilled windows.

Low walled outdoor areas, presently include volleyball courts on one side and parking spaces on the other, with a ramp in the middle leading to the main entry. The stepped end walls are two bays long at the main entry end and three bays long at the other end. The

front walls are five bays long with a tapered column, which originally supported a light globe, located at each pier. Located at the corners of the entry ramp these columns are fluted metal and support spotlights which illuminate the triumphal arch entry. In addition, hau trees supported by a framed pipe trellis are adjacent to the front walls.

The following is a summary of the areas in this project:

1. The Building

Pool	41,200 sq. ft.
Pool Deck	21,400 sq. ft.
Bleachers	10,200 sq. ft.
Area Under the Bleachers	5,200 sq. ft. (not counted in total area)
Outdoor Courts	25,800 sq. ft.
	103,800 sq. ft.

2. The Landside

Park Area	129,100 sq. ft.

3. Total Area 232,900 sq. ft.

2.2.2 The Program

1. Introduction

The following is a summary of the programmatic requirements for the Waikiki War Memorial Park and Natatorium. This program treats the Natatorium as a "municipal pool" for purposes of planning its future uses. The scope of this program covers the pool and deck area, the bleachers and area beneath the bleachers and the vehicle/pedestrian entry areas, including landscaping. The program is the consolidation of the following:

- Meetings with the following City and County of Honolulu, Department of Parks and Recreation officials:

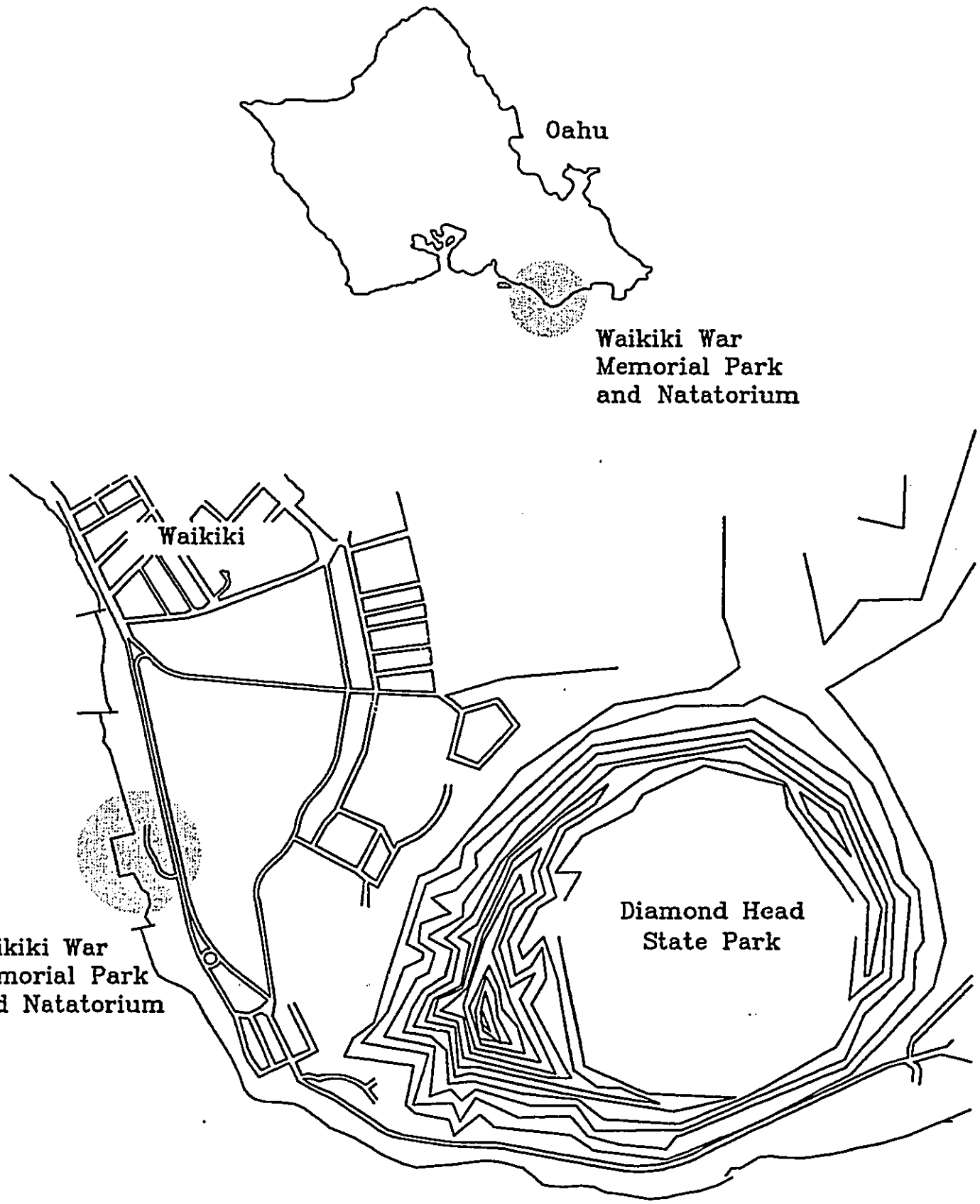
  Wilbert Ching - Parks and Recreation Administrator

  Yukio Taketa - Chief Facilities Development Division

  Ralph Goto - Water Safety Administrator, Water Safety Division

  John Mau - District 5 Chief, Department of Parks and Recreation

- Leo A. Daly produced a User Survey and distributed them to specific governmental agencies and private sector groups and individuals to help determine the possible uses (of a fully restored Natatorium) within the constraints of the existing facility.



Project Location

Exhibit 1

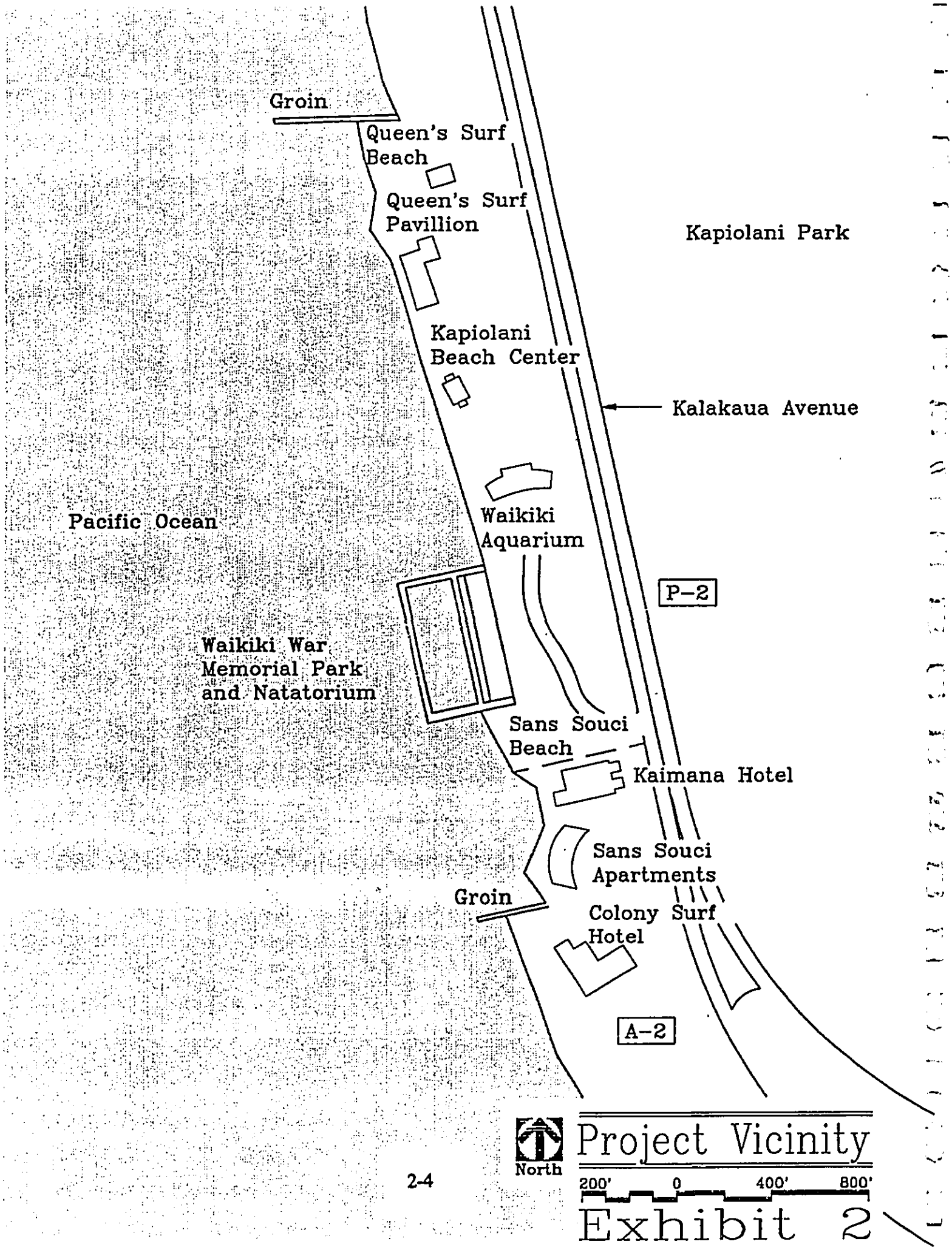

Groin
Queen's Surf Beach
Queen's Surf Pavillion
Kapiolani Park
Kapiolani Beach Center
Kalakaua Avenue
Pacific Ocean
Waikiki Aquarium
P-2
Waikiki War Memorial Park and Natatorium
Sans Souci Beach
Kaimana Hotel
Sans Souci Apartments
Groin
Colony Surf Hotel
A-2
North
Project Vicinity
200' 0 400' 800'

Exhibit 2

- o Hawaii Administrative Rules. Title 11, Department of Health, Chapter 13A, Public Swimming Pools.
- o Land Use Ordinance. City and County of Honolulu, Department of Land Utilization.
- o Uniform Building Code, 1988.

2. The Facility

a. General

Building Security

The facility shall be made available for daytime use only. Provisions for the facility to be secured after hours shall be made.

Building Lighting

Night lighting of the building exterior areas will be sufficient to illuminate potential hazards only. The facade will be illuminated during the early evening hours. Light spillage from these sources will be minimal.

Public Address System

Portable public address systems shall be provided for outdoor events at the facility.

Accessibility Features

The facility will be made accessible to the disabled. Accessible routes and facilities including appropriate signage will be provided.

b. Swimming Pool and Deck Area

Swimming Pool Walls

The swimming pool walls will be of a moderately smooth impervious material and shall be able to endure the affects of the saltwater environment.

Swimming Pool Bottom

The pool bottom will be of a mixture of medium sand.

Average Uniform Depth

The average depth of the pool will be maintained at a uniform depth of 6 feet Mean Sea Level (MSL). The depth at mean high tide will be approximately 7 feet. The depth at mean low tide will be approximately 5 feet.

Water Quality

According to Hawaii Administrative Rules, Title 11, Department of Health, Chapter 13A developed for freshwater Public Swimming Pools, the water

shall have sufficient clarity at all times so that a black disc, six inches in diameter, is readily visible when placed on the floor of the swimming pool at its deepest point. More appropriate to the Natatorium saltwater pool, however, would be the use of the standard (i.e., white) secchi disk in place of the black disc or simple lab testing of water samples. Note: The water quality in the pool can only be as good as the source waters outside. Therefore, some degradation will be experienced during Kona storms and periods of high waves offshore.

Flushing Scheme

The flushing system will be natural (i.e., without mechanical pumps) utilizing the coastal circulation system by opening up two sides to the natural coastal flow. The openings will be designed so as not to allow any unwanted marine life to enter the pool or pose any liability from people swimming into or through such openings.

Pool Deck

The finish texture will be non-slip and there will be no discomfort to bare feet. No diving tower or diving board will be provided. Four drinking fountains will be provided to serve the pool deck and sunbathing areas. At least 50 percent of the drinking fountains will be accessible.

Floating Docks

Perimeter floating docks will be provided to moderate the elevation from the deck to the fluctuating water level.

Depth Markers

Depth of water will be plainly marked at or above the water surface on the vertical pool wall and on the edge of the deck next to the pool. Maximum and minimum points will be shown. Depth markers will be in numerals of 4 in. minimum height and of a color contrasting with background. Markers will be on both sides and ends of the pool.

Lifeguard Chairs

A minimum of four lifeguard chairs will be provided. They will be located on three sides of the pool. At least two will be portable so that they may be placed at points of greatest activity.

Life Line

Life lines will be provided at 75 foot maximum intervals. The life line shall be not less than 3/4 in. minimum diameter. Its terminals shall be securely anchored and of corrosion-resistant material and of a type which will be recessed or have no projection which could constitute a hazard.

Ladders

A minimum of one ladder will be provided for each 75 feet of perimeter. Permanent steps into the pool will not be provided because they will develop algae growth on their surfaces which would be dangerously

slippery. A side handrail extending up above and returning to the horizontal surface of the pool deck will be provided at each side of each ladder.

Ramp

A removable ramp or hydraulic lift will be provided to the swimming pool for access by the disabled or persons with disabilities.

c. Bleachers

The viewing stands will be restored to serve as sunbathing decks for both swimmers and other visitors with occasional use as viewing stands for daytime swimming events. Wheelchair seating locations will be provided. One additional tunnel on each side of the bleachers will be provided.

d. Area Beneath the Bleachers

Offices

The existing enclosed areas under the bleachers will be modified to allow for office space for Parks and/or Water Safety Officers. Rooms for record-keeping and maintenance and instructional equipment storage shall be provided.

Showers

New showers will be located in the changing rooms of the facility. Fourteen showers (7 male and 7 female) will be provided as required by the Hawaii Administrative Rules, Title 11, Department of Health, Chapter 13A, Public Swimming Pools. Cold water shall be provided in all shower areas.

Changing Rooms

The changing rooms will be accessible from the interior of the Natatorium only. The rooms will be well-lighted, drained and ventilated.

All partitions between portions of the restroom toilets will be of durable material not subject to damage by water and will be designed so that a waterway is provided between the partition and floor to permit thorough cleaning of the walls and floor areas with hoses and brooms.

The floors will be free of joints or openings and will be continuous throughout the area with a slip-resistant surface which will be relatively smooth to ensure complete cleaning. Floor drains will be provided to ensure positive drainage of all parts of the building with an adequate slope in the floor towards the drains.

Three-quarter inch hose bibs shall be provided for flushing down the restroom interior.

The following are the minimum code required sanitary facilities for the pool.

Men's	Women's
4 - water closets	5 - water closets
4 - urinals	5 - lavatories
4 - lavatories	

An additional men's lavatory and two urinals, and three additional women's water closet and three lavatories have been added to handle spectators, staff, and other pool visitors.

Toilet paper holders, including accessible dispensers (roll-type) shall be provided at each water closet.

At least one water closet and lavatory in each restroom will be made accessible to the disabled. Also one shower head in each changing room will be provided for use by the disabled. An area 5 feet in diameter will be provided within the restroom for wheelchair accessibility. Appropriate signage shall be provided at accessible facilities.

The changing rooms will remain open during the same hours as the pool.

The additional tunnels through the bleachers improve the flow of users into the changing rooms for better exiting and life safety purposes. They also make the space more usable and provide better natural interior light and ventilation. Having one tunnel act as the wet entrance and the other as the dry entrance improves the safety for the users. With only one tunnel, all traffic is over wet surfaces.

Comfort Stations

To serve the adjacent beach, a men's and a women's comfort station will be provided. The men's room will contain 2 water closets, 1 urinal, and 1 lavatory. The women's room will contain 3 water closets and 1 lavatory. At least one water closet and lavatory in each restroom will be made accessible to the disabled. An accessible water fountain and an accessible exterior shower on the adjoining beach will also be provided. The comfort station will be open twenty-four hours a day, and be accessible from the exterior of the facility only.

3. The Site

   a. Vehicular Circulation

      The vehicular entrance to the Natatorium site will provide safe and easy access to the parking and loading/unloading areas without causing congestion to Kalakaua Avenue.

      The existing driveway and parking stalls will be retained. Passenger loading/unloading areas and accessible van stall shall be incorporated into the design.

   b. Pedestrian Circulation

      The pedestrian entry will provide safe and suitable access to the entrance to the facility. Hard surfaces (i.e., sidewalks) will be minimized with the intent of

maximizing open green areas and passive recreational activities. Hard surfaced walkways will be integrated with the proposed beach promenade which will provide access to the beach area. Provisions for accessibility by the disabled will be made.

c. Outdoor Courts

A single reoriented volleyball court located in front of the Natatorium on the Diamond Head side will be retained for public recreational use. The parking area on the Ewa side will be retained and restricted to Parks or Water Safety Division officers working at the facility. The original reflecting pools will not be restored. Two accessible parking stalls will be provided in the Diamond Head Courtyard.

d. Telephones

Existing public telephones will be relocated and upgraded to be accessible by the disabled.

e. Landscaping

The existing landscaping character of open spaces and tree masses will be retained and further enhanced with additional plantings as deemed necessary. Additional plantings will conform to a master tree and shrub planting plan.

Landscaping elements (i.e., benches, tables, etc.) will be provided to enhance the passive recreational activities on the site. The existing hau trees and trellis, coconut trees and three large banyan trees will be maintained as well as the ironwoods along Kalakaua Avenue which are on the exceptional tree list. Lawn areas will be rehabilitated. Irrigation systems will be automatic.

The stone monument will be maintained. Emphasis, however, will be on the park's open space.

2.2.3 The Design

1. The Swimming Pool Design and Flushing Scheme

a. Swimming Pool Design

All assembled historical data and the acquired field data were analyzed to determine:

- the condition of the existing water quality in the project area;
- the Natatorium benthic conditions;
- the character of the local ocean water circulation as it relates to different tidal profiles and incoming wave characteristics;
- the desired flushing rates for the Natatorium;
- the wave transfer characteristics and wave induced transports in passing over the reefs seaward of the Natatorium;

- the need for and sizing of seaward barriers to direct wave induced flushing; and

- the potentials of employing a tidal gate design, mechanical pumping, and a wave trap for flushing.

The optimum flushing schemes for the Natatorium involves:

- the integration of the available wave climate;

- utilizing the existing consistent coastal circulation;

- developing the constraints of each proposed concept on the area directly seaward of the Natatorium; and

- the hydraulic model testing of several pool opening configurations.

b. Configuration and Modifications

Several potential concepts were initially developed given the above considerations. In the case of complete restoration, the criteria was to retain the existing configuration of the Natatorium while still providing for an active flushing of the pool. These concepts included, for example, development of a unique tidal gate system providing a one-way flow through the pool, a system of wave traps with floating ramps that would accomplish the same result, plus other combination schemes. In support of these efforts, the field program that was planned, funded and completed to obtain the required site specific data required to evaluate each of the proposed schemes, indicated that a simpler and equally effective system could be developed using a natural system of flushing. As a result, the final concept work involved consideration of the optimum scheme to naturally, and very adequately, flush the Natatorium in a "full restoration" configuration. That design concept involves no major physical change in the Natatorium configuration above MSL.

This concept involved developing a free circulation salt water interior pool with a naturally enhanced flushing scheme. The coastal source waters surrounding the Natatorium retains a high quality throughout most of the year. The concept calls for the construction of open areas on the Ewa wall and the Diamond Head makai corner. The specific details of the Natatorium wall openings are also influenced by structural needs and constraints of the existing piles. These openings will be designed to insure an unrestricted, enhanced flow of the daily coastal tidal and wave transported new flow over the coastal reef through the restored Natatorium pool. Both openings will also be designed to provide some pool protection from storm waves and sand transport. A limited model study was carried out to refine the pool opening configuration to optimize the natural pool circulation.

c. Pool Bottom and Bathymetry

The pool bottom will be composed of light colored medium sized sand. This will promote bottom stability along with good visibility to a natural pool bottom. The bathymetry of the restored pool sand bottom will be flat producing a uniform depth ranging with the daily tide between approximately 5 to 7 feet deep (with a average depth of 6 feet ref MSL).

The Complete Restoration action involves relining the pool bottom with sand. The sub-bottom will be cleaned during restoration and replaced with a proper grade of materials, finishing with sand. This bottom will be protected from erosion by design and should be stable. Some maintenance of the bottom sand would, however, be required involving the occasional removal of litter and debris collecting on the pool bottom. Also, the removal of loose coastal algae following severe Kona storms may also be necessary.

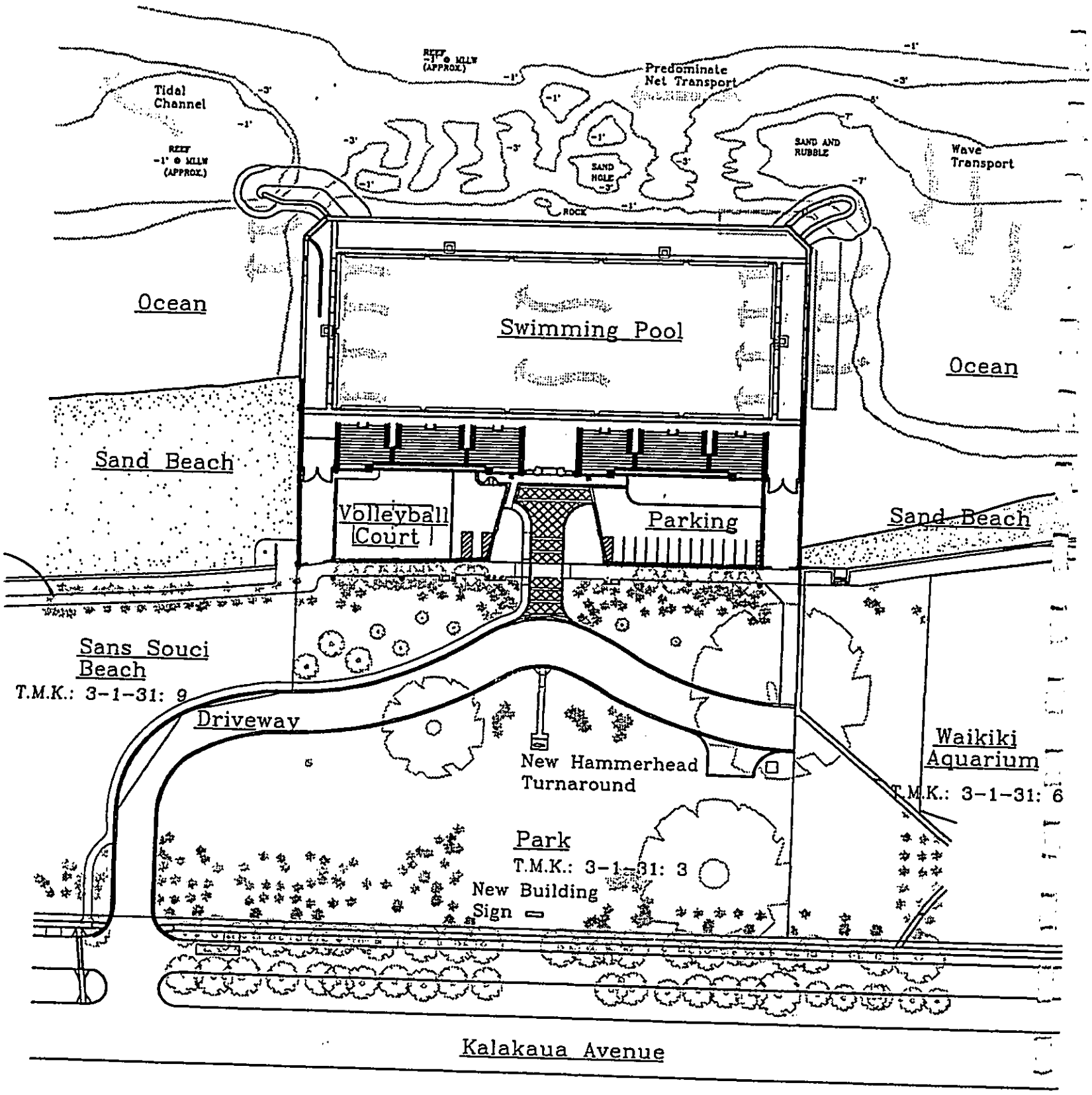
d. Flushing Scheme

The analyses results showed that by far the most advantageous and most effective way to insure flushing of the Natatorium, without providing strong artificial flows, is to open two sides to the natural coastal flow. (See Exhibit 3, Complete Restoration - Flushing System.) The circulation flowing past the Natatorium with each tidal change is a result of both the daily tidal changes and the accumulation of wave transported water over the reef area Ewa of the Natatorium. This flow moves toward Diamond Head the majority of the time at rates that can provide the Natatorium with flushing of 3.9 to greater than 15 times per tidal exchange. The deep Ewa end where the flow enters is dredged reef with no significant sand deposits to intrude into the pool. On the Diamond Head end, the proposed groins would minimize sand transport into the pool.

e. Water Quality

The design intent for this concept is to have water clarity in the Natatorium pool at all times sufficient to see the pool bottom and also to have the pool water quality equal to the ambient coastal waters. It is important to note, however, that both the pool clarity and water quality will be only as good as the quality of the flushing water, which is the ambient coastal water. There will be times, as during periods of high waves or strong Kona storms, when the quality of the coastal water surrounding Oahu is degraded for a day or two. There could also be times when discharge from the Waikiki Aquarium or the neighboring storm drains results in degraded water quality along this coast. During those times, and until the coastal areas flush and clear, the Natatorium pool clarity and water quality will be degraded similar to the coastal water. In general, however, the pool is expected to subsequently clear within one or two tidal cycles given a good quality of coastal water.

The most appropriate method to judge the daily sea water clarity in the Natatorium pool should be the use of the standard secchi disk. This is a white plastic disk, weighted on one side, with an eye for attachment of a line on the other side. The disk is lowered into the water and, if it disappears, the depth of disappearing on the way down and reappearing up are recorded and averaged. The method of calibration of these secchi



Complete Restoration

Flushing Scheme

North

80' 0 80' 160'

Exhibit 3

values to the water visibility in ntu units or to the extinction of light in sea water (averaged over the water column) are well understood and widely used in determining water quality standards. Alternatively, water samples could be quickly tested for their ntu values, and kept for record purposes.

2. The Facility

a. Seawalls and Security Barriers

Refer to Exhibits 4-8 to locate the following features:

All of the portions of the seawall that are above the top of the existing pool deck shall be removed. These portions of the top of the seawall will be reconstructed and made integral with the new elevated precast concrete deck. The seaward face of the existing seawall below the pool deck will be scarified and receive a new concrete coating to provide for added protection. New openings will be cut in the existing seawall to facilitate the new flushing design. The new openings will be formed by precast blocks which will support the elevated precast concrete deck structure.

A code required security fence will be added to the pool deck perimeter on the land sides to secure the pool facility. Measures which will prevent the use of the top of the seawall as platform to dive from are being studied. One option, as shown on Exhibit 6, is a short removable diving barrier which will be added to the top of the seawall. Other options such as signage are being considered.

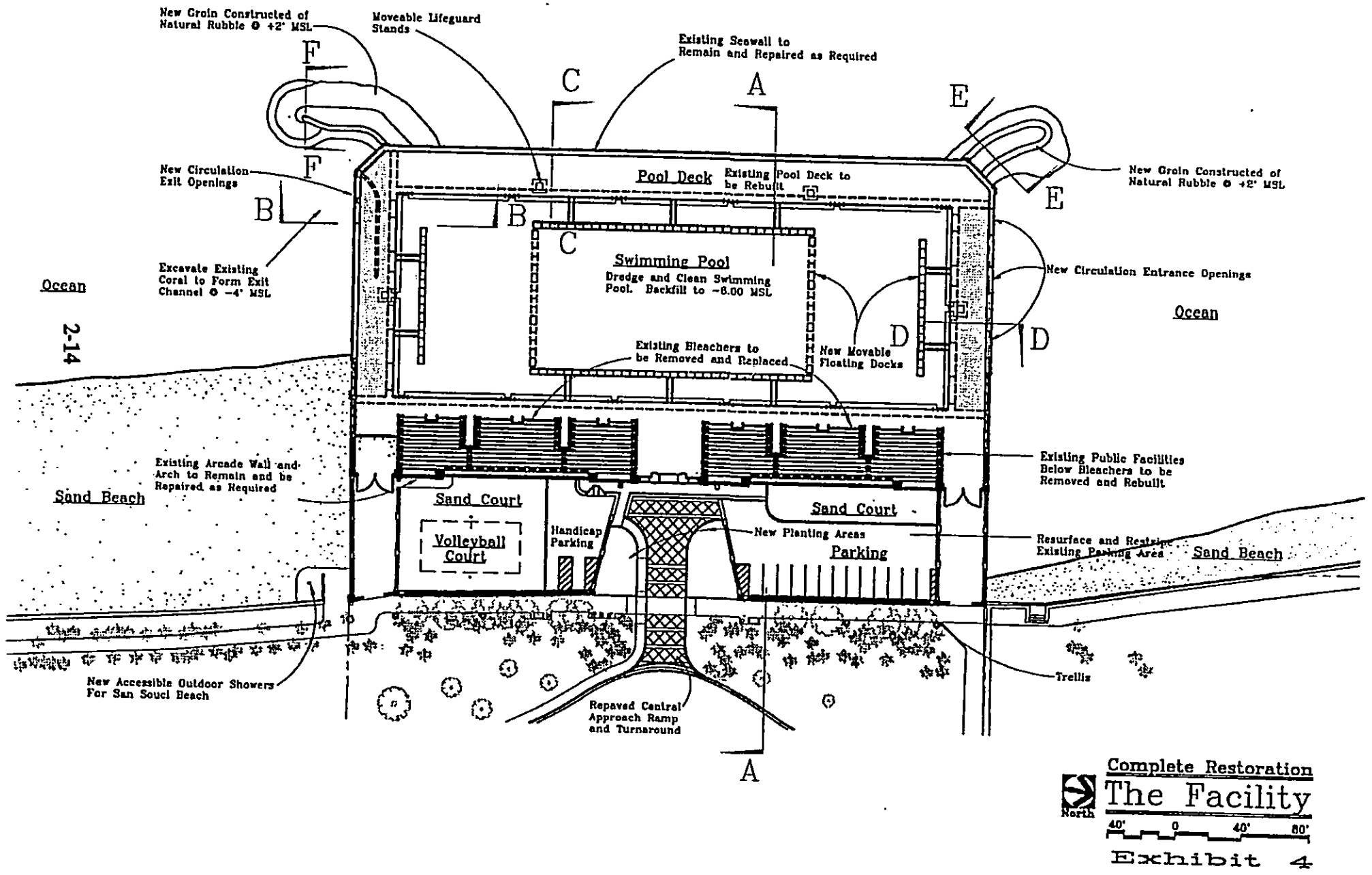
b. Swimming Pool Deck

The entire concrete deck around the swimming pool, including the beams, pile caps, and precast pool wall will be removed. A new elevated precast concrete deck will replace the existing deck. A precast concrete wall will be installed to form the pool sides, and to support the new deck slab. The base of the precast walls will be supported on concrete strip footings.

The deck will be plainly marked at intervals on both sides and ends of the pool indicating the pool depths. Four lifeguard chairs will be strategically located (two on the makai side, and one each on the Diamond Head and Ewa sides of the pool). Lifelines will be provided at 75 foot maximum intervals. Ladders will be provided for access to and from the pool. A removable ramp or hydraulic lift will be constructed for access by the disabled.

c. Bleachers

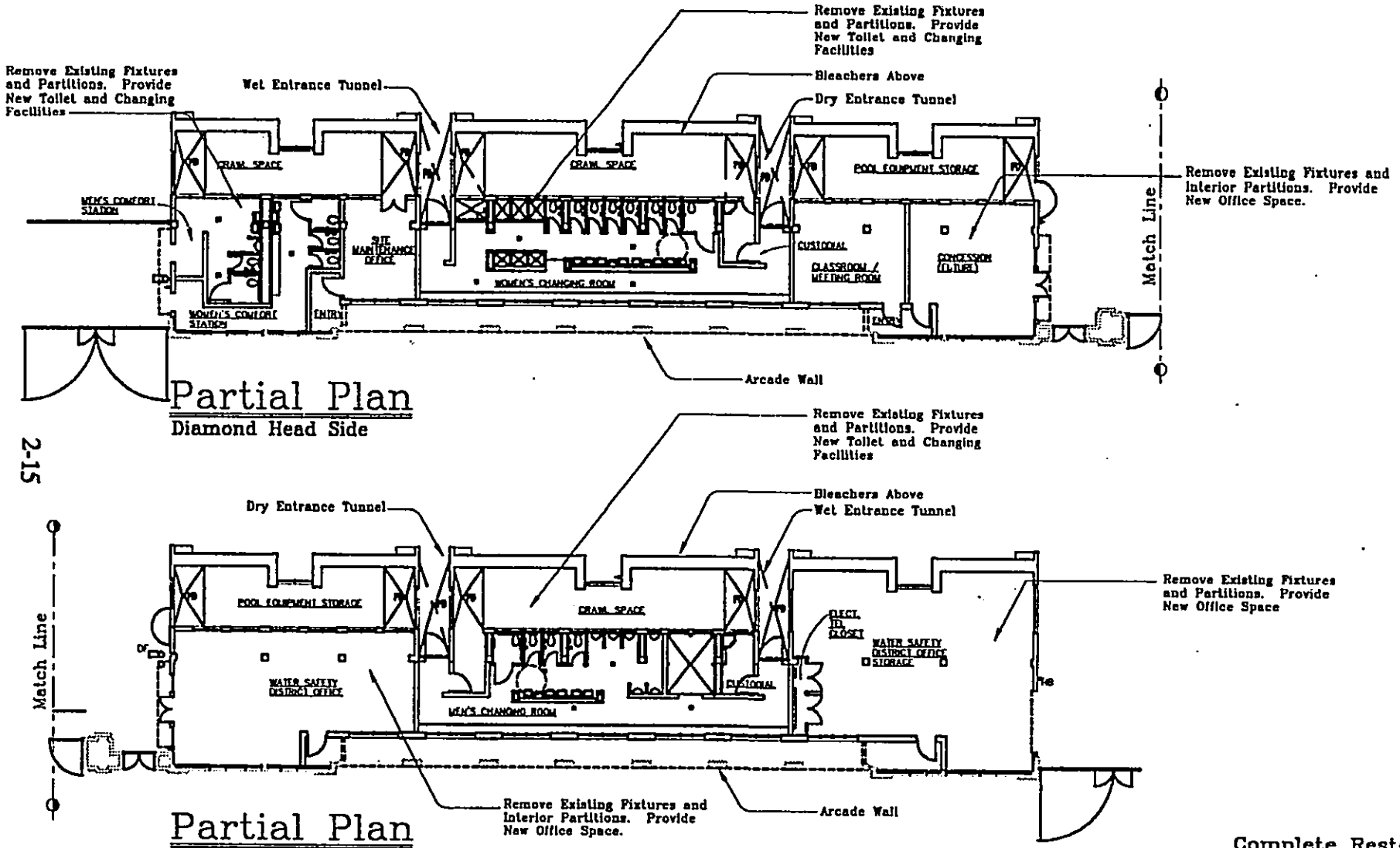
The bleacher slab over the original shower and locker room areas will be removed and a new precast concrete slab will be constructed. Portions of the arcade wall and the nonbearing window wall behind it will be reconstructed. The supporting columns and beams supporting the bleacher slab will be demolished and replaced. The existing foundation will be preserved and reused. The four nonbearing concrete walls at the ends of the two bleacher sections will be demolished and reconstructed.



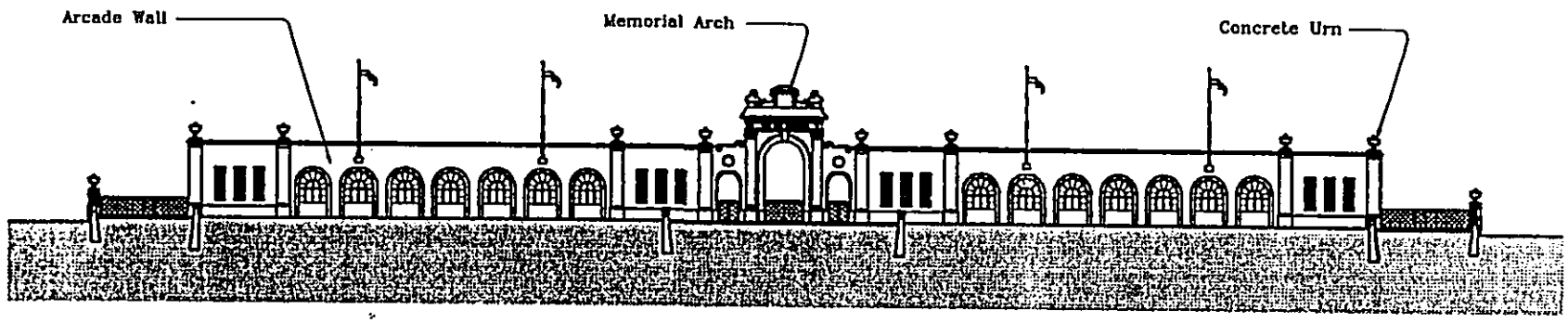
Complete Restoration

The Facility

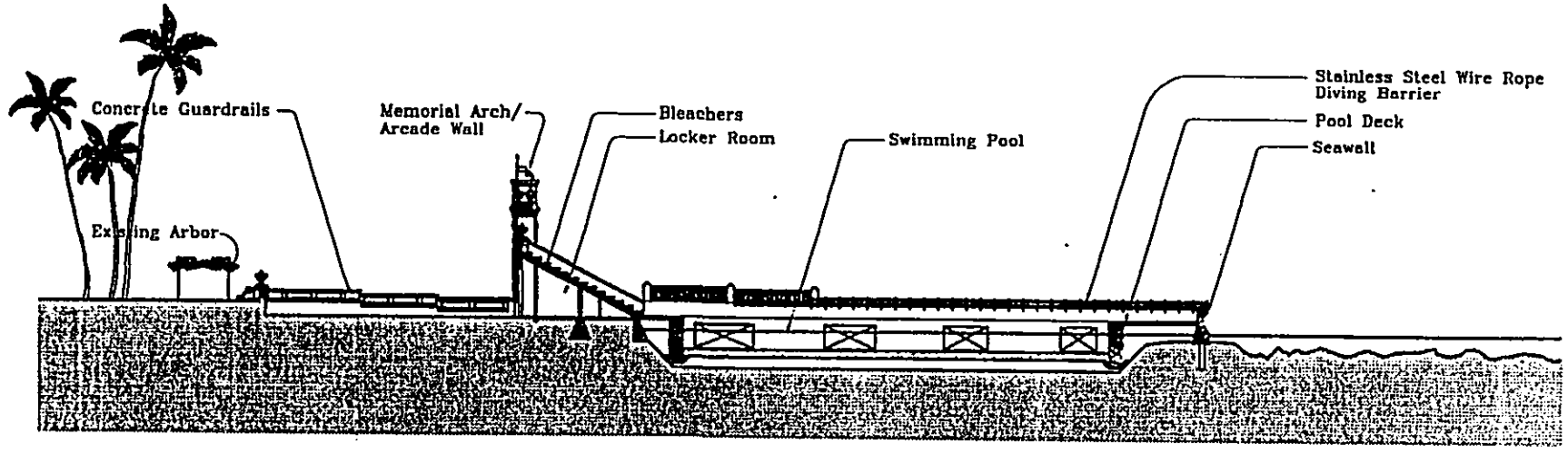
Exhibit 4


Remove Existing Fixtures and Partitions. Provide New Toilet and Changing Facilities
Wet Entrance Tunnel
Bleachers Above
Dry Entrance Tunnel
Remove Existing Fixtures and Partitions. Provide New Toilet and Changing Facilities
CRAWL SPACE
MEN'S COMFORT STATION
SIT. MAINTENANCE OFFICE
CRAWL SPACE
POOL EQUIPMENT STORAGE
CUSTODIAL
CLASSROOM / MEETING ROOM
CONCESSION (FUTURE)
WOMEN'S CHANGING ROOM
WOMEN'S COMFORT STATION
ENTRY
ENTRY
Remove Existing Fixtures and Interior Partitions. Provide New Office Space.
Match Line
Arcade Wall
Partial Plan
Diamond Head Side
Remove Existing Fixtures and Partitions. Provide New Toilet and Changing Facilities
Dry Entrance Tunnel
Bleachers Above
Wet Entrance Tunnel
Remove Existing Fixtures and Partitions. Provide New Office Space
POOL EQUIPMENT STORAGE
CRAWL SPACE
ELECT. TEL CLOSET
WATER SAFETY DISTRICT OFFICE STORAGE
WATER SAFETY DISTRICT OFFICE
CUSTODIAL
MEN'S CHANGING ROOM
Match Line
Remove Existing Fixtures and Interior Partitions. Provide New Office Space.
Arcade Wall
Partial Plan
Ewa Side
Complete Restoration
The Area Beneath
The Bleachers
North
8' 0 8' 16' 32'
Exhibit 6

2-15



The Elevation



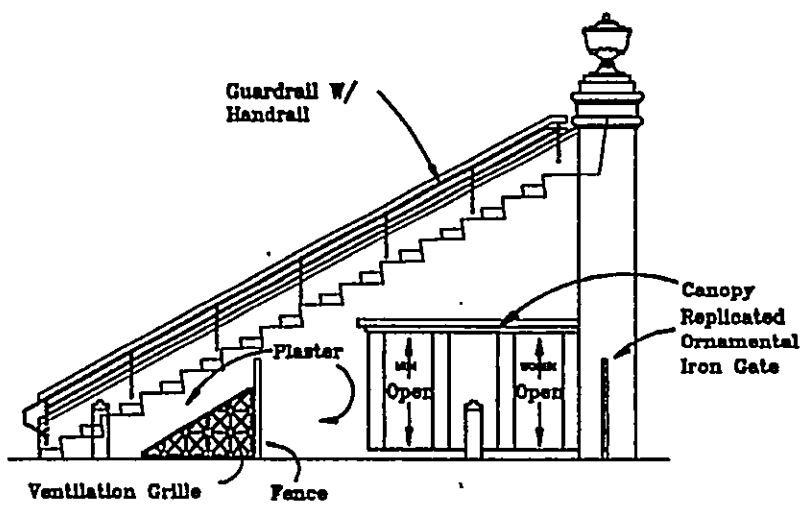
Section A–A

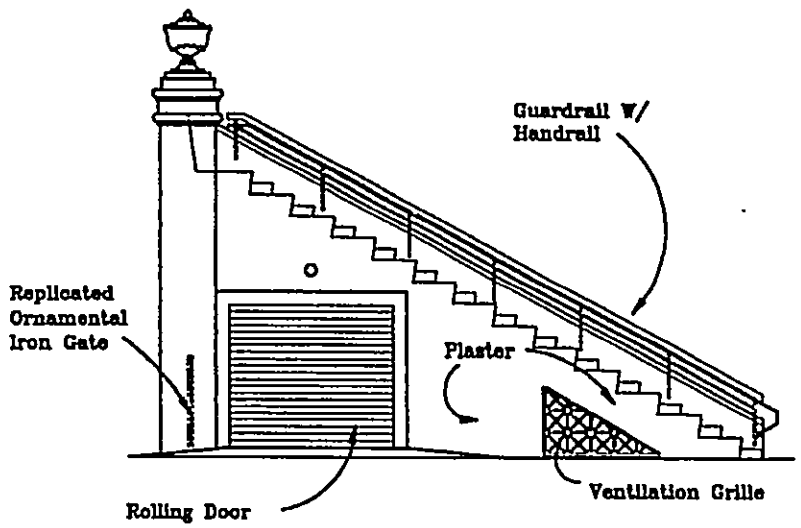
Complete Restoration

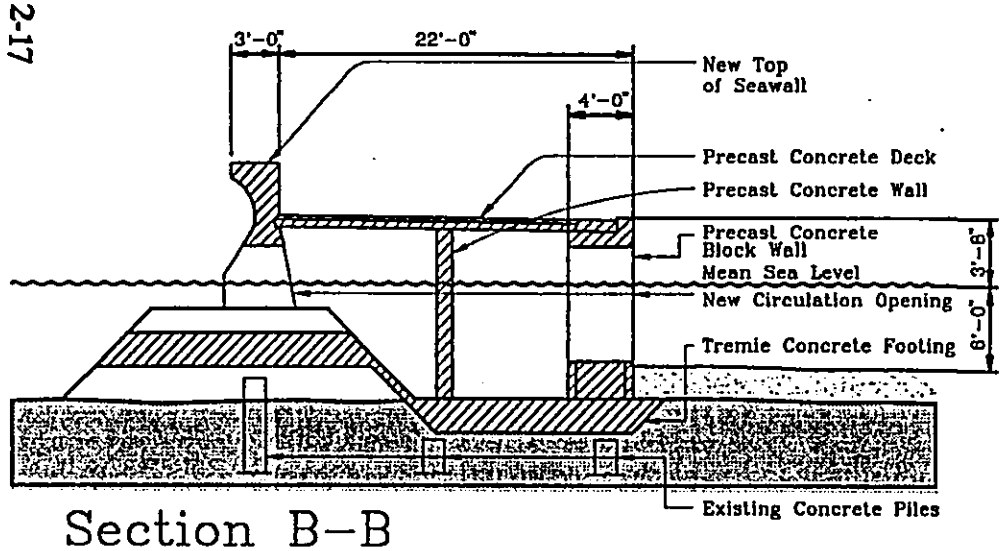
The Elevation and Section

16' 0 16' 32' 64'

Exhibit 6







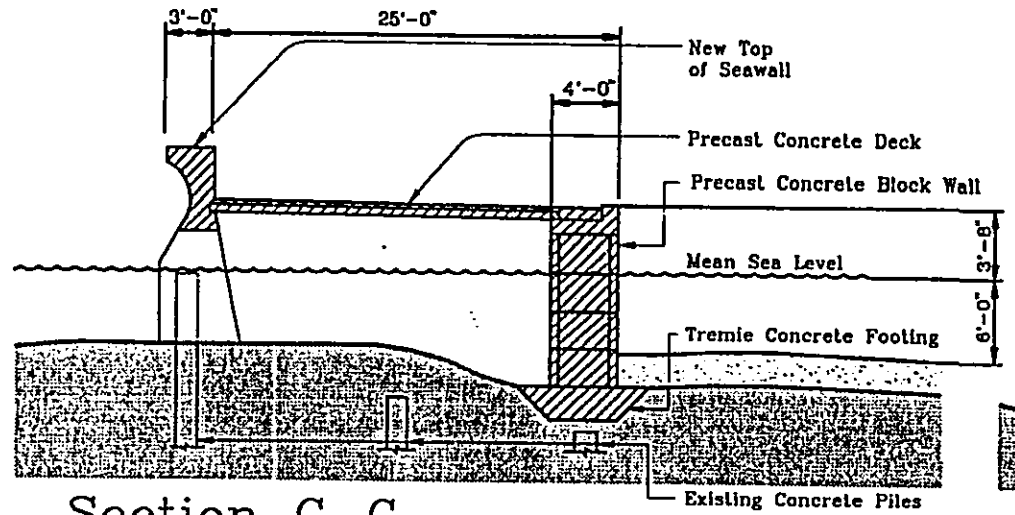
Section B–B

Complete Restoration

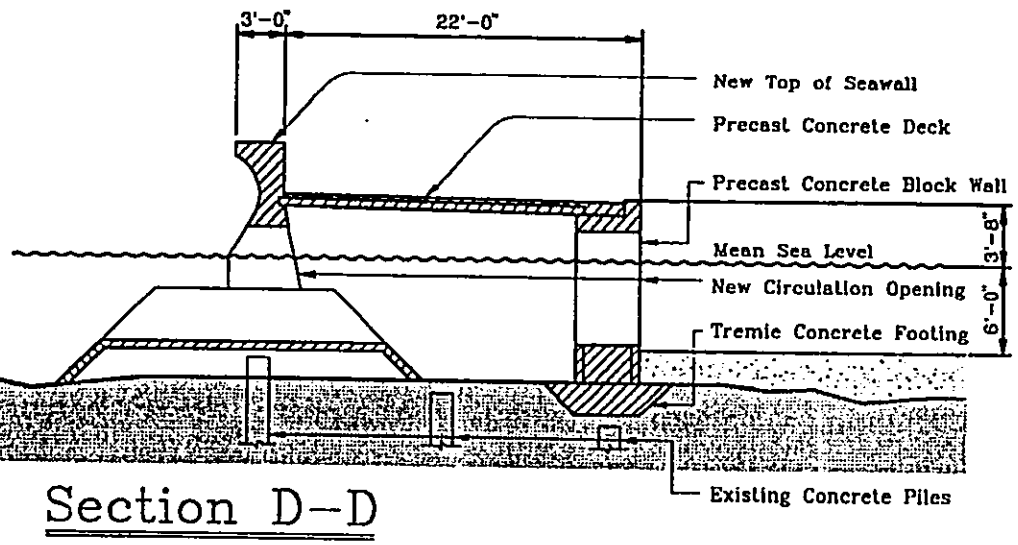
The Details

4' 0 4' 8' 16'

Exhibit 7



Section C-C



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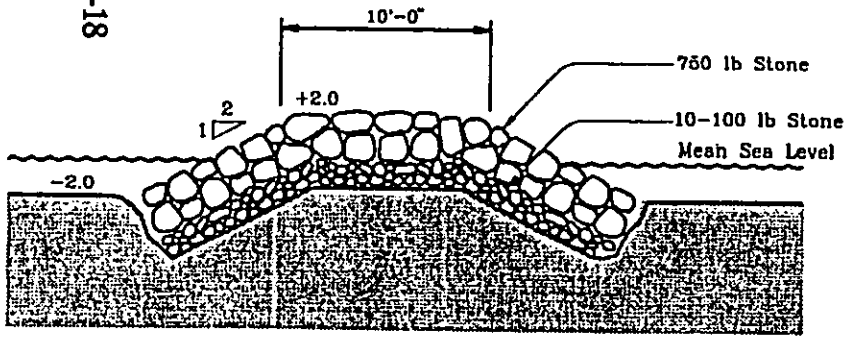
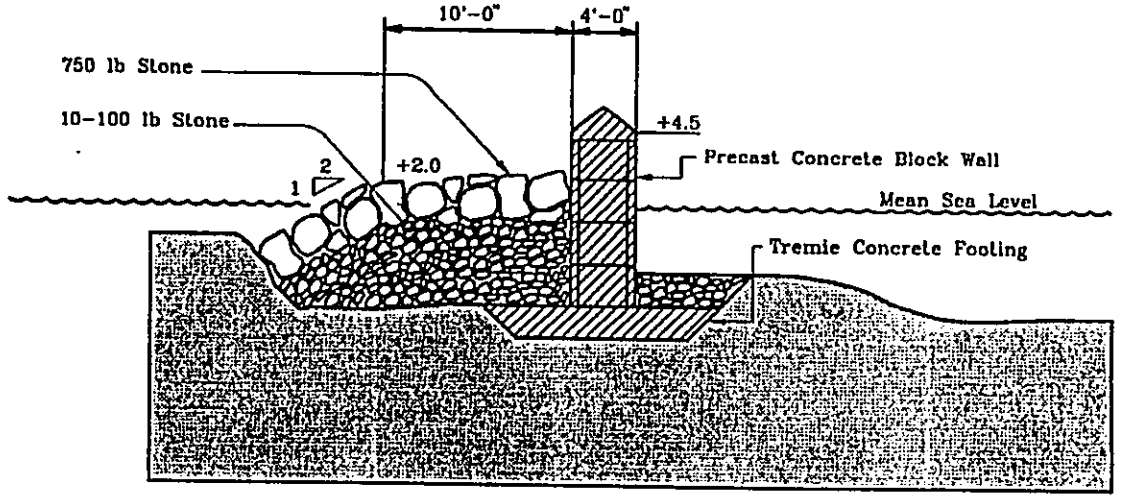


Section E-E



Section F-F

Complete Restoration

The Details

4' 0 4' 8' 16'

Exhibit 8

All loose and deteriorated concrete from the portions of the arcade wall and memorial arches will be removed by high pressure water-jetting and/or other approved methods. All the surfaces will be cleaned, reinforcing repaired and spalling patched. For example, the base of the arcade columns supporting the bleachers will be repaired in this manner.

d. Area Beneath the Bleachers

The interior areas under the bleachers will be totally gutted to make room for accessible offices, and storage space for Parks and/or Water Safety Officers. Under each bleacher, new restrooms and changing room facilities will be constructed. All of the interior nonbearing concrete and concrete masonry walls under the bleachers will be removed. The slab-on-grade in this area will also be removed and replaced.

e. Memorial Arch and Arcade Walls

The Memorial Arch and arcade walls are the architectural features that gives the Natatorium its special character. Efforts to restore it to its original grandeur will be made. Substantial portions of the cement plaster surfaces on the entire arcade wall must be restored. Methods for restoration will be discussed and approved by the State Historic Preservation Office. All the underlying spalling concrete must be repaired and patched. The top portion of the arcade wall shall be completely removed and reconstructed to its original condition. New cement plaster will be applied and the architectural features (i.e., concrete urns, eagles, etc.) will be repaired. Portions of the cast stone will be reconstructed where required.

The nonbearing window walls behind the arcade wall will be demolished and reconstructed out of concrete with new footings. The original windows will be salvaged, repaired, and reinstalled to the extent possible.

f. Outdoor Courts, Ramps and Guardrails

The existing concrete and asphalt pavements will be removed and reconstructed. The sculptured concrete guardrails will be also removed and reconstructed.

g. Plumbing

The existing plumbing fixtures will be removed, along with all above grade and below grade piping. New fixtures will also be provided for the restrooms. The following fixtures will be provided:

Pool and Grounds
- 4 Drinking Fountains (2 accessible minimum)

Men's Changing Room
- 4 Water Closets (1 accessible)
- 6 Urinals (1 accessible)
- 5 Lavatories (1 accessible)
- 7 Showers (1 accessible)

Women's Changing Room
8 Water Closets (1 accessible stall)
8 Lavatories (1 accessible)
7 Showers (1 accessible)

Comfort Station
1 Accessible Drinking Fountain
4 Accessible Outdoor Shower Heads

Men's Rest Room
2 Water Closets (1 accessible)
1 Accessible Urinal
1 Accessible Lavatory

Women's Rest Room
3 Water Closets (1 accessible)
2 Lavatories (1 accessible)

All new water and sanitary waste and vent piping will be provided. A new water meter at Kalakaua Avenue for the Natatorium will be installed. A new 2-1/2 inch domestic water line will be installed to replace the old deteriorated water line.

New waste and vent piping will be cast iron. A new 8-inch gravity sewer lateral will be installed between the Natatorium and the existing City sewer line along Kalakaua Avenue.

h. Ventilation

The restrooms will be provided with sufficient openings to allow for natural ventilation in accordance with local code requirements.

i. Electrical Systems

The entire existing electrical system, including switchboard, panelboards, luminaries, wiring devices, junction boxes, raceways and wire, will be completely dismantled and removed.

The existing transformer will be tested for PCB and disposed of in an appropriate manner.

A new padmounted transformer will be installed by Hawaiian Electric at the end of the new hammer head turn around. New ductlines will be required from Kalakaua Avenue to the transformer location. From the transformer location, a new secondary 208/120 volts, 3 phase, 4 wire service will be installed to a new electric room, located under the Ewa bleachers. The new electrical room will house a main distribution panel, metering equipment, panelboards and lighting control equipment.

A new underground telephone service will be installed from Kalakaua Avenue to the electric room by Hawaiian Telephone.

j. Lighting Systems

Interior lighting systems will be energy efficient to minimize operation costs, and will utilize long life lamps to minimize maintenance costs. Different switching schemes in large rooms will be incorporated in the design to allow for further energy savings.

Pool lighting will be installed for safety and security during evening hours. Luminaries will be constructed of noncorrosive materials as much as possible. Controls will be handled by a time clock with a manual override.

Pool deck lighting will be provided for safety and security of the pool deck areas.

Lighting sufficient to allow nighttime activities will not be provided. Although empty conduits to accommodate possible additional future lighting will be provided.

The archways will be illuminated by providing a period styled pendant with uplight component. The memorial arch and interior archway will be illuminated by focused well lights in the pavement, directed only at the object to avoid spillage. All exterior luminaries will be as durable and corrosion resistant as possible. The luminaries will also be vandal resistant, since they are located within reach of the general public.

k. Public Address System

Portable public address systems will be used. This will permit storage of the equipment when not in use, minimizing the exposure of the equipment to the salt air.

l. Grounding System

The pool's structural rebar system and all the new ladders and railings will also be grounded per the National Electrical Code.

3. The Site

a. Vehicle Circulation

As shown in Exhibit 9, Complete Restoration - The Site, and Exhibit 10, Complete Restoration - The Landside, the existing driveway access from Kalakaua Avenue will be maintained. Due to the current condition of the driveway and the additional wear anticipated from construction vehicles used in the complete restoration of the Natatorium, the existing pavement will require refurbishing. Once the restoration process at the Natatorium is complete, the existing pavement surface will be scarified and paved and new pavement striping and markings will be added. The existing dead end, with a hammerhead-type turnaround, will be slightly revised to conform to current City and County of Honolulu standards. Two existing parking stalls will be eliminated for this purpose.

With the existing driveway access to be resurfaced, parking on both sides of the driveway will be maintained and the parking stalls will be restriped.

b. Pedestrian Circulation

The existing walkway, which runs parallel to the coastline along the existing seawall and the sidewalk on Kalakaua Avenue, will be maintained as the major pedestrian circulation paths to the site. The walkway along the seawall will be paved. The City and County has plans to expand and relocate the sidewalk along Kalakaua Avenue. This will provide additional area for ironwood trees and include a 10-foot wide concrete walkway. The Kalakaua sidewalk work will not be a part of this project and is not in the cost estimate.

A new hard-surfaced walkway will be provided to create a physical link and provide access for the disabled between the Natatorium and the stone monument. A new pedestrian walk will connect the seawall walk to the Kalakaua sidewalks. This will link the two sides of the site and provide access for the disabled.

c. Landscaping

The park's current quick coupler system will be replaced with an automatic irrigation system. The change to an automatic system is beneficial to the reduction of maintenance costs. The existing picnic areas are furnished with wood tables and benches. These will be replaced with precast concrete picnic tables and benches. Two new concrete and wood benches will replace the existing benches located under the hau arbor.

The lawn areas makai of the Natatorium entry drive will be replanted with St. Augustine grass. Tolerant of sun, shade and foot traffic, this grass will maintain its qualities for years to come. The Bermuda grass in the areas mauka of the drive will remain. No palms or trees will be planted; and one palm and one plumeria will be removed. The palm leans through the hau arbor and its trunk is a safety hazard for pedestrians, while the plumeria tree is in poor health and distracts from the importance of the stone memorial. Native plants tolerant of sun and low maintenance, akia and ilima, will be planted in the areas adjacent to the Central Approach Ramp. The existing welded pipe hau arbor support will be removed and replaced and a new steel pipe support will be constructed. These new supports will be located two feet from the existing balustrade, making the hau arbor easier to maintain.

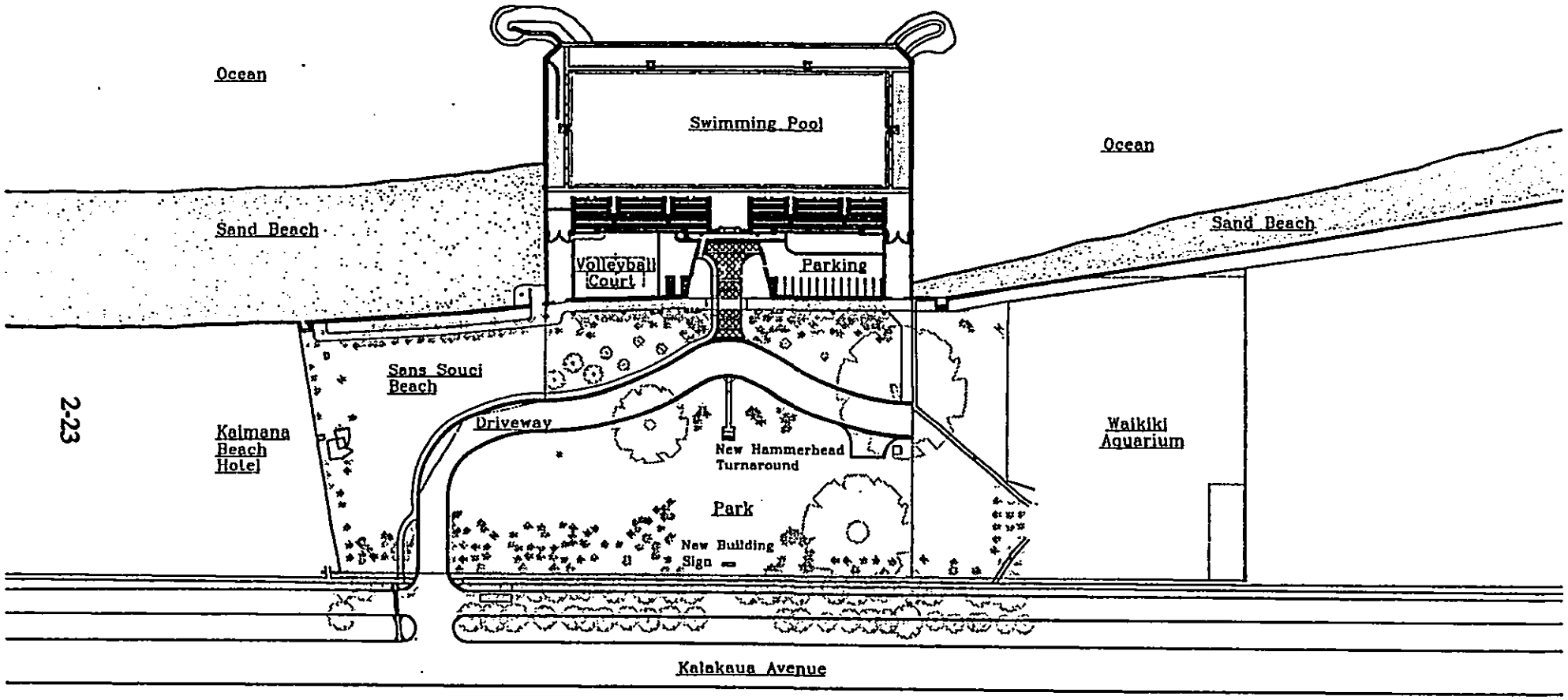
d. Utilities

Domestic Water

Some 500 lineal feet of new waterline, with line sizes ranging from 1-1/2 inches to 2-1/2 inches, will be installed to service the restored public rest rooms at the Natatorium and an outdoor shower facility. The new water system will be connected to an existing 8-inch waterline located in Kalakaua Avenue fronting the Natatorium.

Fire Protection Water

A new 8-inch fire line will be installed to service the Natatorium. A new fire hydrant will be provided along the new Central Access Approach.



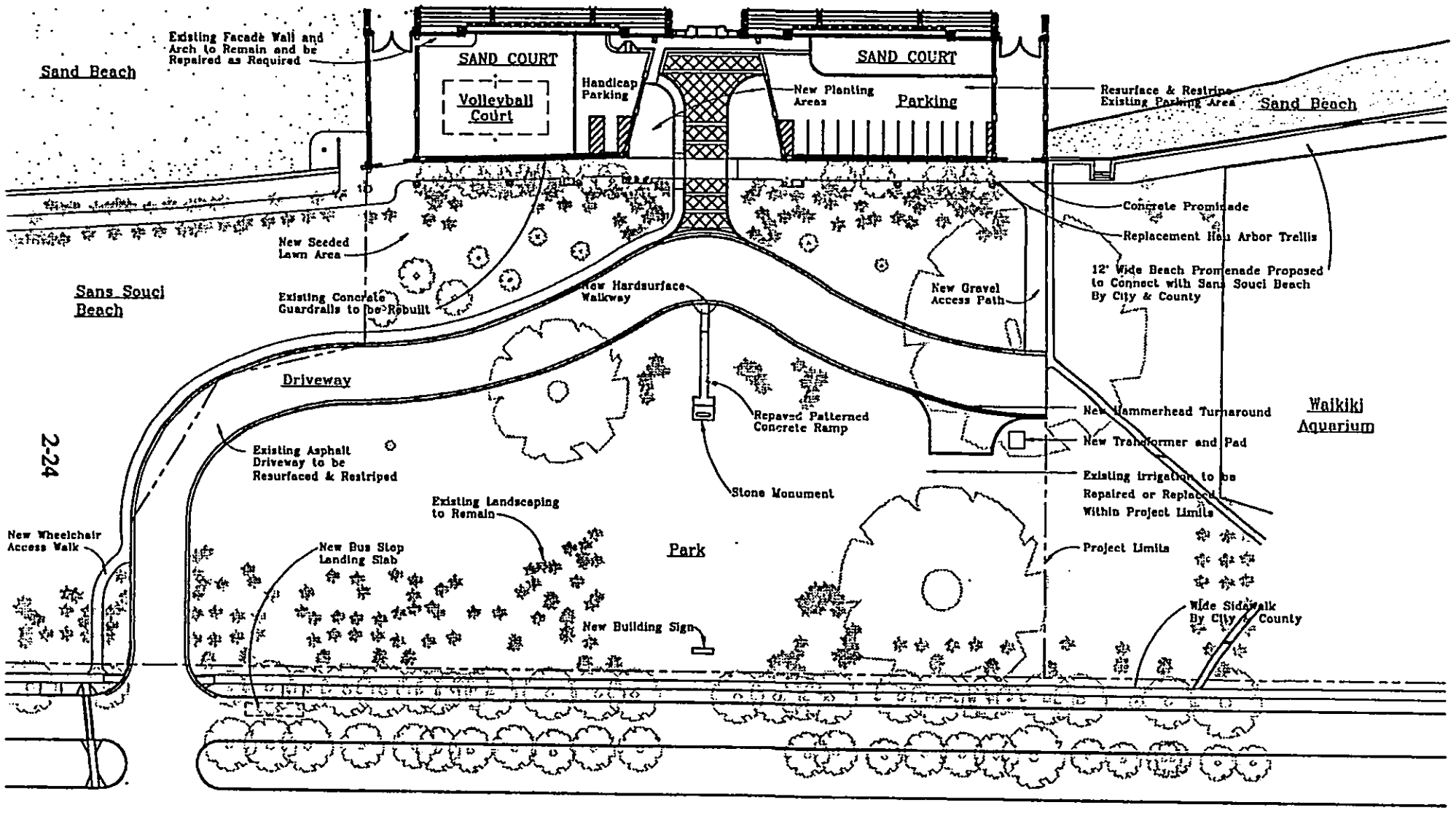
Complete Restoration

North

The Site

80' 0 80' 160'

Exhibit 9



2-24

Complete Restoration

The Landside

Exhibit 10

Sewer

A new 8-inch sewer line, about 650 feet long, will be installed to service the restored public rest rooms at the Natatorium. Sewer connection to an existing 10-inch sewer line will be through an existing sewer man-hole fronting the Diamond Head side of the Waikiki Aquarium property along Kalakaua Avenue.

Drainage

The four existing storm drain inlets along the paved driveway access, which appear to be silted, will be cleaned and reactivitated.

At the existing courtyards mauka of the Natatorium facade, a new drain system with drain trenches and inlets will be installed to provide adequate drainage for the area.

Drainage will follow existing drainage patterns and ultimately be disposed into the ocean.

Exterior Lighting

All exterior lighting, including the parking lot floodlight poles, will be removed. The corrosion is too great to attempt refurbishing any of the poles. The driveway and the courtyard will be illuminated for safety and security. Lighting will be focused to prevent light spillage. Existing roadway lighting will remain. One roadway light standard will be relocated out of view of the central axis.

2.3 Use of Public Funds or Lands

The Waikiki War Memorial Park and Natatorium is owned by the State of Hawaii and are managed by the City and County of Honolulu (pursuant to Ordinance No. 90-1.)*

The following costs required to restore the Natatorium would be appropriated by State of Hawaii Legislative authorization.

1. Construction Costs

Item/Description	Quan	Unit	1994 Dollars
General & Special Conditions	1	LS	$ 1,160,054
Foundations	1	LS	$ 234,334
Structural Systems	1	LS	$ 430,099
Exterior Wall Construction	1	LS	$ 1,182,169
Swimming Pool & Deck Area	1	LS	$ 4,468,214
Bleachers	1	LS	$ 213,898
Interior Construction & Finishes	1	LS	$ 360,840
Plumbing	1	LS	$ 176,980
Electrical	1	LS	$ 434,828
Sitework	1	LS	$ 700,327
Landscaping	1	LS	$ 223,632
Equipment	1	LS	$ 205,344
Demolition	1	LS	$ 1,013,645
Total-ESTIMATED CONSTRUCTION COST (ECC)			$ 10,804,364
ESCALATION (Start January 1996) - 7%			$ 756,305
Total-ESCALATED ESTIMATED CONSTRUCTION COST (EECC)			$ 11,560,669
CONTINGENCY - 6%			$ 693,640
Total - CURRENT WORKING ESTIMATE (CWE)			$ 12,254,309
Rounded			$ 12,300,000

* See Appendix E.

2. Average Annual Operations and Maintenance Costs in 1994 Dollars

1. Personnel Costs

1.1 One (1) full-time pool manager	$ 37,674
1.2 One (1) full-time pool custodian	$ 31,924
1.3 Two (2) full-time groundskeepers	$ 57,240
1.4 Three (3) full-time water safety officers plus one (1) extra during peak times	$139,104
	$265,942

2. Utilities, lifeguard supplies/rescue equipment and miscellaneous.... $ 5,175

3. Facilities maintenance, including periodic patching of concrete/plaster, painting, plastering and replacement of waterproofing membrane on bleachers, hardware and mechanical/electrical systems..... $ 46,575

TOTAL..... $317,692

Say..... $318,000

Explanation

1. Personnel Costs were derived from discussions with Honolulu City and County Department of Parks and Recreation personnel.

1.1 Pool Manager
$26,910 x 1.4 for indirect salary costs x 1 person = $37,674

1.2 Custodian
$22,803 x 1.4 for indirect salary costs x 1 person = $31,924

1.3 Groundskeepers
$20,443 x 1.4 indirect salary costs x 2 persons = $57,240

1.4 Water Safety Officers
$24,840 x 1.4 indirect salary costs x 4 persons = $139,104
(Note: These total hours are based on three (3) Water Safety Officers being on duty during normal pool usage hours and four (4) Water Safety Officers being on duty during peak hour afternoon, weekend and summer pool usage. While the total hours may vary depending on the exact schedule of pool operations, the program is based on daytime use only).

2. Self-explanatory

3. The major item here is the waterproofing membrane replacement on the bleachers which is planned for every ten (10) years. Its initial cost in 1994 dollars is about $84,980.

2.4 Historic Perspective

The following summary of the Natatorium's history is an excerpt from the 1985 report by the Department of Parks and Recreation titled Waikiki War Memorial Park and Natatorium, Kapiolani Park, Honolulu, Hawaii, Final Preliminary Planning Report.

History Of The Natatorium: Summary

In 1927, a natatorium, projecting offshore into the ocean at Waikiki was built as a part of the Waikiki War Memorial Park. The "Natatorium," as it has been called, with its grandeur size and ornate facade, has become symbolic of the members of the service from Hawaii who were killed in World War I. For many, the Natatorium has embodied a patriotic spirit and a sense of pride. It indeed has been a special place filled with memories of the gala opening ceremonies, historic swimming meets and fun-filled days of swimming with classmates and friends.

By 1980, because of major disrepair, the Natatorium had to be closed to public use. Simply put, it had become a safety hazard. Structurally, the facility was failing despite several initial repairs, and an analysis of the water quality showed the pool to be unsafe for swimmers.

A review of the reasons for the deterioration of the Natatorium are listed below.

First, maintaining a man-made structure in a marine environment was inherently problematic. Its structure was required to resist, over time, the ravages of continual wave action and salt water corrosion of the steel reinforcement. It has been found that structural details, such as the recommended depth of the concrete covering over the reinforcing bars, were not correctly implemented. As a result, concrete has spalled away from rusted reinforcing bars, creating hazardous conditions in and around the pool. Evidence of extensive and continued spalling of concrete throughout the Natatorium indicates that the areas repaired in 1949 have not lasted.

Additionally, poor circulation of sea water between the pool and the ocean caused the water quality to approach dangerous levels. The coffered locks that were built to allow for adequate pool circulation did not properly operate from the beginning. This was due in large part because sand accumulation in the locks repeatedly prevented proper circulation. This situation led to a deteriorated and dangerous water quality level which subsequently forced a temporary, and finally, an eventual closing of the Natatorium.

Although improper initial design decisions and construction techniques were found to be the initial difficulties experienced by the Natatorium, these problems were increased by general neglect of the structure over the years.

There were, however, periods of refurbishing in 1929 and again in 1949, but in general, because of a complex layering of governmental control involving both the Territory and the City, the Natatorium continued to deteriorate through neglect. The Natatorium is located on what was then Territorial land and in order to facilitate a unified management of the park, the Territory through a series of executive orders, turned over the maintenance and management of the grounds and Natatorium operations to the City and County of Honolulu in 1949.

Its deterioration grew, however, and public officials along with the general public began to look for a viable solution - demolition became an option. Restoration costs had begun to skyrocket and user demands had begun to change. The 1960's saw numerous fresh water pools built throughout Oahu which were soon hosting the major swim meets. Recognizing a public need for additional beach area and open space in Waikiki, demolition of the Natatorium, coupled with beach restoration, was proposed by governmental officials.

Demolition had become an option - not a clear-cut solution, however. It was felt by many that, despite the costs, the Natatorium should be preserved through renovation. The proponents of such an option were successful in 1972 in having the courts issue an injunction against demolition and subsequently placed the Natatorium on the State and National Register of Historic Places.

Since 1972, several attempts to resolve the issue were unsuccessful. In 1981, proposals, meetings and hearings once again addressed the problem. Resolutions and other actions by the Legislature led to new appropriations for planning, engineering, construction and environmental impact studies in 1982 and 1983.

In 1984 with funds from the State Legislature, the Department of Parks and Recreation of the City and County of Honolulu contracted a study of three basic options for the renovation of the Natatorium area.

The Natatorium's more recent history continues as follows:

January, 1987: Governor John Waihee released funds in the amount of $1,200,000, which the Legislature had appropriated in the prior Session for the purpose of planning and design work.

1990: After studying the Complete and Partial Restoration alternatives in the detailed Planning Report by the Leo A. Daly team, the State and the City and County decided that the Complete Restoration alternative should be pursued.

1990: City Council passed Ordinance 90-1 over the Mayor's veto, which mandates that the Department of Parks and Recreation "shall" Operate and maintain the Waikiki War Memorial Natatorium, including structure, facilities and grounds, etc. Both operating and maintenance funds were appropriated.

1992: Contract was signed between Dept. of Land and Natural Resources and Leo A. Daly, Alfred A. Yee Division, to draw final plans and specifications for full restoration of the Natatorium as close to its 1927 appearance as possible. They were to work closely with the City Parks and Recreation, since the City would be responsible for the maintenance.

1992: Bill was introduced by Senator Mary-Jane McMurdo to appropriate funds for continuing and starting restoration. It did not pass, because priority for funds went elsewhere.

1993: Senators Donna Ikeda and Randy Iwase introduced similar appropriations bill, which failed for the same reason.

1993: Two Concurrent Resolutions, one by Senator Ann Kobayashi, and the other by Representative Les Ihara were introduced. Supporters of the Natatorium Full Restoration, realizing that funds were scarce, wanted to be sure that Legislative intent, for Full Restoration, continued. Ihara's Resolution passed both houses.

1993: The Environmental Impact Statement Preparation Notice for the Waikiki War Memorial and Natatorium Restorations was published in the Office of Environmental Quality Control (OEQC) Bulletin on March 23, 1993. While the normal review and comment period would have ended on April 22, 1993, it was extended to May 6, 1993 at the request of the State of Hawaii Department of Health. Only one (1) written comment was received, that being from the Director, Waikiki Aquarium.

1993: The Draft Environmental Impact Statement for the Waikiki War Memorial and Natatorium Restoration was published in the Office of Environmental Quality Control (OEQC) Bulletin on October 23, 1993 with a review and comment period ending December 7, 1993. While many of the numerous written comments were received after the deadline, all received responses.

1994: The Legislature appropriated $300,000 for fiscal year '94-'95 for additional planning, design and construction.

1994: Mayor Jeremy Harris supports full restoration of the Natatorium.

A more detailed historical review of the park and Natatorium is found in the planning report's accompanying volume, The Waikiki War Memorial Park and Natatorium: Historical Background Report.

2.5 Schedule and Phasing of Action

The following chart (Exhibit 11, Complete Restoration - Construction Schedule) illustrates the thirty and one-half (30-1/2) month construction schedule for the Complete Restoration action for the Natatorium. While this would be the maximum construction period for an all-inclusive, single-phase construction contract, the schedule would vary if the decision were made to have multiple or phased construction contracts.

30 1/2 MONTHS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Mobilization																															
Temporary Causeway/Platform																															
Demolish Deck																															
Pool Dredging																															
Backfill Pool Deep Holes																															
Pool 1' Sand Filter Layer																															
Pool Filter Fabric																															
Pool 2' Gravel Layer																															
Tremie Concrete Foundation																															
Demolish Parts of Seawall																															
Precast Concrete Block Wall																															
Reconstruct Seawall																															
Precast Concrete Pool Deck																															
Pool Deck Conrete Topping																															
2' Sand Finish Layer																															
Offshore Dredging																															
New Groins																															
Pool Deck Coating																															
Shore Memorial Arch Wall																															
Demolish Bleacher/End Walls																															
Remove Slab on Grade																															
Repair & Restore Arch Wall																															
End Walls & Columns																															
Precast Raker Beams																															
Precast Concrete Bleachers																															
Waterproof Bleachers																															
Interior Construction																															
Reconstruct Railings																															
Painting																															
Plumbing																															
Mechanical																															
Electrical																															
Civil																															
Landscape																															
Water Quality Monitoring																															
Punch List																															
Clean Up																															
Demobilization																															

Complete Restoration

Construction Schedule

Exhibit 11

CHAPTER 3 - DESCRIPTION OF ENVIRONMENTAL SETTING

3.1 Physical Environment

3.1.1 Physiography

General - The Waikiki War Memorial Park and Natatorium exists on the South coast of Oahu, adjacent to Kapiolani Park. The Natatorium pool extends from the coastline seaward about 150 feet on to the coastal reef. The reef in this area is a relatively flat fringing reef that extends seaward from the coast several hundred feet. Further seaward the bottom is a down sloping sand bottom with typical sand median diameter of 0.9 to 1.1 Phi sized (0.25 millimeter to 2.0 millimeter).

Several breaks exist in the coastal reef that allow an exchange of the coastal water behind the reef with the open ocean. The major breaks are on the Diamond Head side of the Natatorium. Directly adjacent to the Natatorium on the Diamond Head side exists a stable beach with 0.4 to 1.2 Phi sized sand. The bottom along this side of the Natatorium is a flat sand bottom and flat reef about 1 foot to 1.5 foot above the sand. On the Ewa side of the Natatorium is a 10.5 foot deep (ref MSL) past dredged channel extending about the width of the Natatorium. The sides of this channel contain viable coral, with the channel bottom lined with sand ranging in size from 0.5 to 1.1 Phi.

3.1.2 Marine Environment

The following section documents the results of field observations at the Natatorium as performed by the Leo A. Daly study team for the 1990 Planning Report and for this environmental document. It describes the present conditions of the site (see Exhibit 12, Existing Conditions - The Site) and provides a starting point at which restoration work would begin.

The description of the physical marine environment begins with a discussion of the site oceanographic conditions as they pertain to the two restoration concepts evaluated for the 1990 Planning Report. Next, the land facilities and needs surrounding the Natatorium are discussed. Finally, the physical structures associated with the Natatorium are examined.

1. Coastal Tide

   The coastal tides at the Natatorium average 1.9 feet in height, slightly less in daily amplitude than the Honolulu tide, and preceding the Honolulu tide by about 15 minutes. Annually this range extends from 1.3 feet to 2.8 feet. Combined with incoming wave transport across the coastal reefs the average daily tide at the Natatorium is about 2.0 feet, and varies in character from almost pure diurnal to semidiurnal. A characteristic mixed semidiurnal tide, 2 feet in height, was used for most analyses.

2. Site Hypsography

   The offshore bathymetry, seaward of the reefs off the Natatorium, shows a more rapid drop-off on the Ewa side of the Natatorium verses the Diamond Head side. (See Exhibit 13, Existing Conditions - Oceanographic Conditions.) As a result, incoming tradewind waves and Southern swells refract clockwise, bending toward the shoreline.

In breaking and reforming on the local coastal reefs, the incoming waves pass over several small natural channels in the reef surface and varying reef bathymetry. As a consequence, the incoming waves refract further clockwise.

The elevation of the surrounding beach topography in reference to sea level and the nearshore hypsography around the Natatorium varies with location. On the Diamond Head side, a sand beach slopes into the water, changing to a mixed sand and reef bottom of 4 feet deep (ref MSL). Adjacent to the Natatorium, a shallow reef shoals to about 1 to 1 1/2 foot deep. Off the Ewa side exists an old reef extending out about one half of the Natatorium width. Seaward of this point, the reef bottom drops off abruptly to an 11 foot deep dredged channel behind the coastal reefs. The Ewa side therefore slopes from about 3 feet deep downward, at a 1:1 grade from the past construction finished toe of the Natatorium side to the adjacent deep channel bottom.

Along the Natatorium seaward wall, the hypsography varies from about 1/2 foot deep to about 5 feet deep in the Ewa direction. Further seaward of this area, the coastal reef averages a more uniform 2 to 3 feet depth. It is in the area along the Natatorium seaward wall that the bulk of the coastal transport moves, predominantly in the Southeast (toward Diamond Head) direction.

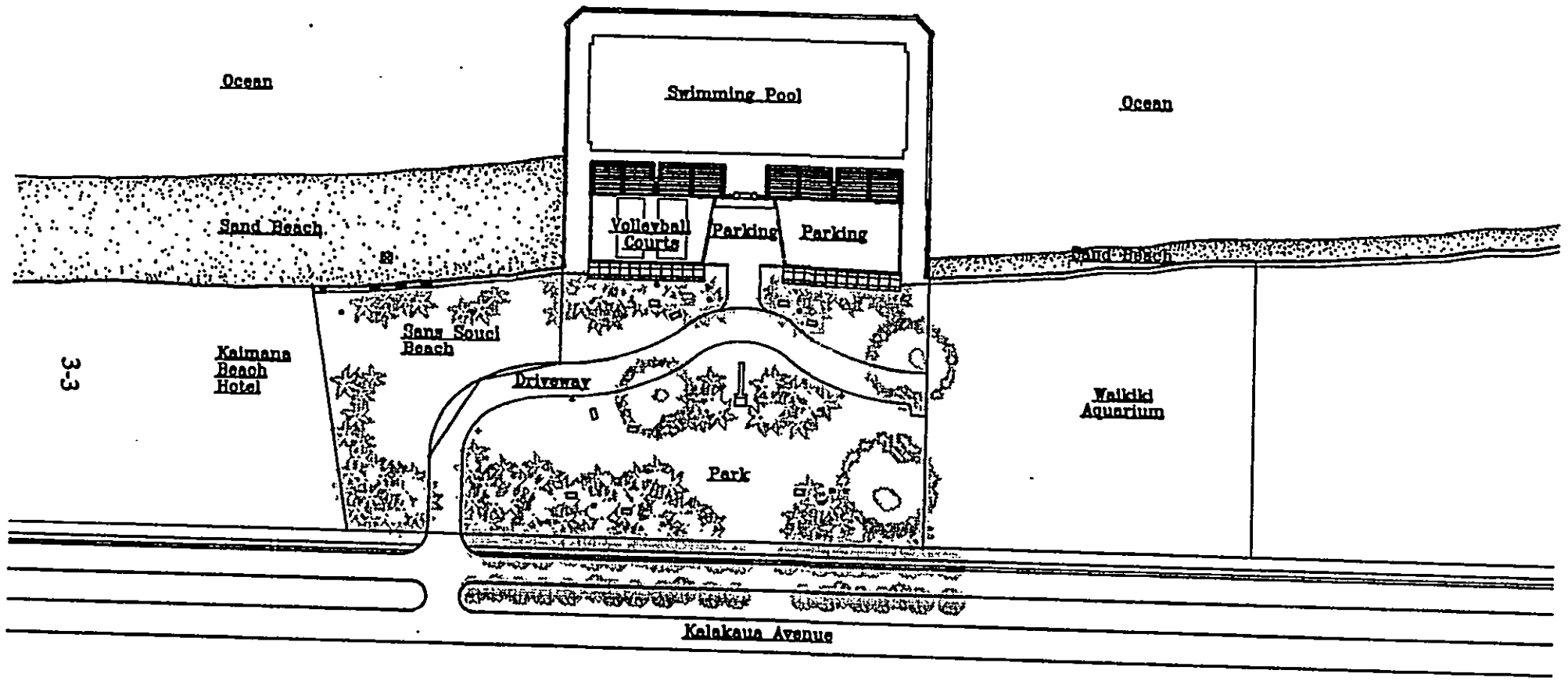
3. Circulation

The result of local offshore and reef bathymetry is that the reformed waves pass over the reef seaward of the Natatorium and strike the Natatorium seaward wall at a zero to 10 degree angle, generally open in the Ewa direction. The distant end of a deep shoreline channel existing on the Ewa side of the Natatorium, however, contains reef obstructions for this wave induced flow to move to the Northwest. The result is a daily predominate flow to the Southeast, i.e., from the Ewa side of the Natatorium to the Diamond Head side, (See Exhibit 14, Existing Conditions - Ebb and Flood Current Patterns).

During ebbing tides this flow becomes strongest, and occasionally during weak flooding tides, the flow is also toward Diamond Head. Overall, the transport toward the Diamond Head side of the Natatorium occurs about 74 percent of the time. Only during strong flooding tides and/or wave climates with significant wave heights (e.g., typically during storm conditions) does an Ewa moving flow predominate for the duration of these conditions. Historically, these latter conditions prevail about 24 percent of the time. The balance of the time (2 percent), the flows are too weak to determine a transport direction.

Water flow speed along the seaward face of the Natatorium was found to vary from 1.0 centimeter/second to 9.7 centimeter/second. During flooding tides, the flows varied from 2 to 5 centimeter/second, and during ebbing tides from 7 to 10 centimeter/second. Historical data imply speeds up to 15 centimeter/second do occur with occasionally greater speeds during short periods of storm conditions. The mode, however, was 5.0 centimeter/second with the bulk of observation ranging from 4.1 to 7.6 centimeter/second. The modal speed of 5.0 centimeter/second was used in the analyses.

These flow rates show that a significant flushing rate can be maintained for the Natatorium if it is properly opened to the coastal transport. The minimum acceptable flushing rate was set as once a day. This was determined by examining a variety of similar projects. Given the proposed



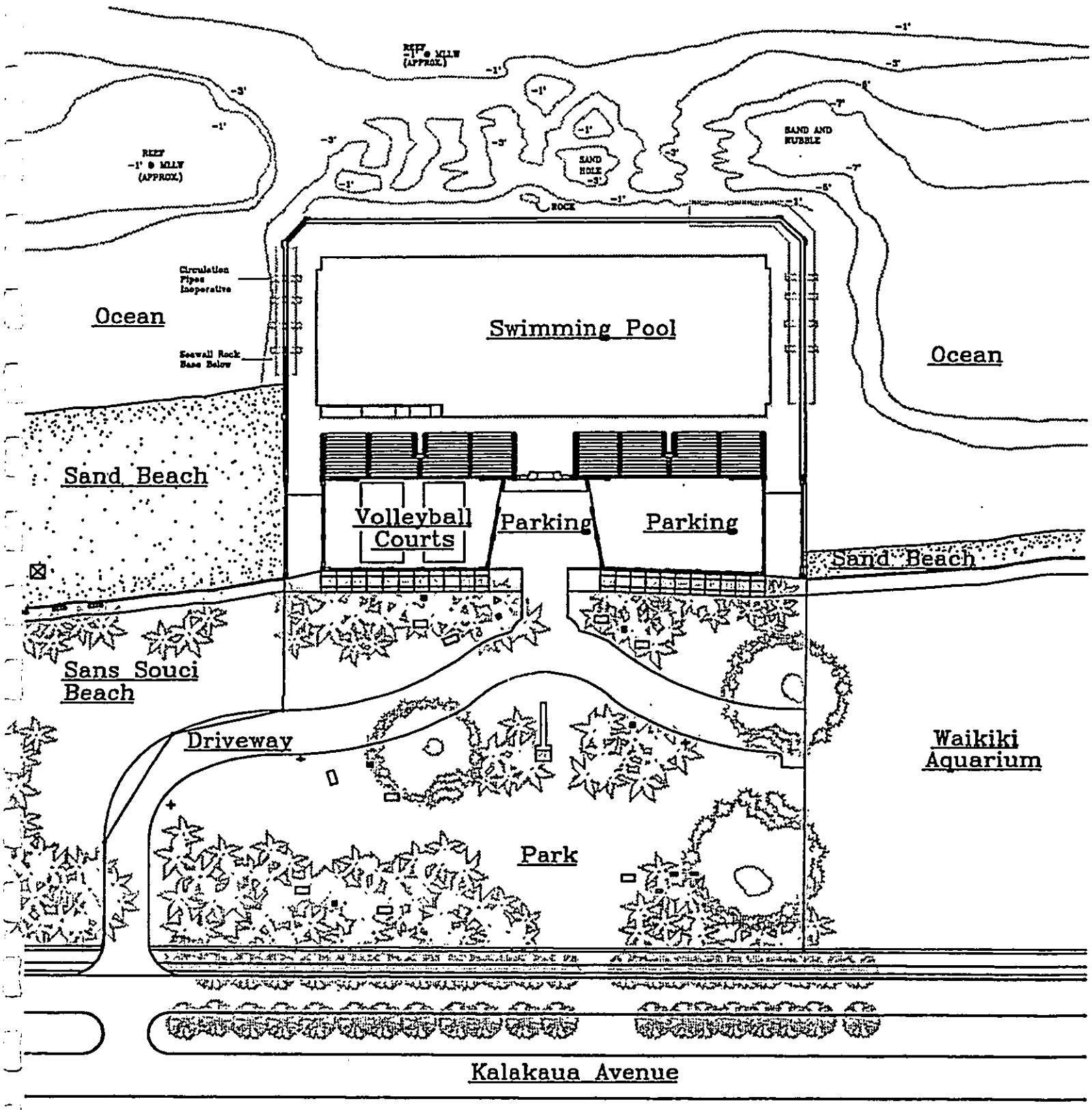
Existing Conditions

The Site

North

80' 0 80' 160'

Exhibit 12



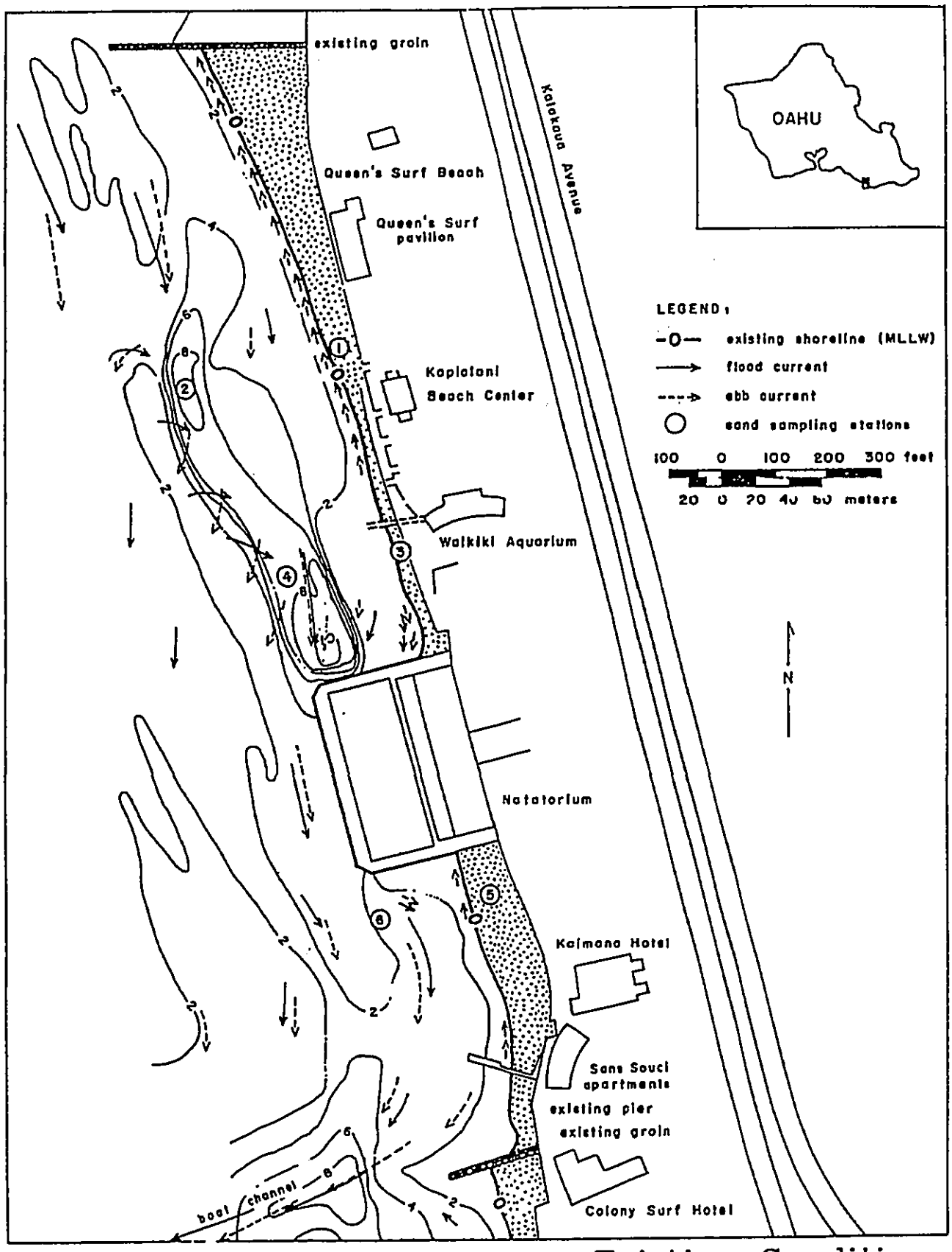
Existing Conditions

Oceanographic Conditions

North

80' 0 80' 160'

Exhibit 13



Existing Conditions

Ebb and Flood Current Patterns

Exhibit 14

interior hypsography for the Natatorium (either proposed concept) flushing rates from 3.9 to 15 times per day are possible to obtain. Considering a limited open area on each end of the Natatorium, typical average flushing rates of 2 times during flood conditions and 4 times during ebb conditions can be easily maintained. This rate will be exceeded at all but the most extreme conditions of flat seas and a minimal tide thus insuring proper flushing. Such extreme conditions rarely occur in the area for more than a few hours.

To summarize, the flushing is expected to range daily from 2 to 8 times per day, with a modal rate of about 4.5 times per day.

4. Water Quality

Observations both in and around the Natatorium were taken and analyzed for several parameters. The averaged results over the survey days show:

	Inside	Outside
Salinity (ppt)	34.10	34.62
Turbidity (ntu)	2.4	1.1
Nitrate/Nitrite (micro gm atms/1)	0.72	1.95
Total Nitrogen (micro gm atms/1)	16.97	14.75
Phosphate (micro gm atms/1)	0.49	0.19
Total Phosphorus (micro gm atms/1)	0.68	0.43

These values show a somewhat degraded condition in the Natatorium. It is important to note, however, that the future water quality in the Natatorium will only be as good as the supply water, (i.e., that water existing outside of the Natatorium). This latter water quality will vary as a function of the amount of wave and tidal induced transport occurring daily over the local coastal reef.

Neighboring uses of this water will also affect the condition of the supply water. One of these is the Waikiki Aquarium. Currently the neighboring Waikiki Aquarium has an existing saltwater intake and discharge system. This consists of two pipe lines which terminate approximately 150 feet from the shore in front of the Aquarium. At this time only the discharge line is in use. Their supply water is currently from an onsite saltwater well. This system supplies the water for their exhibits. The discharge water is monitored and complies with their existing National Pollutant Discharge Elimination System Permit (NPDES). The Aquarium's current plans call for the reactivation of the intake line. This modification is necessary so that they can meet the new more stringent water quality standards.

5. Wave Data

Waves in the Hawaiian Islands can be classified in five different groups:

- o Trade wind waves
- o South Pacific swell
- o North Pacific swell
- o Kona storm waves
- o Hurricane waves

Waves from tradewinds arrive at the Natatorium through the Molokai Channel. The longer components of these waves refract around Diamond Head and arrive from southwesterly directions. This is the typical wave environment for the project area.

In the spring and summer, storm waves generated in the South Pacific arrive at the Natatorium as South Pacific swells. These waves are characterized by longer periods between swells. In wintertime, Kona storms produce locally generated, fairly steep waves. They also affect the project site. The North Pacific swell loses most of its power before it arrives at the project site. Its effects are negligible.

Waves at the site are strongly reduced in height because of the existence of an extensive protective reef on which the large waves break.

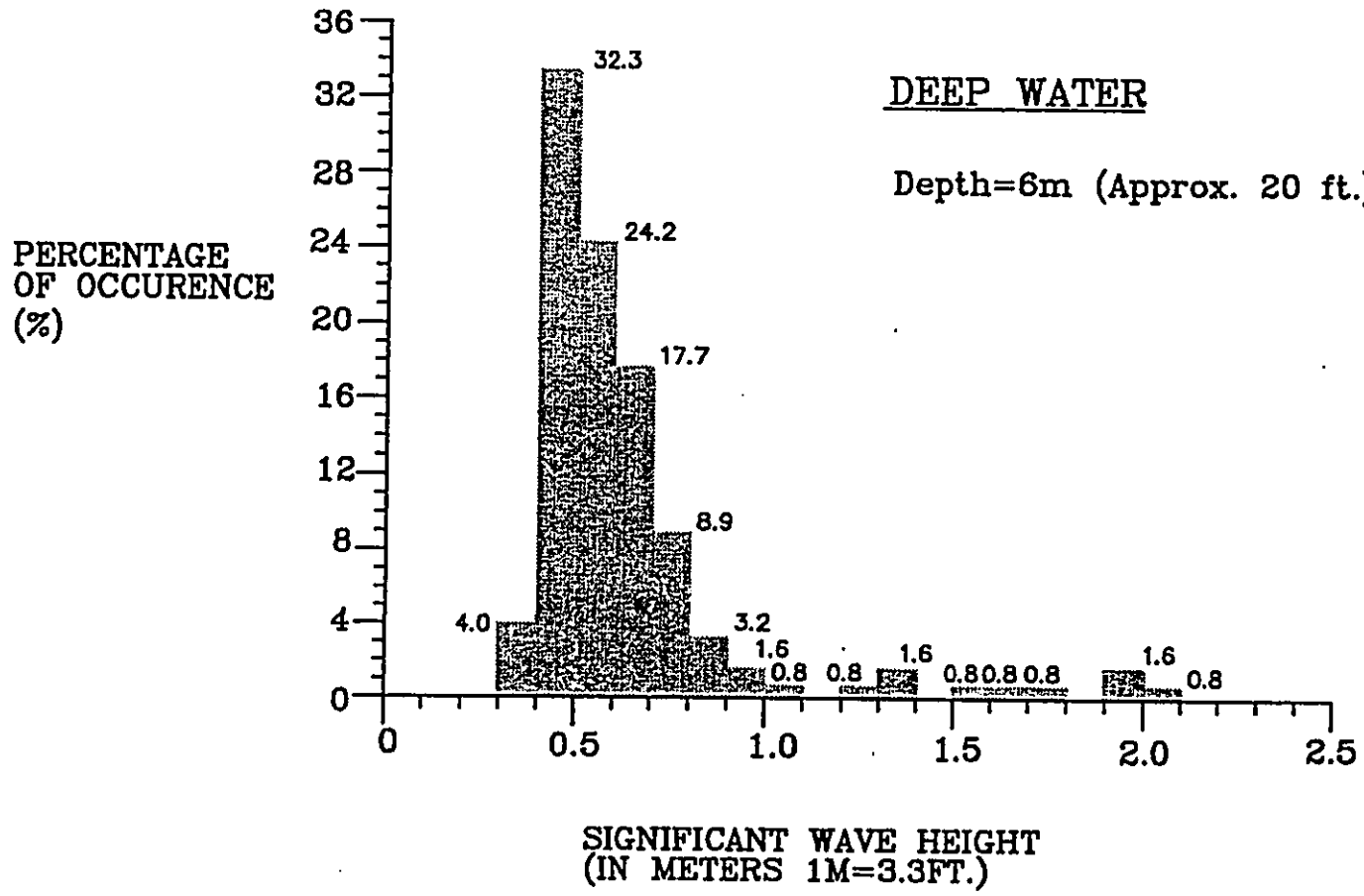
The prevailing wave climate is characterized by a set of wave measurements obtained by Sea Engineering Inc. in February and March 1989. Pressure recorders were used. The measurements were taken in two locations offshore from the site, one at a depth of 20 feet and another closer to the shoreline at a depth of approximately 3.3 feet. The wave measurement at the shoreward station represents design wave conditions for the Natatorium, except for the more severe conditions during the passage of a hurricane. During hurricanes, large deep water waves occur and wave set up increases the size of the waves that can reach the Natatorium. Unusual hurricanes (like Hurricane Iwa) may cause significant wave action and wave set up on the Waikiki coast when approaching from a south/southwesterly direction. The probability for such an event is low, but cannot fully be disregarded.

The results of the wave measurements of February - March 1989 are presented in terms of two histograms for wave height, one for deep water and another for shallow water. (See Exhibit 15, Existing Conditions - Deep Water Wave Histogram and Exhibit 16, Existing Conditions - Shallow Water Wave Histogram.)

The deep water data show that during the time of observation 56.5 percent of the time measured significant wave heights between 0.4 meter and 0.6 meter (between 1.3 feet and 2.0 feet), an estimated 60 percent of the time between 1.0 and 2.0 feet and an estimated 90 percent of the time between 1.0 and 3.0 feet. The highest waves measuring 2.02 meter (6.6 feet) were recorded on March 2, 1989.

Wave periods vary to a lesser degree. An important value is the peak period, which is the period of waves where the energy density reaches its highest value. For the majority of the waves the value is between 8.5 and 14.2 seconds.

In shallow water, waves are much smaller due to energy dissipation on the reef. In the histogram it is shown that 91.1 percent of the time waves are between 0.2 meter and 0.4 meter (between 8 inches and 1.3 feet). Here the wave height values did not exceed 0.5 meter (1.6 feet). In this case the peak periods showed an irregular behavior, depending on the breaking mechanisms present. The zero-crossing wave periods were generally considerably smaller than those of deep water waves often between 5.0 and 6.0 seconds. The mechanism of wave breaking generates waves or shorter wave period in the wave spectrum.

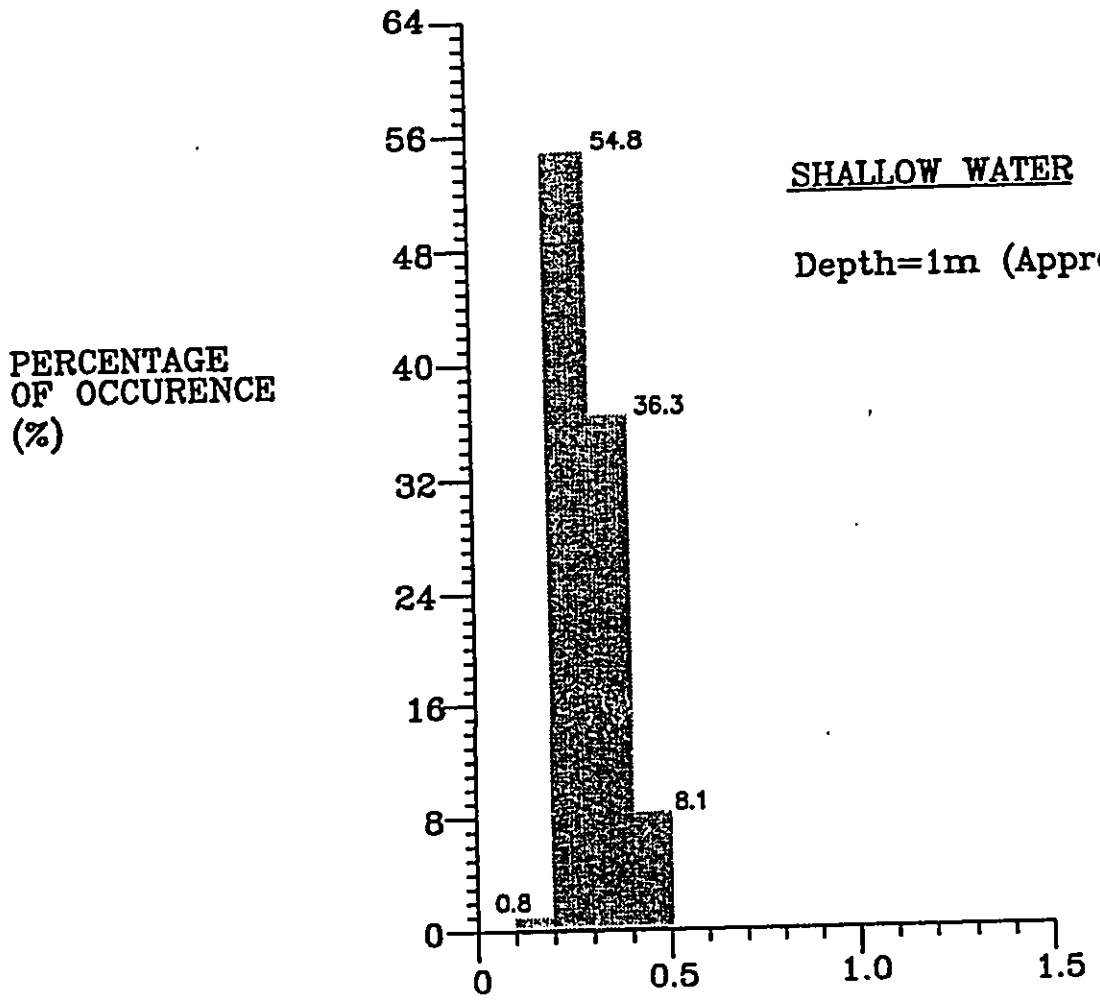


Histogram for significant wave height in deep water based on measurements of February–March 1989.

Existing Conditions

Deep Water Wave Histogram

Exhibit 15



Histogram for significant wave height in shallow water based on measurements of February–March 1989.

3-9

Existing Conditions

Shallow Water Wave Histogram

Exhibit 16

At the Natatorium seawall, waves arriving at a small angle (5-10 degrees) are reflected against the seawall. The front of the seawall waves may be considerably higher than the measured values in shallow water because of the superposition of incoming and reflected waves.

6. Littoral Drift and Beach Profile

Littoral drift is the movement of sediment along a beach. This is an important quantity in considering the natural stability of beaches as well as the effect of coastal structures on those beaches by the Natatorium. The dominant direction of littoral drift is parallel to the shoreline.

Another component of sand movement that affects the beach profile (the erosion or accretion of beaches) is the transport perpendicular to the shoreline. Depending on the type of wave conditions, this transport can either be onshore (towards land) or offshore (towards sea).

Three areas have to be considered to evaluate the conditions near the Natatorium; the beach south of the Natatorium, the area offshore of the Natatorium and the area north of the Natatorium.

a. San Souci Beach

The beach south of the Natatorium is known as San Souci Beach. It is in a stable mode with a tendency for some accretion at the southern Natatorium seawall. There is a slight transport in the northerly direction along this beach, with an offshore transport component at some distance from the Natatorium. The reflection of waves from the southern Natatorium seawall affects the transport mechanisms in this area.

During a previous study on beach behavior, beach profiles were measured at various time intervals. The coastal area south of the Natatorium showed some evidence of standing edge waves of low amplitude. These waves also affect the transport processes in that area. The beach cusp in the middle of San Souci beach may be a result.

Typical beach sand characteristics of the area include sand grains with average diameters of about 0.5mm. The beach north of the Natatorium has larger grain sizes.

b. Transport in Front of the Natatorium Seawall

Some of the sand from the San Souci beach finds it way along the southern seaward corner of the Natatorium due to an offshore transport component. This sand fills some of the crevices in the highly irregular reef bottom. It is expected that during high wave conditions some sand transport takes place along the northern seawall, either to the north or to the south, depending on wave and current conditions.

The waves act as an agent for the sediment in suspension and the currents provide for the actual transport. The sand here is finer than on San Souci beach and sets easily into suspension.

c. Beach North of the Natatorium

Due to the northern transport component of sand along the shoreline and the lack of adequate sand replenishment the beach north of the Natatorium has virtually disappeared over time. There is a deep long channel offshore parallel to the beach that traps most of the beach sand that is passing by the Natatorium. This situation creates favorable conditions for the installation of intake works for the natural flushing of the Natatorium.

In order not to disrupt future plans to improve Waikiki Beach, it is advisable to not alter the shoreline north of the Natatorium. This would also prevent conflict with Aquarium operations.

7. Historical Notes

Historical wave data taken from studies of the Natatorium (seaward of the coastal reefs) show incoming tradewind wave seas with a significant wave height of 4.8 feet and significant wave period of 8.6 seconds occurring 73 percent of the time. Kona storm waves have similar values of 3.5 feet and 6.2 seconds for 10 percent of the year, and South swell wave values are 2.6 feet and 13.1 seconds for 53 percent of the year.

During the summer season, the tradewind and South swell combine to produce the coastal wave conditions. During low wave conditions, flows in the San-Souci Channel (Southwest of the Natatorium) have been observed to be generally outflowing and at less than 0.5 feet/second (15.2 centimeter/second). During high wave conditions, a similar outgoing flow was found with speeds up to 4 feet/second (121 centimeter/second) during storm conditions.

Past water quality samples have been taken in the area during January, March and September, along with one biological transit.

8. Conclusions

The analyses reveal that by far the most advantageous and most effective way to insure flushing of the Natatorium, without providing strong artificial flows, is to open two sides to the natural coastal flow. The circulation flowing past the Natatorium with each tidal change is a result of both the daily tidal change and the accumulation of wave transport over the reef area Ewa of the Natatorium. This flow moves toward Diamond Head the majority of the time at rates that can provide the Natatorium with flushing of 3.9 to greater than 15 times per tidal exchange. This assures more than adequate flushing.

Though the addition of a dual wave trap/wave buffer facility constructed along the seaward wall was also considered, the Natatorium interior configuration and the interior volume eliminated the need for this feature. This feature would add to design complexity and cost. The wave data obtained is used to design protective entrance/exit structures proposed at each end of the Natatorium.

Marine Macrobiota

The following descriptions of the marine life and reef information were prepared for this environmental document.

1. Historical Perspective

   Perhaps some of the greatest impacts to the shallow marine communities in the area of the Natatorium occurred with (1) the dredging of the approximate 15m wide, 3m deep channel through the reef platform that fronts the present Waikiki Aquarium and abuts the western side of the Natatorium, (2) the placement of sand on the beach to the west of the Natatorium in the 1950-51 period, and (3) a severe storm swell from the east of the Natatorium about 1963-64.

   The date of channel construction is unknown but it was probably constructed about the time that Dillingham Construction developed the Ala Wai, Kewalo Basin and the channel fronting Ala Moana Park. This occurred in the period from 1922 through 1935. Dredging, as well as the placement of sand on the beaches, created considerable silt and suspended material all of which did transport from the area, impacting sessile benthic forms (corals, algae, etc.). Of course the construction of the Natatorium in August 1927 eliminated marine communities in the "footprint" of the structure and had impacts to surrounding reef flat communities.

   A field program was completed to provided the database for this assessment of the marine macrobiota in the area surrounding the Natatorium. The field work was completed on the 17th and 18th of December 1991. The area encompassed by the survey covered the shallow waters surrounding the Natatorium structure to a distance of 70m seaward.

2. Biosurvey Methods

   The quantitative sampling of macrofauna of marine communities presents a number of problems; many of these are related to the scale on which one wishes to quantitatively enumerate organism abundance. Marine communities in most Hawaiian settings may be spatially defined in a range on the order of a few hundred square centimeters (such as the community residing in a Pocillopora meandrina coral head) to major biotopes covering many hectares. Recognizing this ecological characteristic and the fact that proposed construction activities are to be relegated to the immediate vicinity of the present structure, a sampling program was completed that attempted to delineate major extant communities in the limits of the study area and to quantitatively describe these communities.

   A number of field methods were used for this environmental biosurvey evaluation. A diver snorkeled over the study site to obtain an overall perspective on the extent of the major "zones" or "biotopes" occurring in the study area. This exercise allowed the qualitative delineation of major biotopes based partially on the presence of large structural elements (e.g., the amount of sand, hard sub-stratum, fish abundance, coral coverage or dominant benthic coverage).

Within each zone as well as around the perimeter of the Natatorium, stations were established and quantitative studies were conducted, including visual enumeration of fish, counts along benthic transect lines and cover estimates in benthic quadrats. Besides these quantitative measures, a qualitative reconnaissance was made in the vicinity of each station by swimming and noting the presence of species not encountered in the transects. All assessments were completed using snorkel gear due to the shallow depths.

The location of stations were subjectively chosen as being representative of a given biotope or community resident to a given section of the Natatorium. Immediately following site selection, a visual fish census was undertaken to estimate the abundance of fishes. These censuses were conducted over a 4 x 20 meter corridor and all fishes within this area to the water's surface were counted. Data collected included species, numbers of individuals and the estimated lengths of all fishes seen. The length data were later converted to standing crop estimates using linear regression techniques. A single diver equipped with SCUBA, transect line, slate and pencil would enter the area, count and note all fishes in the prescribed area. The 20 meter transect line was paid out as the census progressed, thereby avoiding any previous underwater activity in the area which could frighten wary fishes.

Fish abundance and diversity is often related to small-scale topographical relief over short linear distances. A long transect may bisect a number of topographical features (e.g., cross coral mounds, sand flats and algal beds), thus sampling more than one community and obscuring distinctive features of individual communities. To alleviate this problem, a short transect (20 to 25 meter in length) was used as has proven adequate in sampling many Hawaiian benthic communities.

Besides frightening wary fishes, other problems with the visual census technique include the underestimation of cryptic species such as moray eels (family Muraenidae) and nocturnal species (e.g., squirrel fishes, family Holocentridae; aweoweos or bigeyes family Priacanthidae, etc. This problem is compounded in areas of high relief and coral coverage affording numerous shelter sites. Species lists and abundance estimates are more accurate for areas of low relief, although some fishes with cryptic habits or protective coloration (e.g., the nohus, family Scorapenidae; the flatfishes, family Bothidae) might still be missed. Obviously, the effectiveness of the visual census technique is reduced in turbid water and species of fishes which move quickly and/or are very numerous may be difficult to count and to estimate sizes. Additionally, bias related to the experience of the diver conducting counts should be considered in making any comparisons between surveys. In spite of these drawbacks, the visual census technique probably provides the most accurate non-destructive method available for the assessment of diurnally active fishes.

After the assessment of fishes, an enumeration of epibenthic invertebrates (excluding corals) was undertaken using the same transect line as established for fishes. Exposed invertebrates usually greater than 2 centimeters in some dimension (without disturbing the substratum) were censused in a 4 x 20 meter area. As with the fish census technique, this sampling methodology is quantitative for only a few invertebrate groups, e.g., some of the echinoderms and holothurians (sea urchins and sea cucumbers). Most coral reef invertebrates (other than corals) are cryptic or nocturnal in their habits making accurate assessment of them in areas of topographical complexity

very difficult. This, coupled with the fact that the majority of these cryptic invertebrates are small, necessitates the use of methodologies that are beyond the scope of this survey. Recognizing constraints on time and the scope of this survey, the invertebrate censusing technique used here attempted only to assess those few macroinvertebrates species that are diurnally exposed.

Exposed sessile benthic forms such as corals and macrothal loid algae were quantitatively surveyed by use of quadrats and the point-intersect method. The point-intersect technique only notes the species of organism or substratum type directly under a point. Along the previously set fish transect line, 40 such points were assessed (once every 50cm). These data were converted to percentages. Quadrat sampling consisted of recording benthic organisms, algae and substratum type present as a percent cover in five one-meter square frames placed at five-meter intervals along the transect line established for fish censusing (at 0, 5, 10, 15, and 20 meters).

If macrothalloid algae were encountered in the 1 x 1 meter quadrats or under one of the 40 points, they were quantitatively recorded as percent cover. Emphasis was placed on those species that are visually dominant and no attempt was made to quantitatively assess the multitude of microalgal species that constitute the "algal turf" so characteristic of many coral reef habitats.

3. Biosurvey Results

The qualitative reconnaissance to define biotopes or zones in the vicinity of the Natatorium noted two such zones: the biotope of sand and the high energy reef flat biotope. These two zones were examined, along with an examination of the Natatorium pool interior. The high energy reef flat biotope is found both to the west and seaward of the Natatorium as a continuous feature from the outer walls seaward beyond the limits of this study. The biotope of sand is located on the eastern side of the structure.

About midway along the western side of the structure is a dredged channel that parallels the shoreline. This channel is about 15 meters in width and 3 to 3.5 meters in depth; the channel abuts the western wall and was cut into the old reef platform. The vertical sides of this channel provide considerable cover for fishes and the floor of the channel is comprised of fine sedimentary material. Although not defined as a biotope or zone, quantitative sampling was carried out adjacent to the outer walls of the Natatorium because communities in this area would be affected with the proposed changes.

a. Biotope of Sand

The biotope of sand is situated in the area directly adjacent to and east of the Natatorium and continues well outside of the limits of this study. Prior to the replenishment program that created much of the present Sans Souci Beach east of the structure about 1963-64, the biotope of sand was much smaller covering the area directly shoreward of Kapua Channel. At the deepest point near the outer edge of the reef, Kapua Channel had a maximum depth of 7.6 meters; today following the beach replenishment program, maximum channel depth in approximately the same location is about 3 meters.

During the 1964-65 period, sand was replenished on the beach and erosion of this material continued, filling in low points offshore on the reef platform and seaward until an equilibrium was established. Prior to the placement of sand, Sans Souci Beach was narrow and dominated by a seawall; today the seawall remains but is about 15 meter mauka (inland) of the present shoreline.

Sand is not a stable substratum which is a prerequisite for most benthic coral reef species. Also with the impingement of wave energy, sand particles are moved about scouring adjacent hard bottom and benthic communities. The massive sand replenishment program during the mid-1960's must have resulted in the burial of benthic communities and their replacement with a less diverse array of species adapted to the constantly shifting sub-stratum. Besides the physical characteristics of a sand sub-stratum as just mentioned, benthic communities in the shallows adjacent to the east wall of the Natatorium are exposed to considerable human foot traffic (trampling) in the shallows. On the morning of 17 December 1991, at 10:00 a.m., approximately 72 people were counted on the small beach east of the Natatorium; 27 people were in the water and most of these people were wading.

A quantitative station was established in the biotope of sand about 40 meter east of the outer Natatorium wall in 1.6 meter of water. The only species encountered here were one small paki'i or flatfish (Bothus mancus) and an auger shell (Terebra inconstans). The biomass of fish at this station was estimated to be 0.2 gram per square meter. In the vicinity were seen a small school of weke (Mulloides flavolineat us), a small mixed school of juvenile aholehole (Kuhlia sandvicensis) and mullet (Mugil cephalus) along the shoreline as well as a lizardfish or 'ulae (Synodus binotatus) and a box crab or Calappa calappa.

b. High Energy Reef Flat Biotope

The high energy reef flat biotope dominates the shallows both offshore and to the west of the Natatorium. On the west side of the structure, this biotope extends from the shoreline (seawall and beach) seaward to outside of the area of the study area, encompassing depths from about 30 centimeters to about 2 meters. The sub-stratum of this biotope is dominated by limestone with patches of sand and rubble. Most of the sand and rubble is found in the bottom of shallow wave cut channels that have a general orientation perpendicular to shore and are from 1 to 10 meters in width, 5 to 35 meters in length and up to 50 centimeters in depth. These channels are spaced from 5 to 30 meters apart and are best developed in the outer two-thirds of the reef flat. The benthic communities of this biotope are dominated by macroalgae. The high energy reef flat biotope extends from shore on the western side of the Natatorium and on the seaward face of the structure, up to the walls and out to the reef crest. To the east the high energy reef flat biotope is restricted to the more offshore areas adjacent to the reef crest; shoreward of this is the biotope of sand.

Because the waters around the Waikiki Natatorium are part of a State sanctioned Marine Life Conservation District (MLCD), fishing is restricted. The reef west of the Natatorium is permanently closed to all fishing activities. Easterly to the Diamond Head Lighthouse, the

shallow reef area is a Special Management Area where fishing is allowed in even numbered years. Fishing activities are not allowed in odd numbered years.

Four quantitative stations were established to sample the high energy reef flat biotope and outer walls of the Natatorium. One station was established about 25 meters directly seaward of the outer makai (seaward) wall of the Natatorium in water from 0.8 to 1.4 meters in depth. The orientation of the transect in this area were parallel to the outer wall and shoreline. The substratum at this location is comprised of limestone with small wave cut channels through it having an orientation perpendicular to shore. These channels are from 2 to 8 meters in width and up to 20 meters in length with a maximum depth of about 40 centimeters affording some cover for reef fishes. Channels are spaced about 15 meters apart at this location. The bottom of the channels is a mix of sand and coral rubble. The intervening limestone sub-stratum between channels is covered by a macroalgal community dominated by limu wawae'iole (Codium edule), limu kala (Sargassum po lyphyllum) and the red algae, Amansia glomerata.

A quantitative survey was completed in this area. The quadrat survey noted 6 macroalgal species having a mean coverage of 31 percent. The most common algae in this area is limu wawae'iole (Codium edule). Two coral species (Porites lobata and Pocillopora damicornis) were encountered in the quadrat survey; corals have a mean coverage of 0.2 percent. The invertebrate census noted one he'e or octopus (Octopus cyanea) in the census area and two echinoderms: the sea cucumber (Holothuria atra) and the green sea urchin (Echinometra mathaei).

A total of 13 species of fishes (58 individuals) were also seen in this area. The most common species included the manini (Acanthurus triosteg us) and the 'omaka (Stethojulis balteata). The standing crop of fishes here was estimated to be 46 grams per square meter and the largest contributors to this biomass included manini (Acanthurus triostegus) and a single ponuhunuhu (Calotomus carolinus). The corals (Cyphastrea ocellina, Pocillopora meandrina) and a single colony of Porites lobata that had a maximum diameter of about 30 cm were found in the vicinity . Other species seen include algae (Dictyosphaeria versluysii, Bryopsis sp., Halimeda discoidea, Neomeris annulata, Ulva reticu lata, Lyngbya majuscula, Dictyota sandvicensis, Padina sp., Ralfsia pangoensis, Sphacelaria furcigera, Acanthophora spicifera, Amansia glomerata, Centroceras clavulatum, Grateloupia filicina, Halymenia formosa, Plocamium sandicense and Spyridia filamentosa), fishes such as the palani (Acanthurus dussumieri), the humuhumunukunuku a pua'a (Rhinecanthus rectangulus), umaumalei (Naso liturat us), lau'ipala (Zebrasoma flavescens), uhu (Scarus sordidus), awela (Thalassoma trilobatum), hinalea aki'lolo (Coris gaimard), puhi (Gymnothorax eurostus) and kumu (Parupeneus porphyreus).

Macroinvertebrates seen in the general vicinity included the cone shell (Conus ebreus), sea cucumber (Actionpyga maurtiana) and short spined sea urchin (Tripneustes gratilla).

As noted above, the high energy reef flat biotope occurs as a feature that continues up to the outer walls of the Natatorium. Because it is proposed to reconstruct much of the Natatorium seawall, special emphasis was placed on the marine communities resident to the outer walls and the substratum directly adjacent to the walls. Three stations were established to sample these marine communities in this area.

One station was established on the outer western wall of the Natatorium. This station commenced at the makai corner and continued for 20 meters towards shore. It sampled not only the high energy reef flat biotope and Natatorium walls but also the cross-sectional edge of the dredged channel that runs perpendicular to and abuts the Natatorium. The substratum at this station is a mix of coral rubble from the reef flat and basalt stones ranging in size from 30 to 75 cetimeters that were placed along the interface of the concrete walls and the seafloor to stabilize the substratum adjacent to the structure. These basalt rocks provide cover for fishes.

The quadrat survey noted five algal species having a mean coverage of 41 percent; the most important contributors to this standing crop were limu wawae 'iole (Codium edule) and the encrusting pink coralline species, Poroloithon onkodes. Three coral species (Porites lobata, P. compressa and Pocillopora damicornis) were encountered having a mean coverage of 0.3 percent. Three diurnally exposed macro invertebra te species (2 shrimp species - Saron marmoratus and Stenopus hispidus and one cone shell - Conus lividus) were in the 4 x 20 meters census area. In total 20 species of fishes were censused at this station (159 individuals). The most abundant fishes included the weke (Mulloides flavolineatus), mamo (Abudefduf abdominalis) and the kole (Ctenochaetus strigosus). The standing crop was estimated to be 156 grams per square meter. A large number of weke (Mulloides flavolineatus) censused here accounted for 71 percent of this biomass.

The second station was established approximately 30 meters east of the makai west corner of the Natatorium and extending for 20 meters to the east from that point. This station sampled the Natatorium wall, adjacent seafloor as well as the outer part of a large cavity caused by erosion under the seaward side of the Natatorium seawall. This irregular sea floor depression is approximate 7 meters in width and at its greatest point, and is about 1.2 meters maximum depth. A small break continues under the concrete and into the swimming pool.

The results of the quantitative survey conducted at this station noted three algal species having a mean coverage of 20 percent. Amansia glomerata was the most abundant macroalgal species at this station and two coral species (Porites lobata and Pocillopora damicornis) were also seen with a mean coverage of 0.01 percent. Macroinvertebrates seen at this station include the mantis shrimp (Gonodactylus sp.), black shrimp (Saron marmoratus), green urchin (Echinometra mathaei), black urchin (E.oblongata) and sea cucumber (Actinopyga maurtiana) .

The results of a fish census at this station showed twenty-four species of fishes (158 individuals); the most abundant fishes were the mamo (Abudefduf abdominalis), ma'i'i'i (Acanthurus nigrofuscus), kole (Ctenochaetus st rigosus) and manini (Acanthurus triostegus). The

standing crop of fishes was estimated to be 94g per sq m and the species contributing heavily to this estimate included a large ponuhu nuhu (Calotomus carolinus), mamo (Abudefduf abdomialis), ma'i'i'i (Acanthurus nigr ofuscus) and kole (Ctenochaetus strigosus). Outside of the transect area in the large hole under the concrete wall were seen a large school of aholehole (Kuhlia sandvicensis), a large kumu (Parupeneus porphyreus) estimated to weigh 1.5kg, sharpback puffer (Canthigaster rivulatus), puhi paka (Gymnothorax flavimarginatus), moa or boxfish (Ostracion meleagris) and 'ulae (Synodus binotatus).

The third station was established on the outer eastern wall of the Natatorium commencing at the makai corner and running along the base of the wall towards shore. Water depth at this station ranged from 0.8 to 1.2 meters and the substratum is primarily basalt rocks and rubble. The last few meters of the transect terminated in sand because close to the shoreline the biotope of sand is present.

Three macroalgal species were present in this latter quadrat survey with a mean coverage of 9 percent; the most common species was Sargassum polyphyllum. Only one coral species (Porites lobata) was encountered in the quadrat survey having a mean coverage of 0.3 percent. Two macroinvertebrate species were censused; these were the green urchin (Echinometra mathaei) and the sea cucumber (Holothuria atra). Twelve species of fishes (40 individuals) were censused in this area; the most common species were the manini (Acanthurus triostegus), hinalea lauwili (Thalassoma duperrey), kihikihi (Zanclus cornutus) and damselfish (Stegastes fasciolatus). The biomass of fishes at Station 5 was estimated to be 18 grams per square meter; 65 percent of this standing crop was due to three species: moano (Parupeneus *multifasciatus*), *hinalea lauwili* (Thalassoma duperrey) and manini (Acanthurus triostegus). Adjacent to this station were seen the coral (Porites compressa) and the puhi laumilo (Gymnothorax undulatus).

The outer concrete walls of the Natatorium were also qualitatively examined in a number of locations and common species were noted ; among these were algae (Amansia glomerata, Sargassum polyphyllum, Acanthophora spicifera, Ulva fasciata and Lobophora variegata) , invertebrates including the brown sea cucumber (Actionpyga maurtiana), the grey sea cucumber (Holothuria impatiens), sea urchins (Echinometra mathaei and E. oblongata), snails (Nerita picea, Nodolittorina pinctado and Drupa morum) and the ama'ama crab (Grapsus grapsus).

c. Natatorium Pool Interior

A qualitative inspection of the marine communities present in the Natatorium pool was also completed. All species encountered inside the structure were also commonly seen on the outer walls or in the nearby benthic communities. The major component seen were fishes, most of which freely transited through the large hole located on the seaward face of the structure. As with the outer walls, benthic communities on the inner walls of the swimming pool were not well developed.

The bottom of the pool is comprised of sand and fine sedimentary material. These materials have accumulated especially in the eastern inshore corner of the pool. Species encountered on the floor of the swimming pool include holes created by alpheid shrimps and commensal gobies (Psilogobius mainla ndii) and other burrows probably created by unidentified polychaetes, holothurians and crustaceans.

4. Biosurvey Conclusions

The marine communities in the area surrounding the Waikiki Natatorium may be characterized as being dominated by macroalgae and are not particularly diverse relative to many other Hawaiian coral reef communities. Overall, the mean coral coverage at the five quantitative stations studied was less than 0.2 percent. In contrast algae or limu are abundant; the mean coverage of limu at these five stations is 20 percent. The lack of corals in the study area is probably related to the long history of environmental disturbance to this area coupled with occasional high energy conditions. Waves impacting this shoreline usually occur during the summer months; high energy conditions move sand and rubble about scouring the substratum. In such an environment benthic species that have slow growth characteristics (such as corals) cannot successfully become established thus open substratum is colonized by those species that can settle, grow and reproduce before the next storm event occurs. Such species are termed "weedy species" in the ecological literature. They are often the competitive dominants in disturbed or marginal habitats.

The relatively high biomass of fishes encountered at two stations are probably related to (1) the prohibition on fishing in the area and (2) the relatively high cover at these two locations. Much of the cover or shelter at these stations is due to the basalt rock at the base of the outer walls of the Natatorium and the large hole through the outer wall at Station 4.

Nowhere in this study were any rare or otherwise unusual species or "ecotypes" (i.e., morphological variants) encountered. All species seen are common to many of the disturbed reef flat habitats around Oahu.

Water Birds

There are no suitable ponds or marshes on the project site to accommodate the endemic Hawaiian water birds. No change in the areas of the existing habitat will occur. It is possible that migratory shorebirds may be seen on the project site, but it would be of a transitory nature.

3.1.3 Terrestrial Environment

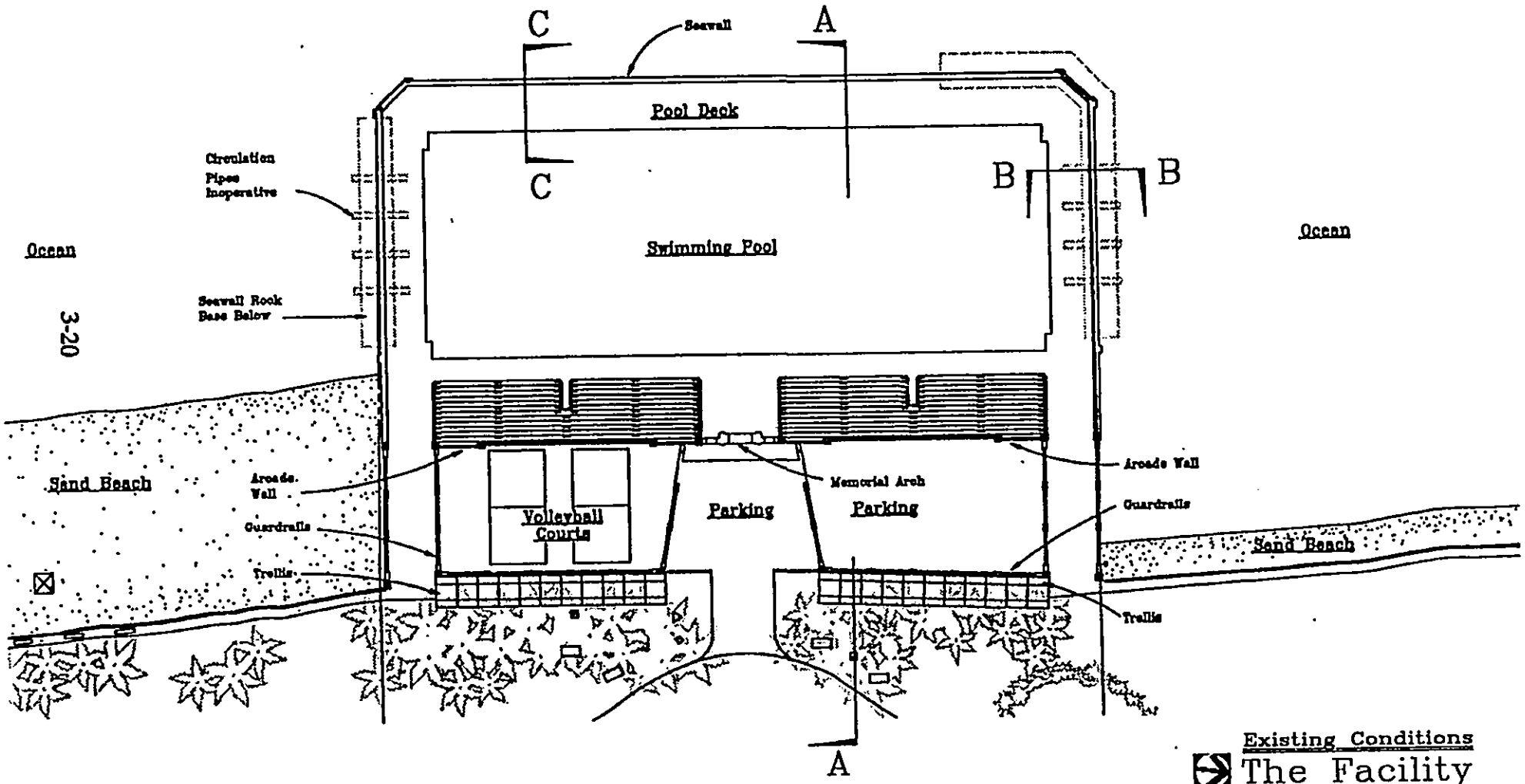
The following description is from the 1990 Planning Report.

The Facility

Refer to Exhibits 17-20 to locate the following features:

1. Seawall

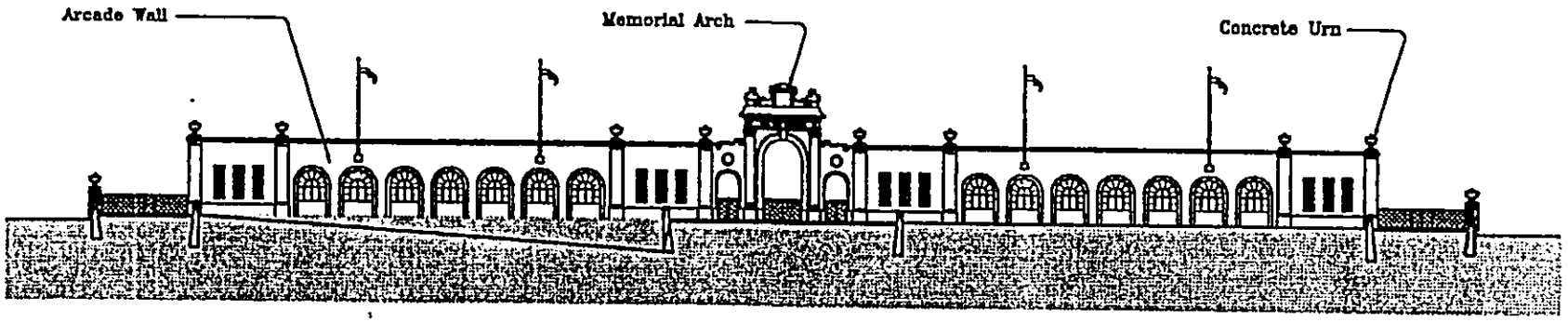
   Portions of the seawall above the deck have experienced severe concrete spalling (chipping, flaking) of concrete and corrosion of concrete reinforcing.



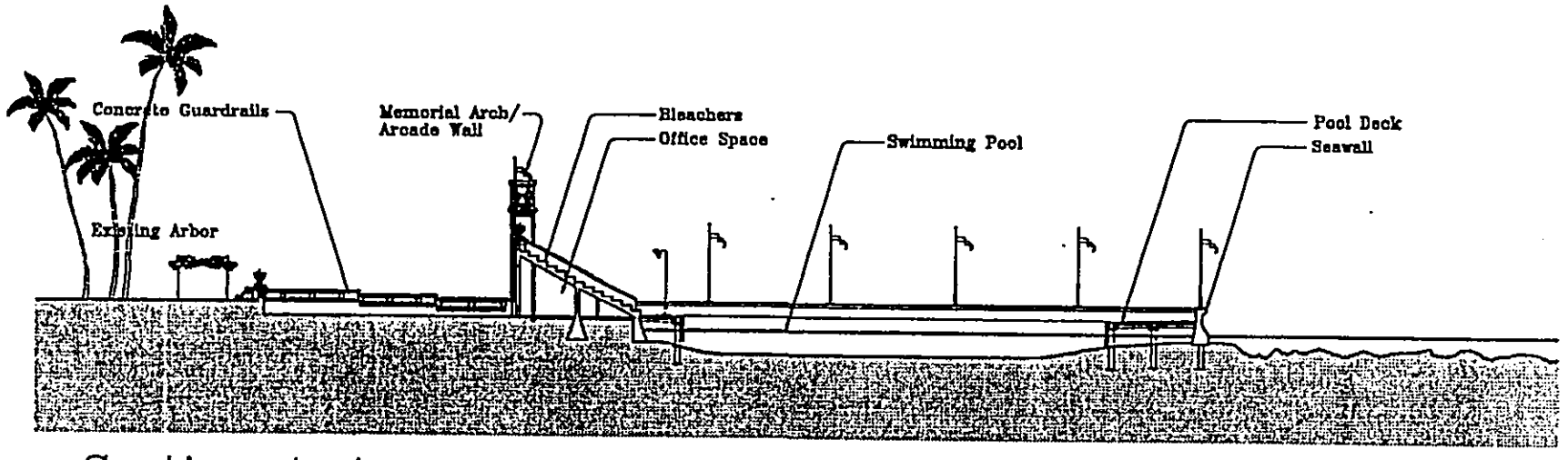
Existing Conditions

The Facility

Exhibit 17



The Elevation



Section A–A

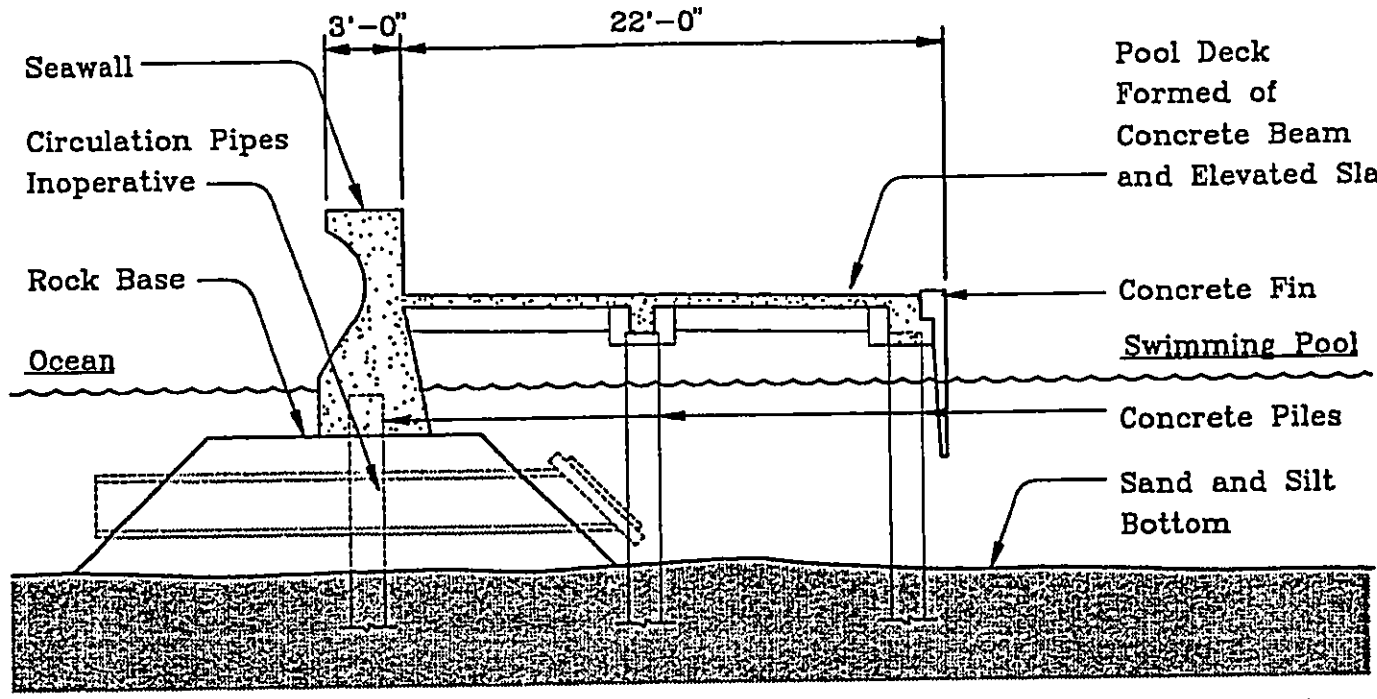
3-21

Existing Condition

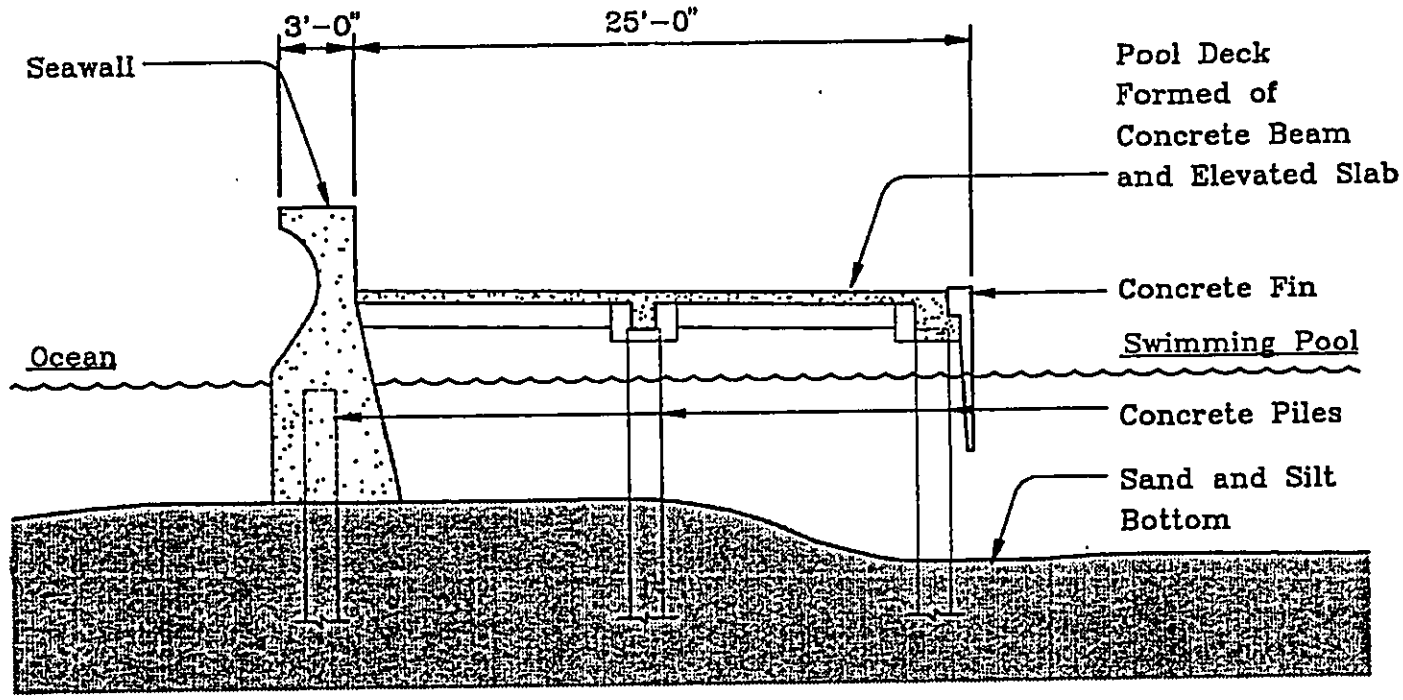
The Elevation and Section

16' 0 16' 32' 64'

Exhibit 18



Section B-B



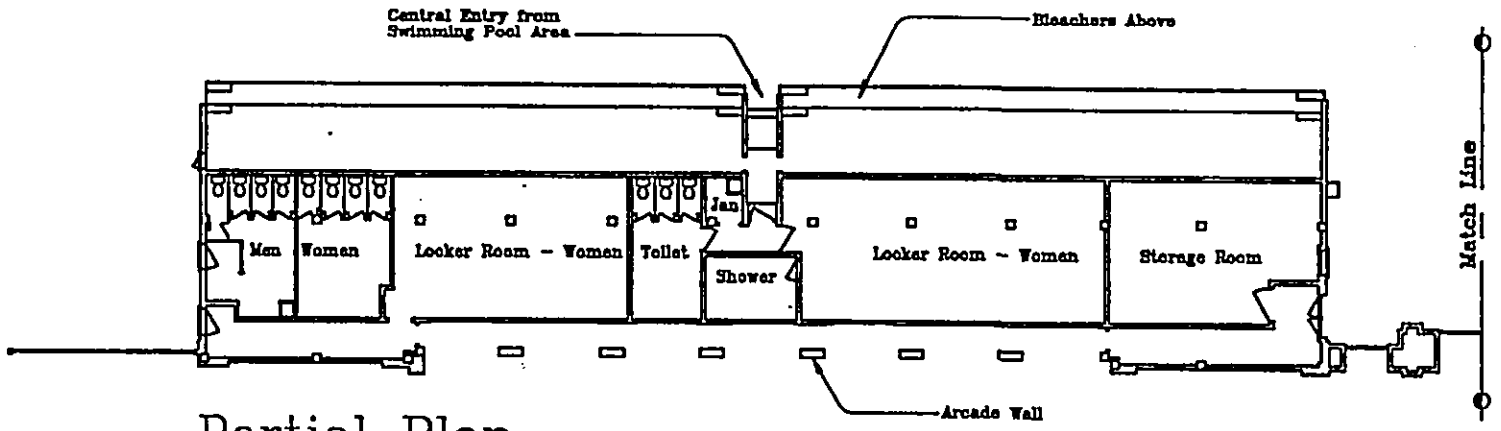
Section C-C

Existing Conditions

The Details

4' 0 4' 8' 16'

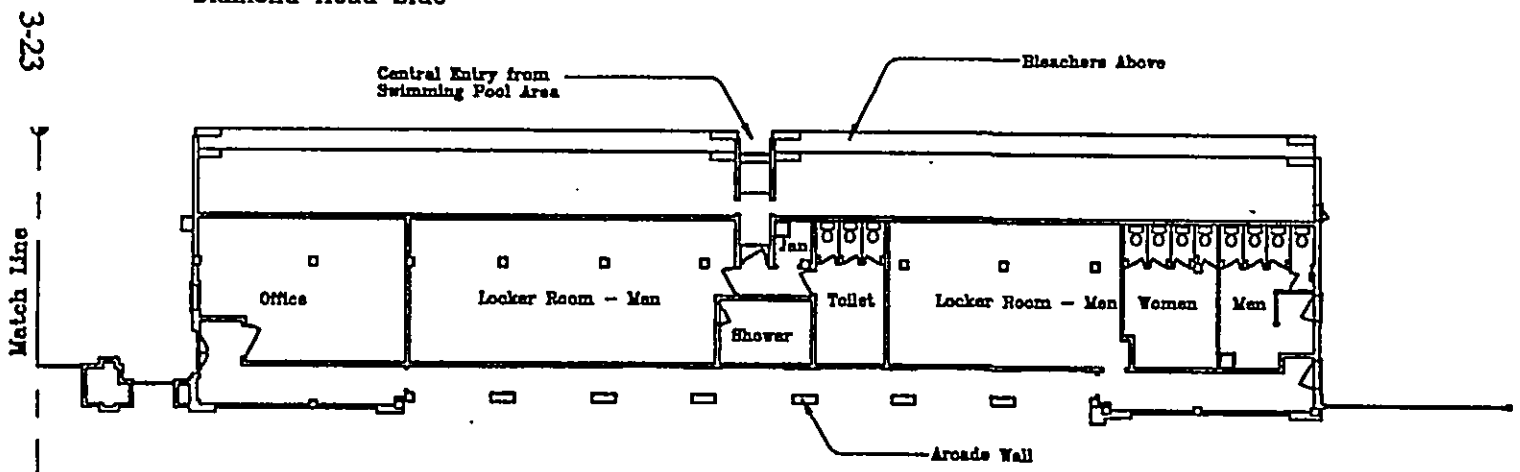
Exhibit 19



Partial Plan

Diamond Head Side

3-23



Partial Plan

Ewa Side

North

Existing Conditions

The Area Beneath The Bleachers

8' 0 8' 16' 32'

Exhibit 20

Below the deck the seawall appears to be intact, except for several vertical cracks through the wall which may be related to construction joints.

2. Pool Deck

The concrete pool deck has experienced extensive corrosion of reinforcing and spalling of concrete on the underside. In some areas the deck has collapsed. The beams and pile caps have also experienced significant corrosion of reinforcing and have extensive cracking. Many of the beams that support the deck have large vertical cracks at the supports which shows large vertical movement. The piles appear to be in good condition. The diving tower is no longer a part of the facility, having been removed at an earlier date.

3. Swimming Pool Bottom

In general, the bottom of the swimming pool is covered with a layer of fine gray silt ranging from a couple of inches to a foot thick. There is a pocket of silt up to 5 feet thick to the makai side of the center of the pool where the diving well was originally located. Apparently, this area has been filled with silt. Throughout the pool the top 1-2 inches of silt has a soupy consistency. Below this, the silt is compacted and is slightly granular. The sub-bottom appears to be composed of gravel or coral rubble.

4. Bleachers

The risers for the bleachers appear to be in good condition except for the delaminating of the topping. The top of the bleachers has at least two coats of a cementitious topping material applied to it. The steel pipe railings that are located around the portals at the middle of each set of bleachers show signs of rusting at the supports.

5. The Area Beneath The Bleachers

The area beneath the bleachers is extremely dirty and is a complete shambles. Dirt, broken glass, spalling concrete, and debris cover the floors. The underside of the bleacher slab over the original shower and locker room areas are badly damaged due to reinforcing bar corrosion and spalling throughout its entire length. There are extensive areas of spalling in the underside of the Ewa bleacher slab around the arcade wall.

6. Memorial Arch and Arcade Walls

The arcade wall is intact except for concrete spalling at the base of the columns. There is a large crack on the mauka face on top of the Ewa end wall. There are also spallings in the interior face at the base of the Ewa end wall. The top portion of the arcade wall is the guard rail wall for the bleachers and it has spalled extensively on the makai side. The original finish and architectural features of the arcade wall were done with cement plaster. Cracks, mildew stains, and spalls occur throughout the entire surface area. In many areas the plaster has delaminated from the substrate.

The nonbearing window walls behind the Ewa arcade wall appears to have settled. Drawings for the construction of the existing facility do not show any footing under this wall. The settlements are evident in the cracking at the bleachers' supporting beams in this location. The lack of any separation

between this wall and the slab has resulted in portions of the underside of the slab being pulled off by the settling wall. It appears that the wall has pulled down the beams that support the slab. In this area the concrete beams show numerous spalls and vertical cracking.

7. Outdoor Courts, Ramps and Guardrails

The decorative concrete guardrails that surround the outdoor courts in front of the arcade wall show extensive spalling. Large portions of the guardrails have collapsed. Severely corroding reinforcing is visible in many areas. The spalling appears to be the result of embedded conduit in the concrete which has corroded. The concrete paved areas show numerous cracks and in many areas the pavement has settled. The existing volleyball courts are located over the original Diamond Head reflecting pool which has been filled in and paved with asphalt. The volleyball courts are in usable condition but need resurfacing.

8. Plumbing System

Many of the plumbing fixtures have already been removed, and those still existing are broken, cracked, and extremely dirty. The interior water, sanitary waste and vent piping are buried within the concrete slab and walls of the building and could not be directly inspected. However, the rusty condition of the fixture piping stubouts and the age of the building suggests that the utility piping is deteriorated and will need to be replaced.

Two and a half inch black steel cold water mains run exposed above grade (supported by wood blocks) along the volleyball court walls on both the Ewa and Diamond Head sides of the property, then proceed up the sides of the building into each locker room. The exterior of these water pipes show only slight corrosion, but it is expected that after years of non-use (and exposure to the atmosphere) the interior of the pipes will be badly corroded and should be replaced with new piping below grade.

A non-functioning vertical sewage sump pump exists on the Ewa side of the Men's Locker Room. From the age and visibly rusted condition of the pump, it does not appear economically feasible to repair the pump for further service. The effects of flooding by tsunami is considered a natural hazard.

9. Power System

The power system consisted of primary service from Hawaiian Electric Company to the transformer located in the transformer vault, which is located under the bleachers on the Ewa end. From the transformer, the secondary feeder fed a switchboard located in an adjacent room. The switchboard then fed the branch circuit panelboards, which fed the various loads throughout the facility.

Currently, the transformer is disconnected. The top of the transformer has been removed and the insulating fluid is exposed. Leo A. Daly Company has contacted HECO as to the nature of the insulating fluid. HECO has determined that the fluid does not contain PCB contamination. The switchboard has been gutted and is therefore unsalvageable.

All exposed equipment, junction boxes, raceways and wires have a significant percentage of corrosion and are not reusable.

10. Lighting Systems

The lighting system consisted of only incandescent sources. The War Memorial was illuminated with two incandescent floodlights each mounted on a cast iron pole. The parking lot and volleyball courts, located on the mauka side, were illuminated by post lights mounted on the stone wall. The pool and deck were illuminated by four tall floodlight poles with incandescent floodlights. Originally, before the floodlight poles were installed, the pool and pool deck were illuminated by post lights located on the ocean wall and on the pool deck. The bleachers were illuminated by industrial type luminaries mounted on poles, which were located at the top of the bleachers. The interior spaces were illuminated with a variety of incandescent luminaries.

Most of the luminaries are missing, damaged or corroding. Reusing luminaries is not possible.

Fauna

The fauna on the project site consists of mammals common in other areas of Oahu. During the restoration land fauna such as mice, rats, feral cats, etc. will likely be displaced or destroyed. This is not viewed as an adverse or significant impact since these animals are considered pests.

3.1.4 Air Quality

The air quality in the Waikiki area , as with most areas of the island of Oahu, is generally considered good due to the presence of the northeast tradewinds which blow emissions from inland areas out to sea.

3.1.5 Noise

The following section summarizes information from the report "Acoustic Study for the Waikiki War Memorial Natatorium," dated April 1992 prepared by Y. Ebisu and Associates for this environmental document.

Existing background ambient noise measurements were obtained to determine the potential intrusiveness of project noise sources at existing noise sensitive properties which are south of the proposed project site. Predictions of voice levels to current land use compatibility criteria and to the noise limits in the State DOH noise regulations.

1. Traffic Noise

The existing traffic noise levels along Kalakaua Avenue in the project environs are approximately 62 Ldn, and the "Moderate Exposure, Acceptable" category at approximately 50 foot setback distance from the centerline of the avenue. Traffic noise levels along a roadway's Right-of Way generally represent the worst case(or highest) levels due to the close proximity of the Right-of-Way to the noise sources. Traffic noise levels at 100 to 300 foot setback distances from the roadway's centerline are approximately 5 to 10 Ldn lower than those along the Right-of-Way due to distance and shielding

effects. An exception occurs for elevated receptor locations which are not shielded from the roadway by intervening terrain features or man-made structures. Because existing noise sensitive buildings in the vicinity of the project site are set back at least 50 feet from the centerline of Kalakaua Avenue, risks of adverse noise impacts from existing levels of traffic are considered to be low.

2. Background Ambient Noise

   The existing daytime background ambient noise levels at the measurement sites can be characterized as being moderate, with average levels of 56 to 60 dB (Leq), and minimum levels of 51 to 55 dB (Leq). The existing background ambient noise levels in the project environs can be characterized as being typical of urban communities, with total background noise levels controlled by rustling of leaves in the wind, birds, and automobile traffic, as well as surf along the shoreline. Because of the moderate background ambient noise levels in the project environs, man-made sounds such as those associated with automobiles, construction activities, crowd noise, etc. may not be audible at large distances (generally in excess of 200 feet) from the sources of the sounds.

3.1.6 Access and Traffic

The Natatorium is presently closed to public usage, except for the volleyball court in the Diamond Head courtyard and the parking area in the Ewa courtyard.

The Site

Refer to Exhibit 21, Existing Conditions - The Landside, to locate the following features:

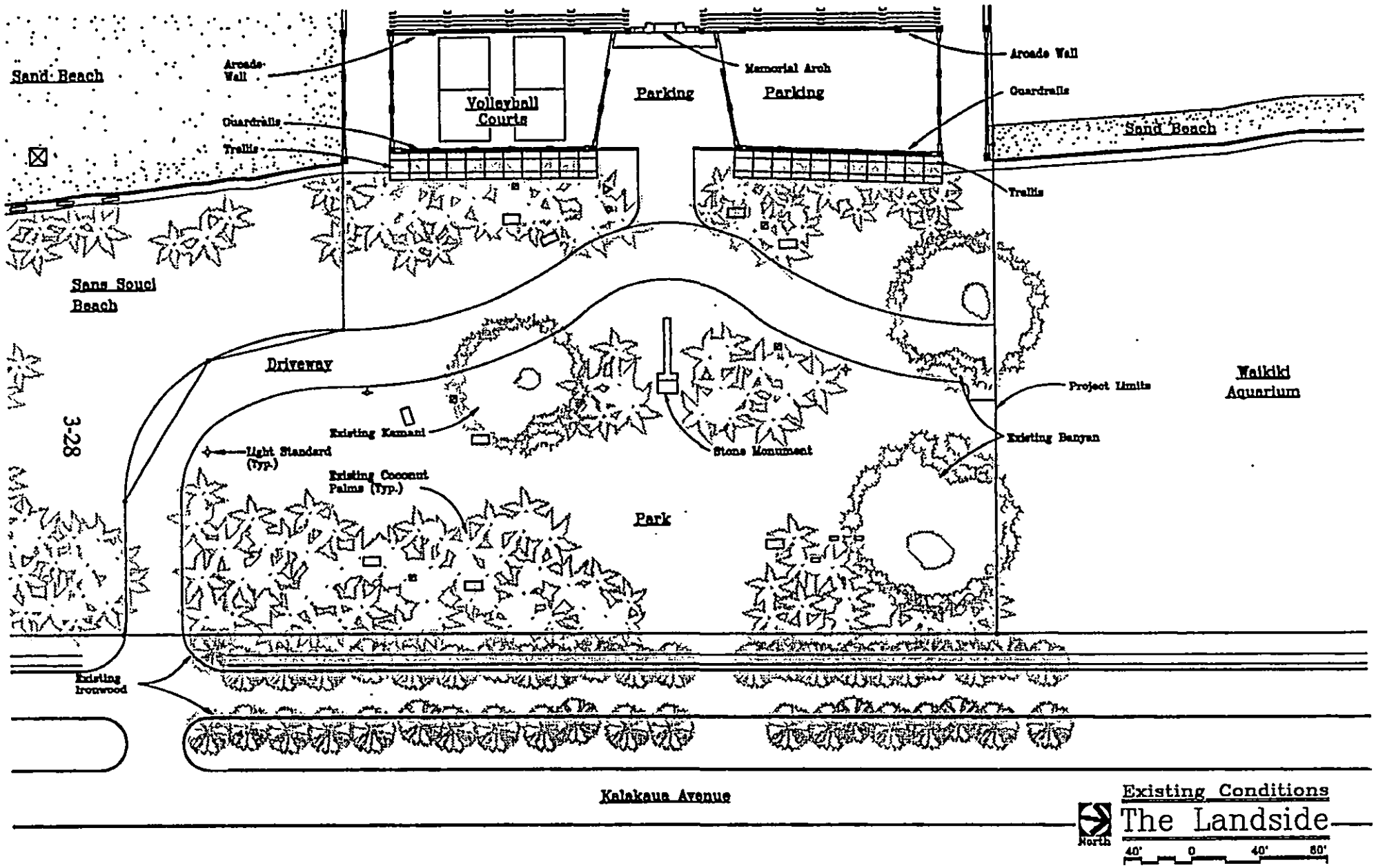
1. Vehicle Circulation

   Kalakaua Avenue is the primary roadway for vehicular access to the Natatorium and surrounding areas. Kalakaua Avenue is a divided roadway in this area, with parallel parking along the makai curb in the east bound lane and diagonal parking along the mauka curb in the west bound lane.

   Generally, traffic moves quite well on Kalakaua Avenue, between Kapahulu Avenue and Diamond Head Road/Paki Avenue during the normal weekday. However, during the weekends and on holidays, traffic can and does get to be congested on Kalakaua Avenue in the vicinity of the Natatorium.

   Kapiolani Park and San Souci Beach are major attractors on weekends and holidays. Traffic therefore, is necessarily slow on these days as motorists look for open parking stalls, even double parking to wait for others to vacate a stall. Peak weekend and holiday traffic generally occurs between 10:00 a.m. and 3:30 p.m.

   City bus service is available on Kalakaua Avenue. There is a bus stop on Kalakaua Avenue fronting the Natatorium.



Existing Conditions

The Landside

40' 0 40' 80'

Exhibit 21

A paved driveway, which varies in width from 32 feet to 35.5 feet, provides access to the Natatorium from Kalakaua Avenue. The existing curb and gutter on the driveway are in good condition and need no maintenance work. The existing pavement surface is in need of resurfacing. The pavement markings delineating the curbside parking stalls are faded and in need of re-striping.

Parking is presently permitted along both sides of the driveway. Approximately 46 parking stalls are striped on the driveway, which ends in a dead end with a hammerhead-type turnaround. There are also 15 parking stalls within the Natatorium complex itself.

2. Pedestrian Circulation

Pedestrian access to the Natatorium is provided by paved sidewalks, which run parallel to the coastline along the existing seawall. The sidewalks are presently covered by beach sand. A beach promenade is planned along the shoreline. These plans include a 12-foot wide concrete walkway along the makai edge of the park. Pedestrian access is also provided by the sidewalk which runs parallel to Kalakaua Avenue. The City and County of Honolulu has plans to provide additional area for the ironwood trees. A new 10-foot wide concrete walkway will be built.

3.1.7 Natural Hazards

Major natural hazards to be considered in developing coastal areas are tsunami, flooding resulting from severe rainstorms, and hurricane wave-induced coastal inundation.

The 100-year tsunami inundation limits within the project vicinity are shown in Exhibit 22. The approximate 100-year tsunami elevation at the site is 9.7 feet MSL. The 100-year event has a one percent chance of being equaled or exceeded in any given year.

Flooding

Zoning for areas of flooding are established by the Federal Emergency Management Agency (FEMA). Flood Insurance Rate Maps (FIRM) show the 100 and 500 year regulatory flood zones. The Natatorium area is designated Zone AE (base flood elevations determined) at elevation +10 feet MSL or less. Zone AE generally designates a Floodway District. There are no areas within the Natatorium area that are in Zone VE (high velocity tsunami flood zones).

3.1.8 Utilities and Public Services

1. Utilities

a. Water and Sewer

Major water and sewer lines are located in Kalakaua Avenue. Service to the Natatorium will be from the existing 8-inch waterline, and from the existing 10-inch sewer line in Kalakaua Avenue. An existing fire hydrant, directly fronting the Natatorium on Kalakaua Avenue and a new fire hydrant provided along the Central Access Approach, will provide for fire protection services.

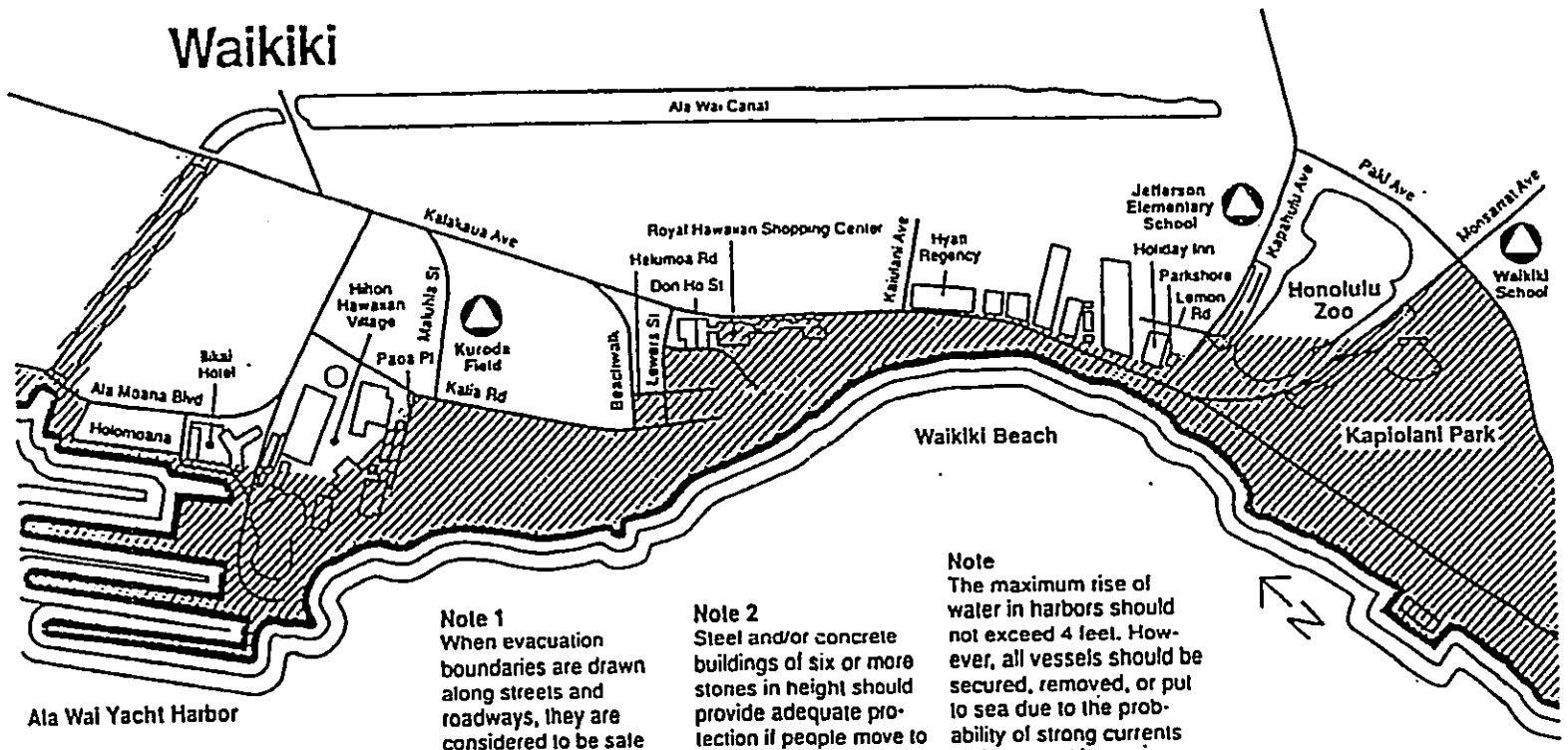


EXHIBIT 22

Civil Defense - Tsunami Evacuation Map for Project Vicinity evacuate all shaded areas.

Source - Joint institute for Marine and Atmospheric Research, University of Hawaii.

Water pressures in this area are adequate for shower and toilet facilities.

b. Drainage

A 21-inch storm drain line with drain inlets are located on Kalakaua Avenue. The grassed area between the Natatorium access driveway and Kalakaua Avenue generally slopes towards Kalakaua Avenue and presents no potential drainage problem.

The four existing storm drain inlets along the paved driveway appear to be silted and will require cleaning.

The drainage system in the existing volleyball area, on the mauka side of the Natatorium arcade and the existing parking area, is probably plugged and abandoned. This existing storm drainage system will be cleaned and restored.

c. Power

The power system to the site is supplied by Hawaiian Electric Company through ductlines leading from Kalakaua Avenue.

d. Exterior Lighting

Existing on site are four street lights placed along the existing roadway.

2. Public Services

a. Emergency Medical Services and Facilities

The Natatorium is accessible to three acute care facilities: Straub Hospital, Queen Medical Center, and the Kaiser Permanente Honolulu Clinic. All three facilities are located within a five mile radius of the Natatorium. Emergency ambulance service for the Natatorium is provided by the Pawaa Unit.

b. Fire and Police Protection

The fire station with the fastest response time in the Natatorium area is the 381 Kapahulu Avenue station which is located within 1 mile of the site. Police service for the Natatorium area is the responsibility of the State Harbors Division Marine Patrol under the Department of Land and Natural Resources.

c. Solid Waste Disposal

The solid waste removal for the Natatorium will be serviced by the City and County of Honolulu, Department of Public Works, Refuse Collection and Disposal Division.

d. Public Transportation

City bus service is available on Kalakaua Avenue. Routes 2 and 14 travel through this area. There is an existing bus stop on Kalakaua Avenue fronting the Natatorium.

3.1.9 Landscaping

The grounds surrounding the Natatorium consists of open lawn areas equipped with picnic benches. Two large Banyan trees shade the northern portion of the project area. Near the memorial is a large Kamani tree. Along the beach promenade is a Hau tree trellis. Coconut palm groves exist throughout the site. Ironwood trees form the edge of the site along Kalakaua Avenue. The Ironwoods (Casuarina equisetifolia) are on the County's Register of Exceptional Trees and must therefore be preserved.

The existing turf is degraded partially due to an antiquated irrigation system, lack of proper grading and turf management, and the encroachment of beach sands. The coconut palms appear to be in good condition; and other trees are in generally good condition. Benches, tables and other accessories are scattered throughout the site. The majority of them are of a standard type, in poor condition and are poorly located, functionally and esthetically. There are no outdoor showers.

A turn of the century theme was set forth in the Kapiolani Master Plan. The design character is a Hawaiian-Victorian style. Ideally, site furniture, bollards and trash receptacles are to reflect this theme. Light standards of this style are also planned.

Irrigation currently located on the site is functional and is operated by a manual quick coupler system. San Souci Beach Park area, while outside the project limits, is run on the same system.

3.1.10 Historic and Archaeological Resources

The Waikiki War Memorial Park and Natatorium is listed on both the National and the State Register of Historic Places.

There are no known subsurface historic sites within the project area. Human burials are frequently uncovered in the Waikiki area. However, no significant excavation is planned within the scope of the project.

3.2 Socioeconomic Factors

This section describes the existing socioeconomic environment of the Natatorium area. The Natatorium is proposed as a public use facility, and therefore is expected to be visited by area resident. It has been estimated that 82 percent of the nearby Kapiolani Park users are local residents.[3]. Adjacent neighborhoods to the Natatorium include the Waikiki, Diamond Head and Kapahulu communities.

3.2.1 Community Characteristics

1. Waikiki

   The Waikiki area is characterized as mostly commercial. There are a number of high-rise hotels along with businesses that support a wide range of tourist activities. Although not as prevalent, military and residential uses also exist in the area.

   The residential community is characterized as being diverse with low to high income bracket residents. There are a number of high and low rise condominiums in the area with very few single dwelling units. The resident population is growing with most of the recent projects in Waikiki consisting of condominium or mixed use condominium/hotel buildings.

2. Diamond Head

   The Diamond Head community is composed of a mix of residential and commercial activity. Commercial users include hotels, restaurants, and shops.

   Most of the residents in the area are considered to be in the moderate to high income bracket. The majority of residences in the community are single-family homes with the average value of approximately $500,000.

3. Kapahulu

   The Kapahulu community is the oldest of the three communities mentioned and is characterized as primarily residential. Many of the area residents are island born.

   The neighborhood is characterized as being in the moderate income bracket. The residences in the area are composed of single dwelling and low-rise apartments.

3.2.2 Population

The population of the island of Oahu has been consistently increasing. Over the last ten years the island's population has increased 10.4 percent from 762,564 in 1980 to 841,600 in 1990. The yearly visitor population has also been consistently increasing, with a 6 percent increase in overall tourists between 1989 and 1990. Migration was a major factor in the population growth between 1980 and 1990. The net migration over this period was 71,000.

The surrounding neighborhoods of Waikiki, Diamond Head, and Kapahulu have a combined population of 40,254, which represents approximately 5 percent of Oahu's total population (Table 3.2.2.1). Over the same period from 1980 to 1990, the combined rate of growth of the three neighborhoods was 4.3 percent.

Table 3.2.2.1
Resident Population of Neighborhoods
Surrounding the Natatorium

Neighborhood	Resident Population	Percent Increase 1980-1990
Waikiki	18,680	7.5%
Diamond Head/Kapahulu	21,574	1.7%

Source: DBED, The State of Hawaii Data Book, Table 13, 1991

3.2.3 Economy and Employment

The Natatorium is viewed as a passive use facility and will not create many new jobs; therefore this project will not have a great impact on the economic activity in the surrounding areas. There will be approximately seven to ten jobs created. Some of the positions include water safety officers, groundskeepers, a custodian, and a pool manager.

The long term design and construction schedule will also produce a wide range of direct and indirect employment.

3.2.4 Recreation

Areas surrounding the Natatorium presently supports a wide variety of recreational activities. The Waikiki beach area is among the most heavily used for swimming and wading in the State. Other activities such as surfing, boating, and underwater sightseeing are also conducted. Kapiolani Park activities include jogging, sunbathing, picnicking, tennis, archery, and league sports. Fishing is permitted during even numbered years in the Natatorium area. At the present time, the Natatorium is not accessible to public use, but after full restoration will provide a wave-free Olympic sized swimming pool for users who desire this type of environment. The pool will not be capable of supporting sanctioned events, but will serve as a casual swimming area.

3.2.5 Surrounding Land Uses and Ownership

Existing surrounding land uses are primarily limited to commercial, public facility, and residential.

Several commercial uses are located along Kalakaua Avenue. The major uses include hotels, restaurants, specialty shops, The Honolulu Zoo, and the Waikiki Aquarium. Kapiolani Park, Kapiolani Beach Park, San Souci Beach Park, and Queen's Surf Pavilion all serve as public facilities in the area. The Diamond Head and Kapahulu communities make up the majority of the residential population surrounding the Natatorium.

The Natatorium is owned by the State of Hawaii and operated and maintained by the City and County of Honolulu. Other areas owned and operated by the State include most of the surrounding beach areas and the Honolulu Zoo. Kapiolani Park, Queen's Beach Park, and portions of Kapiolani Park are owned and operated under the City and County of Honolulu. The Waikiki Aquarium is owned and operated by the University of Hawaii.

3.3 Related Projects or Plans

The following projects and plans relate indirectly to the proposed action:

3.3.1 Master Plan for Waikiki

It is the desire of the State of Hawaii, the City and County of Honolulu, the Waikiki Improvement Association, the Neighborhood Boards and concerned residents and businesses and the tourism industry that master planning guidelines be developed to influence future growth and improvements in the region. Although Kapiolani Park (including the Natatorium) is considered an important feature in the area with its open space and recreational resources, it is actually located in the Diamond Head Special District and is not part of Waikiki.

3.3.2 Modification of the Waikiki Aquarium Seawater System

The Waikiki Aquarium is modifying its seawater intake system which uses only well water to accommodate ocean water. This modification will result in a reduction of pollutant discharge to the waters of Waikiki, and theoretically improve the seawater quality of its neighbor, the Natatorium swimming pool. Most of the modifications will be accomplished within the 40 foot shoreline setback zone.

3.3.3 Waikiki Beach Improvement

The State of Hawaii, Department of Transportation is undertaking a comprehensive mapping of Waikiki wave, wind, current and reef to provide data to improve the beachfront environment. Members of the State Department of Land and Natural Resources' Division of Water and Land Development and the Leo A. Daly team visited the project's modeling efforts at J.K.K. Look Laboratory and found that the projects would not impact each other.

3.3.4 Waikiki 2000 - Kapiolani Park Master Design Plan

Pursuant to and by virtue of the authority set forth in Chapter 13 of the Revised Ordinances of the City and County of Honolulu, 1978, as amended, this master design plan implements the relevant portions of the adopted Management Policy for Kapiolani Park, January 1983 and serves as a guide and basis for detailed planning, engineering and design plans or drawings. The position on the Natatorium and War Memorial Area concurred with House Concurrent Resolution No. 173 whereby the 1982 Legislature reluctantly concluded that the bulk of the Natatorium structure be demolished, the Memorial Park be properly improved and maintained as open park space, containing the existing large stone and memorial plaque, and if feasible, the existing archways of the Natatorium structure bearing the inscription "The War Memorial" together with the minimum supporting structure deemed necessary and appropriate;

(Options to be considered):

1. Complete beach restoration of the area now occupied by the Natatorium;

2. Conversion of all or part of the makai walls of the Natatorium into groins to create a protected swimming area;

3. Conversion of the Natatorium into a landscaped peninsula by filling in the pool;

and that all design options shall include specific provisions for facilitating access to the beach and ocean by the physically handicapped.

Again it should be noted that although Kapiolani Park (including the Natatorium) is considered an important feature in the area, with its open space and recreational resources, it is actually located in the Diamond Head Special District and is not part of Waikiki.

CHAPTER 4 - PROBABLE IMPACTS AND MITIGATION MEASURES

4.1 Water Quality and Circulation

4.4.1 Water Quality

The water quality that is anticipated for the Natatorium is directly related to the quality of the source water flushing daily through the Natatorium. This water is generally of high quality throughout most of the year, with the coastal water turbidity generally being less than 3 ntu. The changes in the Natatorium configuration are expected to induce active flushing daily by the prevailing tides and incoming wave induced flow, allowing the high quality offshore water crossing the coastal reefs to also enter the pool interior.

During Kona storm conditions, the Natatorium area of the South Oahu coast experiences degraded conditions for the duration of the storm. These conditions include strong onshore winds, coastal breaking surf, coastal debris and high water turbidity. Turbidity during these conditions may degrade to greater than 10 ntu. Historical data indicate these conditions could prevail between four to fourteen days each year. However, the active flushing of the Natatorium is expected to clear the pool interior as quickly as the coastal water clears following the storm conditions.

Similarly, if discharge from the Aquarium or nearby storm water culverts degrade the water quality of this coastal area, the entire beach and the Natatorium would be closed. Given the high quality of water in this area, the water will generally clear up rapidly.

4.1.2 Circulation

Circulation around the Natatorium is primarily established by the daily tidal changes and wave induced transport across the coastal reefs. The area experiences generally two tidal changes per day, with the ebbing flow being slightly greater due also to the exit of wave transported water across the coastal reefs. During minimal wave activity the flooding flow is generally toward the west, and the ebbing flow to the east. When an incoming wave transport is occurring the flooding flow can be also to the east. Along the makai face of the Natatorium seawall, the coastal flow moves to the east greater than half of the total time.

The design intent is to open both the Ewa and Diamond Head sides of the Natatorium so as to flush the pool interior daily with a steady cross pool flow. Three openings were designed for the Ewa external wall. They vary in size with the smallest being at the seaward extent of the wall and increasing landward. These openings are limited to about 90 feet of wall length due to the seaward extension of the landward reef. Four Ewa interior pool wall openings were sized so as to allow an equal flow rate into the pool interior across the full width of the Ewa pool wall.

The same sized pool interior wall openings were selected for the Diamond head wall. The Diamond Head wall exterior wall openings are limited in their size by necessity, being located on the seaward end of this wall and needing protection for sand movement off the neighboring beach into these openings during severe storm conditions. Three openings were sized for the Diamond Head wall. The design objective was to size the openings so as to allow the flushing flow to enter or exit the Diamond Head wall with moderate flow velocities.

The Diamond Head seaward corner of the Natatorium is expected to receive the most impact of incoming waves crossing the coastal reefs. The ocean bottom is also shallow outside of this corner of the Natatorium. The designed exterior wall openings on the Diamond Head side of the Natatorium are therefore protected from incoming waves. A short low profile groin is also designed for the Ewa seaward corner of the Natatorium to inhibit any Eastward moving daily flow from going around and seaward of the Natatorium seaward wall. This groin will direct flushing flow through the Natatorium pool interior. A low profile rubble design is also included for the seaward side of the Natatorium to stabilize this seaward wall. This rubble was sized and designed to be below mean sea level.

The expected daily flushing rates were developed from the observed circulation field data from around the Natatorium. The results indicate that at typical tidal and wave induced flow rates along the coast outside the Natatorium flushing flow rates through the pool will vary from 2 centimeter/second to 15 centimeter/second. Under these conditions the Natatorium pool volume is expected to flush between 1.3 to 5.1 times per tidal exchange. There are between two (mixed, principally diurnal tide) to four (mixed, principally semi-diurnal tide) tidal exchanges each day. Therefore, a total of between 2.6 to 10.2 pool volumes are expected to flush through the Natatorium daily. The pool water quality is therefore expected to be as good as, and equivalent to, the source water surrounding the Natatorium.

The finished pool bottom will be lined with clean gravel and sand. The water circulated through the pool will remain in the pool for only a short time and provide a water quality comparable to the outside ocean water. The drainage from the pool deck and bleachers will remain the same as the existing. The changes in the pool will greatly improve the existing water quality inside of the pool.

4.1.3 *Littoral Drift* and Beach Profile

1. San Souci Beach

   As discussed earlier the Natatorium plays an important role in the stability of the neighboring beaches, principally San Souci Beach. With the dominant direction of the littoral drift parallel to the shore, the proposed modifications to the Natatorium were designed to minimize impacts on the existing equilibrium. The addition of the groin at the Diamond Head/makai corner of the natatorium was reduced to the minimal size necessary to protect the seawall opening during a storm. This also insured that the existing wave reflection pattern due to the Natatorium structure was not impacted.

   The offshore component along the face of the Diamond Head seawall may be strongly reduced or eliminated by the relatively strong exit flow coming from the Natatorium through the new opening. This may result in some accumulation of sand immediately behind the new Diamond Head groin. In this area, the new pool openings will be placed above the bottom of the sea floor minimizing the possibility of sand from entering the pool. The new groin has been oriented to insure that the circulation pattern outside of the immediate area behind the groin will not be impacted.

2. Transport in Front of the Natatorium Seawall

   The addition of the Diamond Head/makai groin will reduce the amount of sand from being transported from San Souci beach due to the offshore transport component discussed earlier. The sand which currently fills the

holes in the highly irregular reef bottom may be transported toward the Ewa/makai groin and accumulate there. Because this quantity of sand is small, the impact of this will be minimal.

3. Beach North of the Natatorium

Due to the northern transport component of sand along the shoreline and lack of adequate sand replenishment, the beach north of the Natatorium has virtually disappeared. Because of this, the groin on the Ewa/makai corner of the Natatorium is not anticipated to cause any adverse impact on the bare coastline north of the site.

4.2 Marine Life and Reef

As previously noted, the nearshore waters in the vicinity of the Waikiki Natatorium have been impacted by man's activities since the early 1900's. Prior to the massive development of Waikiki which occurred following the dredging of the Ala Wai Canal to drain much of the mauka swamp lands in the early 1920's, the swamp and estuarine areas served as a "filter" for stream inputs that occurred all along this coastline. This natural filter served to remove silt and detritus as well as nutrients; estuarine areas served as a nursery grounds for many commercially important fish species.

The dredging of drain channels, infilling of swamp and estuarine areas, construction of walls along the shoreline to control erosion all served to alter the community structure of shallow marine communities in the waters adjacent to these activities. The channelization of a stream entering the ocean at the foot of Kapahulu Street is probably the closest natural source of fresh water input relative to the Waikiki Natatorium. Despite these early changes, corals flourished on the reef flat adjacent to the Waikiki Natatorium through the 1920's where Edmondson carried out his classic studies on Hawaiian corals.

The impacts that occurred with the beach sand replenishment program in 1950-51 and xagain in the mid-1960's must have contributed to the decline of corals on the reef flats adjacent to the Natatorium.

The structure of extant benthic and fish communities as described above are the result of historical and presently occurring impacts. The communities are not diverse and it is surmised that the species composition of the benthos is comprised largely of species that are able to rapidly colonize open substratum, i.e., early colonizers and "weedy" species. The benthic communities are probably being kept at an early stage of succession by the occasional impact of high surf that will move loose rubble and sand about, scouring benthic communities. If this is the case, the impact associated with the reconstruction of Waikiki Natatorium should not result in any appreciable change in local species composition.

Many of the algae which are the dominant group in the benthos are early colonizers in the usual succession of coral reef communities. Corals generally are the terminal phase of these successional events. Corals are virtually absent in the study area which lends further support to the hypothesis that occasional wave energy is an important agent in structuring of these communities, especially when the addition of sand will serve to scour the substratum.

Physical disturbance from occasional storm surf is one of the most important parameters in determining the structure of Hawaiian coral communities. Numerous coral studies in Hawaii have shown that occasional storm generated surf may keep coral reefs in a non-equilibrium or sub-climax state. Indeed, the large expanses of near-featureless basalt or

limestone substratum present around much of the Hawaiian Islands at depths less than 30 meters attest to the force and frequency of these events. These same wave forces also impinge and impact fish communities. In the Waikiki setting, the impact of occasional wave energy impinging on the benthic communities was probably exacerbated with the addition of sand from the replenishment program. It is surmised that scouring and burial of benthic organisms occurred with this perturbation.

The reconstruction of the Natatorium will create numerous new surfaces on which benthic colonization and succession may be initiated. Indeed, the presence of stable hard substratum should foster the development of communities as are now present on the existing Natatorium walls. However, impacts from wave impingement and sand scouring will still occur, thus benthic species composition will probably not be any different in the long term.

The development of large exits to enhance the exchange of water in the proposed reconstruction of the swimming pool with the surrounding ocean will create considerable shelter for fishes. With the prohibition on fishing activities, the abundance of fishes should be greater following development than presently exists either in or adjacent to the structure.

Actual physical damage to the nearshore marine environment would occur in the restoration of the Natatorium pool and the addition of the two small groin structures. The construction of the interior of the pool, if completed before break-through to the ocean, would cause no increase in turbidity or siltation in the nearshore marine environment. As soon as the pool is opened to the sea however, an initial period of flushing would occur during which fine particles generated by the dredging activity would be carried out into the ocean by the outflow.

Construction of the groins and seawall openings for the Natatorium would entail removal of material from the reef and existing substrates. This activity would kill all attached organisms in the removal area, but would also expose new surfaces to subsequent colonization. The area of newly-exposed surface would be larger than the area removed. Dredging for the groin construction would also generate turbidity plumes. The impact of this turbidity and the associated siltation of suspended particles would occur within a region up-and down-coast from the Natatorium. The suspended material would impact the resident coral communities through both siltation and decreased light levels due toincreased turbidity. It is not possible at this point to estimate the horizontal extent of the plume and the rates of deposition of suspended material at points along the plume path. It is reasonable to expect, however, that dredge sites and the impact would decrease with distance from the site. It is possible the plume could impact the sea water intake of the adjoining Waikiki Aquarium. The predominant flow of coastal water is in the Diamond Head direction. Because of this, it is anticipated that the plume will extend in that direction the majority of the time. Spoils from dredging activities will be disposed of on land. The dredging will be in the high energy reef flat where the coral coverage is low(less than 0.2 percent mean coral coverage at the five quantitative stations studied in the Biosurvey). It is anticipated that with the following mitigation measures, any impact on the existing biological communities will be minimal:

4.2.1 Pool Construction

1. The dredging and reconstruction of the interior of the pool will be carried out prior to the construction of the new pool openings to minimize the direct impacts to the adjoining waters. The existing seawall will be utilized to contain the turbid waters from those activities.

2. Existing cavities and seawall openings will be sealed. This, combined with silt curtains, will minimize any leakage of turbid pool waters.

3. Once the pool is opened, silt curtains will be used across new openings to impede water exchanges between the pool and the outside waters.

4. Dredging will be scheduled during periods of low tide.

4.2.2 Groin and Seawall Opening Construction

1. Silt curtains will be used to confine the siltation to the immediate dredge area. This will also help to limit the extent of the plume.

2. Limiting the duration of in-water construction (i.e., dredging) to limit the horizontal extent of the plume.

3. Limit the construction activities to periods when the coast flow is in the Diamond Head direction to mitigate any impacts on the Waikiki Aquarium sea water intake.

4. Dredging will be scheduled during periods of low tide.

4.2.3 Overall Construction

1. Sitework will be scheduled for periods of minimal rainfall.

2. Lands denuded of vegetation will be planted or covered as quickly as possible to control erosion.

3. Measures will be taken to prevent construction materials, petroleum products, and debris from falling, blowing, or leaching into the aquatic environment.

4.3 Water Birds

As previously noted there are no suitable ponds or marshes on the project site to accommodate the endemic Hawaiian water birds. There will be no change in the areas of the existing habitat. There will only be a temporary disruption of the existing habitat during construction. No long-term impacts are anticipated.

4.4 Terrestrial Plants and Animal

As previously noted, the fauna on the project site consists of mammals common in other areas of Oahu. During the restoration, land fauna such as mice, rats, feral cats, etc. will likely be displaced or destroyed. This is not viewed as an adverse or significant impact since these animals are considered pests.

The existing terrestrial plants will remain except for areas such as the lawn makai of the entry drive which will be replanted with St. Augustine grass. A new irrigation system will be added which will improve the health of the lawn. Some vegetation will be removed from the outdoor courts. These will be replaced with new planting areas in the Central Approach Ramp. This will enhance the appearance of this area and also reduce the maintenance required. All of the remaining plants on the site will remain except for two trees which will be removed. One is a plumeria in poor health and the other a palm tree whose trunk is creating a hazard for pedestrians. These changes are not viewed as an adverse or significant impact since the health and appearance of the plants on the site will be improved.

4.5 Air Quality and Noise

The opening of the restored Natatorium will likely result in a temporary increase in the number of vehicles competing for the existing parking which will affect the air quality within and in the vicinity of the Natatorium. It is difficult to quantify the amount of additional traffic the Natatorium will create. All that can be said is that the traffic will result in a limited amount of increased carbon monoxide emission. The suggestions to mitigate the adverse effects of added traffic described in the subsequent Section 4.6 will also help mitigate the adverse effects on the air quality.

The following section summarizes information from the report "Acoustic Study for the Waikiki War Memorial Natatorium," dated April 1992 prepared by Y. Ebisu and Associates for this environmental document.

4.5.1 Traffic Noise

There is a relatively low risk of adverse noise impacts from increase in traffic noise associated with the project. On-site parking will not be increased from the existing available and the driveway leading into the Natatorium will remain a dead end street with a hammerhead turnaround.

4.5.2 Crowd Noise

The facility is primarily intended to be used as a public recreational facility and not as a special events facility. Future sound levels from activities on the project site are expected to be intermittent, depending upon the nature and level of activity on the site. During daytime hours, with active recreational activities at the Natatorium facility, average noise levels at the adjoining noise sensitive properties are expected to be less than 55 dB. Although the sounds of voices from on-site activities may intermittently exceed the existing background ambient noise levels near the Kaimana Beach Hotel, they are comparable in level (on the average) to existing background ambient noise sources, such as traffic on Kalakaua Avenue and the existing noise levels of current park users. This is due to the relatively large buffer distance of 300 to 400 feet between the Natatorium facility and the Kaimana Beach Hotel. Crowd noise created by the use of the swimming pool and volleyball court is very unlikely to exceed the State Department of Health daytime noise limit along the site boundary adjoining the existing hotel and apartment buildings.

4.5.3 Construction Noise

Audible construction noise will probably be unavoidable during the entire project construction period. The total time period for construction is estimated at approximately 30 months, but is anticipated that the actual work will be moving from one location on the project site to another during that period. Actual length of exposure to construction noise at any receptor location will probably be less than the total construction period for the entire project. The rooms within the neighboring Kaimana Beach Hotel south of the project site are predicted to experience the highest noise levels during construction activities due to their shorter distances to the construction site. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for regulation of construction noise. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the project site.

Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources (80 to 90+ dB at 50 foot distance) and due to the difficulties in containing exterior construction noise sources. The use of properly muffled construction equipment will be required on the job site. The incorporation of State Department of Health construction noise limits and curfew times is another noise mitigation measure which is normally applied to the construction activities. Noisy construction activities such as pile driving, are not allowed on holidays, Saturdays, Sundays, during the early morning, and during the late evening periods under the DOH permit procedure.

4.6 Access and Traffic

The Natatorium is presently closed to public usage, except for the volleyball court in the Diamond Head courtyard and the parking area in the Ewa courtyard. The restoration of the Natatorium will again permit use of the facility by the public. This is not considered an adverse impact.

The existing roadway with hammerhead turnaround will remain. The hammerhead turnaround will be modified to conform to current standards. This will permit easier turning for emergency vehicles. A new 10-foot wide concrete walkway from Kalakaua Avenue to the Natatorium will be added. This will provide a safe pedestrian path from the existing bus stop to the Central Approach Ramp area. These changes are not viewed as adverse impacts.

As has been stated earlier, the Natatorium pool will be utilized for recreational swimming only (i.e., it will not be used for sanctioned events). It is difficult to project the traffic that will be generated by the newly opened Natatorium. However, based upon the need for user comfort and conveniences, the occupant load should be limited to 400 people in the pool and pool deck area and another 300 people sunbathing in the bleacher area.

Assuming a maximum of 700 people at any given time, a vehicular demand of 150 to 175 cars can be anticipated. This additional number of vehicles will be competing for parking stalls between the 10:00 a.m. and 3:30 p.m. peak period of weekend and holiday traffic. Because the restored Natatorium will be a "novelty" after initial opening, it can be anticipated that there will be a high demand to swim in the saltwater pool for a period of time, perhaps for 6 to 8 months after completion. This will certainly place a strain on the already limited parking available at Kapiolani Park. It is anticipated that the "novelty" will wear off and people will not tolerate swimming under crowded conditions. Other than to say that the additional traffic will add to the congestion, it is difficult to quantify the degree of additional congestion the Natatorium traffic will create. The following are suggestions to mitigate some of the adverse effects of added traffic resulting from the Natatorium restoration:

1. Encourage use of City bus service. There is a bus stop on Kalakaua Avenue, fronting the Natatorium.
2. Encourage use of the facility in conjunction with other activities at Kapiolani Park (e.g., picnic at the park).
3. Establish off-site parking and shuttle people to the Natatorium on weekends (e.g., off-site parking at Kapiolani Community College and shuttle service between Kapiolani Community College and Kapiolani Park).

4.7 Utilities

4.7.1 Water and Sewer

Major water and sewer lines are located in Kalakaua Avenue. Service to the Natatorium will be from the existing 8-inch waterline, and from the existing 10-inch sewer line in Kalakaua Avenue. An existing fire hydrant, directly fronting the Natatorium on Kalakaua Avenue and a new fire hydrant provided along the Central Access Approach, will provide for fire protection services.

Water pressures in this area are adequate for shower and toilet facilities. There will be temporary disruption of the existing traffic flow during the connection to the existing waterline and sewer line, but this is considered unavoidable. This will only be a short term impact during construction only.

4.7.2 Drainage

A 21-inch storm drain line with drain inlets are located on Kalakaua Avenue. The grassy area between the Natatorium access driveway and Kalakaua Avenue generally slopes towards Kalakaua Avenue and presents no potential drainage problem. The four existing storm drain inlets along the paved driveway appear to be silted and will require cleaning. The drainage system in the existing volleyball area, on the mauka side of the Natatorium arcade and the existing parking area, is probably plugged and abandoned. That system will be cleaned and restored. No changes will be made to the existing drainage patterns therefore there will be no significant impacts from the site drainage.

4.7.3 Power

The power system to the site is supplied by Hawaiian Electric Company through ductlines leading from Kalakaua Avenue. A new pad mounted transformer will be placed on the site at the end of the hammerhead turnaround. To mitigate the visual impact of the new transformer, landscaping will be placed around the transformer, and the transformer site will also be shielded from view by an existing banyan tree.

4.7.4 Exterior Lighting

The existing four street lights placed along the existing roadway will remain, relocating one which obstructs the view of the Natatorium. New lights will be added to illuminate the driveway for safety and security, as well as new well lights to illuminate the Memorial arches and monument. The impact of the lighting will be minimized by careful control of the light distribution and light levels; and the lighting will be focused to prevent light spillage. The existing floodlight poles will not be replaced. The lighting around the pool and courtyard areas will be provided only for safety and security. Lighting sufficient to allow nighttime activities will not be provided, although empty conduits to accommodate possible additional future lighting will be provided.

4.8 Landscaping

The existing landscaping will remain except for areas such as the lawn Makai of the entry drive which will be replanted with St. Augustine grass. This will improve the existing lawn in that area. A new irrigation system will be added which will improve the health of the existing lawn.

The existing plants in the outdoor courts will be removed. New planting areas will be created in the Central Approach Ramp. Native plants tolerant of sun and low maintenance, akia and ilima will be planted in those areas. They will enhance the appearance of those areas.

No trees will be added. Two trees will be removed--one a plumeria tree which is in poor health and the other a palm tree which is a safety hazard to pedestrians. The existing welded pipe which supports the hau arbor will be removed and replaced. The arbor will be trimmed back to permit more light under that area and to permit the restoration of the concrete walls.

The impact on the existing terrestrial plants will be minimal. The changes will enhance the appearance of the landscaping.

4.9 Recreation

Areas surrounding the Natatorium presently support a wide variety of recreational activities. The Waikiki beach area is among the most heavily used for swimming and wading in the State. Other activities such as surfing, boating, and underwater sightseeing are also conducted. Kapiolani Park activities include jogging, sunbathing, picnicking, tennis, archery, and league sports. Fishing is permitted on odd numbered years in the Natatorium area. At the present time, the Natatorium is not accessible to public use , but after full restoration will provide a wave free Olympic sized swimming pool for users who desire this type of environment. The pool will not be capable of supporting sanctioned events, but will serve as a casual swimming area.

4.10 Socioeconomic Factors

The Natatorium is viewed as a passive use facility and will not create many new jobs; Therefore this project will not have a great impact on the economic activity in the surrounding areas. There will be approximately seven to ten jobs created. Some of the positions include water safety officers, groundskeepers, a custodian, and a pool manager.

The design and construction schedule will also produce a wide range of direct and indirect employment.

4.11 Historic and Archaeological Resources

The Waikiki War Memorial Park and Natatorium is listed on both the National and the State Register of Historic Places. The restoration of the facility will again permit use of the facility by the public and prevent further deterioration of this historic place. This is not considered an adverse impact.

There are no known subsurface historic sites within the project area. Human burials are frequently uncovered in the Waikiki area. However, no significant excavation is planned within the scope of the project. If, however, historic sites, including human burials, are uncovered in the course of construction activities, then work in the vicinity will stop and the Department of Land and Natural Resources, State Historic Preservation Division will be contacted.

CHAPTER 5 - RELATIONSHIP TO LAND USE PLANS, POLICIES & CONTROLS FOR THE AFFECTED AREA

The proposed action will adhere to the plans, policies and controls as described in the following text.

5.1 Federal

5.1.1 Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)

The Section 10 of the Rivers and Harbors Act of 1899 is a federal legislative act, which prohibits the construction of any structure in or over any navigable water of the United States, the excavating from or depositing of material in such waters, or any other action which affects the course, location, condition, or capacity of such waters without a permit from the U.S. Army Corps of Engineers (Corps).

The Complete Restoration of the Natatorium would involve the construction of short groins from the two seaward corners of the natatorium walls to direct the flow of water in the immediate vicinity of the structure. This is the action that requires a Department of the Army Permit.

5.1.2 Section 404 of the Clean Water Act (33 U.S.C. 1344)

Section 404 of the Clean Water Act prohibits the discharge of any dredge or fill material into waters of the United States without a permit from the Corps.

Although the proposed action would not directly involve discharge of dredge or fill material it is understood that construction activities in the water could indirectly involve the flow of such materials at the site, thus requiring a Department of the Army Permit.

5.1.3 Section 401 of the Clean Water Act (33 U.S.C. 1341)

Section 401 of the Clean Water Act is directed at maintaining the chemical, physical and biological integrity of the Nation's water resources. It requires an applicant proposing any activity that may result in the discharge of a pollutant into the waters of the State of Hawaii to obtain to obtain a State Water Quality Certification from the State Department of Health. Prior to receipt of this certification the Corps will not issue a Department of the Army Permit.

Again, construction activities at the Natatorium may indirectly result in the flow of materials into the water, therefore the Certification will be required, in coordination with the Department of the Army Permit.

5.1.4 The National Historic Preservation Act of 1966

The National Historic Preservation Act of 1966 declares a national policy to preserve for public use historic sites, buildings and objects of national significance. The Act created the Advisory Council on Historic Preservation to advise the President and Congress on matters involving historic preservation. In carrying out its duties the Council is authorized to review and comment upon activities licensed by the Federal Government which may have an effect on properties listed on the National Register of Historic Places, or those eligible for such listing (16 U.S.C. 461). Under this Act the Corps is required to determine whether consultation with the Advisory Council on Historic Preservation is required based on the projects potential for affecting any significant historic or archaeological resources.

The Waikiki War Memorial Park and Natatorium is listed as No. 80-14-9701 on the National Register of Historic Places. Therefore, the Corps will coordinate there permit process with the Advisory Council.

5.2 State of Hawaii

5.2.1 The Hawaii State Plan (Chapter 226, H.R.S., as amended)

The purpose of the Hawaii State Plan is to guide future long-range developments within the State. This includes identifying goal, objectives, policies and priorities for the State. The following objectives that are relevant to the proposed action are discussed below.

Objectives and policies for the physical environment including scenic, natural beauty, and historic resources are to "promote the preservation and restoration of significant natural and historic resources."

Restoration of the Natatorium would be consistent with this policy by recreating the "living memorial" to World War II veterans.

Objectives and policies for socio-cultural advancement with regard to leisure includes the following: "Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently."

Restoration of the Natatorium would conform to this policy by providing a unique swimming opportunity at the pool and leisure activities at the park.

5.2.2 State Functional Plans

Twelve plans serve to implement the Hawaii State Plan. Two of these are relevant to the proposed action. First is the State Historic Functional Plan. This plan identifies the major priorities for the collection and conservation of oral histories, historic records and artifacts, the perpetuation of traditional art and skills, the preservation of historic properties, and the education of the public with regards to Hawaii's past.

Secondly, the State Recreation Functional Plan purpose is to assess present and potential demand and supply of outdoor recreation resources and to guide State and County agencies in acquiring or preserving lands of recreation value, providing adequate recreation facilities and programs, and ensuring public access to recreation areas.

Thirdly, the State Tourism Functional Plan purpose is to balance economic objectives with social and environmental objectives to achieve the balanced growth and quality of life that is desired by residents.

Restoration of the Natatorium is consistent with these three plans.

5.2.3 Hawaii Coastal Zone Management Program (Chapter 205A, H.R.S.)

In accordance with the National Coastal Zone Management Act of 1972, Hawaii's Coastal Zone Management Program (HCZM) outlines objectives, policies, laws, standards and procedures to guide and regulate the use of the State's coastal resources. Administered by the Office of State Planning (OSP), the HCZM encompass broad concerns regarding coastal recreational resources; ecosystems; historic and archaeological resources; scenic and open space resources; economic uses; coastal hazards; and managing development. As part of the HCZM Program, OSP is required to review federal programs, permits, licenses and development proposals, and state programs within the coastal zone

management area from the shoreline to the seaward limit of the State's jurisdiction, for their consistency with the Program's goals and objectives.

Because a federal permit will be required (Department of the Army Permit), the HCZM Program staff will review the proposed action to determine if it is consistent with their goals.

5.2.4 Marine Life Conservation Districts and Fisheries Management Areas

The nearshore ocean waters adjacent to the Ewa edge of the Natatorium wall are a part of the Waikiki Marine Life Conservation District (MLCD). This MLCD extends from the wall to groin at Kapiolani Beach Park. The seaward boundary is five-hundred yards out from the high water mark. The boundaries are further defined, as well as prohibited activities, exceptions, permits and penalties, in the Hawaii Administrative Rules, Title 13, Department of Land and Natural Resources, Subtitle 4 - Fisheries, Part I - Marine Life Conservation Districts, Chapter 36.

Also established in nearshore waters by the Natatorium is the Waikiki-Diamond Head Shoreline Fisheries Management Area. The area encompasses waters between the Ewa wall of the Natatorium and the Diamond Head Lighthouse, and from the high water mark on shore to at least 500 yards out, or to the edge of the fringing reef where it extends beyond 500 yards. Every other year this area is closed to all fishing activities as a conservation measure. In the year 1991, for example, the area is closed.

Restoration of the Natatorium would have a temporary impact on the MLCD and Fisheries Management Area while reconstruction takes place.

5.3 City and County of Honolulu

5.3.1 General Plan

The City and County of Honolulu has a policy document titled The General Plan that contains a "comprehensive statement of objectives and policies setting forth the long-range aspirations of Oahu's citizens and providing a broad plan of action to achieve them." The following objectives and policies discussed below are relevant to the proposed action.

One objective under the Culture topic is "to protect Oahu's cultural, historic, architectural, and archaeological resources", including the policy to "identify, and to the extent possible, preserve and restore buildings, site, and areas of social, cultural, historic, architectural and archaeological significance.

Another objective, under the Recreation topic, is to "provide a wide range of recreational facilities and services that are readily available to all residents of Oahu. Two policies that relate to the restoration of the Natatorium include " encourage ocean and water-oriented activities that do not adversely impact the natural environment" and " encourage the safe use of Oahu's ocean environments.

Restoration of the Natatorium would fulfill these directives.

5.3.2 Zoning and Special Districts

Zoning is administered through Zoning Maps and through the Land Use Ordinance, which includes text, tables and definitions. The existing zoning for the Natatorium site is P-2 General Preservation.

The Natatorium site is within the Diamond Head Special District. The objectives of this district is to preserve the views of Diamond Head Crater and preserve the park-like character of the surrounding area.

Restoration of the Natatorium is consistent with the existing P-2 zoning and would not conflict with the Special District objectives.

5.3.3 Special Management Area

The Special Management Area (Chapter 33 R.O.H.) works in accordance with the Hawaii Coastal Zone Management Program. Generally, the Special Management Area (SMA) are along the coastline. However, SMA maps identify the boundaries. Permits are required for any development in the SMA.

This requirement will apply to restoration of the Natatorium.

5.3.4 Shoreline Setback

Chapter 205A, H.R.S. establishes a shoreline setback area of 40 feet inland from the upper reaches of the wash of the waves. All construction proposed within this setback area would require issuance of a Shoreline Setback Variance (SSV).

Since the Natatorium is within this setback area, a Shoreline Setback Variance will be required.

5.4 List of Required Permits and Status

All of the following permits and approvals are still to be obtained:

- Department of the Army Permit for Activities in Waterways - U.S. Army Corps of Engineers, Operations Branch.
- Water Quality Certification - State Department of Health, Environmental Management Division.
- Historic Site Review - State Department of Land and Natural Resources, Historic Preservation Office.
- Conservation District Use Application - State Department of Land and Natural Resources, Office of Conservation and Environmental Affairs.
- Review of HRS 103-50 for Accessibility Compliance.
- Coastal Zone Management Program: Federal Consistency - Office of State Planning.
- Special Management Area Use Permit - Honolulu City Council.
- Shoreline Setback Variance - City and County of Honolulu, Department of Land Utilization.
- Special District Permit - City and County of Honolulu, Department of Land Utilization.
- Building Permit - City and County of Honolulu, Building Department.
- Zoning Waivers for Public Uses - City and County of Honolulu, Department of Land Utilization.

CHAPTER 6 - ALTERNATIVES TO THE PROPOSED ACTION

6.1 Partial Restoration Alternative

The Partial Restoration Alternative involves partially restoring the Natatorium by retaining the Memorial Arch only, and demolishing elements of the Natatorium as required so as to create a public beach and lagoon along the existing Waikiki beachfront. This concept also provides adequate flushing while maintaining protection for a small stable beach.

This alternative does not meet the objective of restoring the Natatorium to its original use. It does meet the objective of once again providing a place for the public to enjoy outdoor recreation at the site.

The following description of the Partial Restoration Alternative is taken from the 1990 Planning Report prepared by Leo A. Daly for the State of Hawaii.

6.1.1 Introduction

The following section describes the work necessary in developing the partial restoration alternative to the Natatorium. This concept involves relocating the Memorial Arch only, demolishing elements of the Natatorium and constructing a public beach and lagoon in place of the saltwater pool (see Exhibit 23, Partial Restoration - The Site). The recommendations included in this section are based on utilizing portions of the existing seawall combined with new rock riprap walls to create a protected swimming area and minimize erosion of adjacent beaches.

Demolition and removal of the entire Natatorium was never considered a feasible alternative for the site. The existing seawalls of the Natatorium have a significant function along the coastline in addition to physically enclosing the Natatorium pool. Specifically, the Diamond Head seawall is important for the retention of the neighboring San Souci Beach. In the absence of this wall, the San Souci beach sand would be redistributed along the coastline down to the Queen Surf Beach due to the reformed waves passing over the reefs and reaching the coastline. The San Souci Beach would erode seasonally until little or no beach would remain. Since its construction in 1927, the Natatorium seawalls have played an important role in insuring coastline stability in the area. Structural investigations have shown that the seawalls are in sound condition and able to continue in this role.

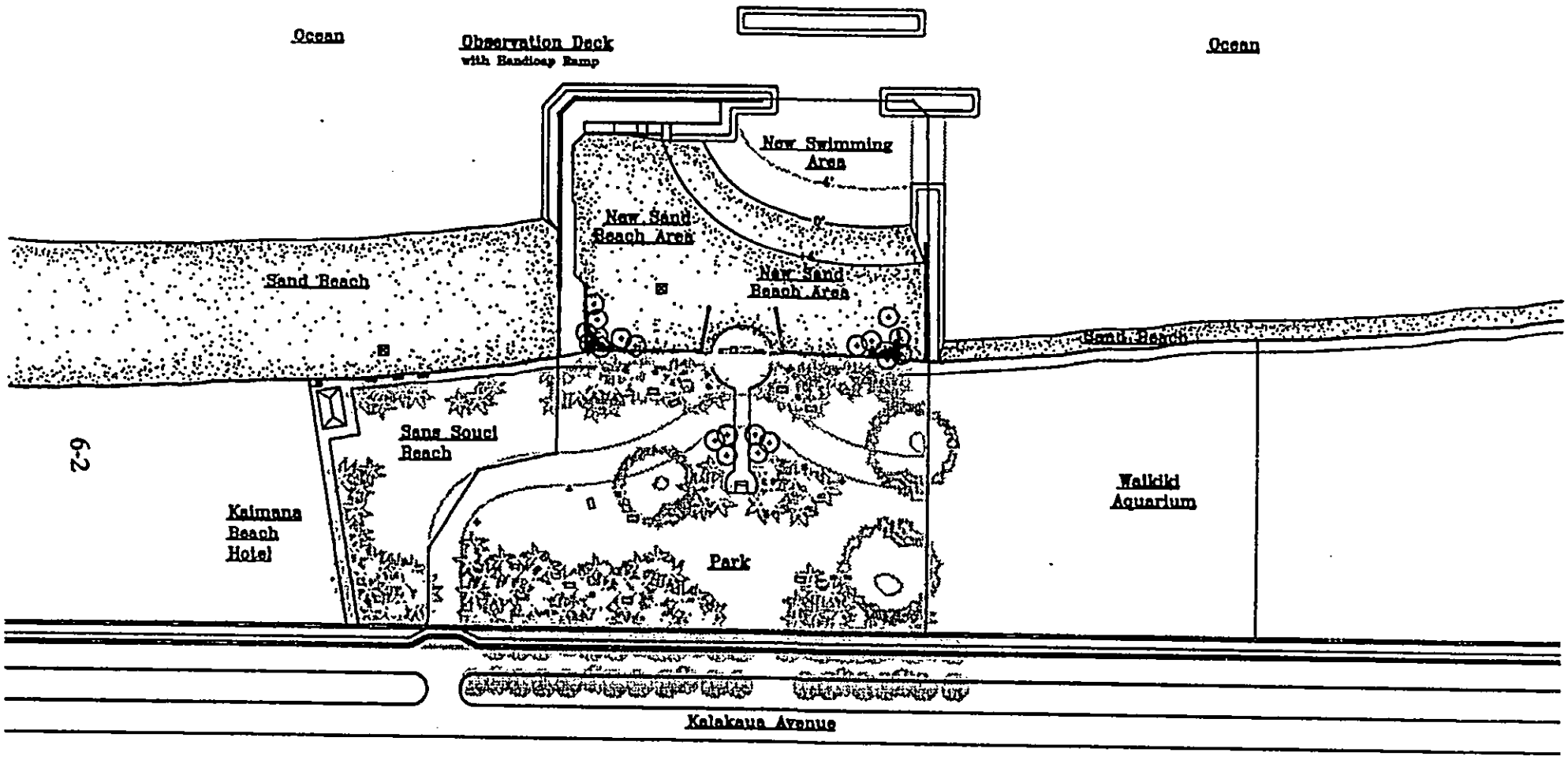
6.1.2 The Program

1. Introduction

The following is a summary of the programmatic requirements for the partial restoration of the Waikiki War Memorial and Natatorium. This program treats the Natatorium as a public beach for the purposes of planning its future use. The scope of this program covers the beach and swimming area, and the vehicle/pedestrian entry areas, including landscaping. The program is in response to the following:

- Review comments by the City & County of Honolulu, Department of Parks and Recreation officials.

- Waikiki 2000 - Kapiolani Park Master Design Plan - January 1983.



6-2

Partial Restoration

The Site

North

60' 0 60' 180'

Exhibit 23

2. The Facility

a. The Beach Area

Handicapped Accessibility

Safe and suitably surfaced pedestrian paths shall be provided to allow access through the beach area.

Sand Quality

The quality of the sand in the beach area shall be established to be suitable for beach use and capable of maintaining a stable beach. The mixture shall be of medium to coarse sand.

Beach Profile

The beach profile shall be of a suitable slope to maintain beach stability according to anticipated beach use.

Outdoor Showers

The showers shall be located for convenient use by beach users; sixteen shower heads shall be provided. Cold water shall be provided at all shower areas.

b. Swimming Area and Deck

Observation Deck

An observation deck shall be consolidated and strategically placed within the beach area. The deck shall be safe and suitably surfaced and accessible to the disabled.

Ramp

An access ramp shall be provided to the swimming area for the disabled.

Water Quality

The water quality in the swimming area can only be as good as the source waters outside, therefore, some degradation will be experienced during Kona storms and periods of high waves offshore.

Average Depth

The average depth of the swimming area shall be maintained at 4 feet (ref. MSL). The slope of the beach shall be uniform and from the beach area to the average depth of the swimming area.

Lifeguard Chair

One lifeguard chair shall be strategically located to provide visual accessibility of the beach and swimming area.

Flushing System

The flushing system shall be natural (i.e., without mechanical pumps) utilizing the coastal circulation systems by opening up the northwest corner of the Natatorium to the natural coastal flow. Each opening shall be designed so as to inhibit sand transport from the Natatorium interior area.

c. The War Memorial Arch

The central Memorial Arch shall be retained and relocated or rebuilt at a safe distance away from the ocean shoreline.

d. Ramps and Guardrails

The major portions of the existing ramps and guardrails shall be retained and incorporated into the beach area.

3. The Site

a. Vehicle Circulation

In keeping with the guidelines of the Kapiolani Park Master Design Plan (which states that no parking areas shall be permitted in the beach park boundaries) the driveway and parking area shall be eliminated to provide additional open space. A safe and convenient drop-off area for beach users and the handicapped shall be provided at a curb cut-out along Kalakaua Avenue where the Memorial Park road entry currently exists.

b. Pedestrian Circulation

The pedestrian entry shall provide safe and suitable access to the entrance to the facility. Hard surfaces (i.e., sidewalks) shall be minimized with the intent of maximizing open green areas and passive recreational activities.

Hard surfaced walkways shall be integrated with the proposed beach promenade which will run along the existing to provide access to the beach area. Provisions for the handicapped shall be made.

c. Landscaping

The existing landscaping character of open spaces and tree masses shall be retained and further enhanced with additional plantings as deemed necessary. Additional plantings shall conform to a master tree and shrub planting plan.

Landscaping elements (i.e., benches, tables, etc.) shall be provided to enhance the passive recreational activities on the site. The existing hau trees and trellis', coconut trees and three large trees shall be maintained as well as the ironwoods along Kalakaua Avenue which are on the exceptional tree list. Lawn areas shall be rehabilitated. Irrigation systems shall be automatic.

The stone monument shall be maintained. Emphasis, however, will be on the park's open space.

6.1.3 The Design

1. The Swimming Area and Flushing Scheme

   a. Swimming Area Design

   All assembled historical data and the acquired field data was analyzed to determine:

   - the condition of the existing water quality in the project area;
   - the Natatorium benthic conditions;
   - the character of the local ocean water circulation as it relates to both different tidal profiles;
   - the desired flushing rates for the Natatorium;
   - the wave transfer characteristics in passing over the reefs seaward of the Natatorium;
   - the need for and sizing of seaward barriers to consider wave induced flushing; and
   - the potential of a tidal gate design, pumping, and a wave trap to induce flushing.

   The optimum flushing schemes for the Natatorium involves:

   - the integration of the available wave climate;
   - the coastal circulation; and
   - the constraints of each proposed concept on the area directly seaward of the Natatorium.

   b. Configuration and Modifications

   Several potential concepts were initially examined given the above considerations. In the case of partial restoration, the criteria was to provide a beach and small swimming area within the Natatorium that would remain stable while still providing for active flushing of the water area. These concepts included, for example, development of a unique system of wave traps with floating ramps that would accomplish the desired result, plus other combination schemes. In support of these efforts the field program, planned to obtain the site specific data required to evaluate each of the proposed schemes, indicated that a simpler and equally effective system could be developed using a natural system of flushing. As a result the final concept work involved consideration of the optimum scheme to naturally, and very adequately, flush the Natatorium in a "partial restoration" concept. It involved construction of a beach and lagoon in place of the existing Natatorium pool. The design concept was concerned with providing sufficient flushing while simultaneously providing protection for a small but stable beach extending from the shore.

In the case of a beach replacement of the Natatorium pool, the beach will be open to incoming flow much the same as the full restoration concept, except the openings to the natural coastal flows will be restricted to the Ewa and seaward corner of the Natatorium. The amount of beach, it's profile, and the required sand size characteristics were determined to insure stability. In addition, a seaward wave absorbing facility is also required for this concept to insure added protection during storm conditions.

c. Swimming Area Bottom and Bathymetry

The swimming area bottom will be composed of light colored medium to coarse sized sand. This will promote bottom stability along with good visibility to a natural bottom. The bathymetry of the sand bottom will contain a beach occupying about half of the Natatorium interior (function of tidal level) sloping to the water line to a swimming area about -4 feet ref MSL.

d. Flushing Scheme

The analyses' results showed that by far the most advantageous and most effective way to insure flushing of the Natatorium, without providing strong artificial flows, is to open two sides to the natural coastal flow (see Exhibit 24, Partial Restoration - Flushing Scheme). The circulation flowing past the Natatorium with each tidal change is a result of both the daily tidal changes and the accumulation of wave transport over the reef area Ewa of the Natatorium. This flow moves toward Diamond Head the far majority of the time at rates that can provide the Natatorium with flushing of 3.9 to greater than 15 times per tidal exchange.

e. *Water Quality*

The design intent for this concept is to have sufficient water clarity in the Natatorium at all times suffice to see the bottom. It is important to note, however, that the clarity will be only as good as the quality of the flushing water, which is the ambient coastal water. There will be times, as during periods of high waves or strong Kona storms, when the quality of the coastal water surrounding Oahu is degraded for a day or two. During these times, and until the coastal areas flush and clear, the Natatorium clarity will be degraded similar to the coastal water. In general, however, the Natatorium is expected to subsequently clear within one or two tidal cycles given a good quality of coastal water.

2. The Facility

Refer to Exhibits 25-27 to locate the following features:

a. The Beach Area

All of the concrete bleachers and supporting structures will be removed. The concrete arch entrance and arcade walls will be removed. The Memorial Arch will be reconstructed at a new location, mauka of the existing location. This relocation is to allow for creation of a wide uninterrupted sand beach. All of the concrete and asphalt pavements will be removed. The volleyball courts shall not be retained. The original reflecting pools shall not be restored.

b. Swimming Area and Deck

The entire concrete deck surrounding the pool, including beams, pile caps, and portions of the seawall from the deck level on up will be removed. Portions of the seawall and piles where the beach and the openings in the seawall are to be made will be removed. The top portions of the seawall which are left in place on the Diamond Head corner will be reconstructed. The seaward face of the remaining seawall segments below the deck level will be scarified and will receive a new concrete coating for added protection. New slab-on-grade walkways on the segments of the seawall which are left in place will be reconstructed.

One lifeguard chair will be strategically located on the beach. An access ramp to the water/beach will be constructed for the handicapped.

The swimming area will be dredged down to hard bottom. The dredged out sand will be recovered and cleaned. The swimming area will be backfilled with clean gravel and covered with a minimum of 2 feet of clean beach sand to the finished design elevations to form the new beach.

New riprap groins will be constructed to provide some protection for the beach from incoming waves and to prevent beach erosion. New channels will be dredged to allow the flushing design to function.

c. The Ramps and Guardrails

The major portions of the existing ramps and guardrails will be retained and incorporated into the beach area.

d. Plumbing

No plumbing systems are required.

e. Electrical Systems

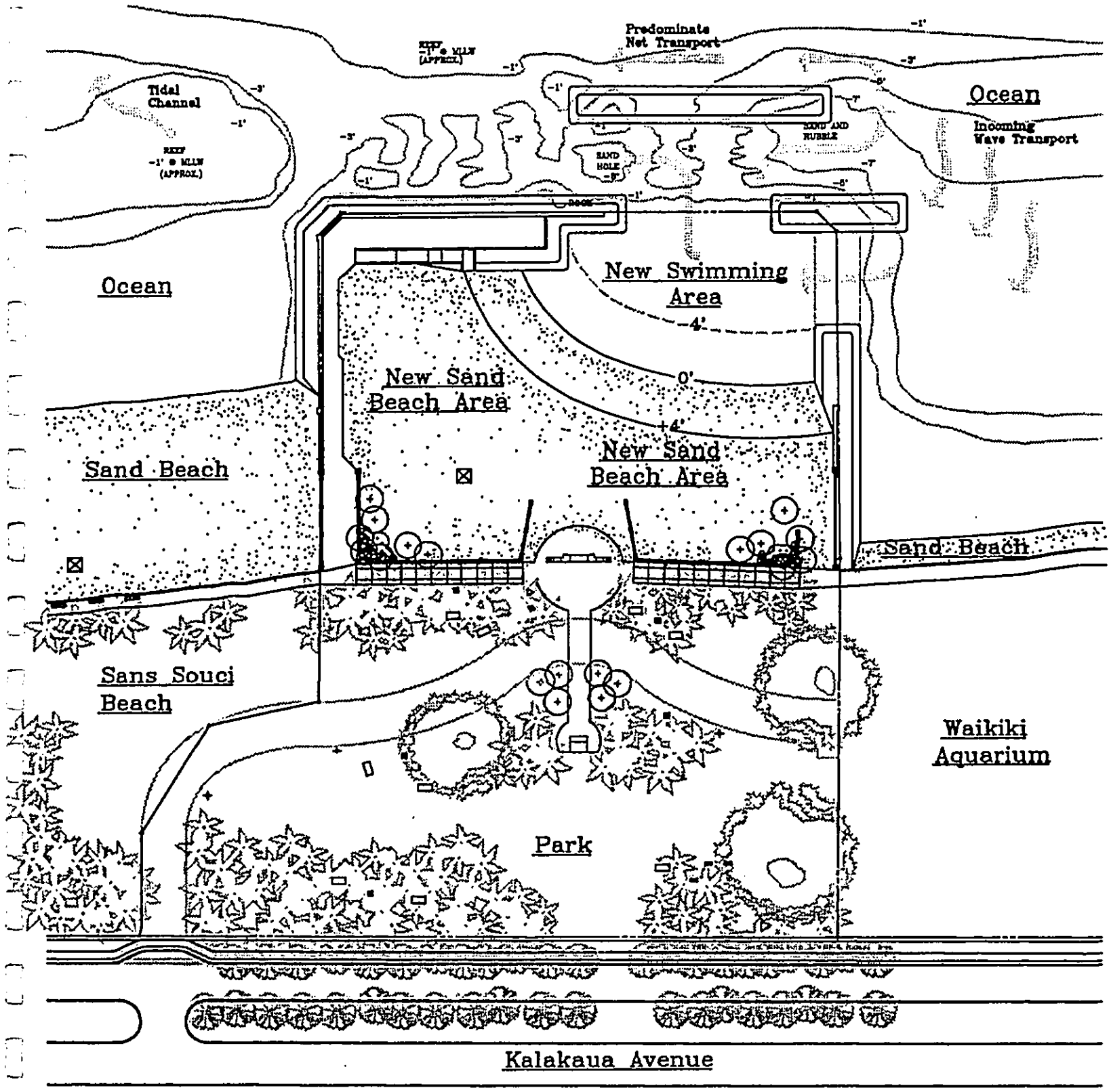
The entire existing electrical system, including switchboard, panelboards, luminaries, wiring devices, junction boxes, raceways and wire, will be completely dismantled and removed.

The existing transformer will be tested for PCB and disposed of in an appropriate manner.

A new pad-mounted transformer will be installed by Hawaiian Electric Company in a carefully selected location on the site. New ductlines will be required from Kalakaua Avenue to the transformer location. From the transformer, 120/240 volts, 1 phase, 3 wire service will be installed to new electric equipment, which will be located in a carefully selected location. The new electrical equipment will include metering equipment, panelboard and lighting control equipment.

f. Lighting Systems

Memorial lighting will be integrated into new period lamp posts, within the Memorial and into the landscaping. The Memorial will be illuminated on both mauka and makai sides. All lighting will be connected to time clocks. Materials used will be noncorrosive to the extent possible.



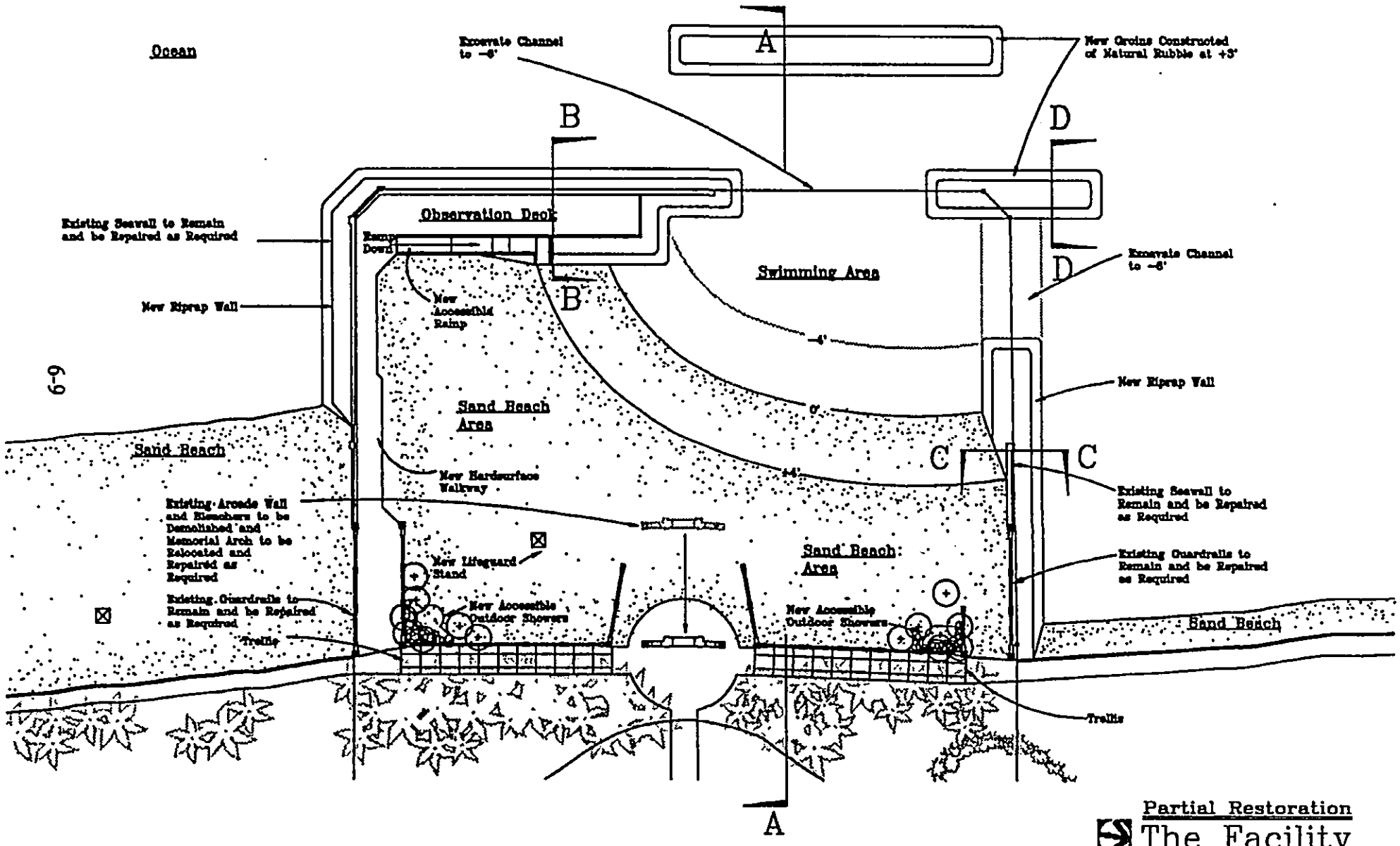
Partial Restoration

Flushing Scheme

North

80' 0 80' 160'

Exhibit 24



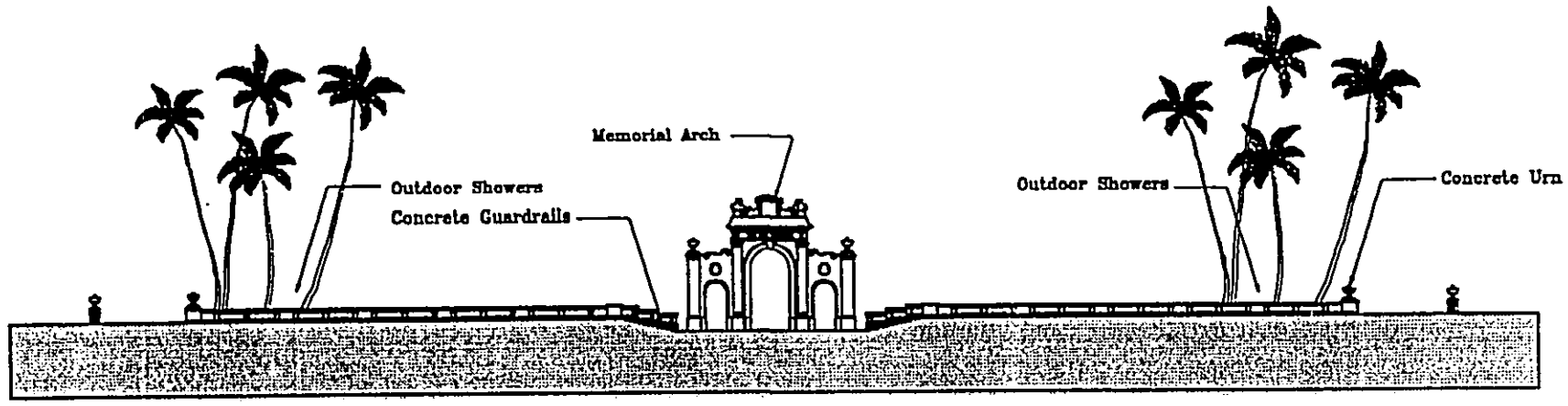
Partial Restoration

The Facility

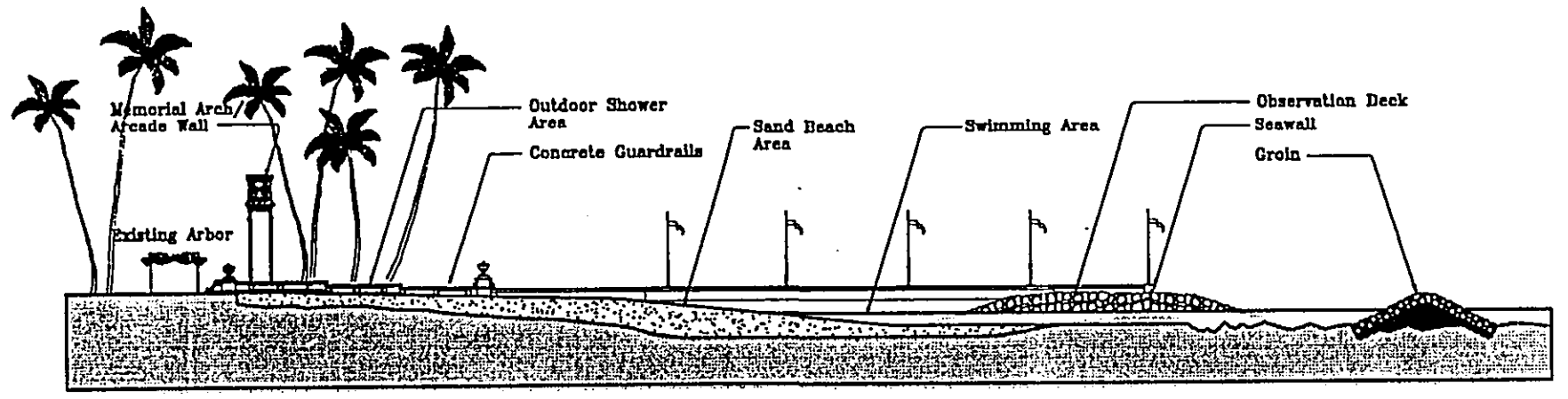
North

40' 0 40' 80'

Exhibit 25



The Elevation



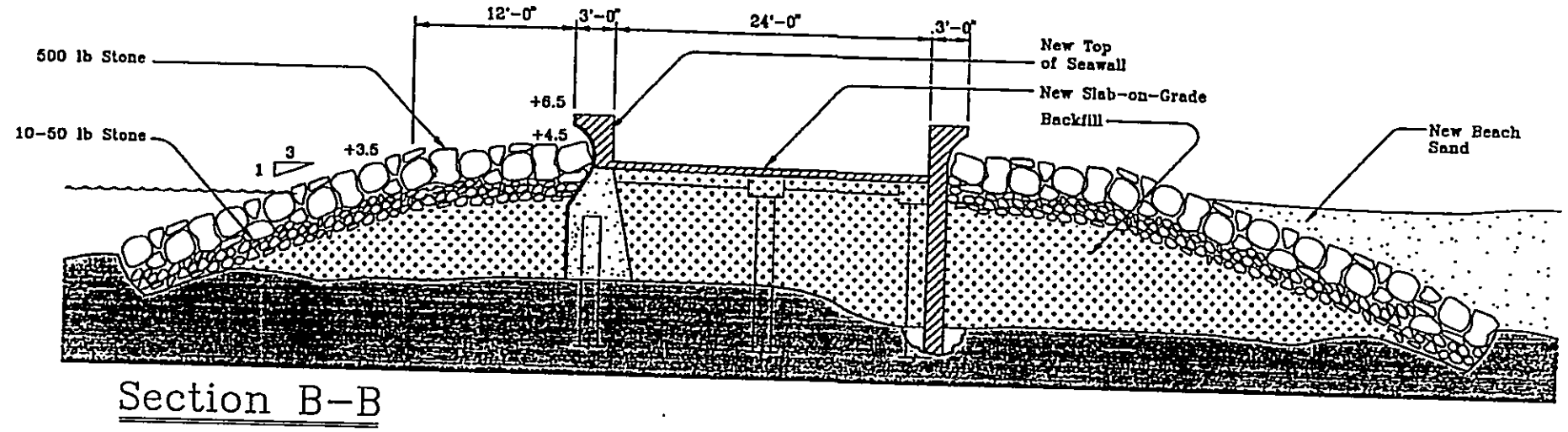
Section A–A

Partial Restoration

The Elevation and Section

16' 0 16' 32' 64'

Exhibit 26



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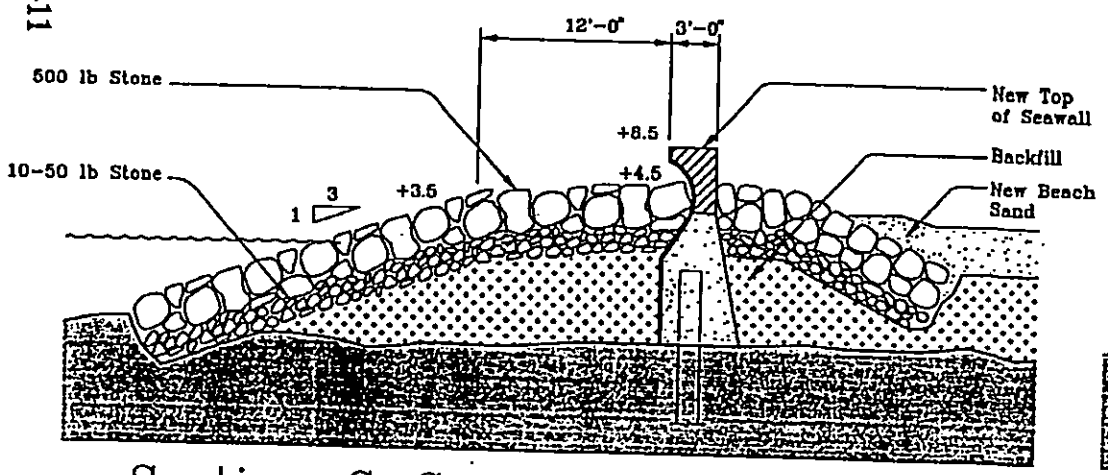
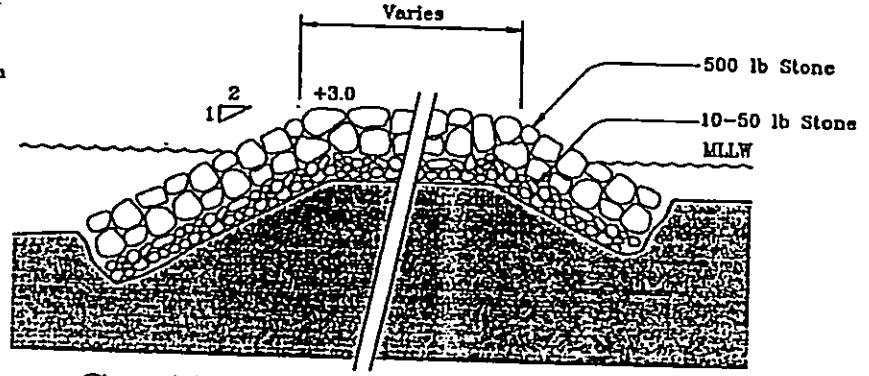


Section C-C



Section D-D

Partial Restoration

The Details

4' 0 4' 8' 16'

Exhibit 27

3. The Site

a. Vehicle Circulation

As shown in Exhibit 28, Partial Restoration - The Landside, the existing driveway access from Kalakaua Avenue will be demolished and new landscaping will be incorporated. A new curb and sidewalk will be constructed to match existing curb and sidewalk along Kalakaua Avenue, at the existing driveway entrance. There will be no direct vehicular entrance to the Natatorium.

With the existing driveway access from Kalakaua Avenue to be demolished, the existing 46 parking stalls along the driveway will be eliminated. With no vehicular entrance to the Natatorium complex, the existing 31 parking stalls within the complex will also be eliminated. All public parking for the Natatorium and surrounding beach area will be along Kalakaua Avenue.

An accessible drop-off area will be provided at the new curbside described above. During non-holiday weekdays, the drop-off area should not significantly affect normal traffic flow. However, on weekends and holidays, some congestion will occur around the area.

b. Pedestrian Circulation

The existing sidewalk, parallel to the seawall, which continues westward to Kuhio Beach, and the sidewalk on Kalakaua Avenue, will be maintained. Sidewalks along Kalakaua Avenue will be widened to 10 feet.

d. Landscaping

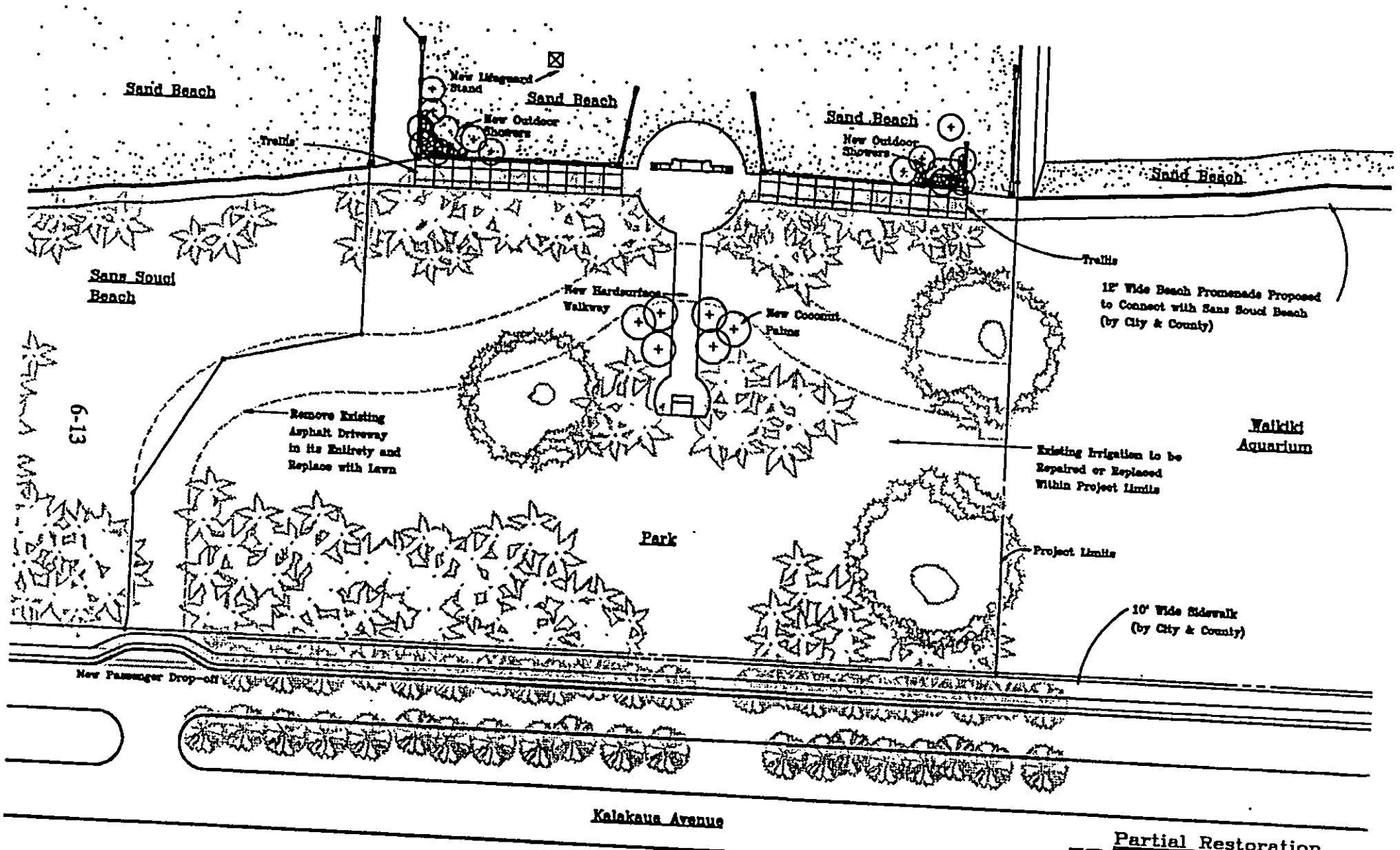
The roadway and parking stalls will be removed. The area will be replaced with topsoil and finished with lawn. The existing street lights along the roadway will be removed. Additional lighting will be located in the picnic areas. The existing picnic areas are furnished with wood tables and benches. These fixtures will be replaced. The current condition of the site furniture warrants replacement for aesthetic reasons. Additional native palms will be placed on either side of the axis to the entry of the Natatorium. These palms are placed to accent the Memorial. The site line to the entry is defined with the addition of these palms. The park's current quick coupler system will be replaced with an automatic irrigation system. The change to an automatic system is beneficial for the reduction of maintenance and for added efficiency.

The shower and planting areas that will be provided in either corner of the Natatorium (mauka side) will create a useful space in what otherwise might become an area of low activity.

e. Utilities

Water

Some 440 lineal feet of new water line, with sizes ranging from 1-1/2 inches to 2-1/2 inches, will be installed to service an outdoor shower facility. The new water system will be connected to an existing 8-inch waterline located in Kalakaua Avenue, fronting the Natatorium.


Sand Beach
New Lifeguard Stand
Sand Beach
New Outdoor Showers
Trellis
Sand Beach
New Outdoor Showers
Sand Beach
Trellis
12' Wide Beach Promenade Proposed to Connect with Sans Souci Beach (by City & County)
Sans Souci Beach
New Hardsurface Walkway
New Coconut Palms
Remove Existing Asphalt Driveway in its Entirety and Replace with Lawn
Existing Irrigation to be Repaired or Replaced Within Project Limits
Waikiki Aquarium
Park
Project Limits
10' Wide Sidewalk (by City & County)
New Passenger Drop-off
Kalakaua Avenue
North
Partial Restoration
The Landside
40' 0 40' 80'
Exhibit 28

Sewer

No sewer service is required.

Drainage

Partial restoration of the Natatorium presents no potential drainage problem. Additional drainage work is not required.

Exterior Lighting

Roadway parking lighting will match existing period lamp posts. Lighting will provide enough illumination for safety and security but will not distract from the Memorial illumination.

6.1.4 Cost Estimates

1. Construction Costs

Item/Description	Quan	Unit	1994 Dollars
General & Special Conditions	1	LS	$ 2,453,347
Foundations	1	LS	$ 645,402
Structural Systems	1	LS	$ 129,944
Exterior Wall Construction	1	LS	$ 269,653
Beach & Deck Area	1	LS	$ 2,860,289
Plumbing	1	LS	$ 23,473
Electrical	1	LS	$ 67,068
Sitework	1	LS	$ 2,334,816
Landscaping	1	LS	$ 142,212
Equipment	1	LS	$ 3,912
Demolition	1	LS	$ 532,593
Total-ESTIMATED CONSTRUCTION COST (ECC)			$ 9,462,709
ESCALATION - (Start January 1996 - 7%)			$ 662,390
Total - ESCALATED ESTIMATED CONSTRUCTION COST (EECC)			$ 10,125,099
CONTINGENCY - 10%			$ 1,012,510
Total - CURRENT WORKING ESTIMATE (CWE)			$11,137,609
Rounded			$11,150,000

2. Average Annual Operations and Maintenance Costs for Partial Restoration Concept in 1994 Dollars

1. Personnel Costs

1.1 One (1) full-time groundskeeper	$ 28,620
1.2 One (1) full-time water safety officer	$ 34,776
	$ 63,396
2. Utilities, lifeguard supplies/rescue equipment and miscellaneous	$ 2,070
3. Facilities maintenance, including periodic patching of concrete, painting, sand replenishment (after major storms), and minor plastering, painting and miscellaneous repairs	$ 25,875
TOTAL	$ 91,341
Say	$ 91,400

Explanation

1. Personnel Costs were derived from discussions with Honolulu City and County Department of Parks and Recreation personnel.

1.1 Groundskeeper
$20,443 x 1.4 for indirect salary costs x 1 person = $28,620

1.2 Water Safety Officer
$24,840 x 1.4 for indirect salary costs x 1 person = $34,776

2. Self-explanatory

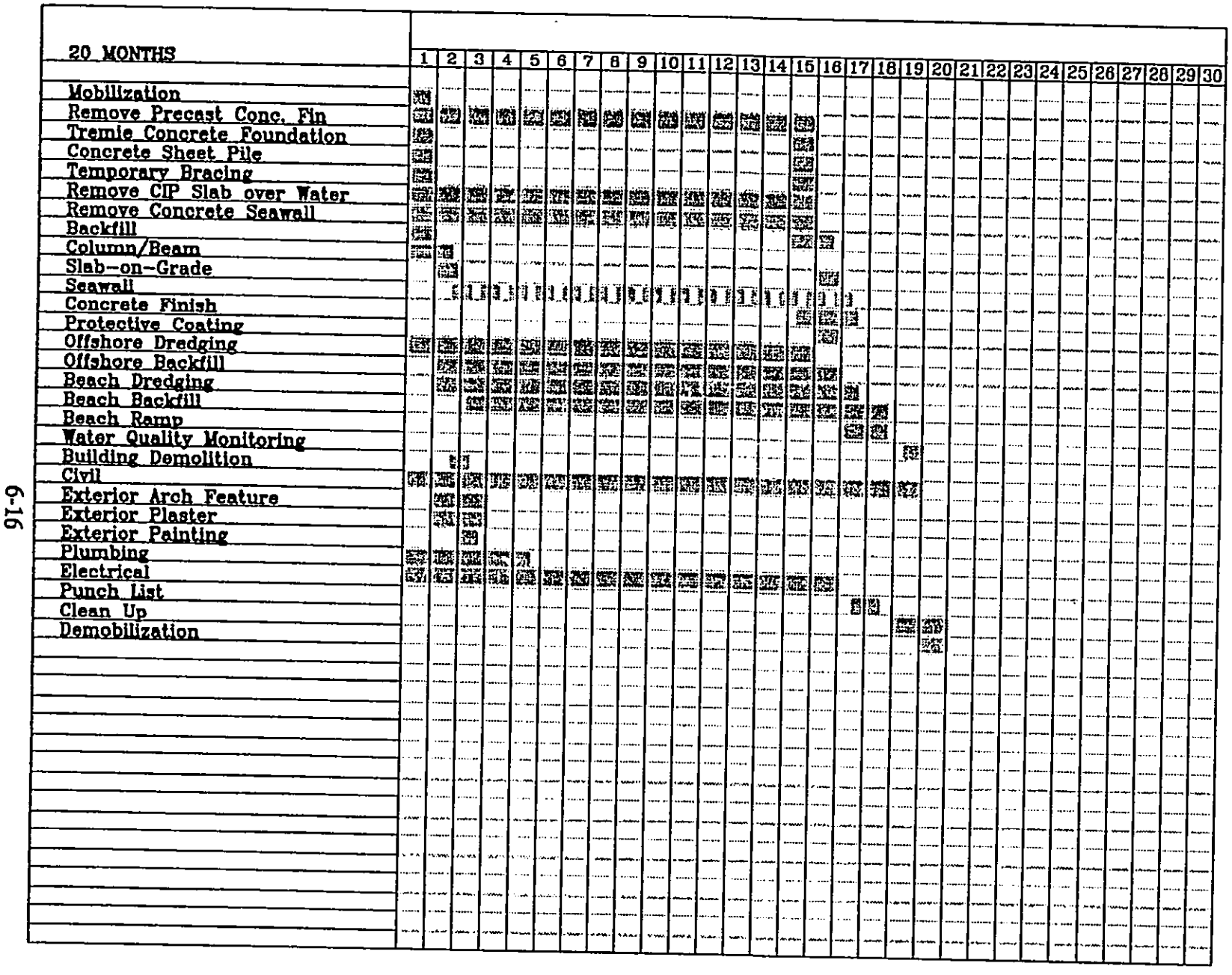
3. Self-explanatory

6.1.5 Construction Schedule

The following chart (Exhibit 29, Partial Restoration - Construction Schedule) illustrates the twenty (20) month construction schedule for the Partial Restoration Alternative for the Natatorium. While this would be the maximum construction period for an all-inclusive, single phase construction contract, the schedule would vary if the decision were made to have multiple or phased construction contracts.

6.2 No Action Alternative

The no action alternative would permit the continued deterioration of the Natatorium structure. Currently the structure is padlocked to protect the public from this safety hazard. Portions of the structure is in a state of partial collapse. It is anticipated that the facility will continue to deteriorate. This alternative would permit this deterioration to continue.



Partial Restoration

Construction Schedule

Exhibit 29

CHAPTER 7 - RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The proposed project will restore the Waikiki War Memorial Park and Natatorium to its original function as an oceanfront salt water pool and park area, open to the public. It will provide a wave-free Olympic sized swimming pool for public use. The new in-water structures will alter areas of the existing reef, but the structures will increase the habitat for the benthic communities. The proposed channels will also increase the shelter available to fishes and thus increase the abundance and diversity of the fishes in the area relative to the present. If the Natatorium were to remain in its present use, the comparable impacts are as follows:

1. The existing concrete structures would continue to deteriorate and present an even greater hazard to the public (i.e., continued spalling of concrete from overhead areas).

2. The facility would continue to be aesthetically unappealing and distract from the surrounding recreational area. It would also continue to restrict the public from use of this section of the coastline.

Resources of various forms will be committed permanently to this proposed project if implemented. Human resources such as monies, time, and effort will be expended. Once time is expended (for planning, design, and construction) it is irretrievable. However, work is compensated with monetary payment for these services. Construction material will be used. These materials can be recycled. However, the project will utilize these resources on a long-term basis. Portions of the reef will be permanently altered by the new groin structures. The marine resources in the footprint of the groins will be lost. This resource will be primarily sessile components of the benthic communities. These consist of a number of common algal species and very few corals. The new groin structures will enhance the area creating new habitat for the displaced species. It is expected that most, if not all, fishes will vacate the general project area once construction commences. They will, however, be among the first components to colonize the habitat once work has been completed. If this project proceeds, the restored facility will again be a resource available for use by the public.

CHAPTER 8 - IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Resources of various forms will be committed permanently to this proposed project if implemented. Human resources such as monies, time, and effort will be expended. Once time is expended (for planning, design, and construction) it is irretrievable. However, work is compensated with monetary payment for these services. Construction material will be used. These materials can be recycled. However, the project will utilize these resources on a long-term basis. Portions of the reef will be permanently altered by the new groin structures. The marine resources in the footprint of the groins will be lost. This resource will be primarily sessile components of the benthic communities. These consist of a number of common algal species and very few corals. The new groin structures will enhance the area creating new habitat for the displaced species. It is expected that most, if not all, fishes will vacate the general project area once construction commences. They will, however, be among the first components to colonize the habitat once work has been completed. If this project proceeds, the restored facility will again be a resource available for use by the public.

CHAPTER 9 - PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

There are no known adverse environmental effects to marine communities residing on the reef flats surrounding the Waikiki Natatorium that will be permanent. It is expected that some small amount of turbidity and silt will be generated by the proposed work. If in sufficient quantity, this material may impact benthic communities away from the Natatorium (i.e., on the reef flat). As described earlier in the report, these communities appear to be in relatively early successional stages, being held there by occasional storm surf and sand scour. Occasional surf and water motion will serve to suspend, dilute and transport sedimentary materials out of the area. Thus if transitory impacts do occur (i.e., as from temporary high sediment loading) which alter the structure of the benthic communities, it is expected that a similar community structure will rapidly return. The impacts due to construction on benthic communities resident to the shallow reef flat surrounding the Natatorium will be transitory and changes to the species composition should likewise be transitory.

There will be changes which will have a permanent impact on the communities residing in the present Natatorium swimming pool or on the walls of the structure. These communities will be removed. It is expected that similar communities will recolonize the structure once work has been completed. The proposed development of channels through the walls of the Natatorium should serve to increase the shelter available to fishes, thus increasing the abundance and diversity of fishes in the area relative to the present.

CHAPTER 10 - SUMMARY OF UNRESOLVED ISSUES

While the already accomplished planning and design of the fully restored Waikiki War Memorial and Natatorium provides general parameters for the operation of the facility, the City and County of Honolulu will determine the specifics of its operation and use.

CHAPTER 11 - CONSULTED PARTIES AND PARTIPICANTS IN THE DEIS PREPARATION

City & County of Honolulu

1. Department of General Planning
2. Department of Parks and Recreation
   Director
3. Department of Parks and Recreation
   Water Safety Adminstrator
4. Department of Parks and Recreation
   Chief-Advance Planning Branch
   Facilities Development Division
5. Department of Public Works
6. Board of Water Supply
7. Department of Transportation Services
8. Building Department
   Chief of Public Building
   Planning Section
9. Department of Land Utilization
   Chief of Urban Design Branch
10. Department of Land Utilization
    Chief of Environmental Branch
11. Honolulu Police Department
    Training Director
12. Honolulu Fire Department
    Administrative Services Director
13. City Council
    Mr. John Henry Felix, Council Member

State of Hawaii

1. Office of Environmental Quality Control
2. Department of Land and Natural Resources
   State Historic Preservation Section
3. Department of Accounting & General Services
4. Department of Health
   Director of Environmental Health

5. Commission on Persons With Disabilities

6. Department of Education

7. Waikiki Aquarium, University of Hawaii
Director

8. Environmental Center, University of Hawaii
Director

9. Water Resource Center
Associate Researcher

10. Senator Ms. Mary Jane McMurdo

Federal

1. U.S. Army Corps of Engineers

2. U.S. Coast Guard
Department of Transportation

3. U.S. National Oceanic & Atmospheric Administration
U.S. National Marine & Fisheries Services

4. U.S. National Park Service
Director

5. U.S. Refuges & Wildlife
Director

6. U.S. Environmental Protection Agency
Manager

7. U.S. Advisory Council of Historic Preservation
Western Division

Special Interests

1. Friends of the Natatorium
President

2. Hawaii International Sports Foundation
Vice President

3. Hawaii Council of Diving Clubs
President

4. Volleyball Player's Spokesperson
Mr. Manual Lopez

5. Veterans of Foreign Wars

6. ARC of Hawaii (Association of Retarded Citizens)
President

7. Hawaii Water Polo Association

8. American Red Cross

9. Keo Nakama International Swim Meet Spokesperson

10. American Legion
Department Commander

11. Hawaii Visitors Bureau
Community Activities

12. West Diamond Head Community Association

13. Waikiki Neighborhood Board #9

14. Kaimana Beach Hotel
General Manager

15. Waikiki Improvement Association
Executive Assistant

16. Sierra Club

17. Kapiolani Park Preservation Society
Executive Vice President

18. Historic Hawaii Foundation

19. Diamond Head/Kapahulu/St. Louis Heights
Neighborhood Board No. 5

20. Rough Water Swimmers
Jim Anderson

21. McCully Moiliili Neighborhood Board #8

CHAPTER 12 - COMMENTS RECEIVED AND RESPONSES DURING PREPARATION OF THE ENVIRONMENTAL IMPACT STATEMENT FINAL NOTICE

The DEIS was published in the OEQC Bulletin on October 23, 1993. The forty-five day review period, announced in the OEQC Bulletin, ended on December 7, 1993. The agencies, organizations, and individuals listed below were sent copies of the DEIS with a request for their comments on the project. These consulted parties included those who requested consulted party status, those who requested a copy of the DEIS, and those who expressed interest in the project or were believed to have an interest in the project. Written comments from these parties and responses to these comments are reported herein.

City and County of Honolulu

1. Planning Department, 11/8/93
2. Department of Parks and Recreation
   Director, 12/7/93
3. Department of Public Works, 10/15/93
4. Board of Water Supply, 11/16/93
5. Department of Transportation Services, 12/8/93
6. Honolulu Police Department
   Training Director, 11/15/93
7. Honolulu Fire Department
   Administrative Services Director, 10/20/93

State of Hawaii

1. Office of Environmental Quality Control, 12/3/93
2. Department of Land and Natural Resources, 11/24/93
3. State Comptroller, 11/10/93
4. Department of Health
   Director of Health, 11/10/93 and 1/24/94
5. Housing Finance & Development Corporation, 10/19/93
6. Department of Defense
   Office of Adjutant General, 11/9/93
7. Department of Business, Economic Development & Tourism, 10/20/93
8. Department of Business, Economic Development & Tourism, Energy Division, 11/2/93
9. Department of Education, 10/28/93

10. Environmental Center, University of Hawaii
Director, 12/7/93

11. Commission on Persons with Disabilities, 10/27/93

12. State Historic Preservation Division, Department of Land and Natural Resources, 1/7/94

13. Department of Transportation, 12/20/93

Federal

1. U.S. Army Engineer District, 12/6/93

2. U.S. Department of Interior
Water Resources Division, 12/2/93

3. U.S. Department of Navy
Commander, Naval Base Pearl Harbor, 10/27/93

Special Interests

1. Friends of the Natatorium
President, 12/3/93

2. West Diamond Head Community Association, 10/16/93

3. Historic Hawaii Foundation, 12/6/93

4. Outdoor Circle, 12/6/93

5. Alice Shelly, Specifications Consultant, 12/1/93

6. Senator Mary Jane McMurdo, 12/7/93

7. Senator Bert Kobayashi, 10/20/93

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JANE P. FASI
MAYOR

ROBIN FOSTER
CHIEF PLANNING OFFICER
ROLAND D. LIBBY, JR.
DEPUTY CHIEF PLANNING OFFICER

TH 10/93-2420

November 8, 1993

The Honorable John D. Waihee III, Governor
State of Hawaii
c/o Office of Environmental Quality Control
Central Pacific Plaza
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

12-3

Attention: Mr. Brian J. J. Choy

Dear Governor Waihee:

Draft Environmental Impact Statement (DEIS)
for the Waikiki War Memorial Park and Natatorium,
Waikiki, Oahu, Hawaii, Tax Map Key: 3-1-31: 3

We have reviewed the subject DEIS and request that the Final EIS address the following comments:

1. The description of the proposed action under the project summary in Chapter 1 should be clarified to indicate that only the memorial arch and arcade walls are proposed to be restored, and that the remainder of the facility basically will be redesigned and replaced.

2. The methods and findings of the user survey referenced in the project's description should be discussed. In addition, there should be an analysis of the public demand for and projected use of a salt water pool.

3. The submerged portions of the seawalls are proposed to be reused and are reported to be in sound condition, although the walls are acknowledged to be cracked. Is it likely that the actual condition of these walls will not be known until at least partially demolished? The

structural integrity of these walls should be discussed in greater detail, including a description of the structural investigations conducted and the manner of assessing the modified seawalls' capability to withstand seismic and hydrodynamic forces. Also, the potential of finding these walls to be unserviceable should be discussed, including the cost implications.

4. Construction costs should be given with more detail and consistency to permit a fair comparison between the full and partial restoration schemes. In addition, an explanation should be given for using different escalation and contingency factors for each scheme.

5. Under the section dealing with related projects or plans, it should be noted that Kapiolani Park and the Natatorium are in the Diamond Head Special District and are not part of Waikiki. While the Waikiki Master Plan recognizes Kapiolani Park as an important open space adjoining Waikiki, it is otherwise unrelated to the Natatorium. This section should reference the "Waikiki 2000 - Kapiolani Park Master Design Plan," which urges the demolition of the Natatorium.

6. The partial restoration scheme with an observation deck and seaward groins appears to be more elaborate than necessary. We suggest considering a simpler and far less expensive scheme for the ocean front improvements consisting of minimal groins to retain and continue the sand beach at San Souci.

7. A comparative analysis of the partial and full restoration schemes should be presented and the justification for selecting the preferred alternative should be provided.

We favor the partial restoration since it will provide more beach frontage, open space and will incur lesser capital, operating and maintenance costs. Conversely, it would seem that replicating the Natatorium will entail inordinate costs for questionable public benefit.

Thank you for the opportunity to comment on this matter. Should you have any questions, please contact Tim Hata of our staff at 527-6070.

Sincerely,

ROBIN FOSTER
Chief Planning Officer

RF:ft

cc: Office of Environmental Quality Control
Department of Land and Natural Resources,
Division of Water and Land Development
Leo A. Daly

12-4

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Mr. Robin Foster
Chief Planning Officer
Planning Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

12-5

Dear Mr. Foster:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of November 8, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

1. In response to comment 1, the description of the Proposed Action on page 1-1 will be revised from:

   ..."Complete Restoration includes replicating the ornate facade at the entrance, rehabilitating the pool walls and deck, and redesigning the pool's flushing scheme."...

   to:

   ..."Complete Restoration includes replicating the ornate facade at the entrance, reconstructing the pool walls and deck, and redesigning the pool's flushing scheme."...

2. In response to comment 2, a copy of the summary section from the user survey will be put in the appendices. The results of the user survey were used in developing the program for the restoration.

3. In response to comment 3, a detailed investigation of the condition of the seawalls was performed by Wiss, Janney, Elstner Associates, Inc. in 1989. This included a visual survey of all faces of the seawalls and concrete cores. The conclusion reached from the investigation was that the seawalls are still sound and can be repaired. The repair consists of reconstructing the top portions of the seawall which has embedded metal conduit. The seawall will be made integral with the new deck structure to resist seismic and hydrodynamic forces.

4. In response to comment 4, the cost estimate for the full restoration will be reformatted to match the format of the cost estimate for the partial restoration. The costs listed for the partial restoration is taken from the 1990 Planning Report. The cost figures will be adjusted to 1993 dollars. The contingency will remain 10 percent for the partial restoration since it is based only on the schematic plans shown in that planning report. The contingency for the full restoration is less since it is based on a prefinal construction drawings and specifications.

5. In response to comment 5, the "Waikiki 2000 - Kapiolani Park Master Design Plan," will be added to the list of Related Projects or Plans.

6. In response to comment 6, the groins shown in the partial restoration scheme are the minimal type of structure which would be required to insure a stable beach in front of the Natatorium and also insure that the adjoining beaches will not be impacted. To provide access to the areas for the physically disabled, a walkway or observation deck structure would also be required.

7. In response to comment 7, we refer you to the Leo A. Daly June 1990 Planning Report listed in the references. In that report, schematic plans and programs for both the partial and full restoration were presented for comparative analysis. Based on the analysis of that information and Honolulu City Ordinance 90-1, which showed strong support by stating that "City Department of Parks and Recreation shall operate and maintain a restored Waikiki Memorial Natatorium's structure," the full restoration was chosen as the preferred alternative.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

WALTER M. OZAWA
DIRECTOR

ALVIN K.C. AU
DEPUTY DIRECTOR

December 7, 1993

Mr. Brian J. J. Choy, Director
Office of Environmental Quality Control
State of Hawaii
Central Pacific Plaza
220 South King Street, Fourth Floor
Honolulu, Hawaii 96813

Dear Mr. Choy:

Subject: Draft Environmental Impact Statement (DEIS)
For the Proposed Renovations to the
Waikiki War Memorial Park and Natatorium
Tax Map Key 3-1-31: 03

12-6

Thank you for providing us with the opportunity to comment on the DEIS for the proposed repair and renovation of the Waikiki War Memorial Park and Natatorium.

We appreciate your department's efforts to enhance the recreational amenities at the Natatorium and are aware of the historical significance of the Natatorium. Your DEIS on page 6-1 correctly indicated our position. Historical considerations aside, we believe that the optimal solution will be to remove the makai portion of the Natatorium and to restore the beach front in this area. We believe that this provides the best solution in terms of recreational opportunities and safety.

The current proposal raises a number of questions that need to be addressed. Our major concern is the health and safety of the park users.

We are concerned that the range between the pool deck and the water level will be too large. In our public pools, the range between the deck/gutters and the water level is a matter of inches. Swimmers who can reach the side of the pool can find a place to cling to if they are tired or in distress. In the Natatorium, this differential will be

measured in feet and will increase with the lower tides. Tired and floundering swimmers may have difficulty saving themselves from difficult situations if they find themselves up against high pool walls.

We also have concerns about people diving into the water from the deck. At low tides, this differential will approach five feet or more.

Will the currents inside the Natatorium be strong enough to move sand around on the inside of the pool? Is it possible that a swimmer might dive into the water thinking that it is five feet deep when the tides and movement of interior sand may have combined to make the depth much less?

Will there be protective barriers that will keep swimmers from entering the water circulation tunnels? We also suggest that a barrier should be constructed on the makai edge of the Natatorium to keep people from diving off of the seawall and into the ocean.

We also received a letter of concern from the West Diamond Head Community Association (attached). They expressed concerns that the floating docks might interfere with the lifeguards' performance of their duties. Will these floating docks be easily accessible to swimmers? Will it be possible for someone to get into trouble under one of the floating docks out of sight of the life guards? In addition won't the floating docks interfere with persons trying to swim the length or width of the facility?

If you have any questions about our comments, please call John Morihara of our Advance Planning Branch at 523-4246.

Sincerely,

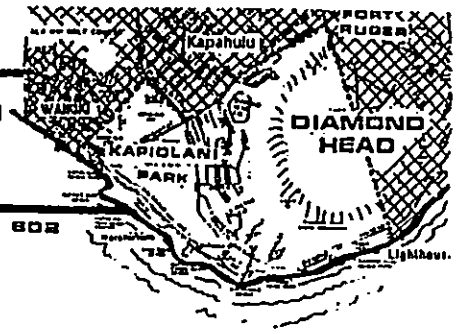
WALTER M. OZAWA, Director

WMO:ai

cc: Edward Lau, Department of Land & Natural Resources
✓Edward Pskowski, Leo A. Daly

WEST DIAMOND HEAD COMMUNITY ASSOCIATION

3015 KALAKAUA AVENUE, APT 602
HONOLULU, HAWAII 96815



October 26, 1993

Mr. Walter Ozawa, Director
Department of Parks and Recreation
650 South King Street
Honolulu, Hawaii 96813

DRAFT ENVIRONMENTAL IMPACT STATEMENT
WAIKIKI WAR MEMORIAL PARK AND NATATORIUM

12-7

Dear Mr. Ozawa,

Enclosed is a copy of Page 2-4 and Exhibit 4 from the referenced DEIS which show the restoration of the Natatorium would fill the pool with three floating docks. There would also be ten gangways which swimmers would use to get onto these docks.

Will the lifeguards be able to guard the Natatorium filled with floating docks and ramps? How will guards be able to see a swimmer in distress under the docks? How will a swimmer be able to get back on a dock?

On page 12-5 DL&NR indicates the floating docks will prevent people from diving into the pool. Exactly how does a floating dock prevent a person from diving into the pool?

Swimmers will be unable to swim lengths or widths of the pool with the interference of the docks.

Your clarification of these points will be appreciated.

Sincerely,

WEST DIAMOND HEAD COMMUNITY ASSOCIATION

David S. Sterrett
David S. Sterrett
President

93-3048
10/28/93 JAO.

the deepest point. More appropriate to the Natatorium saltwater pool, however, would be the use of the standard (i.e., white) secchi disk in place of the black disc or simple lab testing of water samples. Note: The water quality in the pool can only be as good as the source waters outside, therefore, some degradation will be experienced during Kona storms and periods of high waves offshore.

Flushing Scheme

The flushing system will be natural (i.e., without mechanical pumps) utilizing the coastal circulation system by opening up two sides to the natural coastal flow. The openings will be designed so as not to allow any unwanted marine life to enter the pool or pose any liability from people swimming into or through such openings.

Pool Deck

The finish texture will be non-slip and there will be no discomfort to bare feet. No diving tower or diving board will be provided. Four drinking fountains will be provided to serve the pool deck and sunbathing areas.

Floating Docks

Perimeter floating docks will be provided to moderate the elevation from the deck to the fluctuating water level.

Depth Markers

Depth of water will be plainly marked at or above the water surface on the vertical pool wall and on the edge of the deck next to the pool. Maximum and minimum points will be shown. Depth markers will be in numerals of 4 in. minimum height and of a color contrasting with background. Markers will be on both sides and ends of the pool.

Lifeguard Chairs

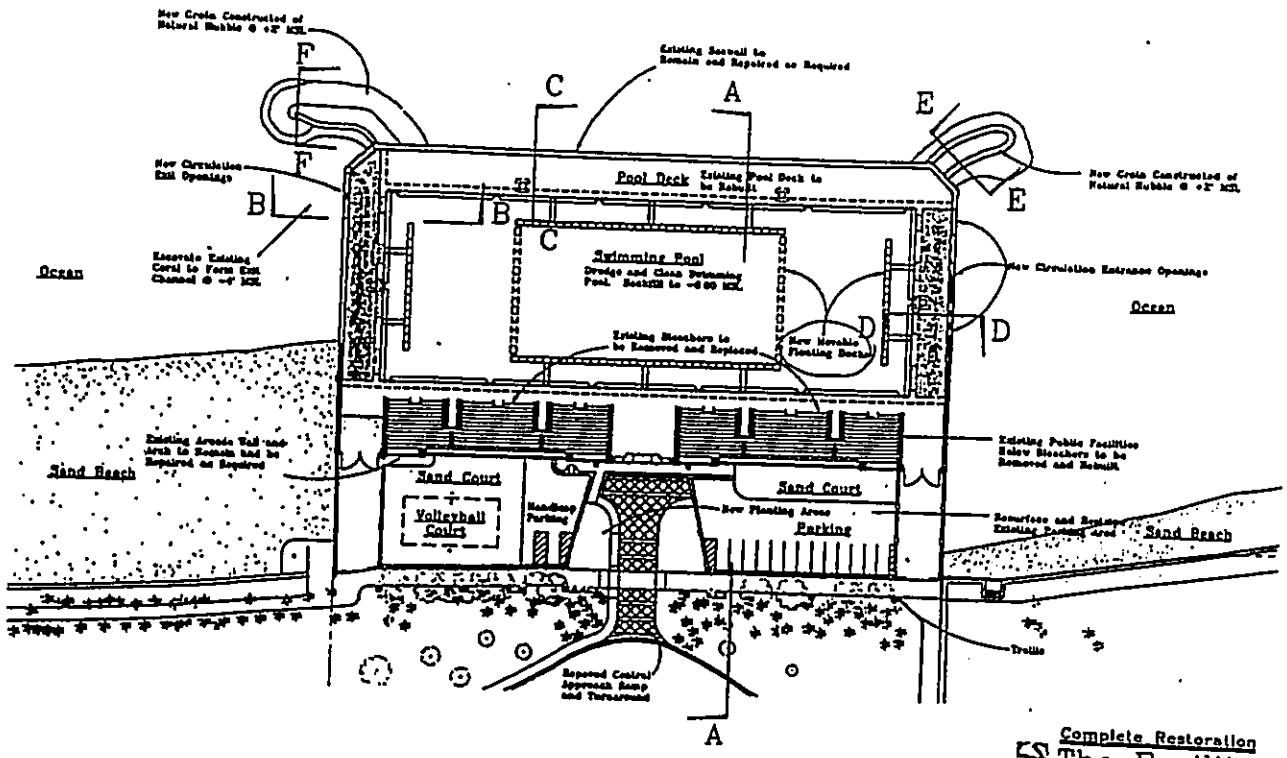
A minimum of four lifeguard chairs will be provided. They will be located on each side of the pool. At least two will be portable so that they may be placed at points of greatest activity.

Life Line

Life lines will be provided at 75 foot maximum intervals. The life line shall be not less than 3/4 in. minimum diameter. Its terminals shall be securely anchored and of corrosion-resistant material and of a type which will be recessed or have no projection which could constitute a hazard.

Ladders

A minimum of one ladder will be provided for each 75 feet of perimeter. Permanent steps into the pool will not be provided because they will develop algae growth on their surfaces which would be dangerously slippery. A side handrail extending up above and returning to the horizontal surface of the pool deck will be provided at each side of each ladder.


New Groin Constructed of Natural Rubble @ +2' MSL
Existing Seawall to Remain and Repaired as Required
F
C
A
E
New Circulation Exit Openings
Pool Deck
Existing Pool Deck to be Rebuilt
B
C
Swimming Pool
Dredge and Close Swimming Pool. Bottom to -8.00 MSL
Excavate Existing Coral to Form Exit Channel @ +4' MSL
Ocean
New Circulation Entrance Openings
Ocean
D
Existing Bleachers to be Removed and Replaced
New Movable Floating Bulkhead
Existing Arcade Wall and Arch to Remain and be Repaired as Required
Existing Public Facilities Below Bleachers to be Removed and Rebuilt
Sand Beach
Sand Court
Volleyball Courts
Handicap Parking
Sand Court
New Planting Areas
Parking
Resurface and Restripe Existing Parking Area
Sand Beach
Trellis
Repaved Central Approach Ramp and Turnaround
A
Complete Restoration
The Facility
Exhibit 4

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
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CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Mr. Walter M. Ozawa
Director
Department Parks and Recreation
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

12-9

Dear Mr. Ozawa:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 7, 1993 to the Director, Office of Environmental Quality Control, State of Hawaii which was received after the deadline for comments. We offer the following clarification and response to your review comments:

1. In response to your recommendation "to remove the makai portion of the Natatorium and to restore the beachfront in this area," please be aware that removal of the makai portion of the Natatorium would impact the stability of the neighboring beaches, principally Sans Souci Beach. The only acceptable alternative to the full restoration of the pool was the construction of the beach shown in the partial restoration scheme. In the Leo A. Daly June 1990 Planning Report listed in the references, schematic plans and programs for both the partial and full restoration were presented for comparative analysis. Based on the analysis of that information and Honolulu City Ordinance 90-1, which showed strong support by stating that "City Department of Parks and Recreation shall operate and maintain a restored Waikiki Memorial Natatorium's structure," the full restoration was chosen as the preferred alternative.

2. In response to your concern that "the range between the pool deck and the water level will be too large," please be aware that the use of floating docks address this. The floating docks provide for a differential of inches only and help to preclude people from diving into the water from the deck.

3. There will be no substantive movement of sand around the inside of the pool.

4. It is difficult to read the minds of others. The floating docks will, however, give a good indication of the tide levels to swimmers.

5. There will be protective barriers that keep swimmers from entering the water circulation tunnels.

6. A diving barrier will be constructed.

7. The layout and design of the floating docks have been closely coordinated with the Water Safety Administrator, Department of Parks and Recreation, City and County of Honolulu. The floating docks are intended to provide easy access. Lifeguard line of sight has been considered. The floating docks are movable, allowing for several configurations, including lap swimming. We will continue to closely coordinate the final design with your Water Safety Administrator.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

C. MICHAEL STREET
DIRECTOR AND CHIEF ENGINEER

KENNETH E. SPRAGUE
DEPUTY DIRECTOR

ENV 93-225

October 15, 1993

Office of the Governor
c/o Office of Environmental Quality Control
State of Hawaii
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

12-10

Gentlemen:

Subject: Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium
TMK: 3-1-31: 3

We have reviewed the subject DEIS and have no comments to offer at this time.

Very truly yours,

C. Michael Street

C. MICHAEL STREET
Director and Chief Engineer

cc: Dept. of Land and Natural Resources
Leo A. Daly

JOHN WAIHEE
GOVERNOR OF HAWAII

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
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CONSERVATION AND ENVIRONMENTAL AFFAIRS
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

Mr. Kenneth E. Sprague
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Sprague:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of October 15, 1993 to the Governor, State of Hawaii.

Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

OF WATER SUPPLY
IO COUNTY OF HONOLULU

COPY

JOHN WAIHEE
GOVERNOR OF HAWAII

November 16, 1993

The Honorable John Waihee, Governor
Office of the Governor
c/o Office of Environmental Quality Control
State of Hawaii
220 South King Street
Fourth Floor
Honolulu, Hawaii 96813

Dear Governor Waihee:

12-11

Subject: Draft Environmental Assessment (EA) of October, 1993, for the Waikiki War Memorial Park and Natatorium, TMK: 3-3-31: 3, Kalakaua Avenue

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the subject project.

We have the following comments to offer:

1. There is an existing four-inch water meter currently serving the project site.

2. If additional water is required, the developer will be required to obtain a water allocation from the Department of Land and Natural Resources. When additional water is made available, the applicant will be required to pay our Water System Facilities Charges for transmission and daily storage.

3. If a three-inch or larger meter is required to serve the project, construction drawings showing the installation of the meter should be submitted for our review and approval.

4. A Board of Water Supply approved Reduced Pressure Principle Backflow Prevention Assembly (RP) should be installed on the domestic water line serving the project, immediately after the property valve and prior to any branch piping.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

cc: Edward Lau, DOWALD
Edward Pskowski, Leo Daly Inc.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
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Mr. Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of November 16, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

1. In response to comments 2 and 3, the design of the restored facility requires only a two-inch meter to meet the domestic requirements. Since the facility currently has a four-inch water meter, an additional water allocation is not anticipated to be required. If additional water is required, an application will be made to the Department of Land and Natural Resources.

2. In response to comment 4, an approved Reduced Pressure Principle Backflow Prevention Assembly is called for in the design.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

D ARTMENT OF TRANSPORTATION SERV S
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA
711 KAPIOLANI BOULEVARD, SUITE 1200
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

JOSEPH M. MAGALDI, JR.
DIRECTOR
AMAR SAPPAL
DEPUTY DIRECTOR

TE-4107
PL93.1.410

December 8, 1993

The Honorable John D. Waihee
Governor
State of Hawaii
c/o Office of Environmental Quality Control
220 South King Street, Fourth Floor
Honolulu, Hawaii 96813

Dear Governor Waihee:

Subject: Waikiki War Memorial Park and Natatorium
Draft Environmental Impact Statement
TMK: 3-1-31: 3

This is in response to your request for our comments on the subject project.

Based on our review, we have the following traffic concerns:

1. The off-site parking proposal appears to be a viable alternative; however, the funding source of the shuttle service should be included in the Final Environmental Impact Statement.

2. We should review all construction plans for all work along Kalakaua Avenue.

3. All loading and unloading activities and provisions for a passenger drop-off area should be done within the project site.

Should you have any questions, please contact Wayne Nakamoto of my staff at 523-4190.

Sincerely,

JOSEPH M. MAGALDI, JR.
Director

cc: Department of Land and Natural Resources

12-12

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

December 15, 1994

Mr. Joseph M. Magaldi, Jr., Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Mr. Magaldi:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 8, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

1. In response to comment 1, the funding source of the shuttle service alternative would have to be determined by the City and County of Honolulu. While the already accomplished planning and design of the fully restored Waikiki War Memorial and Natatorium provides general parameters for the operation of the facility, the City and County of Honolulu will determine the specifics of its operation and use.

2. In response to comment 2, construction plans for all work along Kalakaua Avenue will be submitted to your office for review.

3. In response to comment 3, all loading and unloading activities and provisions for a passenger drop-off area were designed to be done within the project site for passenger cars and vans.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

for MANABU TAGOMORI
Manager-Chief Engineer

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111

JOHN WAIHEE
Governor of Hawaii

KEITH W. AHUE, CHAIRPERSON
Board of Land and Natural Resources

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DONA L. HANAIKE

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RANE P. FASI
MAYOR

MICHAEL S. NAKAMURA
CHIEF

HAROLD M. KAWASAKI
DEPUTY CHIEF

OUR REFERENCE BS-LK

November 15, 1993

12-13

The Honorable John Waihee
Governor
State of Hawaii
c/o Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Governor Waihee:

This is in response to your request for comments on a draft environmental assessment for the Waikiki War Memorial Park and Natatorium.

The project will have no significant impact on the operations of the Honolulu Police Department and we have no comments to make at this time.

Thank you for the opportunity to review this document.

Sincerely,

MICHAEL S. NAKAMURA
Chief of Police

By Eugene Uemura
EUGENE UEMURA
Assistant Chief of Police
Administrative Bureau

cc: OEQC
Department of Land and Natural Resources
Leo A. Daly

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

Mr. Michael S. Nakamura
Chief of Police
Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, HI 96813

Dear Chief Nakamura:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of November 15, 1993 to the Governor, State of Hawaii.

Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

RANDY F. FASI
MAYOR

DONALD S.M. CHANG
FIRE CHIEF

RICHARD R. SETO-HOOK
DEPUTY FIRE CHIEF

October 20, 1993

Office of Environmental Quality Control
State of Hawaii
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

12-14

Dear Sir:

SUBJECT: Waikiki War Memorial Park And Natatorium

We have reviewed the subject material provided and foresee no adverse impact in Fire Department facilities or services. Fire protection services provided from Waikiki and Kaimuki engine companies with ladder service from Waikiki are adequate.

Access for fire apparatus, water supply and building construction shall be in conformance to existing codes and standards.

Should you have any questions, please call Assistant Chief Attilio Leonardi of our Administrative Services Bureau at 831-7775.

Very truly yours,

DONALD S. M. CHANG
Fire Chief

AKL:ny

Attachment: EIS Reports (2)

Copy to: Div. of Water and Land Development (Attn: Edward Lau)
Dept.of Land & Natural Resources
Leo A. Daly, Bank of America Bldg. (Attn: Edward Pskowski)

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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STATE PARKS
WATER AND LAND DEVELOPMENT

Mr. Donald S.M. Chang
Fire Chief
Fire Department
City and County of Honolulu
3375 Koapaka Street, Suite H425
Honolulu, HI 96819-1869

Dear Chief Chang:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of October 20, 1993 to the Office of Environmental Quality Control, State of Hawaii.

Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185

BRIAN J. J. CHOY
Director

December 3, 1993

12-15

Mr. Keith W. Ahue, Chairperson
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Attention: Edward Lau, Division of Water and Land Development

Dear Mr. Ahue,

Subject: Draft Environmental Impact Statement for the Waikiki War Memorial Park and Natatorium

Thank you for the opportunity to review the subject document. We do not have any comments to offer.

Sincerely,

Brian J. J. Choy

Brian J. J. Choy
Director

BC:fc

c: Leo A. Daly

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

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REF:WL-LN

OCT 31 1994

Mr. Brian J.J. Choy
Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street, Fourth Floor
Honolulu, HI 96813

Dear Mr. Choy:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 3, 1993 to the Chairperson, Department of Land and Natural Resources, State of Hawaii.

Should you have any questions, please call Mr. Manabu Tagomori of the Division of Water and Land Development at 587-0230.

Very truly yours,

KEITH W. AHUE
Chairperson

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

Keith W. Ahue, Chairperson
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John P. Keppeler, II
Dona L. Hanaike

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REF:OCEA:SKK

NOV 24 1993

File No.: 94-276
DOC. NO.: 3783

Mr. Brian J.J. Choy, Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

12-16

Dear Mr. Choy:

Subject: Draft Environmental Impact Statement (DEIS): Waikiki War Memorial Park and Natatorium, Waikiki, Oahu, TMK: 3-1-31: 3

We have reviewed the DEIS information for the subject project received by our office on October 18, 1993, and have the following comments:

Division of Aquatic Resources

The Division of Aquatic Resources (DAR) is concerned about the applicants's proposed restoration of this facility because such activities would take place within the Waikiki Fisheries Management Area (FMA) and the Waikiki Marine Life Conservation District (MLCD) and directly affects aquatic resources and the coral reef on the ocean side of the facility.

The reefs facing south and towards San Souci are established as special management areas because of its easy access, variety and value of aquatic resources that are used by both residents and tourists. Fishermen regularly fish there during open season, while tourist use the area for snorkeling, diving and swimming. In addition, the Ewa side reef is a MLCD. The Waikiki Aquarium uses the reef flat adjacent to the seawall of the Natatorium to conduct reef walks and other classes.

DAR surveys indicate that the Waikiki FMA and Waikiki MLCD contain a wide variety of fish, invertebrates, and algae that are significant to this area. However, DAR is also aware and concerned about the Natatorium and its surrounding area being a safety hazard and realizes that restoration activities are necessary and would further enhance the use of the FMA and MLCD.

The proposed project is not expected to have long-term adverse impact on aquatic resources. However, since the project does involve construction and dredging offshore, these activities could have could have short-term impacts on aquatic resources such as temporary turbidity and biota displacement and disturbance. Mitigation measures should be especially adhered to and described in the Final EIS to prevent potential adverse impacts.

DAR supports the following mitigative measures mentioned in the DEIS:

1. Use of silt curtains;
2. Limiting the duration of in-water construction;
3. Limiting the periods when in-water construction is carried out;
4. Disposing of all dredge spoils on land.

In addition to the above, the following additional measures to minimize erosion and siltation should be included:

1. Site work should be scheduled for periods of minimal rainfall;
2. Dredging should be scheduled during periods of low tide;
3. Lands denuded of vegetation should be planted or covered as quickly as possible to control erosion;
4. Construction materials, petroleum products, and debris should be prevented from falling, blowing, or leaching into the aquatic environment.

The applicant should take into special consideration DLNR's concern that the Natatorium lies within the SMA and serves as a common boundary between the Waikiki MLCD and FMA.

DAR believes that special attention should be taken of all mitigation measures to minimize erosion and siltation in this area. The adherence to such measures will be important to this area which is important to recreational, consumptive (fishermen, etc.) and non-consumptive (snorkelers, divers, etc.) users.

Division of Land Management

The Division of Land Management (DLM) comments that:

1. A complete hazardous materials evaluation and removal should be completed before any permits are issued, especially since this area was a swimming pool and chemicals could have been used for years in the maintenance of it;

2. A clear establishment of who is going to control this area should be made first before any work is done on this project.

Office of Conservation and Environmental Affairs

The Office of Conservation and Environmental Affairs comments that the subject area is located within the Protective "P" subzone of the Conservation District and subject to the Conservation District regulations of Title 13, Chapter 2, Hawaii Administrative Rules (HAR) and Chapter 183-41, Hawaii Revised Statutes, as amended. The temporary construction activities required for this project may require a Temporary Variance, pursuant to Section 13-2-3, HAR.

We will forward our Historic Preservation Division comments as they become available.

We have no other comments to offer at this time. Thank you for the opportunity to comment on this matter.

Please feel free to contact Steve Tagawa at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

Very truly yours,

KEITH W. AHUE

cc: Leo Daly
Hanabu Tagomori, DOWALD
Ralston Nagata, DSP

JOHN WAIHEE
GOVERNOR OF HAWAII

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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DORIA L. SWANSON

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

October 27, 1994

TO: Mr. Keith W. Ahue

FROM: Manabu Tagomori

SUBJECT: Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of November 24, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

Division of Aquatic Resources

The four additional measures to minimize erosion and siltation will be added to the current list of mitigative measures listed.

Division of Land Management

In response to comment 1, a survey of hazardous materials may be carried out prior to obtaining permits. A detailed analysis of the pool bottom sediments for hazardous materials may be required prior to the issuance of the permits.

In response to comment 2, the restoration will be carried out by the State. After the facility is restored it will be turned over to the City and County of Honolulu to operate and maintain.

Office of Conservation and Environmental Affairs

At this time permits are not being obtained. When an application is made for the Conservation District Use Permit, a determination will be made for the requirement for a Temporary Variance for the temporary construction activities.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

12-18

(P)1777.3

NOV 10 1993

The Honorable John Waihee
Governor, State of Hawaii
c/o Office of Environmental
Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Gentlemen:

Subject: Waikiki War Memorial Park and Natatorium
Honolulu, Hawaii
Draft EIS

Thank you for the opportunity to review the subject document. We have no comments to offer.

If there are any questions, please have your staff contact Mr. Ralph Yukumoto of the Public Works Division at 586-0488.

Respectfully,

ROBERT P. TAKUSHI
State Comptroller

RY:jy
cc: DLNR, Div. of Water & Land Dev.
Mr. Leo A. Daly

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

KEITH W. AHUE, Chairperson
BOARD OF LAND AND NATURAL RESOURCES

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REF:WL-LN

OCT 31 1994

12-19

Mr. Robert Takushi
State Comptroller
State of Hawaii
P.O. Box 119
Honolulu, HI 96810

Dear Mr. Takushi:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of November 10, 1993 to the Governor, State of Hawaii.

Should you have any questions, please call Mr. Manabu Tagomori of the Division of Water and Land Development at ext. 7-0230.

Very truly yours,

KEITH W. AHUE
Chairperson

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:

November 10, 1993

93-118/epo

To: The Honorable John Waihee
Governor, State of Hawaii

From: John C. Lewin, M.D.
Director of Health

Subject: Draft Environmental Impact Statement (DEIS) for
Restoration of Waikiki War Memorial Park and Natatorium
Honolulu, Oahu, Hawaii
TMK: 3-1-31: 3

Thank you for allowing us to review and comment on the subject document. We have the following comments to offer:

1. Previous Department of Health's (DOH's) Comments

   The DEIS did not address the DOH's May 7, 1993 comments (attached). We feel that these comments should be properly addressed for they are directly related to the swimmers' health risk.

2. Existing Pool Water and Sediment Quality

   a. There is insufficient data to support the Page 1-1 statement that "past analysis of pool water quality indicated the pool to be unsafe for swimmers."

      The only water quality data reported in regard to the existing pool is listed on Page 3-3. However, the data does not show how and to what extent the water is unsafe to swimmers. Detailed information is required to justify this statement and the need for the proposed seawall openings.

   b. Existing pool sediment analysis is also needed.

3. Sand Beaches Adjacent to the Project Site

   The DEIS implies that the erosion of the sand beach located north of the Natatorium is the result of the presence of the Natatorium. However, the proposed project still calls for the construction of groins at the makai end of the Natatorium. Potential adverse impacts from the construction of groins to the existing sand beaches should be properly addressed.

4. Potential Impact Due to Effluent Discharges From Waikiki Aquarium

The Waikiki Aquarium is located immediately north of the facility. Currently, effluent is discharged from the Aquarium at an average rate of 0.875 million gallons per day (mgd). Effluent is being discharged into Mamala Bay through the Aquarium's submerged outfall located 100 feet off the shoreline. The design flow for this discharge point is 1.3 mgd. Our records indicate that there were at least two (2) incidences where the effluent fecal coliform count exceeded state water quality standards. The Waikiki Aquarium is also applying for a mixing zone from the DOH to assimilate the nutrients from its discharges. The proposed mixing zone covers the water body that is immediately north of the swimming pool. The potential impact to the swimming pool intake water quality as well as the health risk to the swimmers was not addressed or analyzed. We request that a comprehensive study in this regard be initiated and the results fully assessed.

5. Receiving Water Impact From the Storm Water Discharges

As specified in the DEIS, there are storm water culverts located near the Natatorium. The potential impact to the swimming pool water quality as well as to the swimmers' health resulting from the storm water discharges was not evaluated.

6. National Pollutant Discharge Elimination System (NPDES) Permit Requirements

An NPDES permit is required if effluent discharge, either directly or indirectly, into State waters from following activities is anticipated:

a. Showers and changing rooms;

b. Hydrotesting process; and

c. Hydrojet or hydroblasting process for repair, maintenance or construction purposes.

The applicant is encouraged to contact Mr. Ed Chen of the Clean Water Branch for details at 586-4309.

7. Section 401 Water Quality Certification (WQC)

A Section 401 WQC is required for the proposed project construction. The applicant is encouraged to contact Mr. Ed Chen of the Clean Water Branch for details at 586-4309.

Attachment

c: Clean Water Branch
Department of Land & Natural Resources
Leo A. Daly

January 24, 1994

TO: The Honorable Keith Ahue
Director, Department of Land and Natural Resources

FROM: John C. Lewin, M.D.
Director of Health

SUBJECT: Natatorium Restoration

12-21

The Department of Health recognizes the urgent need to address the problems created by rapidly deteriorating Natatorium at the Waikiki War Memorial Park. Currently, the structure is an eyesore and presents a safety problem. However, Department of Health staff have continuing concerns relating to the restoration of the Natatorium as a salt-water swimming pool.

Although plans have been revised to address concerns previously raised by increasing flow rates through the pool, we anticipate problems related to the clarity of water and bacterial infections that will exist with any salt-water pool. More specifically, we are concerned that the turbidity and bacterial levels of the water pumped through the pool will be too high to conform with current safety and health requirements as specified in Hawaii Administrative Rules, Title 11, Chapter 13A, Public Swimming Pool.

It is critical that water safety personnel be able to view swimmers in distress under the surface of the water. In fact, the swimming pool rules cited above require that an object at the bottom be clearly discernable at the maximum depth of the pool. The ambient turbidity of the water pumped into the pool is often so high that this would not be possible. The rules require that the pool must be immediately closed if these requirements are not met.

Skin infection is caused by Staphylococcus aureus continues to be a concern despite plans to increase the flow rates through the pool. It would be a problem in any salt water pool or confined water body where large numbers of people swim. S. aureus is

an opportunistic bacteria that can be easily transmitted from the skin or mucous membranes of one person through water to another person. Boils and other skin infections are most commonly caused by these bacteria, but they may also cause more serious systemic infections. Unfortunately, there are no standard or approved methods for measuring or monitoring staphylococcal concentrations.

If either of these problems exist, they will be difficult to mitigate. The only practical means to correct a problem related to turbidity would be to filter the incoming water to remove the suspended solids, which would be costly. Disinfection of salt water would also be difficult and costly. Chlorination as a method of a disinfection is not effective in salt water nor is it recommended because there are potential adverse environmental impacts when chlorinated water is released into the natural environment. Other disinfection methods would be cost prohibitive or ineffective (e.g., treatment with ozone, chlorine dioxide, ultraviolet light, and other chemical disinfectants).

In summary, we continue to be concerned that potentially serious public health problems may result from renovating and restoring the Natatorium as a salt water pool, including the safety of the pool and the potential for the transmission of S. aureus and other bacteria. We recommend that these issues be thoroughly discussed and addressed before proceeding.

If you wish further information regarding this matter, please call me at 586-4410 or Bruce Anderson at 586-4424.

c: Office of Environmental Quality Control
Leo A. Daly

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

REF:WL-LN

OCT 31 1994

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DORA L. HANAMI

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Mr. Peter Sybinsky
Director of Health
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Sybinsky:

12-22

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of November 10, 1993 and of January 24, 1994 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

1. The previous Department of Health's (DOH) comments dated May 7, 1993 were not received prior to the publication of the Draft Environmental Impact Statement. We have reviewed the letter and find that it is identical to a letter sent to our consultant Leo A. Daly on February 10, 1992 by Dr. Bruce Anderson of your office. That letter was reviewed and a response sent to Dr. Anderson. Attached are copies of those four letters.

2. The statement on page 1-1 that, "past analysis of pool water quality indicated the pool to be unsafe for swimmers," is based on a statement from reference 1. Attached are the excerpts from that report. The basis of that statement is a local newspaper article reporting on statements by the DOH. Attached is a copy of the newspaper article.

   An analysis of the pool bottom sediments may be carried out when work is begun on obtaining the required permits for the project. At this time no permits are being obtained.

3. Analysis of the littoral drift was made and the impact of the new groin evaluated. Section 4.1, Water Quality and Circulation, will be revised with additional discussion of the analysis of the new groin impact on the littoral drift.

4. Leo A. Daly have met with the director of the Aquarium and have reviewed their information on the current and future effluent discharge from their facility. Currently

their discharge is in compliance with their existing permit, but may not be in compliance with the new water quality standards. They are making modifications to their system so that it will comply with the new water quality standards. Changes have also been made to insure that they do not exceed the effluent fecal coliform count. Should the DOH determine that a discharge from the Aquarium has created a health hazard and the beach adjoining the project is closed to swimming, then the Natatorium pool will likewise close. The pool would only reopen when the health hazard at the beach has passed. Section 2.2.3 and 3.1.2 will be revised to include discussions of the effluent from the Aquarium and from nearby storm water culverts.

5. The impact of nearby storm water culverts will be to degrade the water quality of this coastal area. Should the resulting discharge create a health hazard, as with the Aquarium discharge, the beach and pool would be closed. Given the high water quality of water in this area, the water will generally clear up rapidly.

6. All water from the interior showers and changing rooms will drain into the sanitary sewer system. If hydrotesting, hydrojet, or hydroblasting is carried out and they result in effluent discharge, either directly or indirectly into State waters, a NPDES permit will be obtained. At this time no permits are being obtained.

7. A Section 401 Water Quality Certification will be obtained when work is begun on the permits. We will contact Mr. Ed Chen when that work is started.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Manabu Tagomori of the Division of Water and Land Development at ext. 7-0230.

Very truly yours,

KEITH W. AHUE
Chairperson

Attach.

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

KEITH W. AHUE, Chairperson
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
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CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION PROGRAM
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REF: WL:KC

NOV 29 1993

Dr. John C. Lewin
Director of Health
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

12-23

Dear Dr. Lewin:

Waikiki War Memorial Park and Natatorium
Draft Environmental Impact Statement (DEIS), Honolulu, Oahu

This is an advance partial response to your comments dated November 10, 1993 addressed to Governor John Waihee regarding the above subject. Thank you for your comments but we must inform you that our department, along with Leo A. Daly and the Office of Environmental Quality Control did not receive your previous letter dated May 7, 1993. Should it have been received, your comments would have been addressed. Also, our department and Leo A. Daly did not receive it as an attachment to your November 10th letter. Therefore, please send your May 7th comments so we may fully consider your department's concerns.

We look forward to your response. Should you have any questions, please call Mr. Manabu Tagomori, Manager-Chief Engineer of the Division of Water and Land Development at 587-0230.

Very truly yours,

KEITH AHUE

c. OEQC
Leo A. Daly-E. Pskowski

Fax Transmittal Memo 7672

To: Karen Chung	No. of Pages: 2	Today's Date: 11/23	Time: 8:00
Company:	From: OEQC - Faith Caplan		
Location:	Company:	Dept. Charge:	
Fax #: 587-0283	Telephone #: 587-0273	Fax #: 586-2452	Telephone #: 586-4185
Comments: This May 7th letter arrived in our office attached to the November 10th DOH letter.	Original Disposition: ☐ Destroy ☐ Return ☐ Call for pickup		

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:

May 7, 1993

93-118/epo

Mr. Leo A. Daly
Honfed Tower, Suite 1000
1357 Kapiolani Blvd.
Honolulu, Hawaii 96814

Dear Mr. Daly:

Subject: Environmental Impact Statement Preparation Notice (EISPN) and Environmental Assessment (EA)
Waikiki War Memorial Park & Natatorium Restoration
Waikiki, Oahu
TMK: 3-1-31: 3

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

The Department of Health has serious concerns relating to the quality of water in the Waikiki War Memorial Natatorium. We anticipate that some serious public health problems will result from the proposed restoration of the Natatorium as a salt-water swimming pool that will be practically impossible to mitigate.

Skin infections caused by Staphylococcus aureus are anticipated to be a major problem. These bacteria may be expected to be a potential problem in any confined water body where large numbers of people swim. Although sea water kills most pathogenic bacteria, staphylococci tolerate a saline environment

skin or mucous membranes of one person through water to another person. Boils and other skin infections are most commonly caused by these bacteria, but they may also cause more serious systemic infections.

It is difficult or impossible to measure staphylococcal concentrations using standard water quality monitoring methods, and they may survive longer than other bacteria used as indicator organisms. Therefore, a problem may exist even if water quality standards are not exceeded. Unfortunately, there are no standard or approved methods for measuring S. aureus in marine water. Methods for quantifying staphylococci are being developed, however, results would not be available to allow for timely decision-making to protect public health.

Disinfection of salt water is difficult and costly. Chlorination as a method of a disinfection is not effective nor is it recommended, because there are potential adverse environmental impacts when chlorinated water is released into the natural environment. In addition to the direct toxic effects of chlorine on marine organisms, chlorination by-products (commonly called tribalomethnes) are formed when chlorine is added to water with any organic material. These by-products, including chloroform and bromoform, are also of concern. Other disinfection methods are cost prohibitive or ineffective (e.g., treatment with ozone, chlorine dioxide, ultraviolet light, and other chemical disinfectants).

In summary, we see a potentially serious public health problem that may result from the use of a renovated Natatorium that will be practically impossible to prevent using standard treatment methods. For the reasons above, we would recommend against the proposed natatorium renovation and that alternate uses for the site be explored.

If you wish further information regarding this matter, please call me at 586-4424.

Sincerely,

BRUCE S. ANDERSON, Ph.D
Deputy Director for Environmental Health

c: Office of Environmental Quality Control

In Cleaning Natatorium

The War Memorial Natatorium in Waikiki — closed since April 23 because of muck, stagnant water and seaweed—may open sometime next week.

Theodore Nobriga, City Parks Director, said equipment, money and other projects were responsible for the delay in re-opening the Natatorium.

Nobriga said last night that no definite date for the opening had been scheduled.

"We have to get an okay from the Board of Health. And we don't know whether the water may bring the sand back in as fast as we take it out."

The ocean water swimming pool was declared unfit for swimming and closed by State Parks and Health Department officials.

"We don't have the necessary dredging equipment, Nobriga said last night.

"We have to have men go down and dig out the sand by hand with buckets," he continued.

Natatorium To Stay Closed

KOV MAY 7 1963

The War Memorial Natatorium in Waikiki remains closed while City Parks officials ponder a dual problem of accumulated muck on the pool bottom and sluggish water circulation.

State Health Department tests showed "poor circulation" in the naturally fed and flushed pool but no strong sign of pollution, a State sanitation engineer reported.

• • •

CITY PARKS director Theodore Nobriga yesterday received a letter from the Health Department reporting the test results, requesting "corrective maintenance" and leaving the next step up to the City.

The sanitation engineer also said the weak-circulation condition in the pool has improved with tides higher than when the pool was closed April 23 because of the stagnant smelly water.

Nobriga said he would have to check back with the Health Department, because he tried to have the pool bottom suction-dredged several years ago but the Health people would not allow the material to be dumped offshore.

• • •

NOBRIGA ALSO said the pool would remain closed while natatorium workers watched the effects of tidal action. The swimming facility is fed and flushed by tidal action, but when the original portholes became clogged, new openings were made at a higher level.

Now the sea water doesn't come and go if tides stay low.

Thursday, Dec. 5, 1963 Honolulu Star-Bulletin 31

Porpoise Training Proposed in Natatorium

Louis Blowbray, director of the Waikiki Aquarium, said yesterday he would like 25 yards of the Waikiki Natatorium in which to train his porpoises.

Although he hasn't got the porpoises yet, Blowbray said he hopes to have some within the next couple of months.

"We're endeavoring to get them all the time . . . whenever we see one of the occasional schools go by the aquarium. But we're handicapped by not having a boat."

He said the porpoises

"But it's almost impossible to train them while with other animals . . . if we could have 25 yards of the natatorium—it would certainly be a great help to us," he said.

Blowbray has already had one experience with the natatorium. Several weeks ago some pranksters freed one of the 45-pound freshwater snapping tortoises

and it was found swimming happily in the public pool.

Although characteristically a fresh water animal, one of 13 species at the aquarium, he said the salt water had "no harmful effect" on the tortoise.

"And he came from Texas only three weeks ago."

LEO A DALY

20 February 1992

Bruce S. Anderson, Ph.D.
Deputy Director
Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: Restoration of the Natatorium

Dear Dr. Anderson:

We are writing in response to your letter dated February 10, 1992. We note your concerns but we are not in agreement with your conclusions. There are two important points which you must consider. The first is that the new pool flushing design will produce water quality in the pool comparable with the adjoining waters. The second point is that the water quality of the adjoining coastal waters is amongst the highest along the entire Waikiki Beach area.

12-25

The "restoration" in the classical sense will be carried out to those portions of the structure that have historical significance. The original pool circulation/flushing system will be changed as it is recognized that the pool itself was built with insufficient flushing.

Significant design changes in the pool's circulation system are considered mandatory and are being carefully explored. A comparison was made of the existing flushing system versus the new design. Considering the original pool geometry and assuming clear wall openings, a maximum exchange of approximately 0.32 pool volumes per day or less than one pool volume per day occurs. Also, this circulation of water is confined to the area immediately around the original pool openings. With restoration, the pool will be opened on both the Diamond Head and the Ewa ends in such a manner as to allow the existing coastal flow to produce consistent cross pool flows over the full duration of each tidal cycle. Field studies and a physical model of the Natatorium have verified that the pool will flush an average of approximately 10 pool volumes per day. This is a 30 fold increase over the original design. Thus, the new pool circulation system will produce water quality within the pool which is essentially identical to the surrounding waters.

It should also be noted that the surrounding waters fronting the Waikiki Aquarium to the north and the Sans Souci Beach to the south of the Natatorium are currently intensively used by swimmers. It would seem, that any concern about potential bacterial contamination, as proposed and discussed in your letter would be, if it were to ever occur, applicable to the entire Waikiki Beach coastline. Since these waters have not shown a history of the types of bacterial problems you discussed, we conclude that the bacterial problems you discuss should not occur under normal conditions.

PLANNING/ARCHITECTURE/ENGINEERING/INTERIORS
HONOLULU TOWER/SUITE 1000
1357 KAPIOLANI BOULEVARD/HONOLULU, HAWAII 96814, USA
TELEPHONE: 808-521-8809/FAX: 808-521-3757/TELEX: 723-8441 DALYHR

The Department of Land and Natural Resources has allowed us to make presentations to the Historic Hawaii Foundation, Neighborhood Boards and the Friends of the Natatorium. Some, such as the City and County Parks and Recreation, and Senator Bert Kobayashi, have asked good, hard questions. We are responding to these concerns in our on-going design efforts. We'd also be happy to discuss your concerns further.

Very truly yours,

LEO A. DALY

Edward J. Pskowski

Edward Z. Pskowski
Principal

EZP:jsm

cc: Department of Land and Natural Resources, State of Hawaii
Department of Parks and Recreation, City and County of Honolulu
Senator Mary-Jane McMurdo
Councilman John Henry Felix
Jack Myers, Myers Development Corporation
Dr. Roger Fujioka, U.H. Water Resources Research Ctr.
Friends of the Natatorium

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
EPHSD

February 10, 1992

12-26

Mr. Edward Pskowski
Leo A. Daly Architects
Honfed Tower, Suite 1000
1357 Kapiolani Boulevard
Honolulu, HI 96814

Dear Mr. Pskowski:

Subject: Health Concerns Associated with the Restoration of the Natatorium

This letter is to apprise you of the Department of Health's concern relating to the quality of water in the Waikiki War Memorial Natatorium. We anticipate some serious potential public health problems will result from the proposed restoration of the Natatorium as a salt-water swimming pool that will be practically impossible to mitigate.

Skin infections caused by Staphylococcus aureus are anticipated to be a major problem. These bacteria may be expected to be a potential problem in any confined water body where large numbers of people swim. Although sea water kills most potentially pathogenic bacteria, staphylococci tolerate a saline environment and survive for extended periods under normal conditions.

S. aureus is an opportunistic bacteria that can be easily transmitted from the skin or mucous membranes of one person through water to another person. Boils and other skin infections are most commonly caused by these bacteria, but they may also cause more serious systemic infections.

It is difficult or impossible to measure staphylococcal concentrations using standard water quality monitoring methods. They may be expected to survive longer than other bacteria used as indicator organisms. Therefore, a problem may exist even if water quality standards are not exceeded. Unfortunately, there are no standard or approved methods for measuring S. aureus in marine water. Methods for quantifying staphylococci are being developed; however, these methods are still in the developmental stage and results would not be available to allow for timely decision-making to protect public health.

Disinfection of salt water is difficult and costly. Chlorination as a method of a disinfection is not effective nor is it recommended. There are potential adverse environmental impacts when chlorinated water is released into the natural environment. In addition to the direct toxic effects of chlorine on marine organisms, chlorination by-products (commonly called trihalomethanes) are formed when chlorine is added to water with any organic material. These by-products, including chloroform and bromoform, are also of concern. Other disinfection methods are cost prohibitive or ineffective (e.g., treatment with ozone, chlorine dioxide, ultraviolet light, and other chemical disinfectants).

In summary, we see a potentially serious public health problem that may result from the proposed renovation of the Natatorium that will be practically impossible to prevent using standard treatment methods. For the reasons above, we will be recommending alternate uses of this area.

If you wish further information regarding this matter, please call me at 586-4424.

Sincerely,

BRUCE S. ANDERSON, Ph.D.
Deputy Director for Environmental Health

BSA:mi

c: Department of Land and Natural Resources, State of Hawaii
Department of Parks and Recreation, City and County of Honolulu
Senator Mary-Jane McMurdo
Councilman John Henry Felix
Jack Myers, Myers Development Corporation
Dr. Roger Fujioka, U.H. Water Resources Research Ctr.

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

JOSEPH K. CONANT
EXECUTIVE DIRECTOR

IN REPLY REFER TO:
93:PPE/5169

October 19, 1993

TO: Governor, State of Hawaii
c/o Office of Environmental Quality Control

FROM: Joseph K. Conant
Executive Director

SUBJECT: Draft Environmental Impact Statement for the Waikiki War Memorial Park and Natatorium

Thank you for the opportunity to review the subject draft EIS. We have no comments to offer.

Enclosed, herewith, is the draft EIS.

cc: Mr. Edward Lau, Dept. of Land and Natural Resources
Mr. Edward Pskowski, Leo A. Daly

12-27

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

KEITH W. AHUE, Chairperson
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
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CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REF:WL-LN

OCT 31 1994

Mr. Joseph K. Conant
Executive Director
Department of Budget and Finance
Housing Finance and Development Corporation
677 Queen Street, Suite 300
Honolulu, HI 96813

Dear Mr. Conant:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of October 19, 1993 to the Governor, State of Hawaii.

Should you have any questions, please call Mr. Manabu Tagomori of the Division of Water and Land Development at 587-0230.

Very truly yours,

KEITH W. AHUE
Chairperson

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96816-4495

EDWARD V. RICHARDSON
MAJOR GENERAL
ADJUTANT GENERAL

MYLES M. NAKATSU
BRIGADIER GENERAL (P)
DEPUTY ADJUTANT GENERAL

November 9, 1993

Engineering Office

Office of Environmental Quality Control
220 South King Street, Fourth Floor
Honolulu, Hawaii 96813

Dear Sir:

Subject: Waikiki War Memorial Park and Natatorium

Thank you for providing us the opportunity to review the above mentioned environmental assessment.

We have no comments to offer at this time regarding the project.

Sincerely,

Jerry M. Matsuda, P.E.
Lieutenant Colonel
Hawaii Air National Guard
Contracting and Engineering Officer

c: Mr. Edward Lau,
Department of Land & Natural Resources
Leo A. Daly

NATIONAL GUARD

12-28

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809
OCT 27 1994

KEITH W. AHUE, Chairperson
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER, II
DONA L. HANAIKE

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WATER AND LAND DEVELOPMENT

Jerry M. Matsuda, P.E.
Lieutenant Colonel
Hawaii Air National Guard
Contracting and Engineering Officer
Office of the Adjutant General
Department of Defense
State of Hawaii
3949 Diamond Head Road
Honolulu, HI 96816-4495

Dear Colonel Matsuda:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of November 9, 1993 to the Office of Environmental Quality Control, State of Hawaii.

Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

JOHN WAIHEE
Governor
MUFI HANNEMANN
Director
JEANNE K. SCHULTZ
Deputy Director
RICK EGGED
Deputy Director
TAKESHI YOSHIHARA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 4th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2355 Fax: (808) 586-2377

October 20, 1993

12-29

Mr. Brian J.J. Choy
Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Choy:

The Department of Business, Economic Development & Tourism is pleased to submit the enclosed comments on the Draft Environmental Impact Statement for the Waikiki War Memorial Park and Natatorium.

The comments were provided by the Land Use Commission and State Tourism Office. Questions regarding these comments may be directed to Esther Ueda, LUC Executive Officer, at 587-3826, or Muriel Anderson, State Tourism Office Manager, at 586-2550.

Thank you for the opportunity to comment.

Sincerely,

Mufi Hannemann

Enclosure
cc: Mr. Edward Lau
Mr. Edward Pskowski ✓

JOHN WAIHEE
GOVERNOR

ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 587-3822

October 20, 1993

Subject: Director's Referral No. 93-299-U
Draft Environmental Impact Statement for the Waikiki War Memorial Park and Natatorium, TMK: 3-1-31: 3, Honolulu, Oahu

We have reviewed the subject draft EIS and have the following comments:

1) We confirm that the project site, as approximately identified in Figures 1, 2, and 3, is located within the State Land Use Urban District.

2) We suggest that the final EIS include a map showing the project site in relation to the State Land Use Districts.

3) Clarification of the project site acreage should be provided in the final EIS. Based on a review of Tax Map Key data, it appears that the entire project site is approximately 5.347 acres. According to page 1-1 of the draft EIS, 3.347 acres are part of the Diamond Head Special District and Kapiolani Park, page 2-1 refers to approximately 2.34 acres (102,000 square feet) of area that projects seaward from the beach edge, and a total area of approximately 5.13 acres (223,400 square feet) is referred to on page 2-2.

4) We also suggest that a map showing the project site in relation to Tax Map Key data be provided in the final EIS.

We have no other comments to offer at this time.

EU:KM:th

October 25, 1993

Subject: Director's Referral No. 93-299-U
Draft Environmental Impact Statement for the Waikiki War Memorial Park and Natatorium, TMK: 3-1-31: 3, Honolulu, Oahu

We have reviewed the Draft Environmental Impact Statement (EIS) for the Waikiki War Memorial Park and Natatorium to determine conformance with the State Tourism Functional Plan (STFP). The proposed project is located in Waikiki, the state's premier resort destination, and one of 19 regions designated by the STFP.

The draft EIS does not include the STFP in its review of functional plans related to this project (page S-2). Although the proposed project is targeted for recreational use by Hawaii residents, its location in Waikiki and its historic significance will likely result in high levels of interest and use by visitors to the state. As such, mention should be made in the final EIS of relevant STFP policies.

Based upon our review, the proposed restoration of the Natatorium is consistent with the objectives, policies and actions contained within the Environmental Resources and Cultural Heritage section of the STFP which call for the visitor industry to assist in the preservation, perpetuation, and interpretation of Hawaii's cultural, historic, and archaeological resources.

Enclosed is a copy of the STFP.

Enclosure

12-30

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

KEITH W. AHUE, Chairperson
BOARD OF LAND AND NATURAL RESOURCES

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JOHN P. KEPPELER, II
DONA L. HANAIKE

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CONVEYANCES
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HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REF:WL-LN

OCT 31 1994

Ms. Jeanne Schultz, Director
Department of Business, Economic Development & Tourism
Central Pacific Plaza
220 South King Street
Honolulu, Hawaii 96804

Dear Ms. Shultz:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of October 20, 1993 to the Director, Office of Environmental Quality Control, State of Hawaii. We offer the following clarification and response to your review comments:

1. In response to comments 1 and 2, Exhibit 2 will be modified to show the project site in relation to the State Land Use Districts.

2. In response to comment 3, the land areas listed on pages 1-1, 2-1, and 2-2 will be corrected. The correct project area is 5.347 acres.

3. In response to comment 4, additional Tax Map Key data will be added to Exhibit 3.

4. In response to your October 25, 1993 comment, a review of the State Tourism Functional Plan was made and a statement will be added to page 5-2.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Manabu Tagomori of the Division of Water and Land Development at 587-0230.

Very truly yours,

KEITH W. AHUE
Chairperson

JOHN WAIHEE
Governor
MUFI HANNEMANN
Director
JEANNE SCHULTZ
Deputy Director
RICK EGGED
Deputy Director
TAKESHI YOSHIHARA
Deputy Director

JOHN WAIHEE
GOVERNOR OF HAWAII

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

ENERGY DIVISION, 335 MERCHANT ST., RM. 110, HONOLULU, HAWAII 96813 PHONE: (808) 587-3800 FAX: (808) 587-3820

12-31

The Honorable John Waihee
Governor, State of Hawaii
c/o Office of Environmental Quality Control
220 South King Street
Fourth Floor
Honolulu, Hawaii 96813

Dear Governor Waihee:

SUBJECT: Waikiki War Memorial Park and Natatorium
Island of Oahu
District of Honolulu
Tax Map Key Numbers: 3-1-31:3

We wish to inform you that we have no comments to offer on the Draft Environmental Impact Statement (DEIS).

Thank you for the opportunity to review the document.

Sincerely,

Maurice H. Kaya
Energy Program Administrator

MHK:ylels97

cc: Mr. Edward Lau, DLNR, Division of Water and Land Development
Mr. Edward Pskowski, Leo A. Daly, Consultant

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
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DONA L. HANAIKE

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WATER AND LAND DEVELOPMENT

Mr. Maurice H. Kaya
Energy Program Administrator
Department of Business, Economic Development and Tourism
335 Merchant St., Room 110
Honolulu, HI 96813

Dear Mr. Kaya:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of October 15, 1993 to the Governor, State of Hawaii.

Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

FACILITIES COPY

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

October 28, 1993

Office of the Governor
c/o Office of Environmental Quality Control
State of Hawaii
Honolulu, Hawaii 96813

12-32

Dear Sir:

SUBJECT: Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

We have reviewed the subject DEIS and have determined that the proposed restoration of the memorial park and natatorium will have no impact on the public schools.

Thank you for the opportunity to comment.

Sincerely,

Charles T. Toguchi
Superintendent

CTT:hy(aw)

cc: A. Suga, OBS
E. Masagatani, HDO
E. Lau, DLNR, HLD
E. Pskowski, Leo A. Daly

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

NOV 7 1994

REF:WL-LN

KEITH W. AHUE, Chairperson
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
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WATER AND LAND DEVELOPMENT

Herman Aizawa, Ph.D.
Superintendent
Department of Education
State of Hawaii
P.O. Box 2360
Honolulu, HI 96804

Dear Dr. Aizawa:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of October 28, 1993 to the Governor, State of Hawaii.

Should you have any questions, please call Mr. Manabu Tagomori of the Division of Water and Land Development at 587-0230.

Very truly yours,

KEITH W. AHUE
Chairperson

University of Hawaii at Manoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawaii 96822
Telephone: (808) 956-7361

December 7, 1993
RE:0638

Governor of Hawaii
c/o Office of Environmental Quality Control
220 South King Street, Suite 400
Honolulu, Hawaii 96813

12-33

Dear Governor:

Draft Environmental Impact Statement
Waikiki War Memorial Park and Natatorium
Honolulu, Oahu

The referenced project proposes to completely restore the Waikiki War Memorial Park and Natatorium, located in the Diamond Head/Kapiolani Park Special District. The restoration criteria for the pool are to retain the existing configuration of the Natatorium while providing for an active circulation of ocean water throughout the pool. The existing pool deck and portions of the seawall that are above the top of the existing pool deck will be removed and reconstructed. Plans also call for reconstruction of the existing bleachers and upgrading existing utilities to conform to current standards and codes. The existing vehicle and pedestrian circulation will be maintained and brought up to current standards and codes.

We have been assisted in this review by Christine Woolaway, Sea Grant; Jacquelin Miller and Huilin Dong, Environmental Center.

General Comments

The document seems to address most concerns relative to the potential impacts of the project. However, technical information presented in the DEIS is insufficient to assess the adequacy of the proposed flushing system. Also, traffic impact mitigation measures appear to be inadequate, and the DEIS fails to consider some potential liabilities to the State.

Water Circulation

Regarding the flushing system, as Dr. Carlson has pointed out, the renovated pool will isolate the enclosed water body from wave action, thereby providing an ideal sedimentation basin. However, in the absence of specific construction details such as the cross-sectional area of the inlet and outlet conduits, the precise volume of enclosed water, bathymetric features of the adjacent ocean bottom, longshore current drift, wind patterns, wave set-up, and other physical parameters, we cannot evaluate the predictable residence times and sedimentation dynamics which this system will engender. Reference is made in Section 2.3 to several conceptual designs and "hydraulic model testing" of flushing parameters. Where are these data? Even if the results are considered excessively technical for the body of the DEIS, figures, dimensions, and summaries of these studies should have been included, and the full report of the engineering studies should have been appended to the DEIS.

The Look Laboratory of Ocean Engineering has, for some time, had a hydraulic model of Waikiki which has been used extensively for studies of water circulation and wave climate along the Waikiki shore. Were inquires made to use this facility? If not, why not?

Pool Design

Regarding the design of the pool, we fully concur with the comments provided by Bruce Carlson of the Waikiki Aquarium. Maintaining the cleanliness of the sand bottom from either trash or silt will be a major problem. A permanent cement bottom is essential and will greatly decrease the maintenance problems associated with trying to maintain a sand bottom (which in our opinion is impossible). From a health and safety aspect, the cement bottom will be far preferable. Besides being a solid surface that can be kept clean by vacuuming to remove silt, glass, trash, leaves, grass, etc., it will minimize turbidity due to resuspension of sand and silt from the bottom by swimmers using the pool.

Relating to the design of the pool, we also have concerns about the gratings over the inlet and outlet conduits. We suspect that if the openings are small enough to preclude entrance of unwanted marine life, i.e. jelly fish and eels, water circulation may be impaired. It may be much less problematic to pump sea water through a sand filter into an enclosed pool system and out through an overflow, rather than relying on long shore currents to flush the pool. An enclosed pool would also eliminate the need, cost, and maintenance, of the floating docks around the perimeter "to moderate the elevation from the deck to the fluctuating water level." These docks also present a safety hazard, since they impair lifeguards' visual access to swimmers that may journey (or be caught) under them.

Night time use of the pool should be included in the plans. Given the cost of the facility and potential demand for evening use, it is not reasonable to limit its use to day time

only. Evening swimming hours would appeal to many whose daily work schedules preclude daytime swim workouts. Furthermore, given the size and location of the natatorium, use for commercial evening productions should not be arbitrarily ruled out. Commercial productions, for example, an "aquacade extravaganza" type venture, might well generate sufficient funds to help maintain the facility for public use during the day. Parking for such an evening affair would be no more troublesome than using the pool during the day. The electrical system should be designed to accommodate night time public swimming and should include provisions for future expansion needs.

Parking

The project is situated near the edge of Waikiki within the boundaries of Kapiolani Park, a much favored park for family events, public recreational activities such as concerts and cultural fairs. It is located next to San Souci beach, a very popular beach frequented by local residents. Parking areas are in short supply, particularly on a normal weekend day. The proposed project will inevitably result in an increase in demand for more parking. The mitigation measures such as encouraging reliance on City bus service and weekend shuttle service are far from adequate, since they fail to address the existing and anticipated parking scarcities in the area.

In light of the above concerns and the high cost ($10 million plus), we would recommend further evaluation of the project.

Thank you for the opportunity to review and comment on the document.

Sincerely,

John Harrison, Ph.D.
Environmental Coordinator

cc: Dept. of Land and Natural Resources
Leo A. Daly
Roger Fujioka
Christine Woolaway
Jacquelin Miller
Huilin Dong

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809
OCT 27 1994

John Harrison, Ph.D.
Environmental Coordinator
University of Hawaii at Manoa
Environmental Center
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

12-35

Dear Dr. Harrison:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 7, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

Water Circulation

The flushing system was designed by Dr. Karl Bathen and Dr. Frans Gerritsen. The results of their work is available at the office of Leo A. Daly for your review. A large scale hydraulic model at Look Laboratories was considered. Due to the limited design budget numerical analyses, a simple small scale circulation modelling was completed. A short video of the circulation model is available for your viewing.

Pool Design

A hard pool bottom was considered but was found to be less satisfactory than a sand bottom. A hard bottom would be subject to much more algae growth. A constant effort to remove this material would be required. With the use of coarse sand, free from fines, disturbance of the bottom by the users would not generate significant turbidity.

In the full restoration, the gratings over the pool wall openings will only be small enough to prevent children from getting stuck between the bars. They will not be small enough to prevent small marine animals such as eels from passing through. The size and shape of the bars will minimize the constriction of the flow through these openings. The use of pumps to circulate sea water through the facility was one

option considered. When the field data showed that there is ample longshore movement of water to flush the pool, that option was not selected. A pumping system as you describe would be more costly and complex. The maintenance of such a system would also be more costly. The floating docks can be offset from the pool wall which would permit the lifeguards visual access to the areas below.

Given the desires of the City and County and the objections of the neighbors, a decision was made to not provide for night time use of the pool. Night time use would require high intensity overhead lighting. However, empty conduits for future night lighting will be provided in the full restoration.

Parking

Given the limited space available on the site and the adjoining areas, the three mitigation measures suggested in section 4.6 may be the only feasible measures which can be implemented.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

COMMISSION ON PERSONS WITH DISABILITIES

Five Waterfront Plaza, Suite 210, 500 Ala Moana Blvd., Honolulu, HI 96813, Ph. ~~548-7606 (V/TDD)~~
586-8121 (V/TDD)
586-8129 (FAX)

October 27, 1993

Mr. Edward Lau
Project Development Branch
Department of Land and Natural Resources
Division of Water and Land Development
1151 Punchbowl Street, Room 227
Honolulu, Hawaii, 96813

Dear Mr. Lau:

Regarding: Waikiki War Memorial and Natatorium Restoration
Draft Environmental Impact Statement

12-36

Our staff has reviewed the Draft Environmental Impact Statement solely with respect to access for persons with disabilities. General Comments have been provided within the document.

In Chapter 1, Section 1.6, (Necessary Permits and Approvals) reference Hawaii Revised Statues 103-50, State Access Requirements as a new section. In particular, we would like to point out that the Draft statement's various proposals involve substantial restoration/modification procedures to make the Project Site a significant multi-use facility all of which must meet the requirements as set forth by the American with Disabilities Act Accessibility Guidelines (ADAAG). New construction is required to comply with ADAAG. In addition, portions of the facility which are historic in nature must comply with Section 4.1.7 of ADAAG.

Should you have any questions or need further assistance, please do not hesitate to contact me.

Sincerely,

Gary L. Batcheller
Facility Access Technician

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
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Mr. Gary L. Batcheller
Facility Access Technician
Commission on Persons With Disabilities
State of Hawaii
Five Waterfront Plaza, Suite 210
500 Ala Moana Blvd.
Honolulu, Hawaii 96813

Dear Mr. Batcheller:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of October 27, 1993 to the Governor, State of Hawaii. We have reviewed your comments made in the copy of the Draft Environmental Impact Statement. Changes per your comments will be made and reflected in the Final Environmental Impact Statement.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

JOHN WAIHEE
GOVERNOR OF HAWAII

CONFIRMATION

KEITH AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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DONA L. HANAIKE

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

January 7, 1994

LOG NO.: 10492
DOC NO.: 9312co23

MEMORANDUM

12-37

To: Roger C. Evans, Administrator
Office of Conservation and Environmental Affairs

From: Don Hibbard, Administrator
State Historic Preservation Division

Subject: Draft Environmental Impact Statement for Waikiki War Memorial Park and Natatorium
TMK 3-1-31:3, Kapiolani Park, Oahu

Thank you for the submittal of the Draft Environmental Impact Statement for Waikiki War Memorial Park and Natatorium. We believe that the overall project will improve and enhance the continued use of the living memorial.

We believe that alternate methods of cleaning of the Memorial Arch and Arcade Walls should be explored and tested, other than the high pressure water jetting. Enclosed please find Preservation Briefs 1, The Cleaning and Waterproof Coating of Masonry Buildings and 23, Preserving Historic Ornamental Plaster; these may help in alternative methods.

We also have reservations on the dive barrier on the top of the sea wall. Although we understand the safety concerns, we recommend that alternative approaches such as signage should be further explored and considered. We look forward to reviewing the plans as they are further developed as this is a state project and will require the concurrence of our department.

Again, a reminder that it is possible that Historic sites, including human burials, will be uncovered during routine construction activities. Should this be the case all work in the vicinity must stop and the Historic Preservation Division must be contacted at 587-0047.

Thank you for the opportunity to comment.

Copy to: Edward Lau, Project Development Branch
DLNR, Division of Water and Land Development

Edward Pskowski, Consultant
Leo A. Daly, Bank of America Building, Suite 1000
1357 Kapiolani Boulevard, Hon. HI 96814-4537

enclosures

CO: ab

12-38

JOHN WAIHEE
GOVERNOR

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

October 27, 1994

TO: Dr. Don Hibbard, Administrator
State Historic Preservation Division

FROM: Manabu Tagomori

SUBJECT: Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your memorandum of January 7, 1994. We offer the following clarification and response to your review comments:

1. High pressure water jetting will not be used for the Memorial Arch and all Architectural concrete features to be restored. Water jetting may be used on large flat plastered surfaces where much of the plaster has delaminated. Alternate methods as you suggested will be explored. The final techniques will be discussed with your office before implementation. The statements on page 2-10 will be revised to clarify this.

2. Alternatives such as signage will be explored. The statements on page 2-9 will be revised to clarify this. The final treatment of the top of the seawall will be discussed with your office.

3. Should any human remains or artifacts be uncovered during the construction, all work in the vicinity will be stopped and your office notified.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

JOHN WAIHEE
GOVERNOR

REX D. JOHNSON
DIRECTOR

DEPUTY DIRECTORS
KAHANA HOLT
JOYCE T. OMINE
AL PANG
CALVIN M. TSUDA

IN REPLY REFER TO:
STP 8.5666

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

December 20, 1993

TO: The Honorable John Waihee, Governor
c/o OEQC

FROM: Rex D. Johnson
Director of Transportation

SUBJECT: Draft Environmental Impact Statement - Waikiki War Memorial Park and Natatorium, TMK: 3-1-31: 03

The proposed restoration of the Waikiki Memorial Park and Natatorium will not have a significant impact on our State transportation facilities.

We appreciate the opportunity to provide comments.

c: Mr. Edward Lau, DLNR
Mr. Edward Pskowski, Leo A. Daly

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

KEITH W. AHUE, Chairperson
BOARD OF LAND AND NATURAL RESOURCES

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WATER AND LAND DEVELOPMENT

REF:WL-LN

OCT 31 1994

12-39

Mr. Rex D. Johnson
Director of Transportation
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Johnson:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 20, 1993 to the Governor, State of Hawaii, which was received after the deadline for comments.

Should you have any questions, please call Mr. Manabu Tagomori of the Division of Water and Land Development at ext. 7-0230.

Very truly yours,

KEITH W. AHUE

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF

December 6, 1993

Planning Division

Office of Environmental Quality Control
State of Hawaii
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Sir/Madam:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Waikiki War Memorial Park and Natatorium, Honolulu, Hawaii (TMK 3-1-31: 3). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. The project will require a DA permit as stated in the draft environmental assessment. Please contact our Operations Division at 438-9258 for further information and refer to file number PO94-015.

b. The flood hazard information presented on pages 3 thru 19 of the environmental assessment is correct.

Sincerely,

Kisuk Cheung, P.E.
Director of Engineering

Copies Furnished:

Mr. Edward Lau
Department of Land and Natural Resources
Division of Water and Land Development
1151 Punchbowl Street, Room 227
Honolulu, Hawaii 96813

Mr. Edward Pskowski
1357 Kapiolani Boulevard
Honolulu, Hawaii 96814-4537

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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DONA L. HANAIKE

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Mr. Kisuk Cheung, P.E.
Director of Engineering
Department of the Army
U.S. Army Engineer District
Ft. Shafter, Hawaii 96858-5440

Dear Mr. Cheung:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 6, 1993 to the Governor, State of Hawaii. At this time work has not started on obtaining the necessary permits. We will contact your Operations Division when the permit work is started.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

12-40

United States Department of the Interior

GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

TAKE PRIDE IN AMERICA

December 2, 1993

Governor, State of Hawaii
c/o Office of Environmental Quality Control
220 South King Street
Honolulu, Hawaii 96813

Dear Governor Waihee:

Subject: Waikiki War Memorial Park and Natatorium, Draft Environmental Impact Statement (DEIS), Honolulu, Oahu

We are in receipt of the subject DEIS. We regret that due to prior commitments, we are unable to review the subject DEIS by the December 7th deadline.

As requested, we are returning the DEIS to your office for your future use

Sincerely,

William Hoyer
District Chief

Enclosure

cc: Mr. Edward Lau
Project Development Branch
Department of Land and Natural Resources
Division of Water and Land Development
1151 Punchbowl Street, Room 227
Honolulu, Hawaii 96813

Mr. Edward Pakowski
Leo A. Daly, Consultant
Bank of America Building, Suite 1000
1357 Kapiolani Boulevard
Honolulu, Hawaii 96814-4537

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
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DONA L. HANAIKE

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12-41

Mr. William Meyer
District Chief
Water Resources Division
Geological Survey
United States Department of the Interior
677 Ala Moana Boulevard, Suite 415
Honolulu, HI 96813

Dear Mr. Meyer:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 2, 1993 to the Governor, State of Hawaii.

Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

DEPARTMENT OF THE NAVY
COMMANDER
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO:
11010
Ser N4(23)/3647
27 OCT 93

Office of the Governor
Office of Environmental Quality Control
State of Hawaii
Honolulu, HI 96813

Gentlemen:

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE WAIKIKI WAR MEMORIAL PARK AND NATATORIUM, HONOLULU, OAHU, HAWAII

Thank you for the opportunity to comment on the subject Draft Environmental Impact Statement (DEIS) dated October 1993. The Navy has no comments to offer at this time.

Our point of contact is Mr. Stanford Yuen, Facilities Engineer at 471-3324.

Sincerely,

Stanford S.C. Yuen, P.E.
Facilities Engineer
By direction of
the Commander

Copy to:
Mr. Edward Lau
Department of Land and Natural Resources
Division of Water and Land Development
1151 Punchbowl Street, Room 227
Honolulu, HI 96813

Mr. Edward Pakowski
Leo A. Daly
Bank of America Building, Suite 1000
1357 Kapiolani Boulevard
Honolulu, HI 96814-4537

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
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DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
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Commander
Naval Base Pearl Harbor
Department of the Navy
Box 110
Pearl Harbor, HI 96860-5020

Dear Sir:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of October 27, 1993 to the Governor, State of Hawaii.

Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

12-42

Friends of the Natatorium

2295 NORTH KING STREET • HONOLULU, HI 96819 • PH: (808) 841-6588

Dec. 3, 1993

Office of the Governor, c/o OEQC
State of Hawaii
Honolulu, HI 96813

Subject: Draft EIS, Waikiki War Memorial Park and Natatorium

1. Page 1-3, para 1.4 in the last paragraph states that lighting for nighttime activities will not be provided.

We feel this is short-sighted and plans should be revised to include conduits in the event that lighting is deemed desirable in the future. During the 17th Legislature, people testified that the Natatorium would be used by local swimmers for physical fitness training in the early morning and late evening hours.

2. Page 2-6, para 2.d, last paragraph states that a water fountain and an exterior shower will also be provided.

In previous meetings with the Division of Water and Land Development and representatives of Leo A. Daly, we stated our objections to the notion of outside showers as not in keeping with the Purpose section as stated in the Waikiki War Memorial Park & Natatorium Planning Report Volume 2, Report R-81, page 1, para I.A. i.e. to "...restoring the Natatorium to the extent possible, *without causing any physical change to its configuration above seal level.*"

3. Page 2-9, Para 2.a. refers to adding a short diving barrier to the top of the seawall in addition to the "code required security fence" to the pool deck perimeter. The "short diving barrier" is not necessary as the security fence and the distance between the pool deck and the top of the seawall meet code requirements. The addition of the diving barrier is not in keeping with the Purpose section as stated in the Waikiki War Memorial Park & Natatorium Planning Report Volume 2, Report R-81, page 1, para I.A. i.e. to "...restoring the Natatorium to the extent possible, *without causing any physical change to its configuration above seal level.*"

4. Exhibit 4, The Facility. The floating docks depicted makes no logical sense. This 100 meter pool should be divided in two fifty meter sections by use of floating docks with baffled kick-off plates, which provide a solid base for kick-turns while providing adequate water circulation.

12-43

5. Page 2-11, para 2.g. Comfort station indicates 4 outdoor shower heads. The comments in 2. above with respect to configuration above sea level applies. The configuration above sea level should not be altered.

6. Page 2-16, para 2.3.2. Personnel costs should not include costs of three full-time water safety officers (one additional for peak time) as these costs would be covered by the City & County of Honolulu.

7. Page 3-22, para 3.3.4. states that the pool will not be capable of supporting events, but will serve as a casual swimming area.

a. On the contrary, the Hawaii Committee of U. S. Water Polo, Inc. in testimony before the 17th Legislature, testified that they annually host the Hawaiian Invitational Water Polo Tournament which is in its 25th year and includes more than 50 teams and about 600 participants from Hawaii, California, Canada Australia and New Zealand. In addition, they also host the Aloha State Games. They feel that the Natatorium would be very important as a venue, not just for the two tournaments, but as a future site for their Little League Water Polo which is scheduled to begin this Fall.

b. In the user survey conducted by Leo A. Daly and reported in Volume 2 Report R-81, several groups indicated the Natatorium would be used for swimming events requiring marked lanes.

c. The State of Hawaii should be the Pacific hub of water sports, particularly salt-water sports competition among Pacific rim nations, and the Natatorium is the logical place for such sporting events. With imagination and initiative, the sky's the limit.

Sincerely,

Linuce C. Pang

Linuce C. Pang
President

cc: Mr. Ed Lau, DOWALD
Mr. Ed Pskowski, Leo A. Daly

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

Mr. Linuce C. Pang
President
Friends of the Natatorium
2295 North King Street
Honolulu, Hawaii 96819

Dear Mr. Pang:

12-44

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 3, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

1. The decision for not providing for night time use of the facility is based on concerns of the adjoining neighbors and the City and County. Provisions for possible installation of future lights will be included in the final design.

2. The exterior shower referred to on page 2-6, section 2d, is a free standing shower on San Souci Beach. It is shown on Exhibit 4. This exhibit will be modified to clearly label this exterior shower.

3. The diving barrier as shown consists of a stainless steel rope fence. Rope was chosen to minimize the visibility of this barrier. Though it is not historically correct, some kind of barrier or device is necessary to inhibit people from jumping off of the seawall. We will continue to explore the options to minimize the impact on the viewplane.

4. The floating dock layout shown on Exhibit 4 is one possible configuration. This arrangement permits lifeguards a clear view of the underside area of the docks. These docks are modular and can be set up in other arrangements. We will be reviewing other options for the dock layouts.

5. The exterior shower referred to on page 2-11, section 2g, is a free standing shower on Sans Souci Beach discussed above in item 2.

6. The operation and maintenance costs, listed on page 2-16, list the total costs for the operating of the facility. The cost of the water safety officers is part of the total operation costs. The funds for these items will be provided by the City and County.

7. The following statement from page 3-22, section 3.3.4, "The pool will not be capable of supporting events, but will serve as a casual swimming area," will be revised. The events being referred to are sanctioned events. A key requirement for those events is that the pool be a freshwater pool. The Natatorium pool does not meet that requirement.

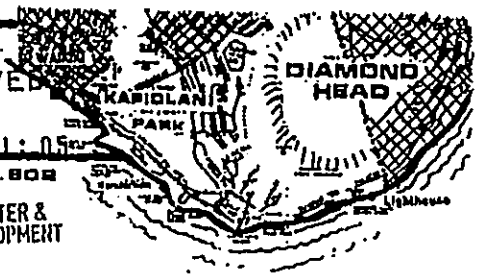
We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

WEST DIAMOND HEAD
COMMUNITY
ASSOCIATION
3015 KALAKAUA AVENUE, APT. 802
HONOLULU, HAWAII 96815



October 16, 1993

OFFICE OF THE GOVERNOR, c/o OEQC
State of Hawaii
Honolulu, Hawaii 96813

DRAFT ENVIRONMENTAL IMPACT STATEMENT
WAIKIKI WAR MEMORIAL PARK AND NATATORIUM

Dear Governor,

12-45

This letter responds to a request for comments on the DEIS for restoration of the Natatorium.

The proposal for full restoration presents a very costly undertaking for a swimming pool filled with movable floating docks. I expect this will be a disappointing result even to those who support it.

The alternative is an elaborate and costly swimming hole, protected by new walls and berms, very nearly as expensive as complete restoration.

Completely missing is the original approved alternative of a landscaped peninsula. Your attention is invited to Governor Ariyoshi's letter dated March 16, 1983 (copy enclosed) which states:

> "After the City has completed its design work, we will see how closely its plans adhere to the state's recommendation that a landscaped peninsula be developed and what additional expenses are involved."

The estimated cost for the landscaped peninsula was $2.057 million, shown on page 5 of the DL&NR Report on HCR 173 to the Legislature, 1983 Regular Session (copy enclosed).

In this era of fiscal shortages, it is strongly recommended that the landscaped peninsula be accomplished.

Sincerely,

David S. Sterrett

David S. Sterrett
President

EXECUTIVE CHAMBERS
HONOLULU

GEORGE R. ARIYOSHI
GOVERNOR

March 16, 1983

Mr. David S. Sterrett
President
West Diamond Head Community Association
3015 Kalakaua Avenue, #802
Honolulu, Hawaii 96815

Dear Mr. Sterrett:

Thank you for your letter of February 26, 1983, regarding the Natatorium.

We hope that, using the additional information provided by the Department of Land and Natural Resources, the Legislature will be able to offer more specific guidance on this matter. There are still differences of opinion over the future of this facility and the Legislature is the best forum to resolve these differences.

You correctly identified the U. S. Army Corps of Engineers as the agency whose approval is essential to the success of this project. The Corps has advised the state that nothing less than a thorough and systematic examination of the alternatives will suffice. This means that an early start would be desirable. Accordingly, I will, as you suggest, consider a request to begin planning and design work when the Legislature decides on the course of action it wants to take.

I expect that the city administration will submit a request through the City Council for an allotment to begin preliminary planning once the Legislature acts. After the city has completed its design work, we will see how closely its plans adhere to the state's recommendation that a landscaped peninsula be developed and what additional expenses are involved. At that time, I am sure that all funding authorities will wish to reassess their positions.

With warm personal regards, I remain,

Yours very truly,

George R. Ariyoshi

Present (November 1981) estimate of the cost of demolition of the Natatorium is $1.5 million. This includes removal of the bleachers, decks, and all sea walls and repairing the ocean bottom to a more natural slope. This estimate must be nearly like the cost of the "protected swimming area" option. Money saved by not tearing down the Diamond Head and makai sea walls can be used instead on fill to reinforce the two sea walls to be retained. Additional funding would ensure sufficient fill to cover the pilings.

This option is not a desirable one because the remaining sea wall may pose a hazard.

Design considerations for improving access for the handicapped are essentially the same as in Option 1.

The cost of stabilizing, patching, and smoothing out faces of the archway is estimated to be $110,000, plus 25% for contingencies and 10% for engineering.

Landscaped Peninsula (Option 3)

This is the option advanced by Warren Waterhouse. It entails saving the central archways and destroying the bleachers and decks, and using the rubble to fill in the pool. The fill area would then be grassed and landscaped. Mr. Waterhouse estimated (1981) that the total cost would be $0.5 million.

Preliminary inspection indicates that the rubble will be insufficient to fill in the pool (Fig. D). Further consideration suggests that the rubble not be used if problems created by voids in the fill must be avoided. If rubble is not used, the amount of fill is estimated to be 28,000 cubic yards. If it is used, the amount of fill is estimated to be 24,000 cubic yards. If 3/4" aggregate is used, the estimated weight of 24,000 cubic yards is 30,000 tons. The cost of filling in the pool is estimated to be:

Fill	$450,000
Top Soil	26,000
Grassing	18,000
Sprinkler	42,000
Contingency	107,000
Engineering	64,000
	$707,000

The cost of $707,000 is in addition to a $1,350,000 estimate for demolition, including $110,000 for saving the archway.* Thus, the total for Option 3 would be $2.057 million. Not included in cost estimate is the cost of a ramp for the physically handicapped.

* Lower estimate for demolition does not include repair of sea bottom or demolition of sea walls. However, it includes cost of hauling away rubble.

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
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LAND MANAGEMENT
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WATER AND LAND DEVELOPMENT

Mr. David S. Sterrett
President
West Diamond Head Community Association
3015 Kalakaua Avenue, Apt. 802
Honolulu, Hawaii 96815

12-47

Dear Mr. Sterrett:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of October 16, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

Given the importance of this beach area, the landscape peninsula was not considered an acceptable alternative which made the best utilization of this valuable beach frontage. The only acceptable alternative to the full restoration of the pool was the construction of the beach shown in the partial restoration scheme. Restoring the pool or creating a beach would be of the most benefit to the public.

In addition, the 1981 cost estimate for the landscaped peninsula is outdated and would likely be substantially higher for the following reasons:

1. The geotechnical investigation of the site has shown that it is underlain by soft sediments. If a landscaped peninsula was built on it, the area would experience very large settlements, on the order of feet. The foundations for the memorial arch and the seawall would likely require stabilization.

2. Since the peninsula requires the integrity of the seawall for stability, there may be substantial shoring and repair work required before the seawall could support the peninsula fill.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

Historic Hawai'i Foundation

December 6, 1993

Ms. Karen Chung
Division of Water and Land Development/DLNR
POB 373
Honolulu, Hawai'i 96809

Dear Ms. Chung:

Re: Testimony in support of complete restoration of the Waikiki War Memorial Park and Natatorium

Thank you for this opportunity to submit testimony supporting the full restoration of the Waikiki War Memorial Park and Natatorium. Over the years, the Foundation has been sensitive to the symbolic and historic significance of the facility and worked to find ways to preserve and protect the site. Unfortunately, in the past for various reasons, we could not support proposals for complete restoration and use.

However, upon reviewing the latest DEIS, the Foundation's Preservation Review Committee (PRC) recommended supporting the full restoration plan. Their recommendation was sent to the Executive Committee, which voted in favor of the PRC recommendation.

We therefore support full restoration relative to partial restoration because of the historic significance of the entire site, and because we favor retaining the pool. In-depth studies outlined in the DEIS adequately address pool circulation, water quality, coastal flow, and shoreline stability.

We respectfully submit testimony in favor of complete restoration of this nationally and locally significant island landmark for recreational use and as a cultural resource for the entire community.

Sincerely,

AC for Tokin
Arthur C. Tokin
Chairman, Board of Trustees

cc: Ralph E. Portmore, PRC Chair
Nancy Bannick, FON
PRC members
Dion Coschigano
Ed Pskowsky, Theo Daly
Ron Yasui, FON
Phyllis G. Fox

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
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STATE PARKS
WATER AND LAND DEVELOPMENT

Mr. Arthur C. Tokin
Chairman, Board of Trustees
Historic Hawai'i Foundation
P.O. Box 1658
Honolulu, Hawaii 96806

Dear Mr. Tokin:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of support dated December 6, 1993 to the Governor, State of Hawaii. Your interest and input for the project is greatly appreciated. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

DEC 22 '93 10:23:41 STATE/DLNR/DOFALO (808)587-0293 P.2/2

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DLNR OCEA NATURAL RESOURCES STATE OF HAWAII BOARD OF WATER & LAND DEVELOPMENT

RECEIVED 93 DEC 14 P12:45

Edward W

AM — KC —

THE OUTDOOR CIRCLE
1110 University Avenue, #406 Honolulu, HI 96826
Phone: 808-943-9638 Fax: 808-955-7364

Established 1912
Non-profit Organization
BRANCHES
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Waimea
KAUAI
MAUI
MOLOKAI
GARDEN CIRCLES
Hawaii Kai
Kaneohe
Lani-Kai
Waialae-Kahala

12-49

December 06, 1993

Governor John Waihee
Office of the Governor, c/o OEQC
State of Hawai'i
Honolulu, Hawai'i 96813

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
WAIKIKI WAR MEMORIAL PARK AND NATATORIUM

Dear Governor Waihee:

In reviewing the Draft Environmental Statement calling for the "complete" restoration of the Waikiki War Memorial Park and Natatorium, it is evident that this costly proposal will not bring about true historic restoration.

The Outdoor Circle believes top priority should be given to our coastal vistas, beaches and shoreline areas. We continue to support the concept of the "lei of green" recommended and initiated by the Circle in 1972.

> "that all buildings be set back and that all our shoreline be primarily devoted to parks and open space with all beaches and shoreline open and available to the general public with ready access."

Vladimir Ossipoff, award winning architect, whose opinions are highly esteemed, stated in 1988 that, "A portion of the Memorial could be preserved, but it would be far better to break down the wall, which is a physical and visual barrier to the ocean". We agree.

The Outdoor Circle continues to support retaining the Memorial and Arch and restoring the beach to its original condition.

Sincerely,

Susan Bright Spangler
President

cc: Keith W. Ahue, Chair, Board of Land and Natural Resources

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

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BOARD OF LAND AND NATURAL RESOURCES

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LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Ms. Susan Bright Spangler
President
The Outdoor Circle
1110 University Avenue, #406
Honolulu, Hawaii 96826

Dear Ms. Spangler

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 6, 1993 to the Governor, State of Hawaii which was received after the deadline for comments.

Please be aware that breaking down the wall and restoring the beach to its original condition would impact the stability of the neighboring beaches, principally Sans Souci Beach. The only acceptable alternative to the full restoration of the pool was the construction of the beach shown in the partial restoration scheme.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

KC:ln

AS
Alice Shelly FCSI, CCS
Specifications Consultant

1154 Fort Street Mall, Suite 405
Honolulu, Hawaii 96813
Phone & FAX (808) 536-0973

December 1, 1993

Office of the Governor, c/o OEQC
State of Hawaii
Honolulu, HI 96813

Subject: Draft EIS for Waikiki War Memorial Natatorium

I have a number of concerns regarding the restoration of the Natatorium, both in scope of work to be done and historical accuracy. Most of these concerns relate to both areas.

First let me state I am unequivocally FOR total restoration, but am concerned that some areas of this project go beyond Natatorium restoration and others don't go far enough.

First, the areas that go beyond or change the original design.

1. The addition of a "diving barrier" (last known to be a stainless steel rope fence) is not historically correct nor desirable from an aesthetic standpoint. It will detract from the view to the ocean from the Natatorium and will add several hundred thousand dollars to the cost of the project. Warning signs cast into the top of the wall (as well as in the restrooms) plus jagged glass, sharp rocks, or serrated stainless steel bars cast into the outer 2 feet of the wall top should be sufficient deterrent to divers without disturbing the viewplane.

2. Adding 2 additional tunnels to the under-bleacher area, as well as the other "cut-outs" and protrusions, detract from the scale and simplicity of the original Natatorium design. The addition of the tunnels and irregular face of the bleachers increases construction costs, and also reduces the usable interior space and exterior seating capacity.

3. The addition of patterned concrete at the entry ramp is not historically correct, was not in the original design, and should be deleted. This would also be a cost reduction.

4. The same is true for the patterned concrete walkway to the stone monument. The original old brick paving is in good condition and should be retained as is. There should be no work required in this area.

5. If a new promenade walk is added along Sans Souci Beach, it should be part of the City's expense, and not charged to the Natatorium Restoration project. If the cost is included in the estimate for the Restoration plan, it should also be included in the cost of the Demolition plan.

12-50

6. Landscaping of the park (i.e. new automatic landscape sprinklers, planting of grass, etc.) I feel is a City maintenance item for the park.

7. Similar comments apply to the proposed new picnic tables and benches. To the best of my knowledge, they were not part of the original Natatorium construction.

8. On the top of the tunnel walls, a pipe guard rail is indicated. I believe the height of these walls is sufficient to eliminate this top rail. This would also be a cost reduction.

9. I question the need for "a minimum of 4" lifeguard stands, which seem excessive and will clutter up the deck area. In any case, I recommend they be removable, with legs inserted in pipe sleeves cast into the deck. Plugs could then be inserted when the location is not in use. Other alternatives would be by frame tie-downs achored to the deck, or heavy-based stands with casters and brakes.

Second, the areas that are lacking in the EIS for the restoration.

1. Since night lighting was provided for the pool, I feel at least the empty conduits (with pull wires) for same should be included in the design.

2. Although the EIS mentions floating docks on all four sides, it does not mention a floating boom to divide the pool into separate areas as needed. Such a boom would make possible the rental or usage of a portion of the pool for water polo groups, swimming classes, lifesaving classes, racing, therapeutic swimming or water exercises sessions for the elderly and/or handicapped, while still allowing portions of the pool to remain open for general public swimming.

3. I feel the inclusion of a small concession area or alcove for soft drink vending machines would be welcomed by the users, and provide revenue to help support operating costs. The small concession stand back of the band shell across the street brings in several hundred thousand dollars a year via a concession contract. Even just soda machine would probably produce over $500 per month.

Other areas of concern are:

1. I feel the operation costs are highly inflated. Why are 3 full time life guards plus 1 extra at peak times required? Adjoining Sans Souci beach has only 1 guard and stand. I also feel 1 full time pool manager, 1 full time pool custodian, and 2 full time groundskeepers are excessive. In any event, the exterior grounds should take even less groundskeeping than currently, as an automat landscape sprinkler system is being included in this project. By comparison, the operating costs of the demolition scheme requires only 1 lifeguard and 1 groundskeeper. In addition, there is no cost included for design and construction of a separate new building for restroom facilities, which would also be required if the Natatorium is not restored.

2. The EIS mentions outside showers, but none are indicated on the site plan. I previous sessions with the City and DLNR, I thought it was agreed to put the showers inside. If additional outside showers are provided, they should be on a separate slab remote from the Natatorium at Sans Souci Beach.

3. In the History of the Natatorium Chronology (Appendix A), no mention is made of the fact that in 1987 the State Legislature passed a bill approving design fees of 1.5 million dollars for FULL restoration of the Natatorium, and the Governor signed the bill. After several years, the design contract was finally awarded, with some backpeddling by the State spending part of the money on a so-called "partial" restoration plan which requires demolishing the Natatorium. The City Council on 1/10/90 passed a law mandating the City Dept. of Parks and Recreation to maintain the Natatorium, once it is restored. The "final" decision to go with the full restoration scheme with a salt water pool was made by the State on November 11, 1990.

12-51

In general, the EIS appears very thorough in the areas of water quality and environmental impacts. I have essentially reviewed this document from the standpoint of the Natatorium structure and its historic restoration, usage, and economic viability.

Sincerely,

Alice Shelly

Alice Shelly FCSI, CCS

Copies: DLNR, Leo A. Daly, Lin Pang, Nancy Bannick, file

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
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WATER AND LAND DEVELOPMENT

Ms. Alice Shelly
1154 Fort Street Mall, Suite 405
Honolulu, Hawaii 96813

Dear Ms. Shelly:

12-52

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 1, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

1. The diving barrier as shown consists of a stainless steel rope fence. Rope was chosen to minimize the visibility of this barrier. Though it is not historically correct, some kind of barrier or device is necessary to inhibit people from jumping off of the seawall. We will continue to explore the options to minimize the impact on the viewplane.

2. The two tunnels are necessary to improve the flow of users through the restrooms and the changing room spaces for exiting and life safety purposes. They also make the spaces more useable and provide better natural interior light and ventilation. Having one tunnel act as the wet entrance and the other as the dry entrance improves the safety for the users. With only one tunnel all traffic will be over wet surfaces.

3. Though not historically identical to the existing pavement, the patterned concrete was shown to enhance the appearance of this area. The existing pavement is deteriorated and must be replaced. The additional costs to provide a texture to the new slab on grade are small. If necessary, it can be taken out and a smooth finish provided. A smooth finish would require some additional surface treatment to make it non-slip.

4. The original brick paving is intended to remain. A new curb cut and ramp will be added leading up to the brick paving. This will provide an accessible route for the disabled.

5. The extension of the promenade across the site to Sans Souci Beach is not part of the Partial Restoration Scheme. If it is included in the costs for the Partial Restoration, the costs for that option would go up.

6. The modifications to the landscaping and the addition of a new sprinkler system are necessary. The heavy construction activities anticipated would require new landscaping to be installed in order to leave the site in a useable condition.

7. Increasing the height of the tunnel walls would be required to eliminate the pipe guard rail around the tunnels. We will review this option for cost savings.

8. The minimum four lifeguard stands are based on the requirements of the lifeguards who would operate the facility. The stands will be moveable free standing units. It is anticipated that the stands will be moved around depending on the needs of the lifeguards.

9. Empty conduits for future night lighting will be provided in the full restoration.

10. A floating boom across the center of the pool is a possible configuration which the floating docks could be placed in. Exhibit 4 shows one possible configuration. Because the units are modular, they can be easily moved into different configurations. We will examine different possible configurations in the final design.

11. A provision for a small concession area is shown on Exhibit 5 in the Ewa end of the Diamond Head Bleacher.

12. The staff listed for the maintenance of the fully restored facility is based on what the operators will require. The fully restored facility is classified as a pool and requires more lifeguards than for a beach. The Partial Restoration would not have any restroom or changing facilities. Because of that, there would be less maintenance personnel required. Assistance by groups such as the Friends of the Natatorium could reduce the number of maintenance personnel required.

13. The exterior shower referred to in the DEIS is a shower located on Sans Souci Beach. It is shown on Exhibit 4, but lacks a label. This exhibit will be revised to label the exterior shower.

14. The History of the Natatorium Chronology will be revised to include significant events as you pointed out in your comments.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGOMORI
Manager-Chief Engineer

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL

EDWARD V. [illegible]

[illegible]

FACSIMILE TRANSMITTAL

(date)

TO: DLNR Div. of Water/Land Attn: Edward Lau — FAX NO. 587-0283 — PHONE NO. 587-0227

FROM: MARY-JANE McMURDO — FAX NO. 737-7886 — PHONE NO. 734-7492

SUBJECT: Natatorium EIS

Note: this is a personal & does not speak for DOD
mjm

TOTAL NUMBER OF PAGES (including cover page) 4

12-53

WAIKIKI WAR MEMORIAL PARK AND NATATORIUM
COMMENTS ON EIS BY MARY-JANE McMURDO
December 7, 1993

On the whole, the Draft EIS is a good document but there are a few areas which lack some facts and one of these is the Chronology of the History of the Natatorium, in Appendix A, Page C-1, which lists only dates through 1985. There were significant developments for several years after that, such as:

January, 1987: Governor John Waihee released funds in the amount of $1,200,000, which the Legislature had appropriated in the prior Session for the purpose of planning and design work.

1990: Planning studies completed. Saltwater design chosen.

1990: City Council passed Ordinance over the Mayor's veto, which mandates that the Department of Parks and Recreation "shall" Operate and maintain the Waikiki War Memorial Natatorium, including structure, facilities and grounds, etc. Both operating and maintenance funds were appropriated.

1992: Contract signed between Dept. of Land and Natural Resources and Leo A. Daly, Alfred Yee Division, to draw final plans and specifications for full restoration of the Natatorium as close to its 1927 appearance as possible. They were to work closely with the City Parks and Recreation, since the the City would be responsible for the maintenance.

1992: Bill introduced by Senator Mary-Jane McMurdo to appropriate funds for continuing and starting restoration. Did not pass, because priority for funds went elsewhere.

1993: Senators Donna Ikeda an Randy Iwase introduced similar appropriations bill, which failed for the same reason.

1993: Two Concurrent Resolutions, one by Senator Ann Kobayashi, and the other by Representative Lee Ihara were introduced. Supporters of the Natatorium Full Restoration, realizing that funds were scarce, wanted to be sure that Legislative intent, for Full Restoration, continued. Ihara's passed both houses.

TO CONTINUE:

The Draft EIS does not make it clear that the Administration's contract with Leo Daly was only for FULL RESTORATION, not for partial restoration! Obviously, other plans and specifications would have to done if the latter route were to be pursued, and that would cost more money and further delays--a dangerous situation, since we are talking about a structure which deteriorates daily as we procrastinate about the restoration.

Also, I believe that some of the City's "concerns" about the dangers of using the Natatorium at night are purely a form of "foot dragging", and should not have been taken so seriously by those who wrote the Draft EIS, especially since the writers go on to say that some night uses could generate significant funds. I urge the designers to install conduits since night use may become feasible.

There appear to be no reasons why the City could not charge "user fees", locker fees, towel fees, and also allow a food concession. All of this would help with maintenance fees. Many of the City's other parks collect significant revenues from food concessions.

If the lifeguards are able to expand training for their people, it would seem that the maintenance expense could be absorbed as a cost of training.

As one last recommendation, hot water showers should at least be a part of the plan and design, even if they are not used immediately. Through the years, other uses will surface and it is better to anticipate than to try to remodel in the future.

Mary-Jane McMurdo
State Senator 15th District '84-'92
469 Ena Rd. #2403
Honolulu, Hi. 96815

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Progress on Natatorium is good news for Waikiki

FRIENDS of the Natatorium are mobilizing for what they hope will be a decisive, productive year for restoring the World War I memorial and swimming pool in Waikiki.

Tangible progress has come in the form of a contract between the state Department of Land and Natural Resources (DLNR) and the architectural firm of Leo A. Daly, Alfred Yee Division, to draw final plans and specifications by November for full restoration of the Natatorium as close to its 1927 appearance as possible. The architects also are to provide the required environmental impact assessment. The architects' team, headed by Ed Pakowski, is working with the DLNR and the city Parks and Recreation Department, which would operate the restored swimming pool. If the environmental impact statement process goes as hoped, by fall the state should have in hand the documents needed for construction bids.

Friends of the Natatorium, with newly elected officers, have been mapping strategy for this legislative session and have a meeting planned for Thursday at 7 p.m. in the Manoa Library. Those interested can write to the group's headquarters at 2295 North King St. or telephone 841-6588 or 841-6585.

Eleven months ago, we noted the legislation introduced by Sen. Mary-Jane McMurdo to revive the site and the support for it by developer Jack Myers. The City Council has backed restoration, despite the Fasi administration's opposition, and John Henry Felix has taken a lead role in the Natatorium cause.

The Star-Bulletin has urged faster action on the Natatorium, at the very least to end the limbo of disrepair in which it has been left. In 1979 it was declared an off-limits safety hazard, unwanted by either city or state administrations.

Fortunately, those days of political gamesmanship have ended, and the Natatorium with its memorial archway and swimming area appears on its way back. We commend the Friends of the Natatorium, private backers, volunteers and public officials who have helped to keep the cause afloat. With fresh momentum, this is the right time to move it forward.

Bush prods North Kore

HRS WARREE
CHAIRPERSON

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT
P. O. BOX 373
HONOLULU, HAWAII 96809

OCT 27 1994

KEITH W. AHUE, CHAIRPERSON
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AQUACULTURE DEVELOPMENT PROGRAM
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HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Ms. Mary-Jane McMurdo
469 Ena Road, No. 2403
Honolulu, Hawaii 96815

12-55

Dear Ms. McMurdo:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 7, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

1. In response to your comment on the Chronology of the History of the Natatorium, additional events after 1985 will be added to the list.

2. In response to your comment on the night time use of the facility, based on concerns of the adjoining neighbors and the City and County, a decision was made to not provide for night time use of the pool. However, empty conduits for future night lighting will be provided in the full restoration. To permit night time use, the pool would require high intensity pole lights to illuminate the pool and deck.

3. In response to your comments on user fees and funding of maintenance, since the facility will be turned over to the City and County to operate, we will recommend that they consider those options also.

4. In response to your comment on hot water showers, because of cost and maintenance considerations, no provisions were made for hot water.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Edward Lau of the Project Development Branch at 587-0227.

Sincerely,

MANABU TAGMORI
Manager-Chief Engineer

The Senate
The Seventeenth Legislature
of the
State of Hawaii

STATE CAPITOL
HONOLULU, HAWAII 96813

December 6, 1993

TO: Office of the Governor, c/o Office of Environmental Quality Control

FROM: Senator Bertrand Kobayashi BK.

RE: COMMENTS ON DRAFT E.I.S. FOR NATATORIUM RENOVATION

The Natatorium needs to be restored in a workable and safe manner. The draft EIS seems to underestimate some of the problems of operating and building a suitable replacement.

1. Cost: The cost estimates in the draft EIS do not allow comparison between the complete and partial restoration alternatives and between the 1990 Leo Daly report and the 1993 draft EIS also prepared by Leo Daly.

Please see my attached letter of October 20, 1993, to Edward Lau of DLNR, who had told me that the construction costs in the draft EIS will be changed and the differences between partial and complete restoration will be increased.

See multiplication error, page 2-16, item 1.3, more funds needed for groundskeepers.

2. Maintenance and Removal of Silt: The letters in the draft EIS from Bruce Carlson of the Waikiki Aquarium, page 12-2 and 12-3, and the response to Dr. Carlson by Manabu Tagomori of DLNR, page 12-4 and 12-5, suggest to me that the problem of long-term maintenance of the Natatorium is being under estimated.

Over the years, silt has accumulated on the bottom of the current Natatorium and it seems inevitable that there will be a similar accumulation of silt in the future Natatorium. To suggest otherwise seems to be an attempt to contradict the laws of nature and considerable experience. The consultant should consult with marine biologists and oceanographers

about this problem. It should be noted that even the Waikiki Aquarium has problems within their exhibit tanks with accumulation of silt even though the water used at the Aquarium comes from a saltwater well and is, hence, cleaner with less sediment and organic matter than would be found in the ocean. If the Aquarium has to deal with the accumulation of silt, the Natatorium will eventually, over the years, also have to deal with silt. Since the silt on the bottom cannot be pumped out into the ocean, cannot be pumped into the city sewers, and cannot be pumped into tanker trucks or a settling pond without very great expense, the question remains as to how to address this long-term maintenance problem.

The Natatorium with its new design will have more surface area for algae growth with the floating docks displayed in Chapter 2 of the EIS and, hence, have more potential silt because of this underwater surface area. The consultants might benefit from examining the large tanks used by the Aquarium to trap the silt from the exhibit tanks and then determine what measures would be necessary for handling silt from the Natatorium which is many times larger than the total tank volume at the Aquarium.

The draft EIS is incorrect in stating that the original pool bottom would not require maintenance dredging as evidenced by the attached article from the Honolulu Advertiser, May 7, 1963.

3. Safety of Floating Docks: In Chapter 2, perimeter floating docks are mentioned on page 2-4 and the diagram on page 2-11 shows perimeter and interior floating docks. Two concerns arise here: (1) the maintanance of the floating docks which may or may not be minimal depending on whom you talk to, and (2) the problems of these docks to lifeguards.

The Diamond Head Neighborhood Board was told last year by DLNR and its consultants that the proposed Natatorium would not be open to swimmers when the bottom could not be seen because of murky water. Is there a liability of not being able to see swimmers who are underwater under the floating docks? Or is the problem of not being able to see the bottom separate from the question of not being able to see under the floating docks? Personally, I would suggest that floating docks be kept to a minimum and that the interior floating docks displayed on page 2-11 be eliminated. Why have a 100 meter pool if it is to be sectioned into smaller units by floating docks?

4. Design Guarantee: Given that the consultant has made a 180 degree change in an important aspect of the design of the Natatorium, I am wondering what guarantees exist that the proposed design will work.

About three years ago, the consultant, Leo Daly, stated that the sand bottom of the Natatorium would have to be raked almost daily in order to maintain the bottom at a specified depth and to keep sand from accumulating in certain spots. At that time, the bottom was designed with the deep end toward the Aquarium and the shallow end toward Diamond Head. Given the virtual impossibility of raking the bottom of the Natatorium almost daily, the design was changed to that of a level bottom without a deep or a shallow end.

The draft EIS does not explain why the bottom does not have to be raked almost daily with the level bottom. On page 2-9 the following sentence appears: "The deep Ewa end where the flow enters is dredged reef with no significant sand deposits to intrude into the pool." This sentence, given the phrasing "deep Ewa end", may have been written when the original design with the deep and shallow ends was still being considered. Nonetheless, if we accept that there are "no significant sand deposits to intrude into the pool" at the Ewa end, then why was it the case that the consultant's earlier opinion was that the bottom of the pool would have to be raked almost daily and not so now with the current proposal.

There is a lack of explanation as to why the current design will work and why the design will not have problems with circulation and clogged openings. The draft EIS provides conclusions (page 3-6) but lacks the explanation behind the conclusion.

detailed breakdowns not found with the complete restoration cost estimates on page 2-15. It would seem that the $7.99 million cost estimate is a very rough ballpark guess which may or may not have any substantive details behind it whereas, as you pointed out in our phone conversation, the cost estimates for partial restoration, contains breakdowns and dollar figures down to the last dollar (e.g., foundation $577;386, exterior wall construction $241,235, beach and deck areas $2,558,856, etc.).

Further, the 12 percent add-on for general conditions and individual costs for complete restoration seems to be a 12 percent fudge factor added to avoid details. What are "general conditions and individual costs" anyway, except almost anything? Could this term be defined, if used, in the final EIS?

It would seem that Leo Daly and Associates should present a report such as they did in 1990, Report R-81, Job #82-OP-E, in which they presented similar cost estimate categories and similar level of detail for the two alternatives. See attachments.

There seems to be no reason why Leo Daly should not give you material in 1993 that is at least as good as what they had previously given you in 1990.

Sincerely

Bertrand Kobayashi
State Senator

cc: Leo Daly, Attn: Edward Pakowski
Office of Environmental Quality Control
Interested Parties

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

KEITH W. AHUE, Chairperson
BOARD OF LAND AND NATURAL RESOURCES

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HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REF:WL-LN

OCT 31 1994

Honorable Bert Kobayashi
Senator, District 10
State Office Tower, Room 401
235 South Beretania Street
Honolulu, Hawaii 96813

Dear Senator Kobayashi:

Draft Environmental Impact Statement (DEIS)
Waikiki War Memorial Park and Natatorium

Thank you for your letter of December 6, 1993 to the Governor, State of Hawaii. We offer the following clarification and response to your review comments:

1. Cost

The cost estimate for the full restoration has been reformatted to match the format used for the partial restoration in the 1990 Planning Report. For both the full and the partial restoration cost estimates, the construction cost for each individual item has been revised to 1993 dollars. An escalation percentage will be used to escalate the construction costs to the start of construction. Note that the contingency for the partial restoration is higher than for the full restoration (10 percent versus 6 percent). This is due to the fact that the partial restoration cost estimate is based only on the schematic plans shown in the planning report. The full restoration cost estimate is based on a complete set of prefinal drawings and specifications. The math error on page 2-16, item 1.3 will be corrected.

2. Maintenance and Removal of Silt

A simple comparison of the Natatorium Pool and the Aquarium's exhibit tanks is not possible because of the following major differences. The first is that the water from the ground water from the well is many times higher in nutrients than the ocean water. This high amount of nutrients causes high amounts of biostimulation, much higher than would occur in the Natatorium, which in turn contributes to generating biological debris. The second major difference is that the exhibit tank is a captive artificial environment. The exhibit is not a complete ecosystem which can process the biological debris being generated. In contrast, the Natatorium pool will be part of a flow through natural ecosystem.

For instance, I would be concerned about sand clogging the opening at the Diamond Head end given the statement, page 3-5, that "Some of the sand from San Souci beach finds it (sic) way along the southern seaward corner of the Natatorium due to an offshore transport component."

Given the proposed groin at the southern seaward corner, the volume of sand at San Souci beach, and strong Kona wave action at least several times yearly, will the proposed groin act as a trap for sand to accumulate at the southern openings? The proposed groin seems to me to have the opposite effect of protecting the opening when the wave activity is from the opposite direction.

Attach.

12-58

The Senate
The Seventeenth Legislature
of the
State of Hawaii

STATE CAPITOL
HONOLULU, HAWAII 96813

October 20, 1993

Mr. Edward Lau
Project Development Branch
Department of Land and Natural Resources
1151 Punchbowl Street, Room 227
Honolulu, HI 96813

Dear Ed:

Thank you for the information you provided yesterday about the cost estimate for the Natatorium in the draft EIS of October, 1993. It is my understanding that the discrepancies contained in the construction costs in the draft EIS between the complete restoration and partial restoration will be resolved in the final EIS and that, according to your phone conversation with Clifford Lau of Leo Daly, the cost difference between the complete versus partial restoration alternatives will be increased to approximately $2 million.

Personally, I believe that this draft EIS should never have been accepted and never made public in this form because of the extremely sloppy and careless apples vs. oranges comparison between the dollar costs of the two alternatives. To have used for the complete restoration alternative# 1993 dollars with 3 percent escalation and 6 percent contingency and then to have used for the partial restoration alternative 1990 dollars with 10 percent escalation and 10 percent contingency is an error so big as to suggest gross carelessness.

May I request that to further aid in comparing the dollar costs of the two alternatives, that you request that the cost estimates be made along similar lines without the lump sum of $7.99 million for architectural and structural costs as contained in the draft EIS, page 2-15.

The cost estimates of the partial restoration alternative on page 6-8 of the EIS contains more

In the design work for the full restoration, a geotechnical investigation was conducted by our soils engineering consultant. Soil borings and test pits in the bottom of the pool were made. One of the items investigated was the sediments on the bottom of the pool. The sampling of the bottom showed it to be silty sand consistent with the geology of the site. The bottom of the existing pool was dredged into a thick deposit of silty sand. There does not appear to be a significant accumulation of silt on the pool bottom. Based on this, it does not appear that the Honolulu Advertiser article you sent us regarding maintenance dredging is correct in that aspect. The article is correct in that the existing pool has a major problem with the poor circulation. That is the primary cause of the degraded water condition and not the bottom sediments as it appears to suggest. There is no indication that dredging of the bottom is needed.

3. Safety of Floating Docks

The floating docks proposed have been used extensively in the marine environment and have held up well. They are light modular units which can be handled without special equipment. This also makes them easily maintained.

The arrangement of the floating docks shown in Exhibit 4 is one possible configuration. One key aspect of the docks, which was developed with input from the City and County Water Safety personnel, is to offset the docks from the edge of the pool. This is done to address the concern you have stated regarding visibility under the floating docks. With the docks offset from the wall, lifeguards around the pool can easily see under the docks . In the final design, other possible arrangements of the floating docks will be studied. The floating docks are moveable with more than one arrangement made.

12-59

4. Design Guarantee

In the presentation by Leo Daly three years ago, a statement was made that the sloping sand bottom of the pool may require daily raking. The purpose of the raking would be to maintain the slope in the sand. Under foot traffic, sand on a sloping profile will migrate downhill until the slope becomes flat. At the time of that presentation, the concept of a sloping bottom with a shallow and a deep end was being considered. As a direct result of your concerns and those of the City and County Parks Department regarding this raking, the sloping sand bottom was changed to a flat sand bottom which is stable.

The statement on page 2-9, "The deep Ewa end," refers to the deep dredged channel off of the Ewa side of the Natatorium. We will revise that statement to make it clearer.

Due to the refraction of the incoming waves, all waves approach the Makai face of the Natatorium seawall from a 5 to 10 degree direction perpendicular to the face of the wall. Even during Kona storms this has been the situation. The proposed small stub breakwater is oriented to protect the openings from these waves without changing the wave climate at that adjoining beach. The orientation of the breakwater is also important to insure that the strong exiting pool flow follows the existing circulation pattern thereby offsetting any impacts of the stub breakwater. The bottom of the

openings at this location are placed above the sea bottom which will prevent sand from entering and blocking these openings.

We thank you for your interest and input for the project. We hope that we have addressed your concerns. Should you have any questions, please call Mr. Manabu Tagomori of the Division of Water and Land Development at 587-0230.

Very truly yours,

Keith W. Ahue

KEITH W. AHUE

12-60

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The ocean water swimming pool was declared unfit for swimming and closed by State Parks and Health Department officials.

"We don't have the necessary dredging equipment, Nobriga said last night.

"We have to have men go down and dig out the sand by hand with buckets," he continued.

Natatorium To Stay Closed

KOY MAY 7 1963

The War Memorial Natatorium in Waikiki remains closed while City Parks officials ponder a dual problem of accumulated muck on the pool bottom and sluggish water circulation.

State Health Department tests showed "poor circulation" in the naturally fed and flushed pool but no strong sign of pollution, a State sanitation engineer reported.

• • •

CITY PARKS director Theodore Nobriga yesterday received a letter from the Health Department reporting the test results, requesting "corrective maintenance" and leaving the next step up to the City.

The sanitation engineer also said the weak-circulation condition in the pool has improved with tides higher than when the pool was closed April 23 because of the stagnant smelly water.

Nobriga said he would have to check back with the Health Department, because he tried to have the pool bottom suction-dredged several years ago but the Health people would not allow the material to be dumped offshore.

• • •

NOBRIGA ALSO said the pool would remain closed while natatorium workers watched the effects of tidal action. The swimming facility is fed and flushed by tidal action, but when the original portholes became clogged, new openings were made at a higher level.

Now the sea water doesn't come and go if tides stay low.

Training Proposed in Natatorium

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"But it's almost impossible to train them while with other animals . . . if we could have 25 yards of the natatorium—it would certainly be a great help to us," he said.

Mowbray has already had one experience with the natatorium. Several weeks ago some pranksters freed one of the 65-pound freshwater snapping tortoises and it was found swimming happily in the public pool.

Although characteristically a fresh water animal, one of 13 species at the aquarium, he said the salt water had "no harmful effect" on the tortoise.

"And he came from Texas only three weeks ago."

In the design work for the full restoration, a geotechnical investigation was conducted by our soils engineering consultant. Soil borings and test pits in the bottom of the pool were made. One of the items investigated was the sediments on the bottom of the pool. The sampling of the bottom showed it to be silty sand consistent with the geology of the site. The bottom of the existing pool was dredged into a thick deposit of silty sand. There does not appear to be a significant accumulation of silt on the pool bottom. Based on this, it does not appear that the Honolulu Advertiser article you sent us regarding maintenance dredging is correct in that aspect. The article is correct in that the existing pool has a major problem with the poor circulation. That is the primary cause of the degraded water condition and not the bottom sediments as it appears to suggest. There is no indication that dredging of the bottom is needed.

12-61

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12-62

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Thursday, Dec. 5, 1963 Honolulu Star-Bulletin 21

Training Proposed in Natatorium

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"And he came from Texas only three weeks ago."

JOB NO. 82-OP-E

WAIKIKI WAR MEMORIAL PARK & NATATORIUM

Kapiolani Park, Honolulu, Oahu, Hawaii

Report R-81

Prepared by:

Leo A. Daly

12-63

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Water and Land Development
Honolulu, Hawaii
June 1990

Cost Estimates

1. Construction Costs *

Item/Description	Quan	Unit	1990 Dollars
General & Special Conditions	1	LS	$ 2,434,300
Foundations	1	LS	$ 2,157,753
Structural Systems	1	LS	$ 576,856
Exterior Wall Construction	1	LS	$ 877,141
Swimming Pool & Deck Area	1	LS	$ 1,111,043
Bleachers	1	LS	$ 102,721
Interior Construction and Finishes	1	LS	$ 328,800
Plumbing	1	LS	$ 78,030
Fire Protection	1	LS	$ 28,000
Air Conditioning and Ventilation	1	LS	$ 72,800
Electrical	1	LS	$ 250,000
Sitework	1	LS	$ 815,318
Landscaping	1	LS	$ 86,643
Equipment	1	LS	$ 25,000
Demolition	1	LS	$ 445,090
Total-ESTIMATED CONSTRUCTION COST (ECC)			$ 9,389,495
ESCALATION - 10%			$ 938,950
Total - ESCALATED ESTIMATED CONSTRUCTION COST (EECC)			$10,328,445
CONTINGENCY - 10%			$ 1,032,845
Total - CURRENT WORKING ESTIMATE (CWE)			$11,361,290
Rounded			$11,400,000

* See Planning Report, Appendix C for Detailed Cost Estimates.

Cost Estimates

1. Construction Costs*

Item/Description	Quan	Unit	1990 Dollars
General & Special Conditions	1	LS	$ 2,194,800
Foundations	1	LS	$ 577,386
Structural Systems	1	LS	$ 116,250
Exterior Wall Construction	1	LS	$ 241,235
Beach & Deck Area	1	LS	$ 2,558,856
Plumbing	1	LS	$ 21,000
Electrical	1	LS	$ 60,000
Sitework	1	LS	$ 2,088,760
Landscaping	1	LS	$ 127,225
Equipment	1	LS	$ 3,500
Demolition	1	LS	$ 476,466
Total-ESTIMATED CONSTRUCTION COST (ECC)			$ 8,465,578
ESCALATION - 10%			$ 846,558
Total- ESCALATED ESTIMATED CONSTRUCTION COST (EECC)			$ 9,312,136
CONTINGENCY - 10%			$ 931,214
Total - CURRENT WORKING ESTIMATE (CWE)			$10,243,350
Rounded			$10,200,000

* See Planning Report, Appendix C for Detailed Cost Estimates.

DIVISION OF WATER AND LAND DEVELOPMENT
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII

This Environmental Document is Submitted
Pursuant to Chapter 343, HRS

DRAFT ENVIRONMENTAL IMPACT STATEMENT
WAIKIKI WAR MEMORIAL PARK AND NATATORIUM
Honolulu, Oahu, Hawaii

PROPOSING AGENCY:

Division of Water and Land Development
Department of Land and Natural Resources
P.O. Box 373
Honolulu, Hawaii 96809

ACCEPTING AGENCY:

Governor, State of Hawaii

Keith W. Ahue
Chairperson
Board of Land and Natural Resources

Prepared by:

Leo A. Daly
1357 Kapiolani Blvd., Suite 1000
Honolulu, Hawaii 96814

2.3 Use of Public Funds or Lands

The Waikiki War Memorial Park and Natatorium are owned by the State of Hawaii and are to be managed by the City and County of Honolulu (pursuant to Ordinance No. 90-1.)

The following costs required to restore the Natatorium would be appropriated by State of Hawaii Legislative authorization.

1. Construction Costs

Item/Description	Quan	Unit	1993 Dollars
Site Work	1	LS	$ 722,000
Architectural & Structural	1	LS	$ 7,999,000
Plumbing	1	LS	$ 178,000
Electrical	1	LS	$ 421,000
SUBTOTAL			$ 9,320,000
General Conditions and Individual Cost - 12%			$ 1,118,400
Total-ESTIMATED CONSTRUCTION COST (ECC)			$10,438,400
ESCALATION - 3%			$ 313,200
Total - ESCALATED ESTIMATED CONSTRUCTION COST (EECC)			$10,751,600
CONTINGENCY - 6%			$ 645,100
Total - CURRENT WORKING ESTIMATE (CWE)			$11,396,700
Rounded			$11,400,000

12-65

Sewer

No sewer service is required.

Drainage

Partial restoration of the Natatorium presents no potential drainage problem. Additional drainage work is not required.

Exterior Lighting

Roadway parking lighting will match existing period lamp posts. Lighting wil provide enough illumination for safety and security but will not distract fron the Memorial Illumination.

6.1.4 Cost Estimates

1. Construction Costs

Item/Description	Quan	Unit	1990 Dollars
General & Special Conditions	1	LS	$ 2,194,800
Foundations	1	LS	$ 577,386
Structural Systems	1	LS	$ 116,250
Exterior Wall Construction	1	LS	$ 241,235
Beach & Deck Area	1	LS	$ 2,558,856
Plumbing	1	LS	$ 21,000
Electrical	1	LS	$ 60,000
Sitework	1	LS	$ 2,088,760
Landscaping	1	LS	$ 127,225
Equipment	1	LS	$ 3,500
Demolition	1	LS	$ 476,466
Total-ESTIMATED CONSTRUCTION COST (ECC)			$ 8,465,578
ESCALATION - 10%			$ 846,558
Total - ESCALATED ESTIMATED CONSTRUCTION COST (EECC)			$ 9,312,136
CONTINGENCY - 10%			$ 931,214
Total - CURRENT WORKING ESTIMATE (CWE)			$10,243,350
Rounded			$10,200,000

REFERENCES

NATATORIUM EA/EIS REFERENCES

1. City and County of Honolulu. Department of Parks & Recreation. March 1985. Waikiki War Memorial Park and Natatorium, Kapiolani Park, Honolulu, Hawaii, Final Historical Background Report.

2. City and County of Honolulu. Department of Parks & Recreation. March 1985. Waikiki War Memorial Park and Natatorium, Kapiolani Park, Honolulu, Hawaii, Final Preliminary Planning Report.

3. City and County of Honolulu. Department of Parks & Recreation. January 1983. Waikiki 2000: Kapiolani Park Master Design Plan.

4. Gerritsen, Franciscus, "Beach and Surf Parameters in Hawaii," Sea Grant Technical Report UNIHI-SEAGRANT-TR-78-02, June 1978.

5. Leo A. Daly. May 1989. Preliminary User Survey Report for Waikiki War Memorial and Natatorium. Prepared for the State of Hawaii, Department of Land and Natural Resources, Division of Water and Land Development.

6. Leo A. Daly. June 1990. Waikiki War Memorial Park & Natatorium Planning Report. Prepared for the State of Hawaii, Department of Water and Land Development.

7. Scientific Environmental Analyses Ltd., January 1992, Quantitative Analysis of Marine Macrobiota in the Vicinity of the Waikiki Natatorium, Prepared for Leo A. Daly.

8. State of Hawaii. Department of Business, Economic Development & Tourism, November 1991, The State of Hawaii Data Book 1991.

9. Y. Ebisu & Associate, April 1992, Acoustic Study for the Waikiki War Memorial Natatorium, Prepared for Leo A. Daly.

10. Revised Ordinances of Honolulu, Article 13, Section 41, Protective Register for Exceptional Trees, 1990.

APPENDIX A

HISTORY OF THE NATATORIUM
CHRONOLOGY

1877 King Kalakaua designates as "parkland", the land on which the Natatorium, the Aquarium and Sans Souci Beach are located.

1896 Lands where Natatorium is located were deeded to W.G. Irwin by Sanford B. Dole, President of the Republic of Hawaii. (July 1)

1919 Act 191 (P. 257 - S.L. 1919) Legislature of the Territory of Hawaii appropriated $200,000.00 for purchase of Irwin property and specified that it be used for park purposes. July 1, 1919 - LOD No. 1925 T.H. The cost of the land was payable by three counties and the City.

1919 L.O.D. No. 1925 T.H. acquired 6.4 acre site from William G. Irwin Estate. Deed recorded October 4, 1919 Liber 525, pg. 274 - Cons. $200,000.00 (July 1)

1920 Governor C.J. McCarthy's Executive Order No. 73 set aside the 6.4 acre site for park purposes, "the same to be cared for managed and controlled by the City and County of Honolulu, until the Legislature shall otherwise provide". (May 17)

1921 Act 15 (P. 21 - S.L. 1921) appropriated $250,000.00 "to provide a memorial to the men and women of Hawaii who served during the great war". A bond issue authorized in this amount to be payable by the three counties and the City. This act also authorized the Governor to appoint a "Territorial War Memorial Commission of three members to conduct an architectural competition for the design of the memorial. The plans shall include a swimming course at least 100 meters in length." $10,000.00 was appropriated from the general fund for the expenses, including the awarding of prizes by the commission. Mr. Lewis P. Hobart, Architect, won the design competition.

1923 Act 14 (P. 11 - S.L. 1923) amended Section 4 Act 15. Amendment allowed counties to raise tax rate to repay bonds.

1925 Act 111 (P. 129 - S.L. 1925) further amended Act 15. Amendment directed Natatorium to be built within appropriation.

1927 The Natatorium, constructed by Mr. T.L. Cliff, was completed and opened. "The actual ceremonies were colorful and dignified. 'Duke' Kahanamoku--who traveled from Los Angeles to open the pool on his birthday--made the first swim, emerging at the end of the 100 meters to a thunderous ovation. It was an unforgettable moment--the man who symbolized the Hawaiian people to the rest of the world, opening a memorial whose design captured so well the character of the Territory and its relationship to the sea." (August 24)

1929 Honolulu Star Bulletin Article "When Will Something Be Done?" described the deplorable condition of Natatorium and grounds as maintained by City and County of Honolulu. (June 7)

1929 Governor McCarthy's Executive Order No. 73 cancelled by Governor Farrington's Executive Order No. 359. (June 17)

1929 Governor Farrington issued Executive Order No. 360 which set aside 6.4 acre Natatorium site to the Department of Public Works, T.H. pursuant to Act 255 (S.L. 1929) which provided for the transfer of the care and maintenance Natatorium site to the Territory of Hawaii Department of Public Works from the jurisdiction of the City and County of Honolulu. (June 17)

1929 Contract awarded to Mr. T.L. Cliff for dredging and enlarging deep section of pool.

1941 to 1943 Natatorium used by U.S. Army for training purposes.

1949 Natatorium was repaired and refurbished for $81,886 by United Construction Company.

1949 Act 6 (S.B. No. 66 - S.L. 1949) transferred operation, management and appropriations for the Waikiki War Memorial Natatorium to the City and County of Honolulu, Board of Parks and Recreation. (July 1)

1951 Governor Farrington's Executive Order No. 360 cancelled by Governor Long's Executive Order No. 1445. (June 14)

1951 Governor Long's Executive Order No. 1446 transferred the management and operation of the Natatorium site to the City and County of Honolulu, Board of Parks and Recreation pursuant to Act 6 (S.B. No. 66 - S.L. No. 1949). (June 14)

1952 Governor Long's Executive Order No. 1536 withdrew 102,210 sf. (2.3 acres) of land from Executive Order No. 1446 and set aside same for U.H. Waikiki Aquarium site. (November 25)

1963 Natatorium closed due to poor water quality (Honolulu Advertiser - May 7, 1963). (April 23)

1964 City and County Building Department report on the hazardous conditions of the structure. (September 9)

1965 The planning and engineering firm of Donald Wolbrink & Associates, Inc., study of the hazardous conditions of the Natatorium. (April 15)

1965 City Council votes to demolish Natatorium upon recommendation by Mayor Neal S. Blaisdell. (June 8)

1965 U.S. River and Harbor Act of 1965 authorizes Beach Erosion Control Improvements for Waikiki Beach with plans to be developed jointly by Department of Transportation, The City and County of Honolulu and the U.S. Army Corps of Engineers.

1972 Funds for Beach Erosion Control Project appropriated again by Congress. $1.3 million appropriation to be used for demolition of Natatorium and beach restoration (including several groins) from Sans Souci Beach to Queen's Surf. Plans for such a project were developed by the U.S. Army Corps of Engineers and the State Department of Transportation. The City Administration, The Department of Land and Natural Resources, and various local organizations such as the Chamber of Commerce, approved the plan.

1973 Land Board agenda Item F-29, Land Board approves and recommends cancellation of Governor's Executive Order No. 1446 in order that the demolition project may be implemented. (July 13)

1973 The Natatorium Preservation Committee filed suit in First Circuit Court against U.S. Army Corps of Engineers and State Department of Transportation for injunction enjoining and restraining them from demolishing the Natatorium. Trial Court ruled against the Natatorium Preservation Committee, but upon appeal, the State Supreme Court ruled in their favor and reversed the Trial Court's decision. (October)

Due to the above action, no follow-up of the Land Board's action to cancel Governor's Executive Order No. 1446 was made by DLNR.

1973 The Waikiki War Memorial Natatorium was placed on the Hawaii Register of Historic Places. (February 5)

1975 Senate Bill No. 384 - Appropriation of $500,000 for the restoration of Waikiki Natatorium requiring matching funds by the City and to be expended by the City.

1977 Act 9 - Special session of the legislature appropriated $323,000 for planning of the demolition of the Natatorium.

1979 City and County of Honolulu - City Council Resolution No. 79-89: (April 25)

"a. Return the management and operation of the Waikiki War Memorial Natatorium and adjacent lands to the State of Hawaii;
b. The City and County of Honolulu petitioning the State of Hawaii to cancel Executive Order No. 1446; and
c. The State of Hawaii to determine the ultimate use and disposition of the Natatorium."

1979 Natatorium officially closed. (June)

1980 Waikiki War Memorial Natatorium placed on National Register of Historic Places. (May 23)

1980 Natatorium facility padlocked. (December)

1981 Senate Resolution #209 requested report by DLNR on the disposition of the Natatorium. (April 22)

1981 DLNR Report - "Waikiki War Memorial Natatorium" report studied options of: restoration with public funds, private development, demolition, and the option of constructing a new inland saltwater pool. Report recommendation: A survey to be funded by the Legislature to determine if the public wants the Natatorium restored or a beach built in place of the Natatorium.

1982 City issued Kapiolani Park Master Planning Report. Report suggested Natatorium area to become passive park area for beach goers and picnickers.

1982 House Concurrent Resolution No. 173 resolved:

a. That the memorial purpose can be served in the form of a park with a memorial memento such as a plaque or the archway.

b. That the Governor should withdraw Executive Order No. 1446, then set aside the same lands for the sole purpose of a Memorial Park.
c. That all lands now under the operation of Executive Order No. 1446 to be under the management and control of the City and County of Honolulu.
d. That commercial use is inappropriate to the Memorial Park and adjacent area.
e. That the present condition of the Natatorium is hazardous and unsightly.
f. That preservation of the Natatorium in its present form would serve no public purpose.
g. That reluctantly, the bulk of the Natatorium structure must be demolished.
h. That a study is needed to analyze design options of:

   1. Complete beach restoration following demolition of the Natatorium.
   2. Conversion of the Natatorium pool area into a landscaped peninsula.
   3. Conversion of all or part of the makai walls to act as a groin for beach areas.

1982 Appropriation of $500,000 for planning and engineering included in 1982 State budget.

1983 DLNR Report - "Waikiki War Memorial Park and Natatorium". Report on HCR No. 173 to the 1983 Legislature.

1983 Kapiolani Park Master Design Plan defined policy of City to create passive use of Natatorium area. Plan concurred with options listed in HCR No. 173.

1984 Governor Ariyoshi released funds ($100,000) for a planning and feasibility study of the Natatorium.

1984 Preliminary Planning Report for the Waikiki War Memorial Natatorium assigned to The CJS Group-Architects, Ltd. by the City and County of Honolulu using State appropriated funds. (May) 1984.

1984 Board of Land and Natural Resources recommended to Governor Ariyoshi to issue an Executive Order cancelling Executive Order No. 1446 and reset aside the land for a "Memorial Park". (March 23)

1984 Governor Ariyoshi issued Executive Order No. 3254 to cancel Executive Order No. 1446. This Executive Order is subject to disapproval by the Legislature by two-thirds vote of either the Senate or House of Representatives or by majority vote of both. (July 11)

1984 Governor Ariyoshi issued Executive Order No. 3261 which reset aside the Memorial Park to be under the control and management of the Department of Parks and Recreation of the City and County of Honolulu. Note that the word "Natatorium" has now been deleted.

1984 At a public hearing at the Waikiki/Kapahulu Library, The CJS Group-Architects, as consultants to the Department of Parks and Recreation of the City and County of Honolulu, presented three alternative schemes for the natatorium area. (November)

1985 The release of the final reports entitled:

The Waikiki War Memorial Park and Natatorium Final Preliminary Planning Report

The Waikiki War Memorial Park and Natatorium Summary of the Preliminary Planning Report

The Waikiki War Memorial Park and Natatorium Background Historical Report

In 1984 with funds from the State Legislature, the Department of Parks and Recreation of the City and County of Honolulu contracted a study of three basic options for the renovation of the Natatorium area.

The Natatorium's more recent history continues as follows:

January, 1987: Governor John Waihee released funds in the amount of $1,200,000, which the Legislature had appropriated in the prior Session for the purpose of planning and design work.

1990: After studying the Complete and Partial Restoration alternatives in the detailed Planning Report by the Leo A. Daly team, the State and the City and County decided that the Complete Restoration alternative should be pursued.

1990: City Council passed Ordinance 90-1 over the Mayor's veto, which mandates that the Department of Parks and Recreation "shall" Operate and maintain the Waikiki War Memorial Natatorium, including structure, facilities and grounds, etc. Both operating and maintenance funds were appropriated.

1992: Contract signed between Dept. of Land and Natural Resources and Leo A. Daly, Alfred A. Yee Division, to draw final plans and specifications for full restoration of the Natatorium as close to its 1927 appearance as possible. They were to work closely with the City Parks and Recreation, since the City would be responsible for the maintenance.

1992: Bill introduced by Senator Mary-Jane McMurdo to appropriate funds for continuing and starting restoration. It did not pass, because priority for funds went elsewhere.

1993: Senators Donna Ikeda and Randy Iwase introduced similar appropriations bill, which failed for the same reason.

1993: Two Concurrent Resolutions, one by Senator Ann Kobayashi, and the other by Representative Les Ihara were introduced. Supporters of the Natatorium Full Restoration, realizing that funds were scarce, wanted to be sure that Legislative intent, for Full Restoration, continued. Ihara's Resolution passed both houses.

1993: The Environmental Impact Statement Preparation Notice for the Waikiki War Memorial and Natatorium Restorations published in the Office of Environmental Quality Control (OEQC) Bulletin on March 23, 1993. While the normal review and comment period would have ended on April 22, 1993, it was extended to May 6, 1993 at the request of the State of Hawaii Department of Health. Only one (1) written comment was received, that being from the Director, Waikiki Aquarium.

1993: The Draft Environmental Impact Statement for the Waikiki War Memorial and Natatorium Restoration was published in the Office of Environmental Quality Control (OEQC) Bulletin on October 23, 1993 with a review and comment period ending December 7, 1993. While many of the numerous written comments were received after the deadline, all received responses.

1994: The Legislature appropriated $300,000 for fiscal year '94-'95 for additional planning, design and construction.

A more detailed historical review of the park and Natatorium is found in the planning report's accompanying volume, The Waikiki War Memorial Park and Natatorium: Historical Background Report.

APPENDIX B

QUANTITATIVE ANALYSIS OF MARINE MACROBIOTA IN THE VICINITY OF THE WAIKIKI NATATORIUM, WAIKIKI, OAHU, HAWAII

for

Leo A Daly
Honfed Tower, Suite 1000
1357 Kapiolani Blvd
Honolulu, Hawaii 96814

Project: Natatorium Restoration

Scientific Environmental Analyses, Ltd.
P.O. Box 240022
Honolulu. Hawaii 96824-0022

CHAPTER 3: DESCRIPTION OF ENVIRONMENTAL SETTING

3.1 MARINE ENVIRONMENT

3.1.A. Historical Perspective

Development commenced along the beach fronting the Waikiki Natatorium commenced before the turn of the century (Scott 1968). The lands surrounding the Waikiki Natatorium were Crown lands designated by King Kalakaua as a public park in 1877. Following the fall of the monarchy much of the park's shoreline was deeded over to wealthy private individuals. Early development included the construction of bungalows and later larger residences. The construction of a series of seawalls along this section of the coast to stabilize the shoreline were probably built sometime after 1910 judging from old photographs of the area (see also Edmondson 1928). In 1919 the Territorial Legislature repurchased about 6 acres back to develop a War Memorial Park. The seawalls in the area remained. These early developments probably had little long term impact to the shallow marine communities in the area. Indeed, Edmondson (1928) presents a map of the shallow reef platform just to the west of the Waikiki Natatorium depicting the locations of individual coral colonies; the map suggests that corals at that time were reasonably plentiful on the reef flat which is not the case today.

The Waikiki Natatorium was completed in August 1927 as part of the Waikiki War Memorial Park honoring those who gave their lives in World War I. When built, the Natatorium was one of the few saltwater swimming pools in the US and its construction presented engineering and construction problems because of the marine environment in which it is situated. The Natatorium is a reinforced concrete structure containing an open air 36 x 100m pool fed by ocean water through a series of rectangular concrete chambers.

Perhaps some of the greatest impacts to the shallow marine communities in the area of the Natatorium occurred with (1) the dredging of the approximate 15m wide, 3m deep channel through the reef platform that fronts the present Waikiki Aquarium and abuts the western side of the Natatorium and (2) the placement of sand on the beach to the west of the Natatorium in the 1950-51 period as well as to the east of the Natatorium about 1963-64. The date of channel construction is unknown but it was probably constructed about the time that Dillingham Construction developed the Ala Wai, Kewalo Basin and the channel fronting Ala Moana Park. This occurred in the period from 1922 through 1935. Dredging as well as the placement of sand on the beaches created considerable silt and suspended material which if not advected out of the area would impact sessile benthic forms (corals, algae, etc.). Of course the construction of the Natatorium in August 1927 elimin-

ated marine communities in the "footprint" of the structure and had impacts to surrounding reef flat communities.

3.1.B. Present Status of Marine Communities

The fieldwork which provided the database for this assessment of the marine macrobiota in the area surrounding the Natatorium was carried out on 17-18 December 1991. The area encompassed by this survey covers the shallow waters surrounding the Natatorium structure to a distance of 70m seaward.

Methods

The quantitative sampling of macrofauna of marine communities presents a number of problems; many of these are related to the scale on which one wishes to quantiatively enumerate organism abundance. Marine communities in most Hawaiian settings may be spatially defined in a range on the order of a few hundred square centimeters (such as the community residing in a Pocillopora meandrina coral head) to major biotopes covering many hectares. Recognizing this ecological characteristic and the fact that proposed construction activities are to be relegated to the immediate vicinity of the present structure, we designed a sampling program that attempted to delineate major extant communities in the limits of the study area and to quantitatively describe these communities. Thus a number of methods were used.

To obtain an overall perspective on the extent of the major "zones" or "biotopes" occurring in the study area, a diver snorkeled over the study site. This exercise allowed the qualitative delineation of major biotopes based partially on the presence of large structural elements (e.g., the amount of sand, hard substratum, fish abundance, coral coverage or dominant benthic coverage). Within each zone as well as around the perimeter of the Natatorium, stations were established and quantitative studies were conducted, including visual enumeration of fish, counts along benthic transect lines and cover estimates in benthic quadrats. Besides these quantitative measures, a qualitative reconnaissance was made in the vicinity of each station by swimming and noting the presence of species not encountered in the transects. All assessments were carried out using snorkel gear due to the shallow depths.

The location of stations were subjectively chosen as being representative of a given biotope or community resident to a given section of the Natatorium. Immediately following site selection, a visual fish census was undertaken to estimate the abundance of fishes. These censuses were conducted over a 4 x 20m corridor and all fishes within this area to the water's surface were counted. Data collected included species, numbers of individuals and the estimated lengths of all fishes seen. The

length data were later converted to standing crop estimates using linear regression techniques (Ricker 1975). A single diver equipped with SCUBA, transect line, slate and pencil would enter the area, count and note all fishes in the prescribed area (method modified from Brock 1954). The 20m transect line was paid out as the census progressed, thereby avoiding any previous underwater activity in the area which could frighten wary fishes.

Fish abundance and diversity is often related to small-scale topographical relief over short linear distances. A long transect may bisect a number of topographical features (e.g., cross coral mounds, sand flats and algal beds), thus sampling more than one community and obscuring distinctive features of individual communities. To alleviate this problem, a short transect (20 to 25m in length) has proven adequate in sampling many Hawaiian benthic communities (Brock and Norris 1989).

Besides frightening wary fishes, other problems with the visual census technique include the underestimation of cryptic species such as moray eels (family Muraenidae) and nocturnal species, e.g., squirrelfishes (family Holocentridae), aweoweos or bigeyes (family Priacanthidae), etc. This problem is compounded in areas of high relief and coral coverage affording numerous shelter sites. Species lists and abundance estimates are more accurate for areas of low relief, although some fishes with cryptic habits or protective coloration (e.g., the nohus, family Scorapenidae; the flatfishes, family Bothidae) might still be missed. Obviously, the effectiveness of the visual census technique is reduced in turbid water and species of fishes which move quickly and/or are very numerous may be difficult to count and to estimate sizes. Additionally, bias related to the experience of the diver conducting counts should be considered in making any comparisons between surveys. In spite of these drawbacks, the visual census technique probably provides the most accurate non-destructive method available for the assessment of diurnally active fishes (Brock 1982).

After the assessment of fishes, an enumeration of epibenthic invertebrates (excluding corals) was undertaken using the same transect line as established for fishes. Exposed invertebrates usually greater than 2cm in some dimension (without disturbing the substratum) were censused in a 4 x 20m area. As with the fish census technique, this sampling methodology is quantitative for only a few invertebrate groups, e.g., some of the echinoderms and holothurians (sea urchins and sea cucumbers). Most coral reef invertebrates (other than corals) are cryptic or nocturnal in their habits making accurate assessment of them in areas of topographical complexity very difficult. This, coupled with the fact that the majority of these cryptic invertebrates are small, necessitates the use of methodologies that are beyond the scope of this survey (e.g., see Brock and Brock 1977). Recognizing constraints on time and the scope of this survey, the inverte-

brate censusing technique used here attempted only to assess those few macroinvertebrates species that are diurnally exposed.

Exposed sessile benthic forms such as corals and macrothalloid algae were quantitatively surveyed by use of quadrats and the point-intersect method. The point-intersect technique only notes the species of organism or substratum type directly under a point. Along the previously set fish transect line, 40 such points were assessed (once every 50cm). These data have been converted to percentages. Quadrat sampling consisted of recording benthic organisms, algae and substratum type present as a percent cover in five one-meter square frames placed at five-meter intervals along the transect line established for fish censusing (at 0, 5, 10, 15 and 20m).

If macrothalloid algae were encountered in the 1 x 1m quadrats or under one of the 40 points, they were quantitatively recorded as percent cover. Emphasis was placed on those species that are visually dominant and no attmept was made to quantitatively assess the multitude of microalgal species that constitute the "algal turf" so characteristic of many coral reef habitats.

Results

The qualitative reconnaissance to define biotopes or zones in the vicinity of the Natatorium noted two such zones: the high energy reef flat biotope and the biotope of sand. The high energy reef flat biotope is found both to the west and seaward of the Natatorium as a continuous feature from the outer walls seaward beyond the limits of this study. The biotope of sand is located on the eastern side of the structure. About midway along the western side of the structure is a dredged channel that parallels the shoreline. This channel is about 15m in width and 3 to 3.5m in depth; the channel abuts the western wall and was cut into the old reef platorm. The vertical sides of this channel provide considerable cover for fishes and the floor of the channel is comprised of fine sedimentary material. Although not defined as a biotope or zone, quantitative sampling was carried out adjacent to the outer walls of the Natatorium because communities in this area would be affected with the proposed changes.

Biotope of Sand

The biotope of sand is situated in the area directly adjacent to and east of the Natatorium and continues well outside of the limits of this study. Prior to the replenishment program that created much of the present Sans Souci Beach east of the structure about 1963-64, the biotope of sand was much smaller covering the area directly shoreward of Kapua Channel. At the deepest point near the outer edge of the reef, Kapua Channel had

a maximum depth of 7.6m; today following the beach replenishment program, maximum channel depth in approximately the same location is about 3m. During the 1964-65 period, sand was replenished on the beach and erosion of this material continued, filling in low points offshore on the reef platform and seaward until an equilibrium was established. Prior to the placement of sand, Sans Souci Beach was narrow and dominated by a seawall; today the seawall remains but is about 15m mauka (inland) of the present shoreline (personal observations).

Sand is not a stable substratum which is a prerequisite for most benthic coral reef species. Also with the impingement of wave energy, sand particles are moved about scouring adjacent hard bottom and benthic communities. The massive sand replenishment program during the mid-1960's must have resulted in the burial of benthic communities and their replacement with a less diverse array of species adapted to the constantly shifting substratum. Besides the physical characteristics of a sand substratum as just mentioned, benthic communities in the shallows adjacent to the east wall of the Natatorium are exposed to considerable human foot traffic (trampling) in the shallows. On the morning of 17 December 1991 (1000 hours on a weekday) approximately 72 people were counted on the small beach east of the Natatorium; 27 people were in the water and most of these people were wading.

A quantitative station (Station 1, Figure 1) was established in the biotope of sand about 40m east of the outer Natatorium wall in 1.6m of water. Table 1 presents the results of the quantitative survey conducted at Station 1. The only species encountered were one small paki'i or flatfish (Bothus mancus; see Appendix A) and a auger shell (Terebra inconstans). The biomass of fish at this station was estimated to be 0.2g m^{-2}. In the vicinity of station 1 were seen a small school of weke (Mulloides flavolineatus), a small mixed school of juvenile aholehole (Kuhlia sandvicensis) and mullet (Mugil cephalus) along the shoreline as well as a lizardfish or 'ulae (Synodus binotatus) and a box crab or Calappa calappa.

High Energy Reef Flat Biotope

The high energy reef flat biotope dominates the shallows both offshore and to the west of the Natatorium. On the west side of the structure, this biotope extends from the shoreline (seawall and beach) seaward to outside of the area of this study and encompasses depths from about 30cm to about 2m. The substratum of this biotope is dominated by limestone with patches of sand and rubble. Most of the sand and rubble is found in the bottom of shallow wave cut channels that have a general orientat-

FIGURE 1. Map of the shallow waters in the vicinity of the Waikiki Natatorium showing the approximate extent of the two biotopes defined in this study. The biotope of sand is marked with an "A" and the high energy reef flat biotope, with a "B". Also shown are the outer walls of the Natatorium, the dredged channel to the northwest as well as the approximate locations of five quantitative stations (numbered 1 through 5) established to sample marine communities in this study. Sandy shoreline is stippled. Not to scale.

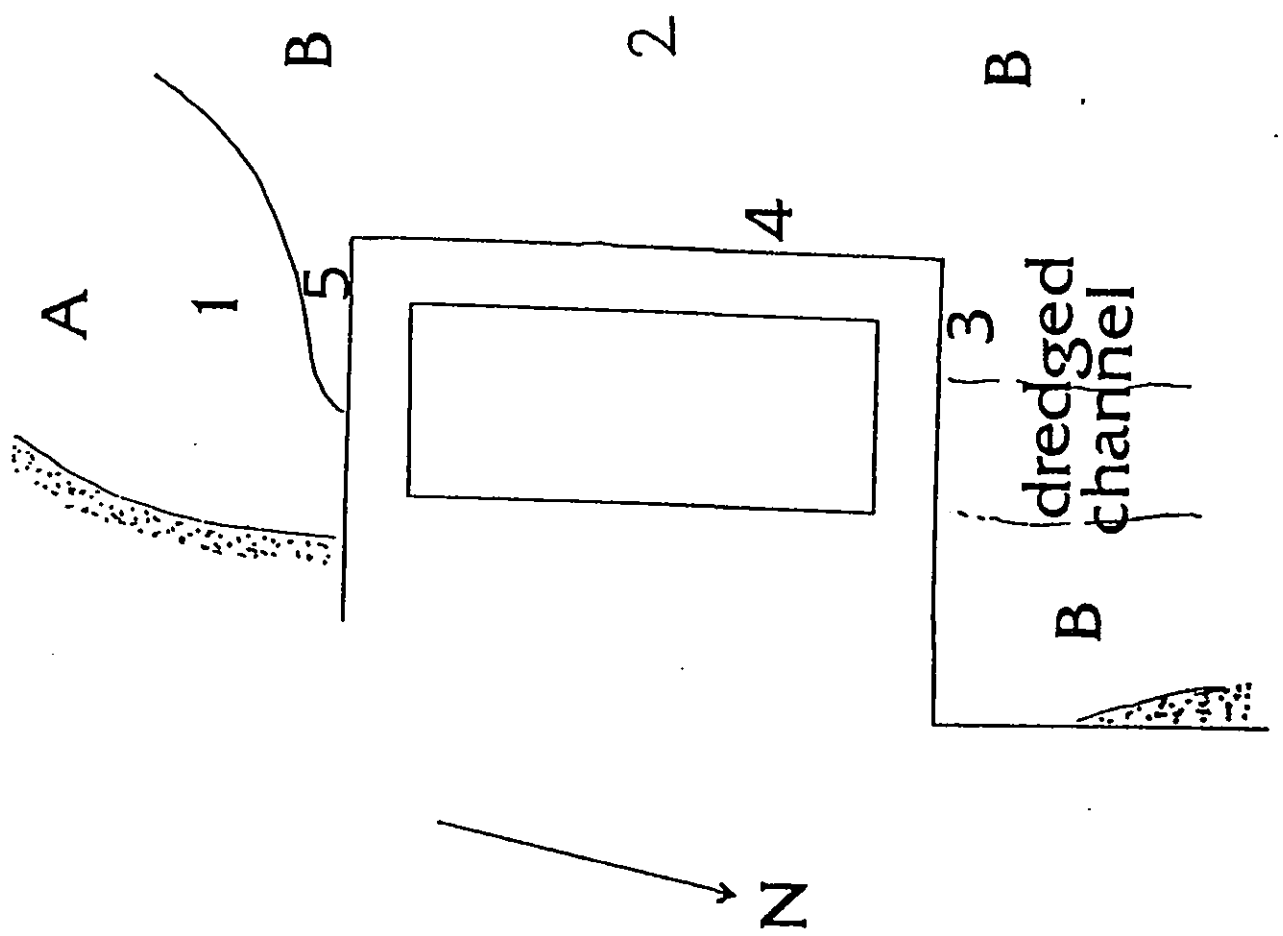
B
2
B
4
A
1
5
3
dredged
channel
B
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TABLE 1. Summary of the benthic survey conducted at Station 1 approximately 35 offshore of Sans Souci Beach and 40m east of the Waikiki Natatorium with an orientation parallel to the beach in the biotope of sand on 17 December 1991. Results of the $5m^2$ quadrat sampling of the benthic community (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 1.6m; no corals were encountered at this station.

A. Quadrat Survey

Species	Quadrat Number				
	0m	5m	10m	15m	20m
Sand	100	100	100	100	100

B. 40-Point Analysis

Species	Percent of the Total
Sand	100

C. Invertebrate Census (4 x 20m)

Species	Number
Phylum Mollusca	
Terebra inconstans	1

D. Fish Census (4 x 20m)

1 Species
1 Individual
Estimated Biomass = 0.2g m^{-2}

ion perpendicular to shore and are from 1 to 10m in width, 5 to 35m in length and up to 50cm in depth. These channels are spaced from 5 to 30m apart and are best developed in the outer two-thirds of the reef flat. The benthic communities of this biotope are dominated by macroalgae. The high energy reef flat biotope extends from shore on the western side of the Natatorium and on the seaward face of the structure, up to the walls and out to the reef crest. To the east the high energy reef flat biotope is restricted to the more offshore areas adjacent to the reef crest; shoreward of this is the biotope of sand.

Because the waters around the Waikiki Natatorium are part of a state sanctioned Marine Life Conservation District (MLCD), fishing is restricted. The reef west of the Natatorium is permanently closed to all fishing activities and easterly to the Diamond Head Lighthouse the shallow reef area is under a Special Management Area status where fishing is allowed in even numbered years and no fishing activities may occur in odd numbered years.

Four quantitative stations were established to sample the high energy reef flat biotope and outer walls of the Natatorium; the locations of these stations are shown in Figure 1.

Station 2 was established about 25m directly seaward of the outer makai (seaward) wall of the Natatorium in water from 0.8 to 1.4m in depth. The orientation of the transect parallels the outer wall and shoreline. The substratum at this station is comprised of limestone with small wave cut channels through it having an orientation perpendicular to shore. These channels are from 2 to 8m in width and up to 20m in length with a maximum depth of about 40cm affording some cover for reef fishes. Channels are spaced about 15m apart at this location. The bottom of the channels is a mix of sand and coral rubble. The intervening limestone substratum between channels is covered by a macroalgal community dominated by limu wawae'iole (Codium edule), limu kala (Sargassum polyphyllum) and the red algae, Amansia glomerata.

The results of the quantitative survey carried out at Station 2 are presented in Table 2. The quadrat survey noted 6 macroalgal species having a mean coverage of 31 percent. The most common algae at Station 2 is limu wawae'iole (Codium edule). Two coral species (Porites lobata and Pocillopora damicornis) were encountered in the quadrat survey; corals have a mean coverage of 0.2 percent. The invertebrate census noted one he'e or octopus (Octopus cyanea) in the census area and two echinoderms: the sea cucumber (Holothuria atra) and the green sea urchin (Echinometra mathaei). The results of all fish censuses are presented in Appendix A. At Station 2, 13 species of fishes (58 individuals) were seen; the most common species included the manini (Acanthurus triostegus) and the 'omaka (Stethojulis balteata). The standing crop of fishes at Station 2 was estimated to be 46g m^{-2} and the largest contributors to this biomass

TABLE 2. Summary of the benthic survey conducted at Station 2 approximately 25 offshore of the Waikiki Natatorium in the high energy reef flat biotope on 17 December 1991. Results of the 5m^2 quadrat sampling of the benthic community (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth from 0.8 to 1.4m; mean coral coverage is 0.2 percent (quadrat method).

A. Quadrat Survey

	Quadrat Number				
Species	0m	5m	10m	15m	20m
Algae					
Codium edule	52	18	1	41	3
Acanthophora spicifera					2
Sargassum polyphllum	1			19	
Turbinaria ornata	0.1	13	0.7		
Lyngbya majuscula		1			
Dictyosphaeria cavernosa		3			
Coral					
Porites lobata	0.1				
Pocillopora damicornis		1			
Sand	1		75.3		19
Rubble	45.8		4		6
Hard Substratum		64	19	40	70

B. 40-Point Analysis

Species	Percent of the Total
Algae	
Codium edule	38
Sargassum polyphyllum	8
Sand	10
Rubble	18
Hard Substratum	26

TABLE 2. Continued.

C. Invertebrate Census (4 x 20m)

Species	Number
Phylum Mollusca	
Octopus cyanea	1
Phylum Echinodermata	
Holothuria atra	2
Echinometra mathaei	5

D. Fish Census (4 x 20m)

13 Species
58 Individuals
Estimated Standing Crop = 46g m^{-2}

included manini (Acanthurus triostegus) and a single ponuhunuhu (Calotomus carolinus). In the vicinity of Station 2 were seen the corals (Cyphastrea ocellina, Pocillopora meandrina) and a single colony of Porites lobata that had a maximum diameter of about 30cm. Other species seen include algae (Dictyosphaeria versluysii, Bryopsis sp., Halimeda discoidea, Neomeris annulata, Ulva reticulata, Lyngbya majuscula, Dictyota sandvicensis, Padina sp., Ralfsia pangoensis, Sphacelaria furcigera, Acanthophora spicifera, Amansia glomerata, Centroceras clavulatum, Grateloupia filicina, Halymenia formosa, Plocamium sandicense and Spyridia filamentosa), fishes such as the palani (Acanthurus dussumieri), the humuhumunukunuku a pua'a (Rhinecanthus rectangulus), umaumalei (Naso lituratus), lau'ipala (Zebrasoma flavescens), uhu (Scarus sordidus), awela (Thalassoma trilobatum), hinalea aki'lolo (Coris gaimard), puhi (Gymnothorax eurostus) and kumu (Parupeneus porphyreus). Macroinvertebrates seen in the general vicinity of Station 2 include the cone shell (Conus ebreus), sea cucumber (Actionpyga maurtiana) and short spined sea urchin (Tripneustes gratilla).

As noted above, the high energy reef flat biotope occurs as a feature that continues up to the outer walls of the Natatorium. Because it is proposed to reconstruct the structure, special emphasis was placed on the marine communities resident to the outer walls and the substratum directly adjacent to the walls. Three stations were established to sample these marine communities: they are Stations 3, 4 and 5.

Station 3 was established on the outer western wall of the Natatorium. This station commenced at the makai corner and continued for 20m towards shore; it sampled not only the high energy reef flat biotope and Natatorium walls but also the crossectional edge of the dredged channel that runs perpendicular to and abuts the Natatorium. The substratum at this station is a mix of coral rubble from the reef flat and basalt stones ranging in size from 30 to 75cm that were placed along the interface of the concrete walls and the seafloor to stabilize the substratum adjacent to the structure. These basalt rocks provide cover for fishes. The results of the quantitative survey carried out at Station 3 are presented in Table 3 and Appendix A (fishes). The quadrat survey noted five algal species having a mean coverage of 41 percent; the most important contributors to this standing crop were limu wawae'iole (Codium edule) and the encrusting pink coralline species, Poroloithon onkodes. Three coral species (Porites lobata, P. compressa and Pocillopora damicornis) were encountered having a mean coverage of 0.3 percent. Three diurnally exposed macroinvertebrate species (2 shrimp species - Saron marmoratus and Stenopus hispidus and one cone shell - Conus lividus) were in the 4 x 20m census area. In total 20 species of fishes were censused at this station (159 individuals). The most abundant fishes included the weke (Mulloides flavolineatus), mamo (Abudefduf abdominalis) and the kole (Ctenochaetus strigosus). The standing

TABLE 3. Summary of the benthic survey conducted at Station 3 along the base of the western outer wall of the Waikiki Natatorium commencing at the offshore corner and continuing 20m mauka (towards shore) on 17 December 1991. Results of the 5m^2 quadrat sampling of the benthic community (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth from 1 to 3.6m; mean coral coverage is 0.3 percent (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 0m	5m	10m	15m	20m
Algae					
Codium edule	42	17			
Dictyosphaeria cavernosa	6	4	7	4	3.5
Porolithon onkodes	2	4	19	47	46
Sphacelaria furcigera		2			
Valonia aegagropila				1	
Corals					
Porites lobata			1		
P. compressa		0.1			
Pocillopora damicornis			0.1		0.1
Rubble	14	16	4		
Basalt Rock	36	56.9	68.9	48	50.4

B. 40-Point Analysis

Species	Percent of the Total
Algae	
Codium edule	10
Dictyosphaeria cavernosa	8
Rubble	18
Concrete Culvert (Pipe)	5
Basalt Rock	59

TABLE 3. Continued.

C. Invertebrate Census (4 x 20m)

Species	Number
Phylum Mollusca	
Conus lividus	1
Phylum Arthropoda	
Saron marmoratus	3
Stenopus hispidus	2

D. Fish Census (4 x 20m)

20 Species
159 Individuals
Estimated Biomass = 153g m^{-2}

crop was estimated to be 156g m^{-2}; the large number of weke (Mulloides flavolineatus) censused here accounted for 71 percent of this biomass.

Station 4 was established approximately 30m east of the makai west corner of the Natatorium and extending for 20m to the east from that point. This station sampled the Natatorium wall, adjacent seafloor as well as the outer part of a large cavity caused by erosion under the seaward side of the structure. This hole is approximate 7m in width and at its greatest height, about 1.2m. It continues under the concrete and into the swimming pool. The results of the quantitative survey conducted at Station 4 are prsented in Table 4. The quadrat survey noted three algal species having a mean coverage of 20 percent. Amansia glomerata was the most abundant macroalgal species at this station and two coral species (Porites lobata and Pocillopora damicornis) were also seen with a mean coverage of 0.01 percent. Macroinvertebrates seen at this station include the mantis shrimp (Gonodactylus sp.), black shrimp (Saron marmoratus), green urchin (Echinometra mathaei), black urchin (E.oblongata) and sea cucumber (Actinopyga maurtiana). The results of the fish census are presented in Appendix A. Twenty-four species of fishes were seen at this station (158 individuals); the most abundant fishes were the mamo (Abudefduf abdominalis), ma'i'i'i (Acanthurus nigrofuscus), kole (Ctenochaetus strigosus) and manini (Acanthurus triostegus). The standing crop of fishes was estimated to be 94g m^{-2} and the species contributing heavily to this estimate include a large ponuhunuhu (Calotomus carolinus), mamo (Abudefduf abdomialis), ma'i'i'i (Acanthurus nigrofuscus) and kole (Ctenochaetus strigosus). Outside of the transect area in the large hole under the concrete wall were seen a large school of aholehole (Kuhlia sandvicensis), a large kumu (Parupeneus porphyreus) estimated to weigh 1.5kg, sharpback puffer (Canthigaster rivulatus), puhi paka (Gymnothorax flavimarginatus), moa or boxfish (Ostracion meleagris) and 'ulae (Synodus binotatus).

Station 5 was established on the outer eastern wall of the Natatorium commencing at the makai corner and running along the base of the wall towards shore. Water depth at Station 5 ranges from 0.8 to 1.2m and the substratum is primarily basalt rocks and rubble. The last few meters of the transect terminated in sand because close to the shoreline the biotope of sand is present. Table 5 presents the results of the quantitative survey carried out at Station 5. Three macroalgal species were present in the quadrat survey with a mean coverage of 9 percent; the most common species was Sargassum polyphyllum. Only one coral species (Porites lobata) was encountered in the quadrat survey having a mean coverage of 0.3 percent. Two macroinvertebrate species were censused; these were the green urchin (Echinometra mathaei) and the sea cucumber (Holothuria atra). Twelve species of fishes (40 individuals) were censused; the most common species were the

TABLE 4. Summary of the benthic survey conducted at Station 4 along the base of the makai (seaward) outer wall of the Waikiki Natatorium commencing 30m east of the makai western corner and progressing east on 17 December 1991. Results of the $5m^2$ quadrat sampling of the benthic community (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth from 0.8 to 2.1m; mean coral coverage is 0.01 percent (quadrat method).

A. Quadrat Survey

	Quadrat Number				
Species	0m	5m	10m	15m	20m
Algae					
Codium edule	24		2	3	9
Amansia glomerata	13	22	14	8	3
Bryopsis sp.		1			
Coral					
Porites lobata		0.3			
Pocillopora damicornis				0.1	
Rubble	6	41	63	27.9	4
Hard Substratum	57	35.7	21	61	84

B. 40-Point Analysis

Species	Percent of the Total
Algae	
Codium edule	13
Amansia glomerata	10
Rubble	18
Hard Substratum	59

C. Invertebrate Census (4 x 20m)

Species	Number
Phylum Mollusca	
Saron marmoratus	8
Gonodactylus sp.	1

TABLE 4. Continued.

Species	Number
Phylum Echinodermata	
Echinometra mathaei	65
E. oblongata	9
Actinopyga maurtiana	1

D. Fish Census (4 x 20m)

24 Species
158 Individuals
Estimated Biomass = 94g m^{-2}

TABLE 5. Summary of the benthic survey conducted at Station 5 along the base of the outer eastern wall of the Waikiki Natatorium commencing at the seaward corner and progressing towards shore on 17 December 1991. Results of the 5m^2 quadrat sampling of the benthic community (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth from 0.8 to 1.2m; mean coral coverage is 0.3 percent (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 0m	5m	10m	15m	20m
Algae					
Codium edule	6	1			
Sargassum polyphyllum	38				
Turbinaria ornata	1				
Coral					
Porites lobata		0.1	1.3		
Sand			4	79	100
Rubble	2	41.9	25.7	21	
Basalt Rock	53	57	70		

B. 40-Point Analysis

Species	Percent of the Total
Algae	
Codium edule	8
Sargassum polyphyllum	8
Sand	33
Rubble	23
Basalt Rock	28

C. Invertebrate Census (4 x 20m)

Species	Number
Phylum Echinodermata	
Echinometra mathaei	13
Holothuria atra	3

TABLE 5. Continued.

D. Fish Census (4 x20m)

12 Species
40 Individuals
Estimated Biomass = 18g m^{-2}

manini (Acanthurus triostegus), hinalea lauwili (Thalassoma duperrey), kihikihi (Zanclus cornutus) and damselfish (Stegastes fasciolatus). The biomass of fishes at Station 5 was estimated to be 18g m^{-2}; 65 percent of this standing crop was due to three species: moano (Parupeneus multifasciatus), hinalea lauwili (Thalassoma duperrey) and manini (Acanthurus triostegus). Adjacent to this station were seen the coral (Porites compressa) and the puhi laumilo (Gymnothorax undulatus).

The outer concrete walls of the Natatorium were qualitatively examined in a number of locations and common species were noted; among these were algae (Amansia glomerata, Sargassum polyphyllum, Acanthophora spicifera, Ulva fasciata and Lobophora variegata), invertevertebrates including the brown sea cucumber (Actionpyga maurtiana), the grey sea cucumber (Holothuria impatiens), sea urchins (Echinometra mathaei and E. oblongata), snails (Nerita picea, Nodolittorina pinctado and Drupa morum) and the ama'ama crab (Grapsus grapsus).

A qualitative inspection of the marine communities present in the Natatorium was also carried out. All species encountered inside the structure were also commonly seen on the outer walls or in the nearby benthic communities. The major component seen were fishes, most of which freely transited through the large hole located on the seaward face of the structure. As with the outer walls, benthic communities on the inner walls of the swimming pool were not well developed. The bottom of the pool is comprised of sand and fine sedimentary material; these materials have accumulated especially in the eastern inshore corner of the pool. Species encountered on the floor of the swimming pool include holes created by alpheid shrimps and commensal gobies (Psilogobius mainlandii) and other burrows probably created by unidentified polychaetes, holothurians and crustaceans.

The marine communities in the area surrounding the Waikiki Natatorium may be characterized as being dominated by macroalgae and are not particularly diverse relative to many other Hawaiian coral reef communities. Overall, the mean coral coverage at the five quantitative stations in this study was less than 0.2 percent. In contrast algae or limu are abundant; the mean coverage of limu at these five stations is 20 percent. The lack of corals in the study area is probably related to the long history of environmental disturbance to this area coupled with occasional high energy conditions. Waves impacting this shoreline usually occur during the summer months; high energy conditions move sand and rubble about scouring the substratum. In such an environment benthic species that have slow growth characteristics (such as corals) cannot successfully become established thus open substratum is colonized by those species that can settle, grow and reproduce before the next storm event occurs. Such species are termed "weedy species" in the ecological literature. They are often the competitive dominants in disturbed or marginal

habitats.

The relatively high biomass of fishes encountered at Stations 3 and 4 are probably related to (1) the prohibition on fishing in the area and (2) the relatively high cover at these two locations. Much of the cover or shelter at these stations is due to the basalt rock at the base of the outer walls of the Natatorium and the large hole through the outer wall at Station 4.

Nowhere in this study were any rare or otherwise unusual species or "ecotypes" (i.e., morphological variants) encountered. All species seen are common to many of the disturbed reef flat habitats around Oahu.

CHAPTER 4: PROBABLE IMPACT AND MITIGATION MEASURES

4.1 Marine Biota

As previously noted, the nearshore waters in the vicinity of the Waikiki Natatorium have been impacted by man's activities since the early 1900's. Prior to the massive development of Waikiki which occurred following the dredging of the Ala Wai Canal to drain much of the mauka swamp lands in the early 1920's, the swamp and estuarine areas served as a "filter" for stream inputs that occurred all along this coastline (see W. Wall's map of Honolulu, 1896). This natural filter served to remove silt and detritus as well as nutrients; estuarine areas served as a nursery grounds for many commercially important fish species. The dredging of drain channels, infilling of swamp and estuarine areas, construction of walls along the shoreline to control erosion all served to alter the community structure of shallow marine communities in the waters adjacent to these activities. The channelization of a stream entering the ocean at the foot of Kapahulu Street is probably the closest natural source of freshwater input relative to the Waikiki Natatorium. Despite these early changes, corals flourished on the reef flat adjacent to the Waikiki Natatorium through the 1920's where Edmondson carried out his classic studies on Hawaiian corals (Edmondson 1928). The impacts that occurred with the beach sand replenishment program in 1950-51 and again in the mid-1960's must have contributed to the decline of corals on the reef flats adjacent to the Natatorium.

The structure of extant benthic and fish communities as described above are the result of historical and presently occurring impacts. The communities are not diverse and it is surmised that the species composition of the benthos is comprised largely of species that are able to rapidly colonize open substratum, i.e., early colonizers and "weedy" species. The benthic communities are probably being kept at an early stage of succession by the occasional impact of high surf that will move loose rubble

and sand about, scouring benthic communities. If this is the case, the impact associated with the reconstruction of Waikiki Natatorium should not result in any appreciable change in local species composition. Many of the algae which are the dominant group in the benthos are early colonizers in the usual succession of coral reef communities; corals generally are the terminal phase of these successional events. Corals are virtually absent in the study area which lends further support to the hypothesis that occasional wave energy is an important agent in structuring of these communities especially when the addition of sand will serve to scour the substratum.

Physical disturbance from occasional storm surf is one of the most important parameters in determining the structure of Hawaiian coral communities (Dollar 1982). Numerous studies have shown that occasional storm generated surf may keep coral reefs in a non-equilibrium or sub-climax state (Grigg and Maragos 1974, Connell 1978, Woodley et al. 1981, Grigg 1983). Indeed, the large expanses of near-featureless basalt or limestone substratum present around much of the Hawaiian Islands at depths less than 30m attest to the force and frequency of these events (Brock and Norris 1989). These same wave forces also impinge and impact fish communities (Walsh 1983). In the Waikiki setting the impact of occasional wave energy impinging on the benthic communities was probably exacerbated with the addition of sand from the replenishment program; it is surmised that scouring and burial of benthic organisms occurred with this perturbation.

The reconstruction of the Natatorium will create numerous new surfaces on which benthic colonization and succession may be initiated. Indeed, the presence of stable hard substratum should foster the development of communities as are now present on the existing Natatorium walls. However, impacts from wave impingement and sand scouring will still occur, thus benthic species composition will probably not be any different in the long term. The development of large exits to enhance the exchange of water in the proposed reconstruction of the swimming pool with the surrounding ocean will create considerable shelter for fishes. With the prohibition on fishing activities, the abundance of fishes should be greater following development than presently exists either in or adjacent to the structure.

Mitigation measures that should be considered when proceeding with the proposed reconstruction, include the use of silt curtains to impede water exchange in the swimming pool while sediment is being removed from within it. If the construction calls for any site preparation (i.e., dredging) to be done outside of the the present walls of the structure, again the use of silt curtains is recommended and this work should be done during periods of low surf activity, primarily for the ease of completing the work.

CHAPTER 8: IRREVERSIBLE AND IRRETRIEVABLE COMMITTMENT OF RESOURCES

If the project proceeds, the only loss of marine resources are primarily sessile components of the benthic communities that are within the footprint of the present structure and any proposed expansion. These communities are dominated by a number of common algal species and very few corals. The invertebrate fauna in this area are all common species. It is expected that most, if not all, fishes will vacate the general project area once construction commences. They will however be among the first components to colonize the habitat once work has been completed.

It is expected that some small amount of turbidity and silt will be generated by the proposed work. If in sufficient quantity, this material may impact benthic communities away from the Natatorium (i.e., on the reef flat). As noted above, these communities appear to be in relatively early successional stages, being held there by occasional storm surf and sand scour. Occasional surf and water motion will serve to suspend, dilute and advect sedimentary materials out of the area. Thus if transitory impacts do occur (i.e., as from temporary high sediment loading) which alter the structure of the benthic communities, it is expected that a similar community structure will rapidly return. The impacts due to construction on benthic communities resident to the shallow reef flat surrounding the Natatorium will be transitory and changes to the species composition should likewise be transitory.

CHAPTER 9: PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

There are no known adverse environmental effects to marine communities residing on the reef flats surrounding the Waikiki Natatorium that will be permanent. As noted above, the changes that will have a permanent impact are those on the communities residing in the present Natatorium swimming pool or on the walls of the structure; these communities will be removed but it is expected that similar communities will recolonize the structure once work has been completed. Impacts to benthic communities on the reef flat will be transitory. The proposed development of channels through the walls of the Natatorium should serve to increase the shelter available to fishes thus increasing the abundance and diversity of fishes in the area relative to the present.

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APPENDIX A. Results of the quantitative visual censuses conducted at five locations in the water around the Waikiki Natatorium on 17 December 1991. Each entry in the body of the table represents the total number of individuals of each species seen; totals are presented at the foot of the table along with an estimate of the standing crop (g m^{-2}) of fishes present at each location.

FAMILY AND SPECIES	STATION NUMBER 1	2	3	4	5
HOLOCENTRIDAE					
Myripristes amaenus			4		
AULOSTOMIDAE					
Aulostomus chinensis			2		
FISTULARIIDAE					
Fistularia commersoni		1			
KUHLIIDAE					
Kuhlia sandvicensis				9	
APOGONIDAE					
Apogon kallopterus			4		
KYPHOSIDAE					
Kyphosus bigibbus				1	2
MULLIDAE					
Mulloides vanicolensis			37		
Parupeneus multifasciatus	2		3	2	2
P. porphyreus				3	
CHAETODONTIDAE					
Chaetodon fremblii				1	
C. lunula				1	
C. auriga	2				
POMACENTRIDAE					
Abudefduf abdominalis			26	26	
A. sordidus				2	1
Stegastes fasciolatus	3		7	1	4
LABRIDAE					
Thalassoma duperrey	4		3	14	4
T. fuscum				1	
Stethojulis balteata	7		4	7	1
Gomphosus varius				7	

APPENDIX A. Continued.

FAMILY AND SPECIES	STATION NUMBER 1	2	3	4	5
SCARIDAE					
Scarus perspicillatus		2	20		
S. sordidus			9		
Scarus sp. (juveniles)				7	
Calotomus carolinus		1		1	
BOTHIDAE					
Bothus mancus	1				
ACANTHURIDAE					
Acanthurus triostegus		18	10	14	16
A. nigrofuscus		14	8	23	2
A. dussumieri			3	7	
Ctenochaetus strigosus			12	21	2
Zebrasoma flavescens			2	3	
Naso lituratus				1	
N. unicornis		2			
ZANCLIDAE					
Zanclus cornutus		1	2	2	4
BLENNIIDAE					
Cirripectus vanderbilti				1	
MONACANTHIDAE					
Pervagor spilosoma			1		
BALISTIDAE					
Rhinecanthus rectangulus		1			
OSRACIONIIDAE					
Ostracion meleagris			1		1
CANTHIGASTERIDAE					
Canthigaster jactator			1	3	
C. rivulata					1
Total Number of Species	1	13	20	24	12
Total Number of Individuals	1	58	159	158	40
Biomass (g m^{-2})	0.2	46	153	94	18

APPENDIX C

ACOUSTIC STUDY
FOR THE
WAIKIKI WAR MEMORIAL NATATORIUM
OAHU, HAWAII

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CHAPTER I. SUMMARY

The existing traffic and future on-site noise levels in the vicinity of the Waikiki War Memorial Natatorium were evaluated for their relationship to current background noise levels as well as to federal noise standards and State Department of Health noise limits for the island of Oahu. The expected traffic noise level increases along Kalakaua Avenue, which fronts the project site, were assumed to be minimal. Because on-site parking will not be provided at the improved Natatorium facility, there is a relatively low risk of adverse noise impacts from increases in traffic noise associated with the project.

Crowd noise during active recreational activities at the salt water swimming pool and volleyball court may be audible at neighboring properties during the quieter periods of the day. However, there is a very low risk of the project exceeding the State Department of Health daytime noise limit of 60 dBA along the south boundary of the Sans Souci Beach Park which adjoins existing hotel and apartment units. Average crowd noise levels from the Natatorium at the existing Kaimana Beach Hotel are predicted to be less than 55 dBA, which is at or below existing background ambient noise levels during the daytime hours. Nighttime activities at the Natatorium between the hours of 10:00 PM and 7:00 AM are not expected to occur.

Risks of adverse noise impacts due to the audibility of sounds from the project at neighboring noise sensitive properties are considered to be low. These risks can be minimized by implementing administrative controls to prevent rowdyism and boisterous behavior. From an acoustical standpoint, the proposed project can be viewed as being neutral in respect to daytime noise impacts, since the existing background ambient noise levels at the neighboring noise sensitive properties are not expected to be exceeded by the proposed daytime activities at the project site.

Unavoidable, but temporary, noise impacts may occur during

the construction phase of the proposed project. Because construction activities are predicted to be audible within the project and at adjoining properties, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to reduce construction noise to inaudible levels will not be practical in all cases, but the use of quiet equipment and the implementation of the State Department of Health construction noise permit procedures are recommended as mitigation measures.

CHAPTER II. PURPOSE

The purposes of this study were to predict possible sound levels associated with the proposed improvements to the existing Waikiki War Memorial Natatorium, to evaluate the potential future noise impacts associated with the proposed project, and to recommend noise mitigation measures as required.

CHAPTER III. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY

The noise descriptor currently used by federal agencies to assess environmental noise in general is the Day-Night Average Sound Level (Ldn). This descriptor incorporates a 24-hour average of instantaneous A-Weighted Sound Levels as read on a standard Sound Level Meter. The minimum averaging period for the Ldn descriptor is 24 hours (by definition). Additionally, sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels (dB) prior to computing the 24-hour average by the Ldn descriptor. A more complete list of noise descriptors is provided in **APPENDIX B** to this report.

TABLE 1, derived from **Reference 1**, presents current federal standards and acceptability criteria for residential land uses exposed to various levels of environmental noise. **FIGURE 1**, extracted from **Reference 2**, presents noise compatibility criteria for various land use categories. Note from **FIGURE 1** that for multiple family residential land uses, noise levels less than 60 Ldn are considered to be "Compatible." Also note from **FIGURE 1** that for lands in transient lodging or commercial uses, noise levels as high as 65 Ldn are considered to be "Compatible."

Noise levels typical of communities on Oahu are shown in **FIGURE 2**. As a general rule, noise levels of 55 Ldn or less occur in rural areas, or urbanized areas which are shielded from high volume streets. In urbanized areas, Ldn levels generally range from 55 to 65 Ldn, and are usually controlled by motor vehicle traffic noise. Residences which front major roadways are generally exposed to levels of 65 Ldn, and as high as 72 Ldn when the roadway is a high speed freeway. Due to noise shielding effects from intervening structures, residences which are located within interior lots are usually exposed to lower noise levels of 60 Ldn or less. Near the shoreline, surf noise tends to be the dominant noise source, particularly if the setback distances from the road-

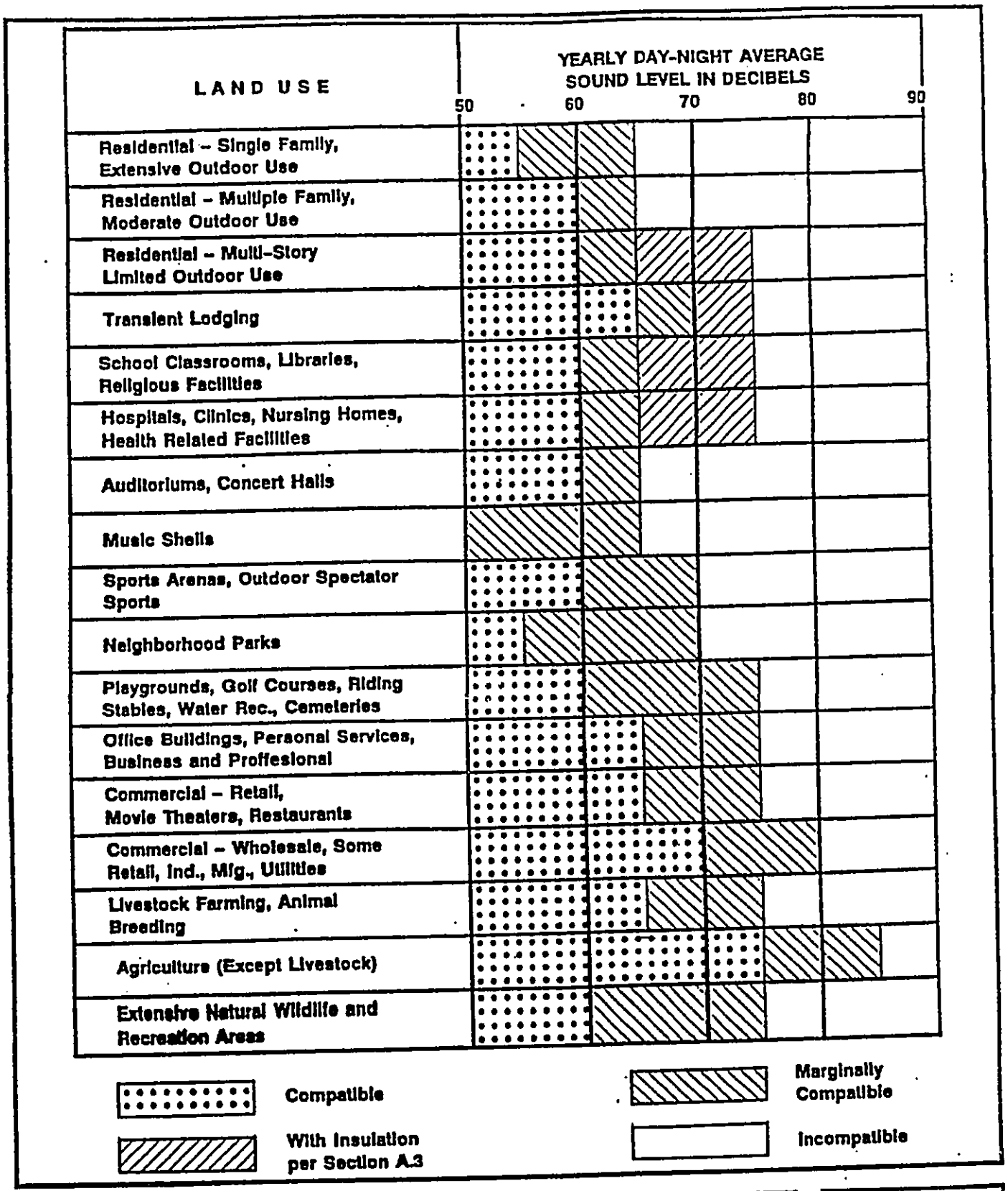
TABLE 1

EXTERIOR NOISE EXPOSURE CLASSIFICATION
(RESIDENTIAL LAND USE)

NOISE EXPOSURE CLASS	DAY-NIGHT SOUND LEVEL	EQUIVALENT SOUND LEVEL	FEDERAL[1] STANDARD
Minimal Exposure	Not Exceeding 55 L_{dn}	Not Exceeding 55 L_{eq}	Unconditionally Acceptable
Moderate Exposure	Above 55 L_{dn} But Not Above 65 L_{dn}	Above 55 L_{eq} But Not Above 65 L_{eq}	Acceptable[2]
Significant Exposure	Above 65 L_{dn} But Not Above 75 L_{dn}	Above 65 L_{eq} But Not Above 75 L_{eq}	Normally Unacceptable
Severe Exposure	Above 75 L_{dn}	Above 75 L_{eq}	Unacceptable

Notes: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the L_{eq} instead of the L_{dn} descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours. The noise mitigation threshold used by FHWA for residences is 67 L_{eq}.

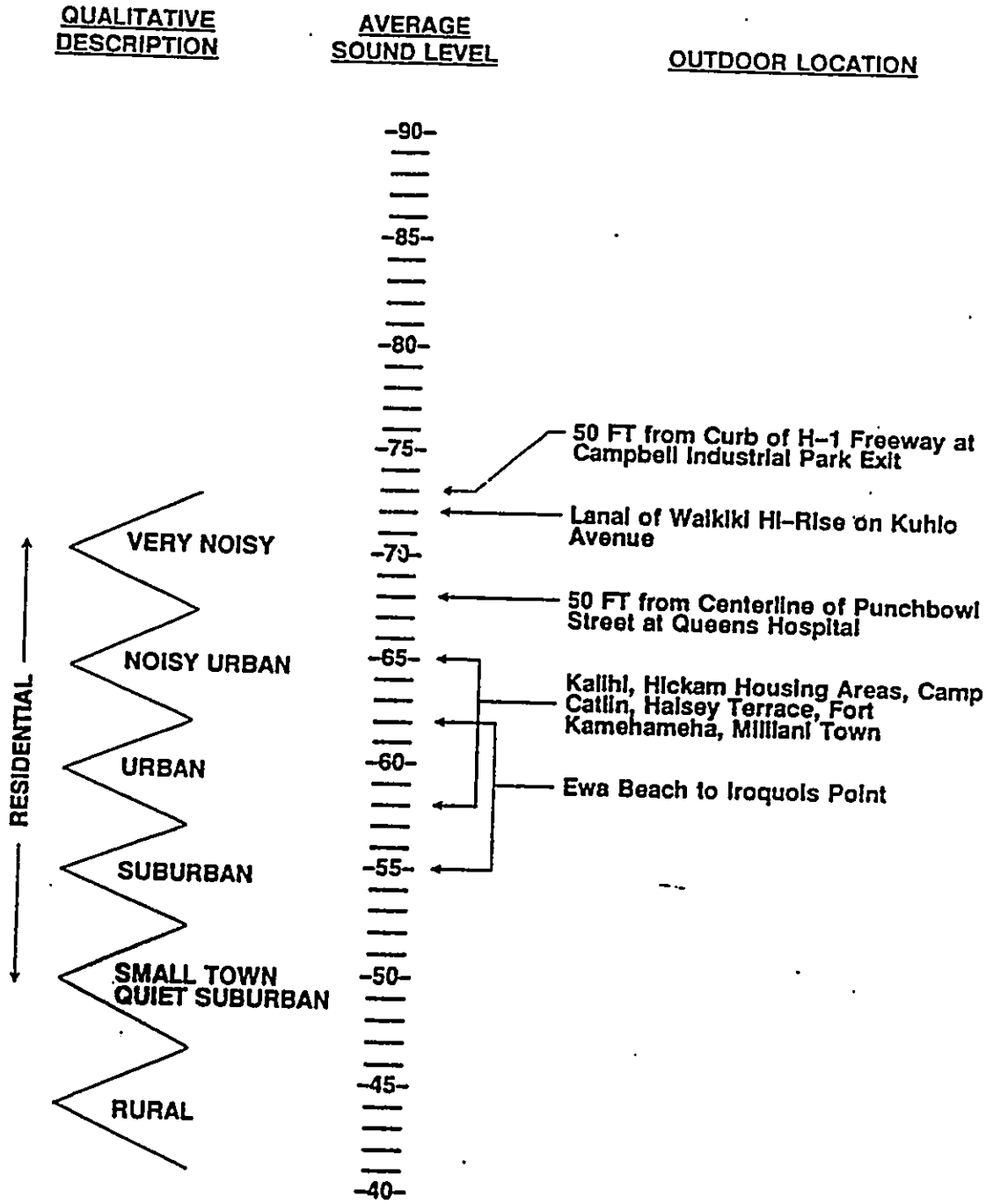


LAND USE COMPATIBILITY
WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVEL
AT A SITE FOR BUILDINGS AS COMMONLY CONSTRUCTED
(Source: American National Standards Institute S3.23-1980)

FIGURE 1

FIGURE 2

RANGE OF EXTERIOR BACKGROUND AMBIENT NOISE LEVELS



ways are large. Typical noise levels during low surf conditions range from 55 to 60 Ldn.

For the purposes of determining noise acceptability for funding assistance from federal agencies (FHA/HUD and VA), an exterior noise level of 65 Ldn or lower is considered acceptable. This standard is applied nationally (see Reference 3), including Hawaii. Because of our open-living conditions, the predominant use of naturally ventilated dwellings, and the relatively low exterior-to-interior sound attenuation afforded by these naturally ventilated structures, an exterior noise level of 65 Ldn does not eliminate all risks of noise impacts. For these reasons, and as recommended in Reference 4, a lower level of 55 Ldn is considered as the "Unconditionally Acceptable" (or "Near-Zero Risk") level of exterior noise. However, after considering the cost and feasibility of applying the lower level of 55 Ldn, government agencies such as FHA/HUD and VA have selected 65 Ldn as a more appropriate regulatory standard.

State Department of Health (DOH) noise regulations (Reference 5) apply on the island of Oahu, and are intended to minimize noise impacts from stationary sources. DOH limits for non-impulsive (or steady) sounds which are applicable along property boundaries which adjoin residentially zoned lots, are 55 dB from 7:00 AM to 10:00 PM, and 45 dB from 10:00 PM to 7:00 AM. For lands zoned for commercial or apartment uses, the State DOH noise limits are higher at 60 dB and 50 dB, for the daytime and nighttime periods, respectively.

CHAPTER IV. GENERAL STUDY METHODOLOGY

Existing background ambient noise measurements were obtained to determine the potential intrusiveness of project noise sources at existing noise sensitive properties which are south of the proposed project site. Predictions of voice levels from users of the project's recreational facilities were also performed to determine the relationship of these voice levels to current land use compatibility criteria and to the noise limits in the State DOH noise regulations.

Measurements and predictions of traffic noise along Kalakaua Avenue from motor vehicles were performed using the Federal Highway Administration (FHWA) Noise Prediction Model (Reference 6). Sound level measurements of the existing traffic noise levels along Kalakaua Avenue at the project site were also performed to calibrate the highway noise model. Base Year (CY 1991) traffic data along Kalakaua Avenue at the Natatorium Site were obtained from the Honolulu Department of Transportation Services traffic counts (Reference 7). For existing traffic, it was assumed that the PM Peak Hour Leq(h) was 1.0 dB lower than the 24-hour Ldn. This assumption was based on counts of hourly variations of traffic on Kalakaua Avenue south of Monsarrat Avenue (Reference 7).

Because existing public parking spaces on the project site will be eliminated, the anticipated traffic increases were assumed to be very low. A bus loading and unloading space will be provided on Kalakaua Avenue, to accommodate group visits to the facility. The net increase in traffic noise levels attributable to the project were assumed to be negligible due to the reduction of on-site parking spaces.

The potential for adverse impacts from the audible sounds associated with crowd noise at the Natatorium facility were evaluated. Measurements of sound levels during a volleyball game at Hickam Air Force Base as well as at Camp Erdman, Oahu, and sound levels measured at the Manoa Park swimming pool facility were used

to model the sound levels from expected activities at the improved Natatorium facility. Recommendations for mitigating possible impacts or concerns were provided.

CHAPTER V. EXISTING NOISE ENVIRONMENT

TABLE 2 summarizes the results of traffic and background ambient noise measurements obtained at Locations "A" thru "C" near the project site. The noise measurement locations are shown in **FIGURE 3**. Location "C" was used primarily to calibrate the FHWA traffic noise computer model using the actual traffic noise measurements shown in **TABLE 2**. The other two measurement locations were used to measure the background ambient noise levels at the nearest noise sensitive neighbors in the project environs. As indicated in **TABLE 2**, the agreement between measured and predicted traffic noise levels at Location "C" was fair at best due to the influence of other background ambient noise sources (wind or trees and birds).

The existing traffic noise levels along Kalakaua Avenue in the project environs are approximately 62 Ldn, and in the "Moderate Exposure, Acceptable" category at approximately 50 FT setback distance from the centerline of the avenue. Traffic noise levels along a roadway's Right-of-Way generally represent the worst case (or highest) levels due to the close proximity of the Right-of-Way to the noise sources. Traffic noise levels at 100 to 300 FT setback distances from the roadway's centerline are approximately 5 to 10 Ldn lower than those along the Right-of-Way due to distance and shielding effects. An exception occurs for elevated receptor locations which are not shielded from the roadway by intervening terrain features or man-made structures. Because existing noise sensitive buildings in the vicinity of the project site are set back at least 50 FT from the centerline of Kalakaua Avenue, risks of adverse noise impacts from existing levels of traffic are considered to be low.

FIGURE 4 depicts the hourly variations of existing traffic noise levels [Leq(h)] at 50 FT setback distance from Kalakaua Avenue in the vicinity of the project site in CY 1991. The traffic noise levels shown in **FIGURE 4** only apply when unobstructed

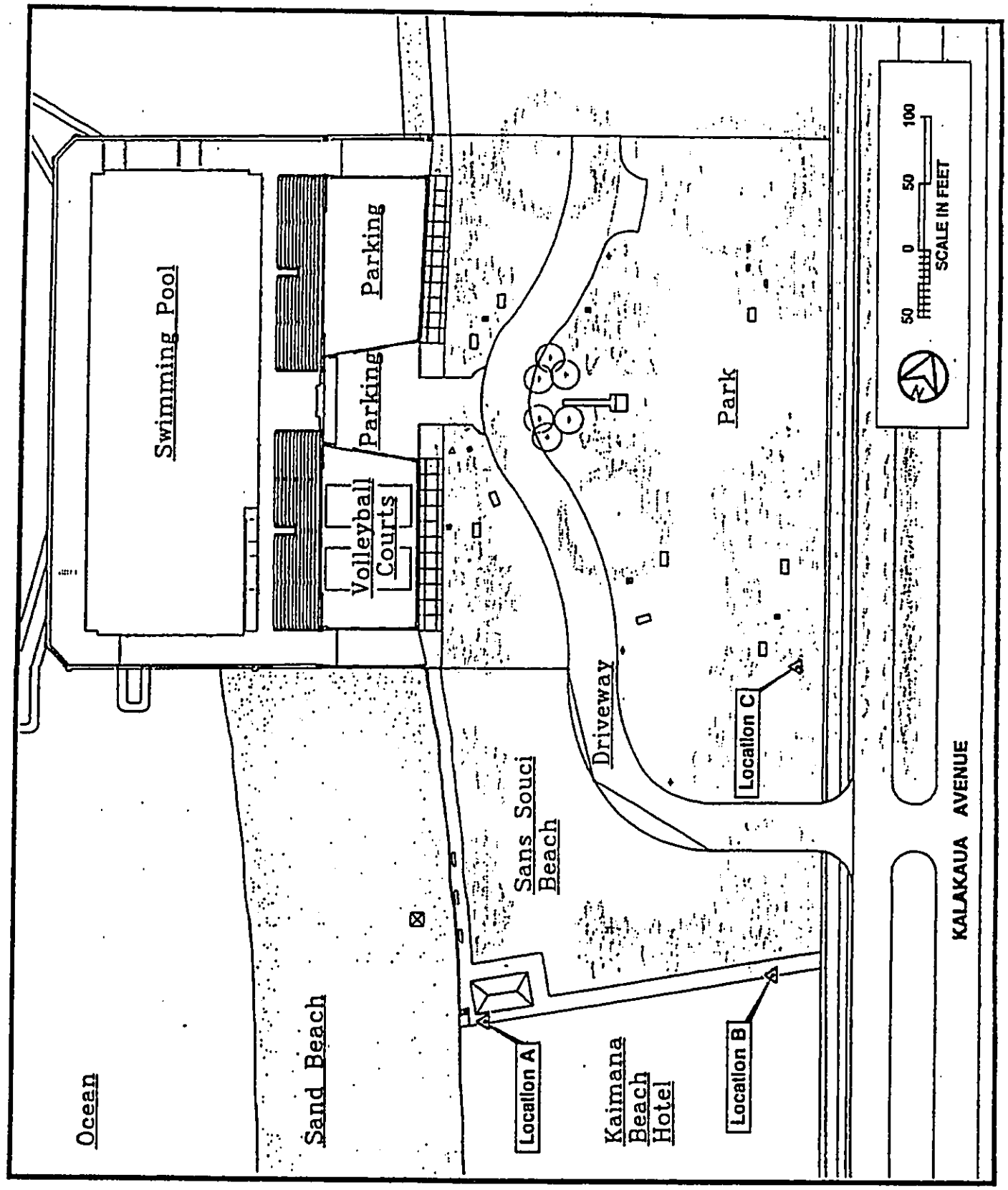
TABLE 2

RESULTS OF NOISE MEASUREMENTS

Location	Time of Day (HRS)	Ave.Speed (MPH)	Hourly Traffic Volume — Auto	Med.Truck	Heavy Truck	Measured Leq (dB)	Predicted Leq(dB)
A. Kaimana Beach Hotel near shoreline. (2/29/92)	1143 TO 1156	N/A	N/A	N/A	N/A	56.2	N/A
B. Kaimana Beach Hotel near Kalakaua Avenue. (2/29/92)	1201 TO 1216	N/A	N/A	N/A	N/A	60.1	N/A
C. 85 FT from the Center-line of Kalakaua Avenue at Natatorium Driveway. (3/3/92)	1630 TO 1730	28	698	21	13	59.1	57.5 *

---

* Difference between measured and predicted traffic noise levels attributed to other background ambient noise level of 54 dB.

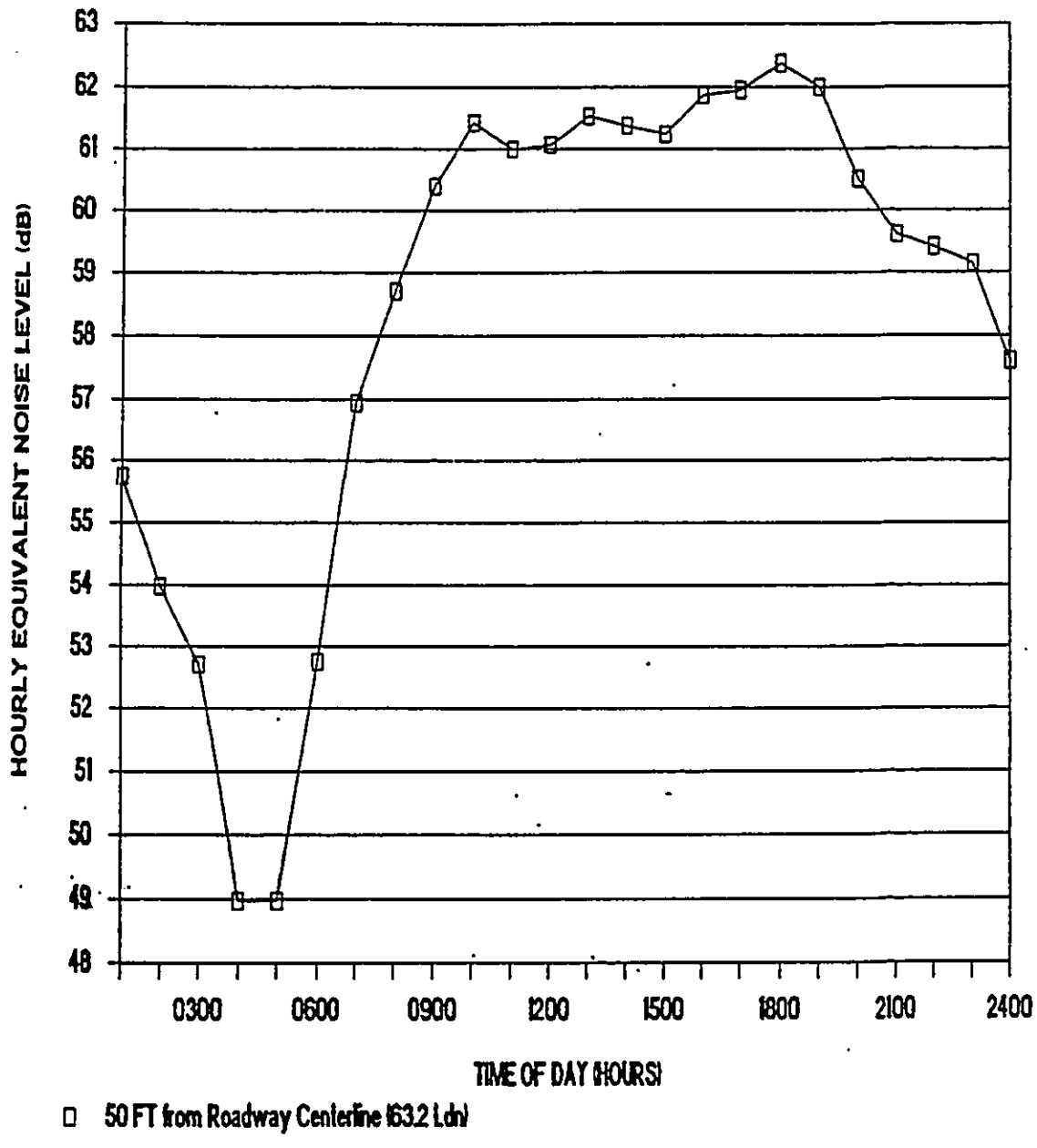


LOCATIONS OF NOISE MEASUREMENT SITES

FIGURE 3

FIGURE 4

HOURLY VARIATIONS OF TRAFFIC NOISE AT 50 FT SETBACK DISTANCE FROM THE CENTERLINE OF KALAKAUA AVE. SOUTH OF MONSARRAT AVE. (7/29-30/91)



line-of-sight conditions exist to Kalakaua Avenue. These conditions would generally occur along the Right-of-Way, within any open space fronting the avenue, or at the upper levels of the high-rise structures south of the project site.

Results of background ambient noise level measurements in the immediate environs of the project are shown in **FIGURES 5 and 6.** At each measurement site where background ambient measurements were obtained, the time of measurement is indicated with the resulting maximum, average, and minimum noise level readings (Lmax, Leq, Lmin) indicated below the histogram. The L10 values shown in the figures are the noise levels which were exceeded ten percent of the time. The existing daytime background ambient noise levels at the measurement sites can be characterized as being moderate, with average levels of 56 to 60 dB (Leq), and minimum levels of 51 to 55 dB (Lmin).

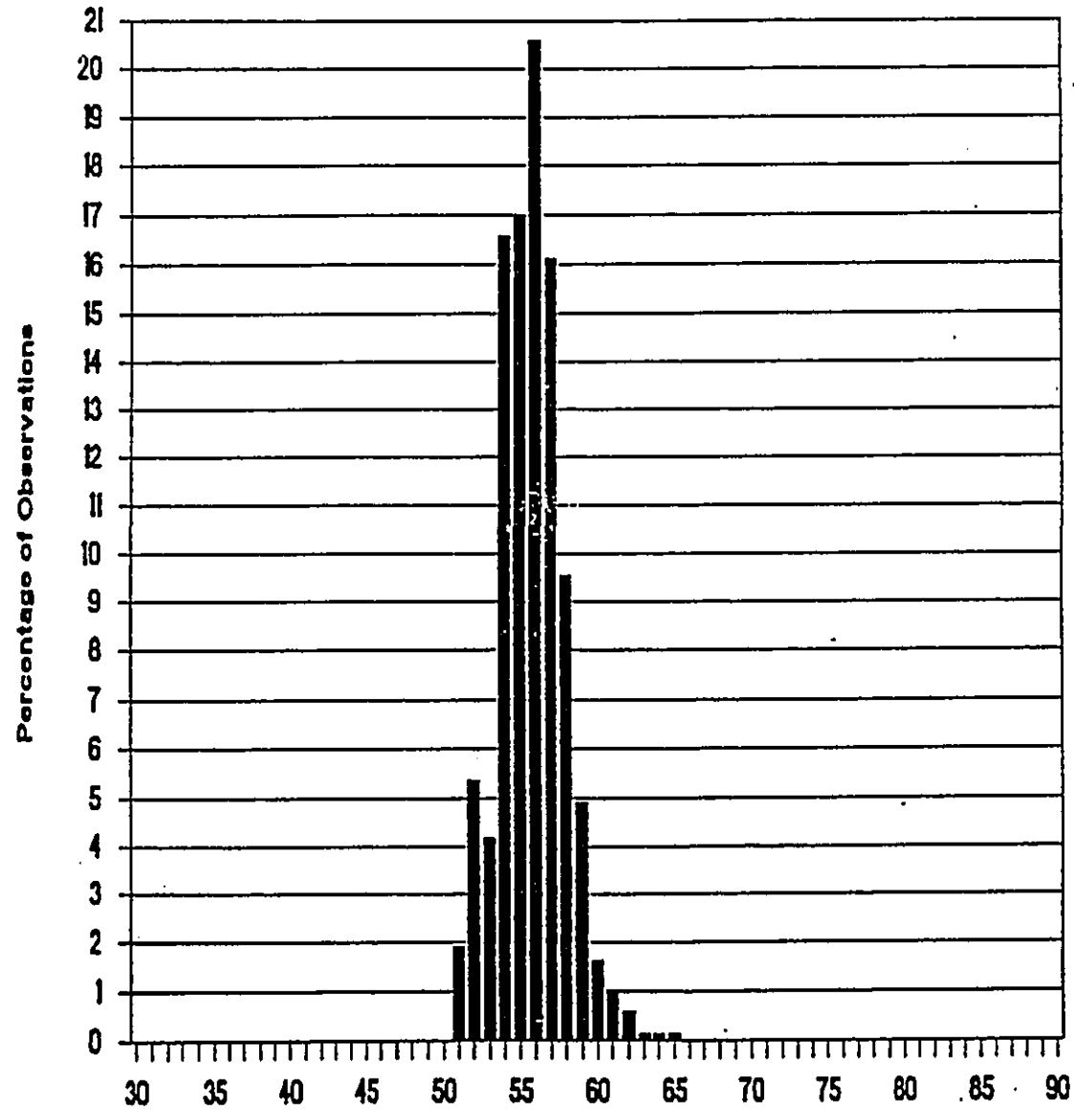
The existing background ambient noise levels in the project environs can be characterized as being typical of urban communities, with total background noise levels controlled by rustling of leaves in the wind, birds, and automobile traffic, as well as surf along the shoreline. Because of the moderate background ambient noise levels in the project environs, man-made sounds such as those associated with automobiles, construction activities, crowd noise, etc. may not be audible at large distances (generally in excess of 200 FT) from the sources of the sounds.

Histograms of the sound levels measured during a volleyball game at Hickam Air Force Base, and during swimming pool activities at Manoa Park are shown in **FIGURES 7 and 8**, respectively. These measured sound levels were used to predict the potential crowd noise levels emanating from the improved Natatorium facility, and the potential noise impacts on noise sensitive properties south of the facility.

FIGURE 5

HISTOGRAM OF A-WEIGHTED SOUND LEVELS AT LOCATION 'A' (1143 HRS TO 1156 HRS)

DATE: February 29, 1992 **METER RESPONSE: Slow**

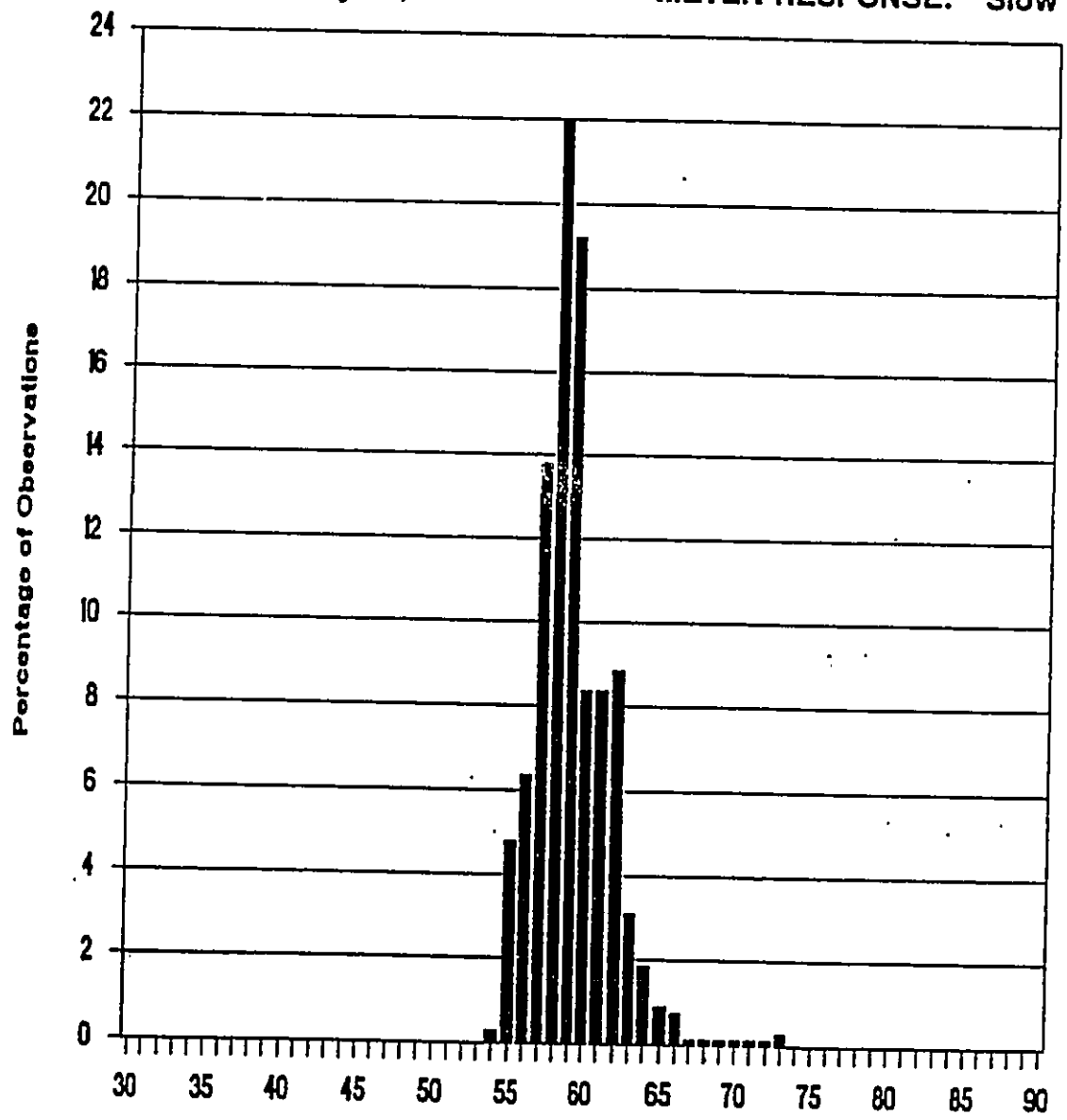


Lmax: 65.0 dBA
L10: 58.0 dBA
Leq: 56.2 dBA
Lmin: 51.2 dBA

FIGURE 6

HISTOGRAM OF A-WEIGHTED SOUND LEVELS AT LOCATION 'B' (1201 HRS TO 1216 HRS)

DATE: February 29, 1992 METER RESPONSE: Slow

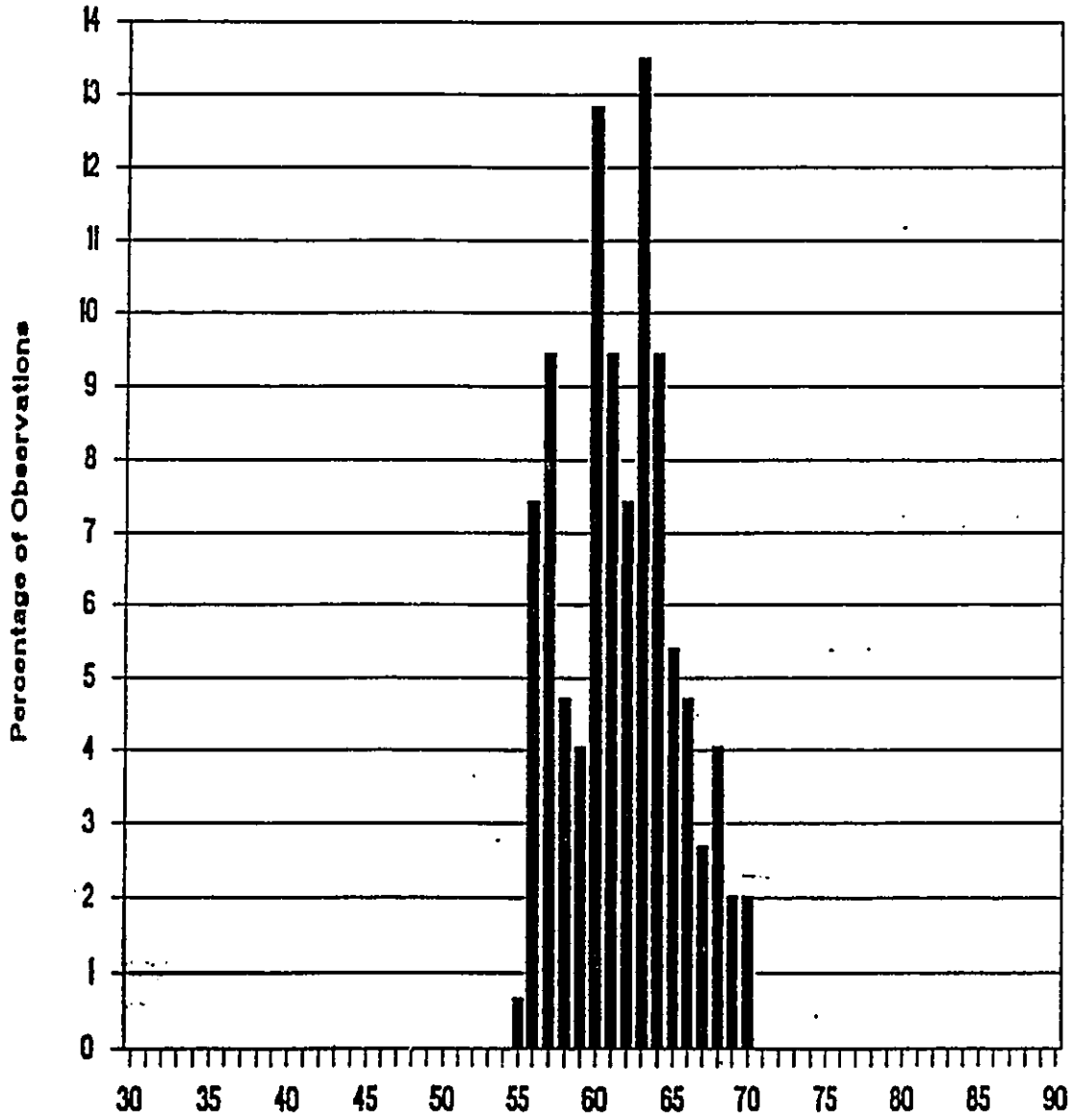


Lmax: 73.2 dBA
L10: 62.0 dBA
Leq: 60.1 dBA
Lmin: 54.5 dBA

FIGURE 7

HISTOGRAM OF A-WEIGHTED SOUND LEVELS FROM CENTER OF VOLLEYBALL COURT AT DISTANCE OF 50 FEET

DATE: February 29, 1992 METER RESPONSE: Slow

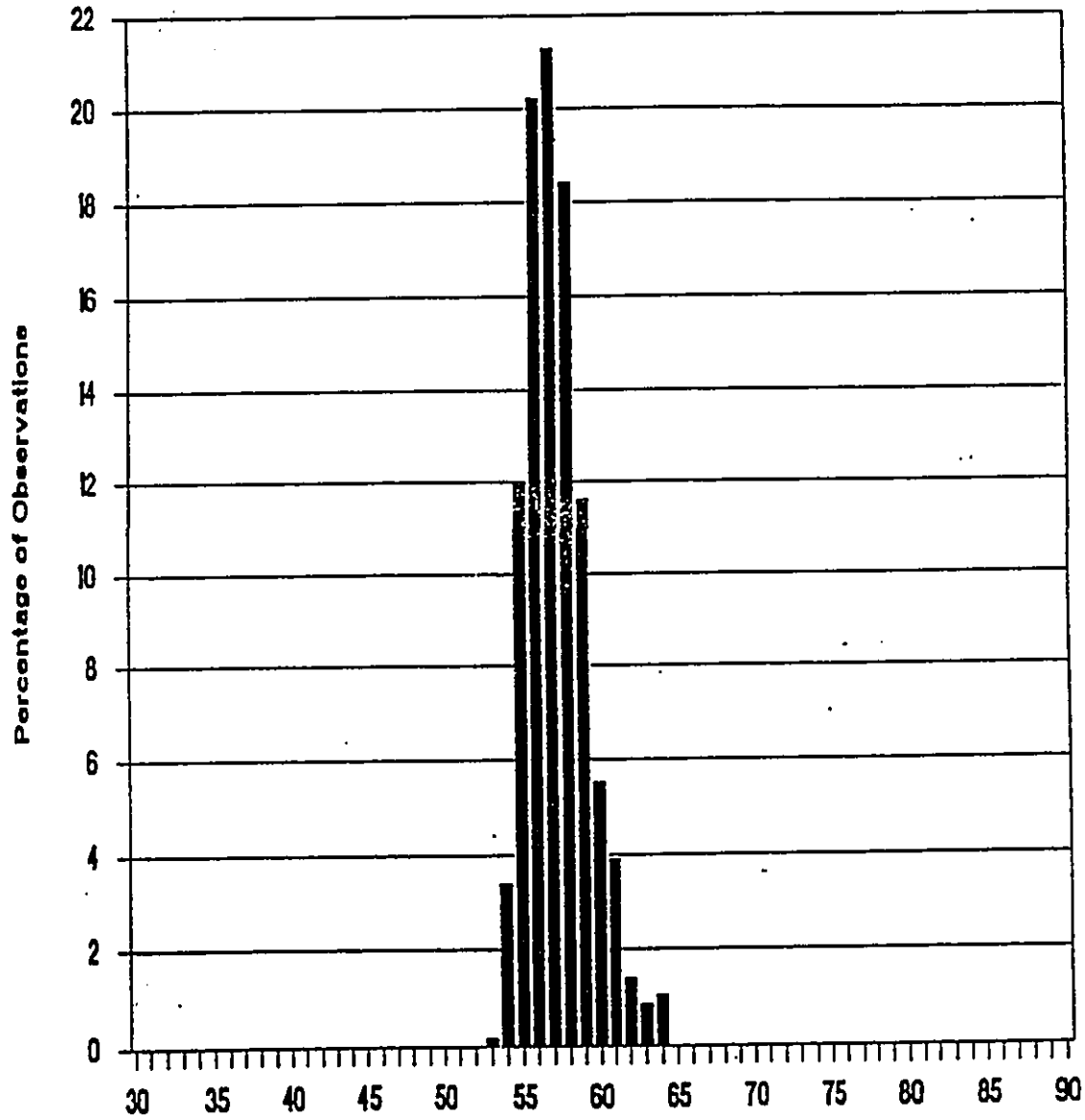


Lmax: 70.3 dBA
L10: 67.0 dBA
Leq: 63.1 dBA
Lmin: 55.4 dBA

FIGURE 8

HISTOGRAM OF A-WEIGHTED SOUND LEVELS FROM CENTER OF SWIMMING POOL AT DISTANCE OF 100 FEET (40 PERSONS)

DATE: March 8, 1992 METER RESPONSE: Slow



Lmax: 64.8 dBA
L10: 60.0 dBA
Leq: 57.5 dBA
Lmin: 53.5 dBA

CHAPTER VI. FUTURE TRAFFIC NOISE ENVIRONMENT

The future traffic noise levels along Kalakaua Avenue in the vicinity of the Natatorium are expected to be controlled primarily by non-project traffic. Forecasts of traffic volumes along Kalakaua Avenue following project build-out were not available, and the increases in project related traffic from existing conditions were assumed to be negligible. For these reasons, the proposed project is not expected to cause significant traffic noise impacts in the project environs.

CHAPTER VII. PREDICTED SOUND LEVELS FROM FUTURE ON-SITE SOURCES

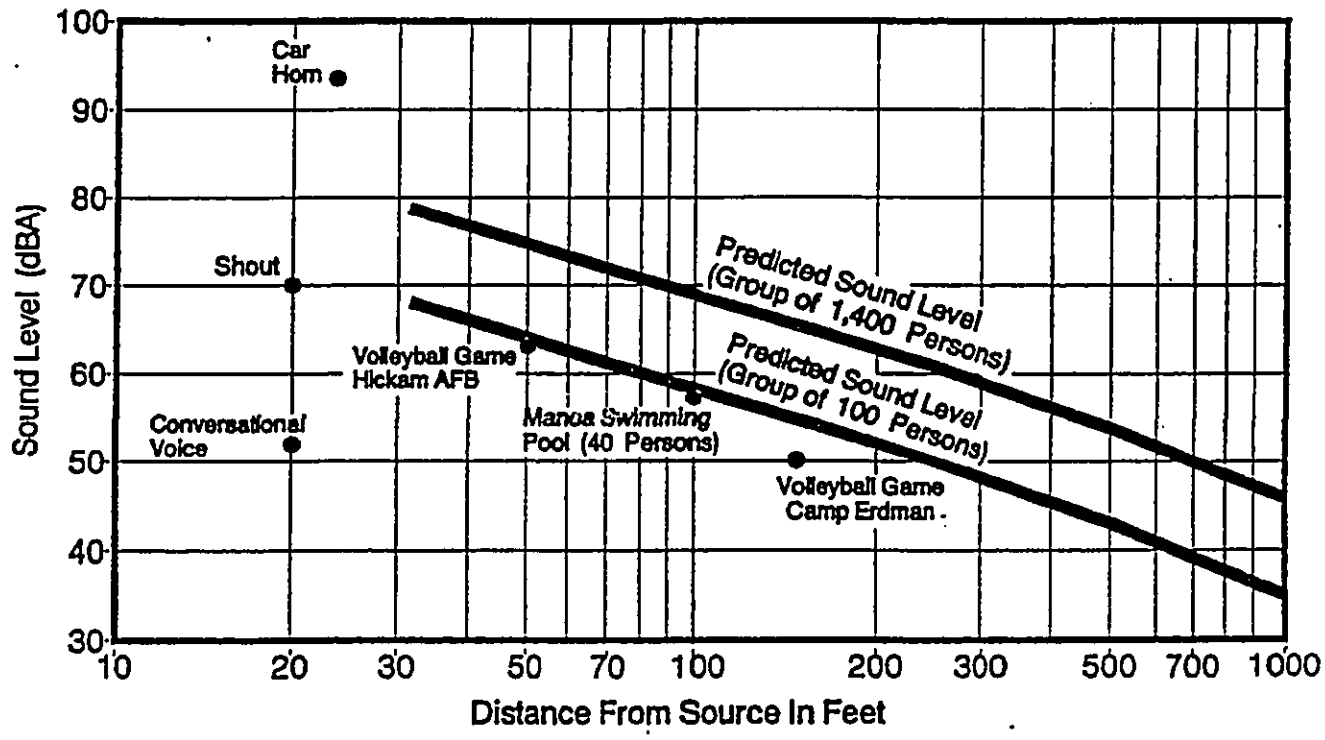
Recreational Activities. The improved Natatorium facility is primarily intended to be used as a public recreational facility and not as a special events facility. Crowd noise from pool users are expected to be the primary source of noise emanating from the facility. The average sound level vs. distance curves used to model groups of 100 and 1,400 persons at the improved Natatorium facility are indicated by the two solid lines in FIGURE 9. In the figure, comparisons are also provided with measured average sound levels of: a volleyball game at Hickam Air Force Base; a volleyball game involving a group of 40 children at Camp Erdman, Oahu; a car horn; conversational voice; a shouting voice; and the results of the sound level measurements at Manoa Park's pool.

Future sound levels from activities on the project site are expected to be intermittent, depending upon the nature and level of activity on the site. During daytime hours, with active recreational activities at the Natatorium facility, average noise levels at the adjoining noise sensitive properties are expected to be less than 55 dB. Although the sounds of voices from on-site activities may intermittently exceed the existing background ambient noise levels near the Kaimana Beach Hotel (see FIGURE 3), they are comparable in level (on the average) to existing background ambient noise sources, such as traffic on Kalakaua Avenue and the existing noise levels of current park users. This is due to the relatively large buffer distance of 300 to 400 FT between the Natatorium facility and the Kaimana Beach Hotel.

Construction Activities. Audible construction noise will probably be unavoidable during the entire project construction period. The total time period for construction is estimated at 30 months, but it is anticipated that the actual work will be moving from one location on the project site to another during that period. Actual length of exposure to construction noise at any receptor location will probably be less than the total construction pe-

FIGURE 9

COMPARISON OF PREDICTED AND MEASURED SOUND LEVELS VS. DISTANCE FROM VARIOUS SOURCES



riod for the entire project. Typical levels of exterior noise from construction activity (excluding pile driving activity) are shown in **FIGURE 10**. The impulsive noise levels of impact pile drivers are approximately 15 dB higher than the levels shown in **FIGURE 10**, while the intermittent noise levels of vibratory pile drivers are at the upper end of the noise level ranges depicted in the figure. Typical levels of construction noise inside naturally ventilated and air conditioned structures are approximately 10 and 20 dB less, respectively, than the levels shown in **FIGURE 10**. The rooms within the neighboring Kaimana Beach Hotel south of the project site are predicted to experience the highest noise levels during construction activities due to their shorter distances to the construction site. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for regulation of construction noise. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the project site.

Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources (80 to 90+ dB at 50 FT distance) and due to the difficulties in containing exterior construction noise sources. The use of properly muffled construction equipment should be required on the job site.

The incorporation of State Department of Health construction noise limits and curfew times, which are applicable on the island of Oahu (**Reference 5**), is another noise mitigation measure which is normally applied to construction activities. **TABLE 3** depicts the allowed hours of construction for normal construction noise (levels which do not exceed 95 dB at the project's property line) and for construction noise which exceeds 95 dB at the project's property line. Noisy construction activities such as pile driving, are not allowed on holidays, Saturdays, Sundays, during the

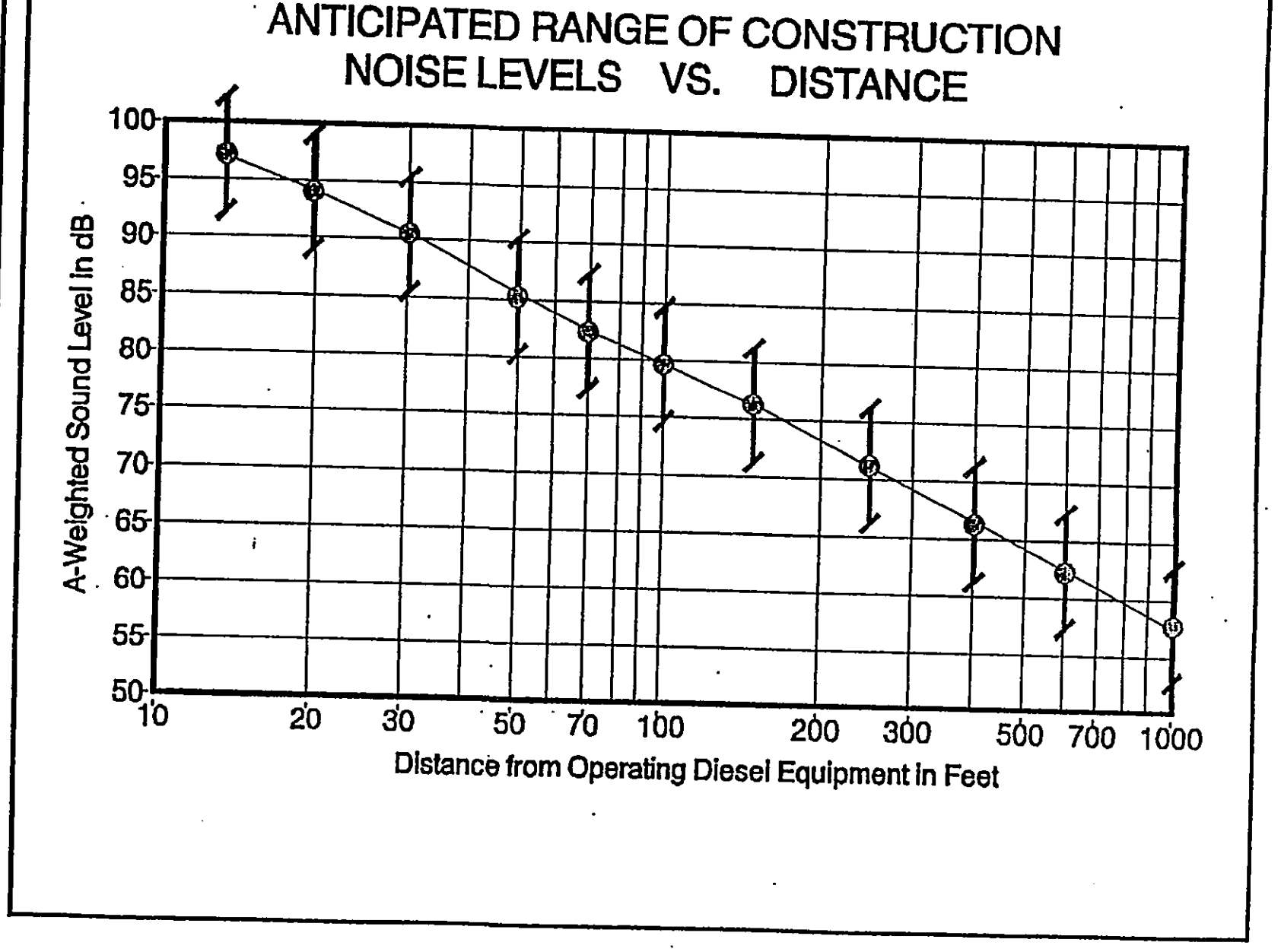
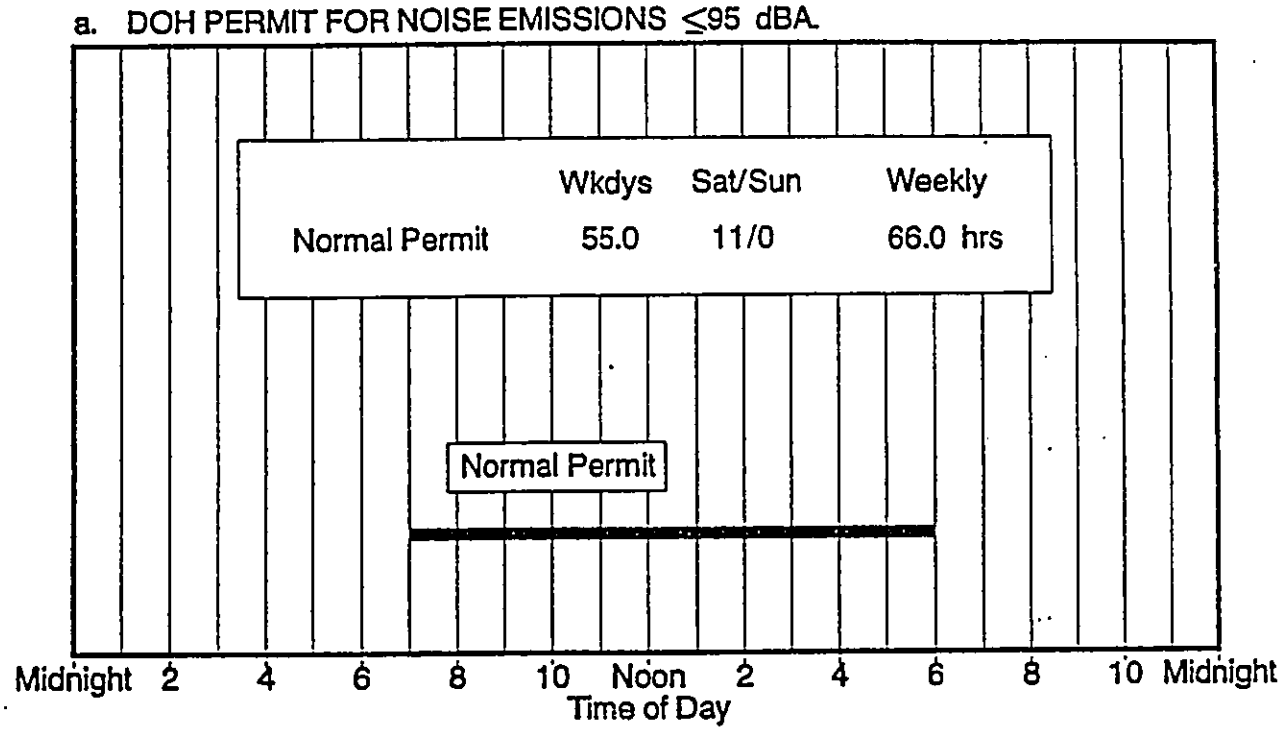

ANTICIPATED RANGE OF CONSTRUCTION
NOISE LEVELS VS. DISTANCE
A-Weighted Sound Level in dB
100
95
90
85
80
75
70
65
60
55
50
10
20
30
50
70
100
200
300
500
700
1000
Distance from Operating Diesel Equipment in Feet

FIGURE 10

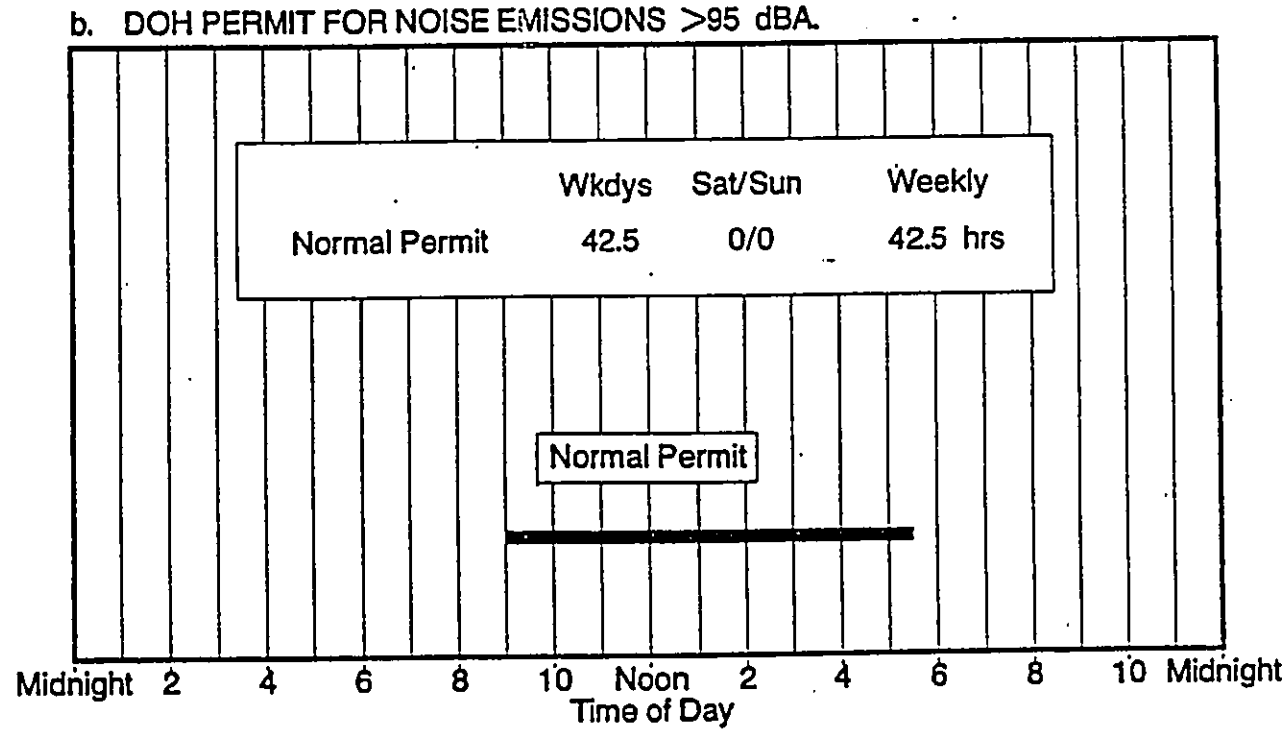
TABLE 3

AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE

a. DOH PERMIT FOR NOISE EMISSIONS ≤95 dBA.



b. DOH PERMIT FOR NOISE EMISSIONS >95 dBA.



early morning, and during the late evening periods under the DOH permit procedures.

CHAPTER VIII. POSSIBLE NOISE MITIGATION MEASURES

By current national land use compatibility criteria and by the reference state Department of Health noise regulations for Oahu, the proposed project should not generate adverse noise impacts on the surrounding properties as long as a nighttime curfew is imposed on activities and excessive noise at the facility. In particular, risks of adverse health and welfare impacts associated with noise from the proposed project are believed to be controllable and may be minimized through the use of administrative controls.

The primary objections to the acoustic emissions from the proposed project will probably be associated with the addition of other sounds to the existing background ambient, and in particular, the voices of users of the swimming pool. These sounds may be audible at neighboring properties during those periods when background ambient noise levels decrease due to low wind or surf conditions, or due to low volumes of traffic on Kalakaua Avenue. To some extent, these types of sounds currently exist, and emanate from the existing beach and park users.

Mitigation of loud crowd noise and boisterous activity at the pool will be necessary if the lifeguards are to maintain control at the pool. In other words, it is unlikely that continuous shouting by large groups of individuals could occur without intervention by the lifeguards. The use of these administrative controls is recommended to mitigate potential noise impacts from rowdyism or other boisterous activities at the improved facility.

APPENDIX A. REFERENCES

(1) "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.

(2) American National Standard: "Sound Level Descriptors for Determination of Compatible Land Use;" ANSI S3.23-1980; Acoustical Society of America.

(3) "Environmental Criteria and Standards, Noise Abatement and Control, 24 CFR, Part 51, Subpart B;" U.S. Department of Housing and Urban Development; July 12, 1979.

(4) "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety;" Environmental Protection Agency, EPA 550/9-74-004; March 1974.

(5) "Title 11, Administrative Rules, Chapter 43, Community Noise Control for Oahu;" State Department of Health; November 6, 1981.

(6) Barry, T. and J. Reagan; "FHWA Highway Traffic Noise Prediction Model;" FHWA-RD-77-108; Federal Highway Administration; Washington, D.C.; December 1978.

(7) July 29-30, 1991 24-hour Traffic Counts; Meter #331, Kalakaua Avenue South of Monsarrat Avenue; Honolulu Department of Transportation Services.

APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E.....). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the LCdn with the LAdn.

Although not included in the tables, it is also recommended that "Lpn" and "LepN" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent". Hence, Leq, is designated the "equivalent sound level". For Ld, Ln, and Ldn, "equivalent" need not be stated since the *concept of day, night*, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristics of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, DBA, PNdB, and EPNdB are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Lpn was found to be 75 dB. Lpn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., deci).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighed Loss of Hearing" (PHL) shall be used consistent with CHABA Working Group 69 Report Guidelines for Preparing Environmental Impact Statements (1977).

APPENDIX B (CONTINUED)

TABLE I

A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

TERM	SYMBOL
1. A-Weighted Sound Level	L_A
2. A-Weighted Sound Power Level	L_{WA}
3. Maximum A-Weighted Sound Level	L_{max}
4. Peak A-Weighted Sound Level	L_{Apk}
5. Level Exceeded x% of the Time	L_x
6. Equivalent Sound Level	L_{eq}
7. Equivalent Sound Level over Time (T) (1)	$L_{eq(T)}$
8. Day Sound Level	L_d
9. Night Sound Level	L_n
10. Day-Night Sound Level	L_{dn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$
12. Sound Exposure Level	L_{SE}

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified a $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA 8-14-78, NOISE REGULATION REPORTER.

APPENDIX B (CONTINUED)

TABLE II

RECOMMENDED DESCRIPTOR LIST

TERM	A-WEIGHTING	ALTERNATIVE[1] A-WEIGHTING	OTHER[2] WEIGHTING	UNWEIGHTED
1. Sound (Pressure)[3] Level	L_A	L_{pA}	L_B, L_{pB}	L_p
2. Sound Power Level	L_{WA}		L_{WB}	L_W
3. Max. Sound Level	L_{max}	L_{Amax}	L_{Bmax}	L_{pmax}
4. Peak Sound (Pressure) Level	L_{Apk}		L_{Bpk}	L_{pk}
5. Level Exceeded x% of the time	L_x	L_{Ax}	L_{Bx}	L_{px}
6. Equivalent Sound Level	L_{eq}	L_{Aeq}	L_{Beq}	L_{peq}
7. Equivalent Sound Level[4] Over Time(T)	$L_{eq(T)}$	$L_{Aeq(T)}$	$L_{Beq(T)}$	$L_{peq(T)}$
8. Day Sound Level	L_d	L_{Ad}	L_{Bd}	L_{pd}
9. Night Sound Level	L_n	L_{An}	L_{Bn}	L_{pn}
10. Day-Night Sound Level	L_{dn}	L_{Adn}	L_{Bdn}	L_{pdn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$	$L_{Adn(Y)}$	$L_{Bdn(Y)}$	$L_{pdn(Y)}$
12. Sound Exposure Level	L_S	L_{SA}	L_{SB}	L_{Sp}
13. Energy Average value over (non-time domain) set of observations	$L_{eq(e)}$	$L_{Aeq(e)}$	$L_{Beq(e)}$	$L_{peq(e)}$
14. Level exceeded x% of the total set of (non-time domain) observations	$L_{x(e)}$	$L_{Ax(e)}$	$L_{Bx(e)}$	$L_{px(e)}$
15. Average L_x value	L_x	L_{Ax}	L_{Bx}	L_{px}

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,.....weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is Leq(1). Time may be specified in non-quantitative terms (e.g., could be specified as Leq(WASH) to mean the washing cycle noise for a washing machine.

APPENDIX D

submitted
to
State of Hawaii
Department of Land and Natural Resources
Division of Water and Land Development

by

Leo A. Daly
Planning, Architecture, Engineering, Interiors
Three Waterfront Plaza, Suite 500
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

PRELIMINARY USER SURVEY REPORT
for
WAIKIKI WAR MEMORIAL AND NATATORIUM
82-OP-E
31 MAY 1989

The State of Hawaii, Department of Land and Natural Resources (DLNR) has retained Leo A. Daly (LAD) to conduct a user survey for the Waikiki War Memorial and Natatorium. This survey treats the Natatorium as a "municipal pool" for the purposes of planning its future uses. It is based on the full restoration of the existing facility and focused on determining the uses for the three major areas that comprises the site: the pool, the area under the viewing stands, and the landside areas.

A list of probable users including government agencies and private sector interest groups was provided to LAD. Of the some fifty individuals initially contacted, the actual user survey questionnaire was issued to seventeen identified users. Input from the Veterans of Foreign Wars (VFW) and the American Legion are still forthcoming.

The following is a summary of our findings from the User Survey for the Waikiki War Memorial and Natatorium.

I. Use

A. Highlights

1. The uses for the Natatorium pool vary from Olympic-style aquatic events and State-wide water polo tournaments to water safety and learn-to-swim instructional programs.

a. The former would require the following:

- a non-saltwater pool,
- swimming venues of varying sizes and depths,
- controlled and monitored water quality,
- additional/larger support facilities including locker rooms, storage rooms, etc.

b. The latter would require a shallow area for swimming instruction.

2. Other uses for the Natatorium focused on recreational activities for the pool and its surrounding areas including a Children's Day event sponsored by the Waikiki Aquarium.

3. Commercial uses for the Natatorium have been proposed.

4. The ARC of Hawaii group intends provide learn-to-swim programs for members who may be physically, as well as mentally handicapped.

B. Response

1. The City and County of Honolulu, Department of Parks and Recreation's (DPR) primary concerns in determining what uses would be feasible for the Natatorium are:

- minimizing operating and maintenance costs,
- avoiding uses that pose liability problems.

2. In the past, DPR has not recommended any commercial activities for the Natatorium due to it having a lack of available parking and causing more congestion in the park.

3. The facility presently does not provide for handicap accessibility.

C. Conclusion

1. The uses should be limited to passive recreational activities. Large events would increase operating and maintenance costs and also pose liability problems.

2. Present handicap accessibility standards will be complied with.

II. Number of Users

A. Highlights

1. The maximum amount of users could reach up to 6000 people at the Children's Day event which is sponsored by the Waikiki Aquarium. This use would mainly be within the landside areas of the Natatorium, however, the aquarium would offset part of the anticipated gathering.

2. Possibly up to 2000 people would be involved with the water polo tournaments. This event would utilize the Natatorium pool and support facilities primarily.

3. The amount of users anticipated for the other proposed uses range from 3-6 people for the ARC of Hawaii group to 60 people for other water safety and swimming instructional programs.

B. Response

1. The maximum capacity of the facility (based on the 1988 Uniform Building Code occupancy load factors) is:

A.	The Pool	800
B.	The Deck	1440
C.	The Viewing Stands	1400
D.	The Area under the Viewing Stands	105
		3745
E.	Landside	N.A.

C. Conclusions

1. The facility can accommodate the number of users for any of the proposed uses.

III. Frequency and Length of Use

A. Highlights

1. The frequency and length of use generally will vary throughout the year.

2. The Olympic-style aquatic event would occur bi-annually during the summer months and would necessitate exclusive use.

3. The water polo tournaments and other swimming events would occur annually and would also necessitate exclusive use.

4. The Children's Day event sponsored by the Waikiki Aquarium would be an annual all day event.

5. All the proposed uses would be daytime only uses except for the Olympic-style aquatic event and the life guard and water safety instructional programs held by the American Red Cross which would require night time availability.

B. Response

1. The Natatorium presently does not have the facilities to accommodate any night uses.

2. Operating and maintenance costs as well as liability problems would increase if night uses were allowed.

3. Lights at night could pose a problem for neighboring hotels and residences.

C. Conclusions

1. The frequency and length of use should be limited to daytime use only. Additional costs for operating and maintenance and liability problems will be curbed.

IV. Special Equipment

A. Highlights

1. The Olympic-style aquatic events require special pool markings and equipment to accommodate their specific events. This would include lane markings on the surface and the bottom of the pool, diving boards, etc.

2. The water polo tournaments require special pool markings and equipment the accommodate their annual event. This would include lane and deck markings, scoreboards, etc.

3. Other items mentioned were P.F.D.'s (Personal Flotation Devices) for water safety and learn-to-swim programs.

B. Response

1. Lane markings on the bottom of the pool is not possible in a pool with a sand bottom.

2. Diving boards would increase liability.

3. Additional storage area is required for equipment storage.

C. Conclusion

1. Only uses with minimal special equipment requirements, such as those required for water safety and learn-to-swim programs, can be accommodated.

D. Landside

1. Vehicle Entry

The vehicular entrance to the Natatorium site shall provide safe and easy access to the parking and loading/unloading areas without causing congestion to Kalalaua Avenue. Landscaping elements shall be used to clearly identify it as the vehicle entry. Proper vehicle turn-around shall be incorporated into the design.

2. Pedestrian Entry

The pedestrian entry shall provide direct access to the entrance to the facility. Hard surfaces (i.e. sidewalks) shall be minimized in an effort to maximize open green areas.

3. Outdoor Courts

The outdoor courts shall be retained for recreational use. The reflecting pools will not be restored.

4. Parking

The existing 39 parking stalls will be maintained. Loading/unloading areas and a vehicular turn-around shall be provided.

5. Landscaping

Landscaping shall be provided to enhance the passive recreational activities on the site. The existing hau trees and trellis', coconut trees and three large banyan trees shall be maintained.

V. Parking Required

A. Highlights

1. The parking requirement ranges from a need for drop-off areas for a bus to 500 cars.

B. Response

1. There are presently 39 parking stalls. Vehicular circulation does not flow through the site.

2. The overall Kapiolani Park area parking is already spoken for.

3. The required parking (based on the Department of Land Utilization off-street parking requirements) is 244 cars.

C. Conclusions

1. The existing parking stalls cannot accommodate the parking requirements for the Natatorium.

VI. Support Facilities

A. Highlights

1. The Olympic-style aquatic event requires support facilities including locker rooms with indoor showers, storage areas, scoring rooms, meeting rooms, etc.

2. The water polo tournament requires support facilities similar to the Olympic-style aquatic event.

3. Hot water showers are requested for those uses where night time use is necessary.

4. Classrooms are requested for water safety and learn-to-swim instructional programs.

5. The A.R.C. of Hawaii requires wheelchair accessible showers and toilets.

B. Response

1. The existing facility has a limited amount of support space.

2. Presently, no hot water is provided at any other municipal pool facility.

3. The facility presently does not provide for handicap accessibility.

C. Conclusion

1. The support facilities for large events cannot be accommodated in the existing faclity.

2. Only cold water will be provided in the restored facility.

3. Present handicap accessibility standards will be complied with.

VII Saltwater vs. Freshwater Swimming Pool

A. Highlights

1. The utilization of saltwater in the Natatorium is an integral part of the War Memorial's character. It is to a large extent, a unique structure due to this utilization of saltwater and, to this day, remains the largest saltwater pool in the United States.

2. Saltwater meets the needs of the primary identified uses of the Natatorium (i.e. recreational swimming, local sporting events).

3. A change to the use of freshwater would be required if major international aquatic sporting events are to be held at the War Memorial and Natatorium.

B. Response

1. Inherent to the staging of major international sporting events are increased support facilities (e.g. parking) and changes to the War Memorial and Natatorium itself (e.g. offices, meeting rooms, areas for media coverage, concrete bottom pool, hot water showers, electrical/mechanical equipment for chlorination and pumping). As presently envisioned, the saltwater flushing system provides for minimum operation and maintenance.

2. The staging of major international sporting events requires "exclusive" use.

3. The staging of major international sporting events will precipitate increased construction and operations and maintenance costs. Such events may also generate significant revenues.

C. Conclusion

1. The continued utilization of saltwater is significant to the preservation of the War Memorial and Natatorium's historic, architectural and cultural value.

Waikiki War Memorial and Natatorium Restoration
User Survey Summary

811188

Person	Organization	Use	No. of Users	Freq. & Length of Use	Special Equipment	Parking Req'd	Support Facilities
Gilbert Minn	Keo Nakama Int'l Swim Meet	Swimming event	40 clubs size varies	3 days per year 8:00 am to 4:30 pm	Lane roped off	75 cars	
Robert Purdie	Hawaii Council of Diving Clubs	Recreational diving activities	10	Yearly 8:00 am to 5:00 pm		5 cars	Wash Area
Jennifer McPeck Marilyn Shigetani Jesse Doyle	American Red Cross	Water safety Life guard instructions	40 - 60	Once every 6 months 60 hr course 5 week program 2x per week (nights) Saturday morning 4 hr per meeting		40 - 60 cars	Hot water for showers Classroom for instructions
Lambert Wai	ARC of Hawaii	Water activities Teach swimming	3 - 6	2-3x weekly 10:00 am - 11:00 am or 12:30 pm - 1:30 pm		1 van	Wheelchair accessible showers and toilets
Bruce Carlson	Waikiki Aquarium	Special events activities (Children's Day)	6000 max	Yearly 9:00 am - 3:00 pm			
Dan Sullivan	State of Hawaii Dept of Education	Water safety Teach swimming	30 per group	Weekly 8 lessons per class 9:00 am - noon Noon - 1:00 pm 1 hr per class		1 Bus per class	Personal Flotation Devices (PFD)

Waikiki War Memorial and Natatorium Restoration
User Survey Summary

811188

Person	Organization	Use	No. of Users	Freq. & Length of Use	Special Equipment	Parking Req'd	Support Facilities
Ed Yee	C & C Honolulu Honolulu Fire Dept	Water safety Training instr	20	Infrequent Yearly 9:00 am - 11:00 am		20 cars	
Manual Lopez	Recreational Activities Organizer	Meeting place Volleyball Lap swimming Water polo	12 - 30 60 max	9:00 am - 6:00 pm W,F 6:00 am - 6:00 pm Sun. and Holidays		20 cars	
Major Clark	C & C Honolulu Honolulu Police Dept	Life safety Training instr Conditioning	60	Once every 4 months 8 hours		30 - 60 cars	
Ralph Hale	Hawaii Water Polo Association	Annual Tourn.	100-150 teams 12-13 per team	August 1 week 4 hours		10 - 12 cars	
		Neighbor Isle Tournament		2-3x per year 2-3 hours			
		Local water polo program training		3-5 days per week 1-1/2 hours			
William Haig	Hawaii Int'l Sports Foundation	Olympic-style aquatic events	50-500	8:00 am - 10:00 pm Full day events	Refer to USOC specs	500+ cars	

APPENDIX E

HO
056
065

16
2-26-90

ORDINANCE NO. 90-1 BILL NO. 117 (1989)

A BILL FOR AN ORDINANCE RELATING TO PARKS AND RECREATION.

BE IT ORDAINED by the People of the City and County of Honolulu:

SECTION 1. Chapter 2, Revised Ordinances of Honolulu 1978, as amended, is amended by adding a new article to be appropriately designated by the Corporation Counsel and to read as follows:

"Article_____. DEPARTMENT OF PARKS AND RECREATION

Sec. 2-___-.1. Additional Powers, Duties And Functions.

The Director of the Department of Parks and Recreation shall:

(1) Operate and maintain the Waikiki War Memorial Natatorium, including its structures, facilities, and grounds.

(2) Perform such other duties as may be required by law."

SECTION 2. This Ordinance shall take effect upon its approval.

INTRODUCED BY:

Councilmembers

DATE OF INTRODUCTION:

August 8, 1989
Honolulu, Hawaii

APPROVED AS TO FORM AND LEGALITY:

Deputy Corporation Counsel

APPROVED this 22nd day of Dec., 1989.

FRANK F. FASI, Mayor
City and County of Honolulu

90-1

CITY COUNCIL

CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

C E R T I F I C A T E

I HEREBY CERTIFY that Bill No. 117 (1989) returned vetoed by the Mayor on January 2, 1990, was taken up by the Council of the City and County of Honolulu for reconsideration on January 10, 1990; and, at the same meeting, APPROVED by the said Council, the veto of the Mayor to the contrary notwithstanding by the following vote:

AYES: Councilmembers Abercrombie, DeSoto, Doo, Felix, Gill, Mansho, Morgado. - 7.

NOES: Councilmembers Kahanu, Kim. - 2.

FURTHER, pursuant to Section 3-203 of the Revised Charter of Honolulu and the foregoing action by the said Council, Bill No. 117 (1989), became a duly enacted ordinance on January 10, 1990.

DATED, Honolulu, State of Hawaii, this 11th day of January, 1990.

COUNCIL OF THE CITY AND COUNTY
OF HONOLULU

By _____
ARNOLD MORGADO, JR.
Chair and Presiding Officer

ATTEST:

_____
RAYMOND K. PUA
City Clerk

APPENDIX F

EXECUTIVE CHAMBERS
HONOLULU

JOHN WAIHEE
GOVERNOR

December 14, 1987

COPY

MEMORANDUM

TO: The Honorable William W. Paty, Chairperson
Board of Land and Natural Resources

SUBJECT: Waikiki War Memorial Natatorium

In reponse to your request, I am approving the release of the full appropriation of $1.2 million in design funds for the restoration of the Waikiki War Memorial Natatorium.

The Department of Land and Natural Resources (DLNR) is to be the expending agency and custodian of the funds with full responsibility for determining the design scope of the project, selecting the engineering consultant, determining the level of funds to be released and establishing a firm understanding of the State's position and commitment to the project with the Friends of the Natatorium and other interested parties. The DLNR will be further responsible for apprising this office and the Department of Budget and Finance of all funds expended for the project.

JOHN WAIHEE

cc: The Honorable Yukio Takemoto

APPENDIX G

90:039-19

RECEIVED DIVISION OF STATE PARKS
90 FEB 12 2 59 PM '90

RECEIVED
90 FEB 12 P1:03

DIV. OF WATER & LAND DEVELOPMENT

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

February 5, 1990

COPY

Honorable Arnold Morgado, Jr., Chair
City Council
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Chair Morgado:

Thank you for your letter of January 11, 1990, and the copy of Ordinance No. 90-1 (Bill No. 117, 1989) pertaining to the Waikiki War Memorial Natatorium.

The City Council's action to override the Mayor's veto provides a key signal of the Council's commitment to work together with the State Legislature and Administration toward the resolution of a long standing problem. By your action, the State is challenged to make the funding commitment necessary to provide construction monies for a fully restored Natatorium. We expect such deliberations will take place during the 1991 legislative session.

Thus, although we cannot predict the outcome of such funding, your positive action at this juncture provides the Department of Land and Natural Resources with a key condition necessary to support upcoming design decisions.

With kindest regards,

Sincerely,

JOHN WAIHEE

bcc: Honorable William W. Paty

TO:
_____ ADMINISTRATOR
_____ ASST. ADMIN.
_____ DEV. BR.
_____ PLAN BR.
_____ RES. MGT. BR.
_____ PROJ CONTROL
_____ SW REC. PLAN.
_____ CLERICAL STAFF
_____ HIST. SITES SEC.
_____ ADMIN. ASST
FOR:
_____ CIRCULATE
_____ COMMENTS & REC.
_____ DRAFT REPLY
_____ FILE
_____ FOLLOW UP
_____ INFO.
_____ SEE ME.
_____ SIGNATURE

APPENDIX H

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
KEITH W. AHUE
MANABU TAGOMORI
DAN T. KOCHI

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION PROGRAM
LAND MANAGEMENT
STATE PARKS
WATER RESOURCE MANAGEMENT

February 7, 1992

Richard Philipovich
Leo A. Daly
HonFed Tower, Suite 1000
1357 Kapiolani Blvd.
Honolulu, Hawaii 96814

LOG NO: 4573
DOC NO: 0554T

Dear Mr. Philipovich:

SUBJECT: Waikiki War Memorial and Natatorium Restoration
Waikiki, Kona, O'ahu
TMK: 3-1-31: 3

There are no known subsurface historic sites at this parcel. However, the beach and back-beach of Waikiki are areas that frequently yield human burials during routine excavation for construction. You do not anticipate any significant excavation at this time, so if your plans do not change, then no archaeological work prior to construction will be necessary. If, however, historic sites, including human burials, are uncovered in the course of construction activities, then work in the vicinity must stop and our office contacted at 587-0047. If your plans change, and excavation will be required, please let us review your plans, so that we may suggest the best possible way to mitigate possible adverse effects of this excavation.

If you have any questions, please call Tom Dye at 587-0014.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

TD:jen

FEB 11 1992

CERTIFICATION

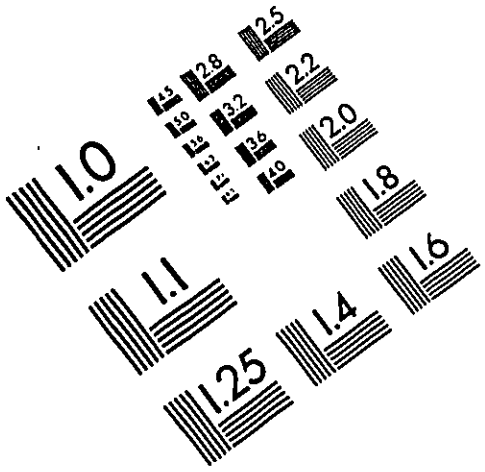
I HEREBY CERTIFY THAT THE MICROPHOTOGRAPH APPEARING IN THIS REEL OF FILM ARE TRUE COPIES OF THE ORIGINAL DOCUMENTS.

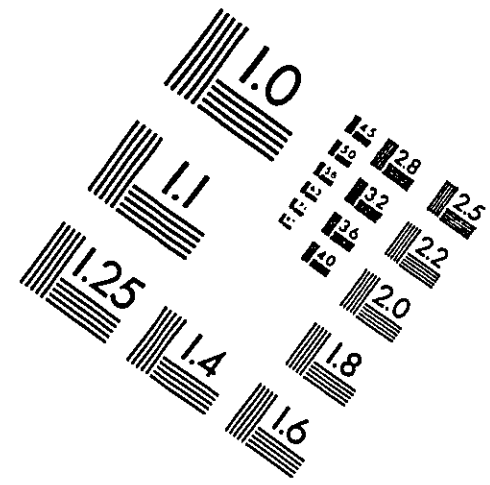
2006
DATE

Tammy Yoshimura
SIGNATURE OF OPERATOR

TOP

Film Identification

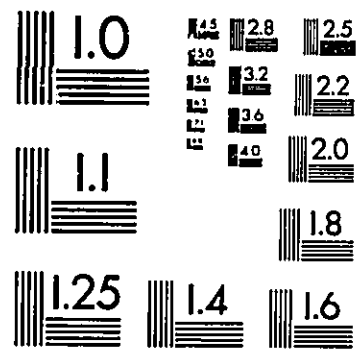




A & P International
715/262-5788 • Fax 715/262-3823
577 Locust Street • Prescott, WI 54021
Web Site http://www.zimc.com/apintl

PRECISION[SM] RESOLUTION TARGETS

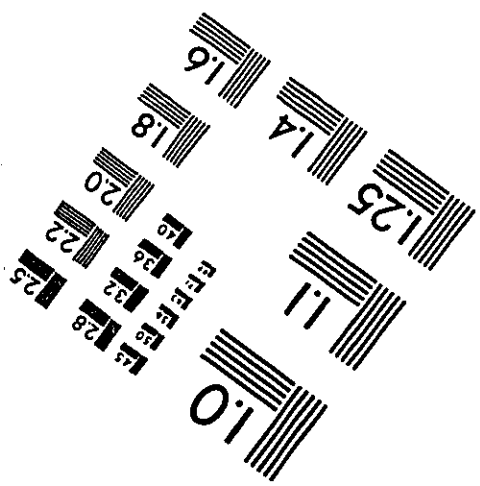
LEFT

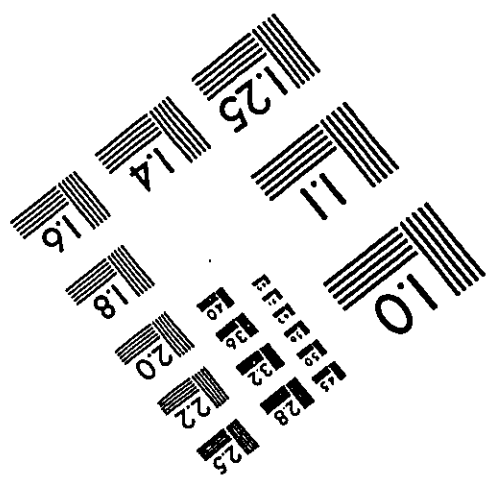


RIGHT

150 MM

6″





PA-3 8½"x11" PAPER PRINTED GENERAL TARGET

DENSITY TARGET