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

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

MAY 19 1998

Ref.:PB:THE

File No.: CDUA OA-2874

Sam Ustare
Leo A. Daly Company
1357 Kapiolani Blvd
Suite 1000
Honolulu, Hawaii 96814

Dear Mr. Ustare:

Subject: Conservation District Use Application (CDUA) to construct two groins extending from the Waikiki Natatorium (Seaward of TMK: [1]1-3-28:11)

I wish to inform you that the subject CDUA was approved by the Board of Land and Natural Resources on April 9, 1998, subject to the following conditions:

1. The applicant shall comply with all standard conditions as established in Section, 13-5-42, Hawaii Administrative Rules (attached);

2. The applicant shall comply with all mitigative conditions described in the Final Environmental Impact Statement for the project;

3. The applicant shall comply with the conditions listed in the memorandum from the Division of Aquatic Resources dated November 24, 1993 (attached);

4. The applicant shall comply with all Department of Health rules and regulations, and shall obtain all necessary approvals from the Department of Health prior to initiating construction on the project;

5. The applicant shall submit a plan for maintenance of the sand traps to the Chairperson prior to the initiation of construction, and shall coordinate the removal of any sand from the Natatorium with the Coastal Lands Program; and

6. Other such terms and conditions as prescribed by the Department.

Please acknowledge receipt of this approval, with the above noted conditions, by signing in the space provided below. Please sign two copies, retain one, and return the other to us within thirty (30) days.

Should you have any questions on this matter, please contact Tom Eisen of our Planning Branch at 587-0386.

Sincerely,

DEAN UCHIDA, Administrator
Land Division

Receipt acknowledged:

5/10/98

Signature **Title** **Date**

attachments

cc: Chairperson's office
Oahu Boardmember
Oahu District Land Office
DOH (Dr. Anderson)
Army Corps of Engineers
C&C Building Department

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Land Division, Planning and Technical Services Branch
Honolulu, Hawaii

File No.: OA-2874
180-Day Exp. Date: 4/12/98

April 9, 1998

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

REGARDING:	Conservation District Use Application to construct two groins extending from the Waikiki Natatorium, to improve water circulation and quality within the pool
APPLICANT:	City and County of Honolulu Building Department 650 South King Street, 2nd Floor Honolulu, Hawaii 96813
AGENT:	Leo A. Daly Company 1357 Kapiolani Boulevard, Suite 1000 Honolulu, Hawaii 96814
LANDOWNER:	State of Hawaii
LOCATION:	Submerged land seaward of Waikiki Natatorium, Waikiki, Oahu
TMK:	Seaward of 1-3-28:11
AREA OF USE:	5,358 Square Feet at Base of Groins
SUBZONE:	Protective Subzone

BACKGROUND:

At the March 27, 1998 meeting of the Board, testimony was heard regarding this item, but action was deferred to the next meeting (April 9, 1998).

Numerous questions and issues were raised during the Board's deliberations on March 27, and this report will attempt to address those concerns. Staff considers this report to be supplemental to the submittal prepared for the March 27 meeting (See Exhibit A); therefore, please refer to the previous report for a comprehensive analysis of the proposal.

AS AMENDED
APPROVED BY THE BOARD OF
LAND AND NATURAL RESOURCES
AT ITS MEETING HELD ON
April 9, 1998. por

ITEM D-22

On the Monday following the March 27 Board meeting (March 30), staff met with representatives of the applicant, the project consultant, and the project engineer to attempt to address outstanding concerns. The applicant team was provided the opportunity to respond to the staff report submitted to the Board on March 27. They were notified of staff's short timeframe to submit this required supplemental report (deadline: Thursday morning, April 2). On Wednesday (April 1) two photographs were provided as additional information for consideration in our analysis, and on Thursday morning (April 2) an eight page letter with attachments was also provided. Since staff has not had sufficient time to fully consider these recent transmittals, they are being attached to this submittal for the Board's consideration (See Exhibit B). Given the short timeframe to conduct the analysis and finalize this report, staff may be in a position to provide further information and analysis at the April 9 Board meeting.

ANALYSIS/DISCUSSION:

Staff has organized this report into sections based on issues that emerged from the discussion at the March 27 Board meeting.

Balanced Presentation:

Staff regrets any perceived lack of objectivity in its analysis of the CDUA. In an effort to summarize the myriad information regarding the proposal, staff may have inadvertantly failed to explicitly provide information on experts who have testified in support of the proposal. For the record, staff would like to clarify that the project engineer is Dr. Franciscus Gerritsen, Professor Emeritus and former Chairman of the UH Department of Ocean Engineering. Additionally, staff has learned the following experts provided oral testimony and information regarding the project at the SMA hearing before the City Council:

Roger Fujioka, Ph.D. (with University of Hawaii Water Resources),

Richard Brock, Ph.D. (with the University of Hawaii),

Bruce Carlson, Ph.D. (Director of the Waikiki Aquarium),

Samuel J. Freas, Ed.D. (President, International Swimming Hall of Fame), and

Mr. Donald Hibbard of DLNR's Office of Historic Preservation.

Legislative Intent

As noted in the Chronology section of the project's EIS, in 1987 Governor Waihee released $1.2 million in funds that the Legislature has appropriated the prior session for the purpose of "design for restoration of Natatorium." In 1993, Representative Les Ihara's resolution supporting full restoration of the Natatorium passed both houses. Additionally, in 1994, the Legislature appropriated $300,000 for FY '94-'95 for additional "plans, design, and construction of the Waikiki Natatorium and related improvements." Staff notes that the quoted information from the line-items of the appropriation bills is not intended to suggest that the planning and designing was not to include the consideration of alternatives.

Impacts on the Surrounding Environment:

a) Impacts on Waikiki MLCD:

Pursuant to Chapter 190, HRS (which establishes the Marine Life Conservation Program), the Department may issue permits to allow otherwise prohibited activities for public purposes on such terms and conditions deemed necessary to minimize any adverse effect within the MLCD. Notably, the adverse effects to be minimized are not limited to "substantial" adverse effects. Dr. Gerritsen indicated after the Board meeting that a critical assumption was the need to maximize flow through the pool. While staff understands that the proposed Ewa groin has apparently been modified over time (and thus it could be argued that an effort to minimize adverse effects has been made), given the fundamental (and unanswered) question about how much flushing is really required to address the public health concerns within the pool (and therefore how necessary the groins are to provide sufficient flushing), staff can not effectively determine whether they have been designed and sized to minimize effects within the MLCD.

Some discussion at the March 27 meeting focussed on the precedence established by the approval of a CDUA to lay fiber optic cable within the Manele Bay MLCD on Lanai. At issue there was a need to provide for very basic public safety and welfare infrastructure, which staff believes unequivocally established the "public purpose" criteria necessary for CDUA approval within that Protective subzone. Further, that project was materially different from the current proposed use of an MLCD in that no dredging, trenching, or fill activities were proposed; the only use of the MLCD was to lay the cable on the sandy bottom and across 30 feet of hard substrate (this 30 foot section also had a semi-circle pipe covering bolted

down over the cable into the substrate). The approval for that CDUA very clearly stated that it was an extraardinary permit granted on a one-time basis and did not confer any vested right to that applicant or any other party for future use of MLCD.

As discussed in the March 27 submittal, staff is not unequivocally convinced that the use of the Protective subzone for the proposed groins is a "mandated governmental function, activity, or service ... in accordance with the purpose of the conservation district."

b) Potential alteration or destabilization of Sans Souci Beach:

While the CDUA acknowledges that the Diamond Head groin would modify the littoral currents in the area, the consultant does not believe that the modification would lead to adverse changes to the sand beach. In fact, the idea was suggested that the proposal would prevent the (assumed) eventual accretion of sand all the way out to where the reef begins, and thus the project would help maintain a sand bottomed swimming area makai of the beach. Staff understands that the beach is indeed slowly accreting seaward, but feels that if the accretion continues to the point where the swimming area is in jeopardy of being filled in, the sand could simply be dredged out and placed elsewhere; the proposed groins are not a necessary element to resolve this problem should it occur.

Dr. Gerritsen contends that his calculations indicate that the flow of water exiting the pool in conjunction with the DH groin will be sufficient to carry away any sand and sediment that settles either into the outflow channels (within the pool structure) or into the area in the path of the outflow (makai of the beach). As noted above, he believes that this flow of water will be strong enough to maintain an open swimming area off the beach. If this is the case, it certainly may be that the flow is strong enough to cause erosion, or at least destabilization, of sand in other areas of the beach. Staff is reliant on knowledgeable intuition in this matter, since staff is not aware of any calculations or modelling that investigated this concern. While it has been mentioned that gates are being considered for the three outflow openings, and that conceivably through the manipulation of the gates into various open and closed configurations, the force of the outflow could be manipulated, staff questions whether is it reasonable to presume that the pool's operating staff will have the expertise to be regularly adjusting the gates to account for wave and tidal forcing in order to optimize flow out of the pool or to prevent beach erosion.

c) DH groin may trap sand and block the pool's outflow openings:

Dr. Gerritsen acknowledges the concern of Dr. Fletcher and others that the DH groin, by itself would cause sand to accumulate in its "shadow" along the DH wall of the Natatorium. However, as noted above, he believes that the flow of water from the pool's outflow opening (at the base of this groin) will mitigate the potential accumulation of sand in this area. In acceptance of the fact that sand may still accumulate in this area, and in an effort to "manage rather than control nature," it has been indicated that a "sand trap" is designed into the outflow channels within the pool. Prior to the March 27 Board meeting, staff was not aware of this feature, since the Natatorium structure itself (which is not in the Conservation District) has not been the focus of our analysis and no detailed information was included in the CDUA. Staff had made its concern about sand acculumation known to the project consultant, but the consultant did not provide any information about this feature to staff; instead, they only reiterated that sand accumulation would not be a problem. At the March 27 meeting, Dr. Gerritsen indicated that "one or two shovelfuls" could occasionally be removed from the sand traps to keep them cleared.

As noted by Dr. Fletcher at the March 27 meeting, the beach is accreting by approximately 75 cubic yards of sand per year. Although Dr. Fletcher made it clear that he did not have the wealth of knowledge that Dr. Gerritsen had to support the design, in the subsequent meeting, Dr. Gerritsen concurred with Dr. Fletcher's figure. Dr. Gerritsen interpolated that some unknown fraction of approximately 1.5 cubic yards could accumulate in the sand traps per week. Assuming that the accumulation is constant at this rate throughout the year, staff believes the regular cleaning of this amount of sand requires a solid maintenance commitment. In prior written responses to questions about the need to deal with sand accumulation, the project consultant stated that "no mechanism is necessary", and that "generally, the strong natural flushing system will clear the area quickly." Thus, staff has not been made aware of any acknowledgement or commitment to physically clear the sand traps. In the case that the accumulation does not occur regularly, but instead in less frequent and larger episodes, then the task of cleaning out the traps could be even more demanding. Further, no description has been provided of how and where the sand would be moved. Given the high value of quality sand with the heightened awareness of beach loss and erosion, staff believes the department's Coastal Lands Program should be involved with any sand clearing program to help determine how and where the trapped sand is moved.

Visual and Aesthetic Impacts

The consultant provided staff with two color photographs of the area on the proposed DH groin; each photograph was enhanced to represent how the scene would look with the DH factored in (See photos in Exhibit B). Staff notes that the photographs indicate that the horizon line, breaking waves on the outer reefs, and sailboats are clearly visible from virtually all perspectives (except perhaps from swimming in the water near the DH seawall). Staff questions, however, how constructing groins (and the DH groin in particular with its concrete face towards the beach) will affect the high aesthetic qualities that are a significant objective of the larger Natatorium restoration project.

Public Health and Safety Issues

Reference was made at the meeting to the Hilton Lagoon CDUA, which the Board approved in 1997. This project entailed the devlopment of an aquatic recreation facility (consisting of an underwater tropical marine environment and a seawater intake pipe) at the existing Kahanamoku Lagoon adjacent to the Hilton Hawaiian Village complex in Waikiki. There are some similarities between the two projects, primarily in that they both involve improving the water quality in "facilities" that will be used for in-water activities.

However, the differences between the two projects are substantial in that the Hilton project will actively pump in seawater (rather than the passive "natural-flushing" design of the Natatorium proposal). As staff has maintained, an active pumping system allows significant control over the constantly fluctuating natural environmental conditions, and if applied to the Natatorium proposal could provide for the attainment of the high water quality objective without the environmental impacts associated with the proposed groins.

A further difference between the two project is that the Natatorium is considered a "pool," subject to DOH's swimming pool rules, while DOH considers the Hilton project to be a "lagoon," and thus outside of the scope of their specific swimming pool rules. As noted in the March 27 meeting, DOH has maintained that a restored Natatorium pool will not meet all of the required standards in their rules, and thus they will not be able to permit it under the existing rules. The project consultant has indicated that some discussion is underway to resolve this significant hurdle; DOH understands that discussions may take place to consider the possibility of applying different water quality standards (such as the "marine

recreational" standards rather than the "swimming pool" standards) or to potentially modify their legal authority over the issue.

Another issue that was considered at the Board meeting was how the effluent from the Waikiki Aquarium's outfall pipe (which is located directly upstream from the proposed intake opening of the Natatorium) could affect water quality within the pool, and thus potentially in the swimming area off Sans Souci Beach. Staff acknowledges and concurs with testimony from Dr. Carlson, Director of the Waikiki Aquarium that indicates no bacterial problems are expected because of filtration of effluent from the monk sea pool. Further, staff understands that the effluent from the Aquarium's discharge pipe into the ocean is regularly monitored for the presence of Enterococcus bacteria, which is a primary indicator of pollution.

In yet another issue discussed at the March 27 meeting, Dr. Fletcher commented that there appears to be a fundamental conflict with water flow within the pool. He noted that decreased turbidity in the water is a laudable goal, which can be achieved by allowing suspended solids time to sink to the bottom of the pool, which in turn is achieved by having calm water. On the other hand however, allowing for calm water does not appear to address the need for improving water quality by increasing the flow of water through the pool (in order to flush out microorganisms). While this is an issue somewhat beyond the scope of the Board in addressing the CDUA for the groins, it does illuminate some engineering concerns that do not appear to have been resolved.

Further, it focusses attention on a larger question of how much flushing is really required to adequately improve water circulation and water quality within the pool. Given the pool's current condition with essentially zero circulation (because the outflow pipes are buried in sand), any amount of circulation would be an improvement. As noted above, the flushing is intended to lead to simultaneous improvements in both the turbidity (i.e., water clarity) and in water quality (i.e., to address the concern about Staphylococcus and other bacteria and viruses, since disinfecting the water is not possible). Once the existing water and sediment from the pool is removed and ambient conditions are reestablished, staff questions how the flushing regime will lead to further improvements in water clarity, since 1) the water entering the pool have the same turbidity as the ambient water outside, and 2) the flushing design is intended for maximum flow, which will not facilitate the settling out of sediment.

Regarding the "water quality" concern, it has become apparent that no one really knows how much flushing is required to address the potential Staph problem. In discussing this with Dr. Gerritsen at the March 30 meeting, he indicated that a goal, therefore, was to maximize flow through the pool in an attempt to prevent this problem. Thus, he said that the Ewa groin was conceived and was calculated to increase the flow into the pool by 20% to 30%. Staff, however, is concerned that the engineers may have inadvertantly either "under-designed" the water circulation scheme (which could establish a public health problem within the pool and the swimming area makai of Sans Souci Beach) or perhaps have "over-designed" it (and thus possibly have called for unnecessary groins, and their associated impacts, within the Conservation District).

As noted above, staff in unaware of any information that clarifies whether this enhanced flow will actually be adequate or whether the flow entering the pool without the groin would be sufficient. Obviously, if the pool is constructed and adequate water quality standards can not be met, then it would have to be closed for the duration of the unmet standards. The consultant has indicated that there may be up to 14 days per year of closures due to public safety concerns (poor water clarity), but no mention has been made of how often the pool may be closed due to public health concerns (such as high concentrations of Staphylococcus bacteria). This is further complicated by the lack of any standards pertaining to acceptable levels of Staphylococcus.

While staff does not purport to have the answers to these issues, it points to the risks inherent in this proposed project, and makes staff all-the-more reluctant to commit highly valued conservation resources to this project.

<u>Modelling and Design Assumptions</u>

Staff understands that project engineers had justification to perform only limited modelling, and instead base the design on other engineering techniques. While staff does not challenge the engineers' expertise in choosing and using the tools they consider appropriate to design an enhanced water circulation scheme for the pool, staff notes that no alternatives beyond natural flushing with groins were ever modelled or seriously considered.

In reviewing DLNR's records for the project, which begin in December 1987 when the Governor identified DLNR as the expending agency with full responsibility for determining the design scope of the project (among other things), staff understands that very soon

after the selection of the design consultant, Dr. Gerritsen as an ocean engineering sub-consultant quickly considered, then eliminated mechanical flushing as an alternative design concept. As noted in a May 12, 1989 set of notes, he indicates that "mechanical flushing can best be obtained by installing 2 or 3 small pumps on the north and east wall with discharge openings in the south and west sides of the pool. Mechanical flushing can be combined with one or more forms of natural flushing. Installation should be done in such a way that maintenance and repair are easily conducted. Installation and energy costs are fairly modest. For a number of reasons natural flushing will have preference over mechanical flushing, despite the fact that construction cost for the natural flushing solution will probably be higher."

Staff understands that Dr. Gerritsen saw the scenario as a perfect situation for natural flushing, given primarily the unique unidirectional flow of both ebb and flood tides, along with the presence of the dredged channel just upstream of the Natatorium. Although at a later date the concept of turning the Natatorium into a mechanically pumped, freshwater pool was considered and then abandoned, apparently the natural flushing/groins concept was never seriously questioned as the preferred design, even though, as Dr. Gerritsen reiterated at the March 30 meeting, the concept is inherently stochiastic (i.e., subject to "questimates" in dealing with multiple, random variables). Staff, however, believes that the coastal engineering perpective may have precluded thorough consideration of potentially unknown environmental and public policy impacts (such as locating the Ewa groin in a MLCD, and potentially destabilizing Sans Souci Beach).

The inclination towards utilizing groins was also evidenced in the limited modelling that did occur. Five different concepts of various pool opening configuration were modelled to visualize the flow patterns. The first concept was the "existing condition" with only the very small inflow and outflow pipes that clearly doesn't work; each of the other four concepts modelled included some configuration of groins at one or both ends, along with varying sized or located openings. The concept of larger openings alone, without any groins was never modelled. Although staff believes the intent to maximize flow through the pool is understandable, as noted previously, given that 1) no information exists as to how much flow is really necessary, and 2) the groins only add between 20% and 30% to the flow, staff is not convinced that the impacts caused by the groins justify their existence in this highly valued conservation area.

CONCLUSION:

Based on the additional discussions and information that have transpired to date since the March 27 board meeting, staff has not uncovered a compelling reason to modify the previous recommendation to deny this request to place two groins in the Protective subzone off the Waikiki Natatorium. Staff reiterates its belief that it would be irresponsible to commit Conservation District resources of this scale when the success and impacts of the project have not been thoroughly evaluated. Finally, staff believes that this recommendation is not intended to pass judgement on the overall Natatorium restoration project; staff believes that it may be very possible to restore the Natatorium without the groins at this time, with the understanding that if flushing does not improve to some pre-determined level, the concept of mechanical flushing or some other technology could be revisited, or a request to construct the groins at a later date could be accepted based on the restored pool's performance.

RECOMMENDATION:

Based on this analysis and that conducted in the prior submittal, staff recommends that the Board of Land and Natural Resources DENY this application to construct two groins on unencumbered, submerged State-owned lands extending off the seaward corners of the Waikiki Natatorium. Staff believes the proposal creates a substantial risk of the following significant adverse impacts to highly valued Conservation District resources:

1) the alteration of the littoral currents and sand transport mechanisms that have lead to the establishment of a stable sand beach that experiences high levels of public use (which could lead to the potential destabilization and degradation of the beach resource);

2) the likely degradation of coastal water quality at a widely-used recreation area; and

3) the unknown public policy implications of establishing a precedence of permitting a major construction project within an established Marine Life Conservation District and Fisheries Management Area.

Additionally, staff is concerned about the lack of information and performance standards regarding adequate flushing necessary to assure public health. This lack of information created the

operating assumption that maximum flushing, and thus groins, are necessary for the pool's restoration. Staff cannot confidently determine that the proposed design of the groins, which was based on the aforementioned assumption of maximum flushing, has satisfactorily avoided or minimized the impacts to the conservation resources. Further, due to a lack of information about potential alternatives to the proposal, staff cannot confidently determine that the impacts are justified and acceptable. Finally, staff believes DOH's strong concerns about the project, and their statement about not permitting the operation of the pool even if the groins are built, sheds light on a serious problem with this proposal.

Respectfully submitted,

Thomas H Eisen

THOMAS H. EISEN
Staff Planner

Approved for submittal:

MICHAEL D. WILSON, Chairperson
Board of Land and Natural Resources

D-22 Approved as Amended--The Board overturned staff recommendation and approved the request by the City for the construction of the two groins subject to the following:

1. All applicable standard conditions for CDUA's in 183C HRS and Chapter 13-5, Hawaii Administrative Rules;
2. The applicant shall comply with all mitigative conditions mentioned in the Final EIS for the project;
3. The applicant shall comply with the conditions listed in the memorandum from the Division of Aquatic Resources dated November 24, 1993;
4. The applicant shall comply with all Department of Health rules and regulations and obtain any necessary permits from the Department of Health prior to initiating construction on the project;
5. The applicant shall submit a plan for maintenance of the Diamond Head Groin Sand Trap, and shall coordinate any removal of the sand with the Departments Coastal Lands Program;
6. Other such terms and conditions as maybe imposed by the Department.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Land Division, Planning and Technical Services Branch
Honolulu, Hawaii

File No.: OA-2874
180-Day Exp. Date: 4/12/98

March 27, 1998

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

REGARDING:	Conservation District Use Application to construct two groins extending from the Waikiki Natatorium, to improve water circulation and quality within the pool
APPLICANT:	City and County of Honolulu Building Department 650 South King Street, 2nd Floor Honolulu, Hawaii 96813
AGENT:	Leo A. Daly Company 1357 Kapiolani Boulevard, Suite 1000 Honolulu, Hawaii 96814
LANDOWNER:	State of Hawaii
LOCATION:	Submerged land seaward of Waikiki Natatorium, Waikiki, Oahu
TMK:	Seaward of 1-3-28:11
AREA OF USE:	5,358 Square Feet at Base of Groins
SUBZONE:	Protective Subzone

BACKGROUND:

The proposed action, to construct two groins attached to the seaward wall of the existing Waikiki Natatorium, is an element of the current effort by the City and County of Honolulu to restore the dilapidated memorial to Hawaii's World War I veterans. The actual Natatorium is not in the Conservation District, as the shoreline and Conservation District boundary follows the outer edge of the structure. Therefore, although the groins are directly linked to the restoration effort, this CDUA does not analyze the proposed restoration project, even though the restoration project may generate spill-over impacts to Conservation District resources.

ITEM D-32

EXHIBIT A

This restoration project is the latest of several proposed initiatives to remedy the situation regarding the poor condition of the facility. Previously, the Land Board, along with other County and State agencies, has approved measures (which were never implemented) to demolish the facility, recreate another memorial to the veterans, and establish a sand beach at the site. This 'concept, which still has some support, is also not the subject of this CDUA and its analysis. However, since the construction of the proposed groins could affect the feasibility of this or other alternate concepts, the Board should also consider its preferred use of this highly valued, State-owned coastal area when making its decision on this CDUA.

DESCRIPTION OF AREA/CURRENT USE:

The project site is located in the shoreline area on the south shore of Oahu, in Waikiki (Exhibits 1-3). The project site is considered unencumbered State submerged land lying below the certified shoreline in the Protective subzone of the State Land Use Conservation District (Exhibit 4).

The project site is bounded to the south by San Souci Beach and on the north by the Waikiki Aquarium. Abutting the project site to the west is the Waikiki War Memorial and Natatorium. Further to the north is Queen's Surf Beach, Kapiolani Park and the resort areas of Waikiki. Further south is the area known as the Gold Coast and the Diamond Head Crater State Park.

<u>Existing Marine Environment:</u>

According to the project consultant, the area of the proposed groin construction is a relatively flat reef that extends seaward from the coast several hundred feet. Further seaward, the bottom is a down sloping sand bottom (Exhibit 5).

There is a major break in the reef on the Diamond Head (DH) side of the Natatorium. Directly adjacent to the Natatorium on the DH side exists a stable sand beach (San Souci Beach). The bottom along this side of the Natatorium is flat sand near the shoreline, and a relatively flat reef about 1.5 feet above the sand further offshore (near the seaward extent of the DH side).

Along the seaward wall of the Natatorium the reef trends downward from the DH side towards the Ewa side, and varies from approximately 0.5 feet to 5 feet deep. Further seaward, the reef averages a more uniform 2 to 3 feet depth.

Extending from the Ewa side of the Natatorium is a 10.5-feet deep channel dredged into the reef, which parallels the shoreline and abuts the seaward half of the Ewa seawall. The sides of this channel contain viable coral, while the bottom is lined with sand. Further north of the Natatorium, landward of the dredged channel, the flat reef extends virtually to the water's edge, with only a narrow strip of sand between the water and the promenade's seawall.

According to the consultant, coastal tides at the Natatorium average 1.9 feet in height, slightly less in amplitude than the Honolulu tide, and preceding the Honolulu tide by 15 minutes. Annually, this range extends from 1.3 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.

According to the project consultant, the bulk of the coastal transport (currents) move predominantly in the southeast (toward Diamond Head) direction. Overall, the transport towards Diamond Head occurs about 74 percent of the time. Only during strong flooding (high) tides and/or episodes of significant wave heights does an Ewa-moving flow predominate for the duration of these conditions, on average about 24 percent of the time (see Exhibit 6, Ebb and Flood Current Patterns).

Water Quality:

According to the project consultant, current water quality within the pool is somewhat degraded because of the poor design of the Natatorium. Assuming completion of the proposed project, future water quality within the Natatorium will only be as good as the water supply (i.e., the seawater from outside of the Natatorium). Generally, the seawater in this area is considered of reasonably high quality, although there are days when the turbidity of the water prevents swimmers from seeing their own hands. Factors affecting water quality in the vicinity include nonpoint sources of pollution entering the coastal waters, the amount of wave- and tidal-induced sediment and biota in suspension at any given moment, and possibly the nitrogen-rich effluent from the Waikiki Aquarium.

Sand/Sediment Transport and Beach Profile:

The substantial beach area south of the Natatorium is known as San Souci Beach. It is in a stable mode with a tendency for some accretion (sand build-up) along the Natatorium's DH seawall. According to the project consultant, there is a slight sediment transport in the Ewa direction along this beach, with an offshore

transport component at some distance from the Natatorium (the reflection of waves from the Natatorium's DH seawall affects this transport mechanism). Exhibit 6 graphically portrays the unusual situation whereby the offshore currents flow in the Diamond Head direction, while the near-shore sand movement tends to be in the Ewa direction.

According to the project consultant, some of the sand from San Souci Beach finds its way around the DH/seaward corner of the Natatorium due to the aforementioned offshore transport component. This sand generally fills the crevices in the highly irregular reef bottom. Due to the existing DH seawall acting as a groin and preventing the free and continuous transport of sand along the coast, coupled with the presence of the dredged channel offshore (which traps most of the sand that is transported around the Natatorium structure) and a lack of adequate sand replenishment, the beach Ewa of the Natatorium has virtually disappeared.

Marine Biota:

The project site is located within both the Waikiki Fisheries Management Area (FMA) and the Waikiki Marine Life Conservation District (MLCD). The boundary between these two managed areas is a line extending seaward from the Ewa seawall of the Natatorium. Thus, the Ewa groin would be primarily within the MLCD, while the base of that groin and the entire DH groin would be located within the FMA.

According to the project consultant, 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. According to the project consultant, the overall main coral coverage at the five stations studied was less than 0.2 percent. In contrast, algae or limu are abundant; the mean coverage of limu at the five stations studied is 20 percent. According to the applicant, 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 wave conditions.

The relatively high biomass of fish encountered at two stations are probably related to (1) the prohibition of fishing in the area and (2) relatively high cover at two of these 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 seaward wall.

According to the project consultant, nowhere in the study were any rare or otherwise unusual species encountered (refer to pages 3-12 through 3-19 of EIS, for a full discussion of the marine biota in the area).

Recreation:

The coastal environment in the vicinity of the Natatorium experiences high levels of usage by residents and visitors, including activities such as sunbathing, beach combing, "sea-gazing", sunset-watching, swimming, surfing, kayaking, sailing, fishing, snorkeling and SCUBA diving. The extensive sand beach, clean water and usually gentle ocean conditions makes San Souci Beach an extremely popular "local" recreation area for Honolulu's residents. Older children often choose to play in the most dynamic surge-zone of this otherwise placid beach; this zone is immediately adjacent to the DH wall of the Natatorium (directly in from the location of the proposed DH groin), where incoming waves currently tend to be reflected and focussed on the beach. In addition, educational reef walks are routinely conducted by the Waikiki Aquarium on the beach and reef flat Ewa of the Natatorium.

Although the noted activities take place in the vicinity of the Natatorium, access to the Natatorium itself is currently prohibited due to the safety and health concerns.

PROPOSED USE:

The proposed project consists of constructing two groins, one at the Ewa-Makai corner of the Natatorium, and the other at the Diamond Head-Makai corner (Exhibit 7). The purpose of the groins is to encourage flow through and circulation within the salt water pool by taking advantage of the natural coastal currents, which primarily run parallel to the shoreline in an Ewa to Diamond Head direction. The Ewa groin is designed to encourage flow into the pool and to inhibit flow around the Ewa-Makai corner of the outer seawall. The DH groin is intended to prevent sand build-up at the outflow openings, particularly during storms.

According to the consultant, the existing flow rates outside the Natatorium (refer to EIS page 3-2) can be maintained for inside the Natatorium if it is properly opened to the coastal transport. The EIS indicates that with the proposed groins and other modifications, the pool is expected to be flushed between 2 and 8 times per day, with a modal (average) rate of about 4.5 times per day.

The groins average 35 feet wide at their bases, ten feet wide at the mean high water line. The groins together total 5,358 square feet in area at their bases. The Ewa groin extends about 60 feet from the Natatorium's outer wall at the Ewa Makai Corner (Exhibit 8). The DH groin extends about 75 feet from the Diamond Head-Makai corner and is roughly parallel to the shoreline (Exhibit 9). The Ewa groin consist of two layers of large stones (750-1,000 pound stones) over a core of smaller stones (100-pound stones) (Exhibit 10). The Diamond Head groin consist of two layers of stones over a stone core over a reinforced concrete base (Exhibit 11). Dredging and excavation of the existing reef in the location of the proposed groins would be required to key the toe stones of the groins in place (Exhibit 12). According to the applicant's representations in the CDUA, two feet of the groins would be visible above the mean water line.

The groins are intended to improve water circulation, and thus water quality, within the Natatorium pool to make it viable for public use and to support the City and County's efforts to restore the Waikiki War Memorial Park and Natatorium. A Special Management Area Use Permit is currently being sought through the City and County of Honolulu for the actual Natatorium restoration project. This CDUA deals exclusively with the groins component of the project and their effect on Conservation resources and values, although the analysis does recognize the linkage between the groins and their objective of improving the water quality within the pool.

Project Alternatives:

Other than the "no project alternative", one alternative was considered in the EIS for the Natatorium that will affect the proposed construction of groins. This partial restoration concept involves demolishing elements of the Natatorium and construction a public beach and lagoon in place of the saltwater pool and relocating the Memorial Arch (Exhibit 13). Under this scenario, parts of the Natatorium's seawalls would be removed and two detached groins would be constructed to help stabilize the sand beach. The EIS noted that this alternative does not meet the objective of restoring the Natatorium to its original use; however, the document did state that the alternative does meet the objective of once again providing a place for the public to enjoy outdoor recreation at the site. No rationale was provided to justify the preference of one objective over the other.

Given the highly visible and controversial nature of the proposed restoration project, different alternative concepts have been

advanced from parties other than the applicant or the project consultant. These alternative concepts (such as Natatorium restoration with mechanical flushing, and different versions of "partial restoration" with and without beaches) have been developed with varying amounts of detail. Other than the EIS' alternative, no details of these various alternatives are readily available for consideration in this analysis. Implementation of at least some of these alternatives would require CDUA analysis and approval, but at this time, it is difficult to consider the implications and preference of the various options from a Conservation District perspective, or to ascertain how the submitted design of the groins would affect the viability of these alternatives. However, staff assumes that the construction of the proposed groins could curtail some of the planning options that were not considered in this analysis.

SUMMARY OF COMMENTS:

The application was referred to the following agencies for review and comment: The U.S. Army Corps of Engineers, Fish and Wildlife Service, and National Marine Fisheries; University of Hawaii Environmental Center; Department of Health, Office of Hawaiian Affairs, Office of Environmental Quality Control, Office of Planning, Department of Land & Natural Resources (Divisions of Aquatic Resources, Engineering Branch, Oahu Land Agent, Boating and Ocean Recreation, Historic Preservation and State Parks); City and County Department of Land Utilization, and the City Council representative for the project area.

Staff has summarized agency comments as follows:

[Also refer to the Final Environmental Impact Statement for the Waikiki War Memorial Park and Natatorium for public/agency comments and responses].

Division of Aquatic Resources (DAR):

The DAR notes their strong concern over the restoration project because the activities would take place within the Waikiki Fisheries Management Area (FMA) and the Waikiki Marine Life Conservation District (MLCD) and would directly affect aquatic resources in these areas. In addition, DAR notes that the Waikiki Aquarium uses the reef flat adjacent to the Ewa seawall of the Natatorium to conduct reef walks and other classes. DAR's 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 believes that the restoration would further enhance use of the FMA and MLCD by the public.

DAR's focussed analysis on the impacts within the footprint of the groins indicates that the groins are not expected to have long-term adverse impacts to aquatic resource values in the area. However, they note the project does involve construction and dredging offshore, and these activities could have short-term impacts on aquatic resources such as temporary turbidity and biota displacement and disturbance. A listing of important mitigation measures is provided, and DAR emphasizes that, should the CDUA be approved, all mitigation measures to minimize erosion and siltation should be addressed in this area and strictly adhered to since it is an important recreational location for consumptive (fishermen, etc.) and non-consumptive (divers, etc.) users.

Oahu District Land Agent:

In regards to the construction of the two groins on submerged lands, the County must request a land disposition from the Department of Land and Natural Resources, Land Division, for an easement, together with a right-of-entry for surveys and construction prior to any activity on the proposed groin area.

Division of State Parks: supports the project.

Office of Planning (DBEDT):

While the Coastal Zone Management Program (CZMP) believes that the project will enhance recreational opportunities and historic resources policies of the CZMP, they have concerns regarding the impacts on other CZM policies, such as those relating to coastal ecosystems and marine resources. One coastal ecosystem policy, for example, calls for the preservation of "valuable coastal ecosystems, including reefs of significant biological or economic importance" and another marine resources policy requires that the "use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial."

CZMP would like a clarification of the effects the project may have on the MLCD down current of the project site. The information on ocean currents along the shoreline at this project is too general to understand small-scale circulation patterns and their impacts.

(The Office of Planning will be conducting their own separate detailed analysis of the proposed groins' consistency with the provisions of the CZM program; their submitted comments are a brief notation of some of their immediate concerns.)

Department of Health:

For our information and background, the DOH submitted a copy of their testimony at the City Council's SMA Permit hearing explaining the DOH's serious public health and safety concerns regarding the restoration of the Natatorium as a flow-through swimming pool.

They state unequivocally that the reconstructed pool will not meet the health and safety standards defined in their swimming pool rules (HAR Chapter 11-13A). Consequently, even if the construction of the "jetties" (their terminology for the groins) is approved, they cannot approve construction and operation of the pool under the existing rules. The Director states, "I raise these issues in order to help ensure that scarce public funds be allocated to projects with a high likelihood of success; without clear resolution of the problems raised in the Department's testimony we will not be in a position to approve operation of a rebuilt flow-through pool." (To staff's knowledge, no such resolution has been made.)

Additionally, they note that, although the proposed jetties are not likely to directly cause major long-term water quality changes in the affected area, they are likely to trap sand moving alongshore. Thus, they recommend that the possibility that a sand-bypassing operation will be needed to keep the circulation vents clear of sand and maintain optimal water exchange rates in the pool be considered when reviewing the jetty design.

City and County of Honolulu:

The Department of Land Utilization has determined that the proposed groin project is outside of the Special Management Area (SMA).

PUBLIC HEARING SUMMARY:

A public hearing was held at the Kalanimoku Building on January 29, 1998 to accept testimony on the proposed project. Staff presented the proposal to the Hearings Officer, emphasizing that the focus of the CDUA and the hearing was limited to the proposed groins, and did not cover the entire Natatorium restoration project. Staff also summarized all written comments that were submitted to date in

connection with the CDUA. Additionally, the Contested Case procedure was described to those present, but ultimately, no one evoked this process.

The applicant, the project consultant, and the project's primary coastal engineer each gave a presentation on various aspects of the proposal. In total, their presentations/testimonies provided a general description of the overall Natatorium restoration project, and a substantial description of how the groins are a major and necessary element of the project's design. They stated that the groins would positively impact the adjoining San Souci Beach, and would not cause any maintenance problems. Further, they indicated that there would not be significant impacts to the coral, fishes or marine macrobiota, nor to the FMA or MLCD.

Approximately 22 members of the public provided oral testimony regarding the project; of these, 16 supported the project, and 6 opposed it. The supporters were generally either members of the "Friends of the Natatorium" group (which is dedicated to supporting the restoration project) or individual members of various veteran organizations (no veterans organization provided any official testimony). Additionally, the Kapiolani Park Preservation Society, Historic Hawaii Foundation, and the Waikiki Aquarium were represented by supportive oral testimony.

Generally, the supporters noted that the Natatorium should be fully restored as a historic memorial to Hawaii's WWI veterans, and thus the groins need to be constructed as a necessary element in support the restoration project. Their concerns were primarily focussed on the importance, need and value of restoring the Natatorium itself, and not on the potential impacts of the groins on Conservation District resources. Although generally not stated, they implied the groins' potential impacts would be tolerable.

The director of the Waikiki Aquarium noted that the area to be directly impacted by the groins did not contain significant concentrations of living coral, and thus the groins would only have a minor impact on the coral. Further, he indicated that the proposed project would not impact their reef walks.

Five of the opponents were members of the "Kaimana Beach Coalition," an ad hoc group opposed to the current restoration project due to, among other things, concerns that the adjacent coastal resources (and user experiences) would be significantly degraded by direct and indirect (i.e., secondary and cumulative) impacts from the proposed restoration project. This group does

support project alternatives that would provide other enhancements to the area. Their testimony identified numerous concerns with the proposed groins, including references to the 16 questions listed below, the lack of adequate modelling for the proposed water circulation design, and the lack of serious consideration of project alternatives.

Additionally, the Sierra Club (Oahu Group) and others provided oral and written testimony opposing the groins and raising specific legal issues regarding the fact that the groins will harm and destroy marine life in the area. They claim that the EIS admits that actual damage will occur, that construction will destroy coral reefs, that DLNR rules prohibit any harm to the marine life, that the project does not comply with CZM objectives, and that the CDUA should be denied since it fails to meet the criteria established in the Conservation District rules.

A discussion emerged about the potential for creating a sand beach on the shoreline Ewa of the Natatorium. The coastal engineer for the project indicated that the groins would not preclude this option, but that additional structures would have to be designed and constructed to keep the imported sand on the beach and prevent it from being transported into the dredged channel paralleling the beach about 100 feet offshore. (This concept for a new beach differs in some ways from other concepts advanced by various supporters of project alternatives, primarily in that some consider the conversion of the existing pool into a "lagoon-type" beach is the most feasible and least impacting option.)

ADDITIONAL TESTIMONY AND PUBLIC COMMENTS RECEIVED:

Staff obtained copies of relevant testimony submitted to the City in its consideration of the Special Management Area Use Permit application. Some of this testimony is germane to issues regarding potential impacts to Conservation District resources, in particular testimonies from University of Hawaii professors of Ocean Engineering, Geology and Geophysics, and Biochemistry and Biophysics.

Hans Krock, Ph.D., P.E., with UH's Look Laboratory of Oceanographic Engineering, notes that after reviewing an extensive record of background studies for the project, he believes the hydraulic scale modelling conducted for the project was not of a scale or design to give a quantitative answer to the water exchange questions or to evaluate any sand transport changes.

Dr. Charles Fletcher, with UH's Coastal Geology Group, is convinced that the Diamond Head groin will trap sand that would otherwise flush offshore. He believes beach sand will be carried toward this groin, where it would accumulate on the inshore side. "This build-up of sand could easily raise the level of the seafloor and restrict pool water circulation out of the two outflowing vents. The need to periodically dredge this deposit to clear these vents has not been budgeted and would likely present a considerable operating expense, perhaps equaling or exceeding the existing maintenance budget." He is concerned that the effect of both groins will be to decrease flow by creating lee areas where currents are resticted, and does not see this as in keeping with the design intent of enhanced circulation of the pool area.

Gordon Edlin, Ph.D., with the John Burns School of Medicine, indicates that bacteria and other disease causing microorganisms will flourish in the sediments that accumulate at the pool's bottom and in the animal and plant organisms that will attach to the walls and surfaces of the pool. Besides subjecting the pool's users to these health hazards, the untreated effluent from the pool would carry these microorganisms into the waters of San Souci Beach.

Following is a list of questions about the proposed groins submitted by a member of the Kaimana Beach Coalition:

1. What physical testing or modeling has been done to document findings by the applicant that the groins will work as they are represented?

2. What affect will the groins have on sand accretion or erosion on San Souci Beach?

3. Will the eddying effect of the groin cause a build up of sand at the Diamond Head water in and outflow area of the Natatorium? Will a sand by-pass mechanism be necessary to keep the sand from building up?

4. Will this mechanism be on the beach? Will it be mechanical and how large will it be?

5. Will tractors be brought in to move the sand around the beach and unclog the water openings in the Natatorium on a regular basis and what are the cost estimated for this procedure?

6. If tractors are brought in, will it be necessary to close Kaimana Beach?

7. What aesthetic affect will the groins have on the surrounding areas?

8. Will the groins block the view planes of swimmers and beach users?

9. Will this project be out of compliance with the rules and regulations of the MLCD?

10. As these groins will be very large, will they have a negative impact on the use and enjoyment of users of the area affected by their presence?

11. What impact will these groins have on moving objects in the water which will be pulled toward the Natatorium intake openings? Could they move small children who frequent the area on the Diamond side.

12. Are the groins necessary or are they an option that could be done without?

13. Will the Ewa groin serve to draw all or most of the discharge from the Waikiki Aquarium into the Natatorium? Is this discharge rich in nitrogen and will it serve as a growth medium agent for algae blooms and other organic build-up on the inside walls of the Natatorium?

14. Given the fact that the Natatorium never functioned properly, and that the planned restoration is based on speculation and little else, and that the plans have been challenged by experts who say that they won't work, is it worth jeopardizing the ocean area and Kaimana Beach?

15. What effect will the Diamond Head groin have on the circulation of water at the Ewa end of San Souci Beach? It seems that when the current is flowing from the Ewa to Diamond Head the circulation pattern would be diminished by the groin pushing the water away from the beach area. This would create a more stagnant water quality on San Souci Beach, especially with the dirty water coming out of the Natatorium.

16. When coral is broken to create the groins, will this create a problem with ciguatera poisoning in the fish that live in the area?

One of the members of the Kaimana Beach Coalition told staff they specifically chose not to encourage a large group turnout for the public hearing since they did not want to instigate a boisterous and potentially disruptive situation. Instead, they provided staff with a petition, signed by approximately 1,000 residents, against the restoration of the Natatorium and in favor of the restoration of the memorial arch and the creation of a beach and appropriate park facilities.

Subsequent to the public hearing, additional written testimony was received from 2 project supporters (one former architect and one current project principal-in-charge for the consultant company for the project). These testimonies primarily reinforced and clarified various aspects of the project as it has progressed so far, and reiterated the importance of the groins and the overall Natatorium restoration project.

Also, 3 opponents of the proposal submitted information elaborating on the issues they raised at the public hearing, and one other member of the public described his reasons (all previously raised) for opposing the project. The emphasis of most of these submittals focussed on the concern that the proposed design of the groin/water circulation scheme was not adequately tested, and could not be counted on to properly function. Thus, given the potential risks involved to public health and the natural resources, they suggest the CDUA for the groins should not be approved, especially not in this designated "year of the ocean."

The project consultant subsequently responded to many of these issues, including the Sierra Club's concerns and the 16 questions posed above, by reiterating, detailing or clarifying points raised in the EIS and CDUA; essentially, they indicated that they believe the construction of the proposed groins can be legally approved under current statutes and rules. As may be expected, certain of these responses elicited further questions from staff, and thus further iterations of responses and clarification. Generally, the following analysis incorporates a discussion of these various issues; however, some remain unresolved and are noted in the "Unresolved Issues" section.

ANALYSIS:

Following review and acceptance for processing, the applicant was notified, by letter dated November 3, 1997, that:

1. The proposed use is an identified land use (P-6, Public Purpose: D-1) within the Protective subzone of the Conservation District according to Section 13-5-22, Hawaii Administrative Rules (HAR). Please be advised, however, that this finding does not constitute Board approval of the proposal;

2. Pursuant to Section 13-5-40, HAR, a public hearing will be required, since the application requires a Board permit in the Protective subzone;

3. A Final Environmental Impact Statement for the project was submitted with the application; and

4. The proposed groins are located on submerged lands outside the Special Management Area (SMA), so no SMA Use Permit will be required.

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

Is the Proposed Land Use Consistent with the Purpose of Conservation District?

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

A relevant issue concerning this criterion is the need to determine that the groins are an appropriate use of the Conservation District that promotes not only the sustainability of important natural resources, but also public health and safety.

The applicant notes that the proposed groins "will enhance the viability of a public facility while enhancing the State's marine natural resources by creating new habitat for the fish species in the area. The project will aid in the long-term sustainability of the Conservation District. Therefore, it is consistent with the purpose of the Conservation District."

If the proposed groins function as designed, they would enhance the viability of the public facility (assumed to be the Natatorium), and thus could be considered to conserve an important natural resource (also the Natatorium). However, staff is not certain that the proposed groins will function as designed, or are the most

appropriate means of obtaining such an enhancement. As will be described later in more detail, staff has identified serious questions regarding how the groins may actually function. Additionally, other methods of improving the water quality within the pool, such as mechanical flushing, might accomplish the enhancement without, or with less, impact to Conservation District resources.

The groins would create new habitat for fish in the area, and thus could enhance certain marine natural resources, if the fish showed preference for, and utilized, the new habitat. However, staff believes this enhancement would come at the cost of the existing habitat (coral and associated ecosystem components) that would be destroyed by the dredge and fill activities. Further, staff has reservations about how other Conservation District resources in the area (such as the stable sand beach and water quality at San Souci Beach) may be affected by the groins over the long-term, and thus we cannot assure that the project will necessarily promote the long-term sustainability of the Conservation District (a full discussion of the possible impacts to the beach and to water quality will be made in following sections).

Is the Proposed Land Use Consistent with the Objectives of the Subzone?

The objective of the Protective Subzone is to protect valuable resources in designated areas such as restricted watersheds, marine, plant, and wildlife sanctuaries, significant historic, archaeological, geological and volcanological features and sites, and other designated unique areas.

At issue here is the need to determine whether the groins are actually protecting a valuable resource in an area designated as a significant historic site. Also, it is necessary to determine if the primary objective of the subzone in this particular area is to protect valuable resources located in a marine sanctuary within the subzone, or if the subzone objective can be met by protecting a valuable historic site located outside of the Conservation District.

The applicant notes that identified land use P-6 PUBLIC PURPOSE USES provides for consideration of land uses undertaken by the counties to fulfill a mandated governmental function, activity, or service for public benefit and in accordance public policy and the purpose of the conservation district. Such uses may include recreational facilities. Further, the applicant notes that the

proposed land use serves to benefit the public by stabilizing a recreational facility for public use, and is therefore consistent with the Protective subzone.

Staff notes that the Waikiki War Memorial and Natatorium is designated as both a State and federal historic site, and thus can be considered "a significant historic site." Additionally, staff has identified that Section 13-5-11(b)(2), HAR, states that the Protective subzone shall encompass lands and waters necessary for the preservation and enhancement of designated historic sites.

Although the applicant says the groins will benefit the public by stabilizing a recreational facility for public use, staff notes however, that the stated objective of the proposed groins is primarily to improve the water circulation and water quality within the existing Natatorium pool. Since the Natatorium pool has stood relatively intact for approximately 70 years, it does not appear that the groins would actually be consistent with the subzone objective of protecting valuable resources. Staff believes that there may be other means of accomplishing the groins' objective that may not require the use of the Protective subzone.

Additionally, it is important to remember that the Natatorium structure itself is not within the Protective subzone, nor even the Conservation District, and staff is unclear if the intent of this most restrictive subzone is to provide for uses that proclaim to stabilize sites outside of the Conservation District.

In fact, staff believes the submerged lands in this area were designated as "Protective subzone" (rather than the much more common and less restrictive "Resource subzone" designation for most submerged lands) to indicate its administrative status as a marine sanctuary (i.e. a Marine Life Conservation District/Fisheries Management Area), and was not related to the historic aspects of the adjacent urban structures. Further, staff questions whether the groins have actually been mandated, pursuant to the definition of the "P-6 Public Purpose" identified land use.

In summary, staff does not believe that consistency with the subzone objective has been established.

Does the Proposed Land Use Comply with Coastal Zone Management (CZM) Provisions and Guidelines?

At issue here is the fact that, pursuant to Section 205A-4(b), HRS, the CZM objectives and policies are binding upon the actions of all

agencies, including the Board of Land and Natural Resources. Therefore, the proposed groins should comply with all relevant CZM objectives and policies for the Board to take the action of approving this CDUA. Following are the CZM foci that, to staff, appear relevant to this proposal:

Recreational resources; Historic resources; Scenic and open space resources; Coastal ecosystems; Economic uses; Beach protection; and Marine resources.

(As noted previously, the Office of Planning will soon conduct a separate analysis of the consistency of the proposed groins with provisions of the CZM program, in conjunction with the application for a federal permit from the Army Corps of Engineers. Their analysis does not have a direct bearing on the requirement for the Board to ensure its action on this proposed land use is consistent with the CZM objectives and policies.)

The applicant notes in the CDUA that Chapter 205A, HRS (the Coastal Zone Management [CZM] law) is the cornerstone of the State's program to guide the use, protection, and development of Hawaii's coastal zone, and states that the project complies with CZM requirements in several ways:

1) the restoration project will once again provide unique coastal recreational opportunities accessible to the public by making viable the Natatorium for public use [and thus is consistent with the "Recreational resources" objective];

2) it protects and preserves an historic man-made resource (the Natatorium) that is significant to American history [and thus is consistent with the "Historic resources" objective];

3) it improves the coastal ecosystem by creating a new habitat for fish species in the area [and thus is consistent with the "Coastal ecosystems" objective];

4) it preserves coastal scenic and open space [and thus is consistent with the "Scenic and open space resources" objective]; and

5) the groins will offer beach protection for the neighboring beach [and thus is consistent with the "beach protection" objective].

As noted above at 3), the applicant claims that the project will improve the coastal ecosystem by creating a new habitat for fish

species in the area, and thus implies that the project is consistent with the "Coastal ecosystems" objective to "protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems." Staff questions how the proposed dredge and fill activities are consistent with protecting the subject reef area (which could be considered a "valuable ecosystem" due to its designation as an MLCD/FMA) from disruption. Further, a supporting policy under the coastal ecosystems objective is to "preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance." While the subject reef area may not be of significant biological importance (since it is not particularly diverse or rare for Hawaii), it has been designated for intensive management and use through the MLCD and FMA programs, and its location in Waikiki does suggest that there may be significant economic importance associated with the sustainable use of the resource.

As noted above at 5), the applicant claims that the groins will offer beach protection for the neighboring Kaimana (San Souci) Beach, and is thus consistent with the "Beach protection" objective "to protect beaches for public use and recreation." Staff notes that the subject San Souci Beach is currently considered to be a stable sand beach that does not require any engineered protection, other than the existence of some structure along its Ewa end to "hold" the sand in place (the Diamond Head seawall of the Natatorium structure serves this purpose, and in fact it was the construction of this structure that "created" San Souci Beach; another engineered structure could replace it if necessary). The reef offshore serves a critical function of reducing the energy of incoming waves. Staff believes the proposed DH groin is not necessary to protect this beach, and instead could lead to the destabilization of the beach as the littoral currents are modified by the groin's existence.

Staff notes that additionally, the project may have relevance to the "Economic uses" objective to "provide public facilities and improvements important to the State's economy in suitable locations"; however, there is a related concern. A supporting policy to this objective is to ensure that coastal dependent- and coastal related-development (such as the proposed groins) is located, designed, and constructed to minimize adverse social, visual, and environmental impacts. Given 1) the uncertainty about whether the design of the Natatorium's proposed water quality enhancements is optimal with respect to minimizing impacts to Conservation District resources, and 2) the concern that has been raised about the unsightliness of the groins, we cannot ascertain

that the visual and environmental impacts have in fact been minimized.

Staff also notes that the "Marine resources" policy to "assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial" has bearing on the proposal. As noted elsewhere, given the questions about the potential adverse effects on the coastal environment and about the likelihood of unbudgeted maintenance needs, staff cannot confidently make the assurance required by this policy.

Given these concerns, staff has reservations about whether the proposal (and thus any associated approval it receives) actually complies with all the relevant CZM objectives and policies.

Will the Proposed Land Use Cause Substantial Adverse Impacts to Existing Natural Resources within the Surrounding Area?

A critical issue relevant to this criterion is investigating and acknowledging the potentially substantial adverse impacts, so that they may be analyzed, and then avoided or mitigated.

The applicant notes that the proposed land use will not cause substantial adverse impact to the existing natural resources in the surrounding area, and that the marine resources in the footprint of the groins will be the only natural resource lost. These resources consist mainly of common species of algae and very little coral. The applicant indicates the new groins will enhance the area by creating new habitat for fish species in the area.

Staff understands that the reef in this area primarily consists of coralline algae, rather than actual coral, and agrees that this is fairly typical of the coastal environment in the region. In addition to the solid algal or coral substrate, staff believes that other slow-moving or sessile benthic organisms such as sea cucumbers, sea stars, sea urchins, etc, inhabiting the affected area would also be lost from the dredging and groin-building activities. The impacts from turbidity plumes and associated siltation generated by the marine construction activities would extend beyond the immediate footprint to include the area contained within a required mitigative silt curtain. DAR suggested that adherence to Best Management Practices with mitigation measures would hopefully contain these direct construction-related impacts within a fairly limited area.

A relevant concern that has been identified by numerous parties is the fact that one of the groins is proposed within the Waikiki Marine Life Conservation District (MLCD). The administrative rules for this MLCD (Chapter 13-36, HAR) specifically prohibits taking, altering, defacing and destroying marine life, sand, coral, rock and other geologic features. However, the rules also state that the department may issue permits to engage in activities otherwise prohibited under such terms and conditions it deems necessary to carry out the purpose of Chapter 190, HRS (which establishes the Marine Life Conservation Program). Although no purpose is specifically established in Chapter 190, HRS, in may be inferred that a purpose is to minimize any adverse effect within the conservation district. DAR staff believe that the proposed project is not expected to have long-term adverse impact on aquatic resource values in the affected areas. While the department may approve the proposed groin within the MLCD, Planning staff notes that perhaps most important is the fact that there is little precedence for approving such a large scale construction project within this established, highly visible and widely used Waikiki MLCD; staff believes the public policy ramifications of such an approval deserve thoughtful consideration.

The potential alteration and destabilization of the existing stable sand resource at San Souci Beach is also a justifiable concern, in that the project consultant has acknowledged that the proposed project will modify the existing littoral currents that have established the stable beach. Groins and other coastal structures typically do cause changes in the littoral dynamics, and Hawaii has innumerable examples of unintended adverse impacts brought about by such structures. The fact that these impacts could affect a very highly valued and widely used coastal recreation area, and thus could be considered substantial, is reason to be very cautious about this project. In fact, the coastal engineer for the project noted that outflow through the DH wall should be avoided to prevent adverse effects on the stability of San Souci Beach; he suggested that the outflow should be through the makai-facing wall of the Natatorium.

Staff and others have identified another substantial concern about the proposed project regarding potential secondary impacts to other Conservation District resources. As noted previously, there is concern that the Diamond Head (DH) groin may not function as designed; rather than keeping sand from blocking the pool's outflow opening, the groin may instead encourage sand to be deposited in its "shadow" along the DH wall. Staff believes, as does DOH and others, that sand will likely be trapped in the area of the

proposed outflow openings (which presently is where sand is carried and deposited by the existing littoral current). Thus, a costly and intrusive sand-bypassing/clearing mechanism may be necessary to keep this area clear of sand in order to maintain optimal water circulation and quality within the pool.

The consultant insists that the DH groin's main purpose is to block waves that may clog the outfall openings with sand, particularly during storms. They indicate that during the occasional Kona storm, reverse flow may occur in which the offshore circulation would flow in the DH to Ewa direction. During such storms, sand and suspended sediments may enter the DH-side openings, but they believe that the natural flushing system will clear the area soon after the storm. Staff questions the utility of the DH groin under such storm conditions, especially if sand is expected to enter the openings even with the groin in place. Further, staff understands these Kona storm waves would be transporting sand and sediment scoured up from the offshore reef as the waves move towards the Natatorium. Since the applicant has indicated that there is fairly little sand in this area, staff feels there may not be much of a problem with waves transporting sand and clogging the openings. Perhaps no groin is necessary.

Staff believes instead that a likely scenario is the typical littoral current, which as noted normally carries sand along San Souci Beach in an Ewa direction, will continue to deposit the sand along the Natatorium's DH seawall, and thus possibly into the exit openings (which will be raised only 6 inches to one foot above the dredged sea floor). The DH groin will 1) block incoming waves from moving this sand up onto the beach, and 2) block the existing littoral current that carries some sand out onto the reef in front of the Natatorium. Thus the only means by which the proposed plan provides for the removal of any accumulated sand (and for the prevention of the clogging of the openings) is that the flow of water exiting these openings will be strong enough to transport any sand that has settled there. Staff questions whether the expected flow rate through the openings (2 to 8 pool volumes per day) is strong enough to carry away any accumulated sand, and thus it is believed that a sand clearing mechanism may be necessary. However, the applicant denies the possiblity of a sand blockage problem and has made no plans to mitigate a problem should it occur.

Unfortunately, the physical modelling conducted to investigate how the proposed water circulation design would actually function leaves much still to be learned about how the project will affect the area outside the pool. An ocean engineer for the project

indicated that it would be desirable to conduct a hydraulic model experiment to verify the design solution, and that possible scales for such experiments are in the range of 1:25 to 1:36 (i.e., a fairly large-scale model). The actual model built was much smaller, with a scale of 1:150; this low cost model was designed just to examine several different configurations for the Ewa and Diamond Head ends of the Natatorium to determine the optimum flushing conditions and configuration (i.e., how many openings and groins are necessary).

Apparently due to cost considerations, a larger model that could have factored in the adjacent sand beach and offshore bathymetry, along with realistic dynamic littoral forces such as waves, was not constructed. Such a larger model could have provided highly desirable information about the possible "spill-over" effects of the pool circulation project on the adjacent Conservation District resources, including the existing littoral currents (which transport sand) and the stable sand beach. Another UH professor of Ocean Engineering noted that the 1:150 model was at a scale that shows the general pattern of water flow; it was not of a scale or design to give a more qualitative answer to the water exchange question or to evaluate any sand transport changes.

The project consultant did verify that the modelling was designed primarily to optimize water circulation within the pool, but claimed that is also assisted in determining the effect of the outflow. Staff believes it is very unfortunate that the model tests that were conducted do not provide critical information on "spill-over" impacts to conservation resources, because it is now virtually impossible to confidently conclude that there will not be any substantial adverse impacts to natural resources in the surrounding area. This is particularly relevant since the outflow is now proposed through the DH wall, and may now affect the San Souci Beach area, as noted by the project engineer.

Additionally, staff is unaware of any efforts to seriously consider alternate designs, such as mechanical flushing, that possibly could have accomplished the objective of improving water circulation within the pool without groins, and thus possibly with less or no impacts to surrounding Conservation District resources (or possibly without raising DOH's water quality concerns). Apparently an early decision was made to favor the natural flushing system over a mechanical flushing concept for three reasons:

1) Lower long-term operational and maintenance costs. Staff is unaware of any actual analyses of these costs for the two

systems, and feels certain that no effort was made to calculate the costs of 1) a potentially necessary sand clearing system and 2) the natural resources destroyed or degraded by the proposed plan;

2) No environmental impacts would occur from chemicals and oils from the pumps. Staff believes the technology for pumping seawater in environmentally benign ways is very standardized and accessible, and should not categorically be a deterrent; and

3) For historical consistency. Staff believes an appropriately designed mechanical system possibly could be hidden from view, and would not be any less "historically consistent" than the proposed addition of the two groins.

Finally, as noted elsewhere, staff believes the proposed project may result in degraded water quality in the area of the pool's outflow opening, may adversely impact the scenic qualities of the surrounding area, and would impinge upon the open space characteristics of this marine area. Given the fact that these impacts would affect a highly valued and widely used recreational area, such impacts could be considered "substantial impacts."

As indicated at the outset of this criterion, a critical issue is determining whether the potentially substantial impacts were thoroughly investigated and acknowledged, so that they could be analyzed, and then avoided or mitigated. As evidenced by the preceding analysis, staff is not convinced that the impacts have been adequately addressed.

<u>Is the Proposed Land Use Compatible with the Locality and Surrounding Areas, and Appropriate to the Physical Conditions?</u>

A relevant issue here is whether the proposed groins have been appropriately designed to accomplish their objective while fitting into the local environment in a benign manner.

The CDUA states that the groins are compatible with the surrounding area and is appropriate to the physical conditions of the existing Natatorium, and further, that the groins are necessary to achieve the targeted 10 pool volume changes per day to make the pool viable for public use. Staff notes that the groins would be constructed adjacent to existing Natatorium, and thus could possibly be considered physically compatible with that structure. However, staff also believes the DH groin will cause the most dynamic area

of the near-shore waters to become quite placid, as this groin will block incoming waves and prevent them from reflecting off the existing DH wall and spilling onto the beach. Beach-goers who currently enjoy this wave-wash would find the groin incompatible with the existing dynamic aspects of the swash zone area.

Importantly, staff is compelled to note that the EIS states that a total of 2 to 8 pool volumes are expected to flush through the Natatorium daily (EIS p.3-6), and thus questions why the consultant expects "10 pool volume changes per day" to occur. Staff has concerns about whether the groins are appropriately designed, whether the pool's viability will actually be achieved, and ultimately, whether the groins should be built if they may not accomplish their intended objective of properly flushing the pool.

Will the Existing Physical and Environmental Aspects of the Land (such as Natural Beauty and Open Space Characteristics) Be Preserved or Improved Upon?

At issue here is whether adequate and accurate information has been provided to make reasonable assessments and assurances regarding ultimate impacts to the somewhat intangible characteristics of scenic quality and open space.

The applicant states that the existing physical and environmental aspects of the land will be improved upon, in that the new groin structures will enhance the area by making the existing Natatorium pool once again viable for public recreational use. Additionally, the applicant claims that no view planes or open space will be intruded upon, and further that the groins would enhance the environmental aspect of the submerged land by creating a new habitat for fish species in the area.

Staff believes that virtually any action to rectify the dilapidated condition of the Natatorium could improve the natural beauty of this coastal area. Such actions could range from total restoration to demolition, provided that appropriate measures are taken to maintain the stable beach at San Souci. Obviously, actions that result in fewer structures rather than additional structures would better preserve or improve open space characteristics. Since construction of the DH groin would lead to the further confinement of the "openness" of the water area adjacent to the Natatorium, and an expansion of the area that will be in close proximity to a built structure, staff does not understand why the project consultant indicates the groins will preserve open space.

The applicant has stated in the CDUA and at the public hearing that 2 feet of the groins would be visible above the mean water line, and that during high tide, the groins will be barely visible above the water line. Further analysis has shown that the "fin wall" portion of the DH wall would actually protrude 4.5 feet above mean sea level (MSL). Staff believes a massive concrete structure of this height and scale would be visible, and that it could have a significant impact on the scenic resource of, and the viewshed from, the beach area even though the horizon may be visible above the wall.

A potentially mitigating factor for the proposed groins is that the existing Natatorium wall is stated to be about 7 feet above MSL, and this structure has already affected the "intactness" of the natural land/seascape. However, people come to this location specifically to enjoy the beauty and tranquility of the sun setting into the sea, and staff believes the DH groin could alter or eliminate this striking view, now that the groin will apparently be closer to the height of the existing Natatorium wall.

Finally, staff is compelled to note that no reason was provided for the misleading figures of the groin's height, and this had hindered staff's ability to make assessments and assurances regarding the potential visual impact of the groin.

Will Subdivision of Land Be Utilized to Increase the Intensity of Land Uses in the Conservation District?

Although the construction of groins could be considered as an increased intensity of use, no subdivision of land is proposed. However, an Executive Order would be required to transfer the unencumbered submerged land under the proposed groins to the applicant.

Will the Proposed Land Use be Materially Detrimental to the Public Health, Safety and Welfare?

An important issue here is whether the proposed project, as currently designed, will lead to a potential public health problem by degrading the water quality of this public recreation area.

The applicant indicates that the proposed land use will not be materially detrimental to the public health, safety and welfare, since the proposed action does not include the use of, or placement of, harmful chemical or biological materials.

A question submitted from the public raised the concern of ciguatera poisoning in the area's fish as a result of the construction activities. The applicant responded by noting some of the mitigation measures that will be employed to minimize impact during the construction period. In addition, they claim that fish are anticipated to vacate the area during this period. Staff understands that the ciguatera toxin in fish may be associated with dredged coral reef areas. Since the causal links are poorly understood, it is unknown whether the project or the noted mitigation measures will have any effect on the presence of the ciguatera toxin.

Staff notes that the proposed groins are intended to improve the water circulation, and thus water quality, within the Natatorium pool. The State Department of Health (DOH) has authority over issues pertaining to water quality within public swimming pools, including pools such as the Natatorium that use saline water. The DOH has serious concerns about the project, and has stated unequivocally that, as currently proposed, the restored pool will not conform with the State's administrative rules established to protect public health and safety, and they could not approve the construction and operation of the pool under their current rules. Given the groins' direct association with the issue of water quality within the pool, staff seriously questions the rationale of providing for the placement of groins that will not result in the achievement of their objective, i.e. acceptable water quality within the pool.

Additionally, the effluent from the pool will discharge into the waters off San Souci Beach in conjunction with the proposed DH groin, and staff is concerned about the implications of this effluent on public health. Although this analysis did not directly focus on the issue of water quality within the pool, staff concurs with the testimony received about the potential problems with the pool's water quality, and believes it is not unreasonable to assume that (notwithstanding the consultant's claims to the contrary) the effluent will be of diminished quality compared with the inflow, since there is no practical way to disinfect any detrimental microorganisms, or filter out any suspended material, in the salt water freely flowing out of the pool into the San Souci Beach area.

Staff believes that the serious consideration of other alternatives, such as the use of a mechanical flushing system for the pool or the replacement of the pool with a much more exposed beach, could lead to the elimination of these substantial public health concerns.

Unresolved Issues

In Staff's opinion, at the time of this submittal, the issue regarding the feasibility of alternative concepts to the proposed design had not been satisfactorily resolved. The project consultant noted the three aforementioned reasons for disregarding the mechanical flushing system concept, but staff feels a much more substantial discussion is necessary before the issue can be considered resolved. Additionally, staff believes there has not been a complete discussion of the feasibility and preference of various partial restoration concepts that could lead to the ultimate objective of determining the most appropriate public use of this highly valued coastal recreation area.

Finally, staff believes DOH's strong concerns about the project, and their statement about not permitting the operation of the pool even if the groins are built, should be considered as a substantial unresolved issue. This matter invokes serious questions about the logic of using scarce public funds to build groins that may not result in the achievement of their intended objective.

CONCLUSION:

As detailed in the above analysis, this proposal to construct the two groins prompts many questions, yet provides the answers to few. The application is substantially based on the Environmental Impact Statement (EIS) for the Waikiki War Memorial Park and Natatorium that was developed under the auspices of the Department of Land and Natural Resources (pursuant to the Legislature's directive) and accepted by the Governor in 1994. Unfortunately, the EIS is significantly focussed on the restoration of the Natatorium structure itself, and much less focussed on the groins that it advances as a means to improve water circulation and water quality within the pool. The EIS, which is written and intended as an information disclosure document, and which is not a permit, includes an adequate description of the existing environmental conditions of the marine area surrounding the Natatorium. It does not, however, provide much insight into the potential effects of constructing the groins; only four pages of the 1.5 inch thick document deals with the probable impacts to the Conservation District resources and with possible mitigation measures.

The project consultant did attempt to enhance the lack of relevant information pertinent to this CDUA for the proposed groins, but unfortunately significant questions remain unanswered. Chief among these relate to the physical modelling conducted to "test" the

proposed groins. Staff feels very strongly that the modelling was designed solely in an attempt to optimize the water circulation within the pool, and there was scant attention paid to devising a water circulation scheme that avoided or fully minimized adverse impacts to the Conservation District resources outside the pool. Thus, the modelling and analyses that was conducted does not provide any additional information about these potential impacts. These impacts include the modification of existing littoral currents that have lead to the establishment of a stable sand beach (and thus the possible destabilization of a very popular public beach), the likely degradation of coastal water quality at a widely-used recreation area, the destruction of reef and other marine life within an established Marine Life Conservation District and Fisheries Management Area, the impairment of well-appreciated scenic view and open space values, and the possible necessity of instituting a problematic sand clearing mechanism. Due to the apparent lack of information regarding these impacts, staff is not confident that the proposed design of the groins has avoided or minimized these impacts.

Additionally, staff believes that other potential alternatives to the groins, which could accomplish their ultimate objective of improving water quality within the pool with possibly less impact to the adjoining Conservation District resources, were not fully considered. Without a serious analysis of the feasibility and preference of such alternatives, such as mechanical flushing of the pool or a "partial restoration" alternative, staff cannot ascertain that the proposed plan is indeed the optimal plan from the Conservation District perspective.

Further, staff does not have full confidence in certain statements submitted in support of this CDUA. The insistence that the Diamond Head groin will not encourage sand build-up in the area of the outflow through the pool's wall at the base of this groin, and thus no consideration of devising a feasible mitigation plan to this potential problem is required, strikes staff and other commentators (both professional and lay people) as unrealistic and unreasonable. In fact, even one of the ocean engineers for the project noted that outflow through the Diamond Head wall is to be avoided to prevent adverse effects on the stability of San Souci Beach.

Also, staff believes the insistence that both groins are absolutely necessary for the restoration of the Natatorium is untenable in light of the fact that other unconsidered alternatives may accomplish the groins' objectives, without actually requiring both of the proposed groins. In this regard, staff is compelled to note

that action on this CDUA is limited to approving or denying the proposed groins, and that the ramification of this action on the larger Natatorium restoration project is beyond the scope of this analysis. Direct action on the pool restoration project itself is the responsibility of the City Council and the Department of Health.

RECOMMENDATION:

Based on the preceding analysis, staff recommends that the Board of Land and Natural Resources DENY this application to construct two groins on unencumbered, submerged State-owned lands extending off the seaward corners of the Waikiki Natatorium. Staff believes the proposal creates a substantial risk of the following significant adverse impacts to highly valued Conservation District resources:

1) the alteration of the littoral currents and sand transport mechanisms that have lead to the establishment of a stable sand beach that experiences high levels of public use (which could lead to the potential destabilization and degradation of the beach resource);

2) the likely degradation of coastal water quality at a widely-used recreation area;

3) the damage to reef and other marine life within an established Marine Life Conservation District and Fisheries Management Area;

4) the distinct likelihood that a problematic sand clearing mechanism will be required at this beach to prevent sand from accumulating and blocking the pool's outfall openings; and

5) the visual impairment of well-appreciated scenic view and open space values.

Additionally, staff is concerned about the apparently modest amount of modelling and testing conducted to assure performance and to minimize adverse spill-over impacts for a project of this magnitude. Due to the resultant lack of information regarding these impacts, staff cannot confidently determine that the proposed design of the groins has satisfactorily avoided or minimized these impacts. Further, due to a lack of information about potential alternatives to the proposal, staff cannot confidently determine that the impacts are justified and acceptable. Finally, staff believes DOH's strong concerns about the project, and their

statement about not permitting the operation of the pool even if the groins are built, sheds light on a serious problem with this proposal.

Therefore, staff believes it would be irresponsible to commit Conservation District resources of this scale when the success and impacts of the project have not been thoroughly evaluated.

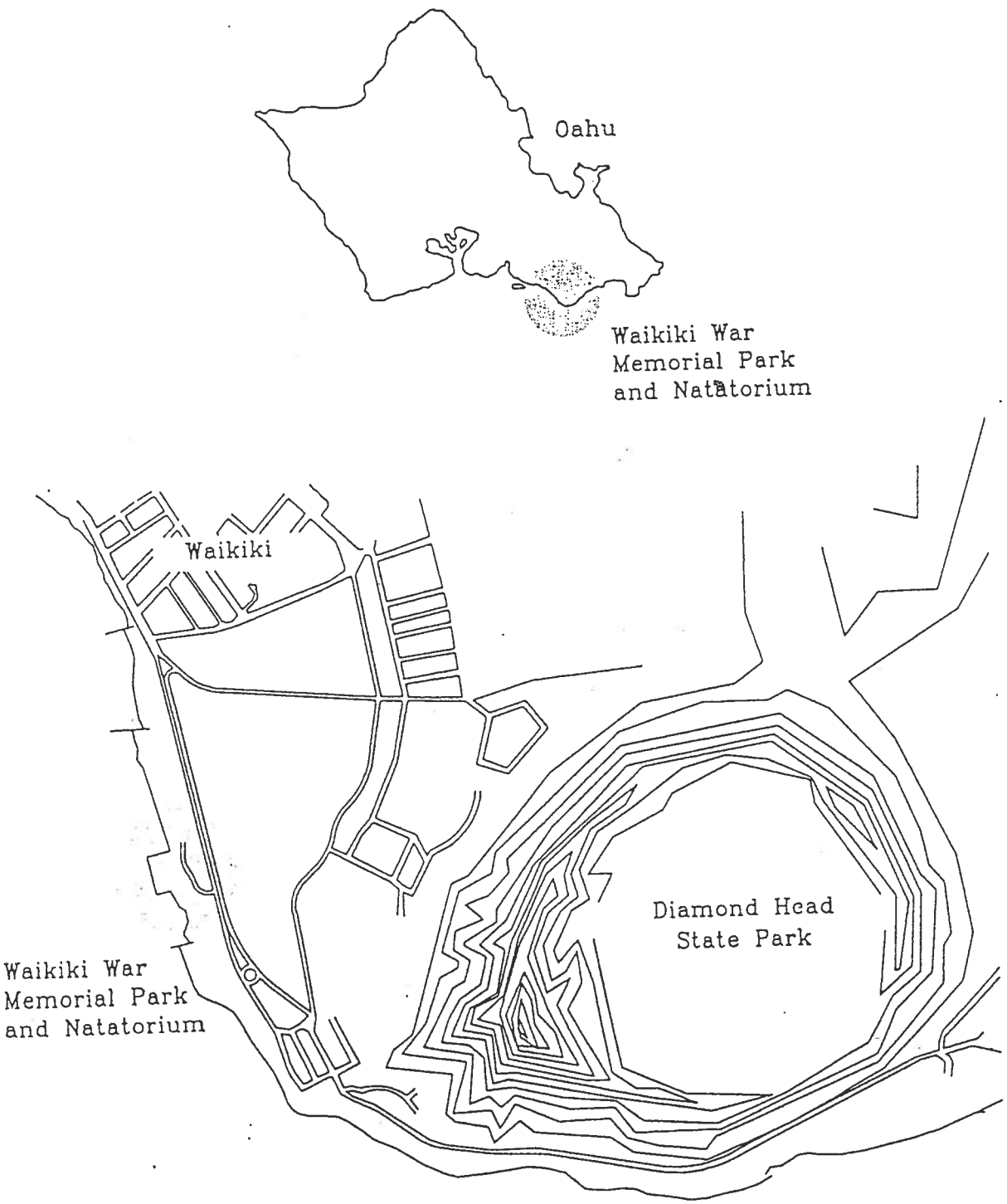
Respectfully submitted,

Thomas H. Eisen

THOMAS H. EISEN
Staff Planner

Approved for submittal:

for MICHAEL D. WILSON, Chairperson
Board of Land and Natural Resources



Project Location

Exhibit 1

EXHIBIT 1 **Pg. 1 of 1**

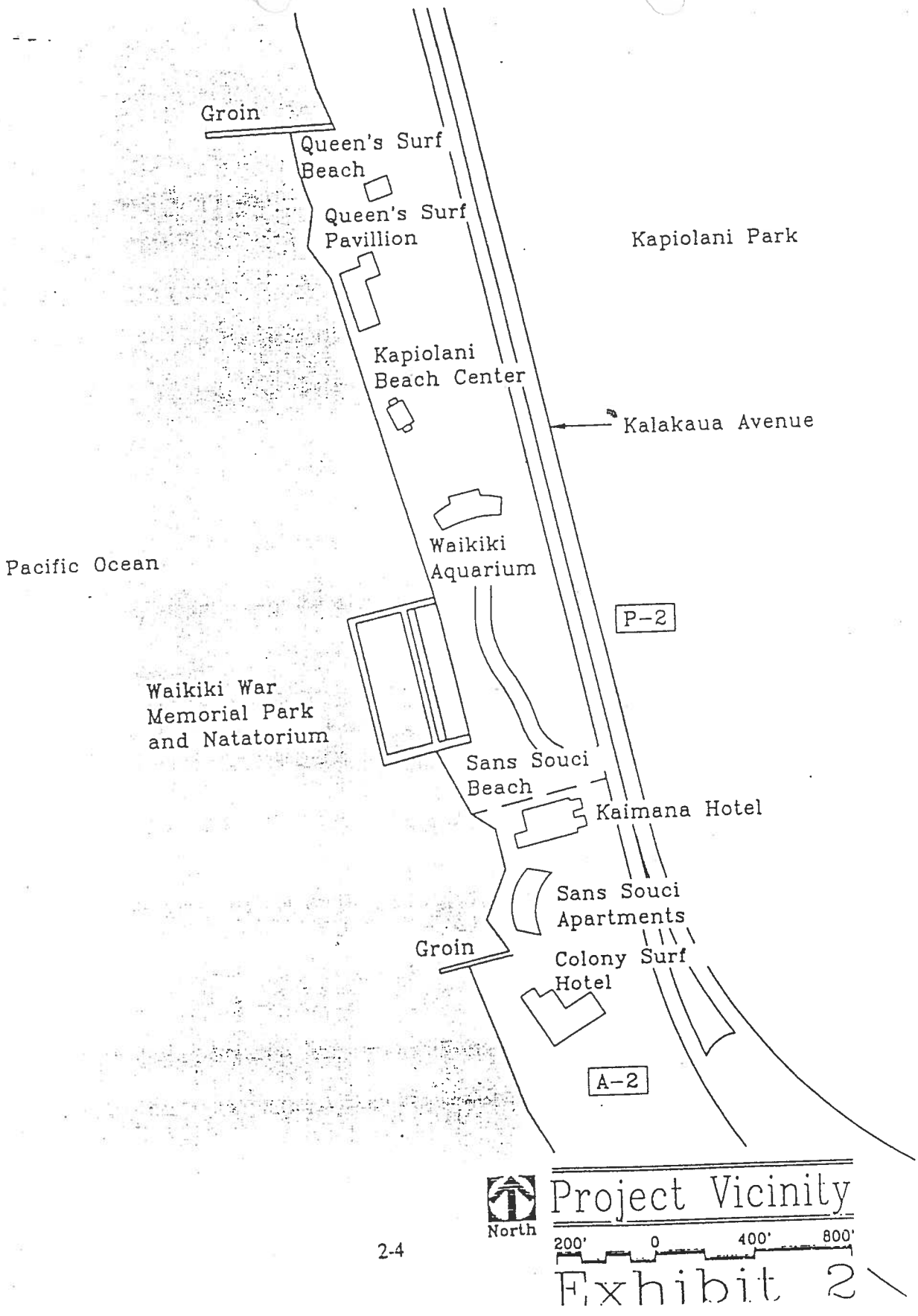
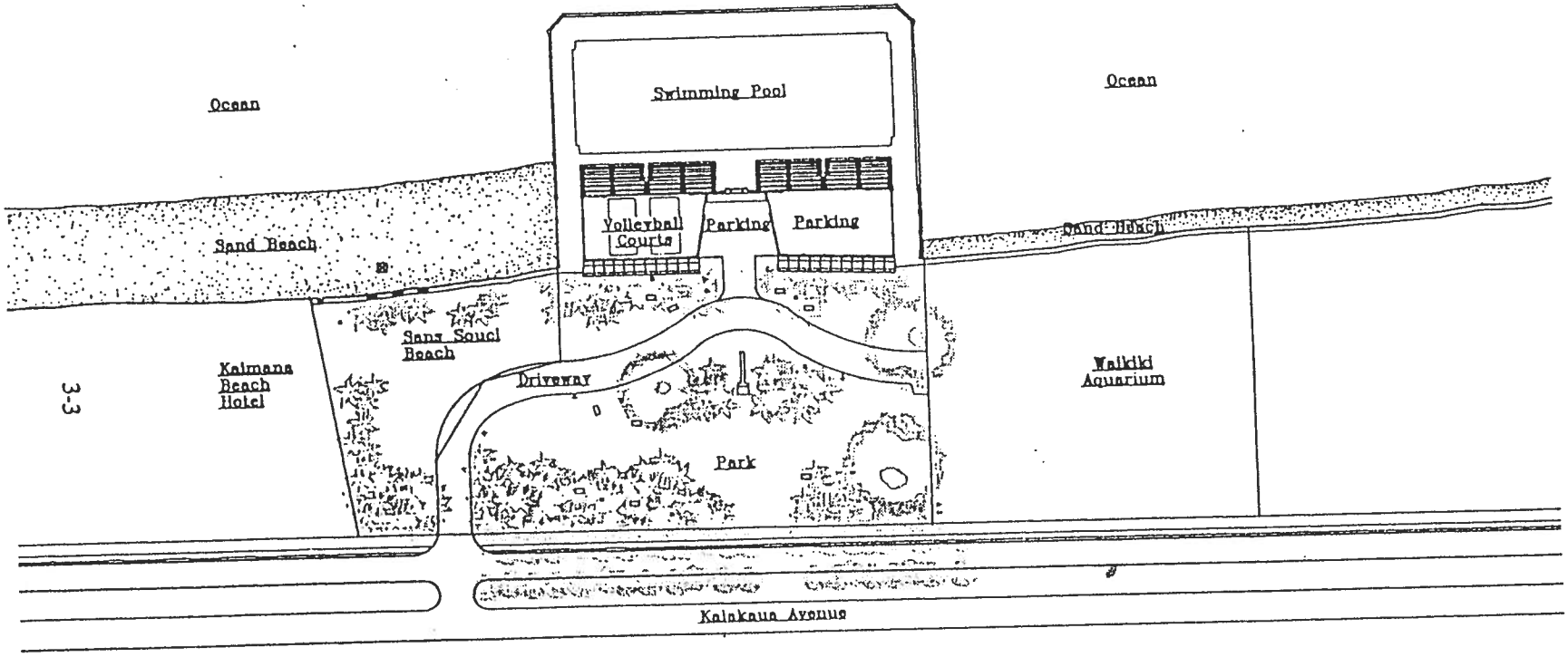


EXHIBIT 2 **Pg. 1 of 1**

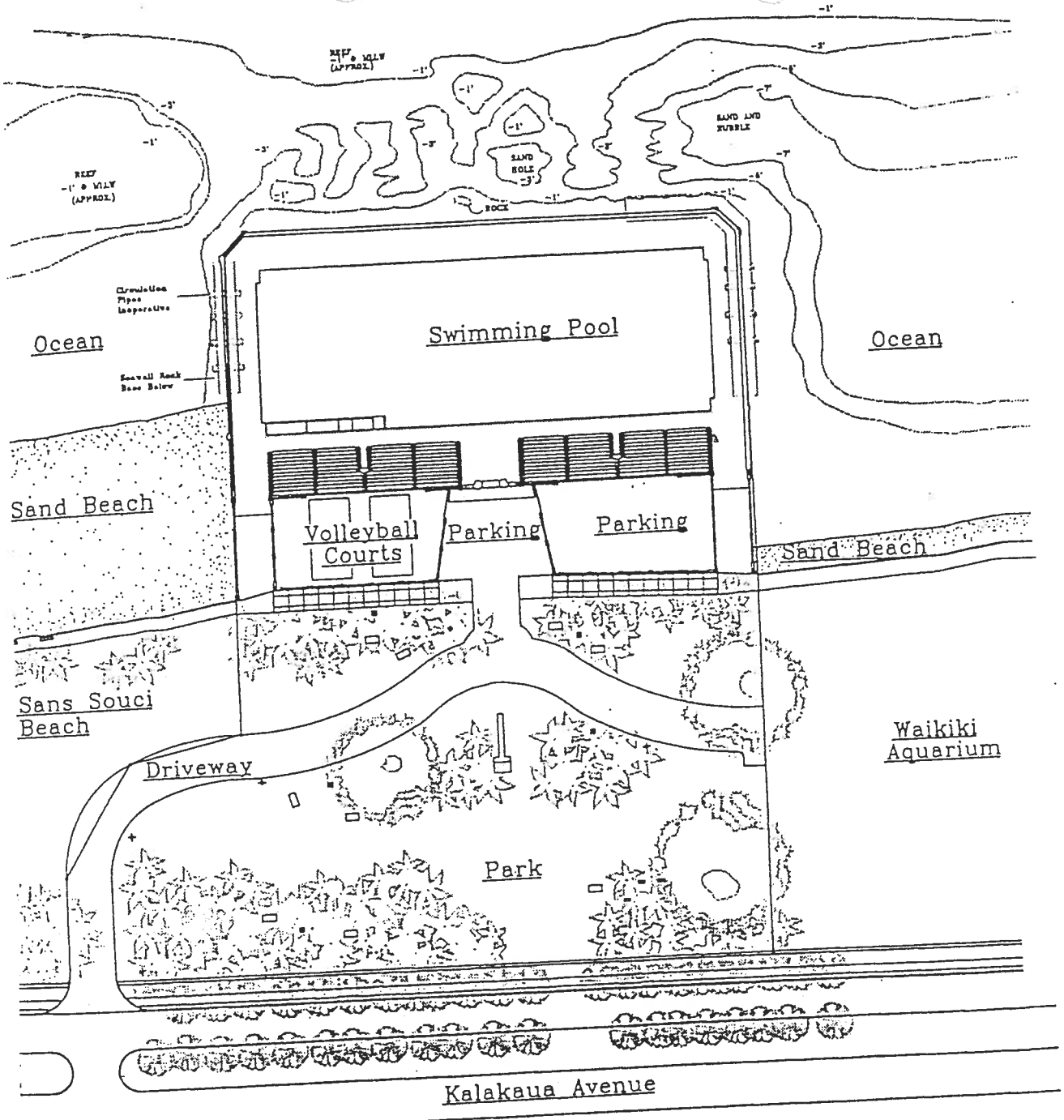
EXHIBIT 3



Existing Conditions
The Site
North
80' 0 80' 160'
Exhibit 12

Pg. 1 of 1

EXHIBIT 4 **Pg. 1 of 1**



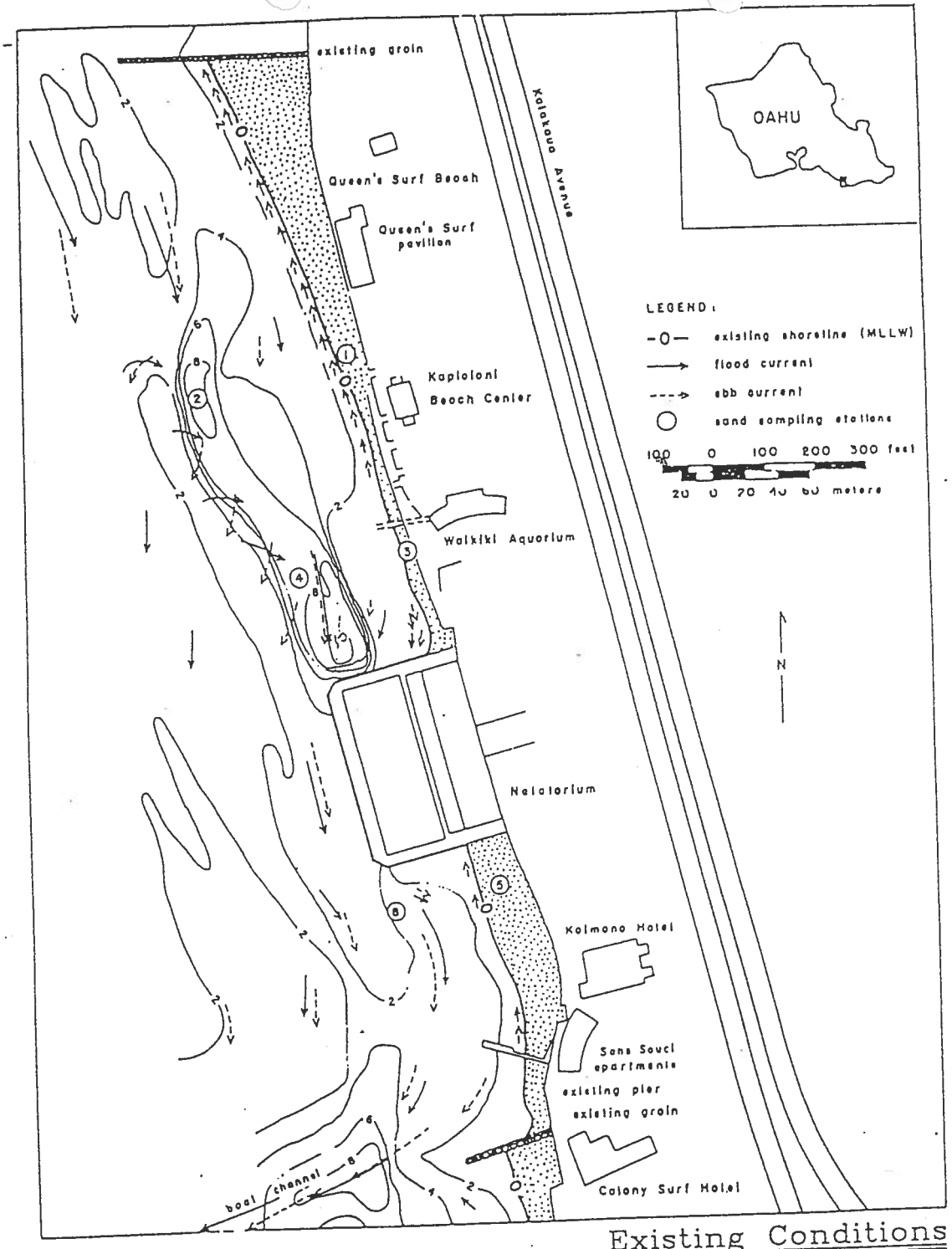
Existing Conditions

Oceanographic Conditions

North

80' 0 80' 160'

Exhibit

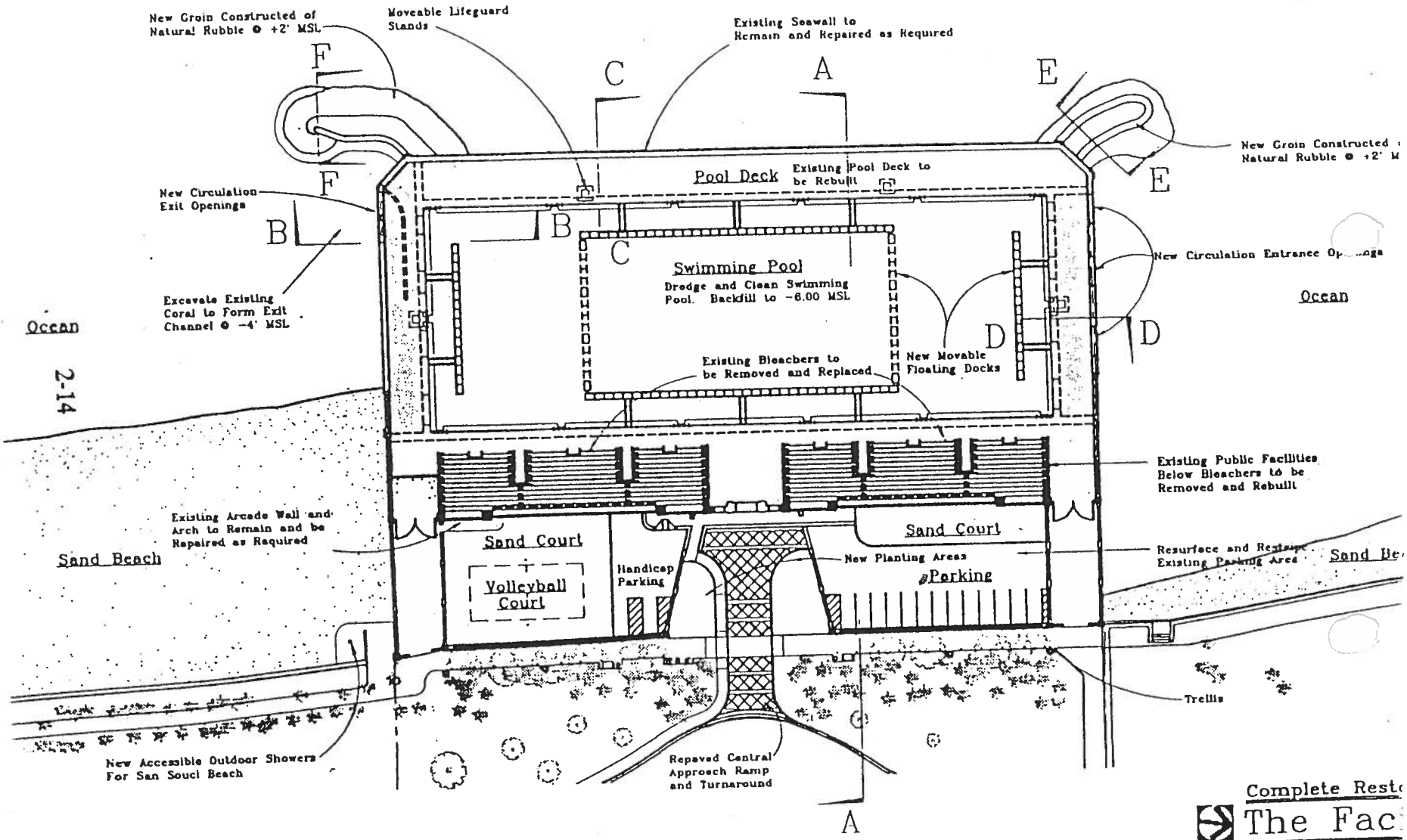


Existing Conditions

Ebb and Flood Current Patterns

Exhibit

EXHIBIT 7



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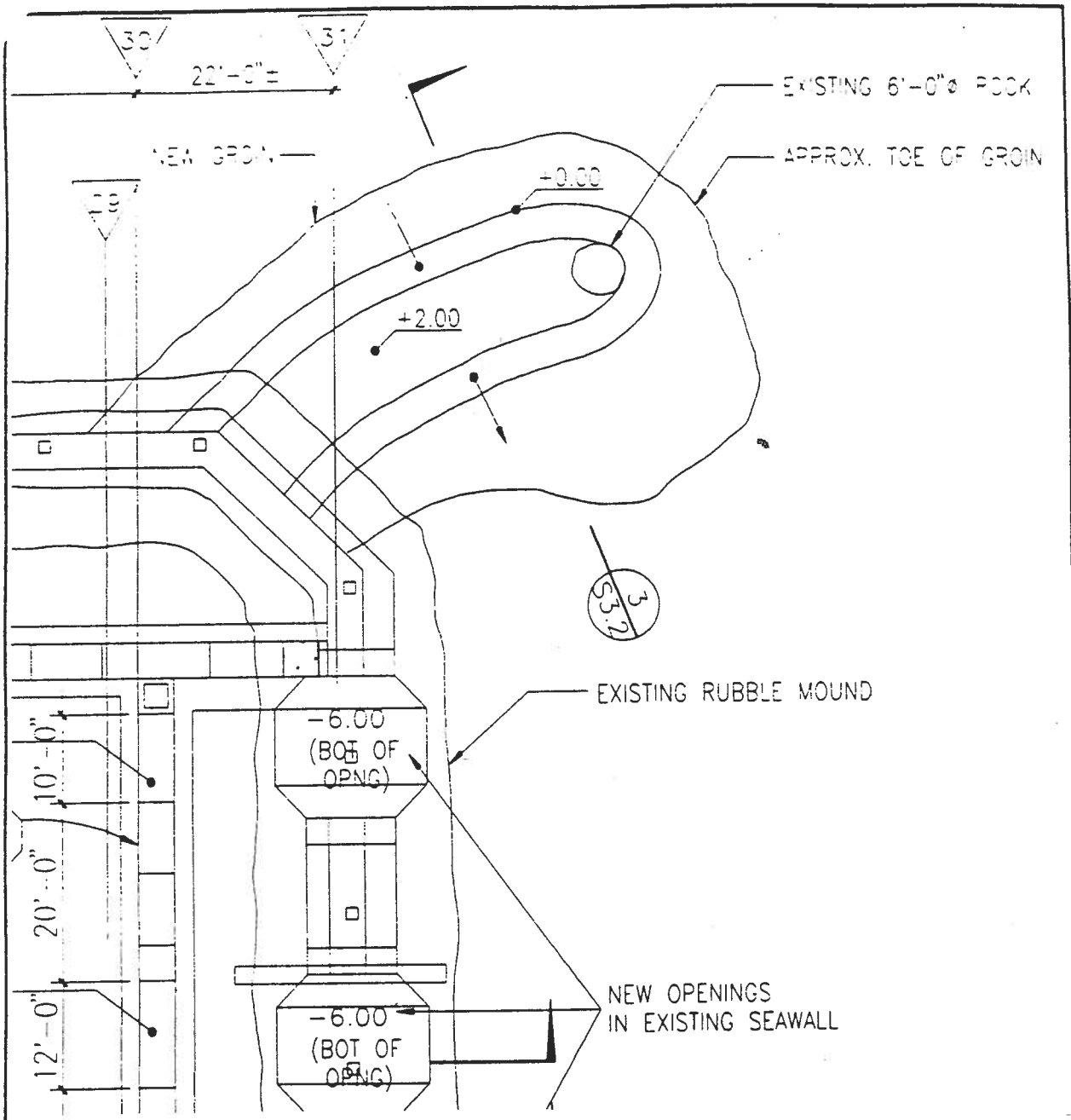


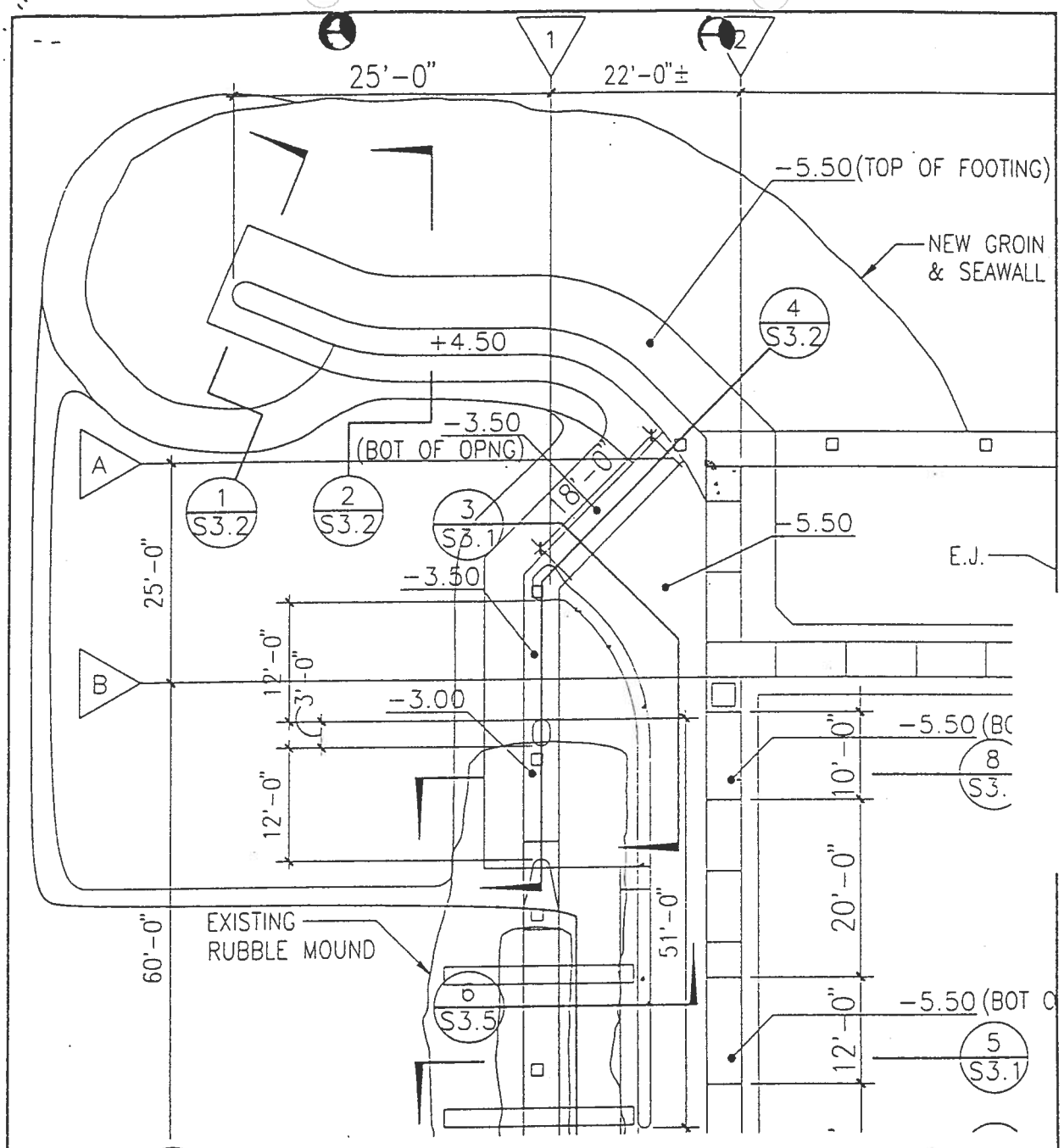
1 / S1.2 ENLARGED PLAN – EWA GROIN

SCALE: 1/16" = 1'-0"

PROJECT TITLE WAIKIKI WAR MEMORIAL AND NATATORIUM	DRAWN SLU CHECKED EGC	DRAWING NUMBER S1.2 DATE 13 AUGUST 1997
PROJECT NO. :R 811188-04		

HEO A DALY

EXHIBIT 8



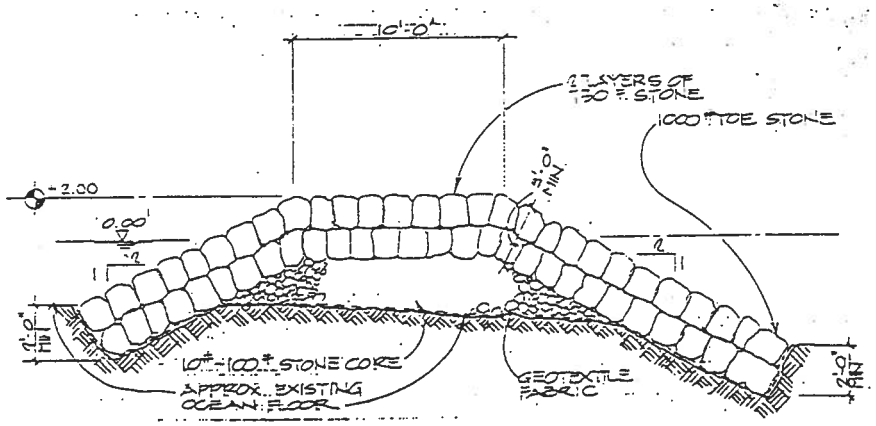
1 / S1.1 ENLARGED PLAN – DIAMOND HEAD GROIN

SCALE: 1/16" = 1'-0"

PROJECT TITLE WAIKIKI WAR MEMORIAL AND NATATORIUM	DRAWN SLU	DRAWING NUMBER S1.1
	CHECKED EGC	DATE 13 AUGUST 1997
PROJECT NUMBER 811188-04		

LEO A DALY

EXHIBIT 9 **Pg. 1 of 1**



3 / A3.2 SECTION

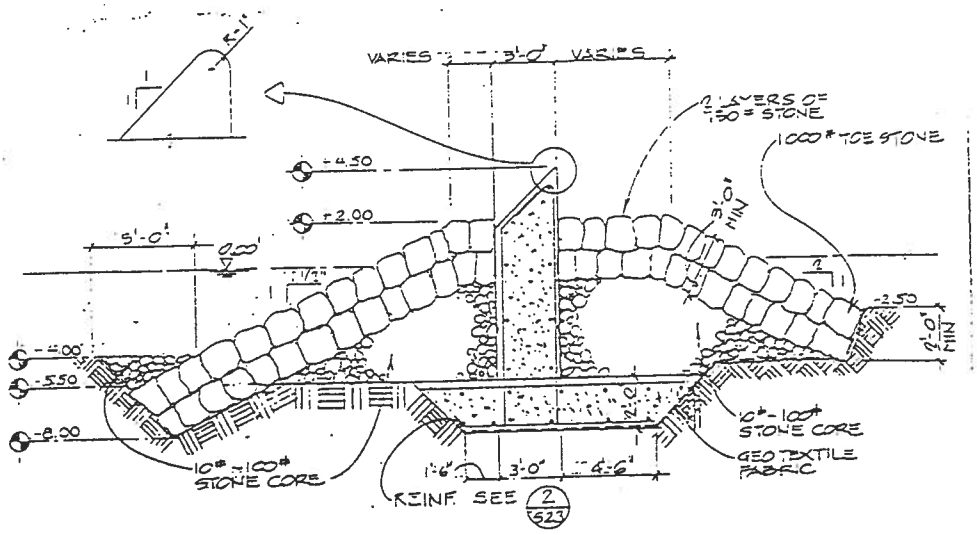
SCALE: 1/8" = 1'-0"

PROJECT TITLE WAIKIKI WAR MEMORIAL AND NATATORIUM	DRAWN SLU	DRAWING NUMBER 3/S3.2
	CHECKED EGC	DATE 13 JUNE 1997
PROJECT NUMBER 811188-04		

LEO A DALY

EWA GROIN

EXHIBIT 10



1/A3.2 SECTION

SCALE: 1/8" = 1'-0"

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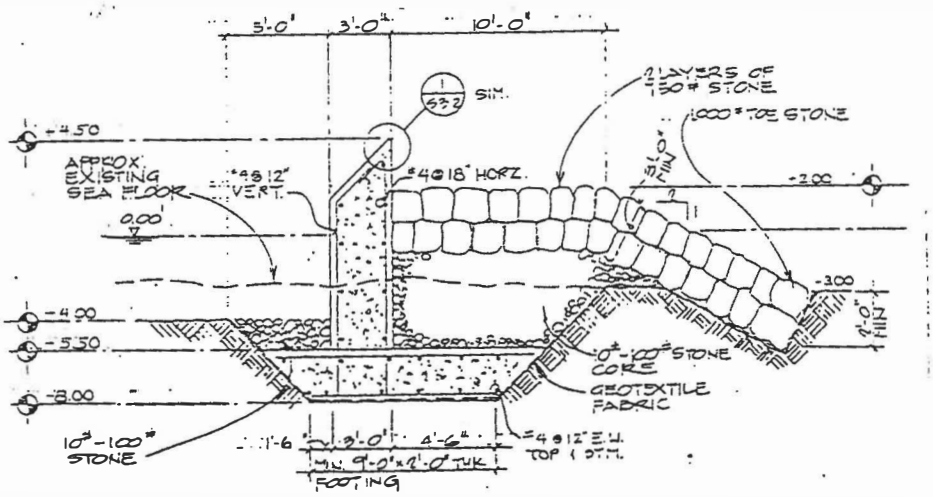
	CHECKED EGL	DATE 13 JUNE 1997
PROJECT NUMBER 811188-04		

HEO A DALY

DIAMOND HEAD GROIN

EXHIBIT 11



2 / A3.2 SECTION

SCALE: 1/8" = 1'-0"

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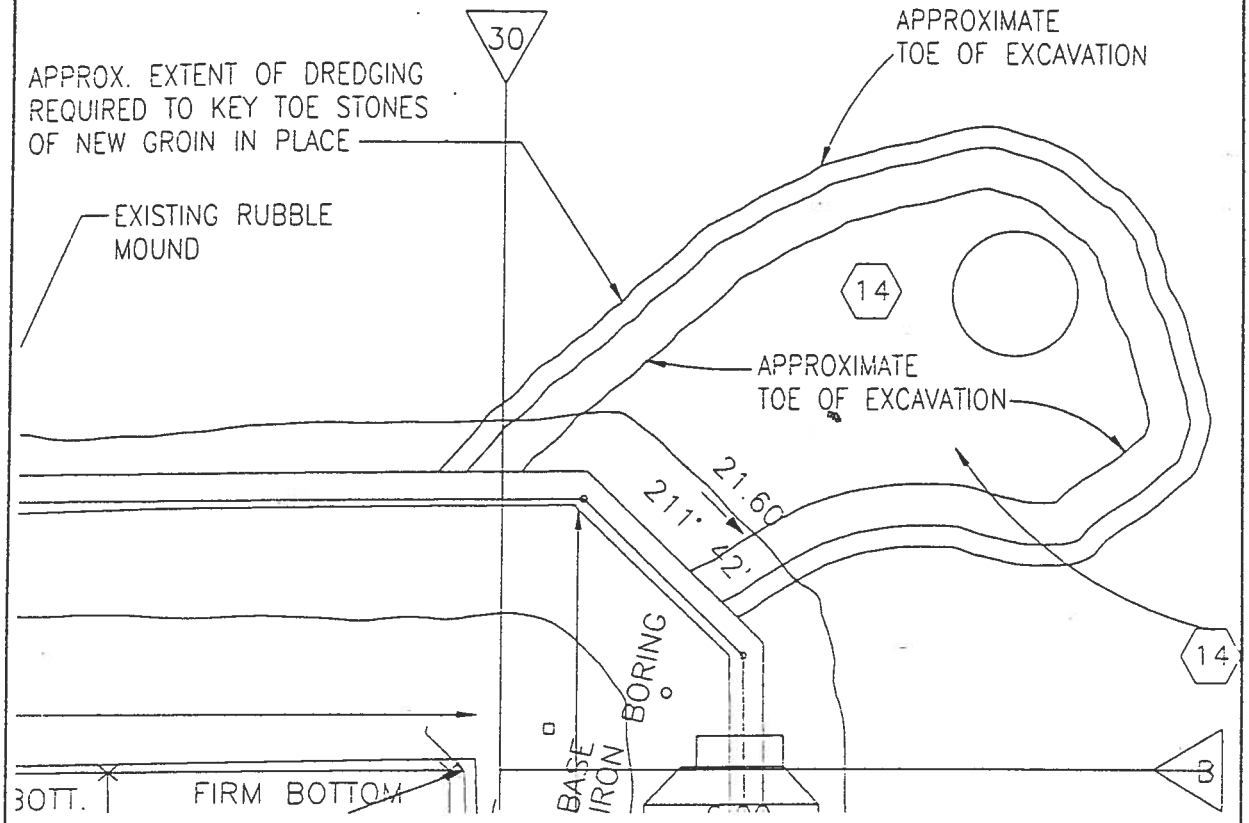
	CHECKED	DATE
PROJECT NUMBER 811188-04	EGC	13 JUNE 1997

LEO A DALY

DIAMOND HEAD GROIN

EXHIBIT 11



NOTE:

1. SPOT ELEVATIONS SHOWN ARE AN EXCERPT OF SURVEY DRAWINGS AND IS INTENDED FOR INFORMATION ONLY.

2. EXTENT OF RUBBLE MOUND IS APPROXIMATE AND MAY NOT BE AN ACCURATE REPRESENTATION OF EXISTING CONDITION.

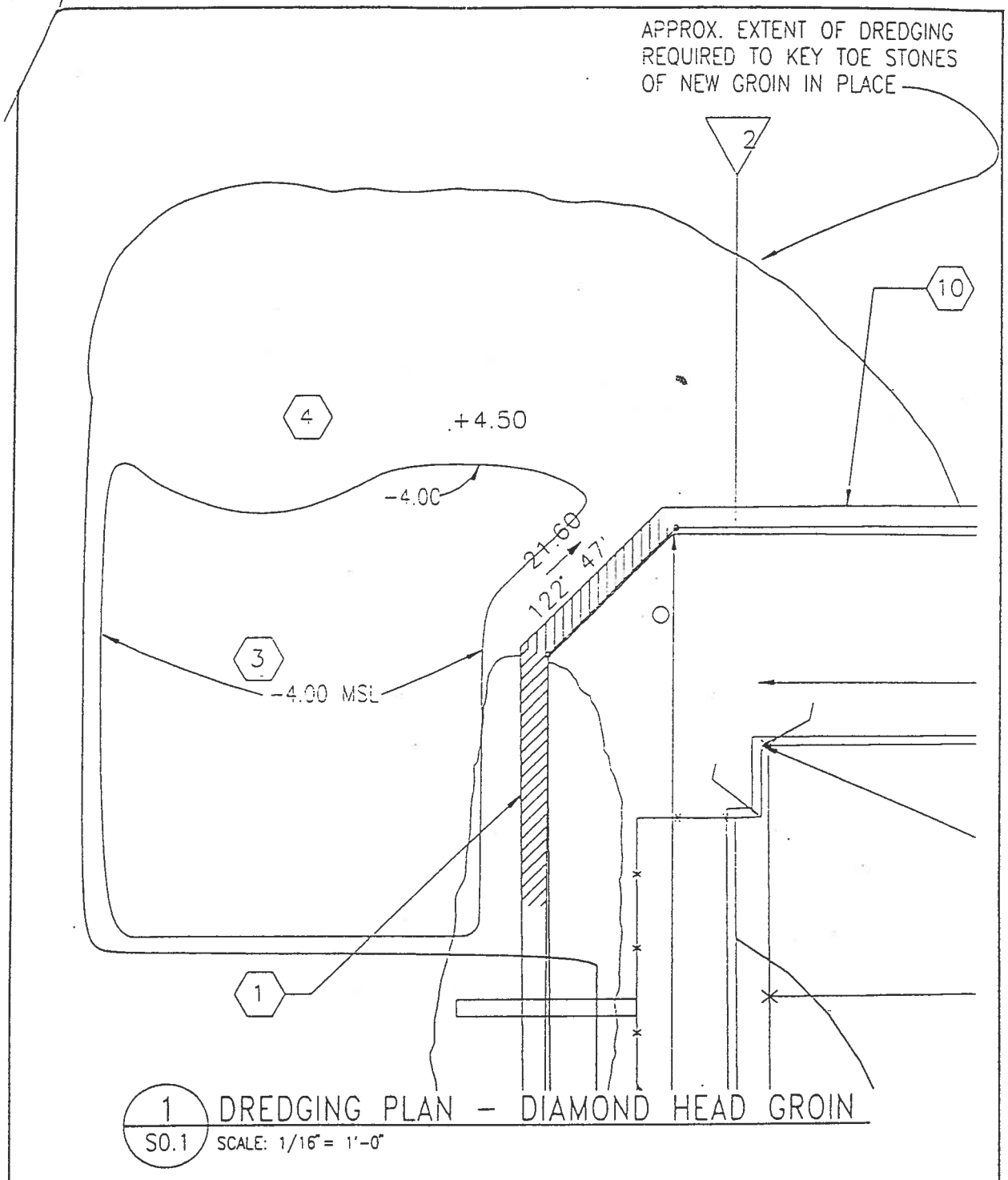
1 / S0.2 DREDGING PLAN – EWA GROIN

SCALE: 1/16" = 1'-0"

PROJECT TITLE WAIKIKI WAR MEMORIAL AND NATATORIUM	DRAWN SLU	DRAWING NUMBER S0.2
	CHECKED EGC	DATE 13 JUNE 1997
PROJECT NUMBER 811188-04		

LEO A DALY

EXHIBIT 12



1 / S0.1 DREDGING PLAN – DIAMOND HEAD GROIN

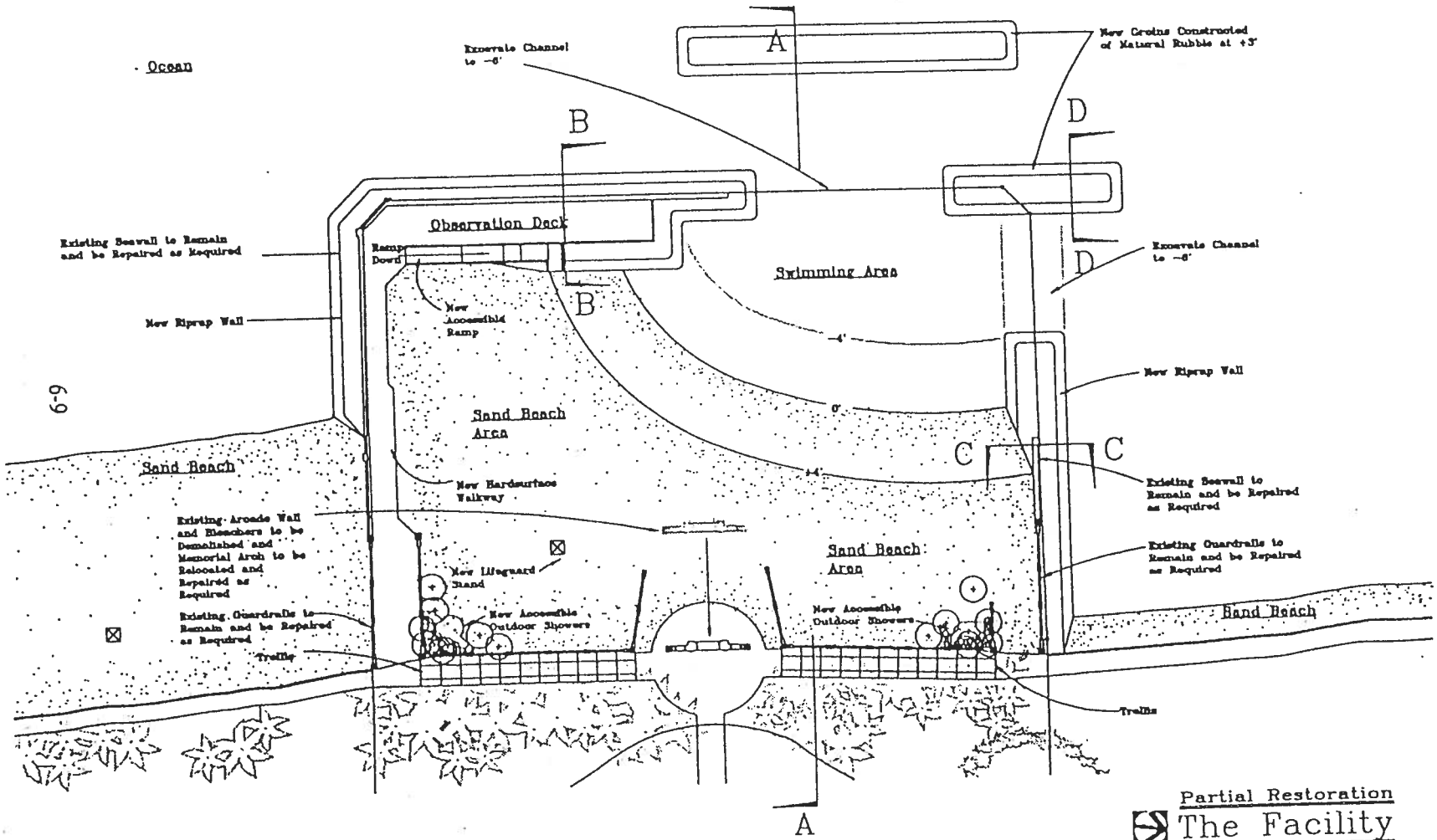
SCALE: 1/16" = 1'-0"

PROJECT TITLE WAIKIKI WAR MEMORIAL AND NATATORIUM	DRAWN SLU	DRAWING NUMBER S0.1
	CHECKED EGC	DATE 13 JUNE 1997
PROJECT NUMBER 811188-04		

LEO A DALY

EXHIBIT 12 **Pg. 2 of 2**

EXHIBIT 13



Pg. 1 of 1