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OFC. OF ENVIRONMENTAL QUALITY CONTROL

UNIVERSITY OF HAWAII

VICE PRESIDENT FOR FINANCE AND OPERATIONS

May 26, 1993

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

Dear Mr. Choy:

Re: Negative Declaration for the University of Hawaii Food Service Facility

The University of Hawaii has reviewed the comments received during the 30-day public comment period which began on April 8, 1993. Based on our review, we have determined that this project will not have significant environmental effect and have issued a negative declaration. Please publish this notice in the June 8, 1993 OEQC Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the final EA. Please contact our consultant, Mr. Taeyong Kim of AM Partners, Inc., or myself if you have any questions.

Sincerely,

Ralph T. Horii, Jr.
Vice President for Finance and Operations

Enclosures

2444 DOLE STREET • BACHMAN HALL • HONOLULU, HAWAII 96822 • TEL (808) 956-8903 • FAX (808) 956-9212

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1993-06-08-OA-FEA - University of Hawaii Food Service

JUN - 8 1993

AM Partners, Inc.

University of Hawaii at Manoa

Food Service Facility

Final Environmental Assessment

May 1993

University of Hawaii at Manoa

Food Service Facility

Final Environmental Assessment

This document is prepared in accordance with: Chapter 343, Hawaii Revised Statutes; Title 11, Chapter 200, Department of Heath Administrative Rules; and Act 241, Session Laws of Hawaii.

Proposing Agency:
University of Hawaii, Board of Regents

Accepting Authority:
Governor, State of Hawaii

Responsible Official:

Ralph T. Horii, Jr.
Vice President for Finance and Operations

5/26/93
Date

Prepared by:
AM Partners, Inc.

May 1993

TABLE OF CONTENTS

APPENDICES

A. Soil Investigation - Soils International
B. Noise Study- Y. Ebisu & Associate
C. Archaeology- Department of Land and Natural Resources

LIST OF FIGURES

CHAPTER I
PROJECT SUMMARY

I. PROJECT SUMMARY

Project Name:	UH Food Service Facility
Applicant:	University of Hawaii Board of Regents
Accepting Authority:	*Governor, State of Hawaii*
Project Location:	University of Hawaii Manoa Campus Honolulu, Oahu, Hawaii
Tax Map Key:	1-2-8-23:3
Landowner:	University of Hawaii, Board of Regents
Gross Building Area:	13,863 square feet
Existing Use:	The project site, also known as University Park, presently consists of an open lawn with clusters of trees used as an open landscaped area.
State Land Use Designation:	Urban
Development Plan Designation:	The project site is designated as a public facility.
Zoning Designation:	Residential District (R-5)
Flood Zone Designation:	The project site is within Zone X an area determined to be outside of the 500 year flood plain.

Project Description:	The proposed project consists of a single story, 13,863 gross square foot food service facility. The structure will include a main kitchen, food court, cashier section, an enclosed dining area, a landscaped outdoor dining area, loading area, and driveway.
Summary of Impacts:	Short-term impacts will result from construction related activities, such as dust, noise, and traffic. However, these impacts will only last during the construction phase. Mitigation measures will be taken whenever possible to minimize these impacts. Food service operations in the area will be maintained during the construction period. Long-term environmental impacts resulting from the project are minimal in that the existing air quality, noise, and traffic conditions will remain unchanged. The loss of open space will be replaced by an active service oriented use which will benefit the University community. Wind tunnel effects caused by the new building are expected to be minimal due to the low height of the structure and the direction of the trade winds.

CHAPTER II
PROJECT DESCRIPTION

II. PROJECT DESCRIPTION

A. Technical Characteristics

The University of Hawaii Manoa campus needs a new snack bar to accommodate its students with more efficient food services and eating facilities. The existing Hamilton Snack Bar located Ewa (west) of Hamilton Library, presently serves university students, faculty and staff on the east upper campus from 6:30 am to 2 pm. The new expanded facility will enhance the east upper campus by providing the student population with a more integrated location, a higher seating capacity, greater variety of foods, improved dining areas, and more comfortable surroundings. The proposed facility will create a social gathering place as well as provide a relaxing respite for all users.

The proposed project consists of a new food service facility which will replace the existing Snack Bar. The new facility will be larger than the Hamilton Snack Bar which it is replacing to better serve the campus population. The existing Hamilton Snack Bar is planned for demolition to accommodate an expansion of Hamilton Library. The proposed UH Food Service Facility is planned to be constructed prior to the construction of the library extension. The loss of food service operations in the area during the construction period is not expected if construction of the Food Service Facility precedes the library expansion. The new replacement facility is expected to serve approximately 3,500 people per day.

The project site (TMK 1-2-8-23:3) is located in front of Manoa Valley, between Makiki Heights and Saint Louis Heights (Figure 1). Specifically, the site is situated on the University of Hawaii-Manoa Campus and is bounded by Moore and Henke Halls to the east, Maile Way to the north, Hamilton Library to the west, and McCarthy Mall to the south (Figures 2 and 3).

Figure 1: Vicinity Map
Source: U.S. Geological Survey (1983)

University of Hawaii Manoa - Food Service Facility

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March 1993

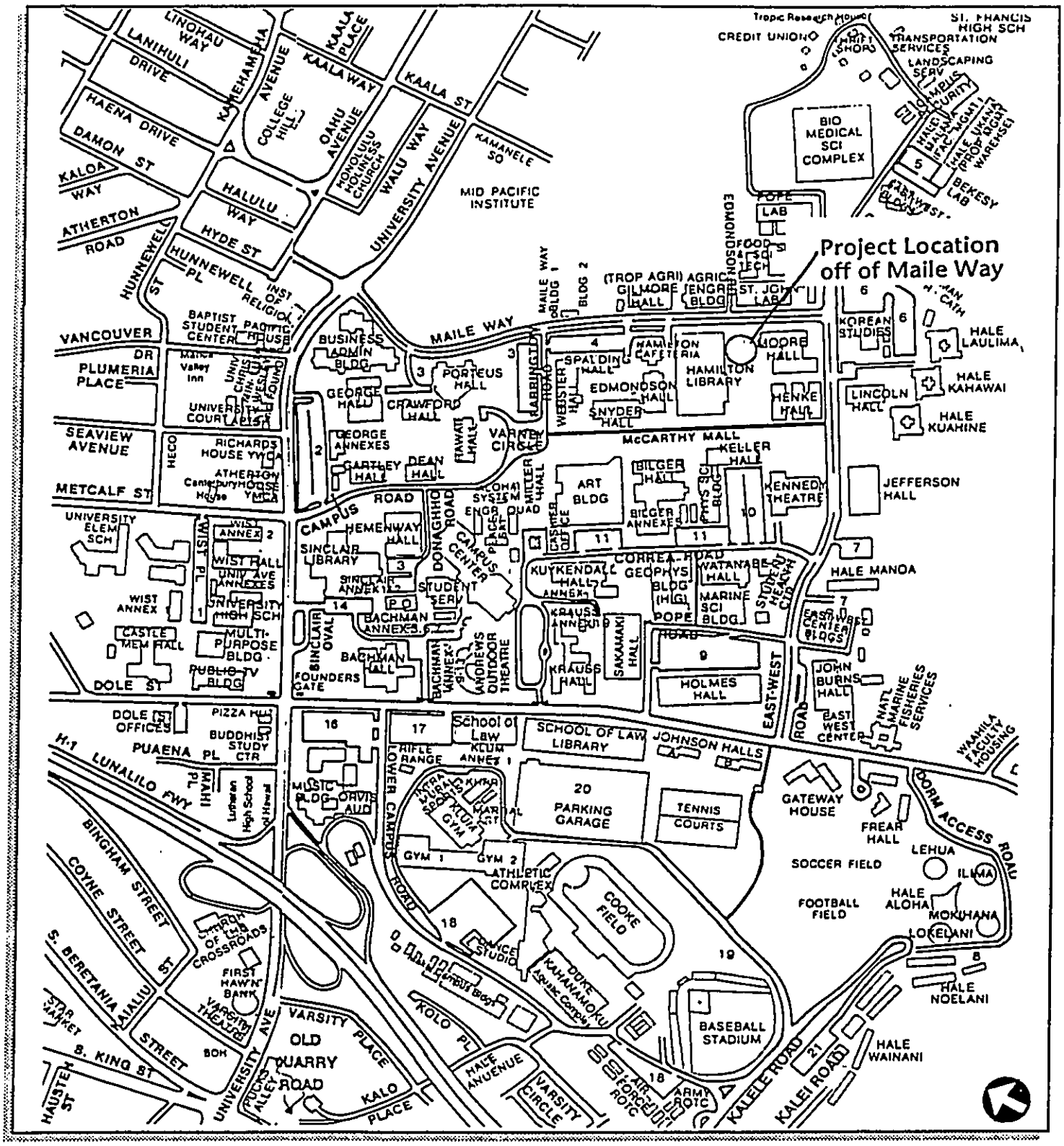

Figure 2: Project Location Map: University of Hawaii

Source: Bryan's Sectional Maps of Oahu (1992 edition)

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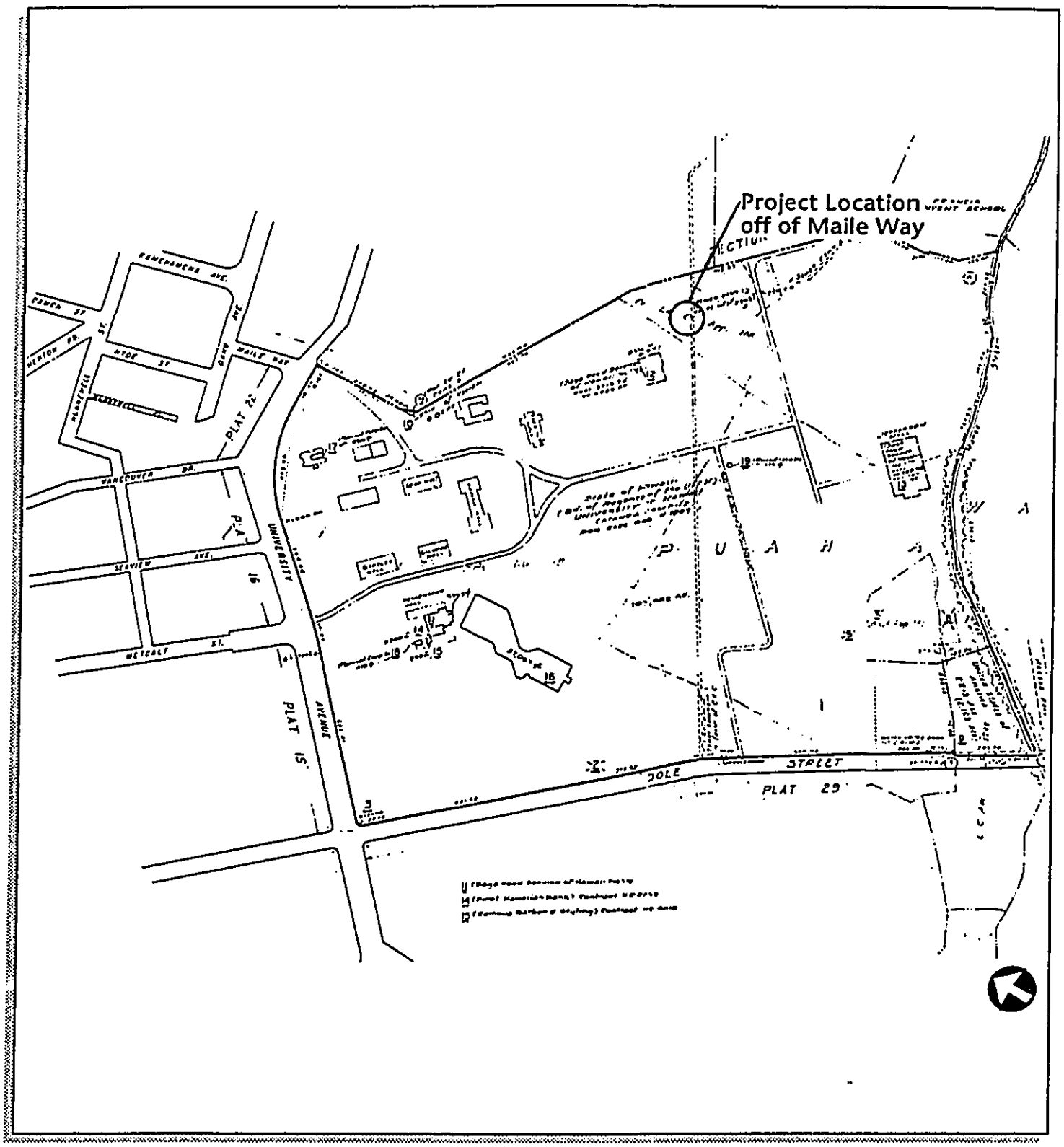

Figure 3 : Tax Map Key : 2 - 8 - 23: 3
Source: Department of Taxation-Tax Map Bureau, State of Hawaii

University of Hawaii Manoa - Food Service Facility

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March 1993

These adjacent land uses include a language arts facility, science laboratory facility, a graduate studies library, a landscaped park and courtyard, major pedestrian walkways, and Maile Way.

The 13,863 gross square foot structure will consist of a main kitchen, pantries, food court, cashier area, enclosed and outdoor dining areas, and rest rooms (Figure 4). The main kitchen located to the north, will be used for food preparation, food and dry goods storage, and warewashing. The food court adjacent to the kitchen will serve a variety of ethnic, vegetarian, grill, and deli sections. Bordering the central cashiers section is an enclosed dining area which opens to a 1,780 square foot outdoor dining area. The dining areas will seat a total of approximately 500 users. The outdoor dining area will have a natural texture slate tile floor, tables, chairs, and patio umbrellas (Figure 5).

The new facility will be located approximately 60 feet from Hamilton Library at the facility's main entry and will be designed with similar finishes. The building exterior will consist of stucco finish concrete masonry walls and aluminum frame glass windows and glass sliding doors. The steel framed metal roof structure will be capped with six aluminum framed skylights. The top of the roof will be approximately 27 feet above the finished grade (Figure 6, 7).

The hours of operation for the proposed facility will be from 6:30 am to 11:30 pm. In compliance to the Uniformed Building Code (UBC), the maximum occupancy load for the proposed facility is 15 employees in the main kitchen and 500 customers in the enclosed dining area.

The main entrance to the facility will be located on the Ewa (west) side of the building facing the entry to Hamilton Library. A second entrance will be situated on the (Koko Head) eastern

side of the building while all service entries will be located along the mauka (north) side. Service vehicle access to and from the site will be located off of Maile Way. A loading dock will be situated at the northwest corner of the building. No vehicular parking will be allowed on site. Employee parking will be provided elsewhere on the campus.

Twelve existing trees presently located on the north, west, and east sides will remain and be incorporated into the new landscape (Figure 8). These existing trees types include: 3 West Mahogany trees, 3 Variegated Coral trees, 4 Cassia Nealiae, and 1 Blue Marble tree. A significant tree situated at the center of the site, known as the Clitoria species was recently planted and dedicated to Martin Luther King. This tree and the remaining 17 trees presently located in the new building area will either be removed or relocated elsewhere on campus. The University will assist the landscape consultant in relocating displaced trees. New trees will also be incorporated into the landscape plan.

B. Social Characteristics

The University of Hawaii Manoa Campus (UHM) encompasses approximately 300 acres of land in Manoa and is surrounded by schools, residential areas, and commercial properties. Statistics from University of Hawaii: 1991-1993 General and Graduate Information Catalog, indicate that the University of Hawaii-Manoa offers 89 Bachelor's degree programs, 84 Master's degree programs, and 42 Doctoral programs. The academic calendar year is based on a semester system which consists of two 15 weeks sessions, and two 6 week summer sessions. University of Hawaii statistics indicate that the Manoa Campus had an aggregate student population of 19,357 in the Fall 1992. The estimated daytime student population on campus consisted of 13,299 undergraduate students and 6,058 graduate students. In addition, the University offers two types of student housing:

dormitories and apartments for both undergraduate students and graduate students.

Food services on campus are varied in both service and location. Several convenience food outlets are found on campus, however, there are only three cash operation cafeterias open to the public. These are Campus Center Dining Room Snack Bar, Manoa Gardens, and the Hamilton Snack Bar. These facilities are extensively patronized for food as well as meeting and gathering spots. The proposed project will replace the existing Hamilton Snack Bar with expanded services such as improved dining facilities, greater variety of foods, and higher seating capacity which will meet the demands of the student population as well as provide a new activity center for the east side of Manoa Campus.

C. Phasing and Economic Characteristics

The proposed project is expected to be constructed in a single phase. Site work is expected to commence in June 1993 and construction is scheduled for completion by Fall 1994. Food service will begin in Fall 1994. The Hamilton Snack Bar structure is expected to remain until site clearing for the library extention begins. Food service is not expected to continue at the Hamilton Snack Bar upon completion of the UH Food Service Facility.

The total project cost is approximately $4.5 million dollars of which $2.25 million will be funded by the University of Hawaii and $2.25 million will be funded by the Marriott Corporation.

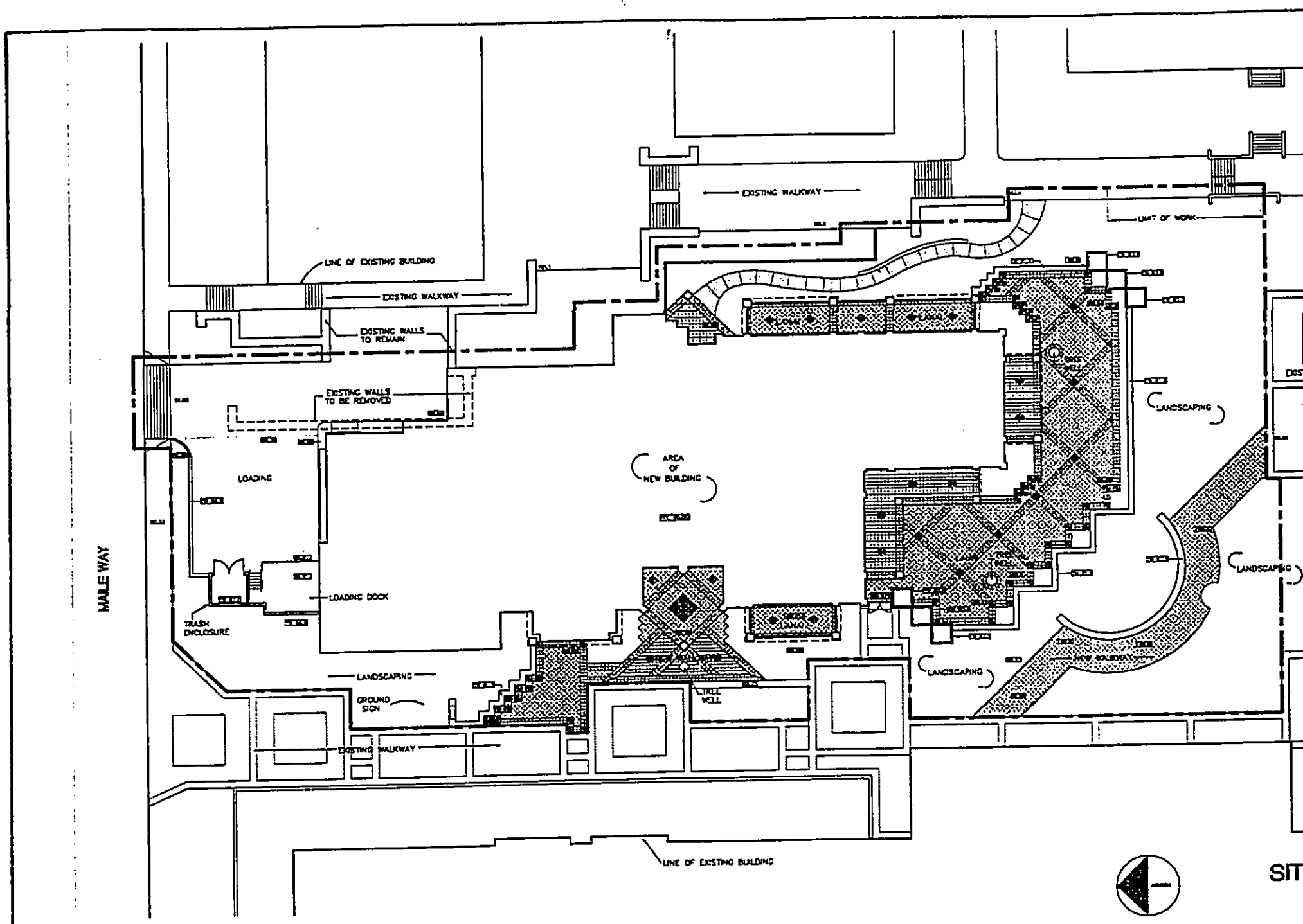
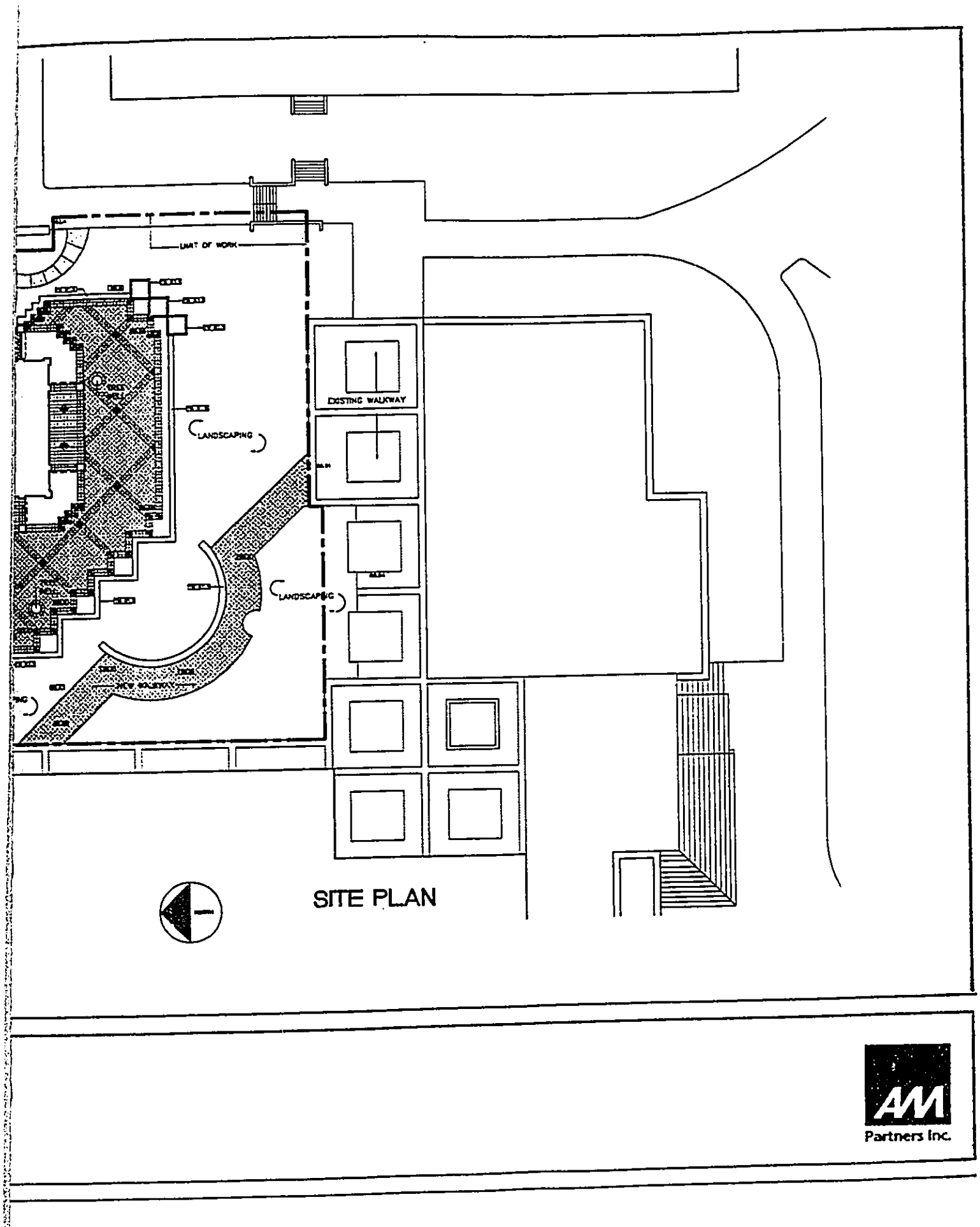


Figure 4: Site Plan
Source : AM Partners, Inc.



SITE PLAN

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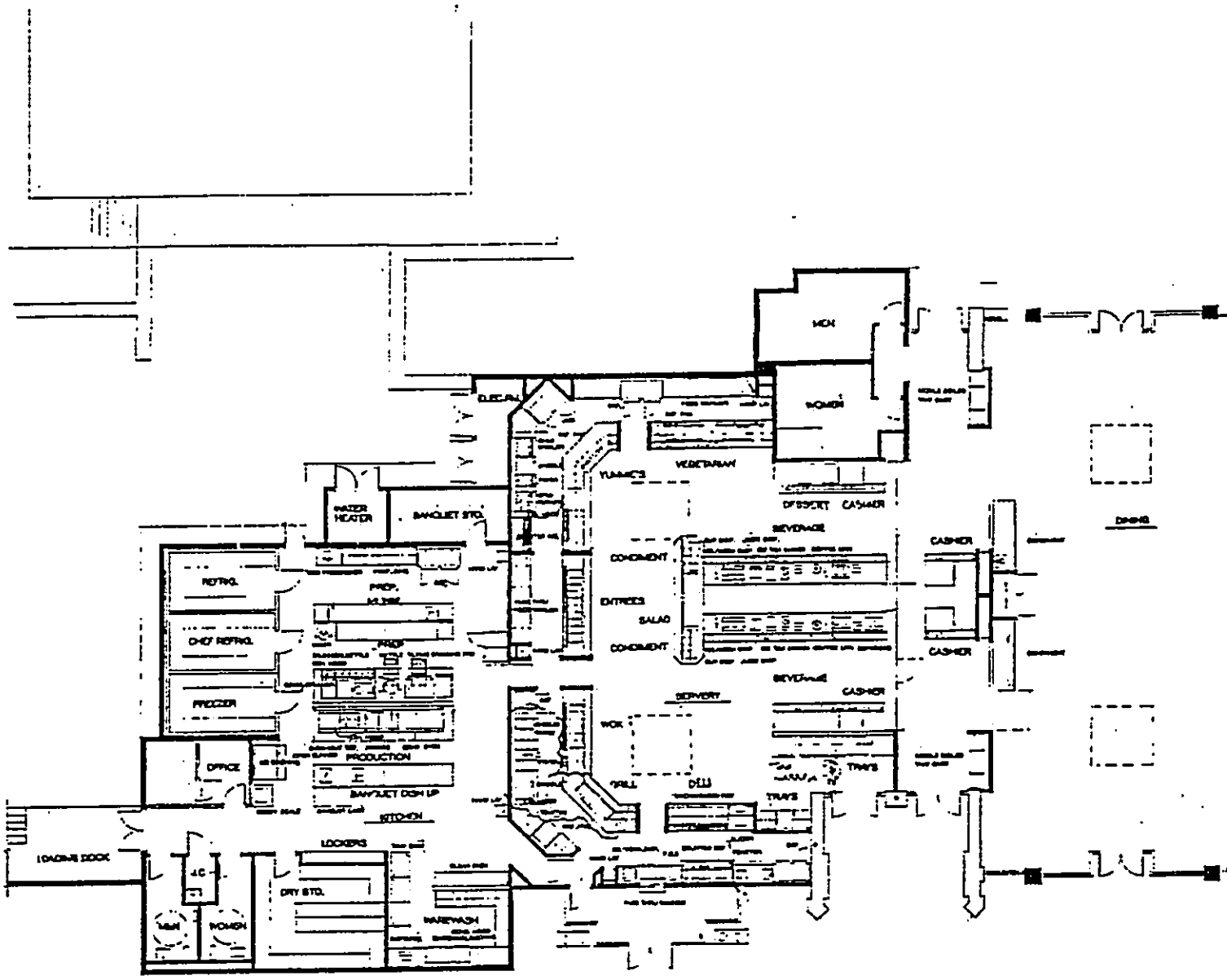
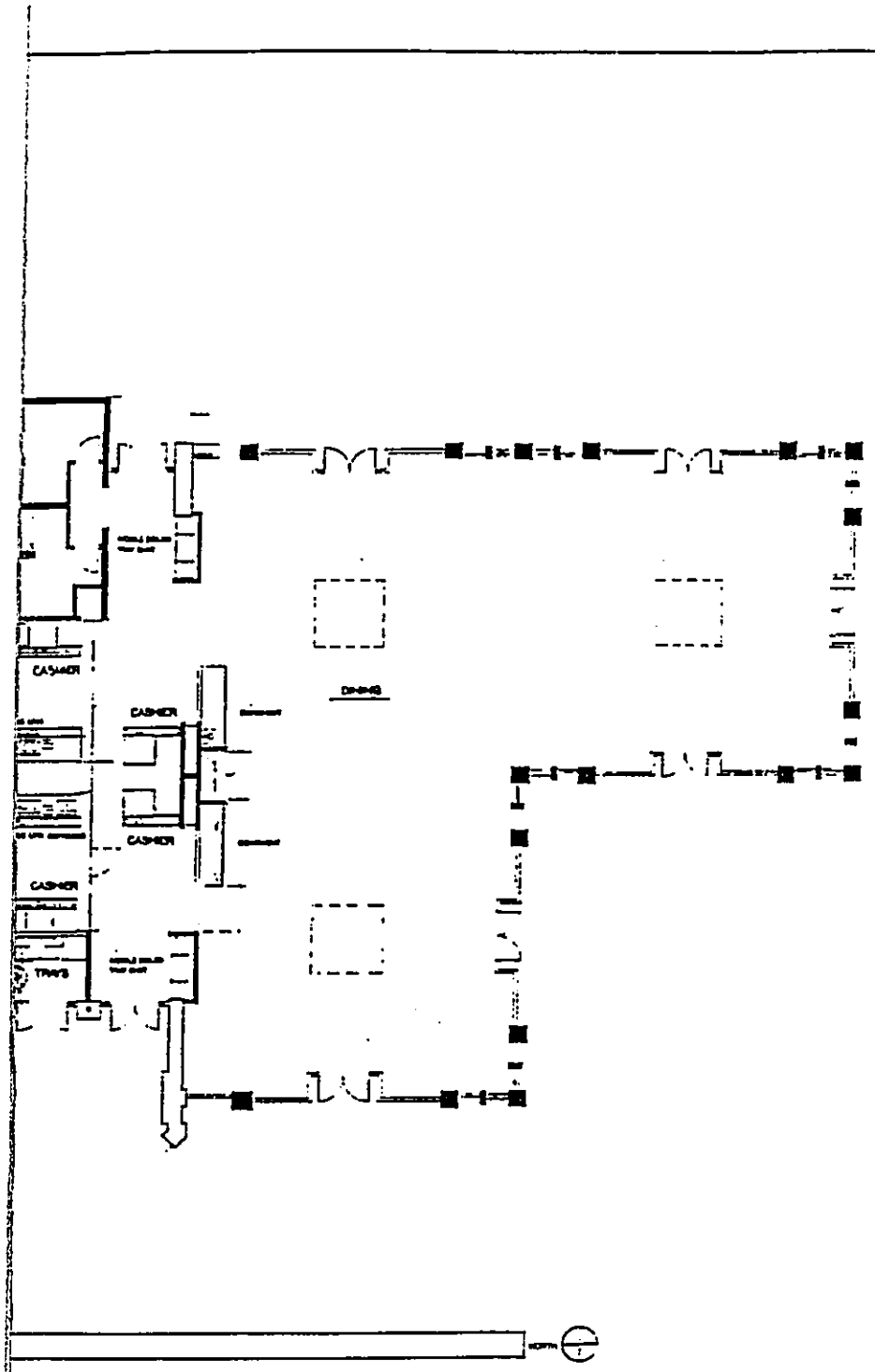


FOODSERVICE EQUIPMENT DESIGN DEVELOPMENT FLOOR PLAN

Figure 5: Food Service Equipment Design Development Floor Plan
Source: R. R. Shape Associates



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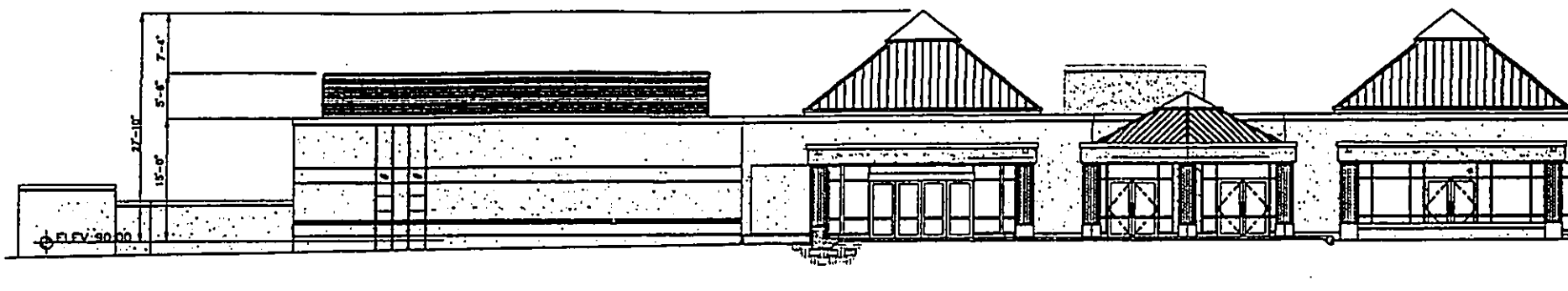


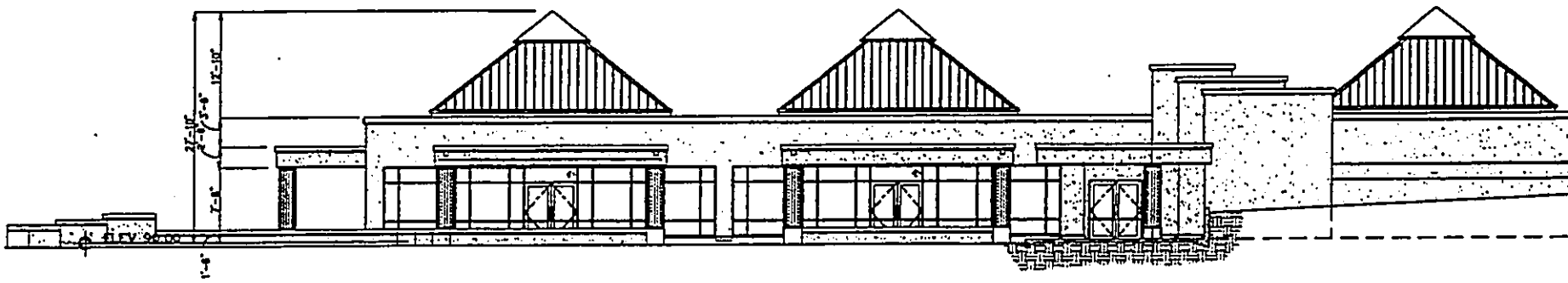
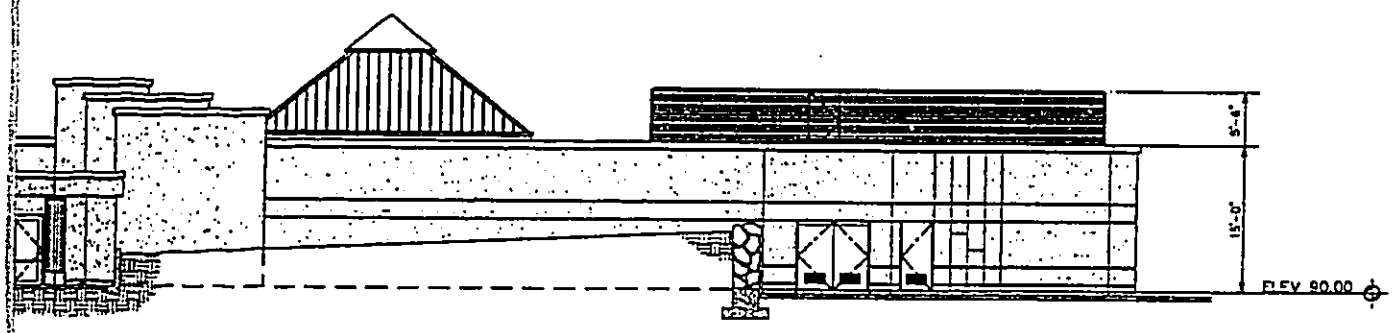


Figure 6 East and West Elevations
Source: AM Partners, Inc.

WEST ELEVATION



EAST ELEVATION

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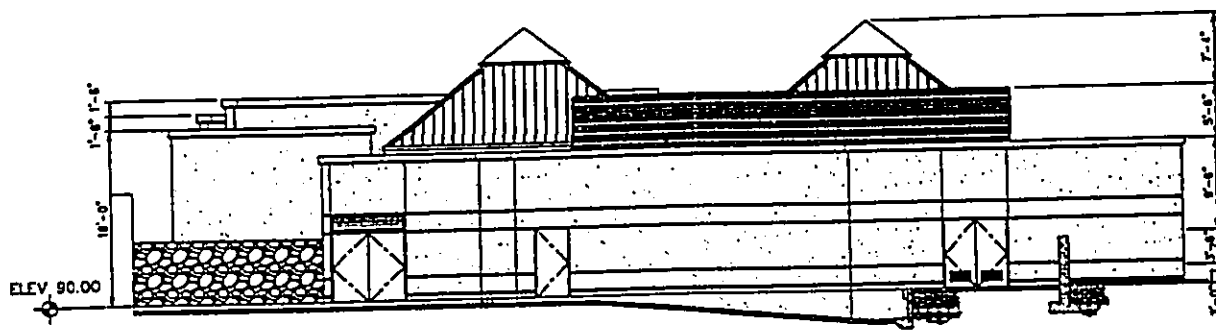
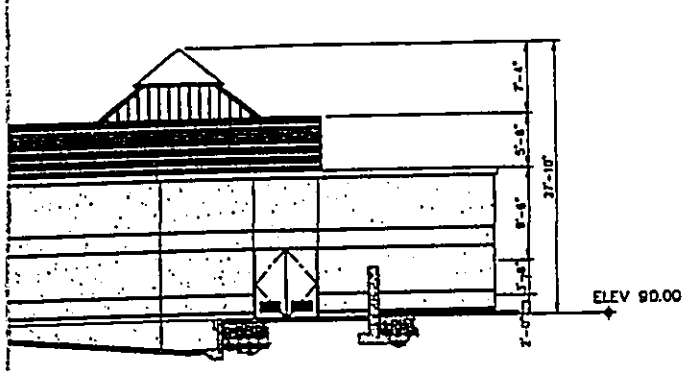


SOUTH ELEVATION

NORTH ELEVATIO

Figure 7: North and South Elevations
Source: AM Partners, Inc.



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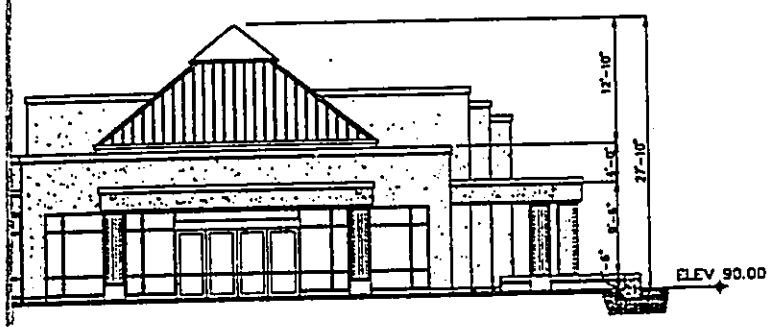

NORTH ELEVATION

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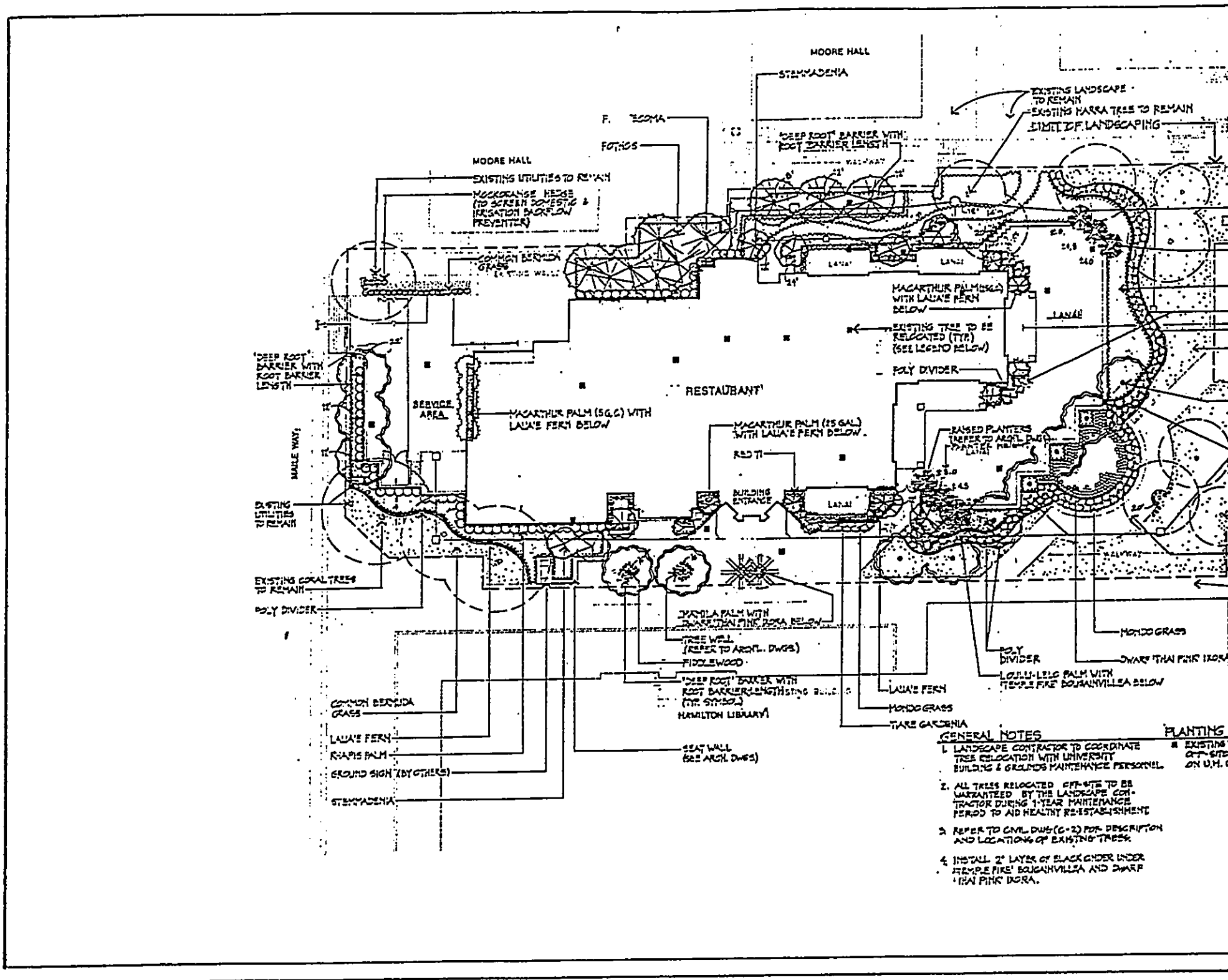

Figure 8: Landscape Plan
Source: Brownlie & Lee

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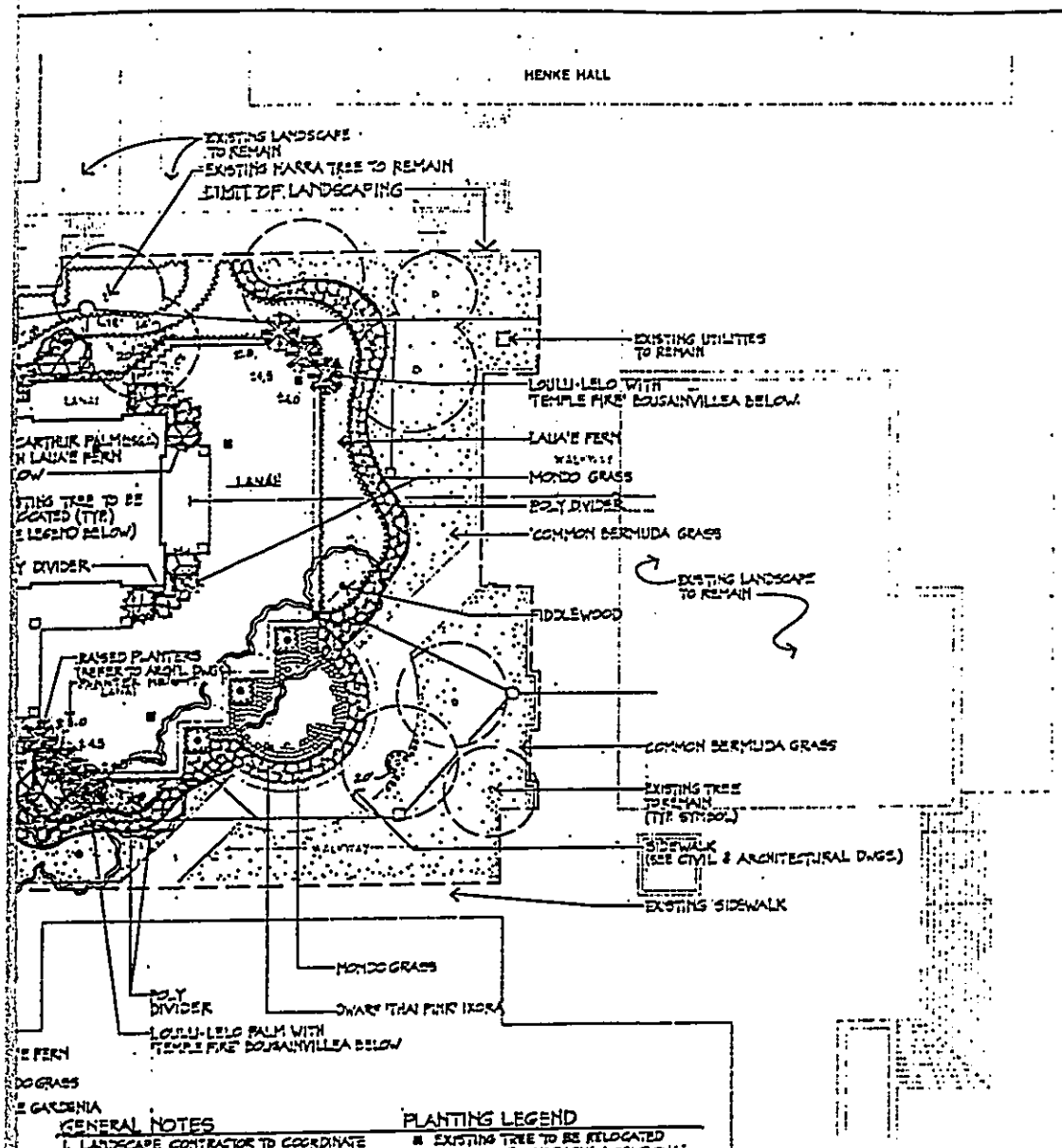

GENERAL NOTES

1. LANDSCAPE CONTRACTOR TO COORDINATE TREE RELOCATION WITH UNIVERSITY BUILDING & GROUNDS MAINTENANCE PERSONNEL.
2. ALL TREES RELOCATED OFF-SITE TO BE WARRANTEED BY THE LANDSCAPE CONTRACTOR DURING 1-YEAR MAINTENANCE PERIOD TO AID HEALTHY RE-ESTABLISHMENT.
3. REFER TO CIVIL DWG (C-2) FOR DESCRIPTION AND LOCATION OF EXISTING TREES.
4. INSTALL 2" LAYER OF BLACK CINDER UNDER 'TEMPLE FIRE' BOUGAINVILLEA AND DWARF THAI PINK IXORA.

PLANTING LEGEND

R EXISTING TREE TO BE RELOCATED OFF-SITE TO VARIOUS LOCATIONS ON U.H. CAMPUS. (TOTAL COUNT 9)

AM Partners Inc.

CHAPTER III
AFFECTED ENVIRONMENT

III. AFFECTED ENVIRONMENT

A. Property Description

The project site presently functions as a park. On-site features include: benches, campus bulletin boards, trash cans, bicycle racks, concrete paved walkways, a landscaped berm, grass, and approximately 28 ornamental trees scattered on the north, west, and east sides with 7 trees along the southern boundary of the project area. Existing tree types include: Common Olive, Harpulla Pendula, Cassia Nealiae, Monkeypods, Seaman, Malabar Chestnut, Roble, Orientalis, Variegated Coral, West Indian Mahogany, Shaving-brush tree, Australian Flame tree, Tabebuia, Baker Shower, Rainbow Shower, and the Clitoria species tree. The landscaped berm situated at the center of the site is planted with Coroyl and Blue Daze flowers.

B. Geological Characteristics

1. Topography

The site is relatively flat with a rise towards Henke and Moore Halls. No unusual topographic features were identified on-site. The site is naturally drained but does experience some muddy conditions.

2. Climate

Climatic conditions in the vicinity include mean temperatures ranging from 69.4 degrees Fahrenheit in the winter to 75.2 degrees Fahrenheit during the summer. Humidity levels vary from 72 percent to 56 percent with prevailing trade winds of approximately 11.4 miles per hour. The annual average precipitation level in the Manoa area is 158 inches.

3. Soils

A Soil Investigation Report has been conducted by a Soils Engineer for the project site (Appendix A). Five test borings which were drilled beneath the soil to determine the soil conditions at the site resulted in these findings: 1) Approximately 1.0 feet to 9.5 feet of the soil is comprised of red brown, moderately stiff to stiff clayey silt. Below the clayey silt, silty sand (Cinders), Sand Gravel (Cinders and Clinkers), Boulders and Basalt were found at the final depths of the borings. 2) No groundwater was found at the site. 3) On-site clayey soils have shrink-well potential ranging from moderate to high expansion levels.

C. Water Resources

1. Flood Plain Management

According to panel 120C of the Federal Emergency Management Agency Federal Insurance Rate Map, the site is within Zone X, an area determined to be outside of the 500 year flood plain (Figure 9).

2. Tsunami Inundation

Civil Defense maps confirm the project site to be outside of the tsunami inundated area (GTE Hawaiian Tel, 1992-1993).

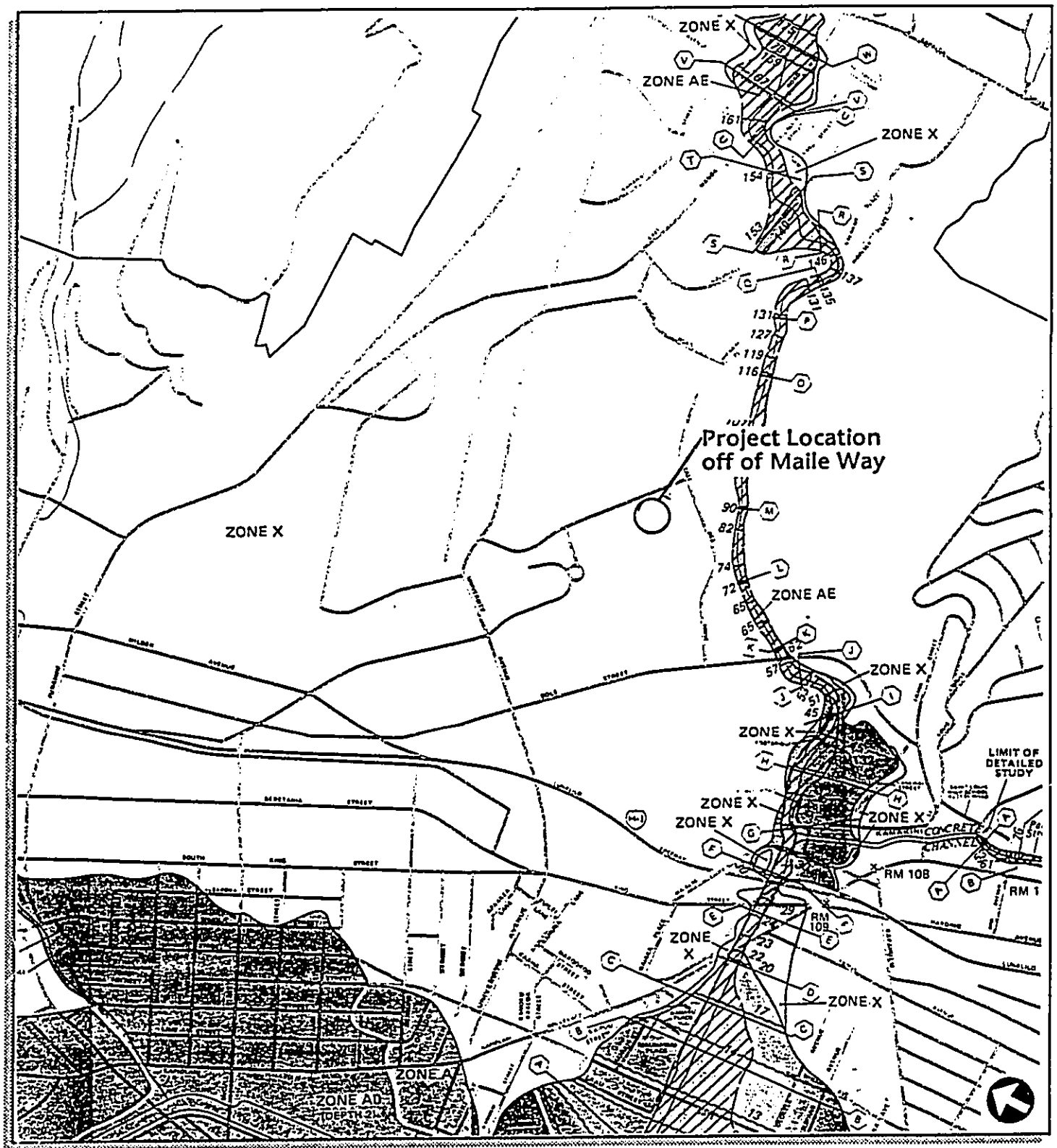

Figure 9: Federal Insurance Rate Map

Source: Federal Emergency Management Agency (September 4,1987)

University of Hawaii Manoa - Food Service Facility

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March 1993

D. Flora and Fauna

No evidence of endangered flora and fauna species were encountered on the site. Wildlife inhabiting the project area may include exotic birds, rodents, insects, and stray dogs or cats. A rare tree identified as Clitoria has been identified on the project site. This significant tree located at the center of the site was planted to commemorate Martin Luther King. A relocation site for this tree will be determined by the University. On-site flora scattered throughout the site consist of: grass, Blue Daze and Coroyl flowers, and various ornamental trees: Variegated Coral, West Mahogany, Monkeypods, Harpullia Pendula, Malabar Chestnut, Common Olive, Cassia Nealiae, Clitoria species, Baker Shower tree, Rainbow Shower tree, Shaving-brush tree, and the Australian-flame tree.

E. Infrastructure and Utilities

1. Pedestrian and Vehicular Access

Existing pedestrian walkways situated along the south, east, west, and north sides of the surrounding site will continue to serve as ingress and egress routes. New pedestrian walkways will be incorporated into the existing Walkway. Newly paved concrete and state walkways will be designed to complement the existing walkway. Pedestrian traffic impacts between Hamilton Library and the new facility are not anticipated. The main entrance to the facility will be located on the west side of the building facing Hamilton Library. A second entrance will be located on the east side facing Henke and Moore Hall.

Vehicular access to and from the site will be limited to delivery and service vehicles utilizing the loading zone located northeast of the structure. Personal vehicles will be restricted in this area.

2. Water

Existing waterlines are expected to serve the proposed facility. Although the demand for this service will be greater than the existing snack bar demand, the Board of Water Supply has indicated that the existing waterlines have the capacity to serve the new facility. Waterlines will be attached to the existing lines situated on Maile Way and connect through the northern portion of the new structure. The new snack bar will be using approximately 15,000 gallons of water per day.

3. Wastewater

The project site will be serviced by existing sewer lines. The demand for this service will increase from the existing snack bar quantities, however existing wastewater lines have the magnitude to serve the new facility. Wastewater lines will be joined from existing lines located at McCarthy Mall and Dole Street and connect through the southern portion of the proposed building. It is anticipated that the proposed building will dispose an average of 15,000 gallons of wastewater per day.

4. Drainage

Existing drainage lines will continue to service the proposed facility. The drainage system will feed a collector line in the existing campus drainage system.

5. Solid Waste

Refuse will be collected by a private vendor and disposed at a sanitary landfill or refuse incineration.

6. Electrical and Telephone Service

Electrical and telephone services for the proposed facility will continue to be provided by Hawaiian Electric Company and Hawaiian Telephone Company through the UH-Telecom Office. Additional demands will be placed on the existing systems to provide adequate services.

F. Public Facilities

1. Schools

The project site is surrounded by elementary and highs schools including: the Mid Pacific Institute, St. Francis Convent, University Lab School and Noelani Elementary School. None will be affected by the proposed project.

2. Parks

The project site is also known as University Park and was designed by George Walters through a commission by the Associated Students of the University of Hawaii (ASUH). The landscaped berm situated between Moore Hall and Hamilton Library is also called Ho'onanea Park (Relaxation Park) and was completed in 1973. While its passive use will be replaced with a food service facility, new and existing landscaped areas will still provide students with a social outdoor/indoor place as well as a relaxing respite environment. New and existing landscape features will include various types of grass shrubs and trees as well as

concrete benches situated along the proposed facility and south of the site.

3. Police

The cafeteria will be patrolled 24-hours by the University of Hawaii Campus Security (*University of Hawaii Campus Security*, December 22, 1992). The Honolulu Police Department will provide police services at the project site should it become necessary. The project site lies within District 7, Central Patrol Bureau.

4. Fire

Fire protection services will be provided by the McCully Fire Station located on Date Street, and the Manoa Fire Station with ladder service situated on East Manoa Road. Building plans will be submitted to the fire department for permit approval (Fire Department, December 22, 1992).

5. Emergency Medical Service

The nearest on campus emergency medical service is the Student Health Center. Off campus facilities are located at Straub Hospital situated on South King Street and Queens Medical Center located on Punchbowl Street and South Beretania Street.

CHAPTER IV
PLANS, POLICIES, AND CONTROLS

IV. PLANS, POLICIES, AND CONTROLS

A. Federal

No federal management programs are applicable to the construction of the proposed project.

B. State

1. State Land Use Plan

The State Land Use Map designates the project site for urban use.

2. State Plan

The Hawaii State Plan was developed to serve as a long-range guideline for future state-wide development. These guidelines consist of 12 State Functional Plans each involving a resource allocation decision-making process.

The objectives and policies for Hawaii's educational system is to provide educational opportunities, development of employable skills, and the efficiency use of facilities. The proposed project confirms to the State of Higher Education Functional Plan as follows:

Policy 2:
Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.

The proposed building will provide enhanced food service for the student population with a more accessible location immediately off McCarthy Mall, greater variety of foods, improved dining areas, and more comfortable indoor/outdoor surroundings.

3. Long Range Development Plan (LRDP) for the University of Hawaii, Manoa Campus

The proposed project has been established in the Long Range Development Plan for the University of Hawaii, Manoa Campus (LRDP) which serves as the principal planning guide for UH development.

The Long Range Development Plan (LRDP) for the Manoa Campus specifically recommended the relocation of Hamilton Snack bar to a site along McCarthy Mall, in the area adjacent to the existing retaining wall. This recommendation was based on the LRDP's plan to expand Hamilton Library on the existing snack bar site. Also, it was stated that *"In its new location, the Food Service facility will provide an activity which will increase McCarthy Mall's attractiveness and use."*

The design criteria for the food service facility presented below in italics were cited from the Appendix A of the 1987 LRDP. These guidelines have been met by the design of the proposed facility as stated below the LRDP Guidelines:

LRDP Guideline A.
The Food Service Facility should be located below grade to preserve the lawn between Hamilton Library and Henke Hall. The height of the Food Service Facility would not exceed the elevation of the Hamilton Library entrance.

Response A
Below grade construction was not considered to be feasible due to the extent of volcanic rock found beneath the surface soils. Prohibitive construction costs have consequently moved the University to proceed with an amended LRDP which will reflect an above grade facility.

LRDP Guideline B
The Food Service Facility should be coordinated with the improvements to McCarthy Mall.

Response B
The area south of the site facing McCarthy Mall will consist of new and existing landscape to integrate the improvements and connections with McCarthy Mall.

LRDP Guideline C
The Food Service Facility should have a transparent facade fronting McCarthy Mall.

Response C
The indoor dining area fronting Henke Hall, the main entrance to Hamilton Library, and McCarthy Mall will consist of glass storefronts to make the facade transparent and enclosed for patron comfort.

LRDP Guideline D
The front of the Food Service Facility would have a landscaped outdoor dining area. Canvas awnings and patio umbrellas will enhance the attractiveness of the Food Service Facility.

Response D:
An outdoor landscaped dining lanai with patio umbrellas encompassing approximately 1,780 gross square feet will be located at the southern portion of the proposed facility.

LRDP Guideline E
The Food Service Facility should be sited to use the service access road which will be constructed between Moore Hall and the proposed Center for Hawaiian, Asian, and Pacific Studies.

Response E
The proposed structure was moved towards Maile Way to maximize the open landscaped area to its fullest potential. The new facility will no longer use the existing service access road located between Moore Hall and the proposed Center for Hawaiian, Asian, and Pacific Studies Center. Service access road to and from the site will be directly off of Maile Way. This road minimizes crossing pedestrian paths, whereas the existing road crosses several pedestrian paths.

C. City and County of Honolulu

1. Development and Public Facilities Plan

The City and County Development Plan Map identifies the project area as a Public Facility (Figure 10). The Public Facilities Map classifies the site to be outside of the public facilities improvement boundaries (Figure 11).

2. Zoning Designation

The Land Use Ordinance Map identifies the proposed site as R-5, Residential District (Figure 12).

3. Plan Review Use (PRU)

The proposed project is subject to PRU review under the City and County of Honolulu Land Use Ordinance Section 3.160. This section establishes a review and approval mechanism for uses of a permanent and institutional nature which, because of characteristics fundamental to the nature of the use, provide essential community services but which could also have a major adverse impact on surrounding land uses.

It is the intent of that the design and siting of structures and landscaping, screening and buffering for these uses be master planned so as to minimize any objectionable aspects of the use or the potential incompatibility with other uses permitted in the zoning district.

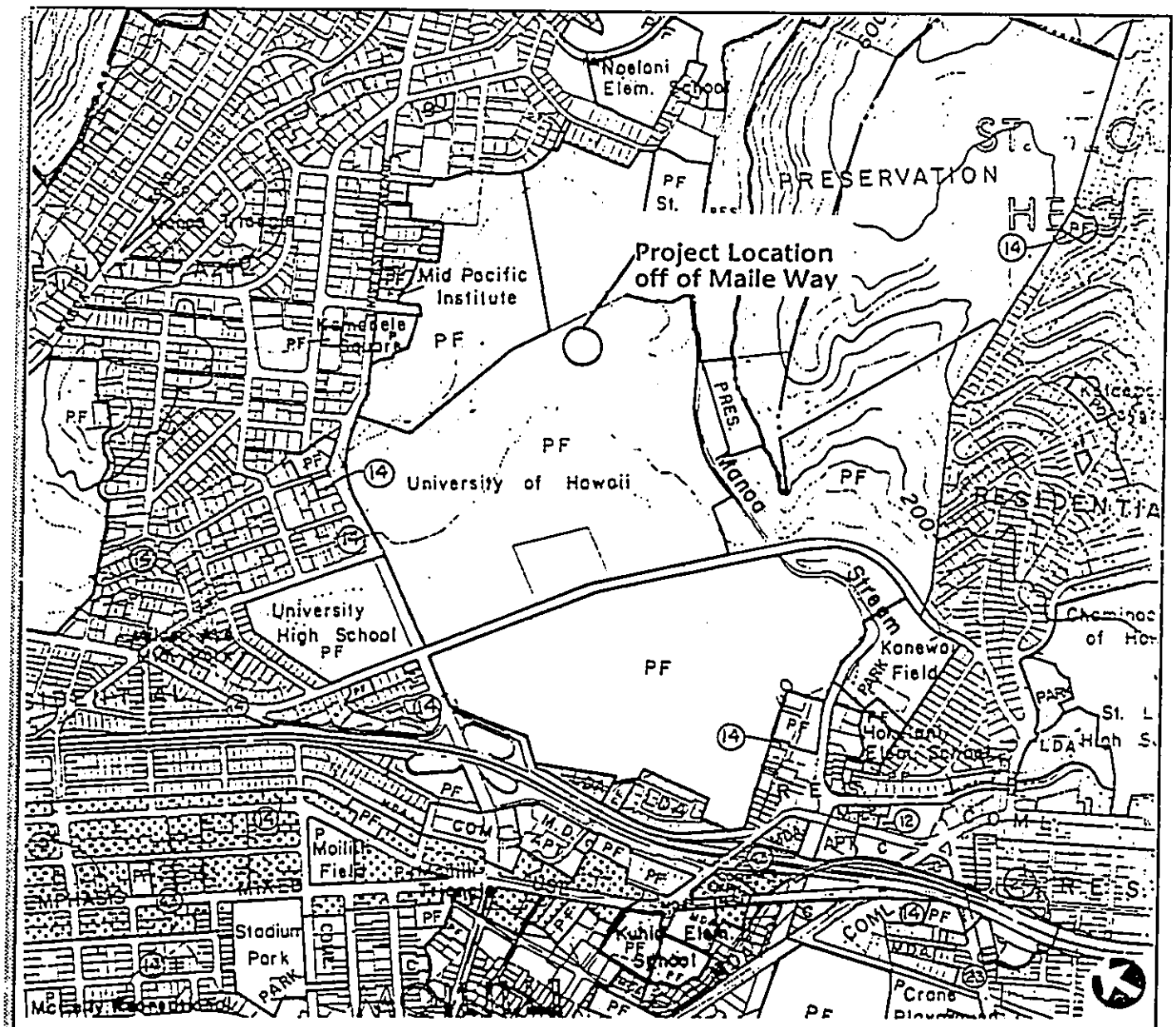

Figure10: Development Plan - Primary Urban Center

Source: City & County of Honolulu (November 25,1981)

University of Hawaii Manoa - Food Service Facility

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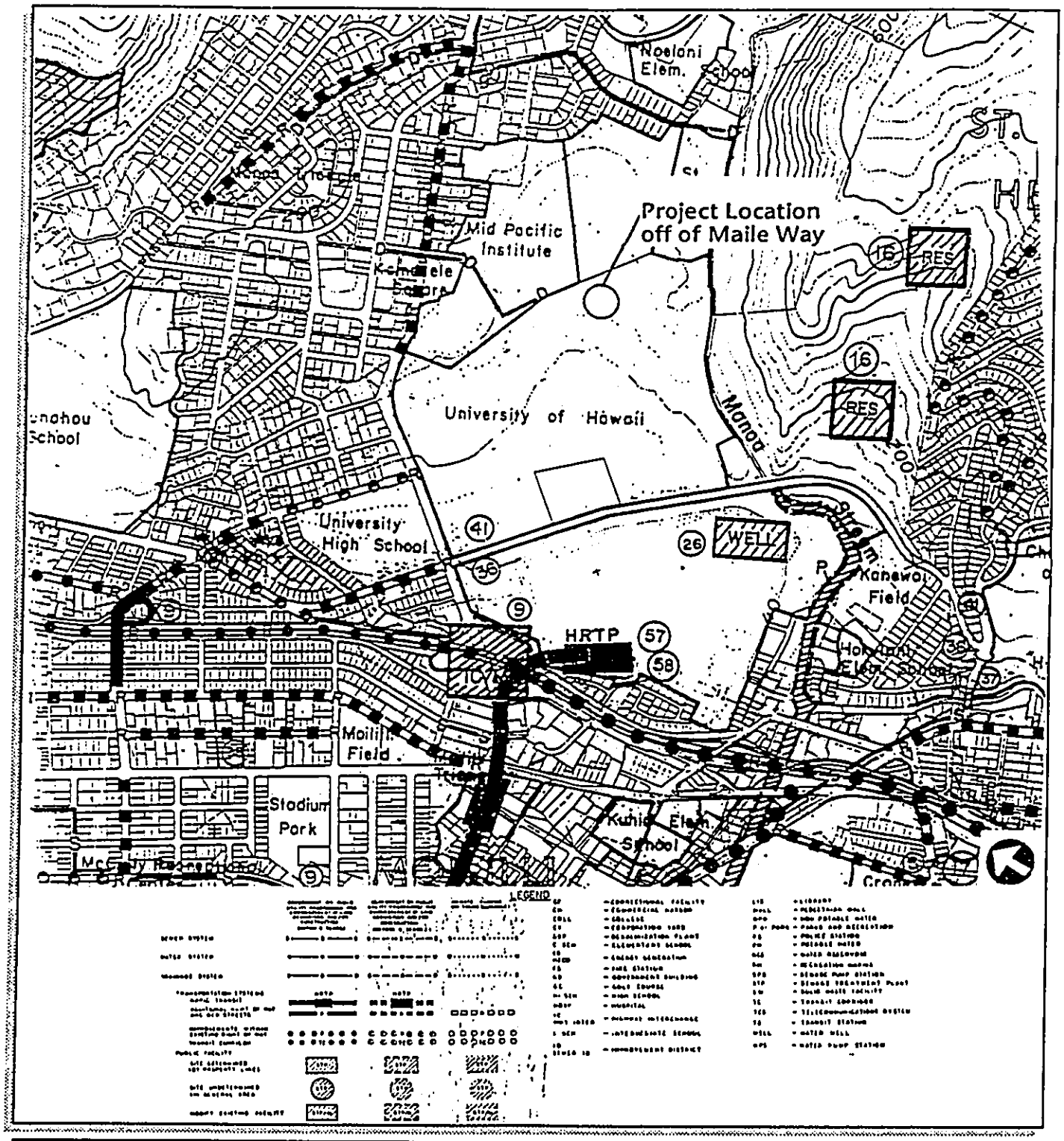

Figure 11: Public Facilities - Primary Urban Center

Source: City & County of Honolulu (November 25,1981)

University of Hawaii Manoa - Food Service Facility

Partners Inc.
March 1993

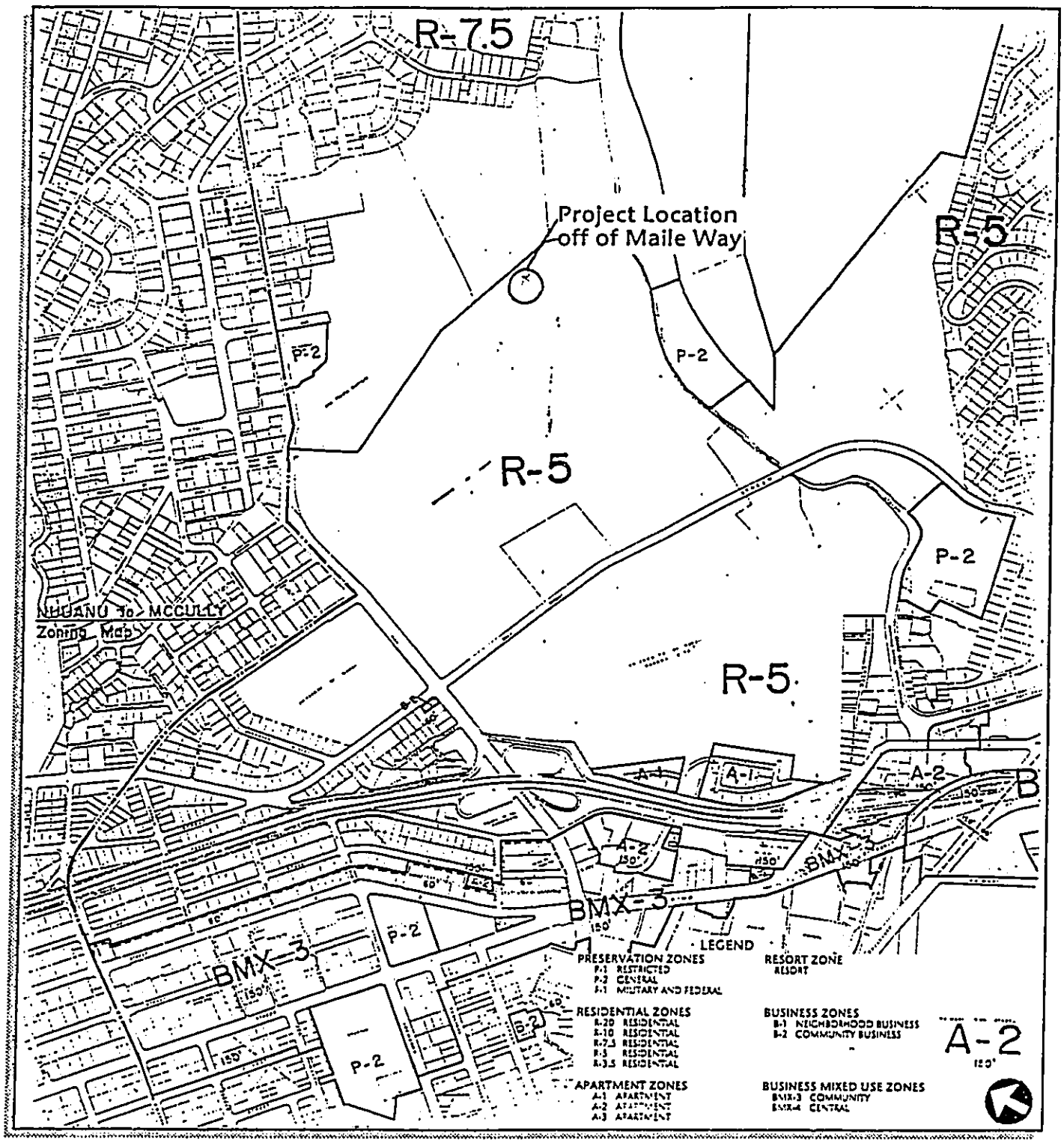

Figure 12: Zoning Map No. 3 Moiliili to Kaimuki
Source: City & County of Honolulu (October 22,1986)

University of Hawaii Manoa - Food Service Facility

Partners Inc.
March 1993

CHAPTER V
SUMMARY OF MAJOR IMPACTS

V. SUMMARY OF MAJOR IMPACTS

Developing the proposed project will result in two general impact categories: short-term construction related impacts and long-term impacts generated from the operation of the facility. These impacts are summarized below.

A. Traffic

Short-term construction related impacts will involve construction vehicle traffic disrupting the existing traffic flow. Mitigation measures will be taken to minimize traffic congestion caused during the construction phase. Construction hours will comply to the existing construction traffic standards to minimize congestion during peak periods. Public transportation related impacts are not anticipated.

The proposed project is similar to the existing snack bar and additional operational traffic volumes are not expected. The loading zone area will have access to Maile Way. Traffic resulting from deliveries and refuse collection are not expected to have a significant impact on traffic patterns.

B. Noise

During the course of construction, noise levels will exceed the acceptable noise standards. Mitigation measures to minimize noise will be used wherever possible. Construction hours will conform to the existing noise standards to reduce high noise impacts.

The noise level surrounding the project will increase slightly due to air condition equipment and increased activity. Limited vehicular access to and from the site and the conformance of design criteria standards for the proposed building should

minimize other long-term noise impacts. A noise study has been conducted to examine the noise impacts from the project mechanical equipment to the surrounding library and classroom uses. This study suggested that no special treatment is required to meet the 45 dBA interior noise standard for libraries (Hamilton Library) or 50 dBA interior noise standard for classrooms within Moore and Keller Hall. However, adding packless silencers to the two high pressure exhaust fans will help reduce equipment noise levels on the Ewa and mauka lanais of Moore Hall. Mitigation measures, including the use of silencers, have been implemented into the new facility design. Equipment noise levels will be tested after the facility is built to ensure effectiveness. Refer to Appendix B.

C. Air Quality

The nearest air quality station is located in Downtown Honolulu. Based on the 1991 results taken from The State of Hawaii 1991 Data Book, the annual particulates suspended range from 20-35 micrograms per cubic meters with an average of 30. This well below the state standard of 150 micrograms per cubic meter. Particulate emissions such as food odors and smoke resulting from the proposed facility are not expected to increase significantly from the existing snack bar emissions nor create adverse impacts on the project site. Exhaust fans with grease vapor collectors installed in the kitchen area will be used to minimize particulate emissions such as food odors and smoke and thus, maintaining good air quality conditions. Since vehicular traffic to the project site will be limited, vehicular emissions will be negligible.

D. Historic Archaeological Resources

Archaeological subsurface remains at the site are unlikely. The State Historic Preservation Office has confirmed that there are no

archaeological subsurface remains in the project area (Appendix C). If any subsurface artifacts are encountered during the construction phase, all work will cease and the State Historic Preservation Officer will be notified.

E. Visual and Aesthetic Impacts

The project site is presently used as passive open space and does not support much activity. The site is well landscaped and contains numerous trees. The proposed use will significantly and irreversibly alter this site through the construction of the food service facility. The facility will, however, provide an activity center as well as a much needed support service.

The Hamilton Snack Bar Replacement has been limited to a single story and is sited to complement Hamilton Library. A low wall will be built on the west side of the proposed structure to incorporate the design of glass windows in the dining areas. The facility will reflect a contemporary design theme sympathetic to the surrounding buildings and will feature a number of covered lanais and open surfaces to integrate interior and exterior activity. Paint colors will be selected to conform with the approved University of Hawaii color scheme and harmonize with the colors of adjacent buildings. Open spaces surrounding the site will consist of new landscaping features such as concrete benches and various types of landscape treatments including grass, shrubs, and trees which will tie into the existing landscape. The landscaped area situated south of the site will consist of grass, concrete benches, trees, paved walkways, campus bulletin boards, bicycle racks and trash cans. While significantly different from the existing open space, the proposed building design is intended to complement and enhance the character of the area.

F. Social Impacts

The University of Hawaii at Manoa has a present enrollment of approximately 19,357 students as of Fall 1992. To meet the dining and refreshment needs of the campus population, the east side of Manoa's upper campus requires a new expanded food service facility to accommodate users including students, faculty, staff and guests, during peak lunch hours. In addition, the Hamilton Snack Bar replacement will provide students with a nearby on-campus dining area, improved dining conditions and greater variety of foods at a more accessible location.

CHAPTER VI
ALTERNATIVES CONSIDERED

VI. ALTERNATIVES CONSIDERED

A. Underground Alternative

In accordance to the 1987 University of Hawaii Manoa Campus Long Range Development Plan, the proposed facility was originally recommended for underground placement to preserve the existing open space between Hamilton Library and Henke Hall. The design of the building was to include a transparent facade facing McCarthy Mall and a landscaped outdoor dining area with tables, benches and patio umbrellas, all of which have been retained in the new scheme.

This underground alternative was not pursued due to the discovery of a volcanic rock base and the high construction cost associated with construction within this material.

B. Other Locations

In reference to the LRDP, no other locations for the food service facility have been identified. While the preservation of open space is desirable, the demands of meeting the physical plant growth of the University are equally if not more important. The proposed building has been sited to retain as much open spaces as possible. The proposed action is considered critical in meeting the objectives of the University to support its student population.

C. No Action Alternative

The no action alternative would also be in conflict with the LRDP since this would affect expansion of Hamilton Library. This would adversely affect the educational and research activities, as well as resource services to the University population and the public.

D. Action Alternative

The proposed facility would be built above grade, replacing the existing open space between Hamilton Library and Henke Hall. The design of the new structure would consist of an indoor dining area with glass window storefronts along the sides of McCarthy Mall, Henke Hall, and Hamilton Library as well as a landscaped outdoor dining lanai with tables, benches and patio umbrellas.

CHAPTER VII
MITIGATION MEASURES

VII. MITIGATION MEASURES

Mitigation measures will be taken to minimize construction related impacts such as dust, noise and traffic. Dust screens and frequent watering will be used to reduce air-borne particulates. Specific construction hours and a construction management plan will be implemented to minimize excessive noise and reduce traffic impacts.

Although construction related impacts are generally unavoidable, mitigation measures will be taken whenever possible. All construction will comply with Federal, State and County regulations.

Long-term impacts resulting from operation of the facility primarily consist of air quality impacts generated from food odors, kitchen and cooking fumes, noise impacts from the operation of mechanical systems, increased user traffic and dining and socializing activity. These operational impacts will be similar to those already experienced at the existing snack bar location and are largely unavoidable considering the nature of the project. Mechanical noise will be muffled and shielded as practicable. Noise from outdoor users is unavoidable but should not adversely affect the surrounding environment.

CHAPTER VIII
NEGATIVE DECLARATION & REASONS SUPPORTING DETERMINATION

VIII. NEGATIVE DECLARATION AND REASONS SUPPORTING DETERMINATION

A. Determination

Under Chapter 343, H.R.S. and Section 11-200-12 Administrative Rules, it has been determined that the University of Hawaii Food Service Facility project will not incur or significantly impact the environment. Therefore, it has been determined that a negative declaration will be filed.

B. Findings and Reasons Supporting Determination

1. The proposed project will not involve an irrevocable commitment to loss or destruction to any natural or cultural resources.
2. The proposed project will not curtail the range of beneficial uses of the environment.
3. The proposed project will not conflict with the State's or University's long-term environmental policies.
4. The proposed project will not substantially affect the economic or social welfare of the community or State.
5. The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities.
6. The proposed project will not involve a substantial degradation of environmental quality.
7. The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.
8. The proposed project will not detrimentally affect air or water quality. Noise impacts will be mitigated to meet applicable noise regulations.
9. The proposed project will not be located in any environmentally sensitive area, such as flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

CHAPTER IX
PARTIES CONSULTED DURING PRE-ASSESSMENT PERIOD

IX. PARTIES CONSULTED DURING PRE-ASSESSMENT CONSULTATION

Several agencies were contacted during the pre-assessment period. A list of these agencies are presented below.

State	Date
Department of Land and Natural Resources	
State Historic Preservation Division	January 18, 1993
University of Hawaii, Manoa, Campus Security	December 22, 1992
City and County of Honolulu	
Board of Water Supply	December 22, 1992
Department of General Planning	December 23, 1992
Department of Public Works	December 22, 1992
Department of Transportation	December 22, 1992
Fire Department	December 22, 1992
Police Department	December 22, 1992

CHAPTER X
PARTIES CONSULTED DURING DRAFT ASSESSMENT PERIOD

X. PARTIES CONSULTED DURING DRAFT ASSESSMENT PERIOD

Federal	Date
U.S. Department of Agriculture, Soil Conservation Service	
U.S. Department of Interior, Fish and Wildlife Services	
American Lung Association	
State	
Department of Accounting and General Services	
Department of Business, Economic Development and Tourism	
Department of Education	April 15, 1993
Department of Land and Natural Resources	May 7, 1993
Department of Health	
Office of State Planning	
University of Hawaii, Water Resources Research Center	
University of Hawaii, Environmental Center	
University of Hawaii at Manoa, Facilities Planning & Management Office	May 7, 1993
City and County	
Board of Water Supply	May 6, 1993
Building Department	April 20, 1993
Planning Department	April 19, 1993
Department of Land Utilization	
Department of Parks and Recreation	April 30, 1993
Department of Public Works	
Department of Transportation Services	May 14, 1993
Police Department	April 15, 1993
Manoa Neighborhood Board No. 7	

ASSISTANT SUPERINTENDENT

CHARLES T. TOGUCHI
SUPERINTENDENT

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

April 15, 1993

Mr. Ralph T. Horii, Jr. VP
University of Hawaii
Board of Regents
2444 Dole Street
Bachman Hall Room 207
Honolulu, Hawaii 96822

Dear Mr. Horii:

SUBJECT: Draft Environmental Assessment
University of Hawaii at Manoa
Food Service Facility

We have reviewed the subject environmental assessment and have no comment on the proposed development.

Thank you for the opportunity to respond.

Sincerely,

Charles T. Toguchi
Superintendent

CTT:hy (4)

cc: A. Suga, Asst. Supt.
T. Kim, AM Partners, Inc.

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

AM Partners, Inc.

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8 May 1993

Department of Education
Attn: Mr. Charles T. Toguchi, Superintendent
P.O. Box 2360
Honolulu, Hawaii 96804

PROJECT: University of Hawaii at Manoa
Food Service Facility

SUBJECT: Draft Environmental Assessment

Dear Mr. Toguchi,

Thank you for your letter in response to our Draft Environmental Assessment for the above referenced project. Your letter will be published in the Final Environmental Assessment for the project.

Sincerely,
AM Partners, Inc.

Taeyong M. Kim

930506

1164 Bishop Street • Suite 1000 • Honolulu • Hawaii 96813
Phone (808) 526-2828 • Fax (808) 536-0027

JOHN WAIHEE
GOVERNOR OF HAWAII

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

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

DEPUTIES
JOHN P. KEPPELER II
DONA L. HANAIKE

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

REF:OCEA:SKK

MAY 7 1993

File No.: 93-546
DOC. ID.: 2732

University of Hawaii, Board of Regents
Bachman Hall, Room 207
2444 Dole Street
Honolulu, Hawaii 96822

Attn: Mr. Ralph T. Horii, Jr.

Dear Regents:

Subject: Draft Environmental Assessment (DEA): University of Hawaii (U.H.) Food Service Facility, Manoa, Oahu, TMK: 2-8-23: por. 3

We have reviewed the DEA information for the proposed food service facility transmitted by AM Partners, Inc.'s letter dated April 8, 1993, and have no comments to offer at this time.

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

Thank you for the opportunity to comment on this matter.

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

Very truly yours,

KEITH W. AHUE

cc: Taeyong M. Kim
OEQC

AM Partners, Inc.
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12 May 1993

Department of Land and Natural Resources
Attn: Mr. Keith W. Ahue, Chairperson
P.O. Box 621 Honolulu, Hawaii 96809
Honolulu, Hawaii 96813

PROJECT: University of Hawaii at Manoa
Food Service Facility

SUBJECT: Draft Environmental Assessment

Dear Mr. Ahue,

Thank you for your letter in response to our Draft Environmental Assessment for the above referenced project. Your letter will be published in the Final Environmental Assessment for the project.

Sincerely,
AM Partners, Inc.

Taeyong M. Kim

930512

1164 Bishop Street • Suite 1000 • Honolulu • Hawaii 96813
Phone (808) 526-2828 • Fax (808) 538-0027

University of Hawaii at Manoa

Facilities Planning and Management Office
Physical Plant Building • 2002 East-West Road • Honolulu, Hawaii 96822
Facsimile: (808) 956-5365

May 7, 1993

MEMORANDUM

TO: Ralph T. Horii, Jr.
Vice President for Finance and Operation

VIA: Allan Ah San
Director, Campus Operations

FROM: Michael Yoneda
Director, Facilities Planning and Management Office

SUBJECT: Draft Environmental Assessment (DEA)
Food Service Facility
University of Hawaii at Manoa

We have reviewed the draft environmental assessment (DEA) and find that most of our comments noted in a previous preliminary DEA have been addressed. Two general area of concerns remain.

1. The scale, mass, architectural treatment, landscape and siting of this building on a relatively small site is an on-going concern. We understand the consultant architect is working with the consultant campus planning firm to resolve these problems.

2. The noise impact of an air conditioned food service facility located between a library and a classroom building is another concern addressed in the DEA and backed by an engineering study. We recommend specifying in the construction documents, D.A.G.S. design criteria for acceptable noise level limits and acceptable remedial solutions if the limits are exceeded.

Please contact me if you have further questions regarding this matter.

MY:la

cc: AM Partners, Incorporated ✓
OEQC

AM Partners, Inc.
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12 May 1993

University of Hawaii at Manoa
Facilities Planning and Management Office
Attn: Mr. Michael Yoneda, Director
650 South King Street, 9th Floor
Honolulu, Hawaii 96813

PROJECT: University of Hawaii at Manoa
Food Service Facility

SUBJECT: Draft Environmental Assessment

Dear Mr. Yoneda,

Thank you for your letter in response to our Draft Environmental Assessment for the above referenced project. We have noted your concerns and offer the following responses:

1. The consultant architects have resolved all design issues and have received the approval of the campus planning consultant.

2. As stated in the noise impact study, DAGS noise levels limits will be met in the adjacent classrooms and library. These DAGS acceptable noise level limits will be specified in the construction documents for the project. A reference to the noise study will also be included in the construction documents so serve as a source for acceptable remedial solutions if DAGS noise limits are exceeded.

Your letter will be published in the Final Environmental Assessment for the project.

Sincerely,
AM Partners, Inc.

Taeyong M. Kim

930512

1164 Bishop Street • Suite 1000 • Honolulu • Hawaii 96813
Phone (808) 526-2828 • Fax (808) 538-0027

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

May 6, 1993

University of Hawaii
Board of Regents
Bachman Hall, Room 207
2444 Dole Street
Honolulu, Hawaii 96822

Attn: Mr. Ralph T. Horii, Jr., Vice President

Gentlemen:

Subject: Draft Environmental Assessment (DEA) for the UH Food Service Facility at the University of Hawaii at Manoa, Honolulu, TMK: 2-8-23: Portion 3

Thank you for the opportunity to review and comment on the proposed food service facility project.

We have the following comments to offer:

1. A water allocation for the project must be obtained from the State Department of Land and Natural Resources.

2. The availability of water will be confirmed when the Building Permit application is submitted for our review and approval. Water System Facilities Charges will be assessed for transmission and daily storage.

3. The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

4. Board of Water Supply approved Reduced Pressure Principle Backflow Prevention Assemblies are required to be installed at the service connection to the facility. The cross-connection control requirements for the facility were approved by the Board on April 28, 1993.

If you have any questions, please contact Roy Doi at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

cc: AM Partners, Inc.
(Attn: Mr. Taeyong Kim)

AM Partners, Inc.
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12 May 1993

Board of Water Supply
Attn: Mr. Kazu Hayashida, Manager and Chief Engineer
630 South Beretania Street
Honolulu, Hawaii 96817

PROJECT: University of Hawaii at Manoa
Food Service Facility

SUBJECT: Draft Environmental Assessment

Dear Mr. Hayashida,

Thank you for your letter in response to our Draft Environmental Assessment for the above referenced project. We have reviewed your comments and offer the following responses:

1. We understand that water allocation for the project must be obtained from the Department of Land and Natural Resources.

2. We understand that water availability will be confirmed upon review of the Building Permit application. Applicable charges will be assessed for transmission and daily storage.

3. Fire protection requirements will be coordinated with the Honolulu Fire Department.

4. Reduced Pressure Principle Backflow Prevention Assemblies will be incorporated in the engineering plans for the facility.

Your letter will be published in the Final Environmental Assessment for the project.

Sincerely,
AM Partners, Inc.

Taeyong M. Kim

9305012

1164 Bishop Street • Suite 1000 • Honolulu • Hawaii 96813
Phone (808) 526-2828 • Fax (808) 538-0027

BUILDING DEPARTMENT
CITY AND COUNTY OF HONOLULU
HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU HAWAII 96813

FRANK F. FASI
MAYOR

HERBERT K. MURAOKA
DIRECTOR AND BUILDING SUPERINTENDENT
WILLIAM REGULAR
DEPUTY

PB 93-419

April 20, 1993

AM Partners, Inc.
1164 Bishop Street, Suite 1000
Honolulu, Hawaii 96813

Attn: Mr. Taeyong Kim

Gentlemen:

Subject: University of Hawaii at Manoa
Food Service Facility
Draft Environmental Assessment

We have reviewed the subject draft environmental assessment and have no comments to offer. Thank you for allowing us the opportunity to review the document.

Very truly yours,

HERBERT K. MURAOKA
Director and Building Superintendent

cc: J. Harada
UH Board of Regents
(Attn: Ralph T. Horii, Jr., VP)

AM Partners, Inc.
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interiors
graphics

8 May 1993

Building Department
Attn: Mr. Herbert K. Muraoka, Director
650 South King Street, 1st Floor
Honolulu, Hawaii 96813

PROJECT: University of Hawaii at Manoa
Food Service Facility

SUBJECT: Draft Environmental Assessment

Dear Mr. Muraoka,

Thank you for your letter in response to our Draft Environmental Assessment for the above referenced project. Your letter will be published in the Final Environmental Assessment for the project.

Sincerely,
AM Partners, Inc.

Taeyong M. Kim

930506

1164 Bishop Street • Suite 1000 • Honolulu • Hawaii 96813
Phone (808) 526-2828 • Fax (808) 538-0027

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

FRANK F. FASI
MAYOR

ROBIN FOSTER
CHIEF PLANNING OFFICER

ROLAND D. LIBBY, JR.
DEPUTY CHIEF PLANNING OFFICER

TH 4/93-942

April 19, 1993

Board of Regents
University of Hawaii
2444 Dole Street
Bachman Hall, Room 207
Honolulu, Hawaii 96822

Attention: Mr. Ralph T. Horii, Jr.
Vice President

Gentlemen:

Draft Environmental Assessment (DEA)
University of Hawaii at Manoa Food Service Facility,
Honolulu, Oahu, Hawaii

In response to AM Partners, Inc.'s letter of April 8, 1993, we have reviewed the subject DEA and have no comments to offer at this time.

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

Sincerely,

ROBIN FOSTER
Chief Planning Officer

RF:lh

cc: AM Partners, Inc.
Attention: Mr. Taeyong M. Kim

AM Partners, Inc.
architecture
planning
interiors
graphics

8 May 1993

Planning Department
Attn: Mr. Robin Foster, Chief Planning Officer
650 South King Street, 8th Floor
Honolulu, Hawaii 96813

PROJECT: University of Hawaii at Manoa
Food Service Facility

SUBJECT: Draft Environmental Assessment

Dear Mr. Foster,

Thank you for your letter in response to our Draft Environmental Assessment for the above referenced project. Your letter will be published in the Final Environmental Assessment for the project.

Sincerely,
AM Partners, Inc.

Taeyong M. Kim

930506

1164 Bishop Street • Suite 1000 • Honolulu • Hawaii 96813
Phone (808) 526-2828 • Fax (808) 538-0027

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU HAWAII 96813

FRANK F. FASI
MAYOR

WALTER M. OZAWA
DIRECTOR
ELWYNE C. AU
DEPUTY DIRECTOR

April 30, 1993

Board of Regents
University of Hawaii
Bachman Hall, Room 207
2444 Dole Street
Honolulu, Hawaii 96822

Attention: Mr. Ralph T. Horii, Jr.

Subject: Draft Environmental Assessment for the
University of Hawaii at Manoa
Food Service Facility
Honolulu, Oahu, Hawaii

Thank you for the opportunity to comment on the Draft Environmental Assessment (DEA) for the proposed improvements to the University of Hawaii at Manoa, Food Service Facility. We have completed our review of the DEA and have no comments to offer at this time.

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

for WALTER M. OZAWA, Director

WHO:ei

✓ cc: Am Partners, Inc. (Taeyong Kim)

AM Partners, Inc.
architecture
planning
interiors
graphics

8 May 1993

Department of Parks and Recreation
Attn: Mr. Walter M. Ozawa, Director
650 South King Street, 9th Floor
Honolulu, Hawaii 96813

PROJECT: University of Hawaii at Manoa
Food Service Facility

SUBJECT: Draft Environmental Assessment

Dear Mr. Ozawa,

Thank you for your letter in response to our Draft Environmental Assessment for the above referenced project. Your letter will be published in the Final Environmental Assessment for the project.

Sincerely,
AM Partners, Inc.

Taeyong M. Kim

930506

1164 Bishop Street • Suite 1000 • Honolulu • Hawaii 96813
Phone (808) 526-2828 • Fax (808) 538-0027

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

[illegible]

[illegible]

JOSEPH M. MAGALDI JR.
DIRECTOR

AMAR SAPPAL
DEPUTY DIRECTOR

TE-1372
PL93.1.140

May 14, 1993

Mr. Taeyong Kim
AM Partners, Inc.
1164 Bishop Street, Suite 1000
Honolulu, Hawaii 96813

Dear Mr. Kim:

Subject: UH Food Service Facility
Draft Environmental Assessment
TMK: 2-8-23: 03

This is in response to your April 8, 1993 request for our comments on the Draft Environmental Assessment of the subject project.

We have no objections or comments to offer at this time.

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

Sincerely,

JOSEPH M. MAGALDI, JR.
Director

cc: University of Hawaii

AM Partners, Inc.
architecture
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interiors
graphics

18 May 1993

Department of Transportation Services
Attn: Mr. Joseph M Magaldi, Jr., Director
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

PROJECT: University of Hawaii at Manoa
Food Service Facility

SUBJECT: Draft Environmental Assessment

Dear Mr. Magaldi,

Thank you for your letter in response to our Draft Environmental Assessment for the above referenced project. Your letter will be published in the Final Environmental Assessment for the project.

Sincerely,
AM Partners, Inc.

Taeyong M. Kim

9305118

1164 Bishop Street • Suite 1000 • Honolulu • Hawaii 96813
Phone (808) 526-2828 • Fax (808) 538-0027

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

FRANK F. FASI
MAYOR

MICHAEL S. NAKAMURA
CHIEF

HAROLD M. KAWASAKI
DEPUTY CHIEF

OUR REFERENCE BS-LK

April 15, 1993

Mr. Ralph T. Horii, Jr.
Vice President
University of Hawaii
Board of Regents
2444 Dole Street
Bachman Hall Room 207
Honolulu, Hawaii 96822

Dear Mr. Horii:

This is in response to your letter of April 8, 1993 about the Draft Environmental Assessment for a Food Service Facility at the University of Hawaii at Manoa.

We are pleased to note that, according to the document, dust, noise, and traffic impacts will be mitigated during construction.

Please amend Section 3 on page 21 as follows. Delete the sentence pertaining to the Honolulu Police Department and add this sentence: The Honolulu Police Department will provide police services at the project site should it become necessary. The project site lies within District 7, Central Patrol Bureau.

Thank you for the opportunity to review this document.

Sincerely,

MICHAEL S. NAKAMURA
Chief of Police

By
CHESTER E. HUGHES
Assistant Chief of Police

cc: AM Partners, Inc.

AM Partners, Inc.
architecture
planning
interiors
graphics

8 May 1993

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

PROJECT: University of Hawaii at Manoa
Food Service Facility

SUBJECT: Draft Environmental Assessment

Dear Mr. Nakamura,

Thank you for your letter in response to our Draft Environmental Assessment for the above referenced project. The Final Environmental Assessment will be revised to reflect the information you have provided. Your letter will be published in the Final Environmental Assessment for the project.

Sincerely,
AM Partners, Inc.

Taeyong M. Kim

930506

1164 Bishop Street • Suite 1000 • Honolulu • Hawaii 96813
Phone (808) 526-2828 • Fax (808) 538-0027

CHAPTER XI
REFERENCES

XI. REFERENCES

Department of Business, Economic Development and Tourism (DBED). The State of Hawaii Data book. Honolulu. 1990.

Federal Emergency Management Agency. FIRM Flood Insurance Rate Map. City and County of Honolulu, Hawaii. September 4, 1987.

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APPENDICES

APPENDIX A
SOILS STUDY

REPORT
SOILS INVESTIGATION

PROPOSED FOOD SERVICE FACILITY
UNIVERSITY OF HAWAII - MANOA CAMPUS
HONOLULU, HAWAII
TMK: 2-8-23: PORTION 3

for

MARRIOTT INTERNATIONAL HEADQUARTERS
MARRIOTT MANAGEMENT SERVICES

AH PARTNERS
Architects

Project No. H-2071-F
September 25, 1992

SOILS INTERNATIONAL
A CORPORATION
Geotechnical Consultants

99-1255 WAIUA PLACE
AIEA, HAWAII 96701
PHONE: (808) 488-0433
FAX: (808) 488-9535

360 PAPA PLACE, #102
KAHULUI, MAUI, HAWAII 96732
PHONE: (808) 877-3789
FAX: (808) 871-1592

99-1255 WAIUA PLACE, AIEA, HAWAII 96701 (808) 488-0433 FAX (808) 488-9535

September 25, 1992
Project No. H-2071-F

Marriott International Headquarters
Marriott Management Services
One Marriott Drive
Washington, D.C. 20058

Attention: Mr Kent Rattan
Project Manager
Department 834.79

Gentlemen:

The attached report presents the results of a soils investigation at the site of the proposed Harriott Food Service Facility to be located at the University of Hawaii-Hamilton Hall in Manoa, Honolulu, Hawaii.

A summary of the findings is as follows:

1) Five (5) test borings were drilled to depths of 12.25 to 17.0 feet below grade to determine the subsurface conditions at the site. In general, the borings disclosed the site to be underlain by brown and red brown, moderately stiff to stiff clayey SILT to depths of 1.0 to 9.5 feet. Beneath the clayey SILT, variable soil conditions which consisted of silty SAND (CINDERS), sandy GRAVEL (CINDERS and CLINKERS), BOULDERS and BASALT were encountered to the final depths of the borings.

2) No groundwater was encountered in any of the borings at the time of the investigation.

3) Spread footings bearing on firm on-site soils or properly compacted fill may be used to support the proposed structure.

4) The on-site clayey soils have moderate to high expansion potential. It is recommended that the on-site clayey soils be removed to a depth of 24 inches below slab-on-grade areas and replaced with properly compacted select granular fill.

Details of the findings and recommendations are presented in the attached report.

This investigation was made in accordance with generally accepted engineering procedures and included such field and laboratory tests considered necessary for the project. In the opinion of the undersigned, the accompanying report has been substantiated by mathematical data in conformity with generally accepted engineering principles and presents fairly the design information requested by your organization. No other warranty is either expressed or given.

Respectfully submitted,

SOILS INTERNATIONAL

Lawrence S. Shinsato

Lawrence S. Shinsato, P.E.
Vice-President

LSS:RCR:rr

cc: AH Partners

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This work was prepared by me or done under my supervision.

TABLE OF CONTENTS

INTRODUCTION

This investigation was made for the purpose of obtaining information on the subsurface conditions from which to base recommendations for foundation design for the proposed Harriott Food Service Facility to be located at the University of Hawaii - Manoa Campus in Honolulu, Hawaii. The location of the site, relative to the existing streets and landmarks, is shown on the Vicinity Map, Plate 1.

SCOPE OF WORK

The services included drilling 5 test borings to depths of 12.25 to 17.0 feet, obtaining samples of the underlying soils, performing laboratory tests on the representative soil samples to determine their engineering characteristics, and performing an engineering analysis from the data gathered. In general, the following information is provided for use by the Architect and/or Engineer:

1. General subsurface conditions, as disclosed by the borings.
2. Physical characteristics of the soils encountered.
3. Recommendations for foundation design, including bearing values, embedment depth and estimated settlement.
4. Recommendations for placement of fill and backfill.
5. Special consideration.

PLANNED DEVELOPMENT

From the information provided, the project will consist of constructing a one-story, food service facility on the property.

SITE CONDITIONS

Surface

The site is a relatively flat lawn area located immediately east of the Hamilton Library. The area is bound by the Hamilton Library on the west, Moore Hall and Henke Hall on the east, McCarthy Mall on the south and Maile Way on the north. Along the eastern side of the area, the ground slopes gently upwards toward the eastern boundary of the site. At the southwestern corner, there is a 4-foot high mound. There are numerous trees throughout the perimeter of the site.

From the topographic map provided by others, elevations range from 88' at the center of the lot to +94 at the eastern side and southwestern corner of the lot.

There is a drainline that runs through the middle of the proposed building area. Along the eastern side of the site, there are numerous underground utilities.

Subsurface

The subsurface condition at the site was explored by drilling 5 test borings to depths of 12.25 to 17.0 feet below existing grade. The locations of the test borings are shown on the Plot Plan, Plate 2. Detailed logs of the test borings are presented in the Appendix to this report.

At Boring 1, moderately stiff to very stiff, brown clayey SILT with some gravel and sand was found to a depth of 6 feet. Boulders and cobbles were found in the clayey SILT layer at 1.5 to 3 feet. Beneath the SILT, dense to very dense, orange-brown silty SAND (cinders) with gravel was encountered to a depth of 9.5 feet followed by loose to moderately dense, gray-brown sandy GRAVEL to a depth of 14 feet. The boring was terminated at 14 feet on either BOULDER or BASALTIC ROCK.

At Boring 2, moderately stiff to stiff, brown clayey SILT with gravel and sand was found to a depth of 6 feet grading to orange-brown from 6 to 9 feet. Boulders and cobbles were found in the clayey SILT layer at 2 to 6 feet. Beneath the SILT, loose to moderately dense, gray-brown sandy GRAVEL was encountered to a depth of 10 feet followed by hard, gray-brown BASALTIC ROCK to the final depth of the boring at 17 feet.

At Boring 3, moderately stiff to stiff, brown clayey SILT with gravel and sand, and few cobbles was found to a depth of 3.5 feet followed by loose, brown sandy GRAVEL to a depth of 4.5 feet. Beneath the GRAVEL, very dense to hard BOULDERS or fractured BASALTIC ROCK was found to a depth of 10 feet followed by moderately dense, gray-brown sandy GRAVEL (clinkers) to the final depth of the boring at 13.5 feet.

At Boring 4, stiff, brown clayey SILT with gravel and sand was found to a depth of 1.5 feet grading to very stiff, red-brown to brown clayey SILT from 1.5 to 6 feet. Beneath the SILT, moderately dense, orange-brown to brown sandy GRAVEL was encountered to the final depth of the boring at 13 feet.

At Boring 5, moderately stiff, red-brown clayey SILT with gravel and some sand was found to a depth of 1 foot followed by moderately dense, gray-brown sandy GRAVEL to a depth of 9.5 feet. Beneath the GRAVEL, moderately dense, orange-brown silty SAND with gravel was found to a depth of 12 feet followed by moderately dense, orange-brown CLINKERS (gravel) to the final depth of the boring at 12.25 feet.

No groundwater was encountered in any of the borings at the time of the investigation.

From the USDA Soil Conservation Service, "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii", the site is located in an area designated as Makiki stony clay loam, 0 to 3 percent slopes (MlA). The Makiki series consists of well-drained soils on alluvial fans and terraces in the city of Honolulu on the island of Oahu. These soils formed in alluvium mixed with volcanic ash and cinders. The stones are angular and make up about 15 percent of the soil volume. Permeability is moderately rapid.

Runoff is slow and the erosion hazard is no more than slight (USDA, 1972, pg. 91-92 and Plate 62).

Geology

The site is located on the southeasterly side of elongated Koolau Mountain Range. The mountain range is believed to have formed during late Tertiary/early Pleistocene time (between 1 and 12 million years ago). Lava flowed from rift zones roughly paralleling the existing mountain crest trends. After a period of volcanic quiet, late stage-stage volcanic eruptions occurred on the southeasterly end of the Koolau mountains. These late-stage eruptions, known as the Honolulu Volcanic Series, form familiar landmarks on Oahu such as Diamond Head, Punchbowl, Tantalus, Aliamanu and Salt Lake craters (Stearns, 1967).

The underlying BASALTIC ROCK is part of the Sugarloaf lava flow that has been dated as 67,000 years old (Gramlich et al., 1971). The flow originated at the Sugarloaf vent (above Round Top) and cascaded down the west side of Manoa Valley. The flow continued down the valley floor and spread out over the present University of Hawaii Campus including the lower campus area (old Moiliili Quarry). A small segment of the flow continued southward into Moiliili and is exposed in cuts at the Waialae Avenue off-ramp to the H-1 freeway (MacDonald, 1986).

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the findings and observations of this investigation, it is concluded that the proposed structure may be supported on spread footings.

Special Considerations

The on-site clayey soils have moderate to high expansion potential. It is recommended that concrete slabs-on-grade be designed with a minimum of 24 inches of select granular fill beneath the slab in order to minimize the possible adverse effects from expansive soils (see Slab-on-grade section to this report).

There are numerous underground utilities. Where encountered under new foundations, the foundation shall be designed to span over the utility trench or the utility line should be re-routed and the old utility line trench should be removed and then backfilled with structural backfill.

Boulders were found in the borings. Excavations may be hampered by the boulders. Any removed boulder material should be hauled from the site.

Foundations

An allowable bearing value of 3,000 pounds per square foot may be

used for footings bearing on firm on-site soils or properly compacted fill. The minimum embedment depth shall be 24 inches below lowest adjacent grade.

For footings located adjacent to new or existing utility trenches, the bottom of the footing shall be deepened below a 1 horizontal to 1 vertical plane projected upwards from the edge of the utility trench. In lieu of this, footings may be designed to span over the trench.

For footings located on or adjacent to slopes, the footing shall be deepened such that there is a minimum horizontal distance of 5 feet from the edge of the footing to the slope face.

The bearing value is for dead plus live loads and may be increased by one-third for momentary loads due to wind or seismic forces. If any footing is eccentrically loaded, the maximum edge pressure shall not exceed the bearing pressure for permanent or for momentary loads.

All loose and disturbed soil at the bottom of footing excavations shall be removed to firm soil or the disturbed soil shall be compacted prior to laying of steel or placing of concrete.

Settlement

Under the fully applied recommended bearing pressure, it is estimated that settlement of footings up to 3 feet continuous or 5 feet square bearing on firm on-site soils or properly compacted fill will be less than 1 inch.

Differential settlement between footings will vary according to the size and bearing pressure of the footing.

Lateral Resistance

For resistance of lateral loads, such as wind or seismic forces, an allowable passive resistance equivalent to that exerted by a fluid weighing 300 pounds per cubic foot may be used for footings, or other structural elements, provided the vertical surface is in direct contact with undisturbed soil or properly compacted fill.

Frictional resistance between footings and the underlying soils may be assumed as 0.4 times the dead load.

Lateral resistance and friction may be combined.

Retaining Walls

Foundations for retaining walls shall be designed as per the foundation section of this report. Where foundations for retaining walls are located on or adjacent to slopes, the horizontal setback

from the edge of the footing to the slope face shall be 5 feet regardless of the size of the footing. It is important to verify that the bottom of the footing, especially the toe, is bearing on stiff material.

For free-standing retaining walls with properly draining backfill, the following active earth (equivalent fluid) pressures may be used:

Backfill Slope	Active Earth Pressure (pcf) Horizontal	Vertical
(On-site soil)		
Level	45	0
3H:1V	50	17
2H:1V	60	30
(Select Granular Fill)*		
Level	30	0
3H:1V	35	12
2H:1V	40	20

*these values may be used when select granular material extends behind the wall stem a horizontal distance equal to at least 1/2 times the wall height.

For restrained walls, such as basement walls, the above active earth pressure shall be increased by 50 percent.

Drainage for the retaining wall backfill shall be accomplished by providing 4-inch diameter weepholes spaced 6-feet on-center (horizontally as well as vertically) or by using a minimum 4-inch diameter perforated PVC footing drain pipe. A 2-foot thick layer of crushed gravel, which is wrapped with geotextile filter fabric, shall be placed above the pipe; the crushed gravel shall be continuous from weephole to weephole, or in the case of a footing

drain pipe, laid throughout the full length of the pipe. Geotextile fabric shall be SUPAC 4NP, or similar.

The backfill for the retaining wall shall be properly compacted in accordance with the Site Preparation and Grading section to this report. Also, surface drainage shall be designed to minimize surface water runoff from entering the backfill area.

The above active pressures do not include surcharge loads such as footings located within a 45 degree plane projected upwards from the heel of the footing, and/or from hydrostatic pressures. If such conditions occur, the active pressure shall be increased accordingly.

Slab-on-Grade

The on-site clayey soil has moderate to high expansion potential. In order to minimize the possible adverse effects from expansive soils, it is recommended that at least 24 inches of select granular fill be placed beneath the concrete floor slabs. Any granular cushion or moisture barrier may be considered a part of the 24 inch thickness.

Preparation of slab-on-grade areas shall be done in accordance with the Site Preparation and Grading section to this report. It is

recommended that floor slabs with moisture sensitive floor covering be protected with a moisture barrier.

Slopes

Cut and fill slopes shall not exceed 2 horizontal to 1 vertical. Exposed slopes shall be covered as soon as practical after construction to minimize erosion.

Fill slopes shall be constructed by either overfilling and cutting back to compacted soil, or the slope shall be track rolled.

Pavement Design

For design of flexible pavements, the following pavement sections are recommended:

Gross Vehicle Weight	A.C.	Base	Select Borrow
under 10,000 lbs.	2"	6"	0
under 20,000 lbs.	2"	6"	6"
over 20,000 lbs.	2"	6"	12"

All material quality and compaction requirements for the pavement section shall be in accordance with the City and County of Honolulu, Department of Public Works "Standard Specifications for Public Works Construction", dated September 1986.

Site Preparation and Grading

It is recommended that the site be prepared in the following manner:

1. In all areas to receive fill and in structural areas, all

vegetation, weeds, brush, roots, stumps, rubbish, debris, soft soil and other deleterious material shall be removed and disposed of off-site.

2. The exposed surface shall then be proof-rolled to detect any loose or soft areas. If encountered, these areas shall be compacted to the degree specified below, or the loose soil shall be removed to firm ground and the resulting depression shall be filled with properly compacted fill.

3. Fill and backfill material shall consist of soil which is free of organics and debris. The material shall be less than 3 inches in greatest dimension. In the upper 24 inches from finished subgrade below slabs, the material shall consist of non-expansive material. The on-site clayey soil is not suitable for re-use as fill and backfill within 24 inches below bottom of slabs.

   Non expansive material shall consist of soil with a ring swell of less than 3% (air-dry to saturation, 144 psf surcharge load). Material such as select borrow, crushed coral, sand, well-graded gravel or similar will meet the criteria for non-expansive material.

4. Fill and backfill material shall be placed in lifts not

exceeding 8 inches in loose thickness. Prior to placing of the fill, the material shall be aerated or moistened to near optimum moisture content (ASTM D-1557 test procedure).

Where fill is placed on existing ground that is steeper than 5 horizontal to 1 vertical, the existing ground surface shall be benched into firm soil as the fill is placed.

5. Each layer of fill and backfill shall be thoroughly compacted to the following minimum degree of compaction:

Structural Fill	95 percent*
Non-structural Fill	90 percent*

*of maximum dry density as determined by the ASTM D1557-78 test procedure.

6. During construction, drainage shall be provided to minimize ponding of water adjacent to or on foundation and pavement areas. Ponded areas shall be drained immediately or water pumped out without damaging adjacent structures and property. If water accumulation softens the subgrade materials, the affected soils shall be removed and replaced with properly compacted fill.

7. Footing excavations shall be cleaned of any soft, loose and/or

disturbed material prior to placing of steel or pouring of concrete.

It is particularly important to see that all fill and backfill soils are properly compacted in order to maintain the recommended design parameters provided in this report.

INSPECTION

During the progress of construction, so as to achieve the desired results, it is highly recommended that qualified engineering personnel be present to observe the following operations:

1. Site preparation.
2. Placement of fill and backfill.
3. Footing excavations.

REMARKS

The conclusions and recommendations contained herein are based on findings and observations made at the boring locations. If conditions are encountered during construction which appear to differ from those disclosed by the explorations, this office shall be notified so as to consider the need for modifications.

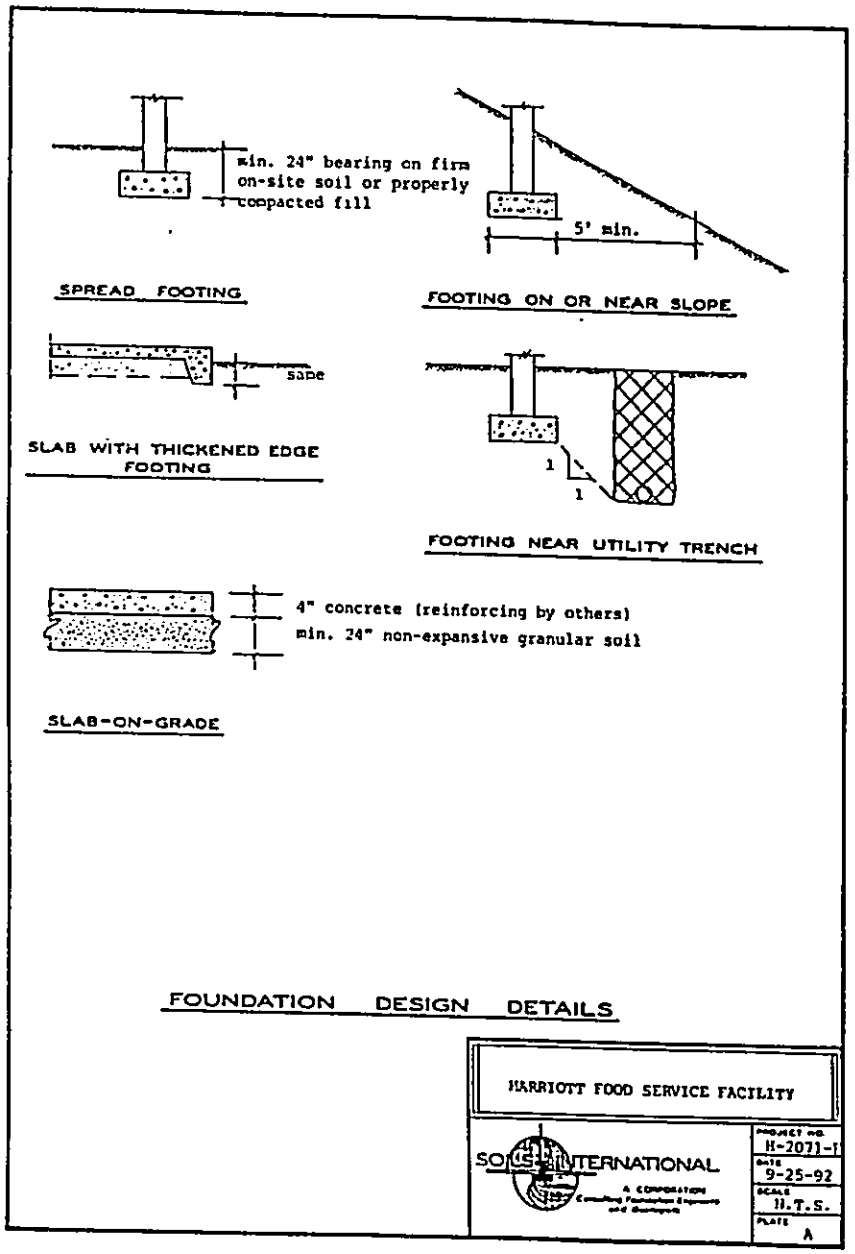
This report has been prepared for the exclusive use of Marriott International Headquarters and their respective design consultants. It shall not be used by or transferred to any other party or to

another project without the consent and/or thorough review by this facility. Should the project be delayed beyond the period of one year from the date of this report, the report shall be reviewed relative to possible changed conditions.

Samples obtained in this investigation will deteriorate with time and will be unsuitable for further laboratory tests within one (1) month from the date of this report. Unless otherwise advised, the samples will be discarded at that time.

The following are included and complete this report:

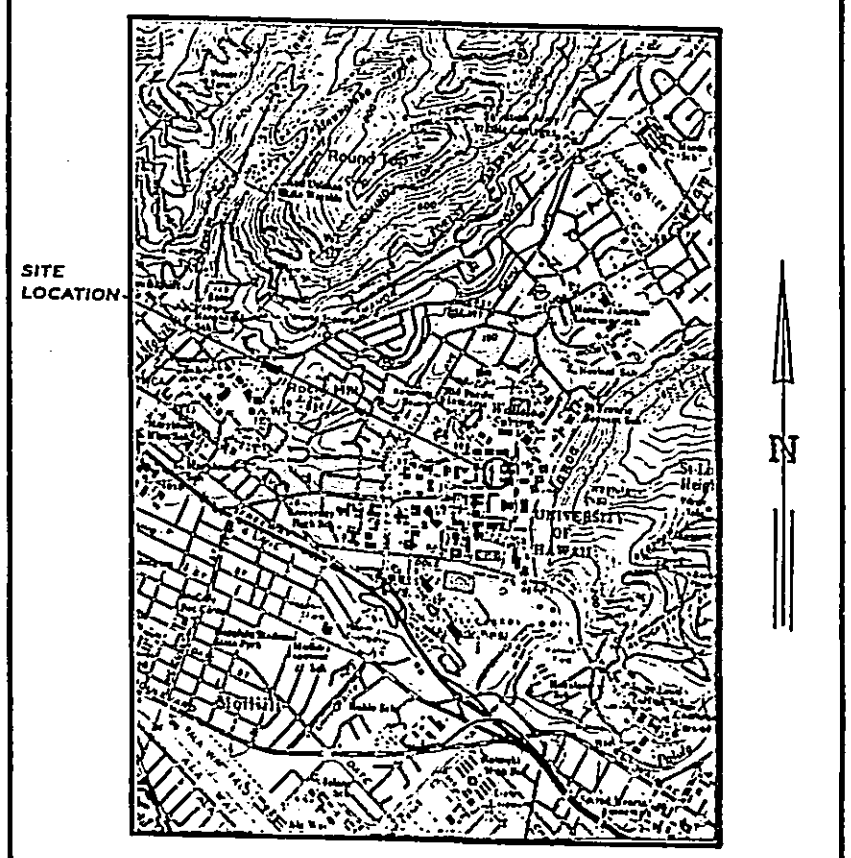
Foundation Design Details ---------- Plate A
Vicinity Map ---------- Plate 1
Plot Plan ---------- Plate 2
Appendix
Field Investigation
Laboratory Testing
Logs of Test Borings
Results of Laboratory Tests



FOUNDATION DESIGN DETAILS

HARRIOTT FOOD SERVICE FACILITY	
SOILS INTERNATIONAL	PROJECT NO. H-2071-F
	DATE 9-25-92
	SCALE N.T.S.
	PLATE A

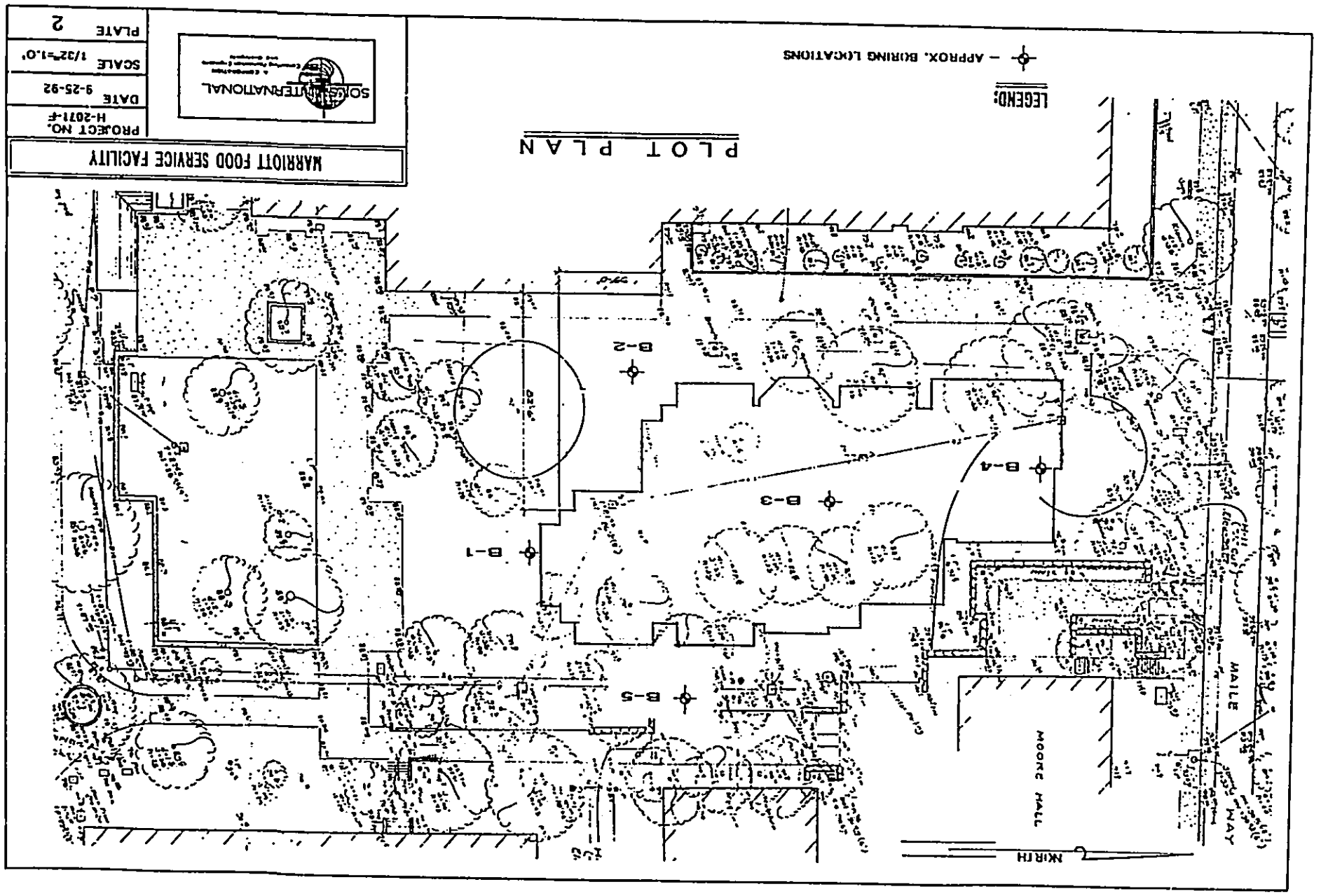
VICINITY MAP



REFERENCE:
USGS TOPOGRAPHIC MAP
HONOLULU QUADRANGLE
Dated: 1983

Project No. H-2071-F

HARRIOTT FOOD SERVICE FACILITY	
SOILS INTERNATIONAL	PROJECT NO.
	DATE 9-25-92
	SCALE 1" = 2000'
	PLATE 1



APPENDIX

FIELD INVESTIGATION AND LABORATORY TESTING

FIELD INVESTIGATION

General

The field investigation consisted of performing explorations at the locations shown on the Plot Plan. The method used for the exploratory work is shown on the respective exploration log. A description of the various method or methods used is presented below.

Test Borings Using Truck-Mounted Drilling Equipment

Truck-mounted borings are drilled using a gas-powered drilling rig. The hole is advanced using continuous flight augers, wash boring and/or NX coring.

Auger drilling is used in soils where caving does not occur. The augers are 4-1/2 inch diameter continuous helical flight augers with the lead auger having a head equipped with changeable cutting teeth. Soil cuttings are brought to the surface by the continuous flights. After the bore hole is advanced to the required depth and cleaned of cuttings by additional rotation of the augers, the augers are retracted for soil sampling or in-situ testing.

In soils where caving of the bore hole occurs, the hole is advanced by wash boring or hollow-stem augering. Wash boring consists of advancing steel casing by rotary action and water pressure to flush the soil from the casing. The lead section of the casing is equipped with a carbide or diamond casing bit. After the casing has been advanced to the required depth, soil samples are obtained through the inside of the casing. Hollow-stem drilling consists of advancing the hole with 7-5/8 inch outside diameter and 4-1/4 inch inside diameter augers. The leading drill bit is connected to drilling rods through the central portion of the auger. At the required sampling depth, the interior drill rods and lead bit are removed, and the soil sample is taken by driving a sampler through the "hollow" section of the augers.

Coring is used for hard formations such as rock, coral or boulders. The core barrel, consisting of a 5-foot long double tube, hardened steel barrel with either a carbide or diamond bit, is attached to drilling rods and set on the hard formation. The core barrel is advanced through the formation by rotation of the core barrel. Water is used to flush out the cuttings. Upon completion of the core run, the sample is removed from the core barrel and inspected. The total core recovery length and the sum of all intact pieces over 4-inch in length are measured. The length of core recovery divided by the length of the core run is the recovery ratio. The combined length of the 4-inch or longer pieces divided by the length of core run is the Rock Quality Designation (RQD). The values provide an indication of the quality of the formation.

Test Borings Using Portable Drilling Equipment

In areas inaccessible to truck-mounted equipment, portable drilling equipment is used to drill the test boring. The boring is advanced by either 1) continuous drive sampling or by 2) using a small gas-powered drill rig with continuous flight augers, wash boring or NX coring.

Soil samples are obtained with a tripod and cathead assembly using soil sampling methods described below.

Test Pits Using Excavators/Hopto

Test pits are excavated using a hopto or backhoe. Material excavated from the pit and the sides and bottom of the pit are visually inspected and a continuous log of the hole is kept.

Explorations Using Hand Tools

In inaccessible areas requiring only shallow explorations, borings and test pits are made using hand equipment. Borings are drilled using hand augers. Test pits are excavated using hand tools. Cuttings from the boring and/or pit are inspected and visually classified.

Soil Sampling

Relatively undisturbed samples of the underlying soils are obtained from borings by driving a sampling tube into the subsurface material using a 140-pound safety hammer falling from a height of 30 inches. Ring samples are obtained using a 3-inch outside diameter, 2.5 inch inside diameter steel sampling tube with an interior lining of one-inch long, thin brass rings. The tube is driven approximately 18 inches into the soil and a section of the central portion is placed in a close fitting waterproof container in order to retain field conditions until completion of the laboratory tests. Standard Penetration Test (SPT) values and disturbed soil samples are obtained with a 2-inch (outside diameter) split-barrel sampler instead of the 3-inch sampler. The number of blows required to drive the sampler into the ground is recorded at 6-inch intervals. The blow count for the last 12-inches is shown on the boring logs.

From test pit excavations, undisturbed samples are retained from cohesive type soil formations and disturbed bulk samples are retained from friable and cohesionless soil formations.

The soil samples are visually classified in the field using the Unified Soil Classification System. Samples are packed in moisture proof containers and transported to the laboratory for testing.

LABORATORY TESTING

General

Laboratory tests are performed on various soil samples to determine their engineering properties. Description of the various tests are listed below.

Unit Weight and Moisture Content

The in-place moisture content and unit weight of the samples are used to correlate similar soils at various depths. The sample is weighed, the volume determined, and a portion of the sample is placed in the oven. After oven-drying, the sample is again weighed to determine the moisture loss. The data is used to determine the wet-density, dry-density and in-place moisture content.

Direct Shear

Direct shear tests are performed to determine the strength characteristics of the representative soil samples. The test consists of placing the sample into a shear box, applying a normal load and then shearing the sample at a constant

rate of strain. The shearing resistance is recorded at various rates of strain. By varying the normal load, the angle of internal friction and cohesion can be determined.

Consolidation Test

Consolidation tests are performed to obtain data from which time rates of consolidation and amounts of settlement may be estimated. The test is performed by placing a specimen in a consolidation apparatus. Loads are applied in increments to the circular face of a one (1) inch high sample. Deformation or changes in thickness of the specimen are recorded at selected time intervals. Water is introduced to or allowed to drain from the sample through porous disks placed against the top and bottom faces of the specimen. The data is then used to plot a stress-volume strain curve which is used in estimating settlement.

Expansion Test - Ring Swell

Expansion tests are performed on clayey soils to determine the expansion potential of the sample. The test is performed using either a remolded or relatively undisturbed field sample. The sample is placed in an expansion apparatus with a one (1) psi surcharge. The sample is saturated and the change in vertical height is recorded. The initial moisture content is varied (field moisture or air-dried) to determine the variation in expansion potential with moisture changes. The data is used to determine the expansion potential of the soil.

Classification Tests

The soil samples are classified using the Unified Soil Classification System. Classification tests include sieve and hydrometer analysis to determine grain size distribution, and Atterberg Limits to determine the liquid limit, plastic limit and plasticity index.

California Bearing Ratio Test

California Bearing Ratio (CBR) tests are performed on materials to determine the bearing strength of the soil for determination of pavement sections. The sample is compacted into a 6-inch diameter mold in 5 equal layers. Each layer is compacted with a 10-pound hammer falling from a height of 18-inches, with each layer receiving 56 blows. The mold is then placed in a water bath for 4-days and the vertical swell is measured under a surcharge weight of 10 pounds. After the soaking period, the sample is placed in a CBR apparatus that has a 3-square inch penetrometer. The penetrometer is pressed vertically into the soil at constant strain and the loads required to press the penetrometer are recorded. A plot of the load-strain relationship is made to determine the CBR value.

Maximum Dry Density/Optimum Moisture Content

The maximum dry density and optimum moisture content of the material is determined in accordance with the ASTM D1557-78 test procedure. The sample is compacted into a mold in 5 equal layers using a 10 pound hammer falling from a height of 18 inches. The diameter of the mold is either 4-inches or 6-inches depending on the proportion of gravel in the sample. The sample is compacted

at various moisture contents to develop a compaction curve for the soil. The curve is usually bell-shaped with a peak indicating the maximum dry density and optimum moisture content.

Penetrometer Test

Penetrometer tests are performed on clayey soils to determine the consistency of the material and an approximate value of the unconfined compressive strength.

Torvane

Torvane tests are used to determine the approximate undrained shear strength of clayey soils. The torvane apparatus consists of a torque device with a small diameter plate that has vanes situated perpendicular to the plate. The vanes are pushed into the soil and torque is applied until failure occurs. The torque required to cause failure is converted to approximate undrained strength of the soil.

LOG OF BORING NO. 1

EQUIPMENT USED: SIMCO

DATE DRILLED: September 2, 1992

ELEVATION:

DEPTH OF BORING: 14.0'

DEPTH TO GROUNDWATER: N.A.

DEPTH (FT)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	BLOWS/FOOT	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT)
0										
		MH	FILL: clayey SILT; some gravel and sand (basalt and calcareous), few roots boulder (1.0' dia.), few cobbles		57	brown	moist to very moist	mod. stiff stiff	88	24.5
5					62		moist	very stiff	91	25.1
		SM	silty SAND: (cinders), with gravel, no roots boulder (1.5' dia.), vesicular cobbles(highly weathered)		51	orange brown		dense to very dense	66	25.6
10		GP	sandy GRAVEL: (cinders), highly weathered, angular clinkers		8	gray brown	sl. moist to moist	loose mod. dense	70	10.9
15			BOULDER or BASALT End of Boring @ 14.0' ATTERBERG LIMITS: @ 2.0' LL=59 PL=33 PI=26 ATTERBERG LIMITS: @ 4.5' LL=56 PL=32 PI=24							

PROJECT NAME: MARRIOTT FOOD SERVICE FACILITY

PROJECT NO. H-2071-F

SOILS INTERNATIONAL

PLATE 3

LOG OF BORING NO. 2

EQUIPMENT USED: SIMCO
DATE DRILLED: September 2, 1992
ELEVATION:
DEPTH OF BORING: 17.0'
DEPTH TO GROUNDWATER: N.A.

DEPTH (FT.)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	BLOWS/FOOT	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT.)
0		MH	FILL: clayey SILT: with gravel and sand, few roots, few cobbles		41	brown	moist to very moist	mod. stiff stiff	97	17.1
			boulder (1.0' dia.), some cobbles							
5			with gravel and sand (highly weathered basalt)		25	orange brown	moist		68	37.1
10			sandy GRAVEL: (cinders), highly weathered		23	gray brown		loose to mod. dense	82	22.4
			BASALT, highly weathered					hard		
15			fractured	core run #1						
			End of Boring @ 17.0'							

CORE RUN #1, 13.5' to 17.0'
Coring Time:
13.5' to 14.5': 11 min.
14.5' to 15.5': 5 min.
15.5' to 16.5': 6 min.
16.5' to 17.0': 4 min.

PROJECT NAME: MARRIOTT FOOD SERVICE FACILITY
PROJECT NO. H-2071-F
SOILS INTERNATIONAL
PLATE 4

LOG OF BORING NO. 3

EQUIPMENT USED: SIMCO
DATE DRILLED: September 2, 1992
ELEVATION:
DEPTH OF BORING: 13.5'
DEPTH TO GROUNDWATER: N.A.

DEPTH (FT.)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	BLOWS/FOOT	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT.)
0		MH	FILL: clayey SILT: with highly weathered gravel, some sand, few cobbles and roots		32	brown	moist to very moist	mod. stiff stiff	83	33.8
		GP	sandy GRAVEL: (cinders)		13			loose	81	37.1
5			BOULDER or fractured BASALT			gray brown		very dense to hard		
10		GP	sandy GRAVEL: (CLINKERS)		17			mod. dense		13.8
			End of Boring @ 13.5'		18					7.1
15										

PROJECT NAME: MARRIOTT FOOD SERVICE FACILITY
PROJECT NO. H-2071-F
SOILS INTERNATIONAL
PLATE 5

LOG OF BORING NO. 4

EQUIPMENT USED: SIHCO
DATE DRILLED: September 22, 1992
ELEVATION:
DEPTH OF BORING: 13.0'
DEPTH TO GROUNDWATER: N.A.

DEPTH (FT)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	BLOWS/FOOT	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT)
0		MH	FILL: clayey SILT; with highly weathered gravel, some sand, few roots, multi-colored mottling			brown	moist	stiff		
					54	red brown to brown		very stiff	86	25.2
5					56				84	20.9
		GP	sandy GRAVEL; highly weathered, some silty areas cinders/clinker zone		28	orange brown to brown	sl. moist to moist	mod. dense	69	29.0
10					69			mod. dense to dense		14.3
			End of Boring @ 13.0'		12/0"					
15			EXPANSION TEST RESULTS: @ 2.5' 7.2% Air dried to saturated 3.8% Field moisture to saturated ATTERBERG LIMITS: @ 2.5' LL=57 PL=31 PI=26							

PROJECT NAME: HARRIOTT FOOD SERVICE FACILITY
PROJECT NO. H-2071-F
SOILS INTERNATIONAL
PLATE 6

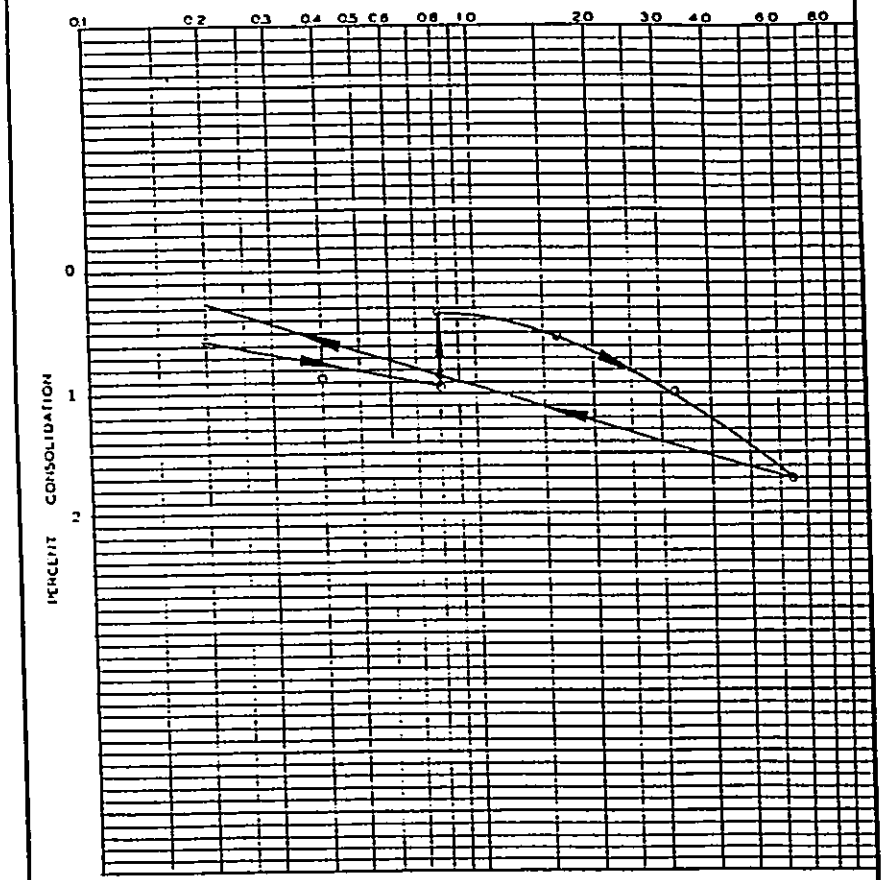
LOG OF BORING NO. 5

EQUIPMENT USED: TRIPOD/HIHUTEHAN
DATE DRILLED: September 3, 1992
ELEVATION:
DEPTH OF BORING: 12'-3"
DEPTH TO GROUNDWATER: N.A.

DEPTH (FT)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	BLOWS/FOOT	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT)
0		MH	FILL: clayey SILT; with gravel, some sand, few roots and black mottlings			red brown	moist	mod. stiff		
			sandy GRAVEL, (basalt and calcareous), with silty areas, few roots		35	gray brown		mod. dense	94	15.1
5			few red brown clayey areas		37				93	11.4
					32				93	11.0
			few cobbles, highly weathered							
10		SM	silty SAND; with gravel, few clayey areas and multi-colored mottlings		42	orange brown	sl. moist to moist		95	20.0
			boulder							
		GP	CLINKERS							
15			End of Boring @ 12'-3"							

PROJECT NAME: HARRIOTT FOOD SERVICE FACILITY
PROJECT NO. H-2071-F
SOILS INTERNATIONAL
PLATE 7

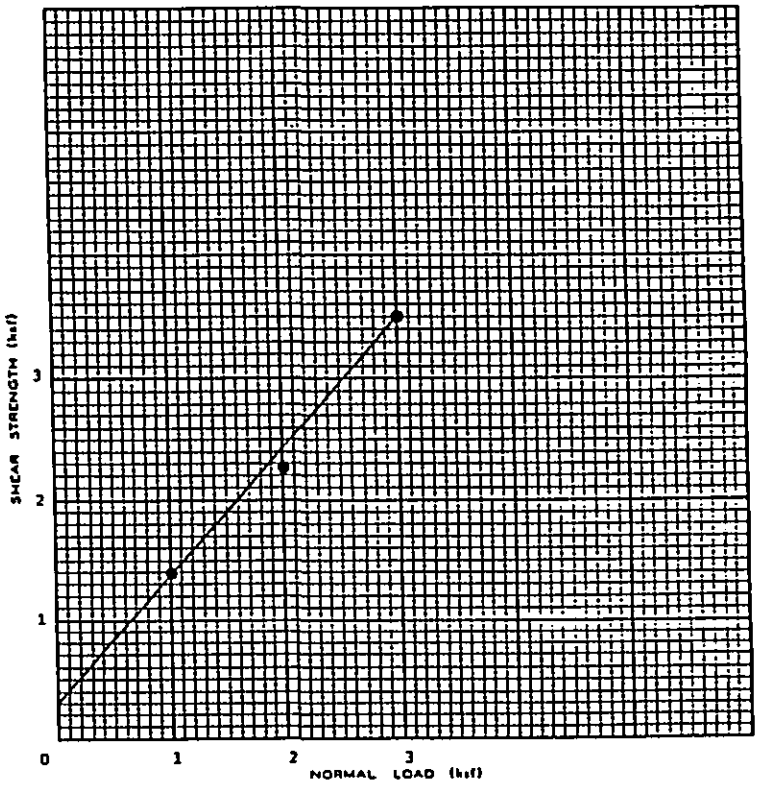
CONSOLIDATION TEST DATA



BORING / TEST PIT NO.: 1
DEPTH: 4.5'
WATER ADDED AT: 0.80 ksf.

PROJECT:	PROJECT NO.		PLATE
MARRIOTT FOOD SERVICE FACILITY	H-2071-F	SOILS INTERNATIONAL 99-1255 WAIUA PL. AIEA, HAWAII 96701	8

DIRECT SHEAR TEST



	LOCATION	DEPTH (ft)	COHESION (psf)	ANGLE OF INTERNAL FRICTION	TEST CONDITIONS
●	B-1, S-3	7.0'	300	46°	Field Density-Peak Strength

PROJECT:	PROJECT NO.		PLATE
MARRIOTT FOOD SERVICE FACILITY	H-2071-F	SOILS INTERNATIONAL 99-1255 WAIUA PLACE AIEA, HAWAII 96701	9

APPENDIX B
NOISE STUDY

Y. Ebisu & Associates
Acoustical and Electronic Engineers
1126 12th Avenue
Room 305
Honolulu, Hawaii 96816
(808)735-1634

November 19, 1992
YEA Job #30.058

AM Partners, Inc.
1164 Bishop Street, Suite 1000
Honolulu, Hawaii 96813

Attention: Mr. Brian J. Glover

Subject: UH/Marriott Hamilton Hall Snack Bar Replacement

Dear Mr. Glover:

I received the Sound Power Level information on the rooftop mechanical equipment on November 16, 1992 from Keith Chan. Changes to my original sound level predictions of November 16, 1992 were required due to the lower than assumed sound levels of the air-cooled chiller, and the higher than assumed sound levels of the high pressure exhaust fans. You may disregard my letter of November 16, 1992. This letter report finalizes my predictions of the anticipated sound levels from the rooftop equipment.

Without treatment, predicted chiller noise level at the third floor study cubicles inside Hamilton Library are 40 dBA or less, and below the 45 D.A.G.S. design criteria for libraries. Predicted interior noise levels from the remaining rooftop equipment are less than 42 dBA, and total noise level from the rooftop equipment should be less than the 45 dBA D.A.G.S. design criteria. Outside Hamilton Library, on the walkway near Noise Measurement Site C (see enclosed FIGURE 1 from our 11/6/92 letter report), predicted noise level from the untreated rooftop equipment was 58 dBA at ground level.

Without treatment, predicted chiller noise level at the outdoor lanais of the mauka wing of Moore Hall was 63 dBA. Predicted noise level from EF-3 and EF-4 was 64 dBA, and predicted noise level from the remaining rooftop units was 58 dBA. Total noise level from all rooftop equipment at the 2nd floor lanai of Moore Hall was 67 dBA. Similar noise levels are predicted along the elevated sidewalk below the lanais of the mauka wing of Moore Hall. These exterior noise levels outside the Ewa end of the mauka wing of Moore Hall are 10 to 16 dBA above measured background anbient noise levels (see our letter report dated November 6, 1992, and are considered to be high. Inside Moore Hall, which is air conditioned, classroom noise levels should be acceptable, and less than the 50 dBA D.A.G.S. design criteria for classrooms.

At ground level and on the sidewalk adjacent to Maile Way, total noise level from the rooftop equipment was predicted to be approximately 56 dBA, which should not be excessive. Outside Keller Hall, which is approximately 450 Ft from the chiller unit, predicted noise level from all rooftop equipment was 51 dBA without treatment, which should be acceptable for naturally ventilated classrooms.

Sound attenuation treatment to the air-cooled chiller as well as to the two high pressure exhaust fans (EF-3 and EF-4) will be required to minimize future exterior noise levels at the Ewa end of the mauka wing of Moore Hall. The addition of IAC 3KM packless silencers (see ENCLOSURE 1) to the discharge ends of EF-3 and EF-4 should reduce this noise component from 64 dBA to approximately 56 dBA at Moore Hall. The chiller noise component, however, will remain at 63 dBA, and may still be considered excessive at 6 to 12 dBA above existing background ambient noise levels.

In order to reduce the predicted noise levels below 63 dBA at the Ewa lanais of the mauka wing of Moore Hall, an enclosure similar to that constructed for the outdoor condenser units at Castle Memorial Annex (D.A.G.S. Job No. 12-31-1717) will need to be constructed around the rooftop chiller. The mauka and Diamond Head sidewalls of the enclosure should not have see-through ventilation openings, and may be constructed from lightweight materials similar to those used on the upper portions of the Castle Memorial Annex enclosure. The inlet air openings should be located on the makai and Ewa sides of the enclosure, and should be treated with IAC 3L duct silencers. The discharge chimney above the chiller unit should be treated with IAC 3L duct silencers. I estimated that approximately 57 SF of duct silencer face area will be required at the inlet and discharge openings of the new enclosure. My estimate of the height of the enclosure above the roof is approximately 10 FT.

With the addition of packless silencers to the discharge outlets of EF-3 and EF-4, plus the construction of the enclosure around CH-1, the noise levels at Moore Hall are predicted to be lowered to at least 60 dBA. Dominant noise sources are predicted to be the treated exhaust fans (EF-3 and EF-4) and AHU-3 thru AHU-5. In order to further reduce noise levels at Moore Hall to 58 dBA or less, a 3-sided enclosure with roof will need be constructed around both EF-3 and EF-4. The silenced discharges of each fan as well as the open side of each fan enclosure should be oriented to face the northeast corner of Hamilton Hall.

In summary, it will be difficult to reduce the rooftop equipment noise levels to existing background ambient noise levels at

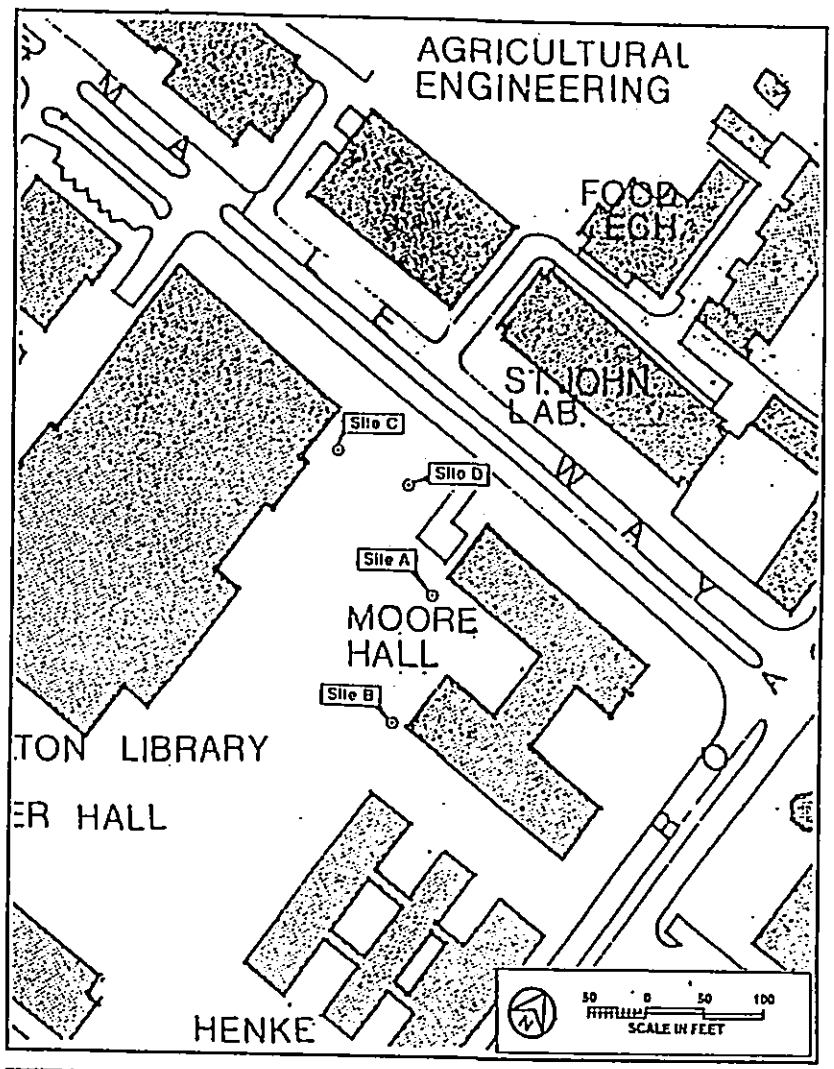
all locations around the Snack Bar facility. No special treatments are required to meet the 45 dBA interior noise criteria (for libraries) within Hamilton Library or to meet the 50 dBA interior noise criteria (for classrooms) within Moore Hall, since these two buildings are air conditioned. No special treatments are required to meet the 50 dBA interior noise criteria at Keller Hall. However, in order to reduce equipment noise levels at the Ewa-mauka lanais of Moore Hall to the upper range of existing background ambient noise levels, the addition of packless silencers to the discharges of EF-3 and EF-4, as well as partial enclosure of EF-3 and EF-4 and enclosure of CH-1 will be required. no yes

Let me know if you have any questions regarding this letter report, or if you need additional details regarding the sound treatment recommendations.

Sincerely,

Yoichi Ebisu, P.E.

encl.



LOCATIONS OF NOISE MEASUREMENT SITES

FIGURE 1

APPENDIX C
DEPARTMENT OF LAND AND NATURAL RESOURCES

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCE

DEPUTIES

JOHN P. KEPPELER, II
DONA L. HANAIKE

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

February 5, 1993

LOG NO: 7424
DOC NO: 9302TD05

Ms. Judy W. Chen
AM Partners, Inc.
1164 Bishop Street, Suite 1000
Honolulu, Hawaii 96813

Dear Ms. Chen:

SUBJECT: Food Service Facility, University of Hawaii at Manoa
Waikiki, Kona, O'ahu
TMK: 2-8-23: 3

Thank you for the opportunity to review this project. A review of our records shows that there are no known historic sites at the project location, which sits between two buildings and is completely landscaped. Because nearby development and landscaping would most likely have destroyed historic sites that might have been present we believe the project will have "no effect" on historic sites.

It is possible that historic sites, including human burials, will be uncovered during routine construction activities. Should this be the case all work in the vicinity must stop and the Historic Preservation Division must be contacted at 587-0047.

If you have any questions please call Tom Dye at 587-0014.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

TD:amk