

VOLUME 1: EXECUTIVE SUMMARY



aloha stadium PLANNING STUDY FINAL REPORT - 12.22.05



Aloha Stadium Planning Study

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VOLUME 1: EXECUTIVE SUMMARY



SECTION I: EXECUTIVE SUMMARY AND RECOMMENDATIONS



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Part I – Executive Summary

On 20 April 2005, the State of Hawaii, Department of Accounting and General Services (DAGS), issued the request for qualifications (RFQ) “Aloha Stadium, Planning Study,” DAGS Job No. 12-10-0374. The RFQ stated that the intent of the 2005 planning study for Aloha Stadium was to assist the State of Hawai’i in the development of a long-range plan for the future of Aloha Stadium. In addition, the State intended to weigh the options of extending useful life of the existing Aloha Stadium as compared to the cost of a new stadium. In accordance with the RFQ, the planning study was to include the following components:

- Structural condition survey, focusing on the protective coatings system
- Architectural condition survey, examining features throughout the stadium
- Stadium enhancement and stadium replacement conceptual options
- Financial analyses, including estimating of costs for various options

On 20 May 2005, Wiss, Janney, Elstner Associates, Inc. (WJE), Honolulu, Hawaii, in conjunction with HOK Sport, Kansas City, Missouri, submitted a detailed qualifications package and proposal in response to the RFQ. The entire project team included in our response is as follows:

Project Team Member	Role
Wiss, Janney, Elstner Associates, Inc. (WJE), Honolulu, Hawaii	Lead Consultant, Structural Engineering, and Coatings Specialist
HOK Sport, Kansas City, Missouri	Architect, Sports Facilities Specialist
Barrett Sports Group, LLP (BSG), Los Angeles, California	Sports Facility Feasibility Consultant
Architects Hawaii, Ltd. (AHL), Honolulu, Hawaii	Hawaii Building Codes Consultant
PCL Construction Group, Inc. (PCL), Honolulu, Hawaii	Lead Cost Estimator
Continental Mechanical, Honolulu, Hawaii, and A-1 A-Electricians, Honolulu, Hawaii	Assistance with cost estimating

During June 2005, WJE was notified that its proposal was selected by DAGS. After negotiation of contract terms, DAGS issued notice to proceed to WJE on 17 August 2005.

Section A - Background and History of the Stadium

The Aloha Stadium, Figure I-1, was designed and constructed in the early 1970s. The first sporting event played in the stadium took place in early September, over the Labor Day weekend,



Figure III-1. Aerial view of Aloha Stadium.

of 1975. Currently, the stadium primarily serves a home for the University of Hawaii football team, the National Football League's Pro Bowl, and three-times-a-week swap meets in the parking lot.

A.1. General Description

The facility contains approximately 50,000 seats primarily for the viewing of athletic events. One unique feature of the stadium is the ability to move four of the six total sections of seating stands to allow the stadium to be changed between either football configuration or baseball configuration. Plans showing the two configurations are given in Figure I-2.

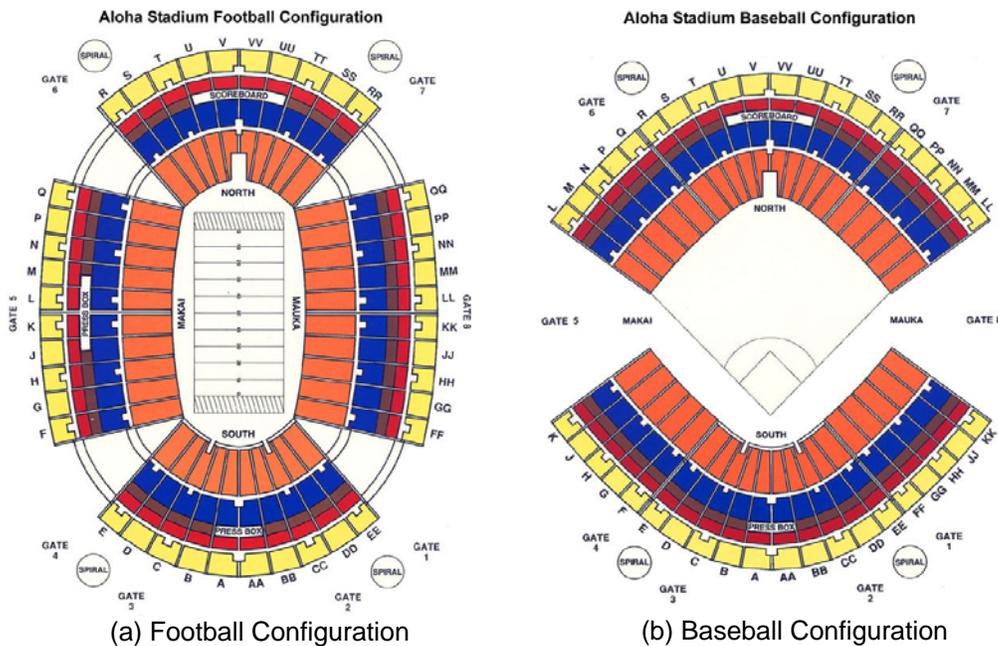


Figure I-2. Expanded plans of Aloha Stadium: (a) Football configuration; (b) Baseball configuration.

The stadium transport systems are based on air film technology, whereby a series of air film bearing assemblies provide a thin film of air as lubricant between the load and the supporting surface to eliminate friction. The bearing assemblies at Aloha Stadium travel across paved concrete runways as the stands are moved. Lateral movement of a stand is accomplished by a transporter drive assembly that reacts against a curved steel guide rail mounted to one of the concrete runways.

The field-level seating at the two stationary seating sections is supported by reinforced concrete structure. The entirety of each of the four moveable seating sections and the tier seating areas of the stationary seating sections are constructed with structural steel, in particular, a weathering type of structural steel. This steel was purported to be resistant to corrosion after an initial, dense, stable rust layer develops on the surface. This dense, stable layer of rust is often called a “protective patina” in the technical and marketing literature for this type of steel. However, it was later learned that weathering steel is sensitive to salt-laden air environments like Hawaii. In such environments, the protective patina does not stabilize but instead continues to corrode. The weathering steel at Aloha Stadium, therefore, required remedial attention. Extensive surface preparation, an application of a protective coating system, and replacement in kind of major portions of the stadium were performed to address the corrosion problems. The corrosion abatement project commenced in about 1985 and was completed in 1995. For this work, the State expended \$80 million.

A.2. Original Design and Construction

The architectural and structural design drawings for the stadium are dated 1972. The architect was Charles Luckman Associates, Los Angeles, California, with Michael T. Suzuki, Honolulu, Hawaii. The structural engineer of record was Erkel / Greenfield & Associates, Los Angeles.

The general contractor was Hawaiian Dredging and Construction Co. The construction cost at the time of original construction was \$37 million. The as-built drawings, submitted by the contractor upon completion to the State of Hawaii, are dated 1975 and 1976.

A.3. Corrosion Mitigation Program

By the late 1970s, it had become evident that the patina on the weathering steel was not stabilizing and that significant, continuing corrosion was taking place. The earliest apparent construction project that addressed corrosion-related problems at the stadium was carried out in 1979. The first significant report on the corrosion problem, prepared by SSFM Engineers, Inc. (SSFM), in December 1981, described the fundamental issues of the corrosion problem to be as follows:

- The structure is situated in an aggressive marine environment;
- Areas within the stadium have poor ventilation, high humidity, are subject to the collection of water and debris, and are continually wetted due to water penetration, all of which promote corrosion; and
- At areas of severe corrosion, “loss of effective base metal” was measured as 10 percent, raising structural concerns.

SSFM recommended that: “to arrest continuing corrosion, the affected areas be repaired and painted with a high performance paint;” a maintenance and repair program be developed and implemented; and that “further studies be made to determine the remaining safety of badly corroded members.”

The first coordinated effort to plan the remedial work commenced in 1985 and was summarized in the report “A Report on Corrosion Related Renovation Work Required at the Aloha Stadium,” SSFM Engineers Inc., April 1987. The report included a comprehensive summary of work required to address the corrosion problems. Significant corrosion abatement work, including the painting of the weathering steel frame beneath the moveable stands, was under way at the time of their report. The report also established a phased construction plan for implementing the remainder of the abatement program as recommended by the report. The corrosion-related work either already completed or recommended to be implemented at the time of the 1987 report included: repair or replace the concrete-and-metal deck at both upper and lower concourse levels and at cross-aisles throughout the stadium; remove corrosion from all weathering steel members throughout entire stadium by abrasive blast cleaning; apply a high performance paint system to all weathering steel members throughout the entire stadium; remove and replace the metal roof deck at the entire stadium; take certain measures to mitigate penetration of water through the metal seat plates throughout the stadium; abrasive blast clean the metal seat plates throughout the entire stadium and then recoat the top surface with waterproofing membrane coating and the bottom surfaces with high performance paint; replace corroded metal siding and metal partitions with new factory-coated metal panels throughout the stadium; take certain measures to promote the drainage of water from structural elements throughout the entire stadium; and numerous other work items. The 1987 SSFM report should be consulted for full details.

An updated corrosion abatement program was issued as part of the February 1990 report, “Aloha Stadium Master Plan Update,” prepared by Pacific Planning and Engineering (PPE). The updated program was based on the 1987 program by SSFM, and included an evaluation of various construction phasing schemes for implementation for the work while minimizing disruption on stadium operations and events. The scope of the identified necessary work was extended to include additional necessary items not identified in the prior report from 1987.

The updated 1990 plan also outlines specific recommendations for an on-going maintenance program for the corrosion protection systems. Among its components, the recommended maintenance program includes: an annual inspection by an outside consultant; major localized maintenance-type repairs to the high performance paint systems every 2 years; apply maintenance coating of waterproofing membrane throughout the entire stadium every 5 years; and complete recoating of the high performance paint system throughout the stadium every 10 years. The 1990 PPE report should be consulted for full details.

As reported in “Final Report and Structural Certification,” Volume 1 of 14, October 1995, by Robert Englekirk Consulting Structural Engineers, Inc. (also identified as Robert Englekirk, Inc., or REI), the corrosion abatement program reached substantial completion in 1995 with the completion of new spiral walkway ramps to replace the existing spiral ramps. The intent of the work by REI was to assess the structural safety of the stadium, taking into account both the repairs that were implemented and also any deteriorated conditions in the weathering structural steel that had not been repaired. With certain stipulations, REI concluded that “the current structural condition of the Aloha Stadium [is] structurally acceptable.” Two of these stipulations are notable: their structural certification did not include any wind load analysis of the seating stands, and so “The certification requires that the stadium [in its entirety] be closed during hurricane or other similar high-wind conditions;” and that the certification may be invalidated “if a regular maintenance program is not implemented as required...” The 1995 structural certification is described in further detail in Section D, below.

Section B - Overview of Planning Study 2005

B.1. Prior Planning Studies and Related Reports

The following are prior Aloha Stadium planning studies that were made available to us for our review:

- “Long Range Master Plan for Aloha Stadium,” Final Report, February 1984, SRI International, Menlo Park, California.
- “Aloha Stadium Master Plan Update,” February 1990, Pacific Planning and Engineering, Honolulu, Hawaii.

While these prior planning studies provide valuable background information, the 2005 planning study is essentially an independent undertaking. This is because much of the information contained in these prior planning studies is outdated. The physical condition of the stadium has changed since 1990, as have the economic circumstances of sports facilities in general, the State

of Hawaii, and that of the stadium itself. Where we have relied upon information from a prior study, we have taken efforts to verify that the prior information remains appropriate.

B.2. Aloha Stadium Planning Study 2005

The requirements for the 2005 planning study were established in the RFQ issued by DAGS on 20 April 2005 (DAGS Job No. 12-10-0374). The general purpose for the study is to assist the State of Hawaii in the development of a long-range plan for the future of Aloha Stadium. In addition, the State intended to weigh the options of extending the useful life of the existing Aloha Stadium as compared to the cost of a new stadium.

The planning study project team (WJE, HOK Sport, PCL, BSG, and AHL) responded with a detailed qualifications package and proposal, which was accepted by the State. In compliance with the RFQ and our response package, the general components of the study given in this report include:

- Condition survey of architectural, structural and functional features (Part II)
- Evaluation of structural safety, based on an update of existing structural studies (Part III)
- Identification of needed capital improvements (repairs, maintenance, and modifications) for a projected useful life of 20 years (Part II), including estimating of costs for the needed capital improvements (Part IV)
- Conceptual options for enhancement of the existing Aloha Stadium (Part V), including estimated construction costs and revenues of enhancement opportunities (Part VII)
- Stadium replacement conceptual options (Part VI), including estimated construction costs and debt service (Part VII)
- Financial analyses, including revenue assessments and comparative analysis of various options (Part VII)

Section C - Condition Survey

The study team collected information on Aloha Stadium and its site primarily through a series of visual inspections and, secondarily, through review of previous studies and documents and interviews of stadium operations personnel. Site visits were conducted by WJE, HOK Sport, AHL, PCL, and other study team members throughout the months of July, August and September 2005. Observation of the moveable stand reconfiguration process occurred in late July. The study team's collective observations, related comments and recommended actions are detailed in Part II – Condition Survey. For each of the stadium's twenty component categories, the recommended action items that have cost implications are identified and their approximate estimated costs are accounted for in Part IV – Capital Improvement Schedule.

The existing conditions assessment revealed several major elements of the stadium and site that have exhausted their useful life. The primary items that need the most immediate attention are:

- Corrosion protection systems for exposed steel elements are overdue for major maintenance throughout the stadium. These systems are in need of immediate repair to avert recurrence of serious structural damage.
- The curved pedestrian bridges suffer from excessive deflections due to pedestrian loading. Preliminary structural analyses to determine the significance of these deflections indicate overstresses on the order of 20% to 30% when evaluated to building code standards. The deflections and overstress should be immediately addressed.
- Entire main roof canopy metal deck is in need of replacement. Serious localized deterioration is evident. Temporary stabilization and spot repair at local damage is warranted until replacement occurs.
- Waterproofing membrane for seating bowl and concourses is in need of immediate replacement to reduce water damage into occupied areas below and to prevent corrosion of structural elements.
- Seating needs replacement throughout the entire stadium seating bowl.
- Scoreboard cooling system is undersized and needs to be replaced to maintain functionality of scoreboard.
- Piping insulation and other water damaged finishes at the event level, primarily in the locker rooms, need replacement.

There are numerous additional items that need attention to protect public safety and, where feasible, address non-compliant code conditions and avert escalating maintenance costs. The more important of these additional items are:

- Moveable stand transport system needs rejuvenation if baseball events are to continue to be hosted in the stadium.
- Additional toilets are needed to meet current code requirements and stadium design "best practices." Women's toilets are currently severely under serviced.
- The concrete-and-metal deck at the upper and lower concourses is severely deteriorated at numerous areas throughout the stadium. Localized repairs or replacement are needed at these deteriorated areas.
- Guardrails need to be raised in numerous locations to meet current code requirements and provide a safer environment. Most obvious deficiencies are open stairs connecting loge level to the upper concourse and bowl rails in front of aisles. Additional stiffening of bowl and concourse guardrails is also recommended to address the public's negative safety perception regarding structural safety/stability.

- Passenger elevators do not exist and should be added to provide access to all levels for disabled patrons to comply with current ADA provisions and, secondarily, to better accommodate the elderly.
- The asphalt parking lot is primarily original paving with extensive cracking. It needs resurfacing to avoid further deterioration leading to more expensive future repairs or total replacement.
- The scoreboard is old technology with hard-to-find parts. A new scoreboard would address maintenance problems by employing modern technology, enhance the game day experience, and potentially attract increased advertising revenues.
- The field lighting and its associated transformers and lighting control system is nearing its useful life and is experiencing operational difficulties.
- The fire alarm system should to be upgraded to meet current life safety and ADA requirements.
- Parking lot lighting transformers are experiencing operational difficulties and are in need of replacement.

Our condition survey observations and associated recommendations are described in detail in Part II – Condition Survey.

Section D - Structural Safety

The need for a structural safety evaluation of Aloha Stadium arose because of the corrosion problems that developed with the weathering structural steel. Upon substantial completion of the corrosion abatement program in 1994, the State commissioned a structural engineering consultant to prepare a final report on the abatement program, including a statement regarding the then-current structural condition of Aloha Stadium. This effort is documented in the October 1995 report “Final Report and Structural Certification,” 14 volumes, by Robert Englekirk Consulting Structural Engineers, Inc. (also identified in their report as Robert Englekirk, Inc., or REI), Honolulu, Hawaii.

In accordance with the DAGS RFQ, the structural safety review for the 2005 Aloha Stadium Planning Study was to provide an “update based on existing studies.” On this basis, therefore, the 2005 update is based on the structural condition survey as documented in Part II and a review of the 1995 REI structural certification as documented in Part III. The following is a summary of the key findings of the 2005 structural safety update performed by WJE. Complete details about the 2005 structural safety update can be found in Part III.

1. The study team has preliminarily identified the curved pedestrian bridges to be overstressed in the range of 20 to 30 percent when exposed to the full live load as

prescribed by current building code requirements. Overstress of this magnitude is indicative of a reduced level of safety and is typically not acceptable. It should be addressed immediately. Further analysis should be immediately undertaken to confirm this preliminary finding regarding the curved pedestrian bridges. Based upon the results of the further analysis, the need for temporary stabilization, if any, can be established.

2. The metal deck that forms a part of the cantilevered roof structure over the stadium seating stands has corroded through at limited, localized areas. The structural fasteners that secure the deck to the supporting structure have fractured in some areas due to corrosion. We recommend that the State of Hawaii immediately undertake a more detailed analysis of these conditions to determine the current extent of corrosion-related damage. We further recommend that appropriate repairs, both temporary stabilization, if needed, and a long-term remedy, be designed and subsequently implemented on the basis of the more detailed study.
3. It was found that the structural steel elements are no longer in conformance with the assumptions used for the 1995 REI structural certification. This is because the protective coating systems on the weathering and galvanized structural steel are in need of necessary maintenance. Furthermore, corrosion has damaged the metal deck and fasteners of the high roof over the seating stands. Maintenance of the protective coating systems and maintenance of the structure itself are clear prerequisites of the 1995 REI structural certification (1995 REI report, Volume 1 of 14, page 24).
4. The structural certification performed by REI in 1995 did not examine wind loads on the structure. Therefore, the structural safety of Aloha Stadium under wind loading is unknown. It is the professional opinion of WJE that this exclusion is unusual, particularly for a public structure that is as prominent as the Aloha Stadium. It is our recommendation that the State commence appropriate structural engineering studies to establish the performance of the stadium under wind loads.
5. Protective coating systems on weathering steel and on galvanized metals are in need of maintenance throughout the entire stadium. Limited corrosion has resumed on structural elements at locations throughout the entire stadium. Corrosion has resumed primarily due to the deferring of necessary maintenance, and in part due to identified deficiencies in the application of the existing coating systems. We recommend that the State immediately commence a detailed coating study of the existing coating systems to determine both detailed existing conditions and also the extent of deficiencies. A detailed condition survey is a necessary prerequisite to the design of any coating system reapplication. Subsequently, the State should commence to prepare construction

documents for repair and maintenance of the coatings system throughout the entire stadium.

Section E - Capital Improvements

The study team performed a needs assessment based on the stadium and its site condition survey, interviews and data research. Recommended needed improvements to address existing deficiencies, nonconforming code conditions and extend the useful life of the stadium for twenty additional years are itemized in the Capital Improvement Schedule, developed by PCL with input from WJE and HOK Sport, contained in Part IV. The improvements identified are intended to protect the value of the State's property by preserving its condition and where feasible, bring nonconforming elements up to current code requirements to improve public safety, operations and accessibility by disabled patrons. Each item is ranked as a high, medium or low priority based on weighing structural and safety concerns first and protection of property second while factoring in its state of deterioration.

The approximate initial repair and replacement cost for each item is quantified in the Capital Improvement Schedule as well as the approximate reoccurring repair and replacement costs for a twenty year period. All costs are based on October 2005 dollars and include a 25% soft cost component to cover design fees, testing and inspections during construction, state administrative costs, and limited contingencies. It should be noted that these costs are approximate due to the limited scope of this study and the unknown aspects inherent in renovating a more than 30 year old facility.

The identified costs assume the most cost effective approach is employed; that being commencing as early as possible with one construction contract to be authorized and implemented over a maximum three year period during football offseasons. The figures do not include cost escalation beyond October 2005, increased costs due to accelerated deterioration, unforeseen conditions, unknown conditions, and other limitations.

The useful life of Aloha Stadium can be extended twenty to thirty years if the identified capital improvements are implemented in the near future and a systematic, cyclic capital improvement program is adhered to throughout its remaining life. The useful life of the superstructure itself could be indefinite if properly maintained. Nonstructural items will need periodic significant maintenance or replacement depending on the individual lifespan of each element.

The anticipated cost for the initial improvements needed is \$99.2M with an additional \$115.4M anticipated to be expended for ongoing maintenance over a twenty year period. These necessary cyclical repairs and replacements are listed along with their associated costs by the specific years

they are anticipated to be incurred in Table I-2 and are discussed in greater detail throughout Sections II and IV. The present value (October 2005 dollars) for these ongoing maintenance costs is approximately \$57.2M assuming a 6.0% discount rate.

Section F - Stadium Enhancements

This portion of the study, reported in Parts V and VII, explores various modifications that can be made to the stadium to enhance the game day experience and provide increased revenue streams. The study determined that some enhancements are potentially feasible and would improve the use and image of the stadium. All of the options included in the study are predicated on permanently fixing the moveable stands into the football configuration, thereby eliminating baseball from the event schedule. From a design opportunity perspective, limitations on the existing transport system used to move the seating stands prevents construction of any additional structural area to support enhancements. This is because load capacity limitations on the existing transport system cannot accommodate any added weight of structure. Elimination of the need to reconfigure the stadium allows consideration of various enhancement options that infill the corners of the football-configured stadium, thereby also replacing the problematic curved pedestrian bridges. The addition of general admission “party decks,” premium seating offerings, and associated upscale amenities along the sidelines and open corners also becomes a possibility, as do conversion of the existing baseball pressbox and dugouts.

From a current financial use perspective, baseball events make up close to half of the events held throughout the year, yet they only attract a very small percentage of the annual attendance (1.4% or 6,650 out of 490,800 attendance). The direct cost to move the stands each year exceeds the annual revenue generated by hosting baseball events without taking into account the unrecovered operating expenses necessary to host baseball events. Additionally, if permanently fixed in football configuration, necessary transport system replacement costs would be avoided and the problems associated with the curved bridges would be more easily resolved. Some costs would still be incurred to structurally secure the seating sections into place, decommission the transport system, and correct the bridge problems.

HOK Sport developed several potential enhancement options for consideration. Each option is briefly described below, with accompanying diagrams in Part V.

The estimated conceptual cost for each potential enhancement option was developed by PCL and incorporated into the revenue enhancement overview analysis by BSG, contained in Part VII. The cost figures are based on October 2005 dollars and include a 25% soft cost component, similar to the needed remedial improvements discussed in Part IV. Some options are anticipated

to be more financially viable than others. It is important to note that the options could be implemented in phases to coincide with market demand.

Given the limited amount of due diligence that has been completed in connection with the various options, the analysis includes “breakeven” price points relative to estimated costs to assess the potential financial viability of certain revenue enhancement options. The breakeven price provides a preliminary indication as to the price required to pay for the improvements, assuming the improvements are financed with taxable bonds amortized over a 20 year period. The breakeven price is presented on a per event basis as a range, subject to the State’s debt coverage requirements.

Each option is listed below with the options that appear most financially viable highlighted in bold (Options 3A, 4A, 5, and 6B). Preliminary findings suggest the highlighted options would potentially generate sufficient new incremental revenues to pay for its cost with possible surpluses. In all cases, further market research should be conducted prior to moving forward with actual development.

- Option 1 Dugout Suite Conversion - Relatively inexpensive to implement, but sightline and location concerns should be studied in greater detail.
Estimated Project Cost: \$350,000
Annual Debt Service: \$30,500
Breakeven Ticket Premium range required: \$35 to \$69

- Option 2 Main Concourse Corner Party Deck Addition – While not anticipated to be financially viable, consideration of enhanced game day environment for general admission spectators may warrant further study. Ticket premium is only for 24 added loge boxes (96 seats) and does not assume any increase in general seating revenues to help fund project cost.
Estimated Project Cost: \$7,100,000
Annual Debt Service: \$619,000
Breakeven Ticket Premium range required: \$806 to \$1,612

- Option 3A** **Lower Bowl Fifty Yardline Suite Addition** – Demonstrates a common approach to readily achieve incremental revenue increase. Minimal quantity is presumed to be desired in the market place.
Estimated Project Cost: \$1,750,000
Annual Debt Service: \$153,000
Breakeven Ticket Premium range required: \$111 to \$179

- Option 3B Lower Bowl West Sideline Suite Addition – Only seen feasible as a subsequent phase or in addition to Option 3A if market demand is demonstrated.
Estimated Project Cost: \$2,750,000
Annual Debt Service: \$240,000
Breakeven Ticket Premium range required: \$133 to \$218

- Option 4A** **Sideline Club Lounge and Amenities Addition** – Adds traditional club amenity package to existing sideline loge seats increasing their value.
Estimated Project Cost: \$4,000,000
Annual Debt Service: \$349,000

Breakeven Ticket Premium range required: \$27 to \$53

- Option 4B Sideline Loge Box Seat Conversion with Club Lounge and Amenities – Similar to 4A, except replacement of loge seats with loge box seating tier is financially unfeasible and not recommended.
Estimated Project Cost: \$4,600,000
Annual Debt Service: \$401,000
Breakeven Ticket Premium range required: \$311 to \$454
- Option 5** South Endzone Baseball Press Box Super Suite Conversion – Permanently converts baseball press box to a super suite with upgraded finishes and amenities to enhance how it is used currently for the NFL Pro Bowl. Low cost suggests this is a financially viable option.
Estimated Project Cost: \$325,000
Annual Debt Service: \$28,300
Breakeven Ticket Premium range required: \$12 to \$23
- Option 6A Loge Level Corner Club Addition – Added lounge area is not sufficient in size to serve existing loge level to spread cost burden across entire loge level. Cost is spread over sideline club seats only (in addition to added club seats and general seating in corners).
Estimated Project Cost: \$14,000,000
Annual Debt Service: \$1,221,000
Breakeven Ticket Premium range required: \$58 to \$116
- Option 6B** Loge Level Corner & Sideline Clubs Addition, Combines 4A & 6A – By combining both options, sufficient lounge area and amenities are added to justify spreading the cost burden across entire loge level, thus making this option financially favorable.
Estimated Project Cost: \$18,000,000
Annual Debt Service: \$1,569,000
Breakeven Ticket Premium range required: \$52 to \$104
- Option 7 Upper Concourse Corner Suites Addition – Not anticipated to be a highly desirable location for premium seating nor financially feasible. Options 3A and 3B offer superior locations at a lower cost.
Estimated Project Cost: \$4,250,000
Annual Debt Service: \$371,000
Breakeven Ticket Premium range required: \$129 to \$257
- Option 8 Suite Tower Addition – Similar approach as that used in numerous other collegiate stadiums, but due to lower premium seating market demand in Honolulu, is not anticipated to be financially viable.
Estimated Project Cost: \$9,000,000
Annual Debt Service: \$785,000
Breakeven Ticket Premium range required: \$241 to \$546

Section G - New Stadium Option

A new stadium option was evaluated to compare its initial and 20 year maintenance program costs against the necessary initial repairs/improvements and 20 year maintenance program costs for the existing stadium. HOK Sport developed concepts for a potential replacement stadium, described briefly below, with accompanying diagrams in Part VI. Although a detailed revenue

study was not conducted, a high-level financial analysis comparing the new stadium option against the capital improvement of the existing stadium was performed by BSG and presented in Part VII. Potential enhancements to Aloha Stadium were not factored into the cost comparison because they are assumed to be self funded through their associated increased revenues.

A critical study assumption is the use of the existing site to build a replacement stadium. This assumption was made after determining that it is feasible to construct a new stadium on the site while maintaining the operation of Aloha Stadium. The weekly swap meet could also continue utilizing a different event layout. This approach reduces the number of variables factored into the comparison and results in significant reductions in cost and other challenges associated with the acquisition and development of a large parcel for an unknown site in or near Honolulu. Two potential new stadium locations in the present site are identified with Option One being the most favorable due to its central location for access to parking and better construction sequencing accommodation.

For purposes of this study, a new stadium was assumed to consist of 50,000 total seats, 20 private suites and 2,500 club seats with associated premium lounge space. The type of construction is assumed to be of durable, longer lasting materials and building systems than the existing stadium and other recently built, but smaller collegiate stadiums. The estimated costs for demolition of the existing Aloha Stadium and for parking replacement are included in the following anticipated cost range for a new stadium. The cost figures include a 20% soft cost component, 5% less than the renovation options. The costs also include 12% escalation over the next two years, anticipating start of design in summer 2006, start of construction in fall 2007, and occupancy in fall 2009. The range of costs is as follows:

Low range total project cost	\$225,000,000
Mid range total project cost	\$252,500,000
High range total project cost	\$280,000,000

Table I-3 below illustrates an estimate of the present dollar value comparison of the initial Aloha Stadium capital improvement program cost with the mid range cost of a new stadium and their respective 20 year maintenance costs.

Table I-3 – Renovation versus New Stadium Financial Comparison

	<u>Aloha Stadium</u>	<u>New Stadium</u>	<u>Difference</u>
Estimated Cost	\$99,200,000	\$252,500,000	\$153,300,000
Present Value of Maintenance	\$57,200,00	\$25,800,000	(\$31,400,000)
Estimated Total Cost	\$156,400,000	\$278,300,000	\$121,900,000
Financing Assumptions:			
20 yr, 5.0% tax-exempt interest			
Estimated Annual Debt service	\$12,549,941	\$22,331,512	\$9,781,571
Incremental Revenue Required to Fund Difference			\$9,781,571

On site parking would be reduced by about 1,500 spaces during the two football seasons played while the new stadium is under construction. This parking would be replaced after the demolition of Aloha Stadium and could potentially be available at the time of opening of the new stadium. Use of nearby underutilized state owned land for development of new parking should be explored to mitigate the loss of parking during construction and provide added parking for the public and additional revenues following construction. This parking possibility should be explored with or without the development of a new stadium. Key milestones assumptions are:

Authorize new stadium design to proceed	July 1, 2006
Begin new stadium construction	August 1, 2007
Start demolition of Aloha Stadium	Feb. 15, 2009
Complete new stadium construction	August 1, 2009

As reported in Part VII and summarized above, it was concluded that from a strictly financial perspective, the incremental revenues expected to be generated by a new stadium compared to the existing stadium are unlikely to support the incremental costs of a new stadium versus the capital improvement program for Aloha Stadium, thus making the new stadium alternative financially unfavorable.

Section H - Recommendations

The useful life of Aloha Stadium can be preserved and extended substantially if the necessary remedial measures are implemented over the course of its immediate and long term future. It is recommended that all the repair and replacement items identified in Part IV be performed as soon as possible to prevent further deterioration and mitigate additional resulting costs. Due to the magnitude and integrated nature of the improvements, with the exception of a few lower cost and all the site items, is not feasible to phase individual improvements. Instead, it is substantially more efficient and cost effective to divide the stadium into three parts and incorporate all the improvements in the three parts in three phases. Working within State funding and football offseason time constraints, the following steps are recommended:

- Make policy decision to eliminate baseball events and lock the stadium into its football configuration. This will avoid approximately \$10M in transport system replacement costs.
- Beginning in July 2006, commence the design of repairs and the production of construction contract documents for the capital improvement items recommended for Year 1 (anticipated to be implemented over three years) in the Part IV - Capital Improvement Schedule. Consideration should be given to replacement of existing deteriorated components with more durable solutions. A prime example is the recommended replacement of the roof canopies with a fabric membrane or PCV single-

ply membrane on top of a new coated steel deck. Planning and design work is to include additional testing of corrosion protection coating conditions on steel throughout the stadium to more accurately document the level of surface preparation required to successfully recoat without expending unnecessary measures. Additional structural analysis of the existing stadium should be conducted to take into account current code provisions and design practices to ensure public safety and address public perception concerns. This analysis should include the curved pedestrian bridges, roof canopy condition and temporary stabilization, and wind loading.

- Select Construction Manager/General Contractor early in the design phase based on qualifications-based proposal to assist in the completion of the documents, primarily to optimize decision-making regarding constructability and scheduling issues that affect the contract documents.
- Complete contract documents by mid-December 2006 to obtain bids for all construction phases. Authorize Phase 1 construction only. Start Phase 1 in mid February 2007, immediately following the Pro Bowl and concluding in August prior to the start of the University of Hawaii football season. Phase 1 is anticipated to consist of all the improvements to be made in the East stands and the roof replacement for all stands.
- Implement Phase 2 improvements consisting of all the improvements to be made in the West stands during the 2008 football offseason. Site improvements could be divided between this phase and Phase 3.
- Implement Phase 3 improvements consisting of all the improvements to be made in the North and South stands during the 2009 football offseason. Site improvements could be started in a previous phase and completed in this phase.
- Plan for and fund future capital improvement program over the life of Aloha Stadium to allow maintenance to take place on a reoccurring basis. For example, assume that ten years after the first phase of improvements are completed, the exposed steel components in the east stands will need to be recoated, followed by those of the west stands the next year, and then those in the north and south stands the following year.

In addition to maintaining the status quo of Aloha Stadium, it is possible to enhance the game day experience for fans and increase revenues by modifying the existing stadium. The following recommendations apply to pursuing this potential.

- Make policy decision to eliminate baseball events and lock the stadium into its football configuration. This configuration is typically more appealing to other events such as concerts and will allow enhancements to be made that will potentially increase revenues and enhance the game day experience.

- Conduct a market/financial feasibility study in 2006 for selected enhancement options to more specifically determine their viability and revenue potentials.
- Commencing in 2007, further develop the design and documentation of selected enhancement options predicated on the market/feasibility analysis and stakeholder input.
- Prepare bid documents to incorporate the selected enhancement options into the 2008 and 2009 capital improvement program. Enhancements could be prioritized and phased depending on determined funding and feasibility conditions.

Aloha Stadium Planning Study Existing Conditions Observations		CIS Estimated																						
		2005 Dollars																						
		Priority	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025		
Description of Needed Capital Improvements			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
A Site																								
1	Replace parking lot trashcans	Medium	\$ 50,000				5,000					5,000					5,000					5,000	70,000	
2	Add safety enclosures for parking lot transformers	High	40,000																				40,000	
3	Painting of light poles in parking lots	Medium	200,000									200,000											400,000	
4	Resurface asphalt parking lots	Medium	8,700,000				250,000					8,700,000					500,000					8,700,000	26,850,000	
5	Painting of all directional signs in parking lots	High	100,000									50,000											150,000	
6	Painting of Parking lot entrance buildings	High	60,000									60,000											120,000	
7	Refurbish parking lot metal bollards	Medium	25,120									25,000											50,120	
8	Paint exterior concession stands	High	75,000									75,000											150,000	
9	Replace parking lot designation signs	High	100,000																				100,000	
10	Replace exterior way finding & prohibitive items signage	High	INC																				-	
11	Paint sign posts designating gate locations	High	20,000									20,000											40,000	
12	Enhanced vehicle intrusion protection at entry points	Medium	80,000																				80,000	
13	Clean and seal block walls at entry gates	High	75,000									75,000											150,000	
14	Paint light fixtures on posts designating gates	Medium	10,000									10,000											20,000	
15	Replace concourse trash can tops with "open" mouths	Medium	18,000				5,000					5,000					5,000					5,000	38,000	
16	Encase show power cables in conduit	Medium	16,250																				16,250	
Subtotal - Site			9,569,370	-	-	-	260,000	-	-	-	-	9,225,000	-	-	-	-	510,000	-	-	-	-	8,710,000	28,274,370	
B Playing Field																								
1	Review grooming & tray installation procedures with manufacturer	High	N/A																				-	
2	Monitor perimeter track & repair as required	Low	N/A																				-	
3	Replace turf system and track when deteriorated.	High							550,000								550,000						1,100,000	
Subtotal - Playing Field			-	-	-	-	-	-	550,000	-	-	-	-	-	-	-	550,000	-	-	-	-	-	1,100,000	
C Event Level																								
1	Add subroof above all finished locker room spaces occurring under bowl.	High	702,500				20,000					20,000					20,000					20,000	782,500	
2	Replace damaged flooring and finishes inc. painting in East locker rooms	High	280,600				140,300					280,600					140,300					280,600	1,122,400	
3	Replace finishes on a five year basis in main locker rooms	Medium	162,000				162,000					243,000					162,000					243,000	972,000	
4	Replace finishes on a five year basis in officials locker room	Medium	10,000				10,000					10,000					10,000					10,000	50,000	
5	Repaint office area surfaces on 5 yr. basis. Replace carpet on ten yr. basis	Medium	108,000				108,000					108,000					108,000					108,000	540,000	
Subtotal - Event Level			1,263,100	-	-	-	440,300	-	-	-	-	661,600	-	-	-	-	440,300	-	-	-	-	661,600	3,466,900	
D Seating Bowl																								
1	Reapply waterproofing membrane topping on all treads, risers and cross aisles	High	12,000,000				50,000			6,000,000			50,000				6,000,000					50,000	24,150,000	
2	Replace all seats and maintain seats in future	High	5,000,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	5,190,000
3	Recoat utilities and other nonstructural steel components	High	8,500,000									8,500,000											8,500,000	25,500,000
4	Replace dented steel deck soffit and recoat	Medium	50,000									50,000											50,000	150,000
5	Recoat steel rakers and steel deck in seating bowl	See "R" costs																					-	
6	Paint walls outside vomitories at cross aisles. Replace damaged panels.	High	300,000									300,000										300,000	900,000	
7	Repair floor drains in movable seating sections	High	100,000									50,000										50,000	200,000	
8	Recoat stair railings, correct heights and provide guardrail at open stairs	High	312,000									100,000										100,000	512,000	
9	Stiffen bowl front railings and recoat	Medium	149,500									25,000										25,000	199,500	
Subtotal - Seating Bowl			26,411,500	10,000	10,000	60,000	10,000	10,000	6,010,000	10,000	10,000	9,035,000	60,000	10,000	10,000	6,010,000	10,000	10,000	10,000	60,000	10,000	9,035,000	56,801,500	
E Roof Canopy																								
1	Upgrade to Membrane Roofing	High	1,010,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	1,010,000	2,110,000
2	Recoat all roof structural steel members, gutter and railings	See "R" costs																					-	
3	Replace all roof drains.	Medium	72,000																				72,000	
Subtotal - Roof Canopy			1,082,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	1,010,000	2,182,000
F Concourses																								
1	Repair cracks in concrete slab @ North/South Fixed Areas	Medium	101,250							101,250							101,250						303,750	
2	Repaint vomitory walls metal decking	Medium	300,000									300,000										300,000	900,000	
3	Add intermediate rails/cables at non-code conforming guardrails	High	100,000																				100,000	
4	Replace existing signs with new signage and wayfinding program	Medium	750,000									250,000										250,000	1,250,000	
5	Repair water fountains missing buttons	Medium	10,000																				10,000	
6	Replace main concourse information booth and other deteriorated counters	Medium	10,000									10,000											20,000	
7	Replace missing usher phones	Low	20,000																				20,000	
8	Reapply waterproofing membrane topping on all elevated structural deck concourses	High	8,750,000							2,887,500							2,887,500						14,525,000	
9	Correct varying riser height at upper concourse stairs	Medium	80,000																				80,000	
10	Stiffen bridge guardrails with additional secondary steel members	Medium	184,000																				184,000	
11	Repair, clean and maintain fire extinguisher cabinets	High	10,000				10,000					10,000					10,000					10,000	50,000	
12	Clean and maintain light fixtures	Medium	37,500				37,500					37,500					37,500					37,500	187,500	
13	Add 50 self illuminated exit signs or emergency lights at existing exit signs	High	50,000																				50,000	
14	Remove asphalt topping above offices, replace with concrete and elastomeric		350,000								175,000						175,000						700,000	
Subtotal - Concourses			10,752,750	-	-	-	47,500	-	3,163,750	-	-	607,500	-	-	-	3,201,250	10,000	-	-	-	-	597,500	18,380,250	
G Toilets																								
1	Add women's toilet fixtures - On Existing Concourses	High	810,000									150,000										150,000	1,110,000	
1a	Add women's toilet fixtures - Lower Concourse Level - New Enclosure	High	660,000									150,000										150,000	960,000	
2	Replace damaged mirrors in restrooms	Medium	7,500																				7,500	
Subtotal - Toilets			1,477,500	-	-	-	-	-	-	-	-	300,000	-	-	-	-	-	-	-	-	-	300,000	2,077,500	

Description of Needed Capital Improvements		Priority	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
H Concessions/Vendor Commissaries																							-
1	Repaint exterior of on grade concessions stands that face the parking lots	High	INC									150,000										150,000	300,000
2	Lower drain in concession stand next to Gate 1	Low	5,000																				5,000
Subtotal - Concessions/Vendor Commissaries			5,000	-	-	-	-	-	-	-	-	150,000	-	-	-	-	-	-	-	-	-	150,000	305,000
I Ramps																							-
1	Repair waterproofing membrane topping in damaged locations. Recoat in future years.	High	20,000				1,463,220							1,463,220							4,434,000		7,380,440
2	Repaint steel surfaces as needed on a regular basis.		See "R" costs																				-
Subtotal - Ramps			20,000	-	-	-	1,463,220	-	-	-	-	-	-	1,463,220	-	-	-	-	-	-	4,434,000	-	7,380,440
J Stairs																							-
1	Recoat main stairs railings and risers. Upgrade lighting and graphics.	Medium	520,000									250,000										270,000	1,040,000
2	Apply safety striping to low clearance beams at main stairs	Medium	INC																				-
3	Lengthen handrails and close excess guardrail openings to meet code.	Medium	107,000																				107,000
4	Replace loge level stair side rails with code compliant guardrails	High	150,000																				150,000
Subtotal - Stairs			777,000	-	-	-	-	-	-	-	-	250,000	-	-	-	-	-	-	-	-	-	270,000	1,297,000
K Elevators																							-
1	Add one bank of two passenger elevators to all levels at each quadrant.	Medium	2,000,000									50,000										50,000	2,100,000
Subtotal - Elevators			2,000,000	-	-	-	-	-	-	-	-	50,000	-	-	-	-	-	-	-	-	-	50,000	2,100,000
L Escalators																							-
1	Add escalator canopies at both escalators	Medium	50,000									50,000										20,000	120,000
Subtotal - Escalators			50,000	-	-	-	-	-	-	-	-	50,000	-	-	-	-	-	-	-	-	-	20,000	120,000
M Press Boxes																							-
1	Repaint painted surfaces on 5 yr. basis. Replace carpet on ten yr. basis	Medium	50,000				25,000					50,000					25,000					50,000	200,000
2	Vertical Circulation in Press Box		In Elevators Above																				-
3	Additional Work/Food Service Area (add'l structure req'd)	Medium	135,000									5,000										5,000	145,000
4	Additional Press Toilets (add'l structure req'd)	Medium	150,000									5,000										5,000	160,000
Subtotal - Press Boxes			335,000	-	-	-	25,000	-	-	-	-	60,000	-	-	-	-	25,000	-	-	-	-	60,000	505,000
N Scoreboard/Video/Audio																							-
1	Replace 150 speaker enclosures on loge level	Medium	90,000									40,000										40,000	170,000
2	Replace video board, scoreboard and controls	Medium	1,500,000									100,000					1,500,000					50,000	3,150,000
Subtotal - Scoreboard/Video/Audio			1,590,000	-	-	-	-	-	-	-	-	140,000	-	-	-	-	1,500,000	-	-	-	-	90,000	3,320,000
O ADA Accommodations																							-
1	Add additional ADA seating areas at loge level (Requires Elevators)	High	127,500																				127,500
2	Prioritize accommodations to provide disabled access, elevators, ramps, etc.	High	-																				-
3	Remodel ticket windows between Gates 1 & 2	High	5,000																				5,000
4	Remodel ticket windows at main box office	High	7,500																				7,500
Subtotal - ADA Accommodations			140,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140,000
P Mechanical/Plumbing/Fire Protection																							-
1 INSULATION																							-
1a	Team locker rooms - piping only	High	256,500									50,000										50,000	356,500
1b	Team Management Office & Locker - piping only	High	45,000																				45,000
1c	Stadium Management & Ticket Sales - piping only	High	89,250																				89,250
1d	Mechanical Equipment room - piping, pumps, ducts and packaged AC unit	High	79,500																				79,500
1e	Sound booth @ Press Box area - ducts only	High	4,200																				4,200
2 HVAC SYSTEMS																							-
2a	Jumbotron AC	High	270,000																				270,000
2b	First Aid Room AC	Medium	37,500				37,500					37,500					37,500					37,500	187,500
2c	Baseball Announcement Room AC	Medium	15,000				15,000					15,000					15,000					15,000	75,000
2d	North End Zone Maintenance Room AC	High	45,000				45,000					45,000					45,000					45,000	225,000
3 PLUMBING SYSTEMS																							-
3a	Mens and women Locker Rooms	High	21,900				21,900					21,900					21,900					21,900	109,500
3b	Water Closet Maintenance	High	41,250				41,250					41,250					41,250					41,250	206,250
3c	Storm Drain Piping	Medium	-				-					-					-					-	-
4 FIRE PROTECTION SYSTEMS																							-
4a	Sprinkler Heads	High	67,500				5,000					5,000					5,000					5,000	87,500
Subtotal - M & P			972,600	-	-	-	165,650	-	-	-	-	215,650	-	-	-	-	165,650	-	-	-	-	215,650	1,735,200
Q Electrical																							-
1	Field lights	Medium	1,375,000																			250,000	1,625,000
2	Field light transformer replacement	High	1,250,000																				1,250,000
3	Fire Alarm Upgrade	High	937,500																				937,500
4	Sports Event Lighting Controls	High	118,750																				118,750
5	Electrical Integrity Study	High	25,000											20,000									45,000
6	Electrical power distribution for concessions stands	Medium	125,000				125,000					125,000					125,000					125,000	625,000
7	Parking lot lighting transformer replacement	High	625,000																				625,000
8																							-
Subtotal - Electrical			4,456,250	-	-	-	125,000	-	-	-	-	125,000	-	20,000	-	-	125,000	-	-	-	-	375,000	5,226,250

Description of Needed Capital Improvements		Priority	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
R	Protective Painting and Corrosion Mitigation on Existing Steel																							
1	Paint System P0 (Powerwash)	High	1,100,000				2,200,000			2,200,000		4,400,000			2,200,000			2,200,000					4,400,000	18,700,000
2	Paint System P1 (Powerwash and Top Coat)	High	5,500,000									5,500,000											5,500,000	16,500,000
3	Paint System P1+ (Powerwash, Local Repairs and Topcoat)	High	1,300,000									1,300,000											1,300,000	3,900,000
4	Paint System P2 (Powerwash, Local Repairs, three coat system)	High	800,000									520,000											520,000	1,840,000
5	Paint System P3 (Powerwash, Sandblasting, and Three Coat)	High	4,100,000									2,665,000											2,665,000	9,430,000
6	Paint System P4 (Powerwash, Sandblast, Three Coat with Structural Repairs)	High	750,000									487,500											487,500	1,725,000
6a	Apply protective coatings to one side of new metal roof deck, all stands	High	700,000									700,000											700,000	2,100,000
7	Moveable stands: mitigate standing water at ground level: concrete pavement under moveable stands (estimated \$900,000 in 1989 dollars)	High	1,700,000									100,000											100,000	1,900,000
7a	Moveable stands: mitigate standing water at ground level: Drainage improvements at all newly-paved areas beneath moveable stands	High	100,000																					100,000
8	Pivot pins: paint all pins	High	-																					-
9	Moveable Stands: Remove/ replace epoxy filler in lower truss nodes	High	144,000									144,000											144,000	432,000
9a	Moveable Stands: Add Weep Holes at Base of Raker to Drain Water	High	59,640																					59,640
10	Moveable Stands: Weld Stiffeners to Corroded Seat Plate Areas in Lower Field Seating	High	200,000																					200,000
11	Moveable Stands: Install Sealant to Seat Plate Joint in Lower Field Seating	High	116,000									116,000											116,000	348,000
12	Moveable Stands: Remove/Replace Delaminated Epoxy Filler in Exterior Bracing Hubs	High	128,000									128,000											128,000	384,000
13	Fixed Stands: Remove/Replace Delaminated Epoxy Filler in Exterior Bracing Hubs	High	88,000									88,000											88,000	264,000
Subtotal - Protective Coatings			-	16,785,640	-	-	-	2,200,000	-	-	2,200,000	-	16,148,500	-	-	2,200,000	-	-	2,200,000	-	-	-	16,148,500	57,882,640
S	Structural Repairs																							
1	Replace Selected Framing Members at high roof, all stands	High	822,000																					822,000
2	Replace metal roof deck at high roof, all stands	High	8,585,000																				200,000	8,785,000
3	Not used		-																					-
4	Other: Replace metal deck in lower concourse	High	195,000																					195,000
5	Other: Replace metal deck in loge area (localized area behind football press box)	High	50,000																					50,000
6	Other: Repairs to steel framing for lighting corridor (fixed and moveable stands)	High	150,000																					150,000
7	Other: Stairwells in Moveable Stands: Replace tread & riser plates that are damaged by corrosion and pack rust	High	125,000																					125,000
8	Stiffening of Space Frame Diagonal members	High	750,000																					750,000
9	Curved pedestrian bridges: stiffening and strengthening at all bridges (use arbitrary allowance of \$150,000 each bridge in 2005 dollars)	High	1,200,000																					1,200,000
Subtotal - Structural Repairs			-	11,877,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200,000	12,077,000
T	Transport System Improvements																							
1	Moveable stands: Major maintenance to air transport system mechanics (use previous estimate, which was \$3,760,000 in 1989 dollars)	High	7,000,000				100,000					100,000					100,000						100,000	7,400,000
2	Other: Concrete repairs and strengthening at pivot pins	High	20,000																					20,000
3	Curved bridges: new vertical lift hoist system due to increased bridge weight after repairs (previously estimated at \$850,000 in 1989 dollars)	High	1,600,000				20,000					20,000					20,000						20,000	1,680,000
4	Curved bridges: new lateral transport system due to increased bridge weight after repairs (previously estimated at \$550,000 in 1989 dollars)	High	1,000,000				20,000					20,000					20,000						20,000	1,080,000
Subtotal - Transport System Improvements			-	9,620,000	-	-	-	140,000	-	-	-	140,000	-	-	-	-	140,000	-	-	-	-	-	140,000	10,180,000
Grand Total for Aloha Stadium - 2005 Current Dollars			-	99,184,710	15,000	15,000	65,000	4,881,670	15,000	9,728,750	2,215,000	15,000	37,163,250	65,000	1,498,220	2,215,000	9,216,250	3,480,950	2,215,000	15,000	65,000	4,449,000	38,033,250	214,551,050
Based on information presently available and furnished to PCL by the owner, architect and/or others and various assumptions have been made as to facts not yet known, this construction cost estimate has been prepared and furnished for the sole purpose of providing approximation of anticipated construction cost. This construction estimate should not, at this time, be relied upon as commitment that the contemplated project can or will be constructed for the estimated cost.																								