King Kalakaua Plaza
Phase II

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
PHONE: (808) 523-4414 • FAX: (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

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98/ED-2(ASK)

November 23, 1998

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
State Office Tower, Room 702
235 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Gill:

CHAPTER 343, HRS
Environmental Assessment (EA)/Determination
Finding of No Significant Impact

Owner/Applicant	:	Kalakaua Southseas Owners, LLC
Agent	:	Wilson Okamoto & Associates, Inc.
Location	:	Waikiki, Oahu
Tax Map Keys	:	2-6-18: 10, 36, 42, 52, 55, 62, 63, 64, 73 and 74
Request	:	Waikiki Special District Permit
Proposal	:	Demolish existing structures and construct a retail/commercial mixed-use complex with one level of underground parking
Determination	:	A Finding of No Significant Impact is Issued

Attached and incorporated by reference is the Final EA prepared by the applicant for the project. Based on the significance criteria outlined in Title 11, Chapter 200, Hawaii Administrative Rules, we have determined that preparation of an Environmental Impact Statement is not required.

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We have enclosed a completed OEQC Bulletin Publication Form and four copies of the Final EA. If you have any questions, please contact Ardis Shaw-Kim of our staff at 527-5349.

Very truly yours,

JAN NAOE SULLIVAN
Director of Planning
and Permitting

JNS:am
attachs.

g:ardis\feakala.ask

1998-12-08-OA-FEA-King Kalakaua Plaza Phase II

Final Environmental Assessment and Finding of No Significant Impact (FONSI)

KING KALAKAUA PLAZA PHASE II
Waikiki, Honolulu, Oahu

Prepared for
Kalakaua Southseas Owners, LLC

Prepared by
Wilson Okamoto & Associates, Inc.

November 1998

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Final Environmental Assessment

and

Finding of No Significant Impact (FONSI)

KING KALAKAUA PLAZA PHASE II

Waikiki, Honolulu, Oahu, Hawaii

Prepared For:

Kalakaua Southseas Owners, LLC
2080 Kalakaua Avenue, #105
Honolulu, Hawaii 96815

Prepared By:

Wilson Okamoto & Associates, Inc.
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

November 1998

0000 0005 0497

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PREFACE

PREFACE

This Final Environmental Assessment and Finding of No Significant Impact has been prepared pursuant to Chapter 343, Hawaii Revised Statutes, and Title 11, Chapter 200, Administrative Rules, Department of Health, State of Hawaii. Proposed is an applicant action by the Kalakaua Southseas Owners, LLC to demolish existing structures and remove existing landscaping and to develop a retail and commercial mixed-use complex in Waikiki, Honolulu, Island of Oahu. Compliance with the provisions of Chapter 343, HRS is required because of the project's location within the "Waikiki Special District." The accepting agency is the City and County of Honolulu Department of Planning and Permitting, in conjunction with the processing of Waikiki Special District Permits required for the proposed action.

While the proposed project is located across the street from and shares a similar name with King Kalakaua Plaza, it is being pursued as a separate and distinct development. When the Environmental Assessment for King Kalakaua Plaza was prepared in July 1995, the applicant had no plans for the current proposal. The applicant did not own or otherwise control the current project site which, at that time, was owned by and/or under lease to various other parties. The project site was acquired by the applicant in 1998.

SUMMARY

SUMMARY

Project: King Kalakaua Plaza Phase II

Applicant: Kalakaua Southseas Owners, LLC
2080 Kalakaua Avenue, #105
Honolulu, Hawaii 96815
Contact: Tom Applegate, President

Accepting Authority: Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813
Contact: Bonnie Arakawa
Phone: (808) 527-5837

EA Preparer: Wilson Okamoto & Associates, Inc.
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
Contact: Earl Matsukawa
Phone: (808) 946-2277

Location: Waikiki, Honolulu, Island of Oahu

Tax Map Key: 2-6-18: 10, 36, 42, 52, 55, 62, 63, 64, 73 and 74

Area: Approximately 109,747 square feet

Landowner: Kalakaua Southseas Owners, LLC

Existing Use: Abandoned retail and residential uses

State Land Use Classification: Urban District

Development Plan Land Use: Resort Mixed Use

Development Plan Public Facilities Map: There are no symbols on or adjacent to the project site

Zoning: Waikiki Special District - Resort Commercial Precinct

Proposed Action: Retail/Commercial Mixed-Use Complex

Impacts:

Hydrology: During the short-term construction period dewatering activities will be required. To minimize the potential for impacts on the caprock water table, and on receiving waters at the Ala Wai Canal and coastal receiving water at Ala Wai Harbor, a dewatering plan and best management practices plan will be prepared in conjunction with the NPDES permit application for Discharges Associated with Construction Dewatering Activity.

Noise: During the short-term construction period, audible construction noise will probably be unavoidable. Based on construction methods used to build the neighboring King Kalakaua Plaza, use of equipment such as impact pile drivers and pneumatic rams will likely be unnecessary and, therefore, will be avoided.

In the long-term, no significant increase in ambient noise levels due to project-traffic are anticipated since the projected volume of project-related traffic is small in relation to existing and projected traffic.

Air Quality: During the short-term construction period, site preparation and earth moving, as well as the construction of structures will generate particulates. The movement of construction vehicles on unpaved areas of the project will also generate dust. To minimize these impacts, unpaved areas will be frequently watered during construction to control dust, and landscaping will be installed as soon as feasible within completed areas.

In the long-term, no significant impacts on air quality due to vehicular emissions are anticipated since the impact of project-related traffic on the operation of roadways in the vicinity are projected to be minor.

Access, Traffic and Utilities: During the short-term construction period various construction activities have the potential to disrupt traffic flow.

To the extent possible, movement of large construction vehicles and equipment will be minimized during the morning and afternoon peak traffic periods.

In the long-term, no significant impacts on roadways and intersections in the vicinity of the project site are anticipated since the projected volume of project-related traffic is small in relation to existing and projected traffic.

No significant impacts on the provision of water, wastewater and drainage services or facilities are anticipated.

<u>Archaeological/Historical Resources</u>: Due to the potential for discovering archaeological resources and human burials during construction of the proposed project, subsurface testing will be conducted. If major findings are encountered during such testing, a mitigation plan will be prepared for review and approval by the State Historic Preservation Division (SHPD). In the event that burials are encountered during subsurface testing, the Burials Program of the SHPD will be notified to determine appropriate treatment.

Although four former apartment structures on the site are over 50 years old, past alterations are likely to have compromised their historic integrity. The former Canlis Restaurant building was less than 50 years old but, according to the SHPD, had historical significance. Toward mitigating the loss of the Canlis Restaurant building, the applicant proposes to prepare a photographic essay, incorporate notable aspects of the Canlis property in the design of the project, and provide a historic exhibit within the project.

<u>Socio Economic</u>: The proposed project will have generally positive social and economic impacts in the region. In the short-term, the project will confer some positive benefits in the local area due to construction activities. In the long-term, the proposed project will restore employment opportunities lost when prior tenants vacated the property. The character of employment opportunities, however, will change with the new tenants.

No significant impacts on the provision of police, fire, medical services and/or facilities is anticipated.

Relationship to Plans, Policies and Controls: The proposed project will conform with the various land use plans, policies and regulatory controls, including, but not limited to, the State Land Use District the City and County's General Plan, Development Plan (DP), and Land Use Ordinance.

Parties Consulted in Pre-Assessment Process:

State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division

City and County of Honolulu
Office of the Managing Director
Department of Planning and Permitting
Department of Transportation Services
Board of Water Supply

Organizations
Historic Hawai'i Foundation

Elected Officials
Mayor Jeremy Harris
Councilmember Duke Bainum
Councilmember Mufi Hannemann

Utility Companies
GTE Hawaiian Telephone Company

Parties Consulted During the Draft EA:

Federal
Department of the Army, U.S. Army Engineer District, Honolulu

State of Hawaii
Department of Transportation
Department of Land and Natural Resources (DLNR)
DLNR State Historic Preservation Division
DLNR Land Division
Office of Environmental Quality Control
Department of Health

Parties Consulted
During the Draft EA (continued):

City and County of Honolulu
Department of Planning and Permitting
Planning Department
Department of Transportation Services
Department of Environmental Services
Board of Water Supply
Police Department
Fire Department

Organizations
The Outdoor Circle
Waikiki Neighborhood Board

Other Interested Parties
Ms. Nitgalda Evans
Dr. Betsy Weiner

Chapter 1

SETTING AND PROJECT DESCRIPTION

1. SETTING AND PROJECT DESCRIPTION

1.1 Setting

The City and County of Honolulu's ***Waikiki Planning and Program Guide*** prepared by the Planning Department in February, 1996 described Waikiki as:

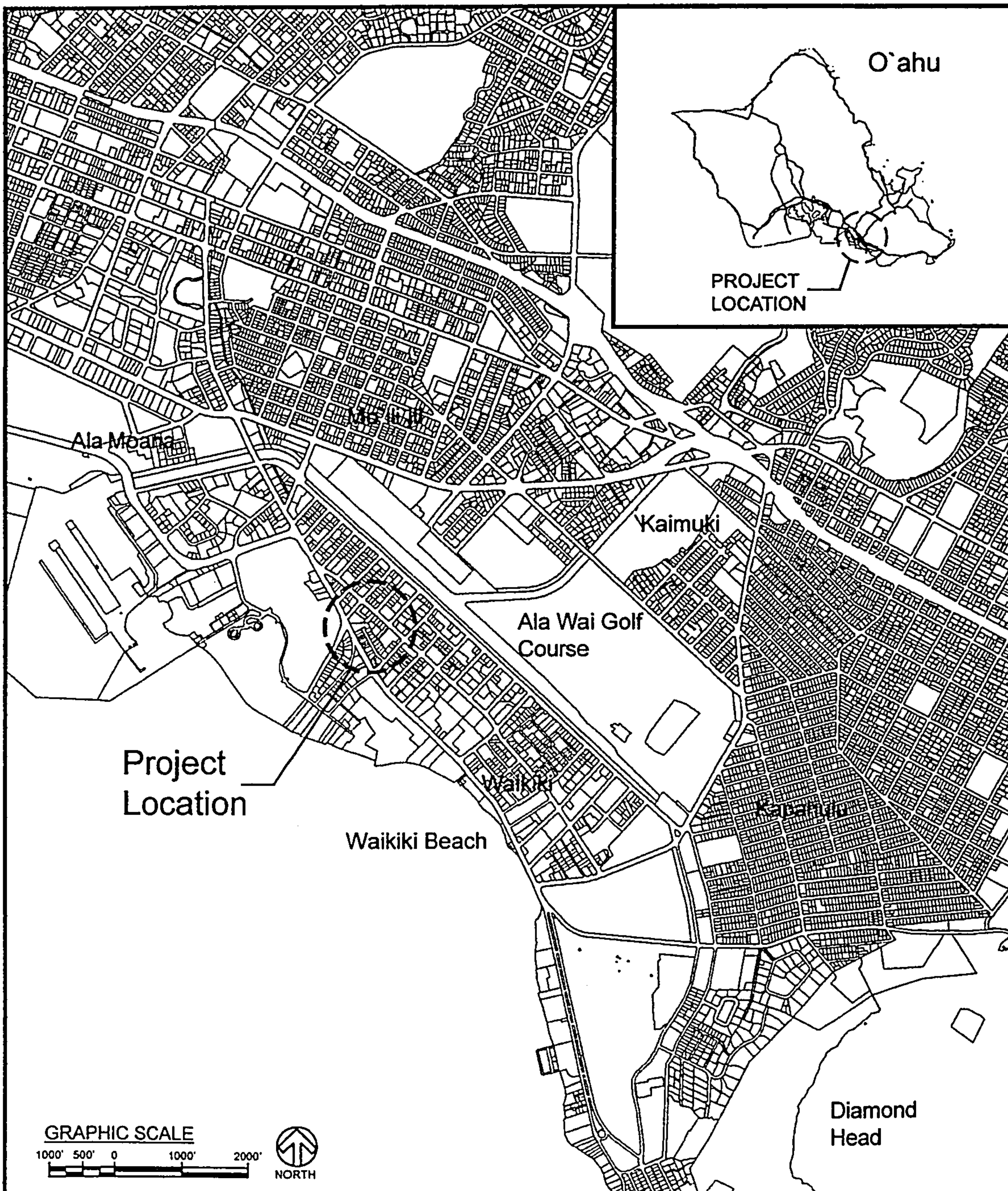
> *"... a city within a city, an island within an island." In 1995, it contained 74 hotel and 52 condominium buildings. There were over 1,000 businesses and another 1,000 retail shops.*
>
> *Waikiki exists successfully as both a residential neighborhood and an urban resort. Visitor and resident activities are integrated, and there is a predominance of mixed use. Commercial establishments support both the resident and visitor populations. This functional interaction contributes to the unique attractiveness of the area for both populations. The social dynamic of mixing the daytime-nighttime population adds a desirable vitality to the community.*

1.2 Project Location

The project site is located in Waikiki, Honolulu, encompassing 10 parcels bounded by Kalakaua Avenue, Kuhio Avenue, and Kalaimoku Street. The site encompasses approximately 109,747 square feet comprising Tax Map Keys (TMK): 2-6-18: 10, 36, 42, 52, 55, 62, 63, 64 73 and 74 (see Figures 1-1 and 1-2). The project site is owned by Kalakaua Southseas Owners, LLC.

1.3 Existing and Surrounding Uses

The project site presently contains approximately 7 abandoned structures that were previously used for retail and restaurant activities, commercial office space, apartments, and parking (See Photographs 1 and 2). Other structures, including the City and County of Honolulu Police Department formerly located in the Canlis Restaurant building, have been demolished and cleared. Landscaping, including several large trees remain on the project site. Businesses that previously were located on the site include: Hula's Bar and Lei Stand, Trixx and Treat Bar, Banana's Restaurant, Canlis Restaurant, Bobby's Seafood and Cafe, Valentino's, 80% Straight, Mitch Milano's Bar, Hernando's Bar, Republic Parking, Popo's Mexican Restaurant and Bar, and South Seas Village.



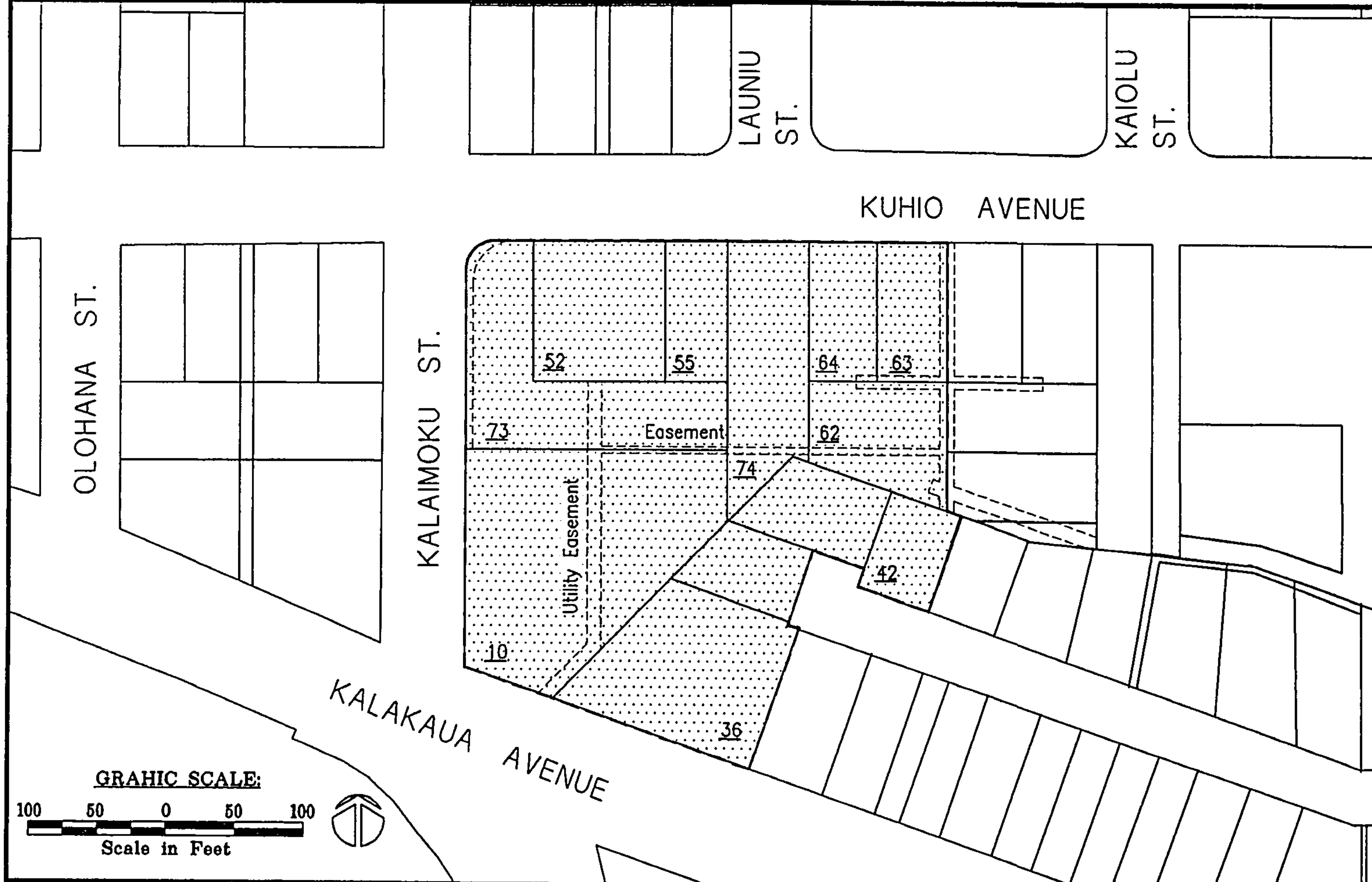
KING KALAKAUA PLAZA PHASE II

Fig 1-1

LOCATION MAP

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.



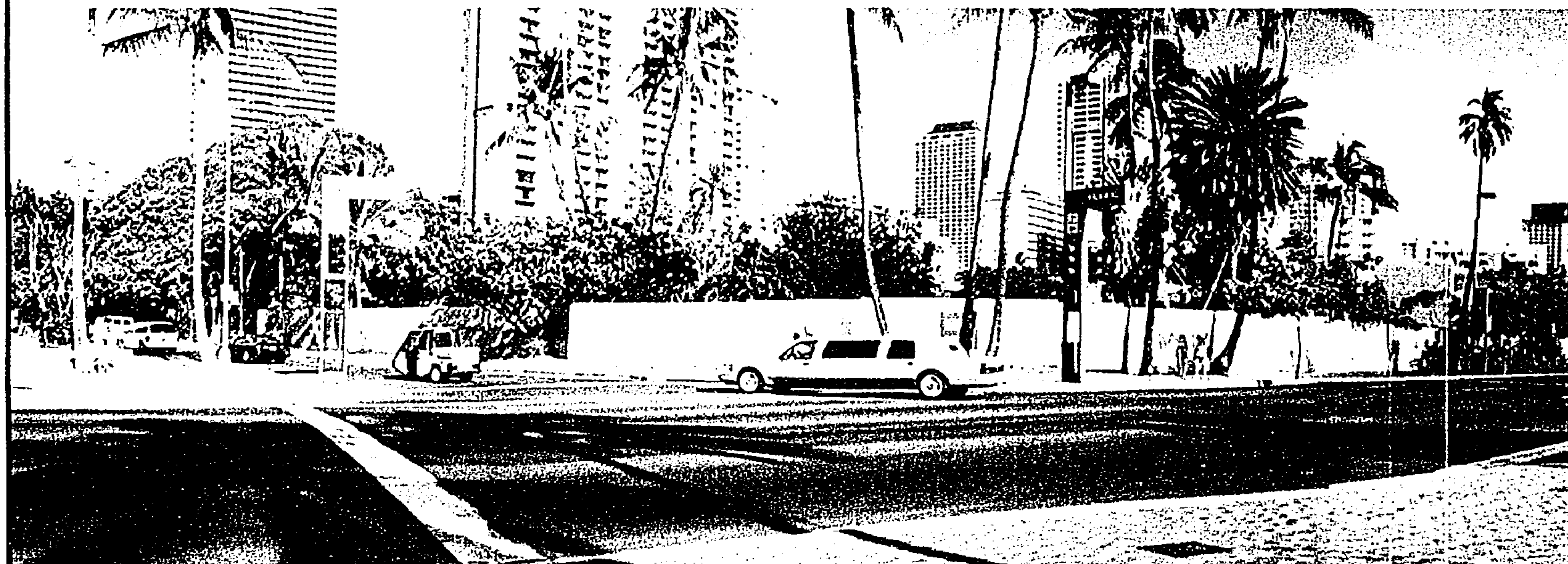
KING KALAKAUA PLAZA PHASE II

TAX MAP KEY 2-6-18

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.

Fig. 1-2



Facing East From Intersection of Kalaimoku St. and Kalakaua Ave.

KING KALAKAUA PLAZA PHASE II

PHOTOGRAPH 1

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.

Facing South From Intersection of Kalaimoku St. and Kuhio Ave.
(Former Hula's Bar at Center)

KING KALAKAUA PLAZA PHASE II

PHOTOGRAPH 2

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.

Surrounding land uses in the immediate vicinity of the project site include King Kalakaua Plaza located across Kalaimoku Street to the west of the project, La Casa located at the corner of Kalaimoku Street and Kuhio Avenue to the northwest of the project, Tropic Surf Apartments, Waikiki Apartments and Four Paddle Condominium located across Kuhio Avenue to the north of the project, ABC Store, Waikiki Video, Hotel Honolulu located on Kuhio Avenue and Kaiolu Street to the east of the project and Kuroda Field, Tokyo Noodle House and Polynesian Plaza located across Kalakaua Avenue to the south of the project. In addition, a variety of eateries, retail shops and boutiques, and apartments are located along Lauula Street and Kalakaua Avenue to the east of the project (See Figure 1-3).

1.4 Project Description

The proposed project is a retail/commercial mixed-use complex in a single structure varying from 3 to 5 stories with one level of underground parking and ground-level landscaping (See Figures 1-4 to 1-6, Note that Figure 1-4 illustrates the ground floor site plan of the proposed project in relation to King Kalakaua Plaza, while Figure 1-5 illustrates a rendered roof plan exclusively of the proposed project).

Major elements of the project include:

- Approximately 59,190 square feet of space on the first floor. These spaces are envisioned to accommodate retail uses and vertical circulation;
- Approximately 66,835 square feet of space on the second floor. These spaces are envisioned to accommodate retail uses;
- Approximately 62,605 square feet of space on the third floor. These spaces are envisioned to accommodate retail and office uses;
- Approximately 49,321 and 21,987 square feet of space on the fourth and fifth floors, respectively. These spaces are envisioned to accommodate retail uses;
- Approximately 289 parking stalls in a single level of below grade parking (access to the parking structure will be from Kuhio Avenue on the easternmost corner of the project site);
- Approximately 34,543 square feet of ground level open space abundantly landscaped along the Kalakaua Avenue, Kalaimoku Street and Kuhio Avenue frontages;

- A single-story structure which will be incorporated as part of the proposed project to reflect the material qualities of the former Canlis Restaurant building. The structure will be occupied by a new police "Koban" service; and

- Two valet drop off areas located on Kalaimoku Street and Kuhio Avenue.

1.5 Project Schedule and Cost

Construction of the proposed project is anticipated to commence in June of 1999 with completion estimated by August 2001. The estimated construction cost of the proposed project is $50 million, while the estimated tenant improvement cost is approximately $60 million.

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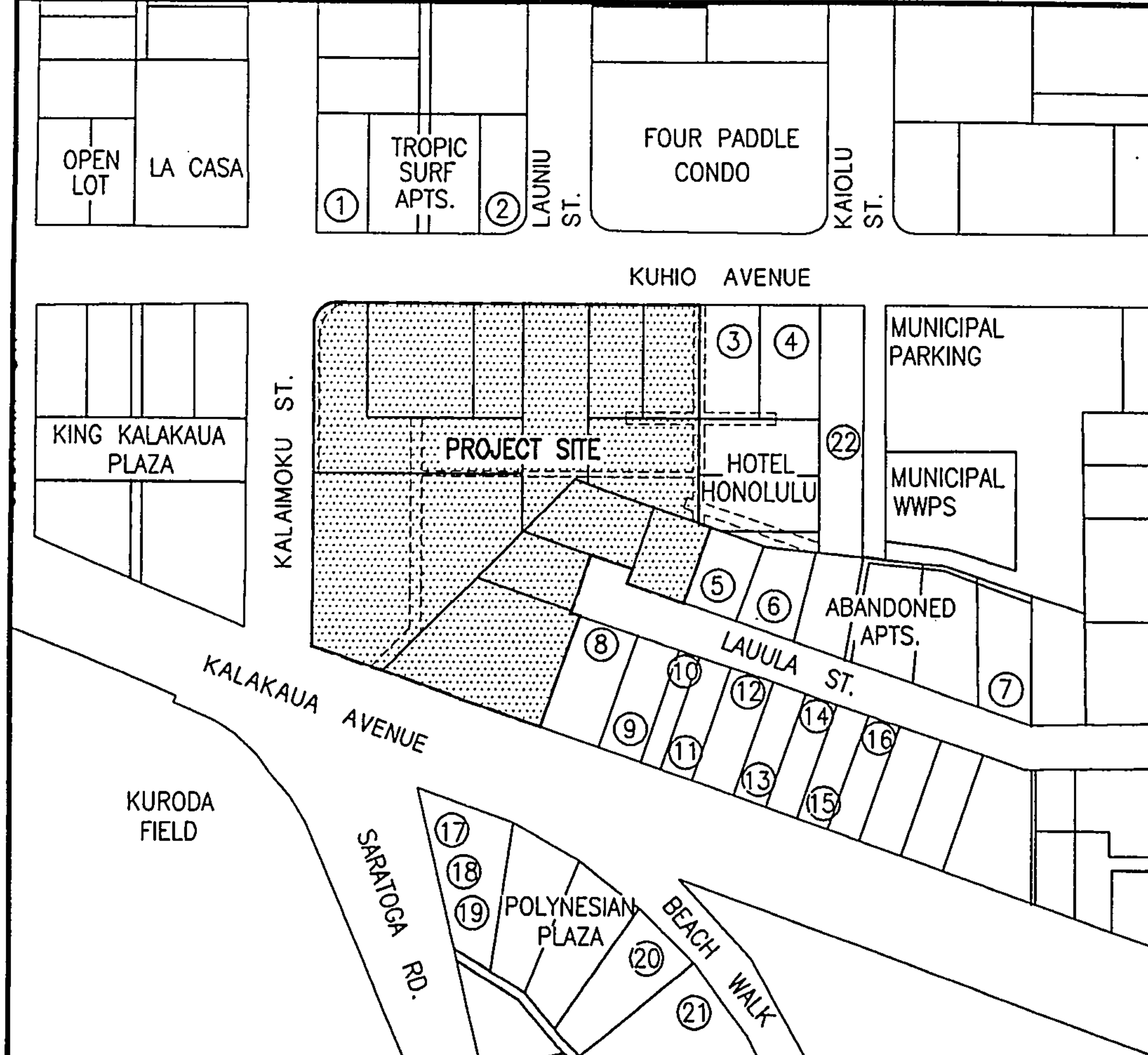


LEGEND

1. RESIDENCE
2. WAIKIKI COVE APARTMENTS
3. ABC STORE
4. WAIKIKI VIDEO
   ANTIQUE STORE
   DELICATE FAST FOOD
   BLACK FLYS
5. DIAMOND PARKING
6. BEACHES APARTMENTS
7. DIAMOND PARKING
8. KUMIS BISTRO
   TENTEKOMAI
9. SKIN DEEP TATTOO
   ADULT VIDEO STORE
   123 FASHION INC.
   LAPPERT'S ICE CREAM
10. OPTIQUE PARIS MIKI
    MAGNUM TRAVEL
11. CURRY HOUSE
12. ABC STORE
13. IGUASU BOUTIQUE
    WAIKIKI GUN CLUB
14. EZOGIKU
15. ACTIVE SHOE WORLD
16. KYOTARU RESTAURANT
17. TOKYO NOODLE HOUSE
18. PLAYERS GIFT SHOP
19. 88 TEES
20. BURBERRY'S
21. NEW TOKYO RESTAURANT
22. DIAMOND PARKING

GRAHIC SCALE:

150 75 0 75 150

Scale in Feet

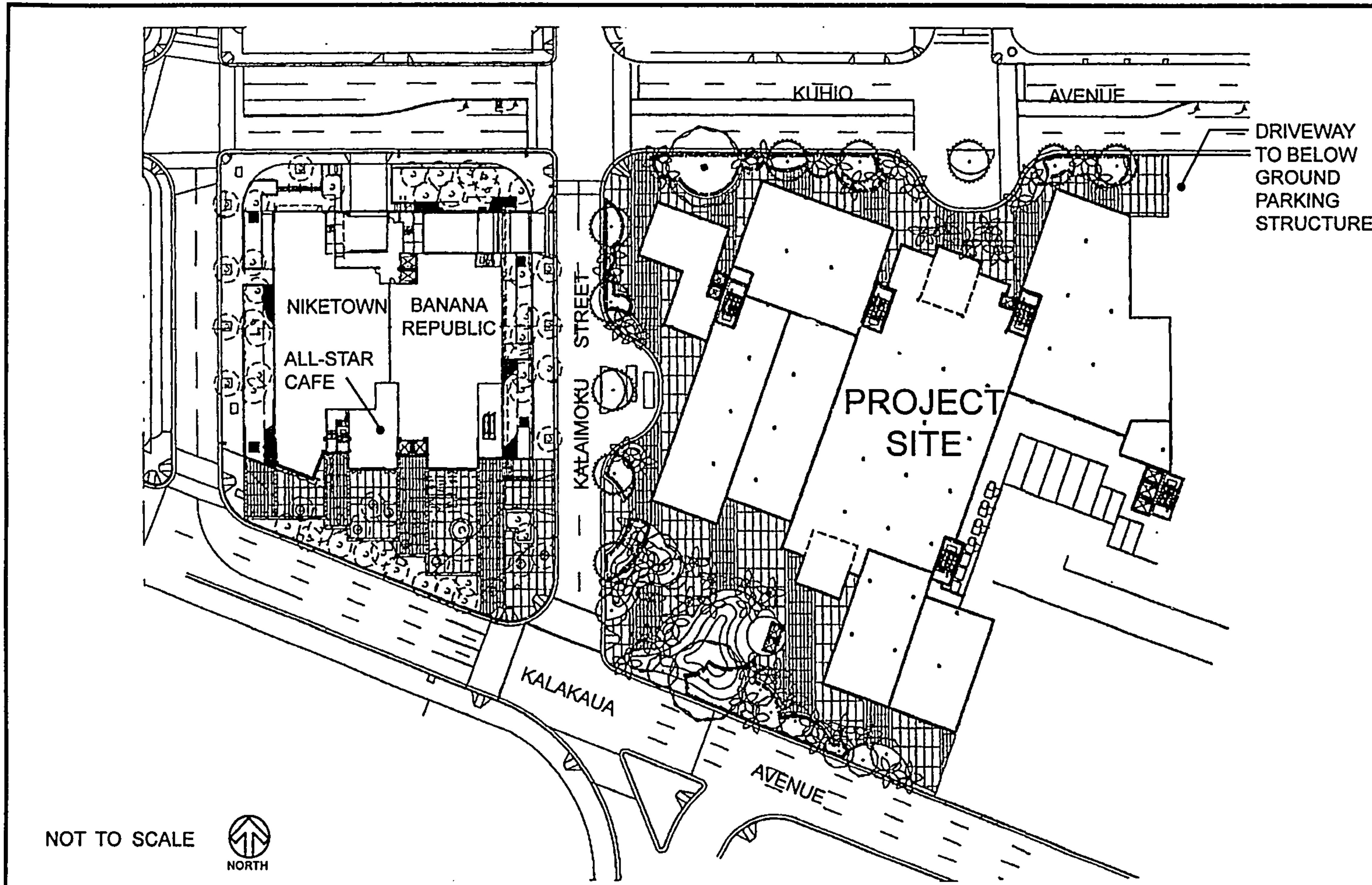
KING KALAKAUA PLAZA PHASE II

SURROUNDING USES

Fig.1–3

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.



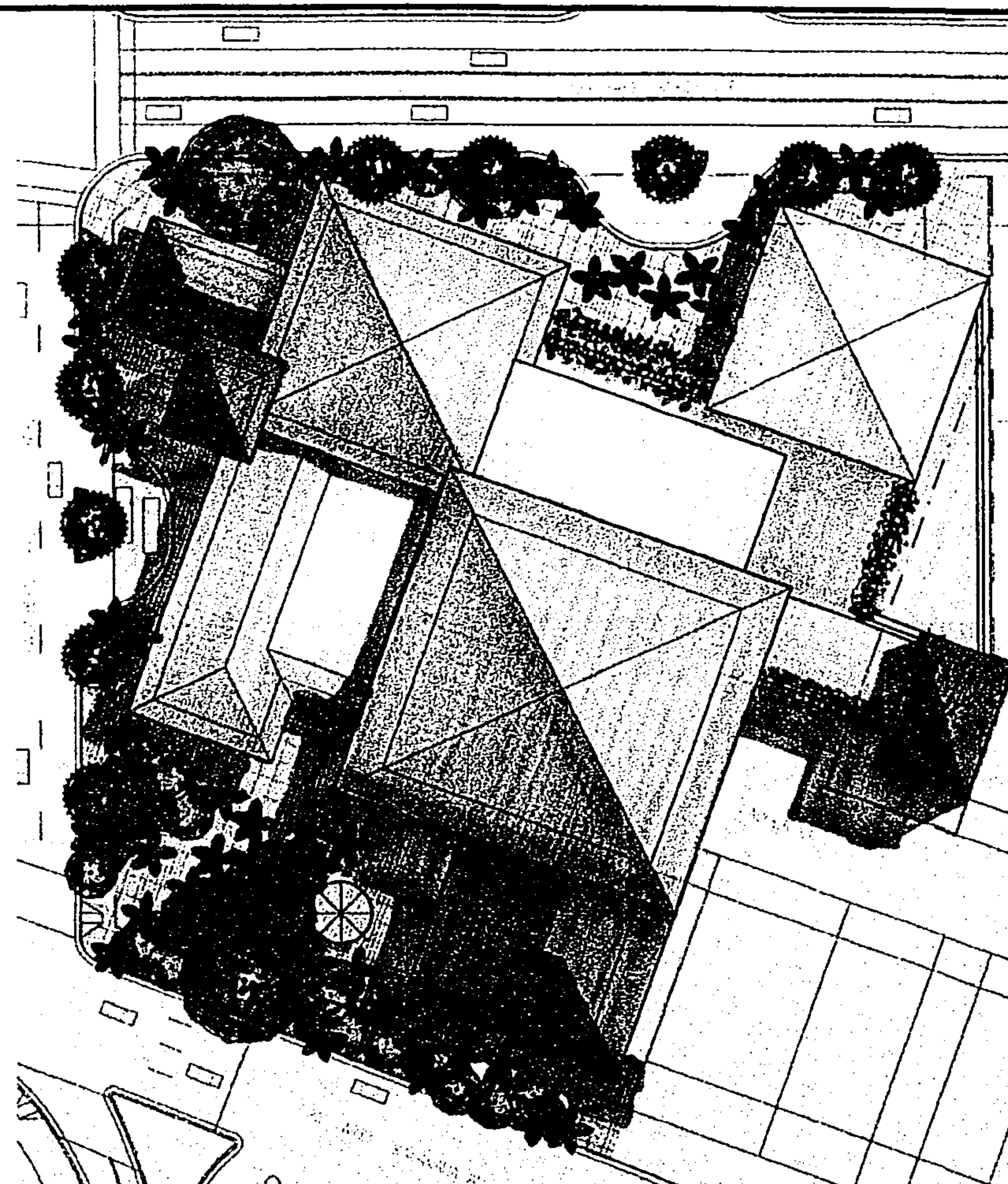
KING KALAKAUA PLAZA PHASE II

Fig 1-4

PROPOSED GROUND FLOOR SITE PLAN

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.



KING KALAKAUA
PLAZA PHASE II

PROPOSED ROOF PLAN

Fig 1-5

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.

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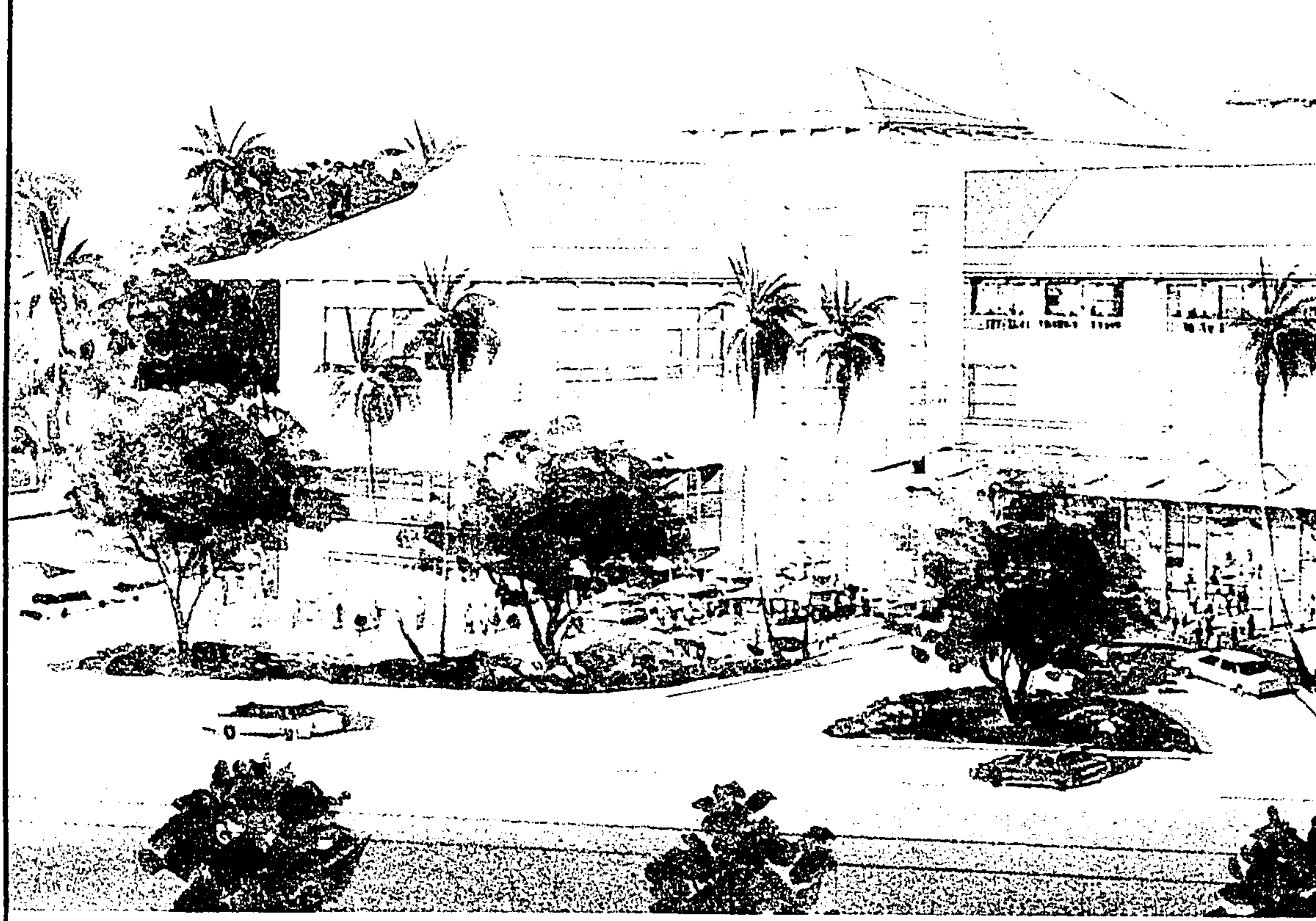
DOCUMENT CAPT

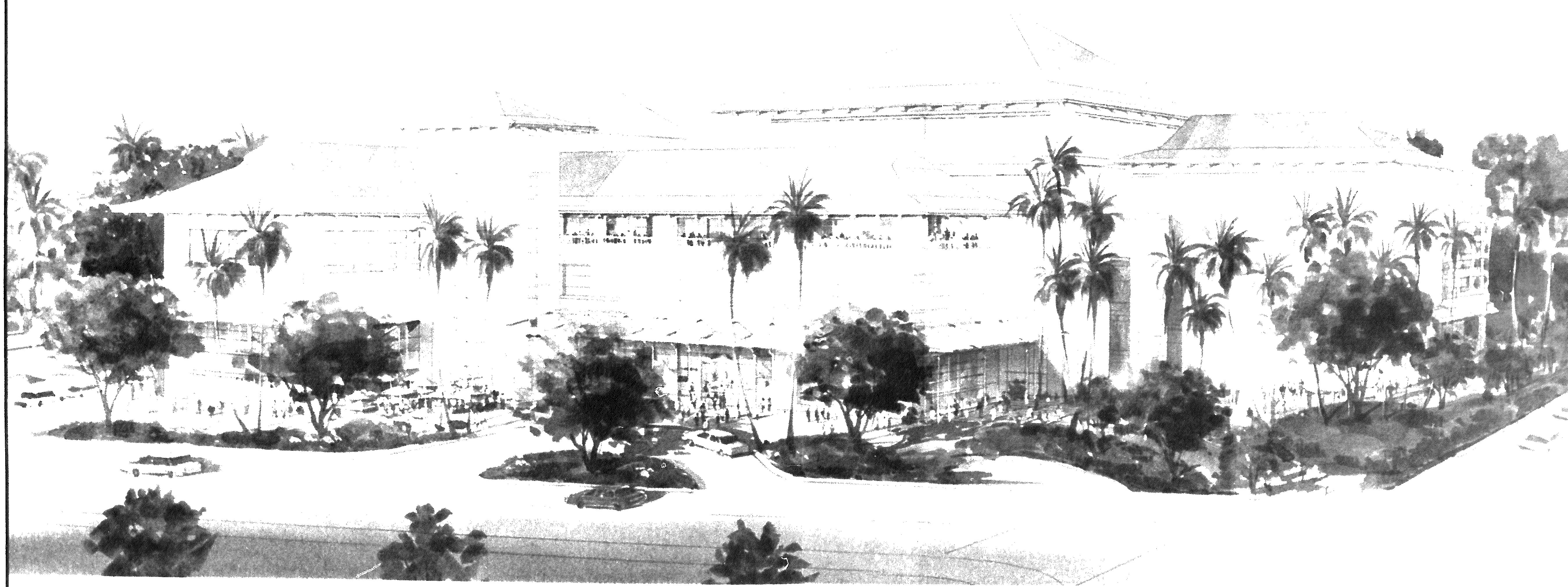


KING KALAKAUA
PLAZA PHASE II

RENDERING OF PROJECT

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

CORRECTION



KING KALAKAUA
PLAZA PHASE II

RENDERING OF PROJECT FROM KALAIMOKU STREET

Fig 1-6

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.

Chapter 2

EXISTING ENVIRONMENT, IMPACTS AND MITIGATION MEASURES

2. DESCRIPTION OF THE EXISTING ENVIRONMENT, IMPACTS AND MITIGATION MEASURES

2.1 Climate

The climate of the Honolulu area is typical of the leeward coastal lowlands of Oahu. The area is characterized by abundant sunshine, persistent tradewinds, relatively constant temperatures, moderate humidities, and the infrequency of severe storms.

Northeasterly tradewinds prevail throughout the year although their frequency varies from more than 90 percent during the summer months to 50 percent in January. The average annual wind velocity is approximately 10 miles per hour.

The mean temperature measured at Honolulu International Airport ranges from 70 degrees Fahrenheit (°F) in the winter to 84°F in the summer. The temperatures in the Waikiki project area may be slightly higher due to localized urban heating effects. The average annual precipitation in the vicinity of the site is approximately 24 inches, with most of the rainfall occurring between November and April. Relative humidity ranges between 56 and 72 percent.

Impacts and Mitigation Measures

The proposed project will not affect regional climate, however, replacing numerous detached relatively low-rise structures interspersed with landscaping with a single structure will alter the microclimate at the perimeter of the project site. Reduced wind speeds at ground level and additional shading would be typical of the microclimate found in built-up areas of Waikiki.

2.2 Geology and Hydrology

Oahu's south central coast, geographically referred to as the Honolulu Plain, is underlain by a broad elevated coral reef which has been partly covered by alluvium carried down from the mountains. Core samples reveal that lava flows of the Honolulu Volcanic Series are interbedded with these reef deposits which were formed when the sea level was higher than it is now.

The same interbedding of coral and alluvial deposits which play an important role in Oahu's geology also influenced the hydrological character of Oahu's leeward coastline. The interface between upper sedimentary layers and the underlying basalt constitutes a zone of low permeability known as caprock. This caprock extends along the coastline about 800 to 900 feet below sea level, forming an impervious zone which prevents the seaward movement of potable water from the basaltic aquifers.

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CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

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EXISTING ENVIRONMENT, IMPACTS AND MITIGATION MEASURES

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The same interbedding of coral and alluvial deposits which play an important role in Oahu's geology also influenced the hydrological character of Oahu's leeward coastline. The interface between upper sedimentary layers and the underlying basalt constitutes a zone of low permeability known as caprock. This caprock extends along the coastline about 800 to 900 feet below sea level, forming an impervious zone which prevents the seaward movement of potable water from the basaltic aquifers.

Historically, Makiki, Manoa and Palolo streams flowed into the area known as Waikiki. Waikiki means the "land of spouting waters" and was extensively cultivated in taro by Hawaiians and later with rice as well by immigrant farmers. The Ala Wai Canal was dredged in 1921, creating fast lands and demarcating the area now known as Waikiki.

There are no surface water bodies within the project site. The nearest surface water body is the man-made Ala Wai Canal.

According to the State Commission on Water Resource Management there are no registered potable water wells in the Waikiki area.

The City and County of Honolulu Board of Water Supply Pass/No Pass line delineates the boundary of the potable water aquifer. The project site falls within areas makai of the Pass line which infers that any activities on the project site will not have any groundwater impacts on potable groundwater resources.

Impacts and Mitigation Measures

In the short-term, construction of the single-level underground parking structure will require excavations to depths of approximately 20 feet from the existing ground level, entailing removal of previous fill material, as well as alluvial and coral deposits. Since the water table will be encountered at a depth of approximately 3 feet, the project will require temporary dewatering. A dewatering plan will be required to address potential concerns such as impacts on the caprock water table and on surface waters that may be affected by the disposal of dewatering effluent.

With respect to impacts on the water table, previous construction of King Kalakaua Plaza, which has two levels of underground parking as opposed to the single level in the proposed development, did not result in impacts such as ground settlement damaging structures in the vicinity. Shoring of the excavated area will minimize the infiltration of groundwater from adjacent properties. Dewatering effluent withdrawn from within the excavated area may also be used to recharge the caprock water table outside of the shoring to help maintain its level. A dewatering plan will be prepared in conjunction with obtaining a National Pollutant Discharge Elimination System (NPDES) permit for Discharges Associated with Construction Activity Dewatering (Notice of Intent Form G).

The NPDES permit for dewatering activities will also address water quality impacts associated with the disposal of dewatering effluent. The dewatering plan will include the anticipated rate of dewatering and method of treatment and disposal. Typically, water is withdrawn from perforated well casings installed beneath the excavation. The effluent that is withdrawn in this manner has a low sediment content since the ground around the well casing acts as a natural filter. To further reduce sediment content, the effluent is treated, typically by passing it through a series of settling containers, where silt particles can settle out of the effluent. The treated effluent can then be used to recharge the water table outside of the shoring and/or discharged into a municipal storm drainage system.

A Best Management Practices (BMP) plan, which is required as part of the NPDES dewatering permit, establishes procedures for operating the dewatering system. Typically, specific procedures are provided for the maintenance of dewatering equipment, including disposal of sediments collected in settling containers; training of workers to inspect equipment to prevent contamination by fuels and engine fluids; monitoring water quality of samples collected from designated points in the dewatering system; preventing storm water runoff and erosion from surrounding areas from entering the excavation; and, procedures for modifying or terminating dewatering activities if the system is failing to operate as intended.

Disposal of the dewatering effluent into the municipal storm drain system will require a permit from the City and County of Honolulu Department of Planning and Permitting. The storm drains in the vicinity of the project site discharge into the Ala Wai Canal.

Storm runoff from the project site during site preparation will be controlled in compliance with City and County of Honolulu grading permit requirements. Typical mitigation measures include: appropriately stockpiling materials on-site to prevent runoff; and, establishing landscaping as early as possible on completed areas. These measures, including those required pursuant to the aforementioned BMP plan for dewatering, will reduce the potential for siltation of drainage facilities, the Ala Wai Canal and coastal receiving waters at Ala Wai Harbor.

In the long-term, the volume of storm runoff from the proposed project will be not be significantly greater than present since most of the site is paved, preventing infiltration. Storm runoff from the proposed project will be directed toward existing catch basins in the immediate vicinity of the site.

2.3 Topography

The project site and surrounding areas are relatively flat and contain no unusual or unique topographic features. The site elevation is approximately five feet above Mean Sea Level (MSL).

Impacts and Mitigation Measures

The proposed project may require some alteration of the topography within the project site, however, any impacts on drainage patterns will be addressed through appropriate engineering design to prevent excessive surface flows or ponding. Since most of the project site is presently built-over or paved, there will be little change in the amount of runoff from the project site when construction is completed.

2.4 Flood/Tsunami

According to the Flood Insurance Rate Map (FIRM, Community Panel Number 150001 120 C revised September 4, 1987) prepared by the Federal Emergency Management Agency (FEMA), the entire project site is designated as Zone AO, special flood areas inundated by 100-year floods. Flood depth at the project site averages two feet.

Impacts and Mitigation Measures

In compliance with City flood ordinances, the lowest floor must be elevated at least two feet above the existing grade. To prevent flooding of the single-level underground parking structure, flood protection measures must be provided, including a watertight design with walls substantially impermeable to the passage of water and driveway entrances raised two feet above existing grade.

2.5 Earthquake

As established in the Honolulu Building Code, Oahu is in Seismic Zone 2A. All structures within the project site will be designed to meet Zone 2A requirements.

2.6 Soils

According to the U.S. Department of Agriculture Soil Conservation Service, the soils underlying the project site are classified as Fill land, mixed (FL). This soil type consists of material dredged from the ocean bottom or hauled in from nearby areas. Landscaped areas are likely comprised of imported soils.

The *Detailed Land Classification - Island of Oahu* published by the University of Hawaii Land Study Bureau (LSB), evaluates the quality or productive capacity of certain lands on Oahu for selected crops and overall suitability in agricultural use. A five-class productivity rating system was established with "A" representing the highest productivity and "E" the lowest. Since the project site is classified as "U" or Urban, it is not rated for agricultural productivity.

In April 1997, a Phase I Environmental Site Assessment was conducted for all except one of the parcels within the project site by Harding Lawson Associates. The assessment concluded that there was no evidence of past uses of the site that would be suspected of storing, using or disposing of regulated or contaminating materials which could potentially impact soils. The study did not include Tax Map Key 2-6-18:36, which was formerly occupied by the Popoš Mexican Restaurant and Bar as well as the South Seas Village. The need for a soils survey is yet to be determined for this parcel. However, given the history of the restaurant at the site, and the similarity of its use to that of the former Canlis Restaurant, it is unlikely that there were any suspect uses that could have contaminated the soils in the area.

Impacts and Mitigation Measures

Construction of the single-level underground parking structure will remove most of the existing soils near the surface as well as underlying fill material. Replacement soils will primarily be provided for landscaping purposes along street frontages.

2.7 Hazardous Materials

Hazardous materials surveys of the structures occupying the project site have been conducted by Clayton Environmental Consultants (See Appendix A). The first survey, conducted in February 1998, included the Popo's Mexican Restaurant and Bar and South Seas Village. This survey identified asbestos containing materials (ACM) in floor tiles and roofing materials, traces of lead in paint and possible polychlorinated biphenyls (PCB) containing light ballasts, capacitors and fluorescent light tubes. Due to the condition of the ACM, no special abatement procedures prior to demolition were required. The lead concentration was below the method of detection limit of 0.1% and the Housing and Urban Development definition of 0.5% lead by weight for the Lead-Based Paint (LBP) classification, therefore, no special disposal methods were required. The possible PCB-containing lighting fixtures were collected and disposed of by a qualified contractor in compliance with Environmental Protection Agency (EPA) requirements. The structures surveyed have since been demolished.

A second hazardous materials survey was conducted for the remaining six structures on the project site in July 1998. These include Hula's Bar and Lei Stand, Trixx and Treat Bar, Banana's Restaurant, Canlis Restaurant, Bobby's Seafood and Cafe, Valentino's, 80% Straight, Mitch Milano's Bar, and Hernando's Bar. These structures are abandoned. The survey found ACM in floor tiles, leveling compound, insulated pipe coverings, and roofing materials, traces of lead in paint and possible PCB-containing lighting fixtures. The lead concentration ranged from below the method of detection limit of 0.1% to 20.277% lead by weight. Fluorescent light fixtures and equipment capacitors were identified.

Hazardous materials were removed from all buildings surveyed during the February 1998 assessment, as well as the former Canlis Restaurant building (which was surveyed during the July 1998 assessment). All hazardous materials were identified, removed and disposed of in accordance with State of Hawaii and EPA regulatory requirements.

Regulated friable and category I non-friable ACM were removed from the property by an EPA and State of Hawaii accredited asbestos removal contractor. ACM was removed in accordance with State of Hawaii Department of Health (DOH) regulatory requirements.

Notifications required by the DOH were submitted to the Noise, Radiation and Indoor Air Quality Branch, Asbestos Division prior to asbestos abatement and building demolition. The asbestos removed from the buildings was disposed of at the Nanakuli Landfill in accordance with regulatory requirements.

Air samples were collected by Clayton Environmental Consultants during asbestos removal activities. The air monitoring results reported concentrations below 0.1 fibers per cubic centimeter (f/cc), which is the Hawaii Occupational Safety and Health (HIOSH) permissible exposure limit (PEL) for worker exposure during an 8-hour time weighted average (TWA) work day. The results also reported concentrations below the EPA level of 0.01 f/cc, which is the level used for building reoccupancy following asbestos abatement activities.

Lead-based paint identified on exterior building surfaces in poor condition was removed by an EPA-accredited lead abatement contractor. Air samples collected during abatement activities were reported below 30 micrograms per cubic meter of air, which is the HIOSH 8-hour PEL for lead dust exposure. Lead paint and associated debris was placed in a closed top, 30-gallon drum. A representative sample of the paint and debris was collected and submitted to the laboratory for toxicity characteristic leaching procedure (TCLP) analysis. The laboratory reported TCLP lead at concentrations above 0.5 milligrams per liter and therefore, the materials were disposed of as hazardous waste at an EPA-approved landfill on the mainland.

PCB ballasts wee removed from fixtures and placed in a 55-gallon, closed-top drum for disposal at an EPA-approved landfill on the mainland.

Fluorescent light tubes were removed, packaged and disposed of at a recycling facility located in Campbell Industrial Park on the island of Oahu.

CFCs were removed from refrigeration units and were recycled in accordance with regulatory requirements.

Impacts and Mitigation Measures

For the demolition of the remaining structures, the following mitigation measure will be complied with:

Any Category I or II non-friable ACM be thoroughly wetted prior to and during building demolition activities. Other ACM was recommended for removal by a licensed EPA-accredited asbestos abatement contractor.

Air monitoring will be conducted to ensure that levels of airborne ACM (if any) during demolition would remain within EPA and HIOSH permissible exposure limits for the demolition contractor's employees and general public.

Paint in poor condition (peeling, flaking or delaminating from the building substrates) will be removed prior to building demolition. During LBP removal activities, representative samples of the LBP debris must be sampled and analyzed for hazardous waste characterization and landfill disposal.

Light ballasts and capacitors will be disposed of at an approved landfill or incinerator, while light tubes will be disposed of at a metal recycling facility because of possible mercury content.

2.8 Flora and Fauna

The project site includes a variety of landscaping, including mature trees. An inventory of existing trees was prepared for the project site and is included as Appendix B. The inventory lists approximately 84 trees on the property including nine Banyan trees, ten MacArthur Palms, six Brassaia trees, 14 Coconut trees, nine Pumeria trees, one Money tree, ten Alexander Palms, six Manila Palms, four White Bird of Paradise trees, one Date Palm, five Pink Tacoma trees, three Fern trees, two Monkey Pod trees, three Tulip Wood trees, and one Opiuma (See Appendix B). None of the trees in the project area are listed by the City and County of Honolulu as an Exceptional Tree.

Species of cats, rats and mice common to inner city environments are probably present at the site. The project site does not provide a habitat for native or endangered avifauna. Species common to urban areas such as sparrows, mynahs, doves, and finches are likely to inhabit the project site.

Impacts and Mitigation Measures

The proposed project will not affect a natural habitat. Site preparation will remove all existing landscaping, comprised of trees, shrubs and groundcover that provide a habitat for various bird, mammal and insect species that thrive in a sub-tropical urban environment. One of the nine Banyan trees, a 40-foot specimen located at the corner of Kuhio Avenue and Kalaimoku Street, will be replanted on-site. The Applicant also coordinated with The Outdoor Circle to propagate through several cuttings a 60-foot tall Banyan tree located along Kalaimoku Street. In addition to the 40-foot Banyan tree, canopy trees that will be planted on-site include Monkey Pod trees and Shower trees. The Applicant is consulting an arborist regarding the current health and condition of the on-site trees, the possibility of retaining additional trees for the proposed development, and the treatment of the 40-foot Banyan tree during construction as well as during its relocation upon the completion of construction.

With regard to impacts on the fauna community, when landscaping for the proposed project is planted, some of the bird and insect species previously inhabiting the site may return, although the dense foliage associated with the existing trees will be reduced.

2.9 Noise

In the vicinity of the project site, ambient sound levels are influenced primarily by vehicular traffic, although land uses such as nightclubs, restaurants and shopping areas also generate noise that may extend into night-time hours after 10:00 PM. Such noises are regarded as particularly sensitive to residential uses. Based on the Day-Night Average Sound Level (Ldn) scale (which is an average sound level over a period of 24 hours with recognition of a greater human sensitivity for evening noise) urbanized areas which are shielded from high volume streets may experience 55 to 65 Ldn. Areas fronting major roadways may be exposed to levels of 65 Ldn, and as high as 75 Ldn when the roadway is a high speed freeway.

Impacts and Mitigation Measures

In the short-term, audible construction noise will probably be unavoidable during the entire project construction period which is estimated to be three years. Such noise impacts will be mitigated to some degree by complying with the provisions of the State Department of Health Administrative Rules, Title 11, Chapter 46, "Community Noise Control". These rules require a noise permit if the noise levels from construction activities are expected to exceed the allowable levels stated in the Chapter 46 rules. In addition, heavy vehicles traveling to and from the project site will comply with the provisions of the Administrative Rules, Title 11, Chapter 42 regarding "Vehicular Noise Control For Oahu". It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment, and to maintain noise levels below allowable regulatory limits. Also, the guidelines for the hours of heavy equipment operation and noise curfew times as set forth by the Department of Health noise control regulations must be adhered to. During construction, the specific location where construction activity will be occurring will change such that the actual length of exposure to construction noise from any particular receptor location will likely be less than the total construction time for the project. Table 2-1 lists the noise levels of various types of construction equipment when measured at a distance of 50 feet.

Based on construction methods used at the neighboring King Kalakaua Plaza development, it is anticipated that impact pile driving of any type will not be required. The building foundation will be on a mat footing consisting of a thick, reinforced concrete slab. Excavation of the site, which will be required for the single-level underground parking structure can be accomplished without blasting and most likely without the use of pneumatic hammering equipment such as hoe rams. Instead, hydraulic and mechanical excavation equipment can be used since the hardest material likely to be encountered are ancient coral layers. Moreover, sheet piling for shoring required during subsurface construction can be installed using vibratory pile drivers instead of impact pile drivers.

All of these methods would avoid using equipment typically associated with generating high levels of noise.

Ground vibrations typically associated with impact pile driving equipment has the potential for causing architectural and structural damage to nearby structures. Such pile driving activities will not be required for constructing the proposed project. Hence, no adverse impacts from ground vibration are anticipated.

Mitigation measures to address short-term construction noise impacts include:

- Using a mat foundation for the project structures instead of piles.
- Installing sheet piling installed with a vibratory driver as opposed to pile driving;
- Avoiding the use of pneumatic hammering equipment such as hoe rams; and,
- Using properly muffled construction equipment on the job site.

Table 2-1

RANGES OF A-WEIGHTED SOUND LEVELS OF CONSTRUCTION EQUIPMENT AT 50 FEET DISTANCE

Equipment	Sound Levels (dBA) Minimum/Maximum
Backhoes, Trencher	72 / 93
Compactors (rollers)	72 / 88
Compressors	68 / 87
Concrete Mixers	72 / 90
Front Loaders	72 / 96
Generators	70 / 82
Hoe Rams (Maximum Levels)	88 / 98
Jackhammers and Drills	75 / 98
Pavers	82 / 92
Pile Drivers (Maximum Levels)	89 / 105
Pneumatic/Hydraulic Hammers	85 / 98
Pumps	70 / 80
Saws	68 / 93
Scrapers, Graders	76 / 95
Steel Ball	74 / 85
Tractors	73 / 95
Trucks	70 / 95
Vibrators	70 / 81

Y. Ebisu & Associates; June 1998

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In the long-term, traffic noise will likely remain the most significant ambient noise component in Waikiki. Since the Traffic Impact Study (see Appendix C) projected no significant increase in traffic attributable to the project in the vicinity of the project site, no significant increase in noise associated with such traffic is anticipated. With respect to the proposed activities at the project site, the retail spaces and pedestrian circulation will be more enclosed than the open-air character of the previous uses at the project site.

2.10 Air Quality

Air quality in the vicinity of the project site is primarily affected by vehicular emissions generated along surrounding streets. Among the various air pollutants for which State and National standards have been established, carbon monoxide levels are the primary concern in areas near heavy traffic flow. The federal standard for carbon monoxide is a maximum of 40 micrograms per cubic meter ($\mu g/m^3$) for 1-hour samples and 10 $\mu g/m^3$ for and 8-hour sample. State of Hawaii regulations, which are more stringent, limit carbon monoxide to 10 $\mu g/m^3$ for 1-hour samples and 5 $\mu g/m^3$ for 8-hour samples. According to the State Department of Health Clean Air Branch, the Waikiki Air Monitoring Station on Kalakaua Avenue reported that carbon monoxide levels have not exceeded State or Federal standards in the past five years.

Impacts and Mitigation Measures

The proposed project will have short-term construction-related impacts on air quality, including the generation of dust and emissions from construction vehicles, equipment and commuting construction workers. The construction contractor is responsible for complying with State Department of Health Administrative Rules, Title 11, Chapter 60-11.1 regarding "Air Pollution Control, specifically Section 11-60.1-33 regarding fugitive dust and the prohibition of visible dust emissions at property boundaries.

Mitigation measures to address short-term impacts include:

- Minimizing the movement of construction vehicles during peak traffic periods; and,
- Controlling the generation of fugitive dust through frequent watering of unpaved roads and areas of exposed soil and planting landscaping as soon as possible on completed areas.

In the long-term, it is not anticipated that traffic associated with the proposed project will adversely affect air quality since the Traffic Impact Study (see Appendix C) projected no significant increase in traffic attributable to the project in the vicinity of the project site.

2.11 Access, Traffic and Utilities

2.11.1 Access and Traffic

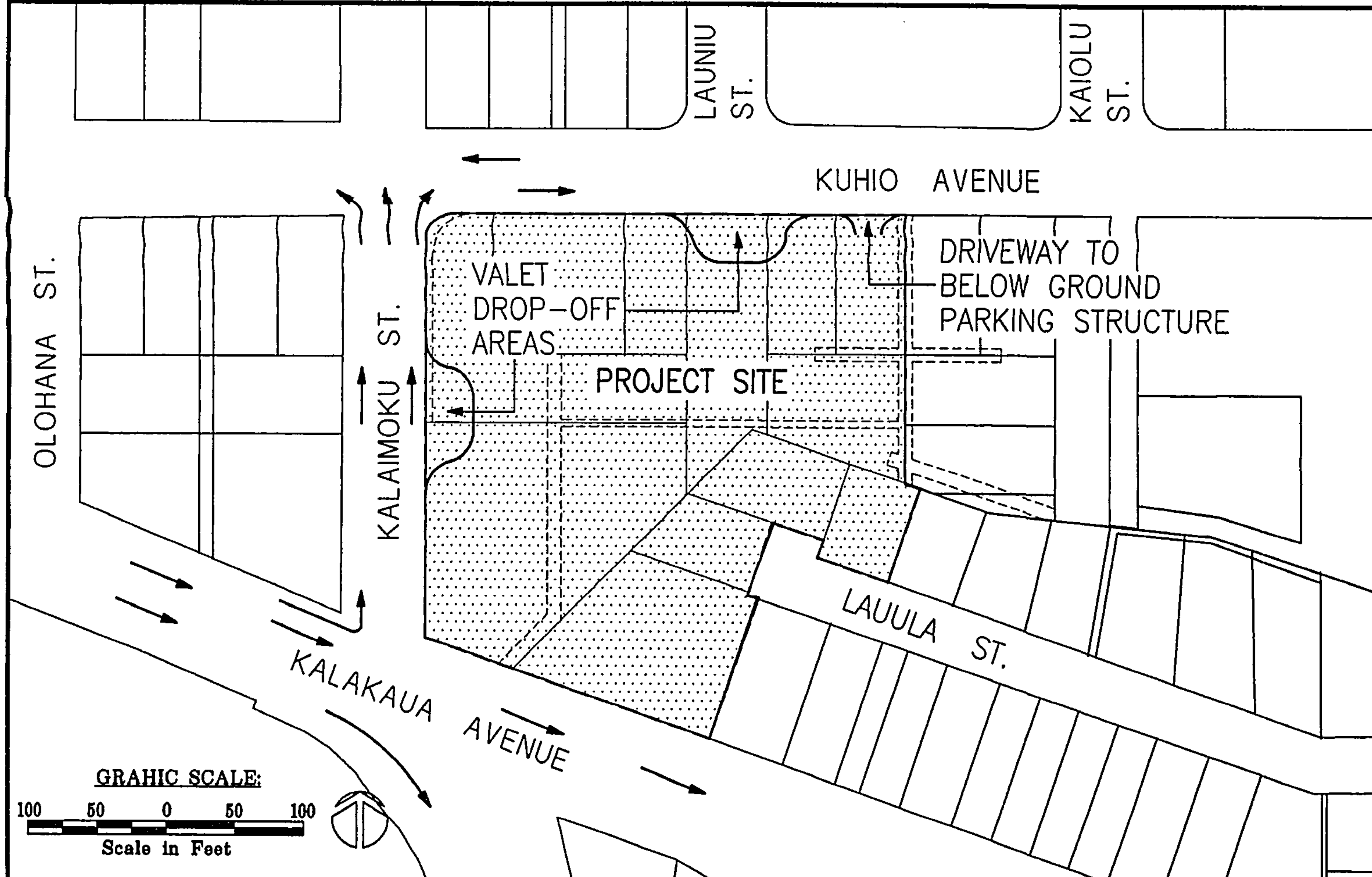
The roadway system in the vicinity of the project site includes the following major streets (See Figure 2-1):

- Kalakaua Avenue: This four-lane City and County of Honolulu roadway is oriented in the east-west direction and provides access to the major hotels, parks and visitor-oriented destinations and resorts. Kalakaua Avenue forms the eastbound component of a one-way couplet system with Ala Wai Boulevard as the westbound component located further north of the project site. At its intersection with Kalaimoku Street, Kalakaua Avenue serves through-traffic movements as well as left-turn traffic movements to northbound Kalaimoku Street and right-turn movements southbound Saratoga Road. Fronting the project site, Kalakaua Avenue has a curb-to-curb width of approximately 47 feet within a 90-foot right-of-way. The intersection of Kalakaua Avenue and Kalaimoku Street/Saratoga Road is controlled by a two-phase traffic signal system.

- Kuhio Avenue: This four-lane, two-way, City and County of Honolulu roadway is oriented in the east-west direction across most of Waikiki, extending from Kapahulu Avenue to the east and ending at its intersection with Kalakaua Avenue west of the project site. The roadway has a curb-to-curb width of approximately 56 feet within a 70 foot right-of-way fronting the project site. Through the Waikiki area, Kuhio Avenue provides an alternative east-west route to the one-way couplet of Kalakaua Avenue and Ala Wai Boulevard. Left-turn storage lanes on Kuhio Avenue are provided at the major intersections and the roadway has a posted speed limit of 25 miles per hour (mph) in the project vicinity.

- Kalaimoku Street: This two-lane, one-way, City and County of Honolulu roadway serves northbound traffic between Kalakaua Avenue and Ala Wai Boulevard. Fronting the project site, Kalaimoku Street has a curb-to-curb width of approximately 32 feet within a 60-foot right-of-way. It intersects Kuhio Avenue and permits left, through and right-turn movements on the northbound approach to the intersection. The posted speed of Kalaimoku Street in the vicinity of the project is 25 mph.

Counts of traffic movements in the vicinity of the project site were conducted on August 26 and 27, 1998 in conjunction with the preparation of the ***Traffic Impact Report for the Proposed King Kalakaua Phase II*** (Appendix C). A highway capacity analysis was performed using the data collected to evaluate traffic operations at key intersections using the concept of the Level Service (LOS). LOS is a quantitative and qualitative assessment



KING KALAKAUA PLAZA PHASE II

Fig. 2-1

TRAFFIC CIRCULATION PATTERN

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
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of traffic operations. LOS are categorized by designations of "A" through "F", with LOS "A" representing an ideal or excellent operating condition, LOS "F" representing an unacceptable operating condition, and LOS "B" through "E" representing progressive steps between the two extremes. The "Volume-to-Capacity" (v/c) ratio is another measure which relates the amount of traffic demand on a roadway to its theoretical carrying capacity.

In general, all of the key intersections in the vicinity of the project site - Kalakaua Avenue/Kalaimoku Street/Saratoga Road, Kuhio Avenue/Kalaimoku Street and Kuhio Avenue/Lewers Street, currently operate well, at LOS "B," during both the morning (7:00 to 9:00 a.m.) and afternoon (4:00 to 6:00 pm) peak hours. In the morning peak hour, the v/c ratios for these three intersections are 0.585, 0.281 and 0.233, respectively. In the afternoon peak hour their respective v/c ratios are 0.656, 0.415 and 0.429.

Impacts and Mitigation Measures

To assess the traffic impact of the proposed project, a "without project" traffic condition was projected using an assumed growth rate of 2.0% per year through the forecast year of 2001 when the proposed project is assumed to become operational. Traffic generated by the proposed traffic was then added using trip generation rates and methods developed by the Institute of Traffic Engineers (ITE). Tables 2-2 and 2-3 compare the existing and future conditions with and without the proposed project for Peak Commuter Periods and Peak Project Generation Periods scenarios, respectively.

With regard to public transportation concerns, the project is not anticipated to significantly increase the number of public transit trips made to or from the Waikiki Area and should not require an increase in transit service. However, the project may require the permanent relocation of an existing bus stop located on the east side of Kalaimoku Street along the project frontage. Adequate waiting areas for bus patrons and provision s of bus shelters along with appropriate furniture will be coordinated with the City and County of Honolulu Department of Transportation Services.

Existing trolley routes in Waikiki may be modified to serve passengers to and from the project site. To maintain traffic flow on the surrounding streets, the trolley stop will be located within the project site to avoid conflicts with vehicular and pedestrian traffic. Similarly, the proposed project may be used as a tour bus stop for shopping trips but would be limited to a maximum of one bus per hour. During the peak hours of operation, one tour bus entering the facility should not have a significant impact on traffic operations in the project vicinity provided that

TABLE 2-2
OVERALL LOS COMPARISON AT STUDY INTERSECTIONS DURING PEAK COMMUTER PERIODS

Intersection	AM Peak			PM Peak		
	Existing (v/c)	Year 2001		Existing (v/c)	Year 2001	
		Without Project (v/c)	With Project (v/c)		Without Project (v/c)	With Project (v/c)
Kalakaua Ave./ Kalaimoku St.	B (0.585)	B (0.619)	B (0.620)	B (0.656)	B (0.700)	B (0.758)
Kuhio Ave./ Kalaimoku St.	B (0.281)	B (0.298)	B (0.340)	B (0.415)	B (0.440)	B (0.541)
Kuhio Ave./ Lewers St.	B (0.233)	B (0.249)	B (0.267)	B (0.429)	B (0.456)	B (0.513)

TABLE 2-3
OVERALL LOS COMPARISON AT STUDY INTERSECTIONS DURING PEAK PROJECT GENERATION PERIODS

Intersection	AM Peak			PM Peak		
	Existing (v/c)	Year 2001		Existing (v/c)	Year 2001	
		Without Project (v/c)	With Project (v/c)		Without Project (v/c)	With Project (v/c)
Kalakaua Ave./ Kalaimoku St.	B (0.585)	B (0.619)	B (0.628)	B (0.656)	B (0.700)	B (0.770)
Kuhio Ave./ Kalaimoku St.	B (0.281)	B (0.298)	B (0.419	B (0.415)	B (0.440)	B (0.561)
Kuhio Ave./ Lewers St.	B (0.233)	B (0.249)	B (0.331)	B (0.429)	B (0.456)	B (0.510)

bus loading and unloading operations do not impede vehicular traffic on the surrounding streets.

In general, the results of the traffic impact study suggest minor changes in the overall operating conditions at the study intersections as a result of the project for both scenarios. The v/c ratios indicate that the intersections will be operating well below capacity. The following recommendations listed in the Traffic Impact Report will implemented to minimize project-related traffic impacts:

- Maintain sufficient sight distances for motorists to safely enter and exit the project access driveway;
- Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations;
- Provide an adequate turn-around area for service, delivery and refuse collection vehicles to maneuver on the project property. Avoid vehicles reversing maneuvers on City streets;
- Provide sufficient driveway width to accommodate save vehicle ingress and egress; and
- Provide sufficient turning radii for drop-off and/or trolley stops.

2.11.2 Utilities

Water: The water system in the project vicinity includes an 8-inch line in Kalakaua Avenue, 12-inch line in Kalaimoku Street, and 16- and 24-inch lines in Kuhio Avenue.

Wastewater: The wastewater system in the project vicinity includes 18- and 24-inch sewerlines in Kuhio Avenue and a 6-inch line in Lauula Street. The wastewater system within the project site includes a 6-inch line.

Drainage: The drainage system in the project vicinity includes 12- and 18-inch lines in Kuhio Avenue, 24-inch line in Kalaimoku Street, and 8- and 18-inch lines in Kalakaua Avenue.

<u>Impacts and Mitigation Measures</u>

Based on informal discussions with the City and County of Honolulu Board of Water Supply (BWS), water pressure in the project area should be adequate for the proposed project (Staff communication, August 20, 1998). In addition, the

BWS indicated in a letter dated October 23, 1998 that the existing off-site water system is presently adequate to accommodate the proposed project. However, final approval by the BWS to connect to the system will be made during the building permit process (see Chapters 7 and 8).

The Department of Planning and Permitting (DPP) Wastewater Branch informally indicated that the 24-inch sewerline located in Kuhio Avenue should accommodate the proposed project (Staff communication, August 18, 1998). However, in a subsequent letter dated October 30, 1998, the DPP indicated that the wastewater connection should be made directly to the 18-inch sewer line located in Kuhio Avenue. The confirmation of sewer capacity reservation is contingent upon the approval of a Sewer Connection Application (see Chapters 7 and 8).

2.12 Solid Waste

Solid waste in the project vicinity is collected by the City and County of Honolulu Refuse Collection and Disposal Division or by private collection companies. The solid waste is transported to the Kapaa Transfer Station and then to the Honolulu Program of Waste Energy Recovery (H-POWER) facility at Campbell Industrial Park where it is converted to electricity. Presently, the refuse station has the capacity to handle about 500 tons of solid waste per day. Alternative disposal sites include the Waimanalo Gulch Sanitary Landfill near the Kahe Power Plant and the Waipahu Incinerator.

Impacts and Mitigation Measures

Solid waste generated by the project during its construction and operation will collected by a private collection contractor, and therefore will not impact municipal services.

2.13 Archaeological/Historical Resources

An archaeological assessment was conducted for the project by Cultural Surveys Hawaii in August 1998. The assessment included historic background research to identify existing and potential archaeological and historic sites, as well as an assessment of possible historic buildings on the project site. Excerpts from the assessment are summarized below and the report in its entirety is included as Appendix D.

Archaeological Concerns: The present project area comprises land created and filled during the 1920s in conjunction with the construction of the Ala Wai Canal. The land fill operations have obscured all traces of any archaeological features within the project area predating the 1920s. However, historic documents and maps, and previous archaeological research, indicate that the project area was likely a marshy field located mauka of an extensive network of fishponds that covered the present Ft. DeRussy grounds. An 'auwai (ditch) that fed the fishponds traversed through the west side of the project site. The 'auwai was entered on the State Inventory of Historic Places as site no. 50-80-14-4970 during archaeological study within the Ft. DeRussy grounds.

Archaeological reports have documented human burials - both pre-contact Hawaiian and historic - throughout Waikiki. Especially relevant to the present project area are several burials that have been encountered within the Ft. DeRussy grounds and adjacent hotels. A burial has also been documented at the intersection of Kuamoo Street and Kuhio Avenue, two blocks to the west of the project site. It is also likely that intact prehistoric and early contact cultural deposits are lying undisturbed beneath modern fill layers within the project area.

Historic Building Concerns: Four structures older than fifty years presently occupy the project site. The concrete structures were former apartments constructed between 1942 and 1948. All four structures have since been renovated for commercial use, and it is likely that these alterations have compromised the buildings' historic integrity.

Concern has been raised over the historic status of the former Canlis Restaurant building, though the building is less than fifty years old. This concern has been expressed in a letter from the Department of Land and Natural Resources State Historic Preservation Division (SHPD) stating that, "... Canlis Restaurant Building, while not quite 50 years old, has exceptional significance as one of the few intact examples left in Hawaii of the once popular restaurant trend and unique building type...".

<u>Impacts and Mitigation Measures</u>

It is recommended that an archaeological survey be conducted, including subsurface testing of the project site, with particular attention given to locating the 'auwai along the west side of the property. If major findings are encountered during subsurface testing a mitigation plan will be prepared for review and approval by SHPD. In the event burials are encountered during the subsurface testing, the Burials Program of the SHPD will be notified to determine appropriate treatment.

It is noted that since publication of the Draft EA in September 1998, the Canlis Restaurant building a demolition permit was approved and the building was subsequently razed. The Applicant has coordinated with the City and County of Honolulu Department of Planning and Permitting with regard to mitigation measures for the former Canlis Restaurant building. The following measures will be implemented:

- A photographic essay will be prepared for small scale single story structures built in Waikiki circa 1950, and will include portions of the Canlis Restaurant as a significant component. The essay will include photographic and/or drawing documentation as available. Information describing original architects, clients, or owners and construction methods and materials will be included for each structure. An archive of this essay will be established for architectural historians and researchers and will be accessible to interested parties;

- A single story structure will be incorporated as part of the proposed project and will reflect qualities of the former Canlis Restaurant building. Rather than a literal translation, the new structure will reflect the material qualities of the former restaurant. With regard to the material composition of the structure, the Applicant has retained a portion of the original copper roof and moss rock from the restaurant and will strive to incorporate these or similar materials into the new structure. The structure will be occupied by a new police "Koban" service. The disposition of the structure, including its use and location within the plaza area, will be resolved during the WSD permit process.;

- A historic exhibit will be incorporated into the proposed development to present selected images and text created for the aforementioned photographic essay. The exhibit will provide a unique perspective on the historic architectural evolution of Waikiki;

- A comprehensive program to identify aspects of the project signage (exclusive of Tenant) with a combination of English and Hawaiian language. This bilingual approach will reflect an ongoing commitment to reinforcing a Hawaiian sense of place whenever possible; and

- The landscape design for the project will reflect many of the features and ideas of the former Canlis Restaurant, including a large setback at the corner of Kalakaua Avenue and Kalaimoku Street.

2.14 Socio-Economic Characteristics

2.14.1 Profile of the Existing Community

General Profile of the Waikiki Community:

Profile of the Project Site Vicinity:

The project site is within the boundaries of the Waikiki Neighborhood Board No. 9 and is located within the 10th Senatorial District, the 21th Representative District, and the 4th Council District.

2.14.2 Population

The following summary of the socio-economic environment is based on demographic and housing data from the 1990 U.S. Census of Population and Housing. Based on this data, the project site is within Census Tract 20.02. To get a broad demographic picture of the project area, socio-economic data from Census Tracts 18.01, 18.02, 19.01, 19.02, and 20.02 are included in the following summary. These Census Tracts are bounded by: Kapahulu Avenue, Ala Wai Boulevard and Waikiki Beach.

Although population has been increasing on Oahu over the past several decades, the rate of population growth has been steadily decreasing. The islandwide average annual population growth rate decreased from 2.3 percent in the 1960s, to 1.9 percent in the 1970s, to less than 1 percent in the 1980s.

In 1990, the resident population of Oahu was 836,231, approximately 75 percent of the State of Hawaii's total population. Waikiki had a resident population of 19,757, a 13.7 percent increase from its 1980 population of 17,384. Table 2-4 highlights the demographic characteristics of the Waikiki Neighborhood.

The study area includes a population which is relatively older than the islandwide population. Only 7.2 percent of the study area's population are under 18 years of age as compared to almost one-fourth of the islandwide population. About 21.2 percent of the area's population are elderly, whereas 11 percent of Oahu's residents are age 65 years or older.

In comparison to the islandwide community, the study area contains similar ratios of males to females, with the male population being slightly greater in both. In terms of ethnicity, the study area is closely representative of the Oahu-wide population, with comparable percentages of residents from the following major ethnic groups: Asian/Pacific Islander, White, Hispanic origin, and Black. Overall, levels of educational

TABLE 2-4
1990 DEMOGRAPHIC CHARACTERISTICS

CHARACTERISTICS	WAIKIKI (Census Tracts 18.01, 18.02, 19.01, 19.02, 20.02)	CITY & COUNTY OF HONOLULU
Total Population	19,757	836,231
Age		
Median age	N/A	32.2
Under 18 years	1,423 *(7.2%)*	204,613 *(24.5%)*
Over 65 years	4,188 *(21.2%)*	91,832 *(11.0%)*
Sex		
Male	N/A	425,994 *(50.9)*
Female	N/A	410,237 *(49.1)*
Ethnicity		
Asian/Pacific Islander	6,048 *(35.2%)*	526,459 *(63.0%)*
White	12,079 *(61.1%)*	264,372 *(31.6%)*
Black	381 *(01.9%)*	25,875 *(03.1%)*
Other	349 *(01.7%)*	N/A
Education of Persons 25 Yrs+		
High school graduate or higher	14,370 *(87.6%)*	433,834 *(81.2%)*
Bachelors or higher degree obtained	4,823 *(29.4%)*	131,169 *(24.6%)*
Households		
Total households	11,445	265,304
Family households	4,170 *(36.4%)*	197,294 *(74.4%)*
Non-family households	7,275 *(63.6%)*	68,010 *(25.6%)*
Persons per household	1.71	3.02
Housing		
Total housing units	17,137	281,683
Occupied housing units	11,342	265,304
Owner occupied	3,582 *(20.9%)*	137,910 *(52.0%)*
Renter occupied	7,760 *(45.3%)*	127,394 *(48.0%)*
Units with more than 1 person per room	1,438 *(12.7%)*	43,526 *(16.4%)*
Units In Structure		
1 to 2 units	212	N/A
3 to 4 units	209	N/A
5 to 9 units	440	18,285
10 or more units	15,499	84,378
Monthly Rent		
Less than $499	1,363	N/A
$500 to $999	4,617	N/A
over $1,000	1,556	N/A

Source: U.S. Bureau of the Census, Summary Tape File 1A attainment are much higher among study area residents over age 25 than among the islandwide population over age 25. The percentage of study area residents who earned a high school diploma is more than 6 percent higher than the islandwide population, the percentage of study area residents who earned a bachelors or higher degree is almost 5 percent higher than that of the islandwide population.

Impacts and Mitigation Measures

The proposed project will have generally positive social and economic impacts in the region. In the short-term, the project will confer some positive benefits in the local area. The project will add construction jobs in the vicinity, thereby stimulating that sector of the economy. Direct economic benefits will result from construction expenditures both through the purchase of materials from local suppliers and through the employment of local labor. Indirect economic impacts may include benefits to local retail businesses resulting from construction activities. Construction activities associated with the proposed project will create some adverse impacts such a minor disruptions of traffic and increased noise nuisances in the immediate vicinity of the project site.

Once operational, the proposed project will restore employment opportunities lost when the prior tenants vacated the property. The type of businesses anticipated to occupy the proposed retail/commercial mixed-use development are likely to be franchises and chain-type outlets as opposed to the small independent businesses that previously occupied the property. Thus, the character of employment opportunities will change as a result of the proposed project.

2.14.3 Police, Fire and Medical Services

Police Protection: The project area is located within Honolulu Metropolitan Police District 6 which extends from Kapiolani Park along Ala Wai Boulevard and along Kalakaua Avenue. District 6 headquarters are at the Waikiki Substation located on Kalakaua Avenue at Kuhio Beach, near the intersection with Kanekapolei Street. The general area is patrolled by officers on bicycles, Cushman vehicles, all-terrain vehicles and automobiles.

A new police "Koban" service will be incorporated into the project.

Impacts and Mitigation Measures

During the construction phase of the project, calls for police service in the area are likely to increase as a result of construction activities, based on public concerns and perceptions related to the generation of noise, dust and traffic. In the long-term, police service will be required for typical problems associated with developments in Waikiki, including shoplifting, thefts in parking and other areas, and traffic.

The proposed project will improve public safety in the project vicinity via a new police "Koban" service which will be incorporated into the development. The Honolulu Police Department will continue to be consulted regarding potential impacts of the project on the provision of police services.

Fire Protection: Fire protection services for the project area are provided by the Honolulu Fire Department (HFD) through the Pawaa Fire Station #2, which is located at the intersection of Makaloa and Kaheka Streets. The Pawaa Fire Station is equipped with engine, ladder and rescue companies and is considered the primary fire station in the project vicinity. The Waikiki Fire Station located on the corner of Kapahulu Avenue and Paki Street provides backup services and is equipped with engine and ladder companies.

Impacts and Mitigation Measures

The proposed project meet all present building codes and standards including access to fire apparatus, water supply and building construction as set forth by the Honolulu Fire Department (HFD). Therefore, the project will improve public safety with respect to fire protection in the project vicinity as older, non-conforming structures will be replaced by a new development built to current standards. The HFD will be consulted regarding the potential impacts of the project on fire protection services.

Medical Facilities: Major health care facilities near the project site include the following:

Facility	Location	Distance
Kapiolani Medical Center	Punahou Street	1.5 miles
Kaiser-Permanente Clinic	Pensacola and King Streets	1.8 miles
Straub Clinic and Hospital	King and Ward Streets	2.1 miles
Queen's Medical Center	Punchbowl Street	2.5 miles

These medical facilities are located less than 15 minutes by car from the project site and provide a full range of services, including 24-hour emergency service. Mobile emergency care on Oahu is provided by the City's 16 ambulance units. The City ambulance nearest the project site is located at Queen's Medical Center.

Impacts and Mitigation Measures

The proposed project is not anticipated to significantly affect the provision of medical services in the community.

Chapter 3

RELATIONSHIP TO PLANS, POLICIES AND CONTROLS

3. RELATIONSHIP TO PLANS, POLICIES AND CONTROLS

This section discusses State and City and County of Honolulu land use controls, and City plans, policies relating to the proposed project.

3.1 State Land Use District

The Hawaii Land Use Law of Chapter 205, Hawaii Revised Statutes, classifies all land in the State into four land use districts: Urban, Agricultural, Conservation, and Rural. The project site is designated within the Urban District which includes *"lands characterized by city-like concentrations of people, structures, streets, urban level of services and other related land uses."* The proposed project is consistent with the Urban classification.

3.2 City and County of Honolulu General Plan

The General Plan for the City and County of Honolulu (adopted 1977) was amended by the City Council in 1992. The Plan is a statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of Oahu. The Plan is also a statement of broad policies which facilitate the attainment of the objectives of the Plan. Eleven subject areas provide the framework for the City's expression of public policy concerning the needs of the people and functions of government. These areas include population; economic activity; the natural environment; housing; transportation and utilities; energy; physical development and urban design; public safety, health and education; culture and recreation; and government operations and fiscal management. The relationship of the proposed project to the relevant objectives and policies of the General Plan are as follows:

II. Economic Activity

Objective B: To maintain the viability of Oahu's visitor industry.

The proposed project responds to trends in demands of visitors to Waikiki for high quality shopping and dining opportunities. By responding to these demands, the proposed project helps to maintain Waikiki as a visitor attraction.

Policy 4: Prohibit major increases in permitted development densities in Waikiki.

The proposed project complies with the density limits established by the Waikiki Special District in the Resort Commercial Precinct (See Section 3.4, below).

Policy 5: Prohibit further growth in the permitted number of hotel and resort condominium units in Waikiki.

The Waikiki Special District (See Section 3.4, below) prohibits hotel uses within the Resort Commercial Precinct. Hence, the proposed project will not include any hotel uses.

3.3 City and County of Honolulu Development Plan

The City and County of Honolulu's Development Plan (DP) program provides a relatively detailed framework for implementing the objectives and policies of the General Plan on an areawide basis. Eight Development Plans have been adopted covering the entire island. The Development Plan Ordinance consists of Common Provisions applicable to all Development Plan areas, Special Provisions for each area, Land Use Map, and Public Facilities Map. The Development Plan Land Use Maps depict land use patterns which are consistent with the objectives and policies for the General Plan.

The project site is located within the Primary Urban Center (PUC) area which includes the communities from Waialae-Kahala to Pearl City. It is the most populated part of the State and is Oahu's largest employment center.

The PUC Development Plan includes 14 Special Provisions for Waikiki. The following provisions are related to the proposed project:

(A) "In general, resort and related commercial activities shall be concentrated in the areas makai of Kuhio Avenue and Ala Moana Boulevard ..."

The project site is located makai of Kuhio Avenue.

(B) "Resort facilities shall be developed to support a destination area of 32,800 visitor units in the Waikiki Special Area ..."

(C) "Any additional high-density development shall be discouraged."

The proposed project does not include any visitor units and has a floor area density below that permitted by the Waikiki Special District (See Section 3.4, below).

(D) "The general height limit for the area shall be provided in the Waikiki Special Design District."

The proposed project complies with the height limit established by the Waikiki Special District (See Section 3.4, below).

(M) *"The pedestrian traffic network within the area shall be substantially improved to recognize the unique visitor destination area requirements. Special consideration shall be give to pedestrian safety, comfort, and enjoyment since walking constitutes a major activity for the visitor within this area. Sidewalks along... Kalakaua Avenue, Kuhio Avenue, and other important streets for pedestrian circulation shall be widened and enhanced."*

3.3.1 Development Plan Land Use Map

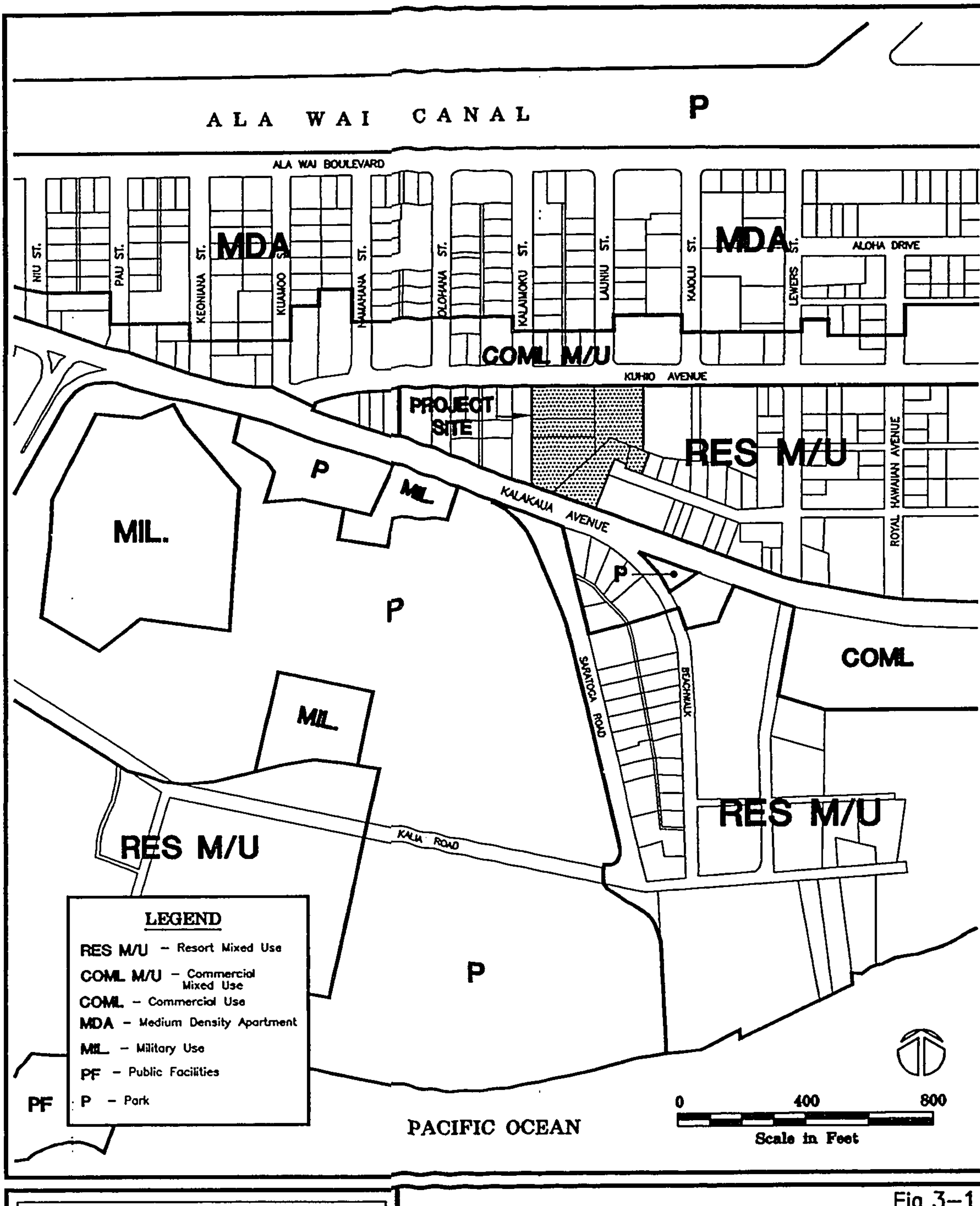
The PUC Development Plan Land Use Map designates the project site as *Resort Mixed Use* (see Figure 3-1). The proposed project conforms with the Land Use Map designation of *Resort Mixed Use* as defined by the Development Plan Common Provisions:

(p) *Resort Mixed Use*

"Resort uses which provide a full range of facilities and services for visitors shall be the predominant type of development. The resort mixed use designation shall be confined to the Waikiki Special Area as defined in ROH Section 24-2.2(b)(2). The term visitor unit, which is used in the special provisions, includes hotel rooms and resort condominiums, as well as other accommodations which are located in resort mixed use designated areas and reserved for visitor use. Resort mixed use areas shall permit hotel, visitor unit, apartment, housing and commercial uses. The land use ordinance shall establish appropriate requirements, which may include limits on the various land uses permitted within the resort mixed use areas, to prevent over-commercialization and excessive development of hotels and other visitor units."

3.3.2 Development Plan Public Facilities Map

The Development Plan (DP) Public Facilities Map identifies public and private proposals for parks, streets and highways, major public buildings, utilities, terminals, and drainage. The DP Public Facilities Map for the PUC shows no designations in the immediate vicinity of the project site.



KING KALAKAUA PLAZA PHASE II

Fig 3–1

DEVELOPMENT PLAN LAND USE MAP

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.

3.4 City and County of Honolulu Land Use Ordinance and Zoning

The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the Oahu General Plan and Development Plans. The provisions are also referred to as the zoning ordinance. Zoning designations are shown on the zoning maps for the City.

The project site is located within the Waikiki Special District (WSD) which provides unique zoning precincts with associated land use and design standards that are generally more stringent that those applicable to the rest of Oahu. The District was established in 1976 to preserve and enhance the character of Waikiki, and to maintain a balance in Waikiki's mix of resort, commercial, residential and recreational use. In February, 1996 the City Planning Department published the Waikiki Planning and Program Guide to provide an overview of recent efforts toward the continued improvement and enhancement of Waikiki. Among its recommendations were amendments to the WSD to promote renovation, replacement and enhancement in the resort districts, promote a "Hawaiian Sense of Place" and preserve views and unique Hawaiian features. Subsequently, significant amendments to the WSD were made which are intended to implement the recommendations.

The project is currently in the schematic phase of design and, therefore design details, including specific building articulation, material and color, ground level and yard features, and lighting are unavailable at this time. As such, it is premature at this juncture to discuss how the project will specifically fulfill the WSD objective and design guidelines for promoting a "Hawaiian Sense of Place". Specific information will become available as the project design progresses and, during the processing of the WSD Major Permit, these details will be finalized and will comply with all WSD permitting requirements. The following discusses, in general terms, the ways in which the project will address a "Hawaiian Sense of Place":

- A single structure varying in height from three to five stories will provide graduated, stepped roof forms which will, in turn, provide the height transition to neighboring small-scale buildings located to the east of the project;

- The single level parking structure will be located underground. Therefore, it will be unseen and will not visually affect any street frontage or open space area;

- The roof design will include hipped-roof forms and landscaping along all three street frontages;

- Approximately 35,543 square feet of ground level landscaped open space will be provided. The landscape design for the project will reflect many of the features and ideas of the former Canlis Restaurant, including a large setback at the corner of Kalakaua Avenue and Kalaimoku Street. This setback area will provide a public focus to the area. Landscaped areas will include native tropical plant species such as, an existing 40-foot Banyan tree, Monkeypods, Coco Palms and Plumeria. In addition to the concentration of landscape at the corner of Kalakaua Avenue and Kalaimoku Street, landscaped areas will be located along all three street frontages of Kuhio Avenue, Kalaimoku Street and Kalakaua Avenue; and

- A comprehensive program to identify aspects of the project signage (exclusive of Tenant) with a combination of English and Hawaiian language.

With regard to historic aspects of the WSD guidelines, the Applicant has coordinated with the City and County of Honolulu Department of Planning and Permitting to discuss mitigation measures for the former Canlis Restaurant building, and have agreed upon the following measures:

- A photographic essay will be prepared for small scale single story structures built in Waikiki circa 1950, and will include portions of the Canlis Restaurant as a significant component. The essay will include photographic and/or drawing documentation as available. Information describing original architects, clients, or owners and construction methods and materials will be included for each structure. An archive of this essay will be established for architectural historians and researchers and will be accessible to interested parties;

- A single story structure will be incorporated as part of the proposed project and will reflect qualities of the former Canlis Restaurant building. Rather than a literal translation, the new structure will reflect the material qualities of the former restaurant. With regard to the material composition of the structure, the Applicant has retained a portion of the original copper roof and moss rock from the restaurant and will strive to incorporate these or similar materials into the new structure;

- A historic exhibit will be incorporated into the proposed development to present selected images and text created for the aforementioned photographic essay. The exhibit will provide a unique perspective on the historic architectural evolution of Waikiki;

- As aforementioned, a comprehensive program to identify the project signage with English and Hawaiian language; and

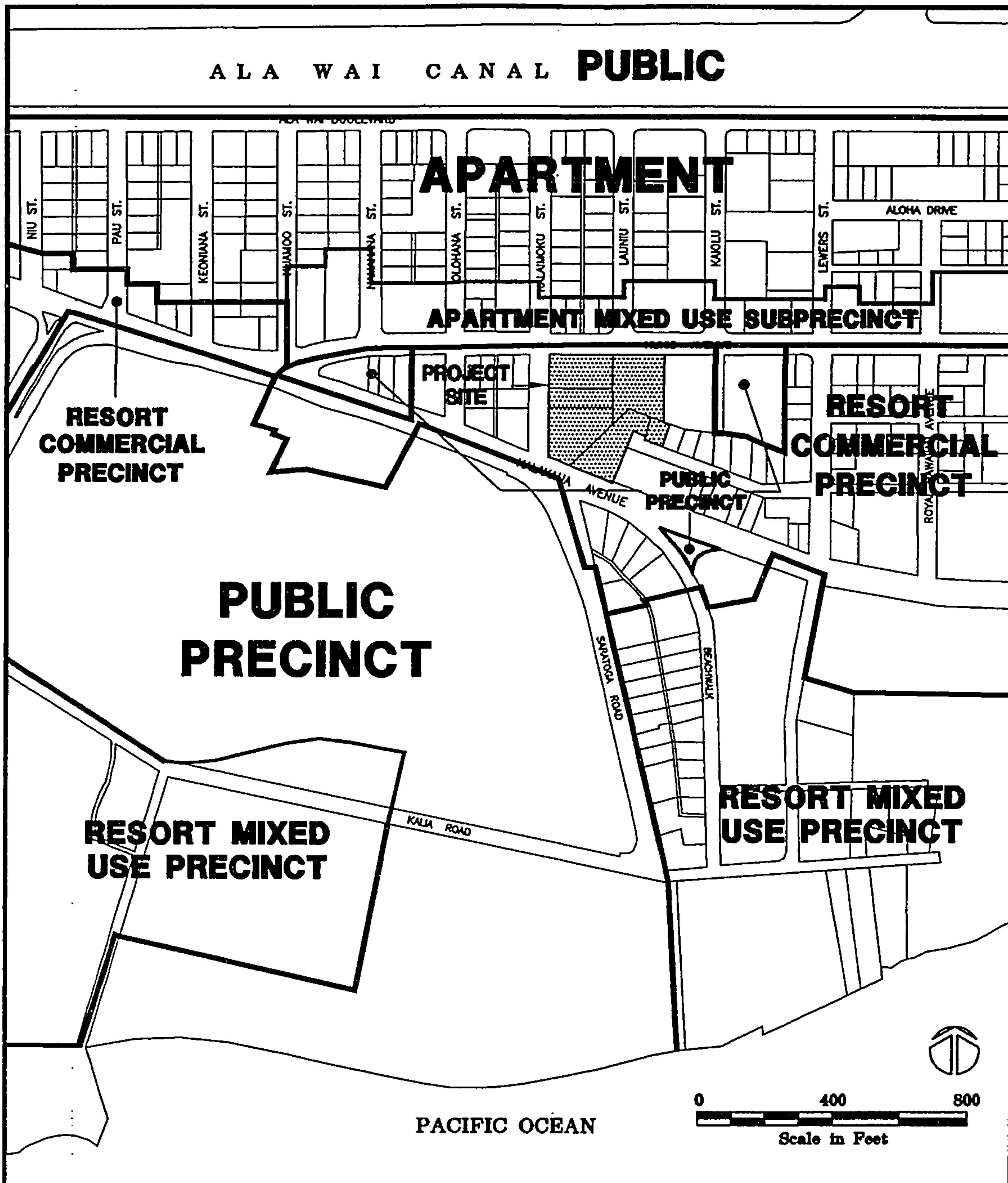
- As aforementioned, the landscape design for the project will reflect many of the features and ideas of the former Canlis Restaurant.

The project site is located within and will conform to the allowable uses and design standards of the *Resort Commercial Precinct* (see Figure 3-2). The proposed retail/commercial mixed-use is a "Permitted Principal Use" and will be subject to the Development Standards for the Precinct, including those governing lot area/dimensions, yards, density, open space, heights and transitional height setbacks.

The height limit for the project site, as established by the Waikiki Special District Urban Design Controls is 300 feet (LUO Section 7.80-7 *Resort Commercial Precinct* and Table 7.6(B) *Waikiki Special District Precincts Development Standards*). By comparison, the height of the tallest structure in the proposed project is approximately 180 feet.

The permitted density for the proposed project is established in LUO Section 7.80-7 *Resort Commercial Precinct* and Table 7.6(B) *Waikiki Special District Precincts Development Standards*. The permitted density determines the amount of floor area that may be developed on the project site. Density is defined by the allowable Floor Area Ratio (FAR) which is basically the ratio of floor area to the land area of the project site. Within the Resort Commercial Precinct, the land area used in the calculation allows one-half of the area of adjacent streets to be included. In addition, by providing publicly accessible open spaces and arcades, additional floor area referred to as an *Open Space Bonus* can be included in the calculation of allowable floor area. Based on a preliminary calculation, up to 415,190 square feet of floor area can be developed on the project site. By, comparison, the proposed project provides approximately 269,338 square feet of floor area. The off-street parking requirements for the proposed project will be partially met. According to the Land Use Ordinance (LUO Section 7.80-4(h) and Section 3.70-2), one parking stall is required for 800 square feet of gross floor area. This would amount to 366 stalls for the proposed development (292,118/800 = 365.15). The proposed project includes 289 parking stalls, leaving a deficit of 77 stalls. The applicant proposes to accommodate this deficit at the adjoining King Kalakaua Plaza which has 77 parking stalls in excess of its off-street parking requirement. This will require approval of a Conditional Use Permit (CUP) Type 1 for *Joint Use of Parking Facilities* (see Section 3.4.1, below).

The Waikiki Special District also includes provisions for the protection of prominent view corridors (LUO Section 7.80-3). None of the three streets bordering the property



KING KALAKAUA PLAZA PHASE II	ZONING MAP Prepared for: KALAKAUA SOUTHSEAS OWNERS, LLC	Fig 3–2 Prepared by: Wilson Okamoto & Associates, Inc.

including Kalakaua Avenue, Kuhio Avenue and Kalaimoku Street, are identified by the Urban Design Controls as major view corridors.

Pursuant to the requirements of the Waikiki Special District, the proposed project will require a major WSD Permit which would be reviewed as a new building (LUO Section 7.80-9 *Tables for Permitted Uses and Structures, Development Standards and Project Classification* and Table 7.6(C) *Waikiki Special District Project Classification*). A WSD minor permit will also be required for the removal of trees over six inches in diameter. The WSD major permit requires a review of the proposed project by the Waikiki Neighborhood Board No. 9, a public hearing and is acted upon by the Director of Planning and Permitting. The WSD minor permit is acted upon by the Director of Planning and Permitting and does not require a public hearing.

3.4.1 Conditional Use Permit Type 1

The project will require two Conditional Use Permits (CUP) - Type 1 for *Joint Development of Two or More Adjacent Zoning Lots* and for *Joint Use of Parking Facilities*, respectively. In general, CUP Type 1 is required to allow certain conditional uses in specific zoning districts if they meet minimum standards specified in the LUO. The CUP Type 1 is administered by the Department of Planning and Permitting, does not require a public hearing, and the decision is rendered by the Director of Planning and Permitting.

The CUP Type 1 for *Joint Development of Two or More Adjacent Zoning Lots* is required for the proposed project since the project site is comprised of 10 separate parcels. In applying for the CUP Type 1, *"the applicant much submit an agreement binding themselves and their successors in title or lease, individually and collectively, to maintain the pattern of development proposed in such a way that there will be conformity with applicable zoning regulations."* The agreement is subject to the approval of the City's Corporation Counsel and, if the permit is approved, must be *"filed as a covenant running with the land with the Bureau of Conveyances or the Registrar of the Land Court."* (LUO Section 4.40-21)

The CUP Type 1 for *Joint Use of Parking Facilities* is required to accommodate the deficit of 77 off-street parking stalls at King Kalakaua Plaza (LUO Section 4.40-22). The proposal for joint-use of parking complies with the 400-foot maximum distance between the developments. A written agreement assuring continued availability of the spaces will need to be executed and is subject to review by the City's Corporation Counsel.

3.5 City and County of Honolulu Special Management Area

The Coastal Zone Management Act contains the general objectives and policies upon which all counties within the State have structured specific legislation which created Special Management Areas (SMA). Any development within the SMA requires a SMA Use Permit, which is administered by the City and County of Honolulu Department of Land Utilization (DLU) pursuant to Ordinance No. 84-4.

The project site is located outside the boundaries of the City and County's SMA (see Figure 3-3). Therefore, the proposed project is not subject to the provisions of the SMA Use Permit.

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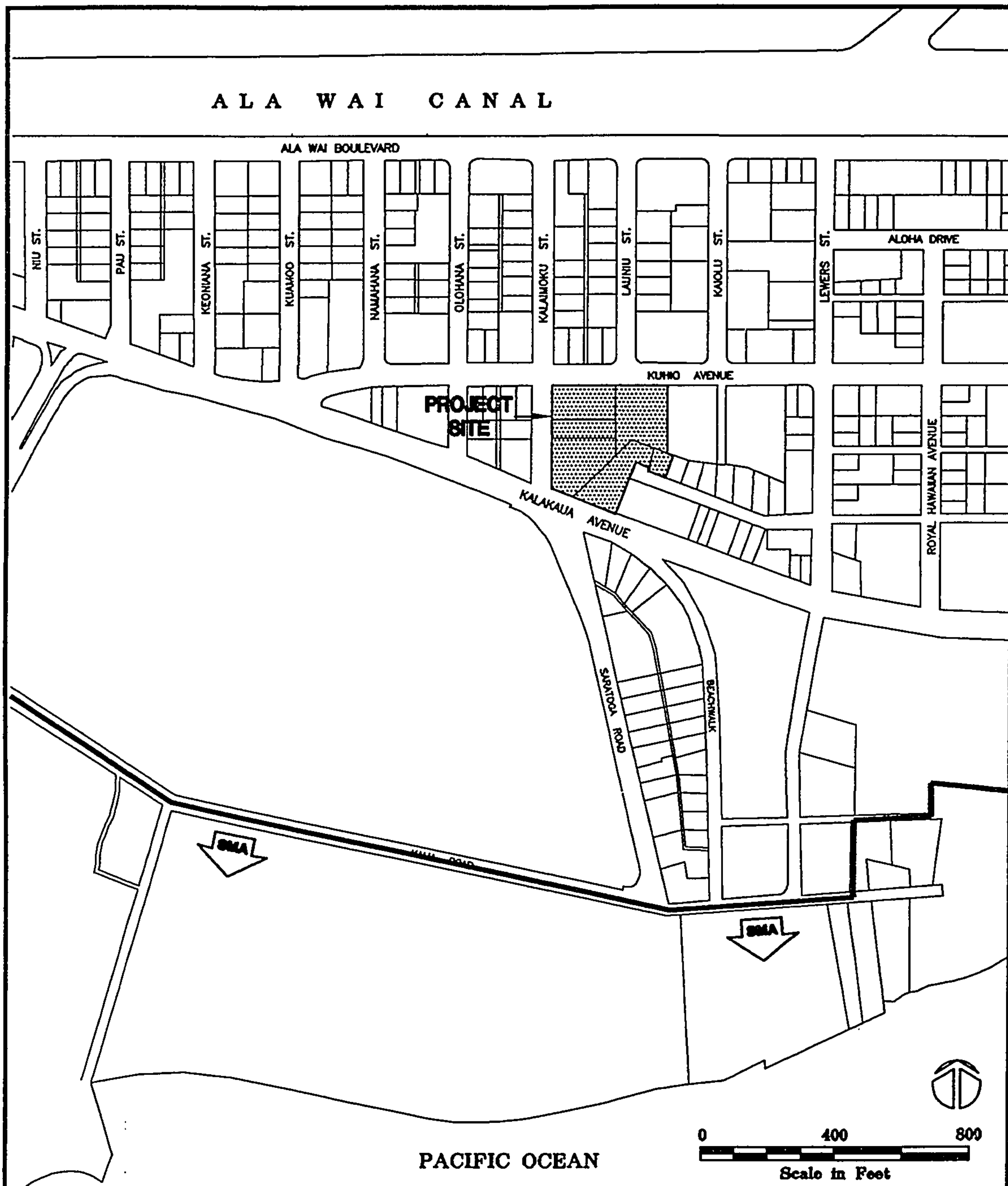

KING KALAKAUA PLAZA PHASE II

Fig 3–3

SPECIAL MANAGEMENT AREA

Prepared for:
KALAKAUA SOUTHSEAS OWNERS, LLC

Prepared by:
Wilson Okamoto & Associates, Inc.

Chapter 4

ALTERNATIVES TO THE PROPOSED ACTION

4. ALTERNATIVES TO THE PROPOSED ACTION

4.1 No Action Alternative

The no action alternative would retain the abandoned structures presently occupying the site. It is assumed that the structures could be rented out for retail uses comparable to those previously occupying them. Due to the dilapidated condition of many of the structures, however, it likely that the project site could be sold or divided and sold for redevelopment.

The no action alternative would, in the immediate future, preclude all short- and long-term beneficial and adverse impacts described in this Environmental Assessment. Construction-related environmental impacts, including those of traffic, air and noise, would be avoided until the project site is redeveloped with other uses.

4.2 Alternative Locations

Alternative locations for the proposed project were not considered since the applicants proposal is based on ownership of the project site.

4.3 Alternative Site Development Concepts

A variety of alternative site development concepts were developed as part of the master planning process to analyze and evaluate the desired density and allocation of leasable areas. The proposed project is considered to be an economically viable alternative for the project site. It is assumed that some modifications to the proposed project will be required as it is reviewed through the Waikiki Special District Major Permit.

Chapter 5

PERMITS AND APPROVALS

5. PERMITS AND APPROVALS

The following is a list of permits and approvals which may be required prior to construction of the proposed project:

State of Hawaii

Department of Land and Natural Resources
- Chapter 6E Hawaii Revised Statutes Consultation

Department of Health
- Noise Variance Permit
- Permit for Air Emissions
- National Pollutant Discharge Elimination System (NPDES) Permit for Construction Activity Dewatering
- Commission on Persons with Disabilities (Review pursuant to Americans with Disabilities Act Accessibility Guidelines (ADAAG)

City and County of Honolulu

Department of Planning and Permitting
- Waikiki Special District Minor Permit for Removal of Trees Over Six Inches in Diameter
- Waikiki Special District Minor Permit for Demolition of Buildings Over 50 years Old
- Waikiki Special District Major Permit for a New Building
- Conditional Use Permit (CUP), Type 1 for Joint Development of Two or More Adjacent Zoning Lots
- Conditional Use Permit (CUP), Type 1 for Joint Use of Parking Facilities
- Wastewater Permits
- Sewer Connection Permits
- Sewer Extension, Oversizing and Relief Sewer Requirements
- Grading and Drainage Permits
- Excavation Permit
- Permit to Excavate Public Right-of-Way
- Construction Permit
- Construction Dewatering Permit
- Building Permit
- Electrical Permit
- Plumbing Permit
- Sidewalk/Driveway Work Permit

- Certificate of Occupancy
- Street Usage Permit

Board of Water Supply
- Water and Water System Requirements for Developments

Utility Companies
- Utility Service Requirements
- Permit Regarding Work on Utility Lines

Chapter 6

NOTICE OF DETERMINATION

6. NOTICE OF DETERMINATION

A. Applicant

Kalakaua Southseas Owners, LLC

B. Accepting Authority

City and County of Honolulu Department of Planning and Permitting

C. Description of the Proposed Action

The Applicant proposes to construct a retail/commercial mixed-use complex on approximately 109,747 square feet in Waikiki, Oahu. The project is bounded by Kalakaua Avenue to the south, Kalaimoku to the west, Kuhio Avenue to the north and various retail business to the east. The proposed project will provide approximately 260,000 square feet of floor area within a single structure varying from 3 to 5 stories. Approximately 34,543 square feet of ground level open space and landscaping will be provided, as well as 289 parking stalls located within a single level underground parking structure.

D. Determination and Reasons Supporting Determination

The Draft EA was filed with the State Office of Environmental Quality Control (OEQC) and published in the September 23, 1998 publication of The Environmental Notice. A total of 16 comment letters were received during the 30-day public review period which ended on October 23, 1998. Based on the comments received and the significance criteria set forth in Section 11-200-12 of Title 11 Chapter 200, Administrative Rules, Department of Health, State of Hawaii, it has been determined that the project will have no significant adverse impact on the environment, and that an Environmental Impact Statement is not required.

In general, construction and operation of the proposed King Kalakaua Plaza Phase II will not:

1. Involve the loss or destruction of any natural or cultural resources.

The proposed action will not involve any construction activity which might lead to a loss or destruction of any natural or cultural resource. Due to the potential for discovering archaeological resources and human burials during construction of the proposed project, however, subsurface testing will be conducted prior to construction. If major findings are encountered during such testing, a mitigation plan will be prepared for review and approval by the State Historic Preservation Division (SHPD). In the event that burials are encountered during subsurface testing, the Burials Program of the SHPD will be notified to determine appropriate treatment.

2. *Curtail the range of beneficial use of the environment.*

The proposed project will not curtail the beneficial uses of the environment. The proposed project involves the redevelopment of a site within a highly urbanized area with uses that are consistent with the City's Development Plan and Zoning designations.

3. *Conflict with the State's long-term goals or guidelines as expressed in Chapter 344, HRS.*

The proposed project does not conflict with long-term environmental policies, goals, and guidelines of the State of Hawaii. Temporary impacts associated with construction activity of the proposed project can be adequately mitigated.

4. *Substantially affect the economic or social welfare of the community or state.*

The proposed project would provide short-term economic benefits in the form of construction jobs, and long-term economic benefit through the creation of retail employment opportunities.

5. *Substantially affect public health.*

The proposed project will not affect public health.

6. *Involve substantial secondary effects, such as population changes or infrastructure demands.*

No secondary effects are anticipated with the construction or operation of the proposed project.

7. *Involve a substantial degradation of environmental quality.*

Construction activities associated with the proposed project are anticipated to result in relatively insignificant short-term impacts to noise, air quality, and traffic in the immediate project vicinity.

8. *Cumulatively have considerable effect upon the environment.*

No cumulative effects are anticipated, inasmuch as the proposed project involves redevelopment of a site with a highly urbanized area with uses that are consistent with the City's Development Plan and Zoning designations.

9. *Substantially affect a rare, threatened or endangered species or its habitat.*

There are no known rare, threatened or endangered flora or fauna on the project site that could be adversely affected by the construction and operation of the proposed project.

10. *Detrimentally affect air or water quality or ambient noise levels.*

Operation of construction equipment would temporarily elevate ambient noise and concentrations of exhaust emission in the immediate vicinity of the project site. Pperation of the proposed project will have no significant impact on air or water quality or ambient noise levels in the vicinity.

11. *Affect or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, freshwater area, or coastal waters.*

The proposed project will comply with flood hazard requirements regarding the elevation of lowest occupied floor. The project site is otherwise not within an environmentally sensitive area.

12. *Substantially affect scenic vistas and viewplanes identified in county or state plans or studies.*

The proposed project will alter the visual setting by replacing older structures with new ones. The new structures will comply with applicable development standards of the existing zoning designation and will reflect a "Hawaiian Sense of Place" pursuant to the provisions of the Waikiki Special District.

13. *Require substantial energy consumption.*

Construction and operation of the project will not require substantial increases in energy consumption.

Chapter 7

CONSULTATION

7. PARTIES CONSULTED DURING THE PRE-ASSESSMENT

7.1 Pre-Assessment Consultation

The following agencies, organizations and elected officials were consulted during the pre-assessment phase of the Environmental Assessment. Contact memoranda are included herein for consultations with the Wastewater Branch, Traffic Review Branch, Site Development Division of the Department of Planning and Permitting, as well as the Board of Water Supply.

<u>State of Hawaii</u>
Department of Land and Natural Resources
State Historic Preservation Division

<u>City and County of Honolulu</u>
Office of the Managing Director
Department of Planning and Permitting
Department of Transportation Services
Board of Water Supply

<u>Organizations</u>
Historic Hawai'i Foundation

<u>Elected Officials</u>
Mayor Jeremy Harris
Councilmember Duke Bainum
Councilmember Mufi Hannemann

<u>Utility Companies</u>
GTE Hawaiian Telephone Company

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& ASSOCIATES, INC.

ENGINEERS
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FAX: (808) 946-2253

6250-01
August 18, 1998

CONTACT MEMORANDUM

PERSON
CONTACTED: Mr. Dennis Nishimura, Department of Planning and Permitting (DPP), Site Development Division, Wastewater Branch

INFORMATION ITEMS:

1. WOA explained that the King Kalakaua Plaza Phase II will consist of approximately 280,000 square feet of commercial/retail space and will be located across Kalaimoku Street from Phase I between Kuhio Avenue and Kalakaua Avenue.

2. DPP indicated informally that the project should not have problems hooking up to the 24-inch sewer located along Kuhio Avenue.

Barry Toyota, P.E.
Civil Engineer

cc: Mr. Dennis Nishimura

0000 0005 0573

6250-01
August 18, 1998

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CONTACT MEMORANDUM

PERSON
CONTACTED: Mr. Melvin Hirayama, Department of Planning and Permitting (DPP), Site Development Division, Traffic Review Branch

INFORMATION ITEMS:

1. WOA explained that the King Kalakaua Plaza Phase II will consist of approximately 280,000 square feet of commercial/retail space and will be located across Kalaimoku Street from Phase I between Kuhio Avenue and Kalakaua Avenue.

2. DPP indicated informally that the project should not have to deal with. "Ordinance 2412" regarding street widening except for corner rounding at Kalaimoku Street and Kalakaua Avenue. At Kalaimoku Street and Kuhio Avenue the property corner has already been rounded to a 30-foot radius. "Ordinance 2412" street widening improvements in Waikiki has been suspended except for corner roundings. DPP indicated that this should be confirmed by the Civil Engineering Branch.

Barry Toyota, P.E.
Civil Engineer

cc: Mel Hirayama

WILSON
OKAMOTO
& ASSOCIATES, INC.

ENGINEERS
PLANNERS

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FAX: (808) 946-2253

6250-01
August 19, 1998

CONTACT MEMORANDUM

PERSON
CONTACTED: Ms. Dawn Kimura, Department of Planning and Permitting (DPP), Site Development Division, Project Review Section

INFORMATION ITEMS:

1. WOA explained that the King Kalakaua Plaza Phase II project will consist of approximately 280,000 square feet of commercial/retail space and will be located across Kalaimoku Street from Phase I between Kuhio and Kalakaua Avenues.

2. DPP indicated, informally, that the project should not be affected by the requirements of the "Ordinance 2412" street widenings with the exception of corner rounding at property corners of a 30 feet radius. DPP also indicated that the same type of sidewalk pavers along Kalakaua Avenue need to be used for any alterations to the Kalakaua sidewalk. In addition, DPP indicated that if landscaping encroaches into public rights-of-way, an application for surface encroachment variance will need to be processed. If the sidewalk area is entirely covered by a landscaped area, then an easement for public access needs to be created similar to the Phase I project.

Barry Toyota, P.E.
Civil Engineer

cc: Ms. Dawn Kimura

6250-01
August 20, 1998

WILSON
OKAMOTO
& ASSOCIATES, INC.

ENGINEERS
PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

CONTACT MEMORANDUM

PERSON
CONTACTED: Mr. Robert Chun
Board of Water Supply(BWS)
Planning and Engineering Division
Planning Branch
Project Review Section

INFORMATION ITEMS:

1. WOA explained that the King Kalakaua Plaza Phase II project will consist of about 280,000 square feet of commercial/retail space and will be located across Kalaimoku Street from Phase I between Kuhio and Kalakaua Avenues.

2. BWS informally indicated that there should not be any problems with supplying water for the project. Pressure in the project area should be adequate. Depending on the height for the structures fire pumps may be required. Final commitment will be at issuance of the building permit for the project.

3. Existing water mains in the project area include:

   a. 8-inch in Kalakaua Avenue;
   b. 12-inch in Kalaimoku Street;
   c. 16- and 24-inch in Kuhio Avenue.

Barry Toyota, P.E.
Civil Engineer

cc: Robert Chun, BWS

7.2 Parties Consulted During the Draft EA

The following agencies and organizations were sent copies of the Draft EA with a request for their comments on the project. Of those who formally replied, some had no comments while others provided substantial comments as indicated by the "✓" and "✓✓", respectively. All written comments and responses are reproduced herein.

Federal

✓ Department of the Army, U.S. Army Engineer District, Honolulu

State of Hawaii

Department of Land and Natural Resources (DLNR)
✓✓ DLNR State Historic Preservation Division
✓✓ Office of Environmental Quality Control
✓ Department of Transportation
✓ DLNR Land Division
✓✓ Department of Health

City and County of Honolulu

✓ Fire Department
✓ Department of Environmental Services
✓ Planning Department
✓✓ Police Department
✓✓ Department of Transportation Services
✓✓ Board of Water Supply
✓✓ Department of Planning and Permitting

Organizations

✓✓ The Outdoor Circle
Waikiki Neighborhood Board

Other Interested Parties

✓✓ Ms. Nitgalda Evans
✓✓ Dr. Betsy Weiner

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
FORT SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF

Operations Branch

September 23, 1998

'98 SEP 29 PM 1 23
DEPT OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU

Ms. Bonnie Arakawa
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Ms. Arakawa:

This letter is written in regards to your request for agency comments regarding the King Kalakaua Plaza Phase II project located in Waikiki, Hawaii.

Based on the information submitted, the proposed project will not have any impact to waters of the U.S. Therefore, a Department of the Army permit will not be required.

Thank you for the opportunity to review the project. File number 980000318 is assigned to this project. Should you need additional information, you may call Ms. Lolly Silva of my staff at (808) 438-9258, extension 17.

Sincerely,

George P. Young, P.E.
Chief, Operations Branch

WILSON OKAMOTO & ASSOCIATES, INC.
ENGINEERS PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH. (808) 946-2277
FAX: (808) 946-2253

6250-01
November 10, 1998

Mr. George P. Young, P.E., Chief
Operations Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Mr. Young:

Thank you for your letter dated September 23, 1998 commenting on the subject Draft EA and verifying that the project will not require a Department of the Army permit.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

'98 OCT 20 PM 2 05

DEPT OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET
HONOLULU

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE

October 12, 1998

Ms. Jan Naoe Sullivan, Director
Department of Land Utilization
City and County of Honolulu
650 S. King Street, 7th Floor
Honolulu, Hawaii 96813

LOG NO: 22365
DOC NO: 9810SC05

ATTN: Mr. Arthur Challacombe

Dear Ms. Sullivan:

SUBJECT: Chapter 6E-42 Historic Preservation Review of an Environmental Assessment (EA) for the Proposed King Kalakaua Plaza Phase II Project
Waikiki, Honolulu, O'ahu
TMK: 2-6-018: 010, 036, 042, 052, 055, 062, 063, 064, 073 and 074

Thank you for the opportunity to comment on the EA prepared for the proposed King Kalakaua Plaza Phase II project to be built on parcels bounded by Kalakaua Avenue, Kuhio Avenue, and Kalaimoku Street. Currently, the parcels contain eight abandoned structures, formerly used for business, and the remainder of the land has been improved for commercial purposes.

The subject parcel has not undergone an archaeological inventory survey, so it is uncertain if subsurface historic properties are present. However, we agree with the archeological assessment in Appendix D (Hammatt & Chiogioji 1998. *Archaeological Assessment of King Kalakaua Plaza Phase II*. Cultural Surveys Hawaii ms.), which concludes that it is likely that significant historic sites, such as subsurface deposits *associated with fishponds, cultivation, or habitations (with associated human burials)*, may be present in soils beneath the more recent fill soils which cover the project site. Such sites can contain important information on the history of Waikiki. Construction of the proposed plaza may have an "adverse effect" on any significant historic sites which may be present.

Given this information, we agree with the recommended mitigation presented in the EA on pages 2-15 through 2-17, and as follows:

An archaeological inventory survey using subsurface testing shall be conducted prior to construction in order to locate and identify any significant historic sites which may be present. An acceptable report documenting the results of the survey shall be submitted to the State Historic Preservation Division. If significant historic sites are present, an acceptable archaeological mitigation plan (scope of work) shall be prepared for review and approval by the State Historic Preservation Division. The mitigation plan shall be implemented prior to construction taking place. An acceptable report documenting the results of archaeological mitigation shall be prepared and submitted to the State Historic Preservation Division for review and approval. (Note: Ample time should be left before the start of construction, because if significant sites are found, then mitigation (probably data recovery) will be needed.)

If these steps are followed, then we believe that the special district major permit and two conditional use permits, if approved, will have "no adverse effect" on any significant archaeological properties which may be present.

Also the EA notes that our Division has expressed concern over the demolition of the former Canlis Restaurant building. As noted before, we believe the building would qualify for the Hawaii and National Registers of Historic Places, and its demolition would be an adverse effect on historic sites. We are confused by the language in the EA which represents that the building and its hazardous materials still stands, when in fact it has already been demolished and cleared from the site. We would appreciate a clarification of the EA language.

Should you have any questions about the archaeology, please feel free to call Sara Collins at 587-0013. If you have any questions about architecture, please contact Tonia Moy at 587-0005.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

SC:jk

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6250-01
November 10, 1998

Mr. Don Hibbard, Ph.D, State Historic Preservation Officer
Department of Land and Natural Resources
State Historic Preservation Division
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Dr. Hibbard

Thank you for your letter dated October 12, 1998 (Ref. Log No: 22365, Doc No: 9810SC05) commenting on the subject Draft EA. Upon completion of the subsurface archaeological inventory survey, a findings report will be submitted to your office for review and comment. In the event that significant historic sites are encountered, a mitigation plan will also be submitted for your review and approval, and will be implemented prior to construction.

With regard to the disposition of the Canlis Restaurant building, when we completed the Draft EA, we were unaware that the demolition permit for the building had been approved. After the Draft EA was filed with the Department of Planning and Permitting, the building was removed. Section 1.3 of the Draft EA pertaining to *Existing and Surrounding Uses* will be updated to reflect the removal of the building.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

FILE COPY

BENJAMIN J. CAYETANO

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

October 12, 1998

Jan Naoe Sullivan, Director
Department of Planning & Permitting
650 South King Street
Honolulu, Hawaii 96813

Attention: Bonnie Arakawa

Dear Ms. Sullivan:

RE: Draft Environmental Assessment (EA) for King Kalakaua Plaza Phase II, Waikiki

We have the following comments to offer:

1. Segmentation: The proposed project has the same name as the complex across the street. Are they part of a larger development plan? The Environmental Impact Statement law prohibits segmentation of larger projects and requires that full disclosure of impacts be made on projects in their entirety. Provide a full analysis and discussion of this and all related projects in the area.

2. Contacts: Consult with the Waikiki Improvement Association regarding this project and document your contact in the final EA.

3. Significance criteria: Include a discussion of findings and reasons, according to the significance criteria listed in HAR 11-200-12, that supports your forthcoming determination, either Finding of No Significant Impact (FONSI) or EIS preparation notice. You may use the enclosed sample as a guideline.

4. Sustainable Building Design: Please consider applying sustainable building techniques as presented in the enclosed "Guidelines for Sustainable Building Design in Hawaii." In the final EA include a description of any of these techniques you will implement.

If you have any questions call Nancy Heinrich at 586-4185.

Sincerely,

Gary Gill
Director

Enc.

c: Laura Mau, Wilson Okamoto

DRAFT

Guidelines for Sustainable Building Design in Hawaii

A planner's checklist

OEQC September 1998

Introduction:
What is a "sustainable" building?
A sustainable building is built to minimize energy use, expense, waste, and impact on the environment. It seeks to improve the region's sustainability by meeting the needs of today's market without compromising the needs of future generations. Compared to conventional projects, a resource-efficient building project will:

I. Use less energy for operation and maintenance

II Contain less *embodied* energy (e.g. locally produced building products contain less *embodied* energy than imported products because they require less energy-consuming transportation to the site)

III. Protect the environment by preserving/conserving water and other natural resources and by minimizing impact on the site ecosystem

IV Minimize health risks to those who construct, maintain, and occupy the building

V. Minimize construction waste

VI Recycle and reuses generated construction wastes

VII. Use resource-efficient building materials

VIII. Provide the highest quality product practical at competitive (affordable) prices

Hawaii law calls for efforts to conserve natural resources, promote careful use of water, efficient use of energy and recycle all waste products. To meet this goal, special care must be taken to plan a project from the very beginning to be in keeping with sustainable building design concepts.

The purpose of the state's environmental review law (HRS Ch. 343) is to encourage full, accurate and complete analysis of proposed actions, promote public participation and support enlightened decision making by public officials. To assist agencies and applicants in meeting this legal purpose, the Office of Environmental Quality Control offers the following guidelines for preparers of environmental reviews under the authority of HRS 343.

These guidelines do not constitute rules or law. They have been refined by staff and peer review

I. Team Building

___ Hold programming team meeting with client representative, Project Manager, planning consultant, architectural consultant, civil engineer, mechanical, electrical, plumbing (MEP) engineer, structural engineer, landscape architect, interior designer, sustainability consultant and other consultants as required by the project. Identify project and environmental goals. Client representatives and consultants to work closely to ensure that environmental and project goals are met.

___ Develop sustainable guideline goals to insert into outline specifications as part of the Schematic Design documents. Extract applicable goals from the following sections as appropriate to project.

___ Use Benefit Cost Method for economic analysis of the sustainability measures chosen. (Benefit Cost Method is a method of evaluating projects or investments by comparing the present value or annual value of expected benefits to the present value or annual value of expected cost.)

___ Include "Commissioning" in the project budget and schedule. (Commissioning is the process of verifying that equipment and systems are installed and are able to operate according to the design and operational needs. It improves the performance of building, resulting in energy conservation and efficiency, improves air quality and lowers operation costs. *Refer to Section IX.*)

II. Building Design

___ Consider renovating an existing building instead of demolishing and/or constructing a new building.

___ Plan for high flexibility while designing building shell and interior spaces to accommodate changing needs of the occupants, and hence possibly extend life span of building.

___ Design for re-use and/or disassembly. For building products, see Section VII.

___ Provide facilities for bike/walking commuters (showers, lockers, bike racks).

___ Plan for comfortable and healthy work environment. Include inviting outdoor spaces, wherever possible. *(Refer to Sections VII and VIII.)*

___ Design space for recycling/waste diversion opportunities during occupancy.

___ Design with an integrated pest management approach. Investigate using products such as Termi-mesh, Basaltic Termite Barrier and Sentricon to limit pest access into structure.

___ Design building that is energy efficient and resource efficient. *(See Sections III, IV, V, VI, VII.)* Determine building by-products such as heat, gray-water etc., and plan to minimize them or find alternate uses for them.

___ For natural cooling, use
1. Reflective roof, radiant barrier or insulation, roof vents
2. Light colored paving (concrete) and building surfaces
3. Tree Planting to shade buildings and paved areas
4. Building orientation and design to capture trade winds

III. Site Selection & Site Design

Site Selection

___ Understand the site through careful analysis and assessment of site characteristics such as vegetation, topography, geology, climate, natural access to site, solar orientation patterns, water and drainage, existing utility and transportation infrastructure to determine the appropriate use of site, and design to minimize the environmental impact of the development.

___ Select site in a neighborhood, when feasible, on which the project could have a positive social, economic and environmental impact.

___ Select a site with short connections to existing municipal infrastructure (water, waste water treatment plant, roads, electricity, telephone, data and gas). Select a site close to mass transportation, bicycle routes and pedestrian access.

Site Preparation and Design

___ Preserve existing resources and natural features to enhance the design and add aesthetic, economic and practical value. Design to minimize the environmental impact on vegetation and topography.

___ Site building(s) to take advantage of natural features and maximize their function such as solar access, day-lighting and natural cooling. Design ways to integrate the building(s) with the site that maximizes site efficiencies, enhances human comfort, safety and health, as well as, achieves operational efficiencies.

___ Locate the building(s) to encourage bike and pedestrian access and pedestrian oriented uses.

___ Retain existing topsoil and maintain soil health by clearing only the areas carefully marked for construction of streets, driveways, parking areas, and building foundations. Replant exposed areas when practical. Reuse soils and vegetation excavated for fill or mulch.

___ Grade slopes to ratio less than 2 : 1 (run to rise). Balance cut and fill to eliminate hauling. Check grading frequently to prevent accidental over excavation.

___ Minimize altering natural water drainage. Provide siltation basins to protect the site during and after construction, especially, in the event of a major storm.

___ Minimize area required for the building footprint. Consolidate utility and infrastructure into common corridors to reduce unnecessary site degradation, and minimize cost, improve efficiency, centralize runoff, and reduce impermeable surfaces.

___ For ground treatment, avoid the use of pesticides or other toxic chemicals. Use alternative methods such as Termi-mesh, Basaltic Termite barrier, and Sentricon, etc.

IV. Energy Use

___ Facilitate site sensitive orientation by
1. Minimizing impact on cooling load through site shading and east-west orientation.

2. Incorporating natural ventilation through channeling trade winds.
3. Using day lighting where possible.

___ Maximize efficiencies for Lighting, Heating, Ventilation, Air Conditioning (HVAC) and other equipment.
___ Design south, east and west shading devices to minimize solar heat gain.
___ Utilize low shading co-efficient window system to minimize solar heat gain. Minimize effects of thermal bridging in walls, roof and window systems.
___ Eliminate hot water in restrooms when possible.
___ Pressurize building to reduce mold and mildew
___ Obtain a copy of State of Hawaii Model Energy Code (available through the Hawaii State Energy Division, at Tel.(808)-587-3811). Exceed its requirements.
___ Use renewable energy. Consider the use of solar water heaters and photovoltaics. (Contact State Energy Office at Tel (808)-587-3810 for information on the utility-sponsored Commercial and Industrial Energy Efficiency Programs which offer incentives to businesses for installing qualifying energy efficient technologies.)
___ Use available energy resources such as waste heat.
___ Consider design for tenant sub-metering to encourage utility use accountability

Energy Lighting

___ Design for at least 15% lower interior lighting power allowance than the Energy code
___ Select lamps with high efficiency, compatible with the desired light source and color rendering capabilities.
___ Select luminaires which maximize system efficacy (i.e. which deliver the light to the task, not the surrounding areas).
___ Reduce light absorption on surfaces by selecting colors and finishes with high reflectance values, but avoid glare
___ Use task lighting with low ambient light levels
___ Use luminaires with heat removal and recovery capabilities.
___ Maximize integration of day lighting through the use of vertical fenestration, light shelves, clerestories /monitors, and building form as well as through translucent/transparent/modular interior partitions. Coordinate electrical lighting with day lighting for maximum electrical efficiency.
___ Incorporate day lighting control, or photo/motion sensors in low or intermittent use areas
___ Avoid light spillage in exterior lighting by using directional fixtures.
___ Minimize light overlap in exterior lighting schemes.
___ Use lumen maintenance controls.

Mechanical Systems

___ Design to comply with the Energy code and to exceed it's energy conserving requirements
___ Utilize thermal storage for reduction of peak energy usage.
___ Use Variable air volume systems to save fan power.
___ Use variable speed drives on pumping systems and fans for cooling towers and air handlers.

___ Use air -cooled refrigeration equipment or use cooling towers designed to reduce drift.
___ Reduce need for mechanical ventilation by reducing sources of indoor air pollution. Use high efficiency air filters. Use ASHRAE standards as minimum.
___ Locate fresh air intake away from polluted or overheated areas. Locate on roof where possible. Separate air intake from air exhausts by at least 40 ft.
___ Use separate HVAC systems to serve areas that operate on widely differing schedules or design conditions.
___ Use shut off or set back controls on HVAC system when areas are not occupied.
___ Evaluate the potential use of condenser heat, waste heat or solar energy to reduce water heating energy cost. (Contact State Energy Office at Tel. (808)-587-3810 for information on the utility-sponsored Commercial and Industrial Energy Efficiency Programs which offer incentives to businesses for installing qualifying energy efficient technologies.)
___ Evaluate plug-in loads for energy efficiency and power saving features.
___ Improve comfort and save energy by reducing the relative humidity by waste reheat, heat pipes or solar heat.
___ Minimize heat gain from equipment and appliances by using:
1. Environmental Protection Agency (EPA) Energy Star rated appliances
2. Hoods to remove heat from concentrated sources.
3. Specify high performance water heating that exceeds the Energy Code.
4. Specify HVAC system "commissioning" period to reduce occupant exposure to Indoor Air Quality (IAQ) contaminants
5. Specify premium efficiency motors.

V. Water Use

Building Water

___ Install water efficient fixtures as required by the Uniform Plumbing Code.
___ If practical, eliminate hot water in restrooms.
___ Use infrared sensors for flushing of toilets and urinals.
___ Use self closing faucets (infrared sensors or spring loaded faucets) for lavatories and sinks

Landscaping and Irrigation

(See Section VI.)

VI. Landscape and Irrigation

___ Incorporate water efficient landscaping (xeriscaping) using the following principles:
1. Planning. Efficient irrigation: Create watering zones for different conditions. Separate vegetation types by different watering requirements. Install moisture sensors to avoid operation of the irrigation system in the rain and if the soil has adequate moisture. Use

different types of (appropriate) sprinkler heads

2. Soil analysis/improvement: Use (locally made) soil amendments and compost for plant nourishment, better absorption and water holding capacity.

3. Appropriate plant selection: Use drought tolerant and/or slow growing hardy grasses, native plants, shrubs, ground covers, trees, appropriate for local conditions, hence minimizing the need for irrigation. Maintain existing vegetation to encourage bio-diversity and protect nutrients.

4. Practical turf areas: Turf only in areas where it provides functional benefits.

5. Mulches: Use mulches to minimizes evaporation, reduce weed growth, retard erosion.

___ Protect existing natural site features and save native trees to prevent erosion. Establish tree protection areas well before construction.

___ Limit staging area and prevent unnecessary grading of site to protect native vegetation

___ Use native top soil from the structure's footprint, stockpiled on the site with a silt fence in order to reduce the need for imported top soil.

___ Irrigate with non-potable water or reclaimed water. Harvest rainwater from the roof for irrigation.

___ Sub-meter the irrigation system. Locate irrigation controller within visual site of the irrigated area to verify that the system is operating properly

___ Use pervious paving instead of concrete or asphalt paving. Integrate natural and man-made berms, hills and swales to control water runoff

___ Avoid materials that leach out pollutants which can contaminate the water runoff. Contact the Clean Water Branch at 586-4309 to determine whether a NPDES (National Pollutant Discharge Elimination System) permit is required

___ Use trees and bushes that are felled at the building site (i.e. mulch, fence posts, trim)

___ Use recycled landscape materials such as plastic lumber for planters and benches.

VII. Building Materials & Solid Waste Management

Design for Material

___ Use durable products. Opt for natural products or products with low embodied energy.

___ Specify and use products with recycled content such as steel, concrete with fly ash or glass, drywall, carpet etc. Use ground recycled concrete, graded glass cullet or asphalt as base or fill material.

___ Specify low toxic or non -toxic materials whenever possible, such as low VOC. (Volatile Organic Compounds) paints, sealers and adhesives, low or formaldehyde-free materials) Also avoid products with CFCs (Chloro-fluoro-carbons).

___ Use locally produced products such as plastic lumber, insulation, hydromulch, glass tiles, compost

___ Use advanced framing systems, two stud corners, engineered structural products and panel systems

___ Use materials which require limited or no application of finishing or surface preparation. (i.e. finished concrete floor surface).

___ Use re-milled salvaged lumber where appropriate and as available. Minimize the use of old growth timber.

___ Use sustainably harvested timber.

___ Commit to a material selection matrix for efficient and environmentally sensitive use of raw materials and building materials, and locally available building materials. (A list of Earth friendly products and materials is available through the Green House Hawaii Project. Call Clean Hawaii Center, Tel. (808)-587-3802 for the list.)

Develop a Solid Waste Management, Recycling and Diversion Plan

___ Prepare and post a job-site recycling plan at the site office.

___ Conduct pre-construction waste minimization training for employees and sub-contractors

___ Use a central area for all cutting.

___ Establish a dedicated waste separation/diversion area. Include Waste/Compost/Recycling collection area and collection system for both construction process and building operation

___ Separate and divert all unused or waste cardboard, ferrous scrap, construction materials, fixtures for recycling or to a salvage exchange facility. Information on "Minimizing C&D (construction and demolition) waste in Hawaii" is available through Department of Health, Office of Solid Waste Management, Tel. (808)-586-4240.

___ Use on site or divert all green waste, untreated wood and clean drywall for soil amendments

___ Use on-site or divert all concrete and asphalt rubble.

___ Manage waste from the use of solvents, paints, sealants, etc. separate from C&D (construction and demolition) waste. Donate paint to non-profit organizations or list on HIMEX (Hawaii Materials Exchange). HIMEX is a free service operated by Maui Recycling Group, that offers an alternative to landfill disposal of usable materials, and facilitates no-cost trades. See web site, www.himex.org.

___ Use suppliers that re-use or recycle packaging material whenever possible.

VIII. Indoor Air Quality

___ Provide IAQ requirements during design and contract document phases. Requirements are to be followed during construction in order to minimize or contain IAQ contaminant sources during construction, renovation and remodeling, especially if there are occupants in the building.

___ Notify the occupants of any type of construction, renovation and remodeling

___ Allow a flush-out period after construction, renovation and remodeling to minimize exposure to any chemicals and debris.

___ Use low-emitting materials, products, and solvents. *Reduce sources of interior formaldehyde.* Select furnishing and cabinetry with no VOC (Volatile Organic Compounds) off-gassing.

___ Research the original usage and design of the building before it is reoccupied to ensure that adequate amounts of fresh air is available and distributed to the occupants.

- ___ Asbestos and lead paint are not allowed in new buildings. Inspect for the same in existing buildings and abate as needed.
- ___ Stage finish application to prevent absorption of Volatile Organic Compounds (VOC's) into surrounding materials.
- ___ Supply workers with, and ensure use of, VOC-safe masks.
- ___ Install separate exhaust fans in rooms where office equipment is used, and exhaust to the exterior of the building.
- ___ Place bird guards over air intakes to prevent pollution of shafts.
- ___ Use low or non-toxic cleaners.

IX. Commissioning & Construction Project Closeout

- ___ Project Manager to coordinate Commissioning activities during project closeout. Criteria to be established by Architect/Engineer Consultant.
- ___ Provide as-built drawings and documentation for all systems and their control strategies as well as maintenance and cleaning manuals for finish materials.
- ___ Involved parties should successfully demonstrate all systems before final acceptance.
- ___ Provide flush-out period to remove air borne contaminants from the building and systems

X. Occupancy and Operation

General Objectives

- ___ Develop User's Manual for building occupants that illustrates the commitment to sustainable operations
- ___ Administrator's responsibilities must include ensuring that the department's sustainability policies are being carried out.

Energy

- ___ Purchase EPA rated, Energy Star, energy-efficient office equipment, appliances, computers, and copiers (Energy Star is a program sponsored by U.S. Dep. Of Energy, implies that product will contribute to reduced energy costs for buildings and reduce air pollution.)
- ___ Institute an employee education program about efficient use of building, appliances, occupants impact on water use, energy use, etc
- ___ Re-commission systems whenever modifications are made to the systems

Water

- ___ Start the watering cycle in early morning in order to minimize evaporation
- ___ To reduce cooling tower water consumption, increase cycles of concentration utilizing chemical treatment

Air

- ___ Provide incentives which encourage building occupants to use alternatives to single occupancy vehicles.
- ___ Provide location map of services within walking distance (child care, restaurants, gyms, shopping).
- ___ Periodically monitor or check for indoor pollutants in building.
- ___ Provide an IAQ plan for tenants and management to establish a policy/documentation response procedure. This helps tenants understand their responsibility to protect the air quality of the facility.

Materials and Products

- ___ Purchase business products with recycled content such as paper, toners, ribbons.
- ___ Purchase Furniture made with natural, sustainably harvested wood, or with recycled materials, which will not off gas VOC's.
- ___ Remodeling and painting should comply or improve on original sustainable design intent
- ___ Use low VOC, non-toxic, phosphate and chlorine free, biodegradable cleaning products.

Solid Waste

- ___ Collect recyclable business waste such as paper, soda cans, and cardboard boxes.
- ___ Avoid single use items such as paper or Styrofoam cups and plates, and plastic utensils.

XI. Resources

<u>Buy Recycled in Hawaii</u> Clean Hawaii Center, Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, November 1997. (Call 587-3802 for publication)

<u>Guide to Resource-Efficient Building in Hawaii</u>. University of Hawaii at Manoa, School of Architecture and Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, October 1998. (Call 587-3804 for publication)

<u>Minimizing Constuction and Demolition Waste</u>. Office of Solid Waste Management, Department of Health and Clean Hawaii Center, Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, February 1998. (Call 586-4240 for publication)

<u>Hawaii Model Energy Code</u>. Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, November 1997. (Call 587-3810 for publication)

WILSON
OKAMOTO
& ASSOCIATES, INC.

ENGINEERS
PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH (808) 946-2277
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6250-01
November 10, 1998

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Mr. Gill:

Thank you for your letter dated October 12, 1998 commenting on the subject Draft EA. The following is provided in response to your comments:

Segmentation: Please refer to the second paragraph of the Preface in the Draft EA which states, "*While the proposed project is located across the street from and shares a similar name with the King Kalakaua Plaza, it is being pursued as a separate and distinct development. When the Environmental Assessment for King Kalakaua Plaza was prepared in July 1995, the applicant had no plans for the current proposal. The applicant did not own or otherwise control the current project site which, at that time, was owned by and/or under lease to various other parties. The project site was acquired by the applicant in 1998.*"

Contacts: We are awaiting confirmation regarding presentations of the proposed project to the Waikiki Neighborhood Board and Waikiki Improvement Association for December 15th and 17th, respectively.

Significance Criteria: The Final EA will include a discussion of findings and reasons according to the significance criteria listed in HAR 11-200-12 supporting a Finding of No Significant Impact.

Sustainable Building Design: Thank you for providing the "Draft Guidelines for Sustainable Building Design in Hawaii". We have forwarded a copy to the project architects for consideration in the project design. In as much as the project is in the schematic design phase, it is too early to commit to any specific techniques recommended by the guidelines.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

BENJAMIN J. CAYETANO
GOVERNOR

98 OCT 15 AM 9:13

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

IN REPLY REFER TO
HWY-PS
2.1247

OCT 13 1998

Ms. Jan Naoe Sullivan, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

Subject: Draft Environmental Assessment (DEA)
King Kalakaua Plaza Phase II
Waikiki, Honolulu, TMK: 2-6-18

Thank you for the opportunity to review the subject DEA. The proposed King Kalakaua Plaza Phase II will not significantly affect State highway facilities.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

WILSON
OKAMOTO
& ASSOCIATES, INC.
ENGINEERS
PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

6250-01
November 10, 1998

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Mr. Hayashida:

Thank you for your letter dated October 13, 1998 (Ref. HWY-PS 2.1247) verifying that the project will not significantly affect State highway facilities.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
PO BOX 621
HONOLULU, HAWAII 96809

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

October 19, 1998

LD-NAV
REF.:DEA98ED2.RCM

Mr. John L. Sakaguchi
Senior Planner
Wilson Okamoto & Associates, Inc.
1907 S Beretania Street
Honolulu, Hawaii 96826

Dear Mr. Sakaguchi:

SUBJECT: Review : Draft Environmental Assessment
Project : King Kalakaua Plaza Phase II
Applicant: Wilson Okamoto & Associates, Inc., on behalf of, Kalakaua Southseas Owners, LLC
Location : Waikiki, Island of Oahu, Hawaii
TMKs : 1st/ 2-6-18: 10,36,42,52,55,62,63,64,73 & 74

Thank you for the opportunity to review and comment on the subject matter.

Our Land Division Engineering Branch confirms that the proposed project is located in Zone AO. This is an area located within the 100-year flood plain with flood depth averaging two (2) feet.

The Department of Land and Natural Resources has no other comments to offer on the subject matter at this time.

Should you have any questions, please contact Nicholas Vaccaro of our Land Division's Support Services Branch at 587-0438.

Very truly yours,

DEAN Y. UCHIDA
Administrator

c: Oahu Land Board Member
Oahu District Land Office

WILSON OKAMOTO & ASSOCIATES, INC.
ENGINEERS PLANNERS
1907 S BERETANIA STREET
HONOLULU, HAWAII 96826
PH (808) 946-2277
FAX (808) 946-2253

6250-01
November 10, 1998

Mr. Dean Y. Uchida, Administrator
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Mr. Uchida:

Thank you for your letter dated October 19, 1998 (LD-NAV Ref.: DEA98ED2.RCM) confirming that the project is located in Zone AO, areas located within the 100-year flood plain with flood depth averaging two feet.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

LAWRENCE MIIKE
DIRECTOR OF HEALTH

98 OCT 29 AM 8:27

In reply, please refer to:
98-204/epo

October 26, 1998

Ms. Jan Naoe Sullivan, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

Subject: Draft Environmental Assessment (DEA)
King Kalakaua Plaza, Phase II
Waikiki, Oahu
TMK: 2-6-18: 10 and others

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

Noise Concerns

1. Activities associated with the construction phase of the project must comply with the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."

   a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the rules as stated in Section 11-46-6(a).

   b. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers as stated in Section 11-46-6(b)(1)(A).

   c. The contractor must comply with the requirements pertaining to construction activities as specified in the rules and the conditions issued with the permit as stated in Section 11-46-7(d)(4).

2. Heavy vehicles traveling to and from the project site must comply with the provisions of the Administrative Rules, Chapter 11-42, "Vehicular Noise Control for Oahu."

3. Through facility design, sound levels emanating from stationary equipment such as air conditioning systems, exhaust fans, refrigeration compressors or generators must be attenuated to comply with the provisions of the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."

Should there be any questions on this matter, please call Mr. Jerry Haruno, Environmental Health Program Manager of the Noise, Radiation and Indoor Air Quality Branch at 586-4701.

Control of Fugitive Dust

Construction activities must comply with provisions of Hawaii Administrative Rules, Chapter 11-60.1, "Air Pollution Control," Section 11-60.1-33, Fugitive Dust.

The contractor should provide adequate measures to control dust from the road areas and during the various phases of construction. These measures include, but are not limited to:

a. Planning the different phases of construction, focusing on minimizing the amount of dust generating materials and activities, centralizing on-site vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact;

b. Providing an adequate water source at the site prior to start up of construction activities;

c. Landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;

d. Controlling of dust from shoulders and access roads;

e. Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and

f. Controlling of dust from debris being hauled away from project site.

If you have any questions regarding these issues on fugitive dust, please contact the Clean Air Branch at 586-4200.

Sincerely,

Paula Yoshioka

for BRUCE S. ANDERSON, Ph.D.
Deputy Director for
Environmental Health

c: CAB
NR&IAQB

WILSON
OKAMOTO
& ASSOCIATES, INC.

ENGINEERS
PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

6250-01
November 10, 1998

Mr. Bruce S. Anderson, Ph.D.
Deputy Director for Environmental Health
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Dr. Anderson:

Thank you for your letter dated October 26, 1998 (Ref. 98-204/epo) commenting on the subject Draft EA. Your concerns regarding noise and fugitive dust associated with construction activity will be forwarded to the selected construction contractor.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

'98 SEP 25 PM 1 56

DEPT OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU

ATTILIO K. LEONARDI
FIRE CHIEF

JOHN CLARK
DEPUTY FIRE CHIEF

September 22, 1998

TO: JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: ATTILIO K. LEONARDI, FIRE CHIEF

SUBJECT: ENVIRONMENTAL ASSESSMENT, CHAPTER 343, HRS
PROJECTS WITHIN THE WAIKIKI SPECIAL DISTRICT

PROJECT NAME	: KING KALAKAUA PLAZA PHASE II
LOCATION	: WAIKIKI, OAHU
TMK	: 2-6-18: 10, 36, 42, 52, 55, 62, 63, 64, 73 AND 74
STAFF PLANNER	: BONNIE ARAKAWA
HFD INTERNAL NO.	OL 98-335

In response to your memorandum of September 17, 1998, we have reviewed the Environmental Assessment (EA) for the subject property and support the issuing of a Finding of No Significant Impact.

Should you have any questions, please call Battalion Chief Charles Wassman of our Fire Prevention Bureau at 831-7778.

for ATTILIO K. LEONARDI
Fire Chief

AKL/CW:hh

WILSON OKAMOTO & ASSOCIATES, INC.
ENGINEERS PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH (808) 946-2277
FAX (808) 946-2253

6250-01
November 10, 1998

Mr. Attilio K. Leonardi, Fire Chief
Fire Department
City and County of Honolulu
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Mr. Leonardi:

Thank you for your letter dated September 22, 1998 (Ref. OL 98-335) supporting the issuance of a Finding of No Significant Impact determination for the proposed project.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

'98 OCT 8 AM 8 55

CITY & COUNTY OF HONOLULU

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET 3RD FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 527-6663 • FAX: (808) 527-6675

JEREMY HARRIS
Mayor

KENNETH E. SPRAGUE, P.E., PhD
Director

CHERYL K. OKUMA-SEPE, ESQ.
Deputy Director

ENV 98-194

October 7, 1998

MEMORANDUM

TO: MS. JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: for KENNETH E. SPRAGUE, DIRECTOR
DEPARTMENT OF ENVIRONMENTAL SERVICES

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
KING KALAKAUA PLAZA, PHASE II
TMK: 9-1-16: 74 AND POR. 75

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

Should you have any questions, please contact Alex Ho, Environmental Engineer, at extension 4150.

WILSON
OKAMOTO
& ASSOCIATES, INC.

ENGINEERS
PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

6250-01
November 10, 1998

Mr. Kenneth E. Sprague, Director
Department of Environmental Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Mr. Sprague:

Thank you for your letter dated October 7, 1998 (Ref. ENV 98-194) stating that you have no comments regarding the proposed project.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

PLANNING DEPARTMENT

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 8TH FLOOR • HONOLULU, HAWAII 96813 3017
PHONE (808) 523-4933 • FAX (808) 523-4950

'98 OCT 12 AM 9 23

DEPT OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU

PATRICK T. ONISHI
CHIEF PLANNING OFFICER

DONA L. HANAIKE
DEPUTY CHIEF PLANNING OFFICER

LC 9/98-1839

October 8, 1998

TO: JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: PATRICK T. ONISHI
CHIEF PLANNING OFFICER

SUBJECT: ENVIRONMENTAL ASSESSMENT, CHAPTER 343, HRS, PROJECTS WITHIN THE WAIKIKI SPECIAL DISTRICT-- KING KALAKAUA PLAZA PHASE II, TAX MAP KEYS 2-6-18: 10, 36, 42, 52, 55, 62, 63, 64, 73 AND 74

In response to your memorandum of September 17, 1998, we have reviewed the Draft Environmental Assessment for the subject project 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 Lowell Chun of my staff at 527-6015.

PTO:js

WILSON OKAMOTO & ASSOCIATES, INC.
ENGINEERS PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH. (808) 946-2277
FAX (808) 946-2253

6250-01
November 10, 1998

Mr. Patrick T. Onishi, Chief Planning Officer
Planning Department
City and County of Honolulu
650 South King Street, 8th Floor
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Mr. Onishi:

Thank you for your letter dated October 8, 1998 (Ref. LC 9/98-1839) stating that you have no comments regarding the proposed project.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

JEREMY HARRIS
MAYOR

'98 OCT 13 AM 8 57
DEPT OF PLANNING
AND PERMITTING
CITY & COUNTY OF HONOLULU

LEE D. DONOHUE
CHIEF

WILLIAM B. CLARK
MICHAEL CARVALHO
DEPUTY CHIEFS

OUR REFERENCE CS-DL

October 9, 1998

TO: JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: LEE D. DONOHUE, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: ENVIRONMENTAL ASSESSMENT, CHAPTER 343, HRS
PROJECTS WITHIN THE WAIKIKI SPECIAL DISTRICT
(KING KALAKAUA PLAZA PHASE II)

We have reviewed the subject document and have the following comments relative to the impact it will have on police services.

In spite of measures to mitigate problems, the usual construction noise, fugitive dust, and traffic problems in and around the construction site will inevitably cause an impact on calls for police service in and around the area.

Further, when the proposed project is completed, we anticipate the usual problems of shoplifting, people breaking into vehicles parked in the structure, and traffic congestion caused by employees being dropped off and picked up at the beginning and end of the workday.

We would like to recommend the following:

The principles of crime prevention through environmental design be incorporated into the design of the facility to minimize opportunity for criminal activity.

Private security and/or strategically placed security cameras be used to help minimize vehicle break-ins and shoplifting activities.

An off-street area be designed and designated as an employee drop-off and pick-up area to minimize traffic congestion during peak traffic hours.

Thank you for the opportunity to respond. If there are any questions, please call me at 529-3175 or Major John Kerr of District 6 at 529-3361.

LEE D. DONOHUE
Chief of Police

By [signature]
JAMES FEMIA
Assistant Chief
Administrative Bureau

cc: District 6

WILSON
OKAMOTO
& ASSOCIATES, INC.

ENGINEERS
PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH (808) 946-2277
FAX (808) 946-2253

6250-01
November 10, 1998

Mr. James Femia, Assistant Chief, Administrative Bureau
Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Mr. Femia:

Thank you for your letter dated October 9, 1998 (Ref. CS-DL) commenting on the subject Draft EA. We provide the following in response to your comments:

1. The Final EA will include the following discussion of project impacts on police services preceding the existing discussion:

   "During the construction phase of the project, calls for police service in the area are likely to increase as a result of construction activities, based on public concerns and perceptions related to the generation of noise, dust and traffic. In the long-term, police service will be required for typical problems associated with developments in Waikiki, including shoplifting, thefts in parking and other areas, and traffic."

2. We appreciate your recommendations for crime prevention and employee drop-off and have forwarded them to the project architect for consideration in the project design.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

[signature]

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

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0000 0005 0594

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE (808) 523-4529 • FAX (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

October 20, 1998

TPD98-00688

Mr. Tom Applegate, President
Kalakaua Southseas Owners, LLC
2080 Kalakaua Avenue, #105
Honolulu, Hawaii 96815

Dear Mr. Applegate:

Subject: King Kalakaua Plaza Phase II

This department reviewed the draft environmental assessment prepared for the subject project. The following comments are the result of this review:

1. On Page 1-6, Section 1.4 Project Description states that two valet drop off areas are to be located on Kalaimoku Street and Kuhio Ave. The location of the Kalaimoku Street drop off area is acceptable. However, we cannot accept the Kuhio Avenue location across from Launiu Street, as shown in Figure 1-4. A drop off area should not be located at a signalized intersection. Consideration should be given to locating the valet drop off areas in the parking garage, similar to that of the King Kalakaua Plaza.

2. Figure 1-4 should show the existing crosswalk across Kuhio Avenue at Launiu Street and the location of the proposed garage entrance.

3. The second "bullet" on Page 2-12 describes Kalaimoku Street as a "four-lane" roadway. This is not consistent with Figure 2-1 and the description on Page 6 and the exhibits in Appendix C, Traffic Impact Report for the Proposed King Kalakaua Plaza Phase II.

4. The section on traffic impacts on Page 2-13 should include discussions regarding whether tour buses would be servicing the project and provisions for employee parking.

5. Exhibit 3 of Appendix C, Traffic Impact Report for the Proposed King Kalakaua Plaza Phase II, incorrectly identifies Kuhio Avenue as Ala Wai Boulevard. This project site plan should also show the crosswalk across Kuhio Avenue at Launiu Street. The lane markings east of the intersection of Kuhio Avenue and Launiu Street should be corrected.

6. Section 3.3.2.4 (Page 11) of Appendix C, Traffic Impact Report for the Proposed King Kalakaua Plaza Phase II, states that the project may require the permanent relocation of an existing bus stop located along the Kalaimoku Street frontage of the project. Provisions shall be made to incorporate the bus stop as part of the project. Adequate space shall be provided to accommodate bus patrons waiting for the bus. The provision of bus shelters and appropriate furniture for the bus stop shall be coordinated with this department.

Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Mr. Gary Gill, Office of
Environmental Quality Control
Mr. Earl Matsukawa, Wilson Okamoto
& Associates, Inc.

WILSON
OKAMOTO
& ASSOCIATES, INC.

ENGINEERS
PLANNERS
1907 S. BERETANIA STREET
HONOLULU HAWAII 96826
PH (808) 946-2277
FAX (808) 946-2253

6250-01
November 10, 1998

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Ms. Soon:

Thank you for your letter dated October 20, 1998 (Ref. TPD98-00688) commenting on the subject Draft EA. We provide the following in response to your comments:

1. The location of the proposed drop off area on Kuhio Avenue will be coordinated with your Department.
2. Figure 1-4 will be revised in the Final EA to include the existing crosswalk at Launiu Street.
3. The Final EA will be corrected to describe Kalaimoku Street as a two-lane roadway.
4. In the Final EA, the traffic study will include an analysis of tour buses servicing the proposed project
5. In the Final EA, Exhibit 3 of the Traffic Impact Report will be revised accordingly.
6. The provision of a replacement bus stop as part of the proposed project will be coordinated with your Department.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714

'98 OCT 23 PM 2:24

October 23, 1998

TO: MS. JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: CLIFFORD S. JAMILE

SUBJECT: YOUR MEMORANDUM OF SEPTEMBER 17, 1998 ON THE DRAFT ENVIRONMENTAL ASSESSMENT, CHAPTER 343, FOR THE KING KALAKAUA PLAZA PHASE II, WAIKIKI, OAHU, TMK: 2-6-18: 10, 36, 42, 52, 55, 62-64, 73, 74

Thank you for the opportunity to review the document for the proposed commercial center.

We have the following comments to offer:

1. The existing off-site water system is presently adequate to accommodate the proposed project.
2. The availability of water will be determined when the building permit applications are submitted for our review and approval. If water is made available, the applicant will be required to pay the applicable Water System Facilities Charges for resource development, transmission and daily storage.
3. We have two water main replacement projects scheduled for the area. One project involves the replacement of the existing 8-inch main on Kalakaua Avenue with a 12-inch main starting in FY 2000. The other project involves the replacement of the existing 6-inch main on Lauula Street with an 8-inch main and is tentatively scheduled for the latter part of 2001
4. There are ten (10) existing water services at the project site. Two (2) of these services have been ordered-off, one on May 10, 1976 and the other on August 6, 1998.
5. If a three-inch or larger water meter is required, the construction drawings showing the installation of the meter should be submitted for our review and approval.
6. The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.
7. Board of Water Supply approved Reduced Pressure Principle backflow prevention assemblies are required to be installed immediately after all water meters serving the project site.

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

cc: Office of Environmental Quality Control
Wilson Okamoto & Associates, Inc.

WILSON OKAMOTO & ASSOCIATES, INC.

ENGINEERS PLANNERS

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH (808) 946-2277
FAX (808) 946-2253

6250-01
November 10, 1998

Mr. Clifford S. Jamile, Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Mr. Jamile:

Thank you for your letter dated October 23, 1998 commenting on the subject Draft EA. We provide the following in response to your comments:

1. We appreciate being informed that the off-site water system is presently adequate to accommodate the proposed project.
2. We acknowledge that the availability of water for the project will be determined when the building permit applications are submitted for your review and approval. We also acknowledge that the developer will be responsible for paying the applicable Water System Facilities Charge for resource development, transmission and daily storage.
3. We appreciate being informed of your planned water main replacement projects scheduled for the area.
4. Thank you for confirming the termination of water service at the project site. This information correlates with our records.
5. Currently, we do not anticipate that a three-inch or larger water meter will be required for the proposed project. If such a meter should be required, however, the construction drawings showing the installation of the meter will be submitted for your review and approval.
6. The on-site fire protection requirements will be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

7. Board of Water Supply-approved Reduced Pressure Principle backflow prevention devices will be installed immediately after all water meters serving the project site.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
Phone (808) 523-4414 • Fax (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K C CHEE
DEPUTY DIRECTOR

October 30, 1998

98/ED-2(ASK)

Mr. Earl Matsukawa
Wilson Okamoto & Associates, Inc.
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Draft Environmental Assessment (EA)
For the King Kalakaua Plaza Phase II
Tax Map Keys: 2-6-18: 10, 36, 42, 52, 55, 62, 63, 64, 73 and 74

We have reviewed the above document and offer the following comments:

Hazardous Materials

1. Page 2-5 and Appendix A of the Draft EA describe existing hazardous waste found in the existing buildings. The final EA should indicate if the soils were tested for hazardous materials and if any were found.

Archaeology

2. Appendix D, Archaeological Assessment of King Kalakaua Plaza Phase II of the Draft EA, indicates that it is likely that intact prehistoric and early contact cultural deposits are lying undisturbed beneath modern fill layers within the project area. Based on this, an archaeological inventory survey was recommended. We suggest that the results of the archaeological inventory be included in the final EA.

Waikiki Special District

3. Alternative plans, such as lower elevations along Kalakaua Avenue with a gradual step back, should be seriously considered.

4. The removal of any building more than 50 years old will require a minor special district permit, prior to issuance of a demolition permit.

5. The final EA should address how the proposed project satisfies the Waikiki Special District objective and design guidelines promoting a Hawaiian sense of place, including appropriate ground level features, building scale and architectural features.

6. Page 2-16 of the Draft EA states that a single-story structure will be incorporated as part of the proposed project and will reflect the architectural qualities of the former Canlis building. The project description and renderings do not indicate that these features have been incorporated into the current design.

The proposed plaza structure (elevators) is inappropriately sited within the open space and landscaped area, and should be incorporated into the main structure. Any proposed plaza structure should aesthetically and functionally complement the open space and its potential use for public gatherings, social interaction and entertainment (e.g., open pavilion or gazebo).

7. The proposed building encroachments and valet activities seem to be within the required front yard. This is not permitted as front yard landscape requirements must be met. Valet driveways are not considered necessary driveways, and therefore, will not be allowed to reduce the required landscape area. The building encroachments and valet driveways can be acceptable if yard averaging is used and these activities occur outside of the resulting front yard.

8. The trash receptacles along Lauula Street must be screened from view.

Parking

9. Pages 3-7 and 3-8 of the Draft EA state that the project will require a Conditional Use Permit, Type 1 for Joint Use of Parking Facilities and that the project will comply with the 400-foot maximum distance between the developments. The appropriate Conditional Use Permit would be a CUP, Type 1 for Off-Site Parking Facilities. In addition to meeting the requirements of Section 4.40-28(b) of the LUO relating to customary pedestrian routes, the proposed use of excess parking spaces must also meet requirements related to stall sizes. That is to say that only excess standard stalls at the existing King Kalakaua Plaza can be credited toward the parking requirements of the King Kalakaua Plaza Phase II Development.

Utilities

10. The final EA should clearly indicate if utilities are adequate or whether improvements are required.

Wastewater

11. The municipal sewer system is available and adequate provided that connection is made directly to the existing 18-inch sewer line on Kuhio Avenue. Connection should not be made to either existing 6-inch sewer.

This statement shall not be construed as confirmation of sewer capacity reservation. Sewer capacity reservation is contingent on submittal and approval of a Sewer Connection Application form.

Traffic Review

12. Walls, structures and landscaping in the vicinity of all driveways should be designed and located to provide adequate vehicular sight to pedestrians and other vehicles.

13. All access locations should be designed as standard City dropped driveways. The driveway grade should not exceed five percent for a minimum distance of 25 feet from the property line or back of the pedestrian walkway, whichever is further from the curb.

14. The pavement width at the proposed drop off areas where loading and unloading activities are expected to occur should be wide enough to accommodate two lanes of traffic, designed to facilitate a one-way flow of traffic and located entirely within private property.

15. The drop off area on Kuhio Avenue should be adjusted so that the egress is aligned directly across Launiu Street. The developer should consider using a modified curb return type driveway. Adjustments to the intersection and traffic signal system may also be required.

16. All loading and unloading activities of patrons and maneuvering of delivery vehicles should occur on-site. Loading areas should be designed and located where it will provide convenient access to businesses in the building to limit this type of activity from occurring on public streets.

17. The pedestrian sidewalk on the Kalakaua Avenue frontage should not significantly depart from the intended sidewalk location adjacent to the roadway as shown on the proposed ground floor site plan.

18 The proposed relocation of the bus stop on Kalaimoku Street should be coordinated with the Department of Transportation Services prior to submittal of construction plans for this project.

19. The traffic study should also provide an analysis of traffic conditions during the peak hour of the proposed project.

20. The developer should work with the City during the early stages of the project to establish vehicular access restrictions to the site. Left turns into and out of driveways fronting Kuhio Avenue may be banned, unless provisions can be provided to facilitate this movement.

21. Construction plans for all work within the City right-of-way will need to be submitted for review and approval. Traffic control plans, as required, should be included.

22. Corner rounding at Kalakaua Avenue and Kalaimoku Street to create a 30-foot property line radius will be required.

Thank you for the opportunity to comment on this project. Should you have any questions, please contact Ardis Shaw-Kim of our Coastal Lands Branch at 527-5349 or Bonnie Arakawa of our Urban Design Branch at 527-5837.

Very truly yours,

JAN NAOE SULLIVAN
Director of Planning
and Permitting

JNS:am

g:ards\king2.ask

In reply refer to:
WWM 98-85

October 9, 1998

MEMORANDUM:

TO: BONNIE ARAKAWA, PLANNER VI
URBAN DESIGN BRANCH

Dennis Nishimura

FROM: DENNIS NISHIMURA, BRANCH HEAD
WASTEWATER BRANCH

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
KING KALAKAUA PLAZA PHASE II
TMK 2-6-18:10,36,42,52,55,62,63,64,73, AND 74

The municipal sewer system is available and adequate provided that connection is made directly to the existing 18-inch sewer line on Kuhio Avenue. Connection should not be made to either existing 6-inch sewers. The proposed development includes approximately 260,000 square feet of retail and office space.

Hereafter, pre-assessment consultations should be requested in writing. We will not honor an erroneous verbal confirmation of sewer capacity availability.

This statement shall not be construed as confirmation of sewer capacity reservation. Sewer capacity reservation is contingent on submittal and approval of a Sewer Connection Application form.

If you have any questions, please contact Ms. Tessa Ching of the Wastewater Branch at 523-4956.

DN/est

WILSON
OKAMOTO
& ASSOCIATES, INC.
ENGINEERS
PLANNERS
1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

6250-01
November 10, 1998

Ms. Jan Naoe Sullivan, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Ms. Sullivan:

Thank you for your letter dated October 30, 1998 (Ref. 98/ED-2[ASK]) commenting on the subject Draft EA. We provide the following in response to your comments:

Hazardous Materials

1. In April 1997, a Phase I Environmental Site Assessment was conducted for all except one of the parcels within the project site by Harding Lawson Associates. The assessment concluded that there was no evidence of past uses of the site that would be suspected of storing, using or disposing of regulated or contaminating materials. The study did not include Tax Map Key 2-6-18:36, which was formerly occupied by the Popo's Mexican Restaurant and Bar as well as the South Seas Village. The need for a soils survey is yet to be determined for this parcel. However, given the history of the restaurant at the site, and the similarity of its use to that of the former Canlis Restaurant, it is unlikely that there were any suspect uses that could have contaminated the soils in the area. The Final EA will include this discussion regarding the disposition of the soils.

Archaeology

2. The archaeological inventory survey recommended in Appendix A of the Draft EA "would comprise subsurface testing of the entire project area consisting of a series of backhoe trenches." This would be done after the project site has been cleared. The entire site cannot be cleared until after the Final EA has been processed and the applicant receives required permits for demolishing structures over 50 years old and removing trees over six inches in diameter. The intent of the subsurface survey is to determine if a mitigation plan would need to be prepared for approval by the State Historic

Preservation Division. The mitigation plan would be implemented prior to and during subsequent excavation of the site.

Waikiki Special District

3. The current proposal includes a step back along all three street frontages of the project site. We will forward your suggestions to the project architect for consideration.

4. We acknowledge that the removal of any building more than 50 years old requires a minor special district permit prior to the issuance of a demolition permit.

5. The Final EA will discuss, on a general level, the fulfillment of the Waikiki Special District objective and design guidelines promoting a Hawaiian sense of place. However, design details such as specific ground level and architectural features are unavailable at this time, as the project is in the schematic design phase. Specific information will become available as the project design progresses and, during the processing of the Waikiki Special District Major Permit, these details will be finalized and will comply with all WSD permitting requirements.

6. The rendering depicted in Figure 1-6 is conceptual in nature and the one-story structure you refer to, although not a literal translation of the former Canlis Restaurant Building, is intended to reflect the material qualities of the former restaurant. With regard to the material composition of the structure, the developer has retained a portion of the original copper roof and moss rock from the restaurant and will incorporate these or similar materials into the proposed one-story structure. The Final EA will include clarification regarding the use of existing building materials from the Canlis Restaurant. The disposition of the structure, including its use and location within the plaza area, will be resolved during the WSD permit process.

7. We have forwarded your comments regarding the building encroachments and valet areas to the project architect for consideration in the project design.

8. We have forwarded your comments regarding screening of the trash receptacles along Lauula Street to the project architect for consideration in the project design.

Parking

9. The use of parking located at King Kalakaua Plaza for the proposed project will comply with all off-site parking requirements stipulated in the Land Use Ordinance.

Utilities/Wastewater

10. We have received written confirmation from the Board of Water Supply regarding the adequacy of existing the off-site water system. In addition, we appreciate being informed that the 18-inch sewer line on Kuhio Avenue is available and adequate to accommodate the proposed project. The adequacy of the off-site drainage system, however, has not been verified. Accordingly, the Final EA will be revised to reflect this information.

11. We acknowledge that your statement is not a confirmation of sewer capacity reservation and that such confirmation is contingent upon the approval of a Sewer Connection Application.

Traffic Review

12 - 18. The project will comply with all City and County of Honolulu requirements for traffic accessibility and roadway design. All items will be referred to the project architect and engineer for consideration into the project's design. The developer will consult with the City regarding these concerns during latter design phases of the project.

19. In the Final EA, the traffic study will include an analysis of traffic conditions during the peak hour of the proposed project

20. The developer will continue to work with the City at this early stage of the project to establish vehicular access restrictions to the site.

21. Construction plans for all work within the City right-of-way, will be submitted to your Department for review and approval. This would include traffic control plans, as required.

22. Corner rounding at Kalakaua Avenue and Kalaimoku Street will create a 30-foot property line radius, as required.

WILSON
OKAMOTO
& ASSOCIATES, INC.

6250-01
Letter to Ms. Sullivan
November 10, 1998
Page 4

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

S. Send a copy of this to the developers?

from Nitgalda Evans 48-03074
320 Ohua Avenue
1302
Honolulu, Hawaii
96815

P.P.S. The sister building by the same architects is a colossal (sp?) waste of space and unappealing to the people: A bizarre influence — for a prostituted locale

10/22

Dear Bonnie:
Thanks for your attention a few hours ago! It's perplexing, sad, outrageous that treasures are plundered by those who aren't even residents here. Salivating isn't too strong a word.

It's sad to destroy instead of value.

Destroying Indian Banyan trees is highly 'inauspicious'... but sad to say insensitive people don't even know or care, and life goes on.

Waikiki has already lost alot. Hulas and the two trees are next on the list.

No benefit is a reality being obtained for either residents or visitors.

The only thing to do? Focus one's attention elsewhere instead of getting tarred by attempting to save Tarbaby, as the old story goes.

Let the oblivious spend thousands more lifetimes wallowing in material, not spiritual goods.
Focus on it ... and cry.
If your office and attached entities can stop this latest classless excuse for making money by saying, "Enough is Enough",

WILSON
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& ASSOCIATES, INC.
ENGINEERS
PLANNERS
1907 S. BERETANIA STREET
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PH (808) 946-2277
FAX (808) 946-2253

6250-01
November 10, 1998

Ms. Nitgalda Evans
320 Ohua Avenue, #1303
Honolulu, Hawaii 96815

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Ms. Evans:

Thank you for your letter dated October 22, 1998 commenting on the subject Draft EA. We acknowledge and concur with your concern for the larger Banyan trees located on the project site.

Please be assured that, as the project's design development progresses, great attention is being paid to incorporate as much native landscaping as possible into the project design. For your information, and as stated in Section 2.8 of the Draft EA, one of the existing Banyan trees will be replanted in a different location within the proposed project. This is the 40-foot Banyan located at the corner of Kuhio Avenue and Kalaimoku Street. While the larger, 60-foot Banyan tree located along Kalaimoku Street will not be incorporated into the project, several cuttings were taken from the tree and will be replanted in various off-site locations. This was also stated in the Draft EA. In addition, Kalakaua Southseas Owners, LLC is consulting with an arborist regarding the current health and condition of on-site trees, the possibility of retaining additional trees for the development, and the treatment of the 40-foot Banyan tree during construction as well as during its relocation upon the completion of construction.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

240 Makee Rd. 98-U8099
Honolulu, Hawaii
October 22, 1998

Department of Planning and Permitting
Honolulu Hale High-rise
Honolulu, Hawaii

In considering the future of the Former Cinerama-Hula's lot it is my earnest wish that it be maintained as a green oasis. Waikiki and Ala Moana have a record number of shops. We do not need another mall.

As a long-time resident of Waikiki I have seen many changes. Driving down Kalakaua and Kuhio I see what a difference a natural Oahu Oasis can continue to make.

Please consider long and hard and decide what will really improve Waikiki.

Sincerely, Betsy Weiner, MD

B. Weiner
240 Makee Rd.
Honolulu, H. 96815.

WILSON OKAMOTO & ASSOCIATES, INC.
ENGINEERS PLANNERS
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FAX: (808) 946-2253

6250-01
November 10, 1998

Dr. Betsy Weiner
240 Makee Road
Honolulu, Hawaii 96815

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Dr. Weiner:

Thank you for your letter dated October 22, 1998 commenting on the subject Draft EA. Your concerns regarding the proposed project are acknowledged.

Please be assured that, as the project's design development progresses, great attention is being paid to incorporate as much native landscaping as possible into the project design. For your information, and as stated in Section 2.8 of the Draft EA, one of the existing Banyan trees will be replanted in a different location within the proposed project. This is the 40-foot Banyan located at the corner of Kuhio Avenue and Kalaimoku Street. While the larger, 60-foot Banyan tree located along Kalaimoku Street will not be incorporated into the project, several cuttings were taken from the tree and will be replanted in various off-site locations. This was also stated in the Draft EA. Further, Kalakaua Southseas Owners, LLC is consulting with an arborist regarding the current health and condition of on-site trees, the possibility of retaining additional trees for the development, and the treatment of the 40-foot Banyan tree during construction as well as during its relocation upon the completion of construction.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

THE OUTDO(
1314 South King St., Suite 3
Phone 808-593-0300

Established 1912
Non-profit Organization
RANCHES
AHU
Kaneohe
Lani-Kailua
North Shore
Waialae Kahala
AWAI'I
Hilo
Ka'u
Kona
Puna
Waimea
(UAI
AUI
OLOKAI
ARDEN CIRCLE
Lani-kai

October 23, 1998

Kalakaua Southseas Owners, LLC
2080 Kalakaua Avenue, #105
Honolulu, HI 96815

RE: Draft Environmental Assessment, King Kalakaua Plaza, Phase II

To Whom It May Concern:

Thank you for the opportunity to comment on the above referenced Draft Environmental Assessment (DEA). We have reviewed the document and have the following comments/questions:

General/Overall Comments:
The existing conditions on the project site are not as stated in the DEA. Buildings under 50 years old, including Canlis Restaurant, have already been removed. Therefore, the alternatives to the proposed action (page 4-1) is not viable and makes this section irrelevant. The Final Environmental Assessment should accurately reflect the site conditions.

The Outdoor Circle does not consider itself to be a consulted party in the pre-assessment process. Under a previous owner, we reviewed and commented on landscaping plans. Once the project changed ownership (and the plans changed considerably) we were not consulted. In fact, after publication of the Draft Environmental Assessment in the *Environmental Notice* we had to request a copy of the document. As a consulted party, the DEA should have been sent to us.

Archaeological/Historical:
In a letter sent by the State Historic Preservation Office and published in the DEA, the comment was made that Canlis Restaurant has significant historic impact. The building was demolished prior to the publication of this document, thereby not allowing for appropriate community input. This seems in direct opposition to the City and County's Land Use Ordinance 7.80-3 (3) which states that development should preserve, maintain and enhance historic properties whenever possible.

In addition, the DEA states that a single story structure will be incorporated into the proposed project reflecting qualities of the former Canlis Restaurant (pg 2-16). The rendering shown in the document shows a very small gazebo, but does not show a one-story structure, and current plans for the site (shown to The Outdoor Circle by Honu Group on 10/21/98) do not reflect this either. The document should be amended and the claim, cited as a mitigation measure, removed.

Landscaping:
Although the Draft Environmental Assessment gives the project description as "abundantly landscaped along Kalakaua Avenue, Kalaimoku Street and Kuhio Avenue frontages," (pg. 1-6) no details are provided. The Outdoor Circle feels strongly that the new project site must provide equivalent shade to make up for what is being removed. We feel that large, canopy trees must be planted on site and that all documents reflect this commitment.

The document refers to relocating one banyan tree and reusing it on the project site. The Outdoor Circle has a great deal of interest in how this will be accomplished and feels that the DEA must include a discussion on protections for the tree. Throughout the process, care must be given to protecting the tree's canopy and roots. Further discussion with the Honu Group, but not in the DEA, leaves open the possibility of allowing the tree to stay where it presently sits. Of course, this is preferable to its relocation, but again, the DEA needs to state the ways in which the tree will be protected during construction.

Other:
Under utilities, Hawaiian Electric Company is not listed as a consulted party. We feel it is important that this project incorporate energy conservation into its plan. Rather than rely on traditional power supplies it is time for projects such as this to look to alternatives. The DEA should address power demand and supply for this project.

Please update the DEA to inform the public as to how the hazardous materials were handled when demolishing the buildings on the site. Since the buildings were removed prior to the public comment period, it is important for us to know this information. It can be included in the final document.

Since the publication of this document, we have met with representatives of the Honu Group. They have told us of their desire to work with both The Outdoor Circle and the community when it comes to making decisions on King Kalakaua Phase II. They also told us that the project schedule given in the DEA is not accurate. This schedule should be updated in the FEA.

Trees make an important statement when it comes to creating an Hawaiian Sense of Place. Once again, we urge the developers to include a large amount of shade on the site. This is one way to balance the site with the very green Ft. DeRussy park-like setting across the street. In addition, we encourage them to have as much community input as possible. By doing so, the final product will be one we can all be proud of.

Sincerely,

Mary Steiner
CEO

cc: Laura Mau, Wilson Okamoto & Associates
Bonnie Arakawa, Department of Planning and Permitting
Council member Duke Bainum
Gary Gill, Office of Environmental Quality Control

WILSON
OKAMOTO
& ASSOCIATES, INC.

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FAX (808) 946-2253

6250-01
November 10, 1998

Ms. Mary Steiner, Chief Executive Officer
The Outdoor Circle
1314 South King Street, Suite 306
Honolulu, Hawaii 96814

Subject: Draft Environmental Assessment (EA)
King Kalakaua Plaza Phase II
Honolulu, Hawaii

Dear Ms. Steiner:

Thank you for your letter dated October 23, 1998 commenting on the subject project. We also appreciate your time spent meeting with the developer, Kalakaua Southseas Owners, LLC, and Ms. Laura Mau of our office on October 16 and 21, 1998 to discuss your concerns regarding the project. We provide the following in response to your comments:

General/Overall Comments:
As explained at our October 16th meeting, when we completed the Draft EA, we were unaware that the demolition permit for the Canlis Restaurant building had been approved. After the Draft EA was filed with the Department of Planning and Permitting, the building was removed. Section 1.3 of the Draft EA pertaining to *Existing and Surrounding Uses* will be updated to reflect the removal of the building. With this modification, the alternatives discussion on Page 4-1 will be accurate as it is presently worded.

Chapter 343 Hawaii Revised Statutes does not specifically define a "consulted party". For the purposes of the Draft EA, any agency or group with whom the project was discussed was listed as a consulted party during the pre-assessment phase. We considered the meeting between Kalakaua Southseas Owners, LLC and your office held on August 10, 1998 a consultation. Nevertheless, in the Final EA, we will remove The Outdoor Circle from the Pre-Assessment Consultation list. We concur that a copy of the Draft EA should have been sent to your office for review and regret that this was not done.

Archaeological/Historical
As discussed during our October 16th meeting, the Draft EA was required in conjunction with filing an application for a Waikiki Special District (WSD) Minor Permit for the removal of trees over six inches in diameter and the demolition of nonhistoric structures which are over 50 years old. The demolition of nonhistoric

structures which are 50 years or less are otherwise exempt from permitting (Land Use Ordinance, page 7-115, Table 7.6(C). In addition, Chapter 11-200 (8)(a)(8) Hawaii Administrative Rules regarding *Exempt Classes Of Actions* exempts the demolition of structures from the EA process unless a building is listed on the State or National Register of Historic Places

The rendering depicted in Figure 1-6 is conceptual in nature and the one-story structure you refer to, although not a literal translation of the former Canlis Restaurant Building, is intended to reflect the material qualities of the former restaurant. With regard to the material composition of the structure, the developer has retained a portion of the original copper roof and moss rock from the restaurant and will strive to incorporate these or similar materials into the proposed one-story structure. The Final EA will include clarification regarding the use of existing building materials from the Canlis Restaurant. Please be apprised that the provision of the single-story structure will continue to be discussed as a mitigative measure with the Department of Planning and Permitting and the Department of Land and Natural Resources State Historic Preservation Division. As such, the structure is a committed element which will be incorporated as part of the project.

Landscaping
Your concern that adequate provisions be made for on-site canopy trees is duly noted. Canopy trees that will be planted on-site include Monkey Pod trees, Shower trees, and the existing 40-foot Banyan tree. Please be assured that, as the project's design development progresses, great attention is being paid to incorporate as much native landscaping as possible into the project design. As you are aware, however, the project design is currently in the schematic phase and, as such, a landscape plan specifying the size, type and location of trees is unavailable. Details regarding a formal landscape plan, particularly those addressing the protection and relocation of the 40-foot Banyan tree, are expected to be resolved during the processing of the aforementioned WSD Minor Permit. As you are also aware, per your recommendation, Kalakaua Southseas Owners, LLC is consulting an arborist regarding the current health and condition of on-site trees, the possibility of retaining trees for the proposed development, and the treatment of the 40-foot Banyan tree during construction as well as during its relocation upon the completion of construction.

Other
We concur that the energy efficiency of the project is important and Kalakaua Southseas Owners, LLC has consulted the account manager of new construction at the

WILSON OKAMOTO & ASSOCIATES, INC.

Energy Service Department of the Hawaiian Electric Company (HECO) in this regard. Because the project is in the preliminary stages of design, it is premature to consult with HECO regarding specific energy requirements. HECO will be consulted further regarding specific energy needs and sources for the project once the project progresses to the design development stage.

All hazardous materials were removed and disposed of in compliance with U.S. Environmental Protection Agency, State of Hawaii Department of Health and Hawaii Occupational Safety and Health regulations. The Final EA will include a discussion regarding the handling of hazardous materials.

The Final EA will be revised to reflect the updated project schedule.

Your letter, together with this response will be reproduced in the forthcoming Final EA. We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely,

Earl K. Matsukawa, AICP, Project Manager

cc: Ms. Ardis Shaw-Kim, Department of Planning and Permitting
Mr. Tom Applegate, Kalakaua Southseas Partners, LLC

Chapter 8

REFERENCES

8. REFERENCES

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City and County of Honolulu. *Land Use Ordinance.* August 1997.

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Appendix A

HAZARDOUS MATERIALS ASSESSMENT SURVEY KING KALAKAUA PHASE II

Prepared by Clayton Environmental Consultants,
a Division of Clayton Group Services, Inc.
February 25, 1998
and
July 17, 1998

Honolulu Regional Office

Pali Palms Plaza
970 N. Kalaheo Avenue
Suite C-316
Kailua, Oahu, HI 96734
(808) 531-6708
Fax (808) 537-4084

Clayton
ENVIRONMENTAL
CONSULTANTS

Hazardous Materials Assessment Survey
King Kalakaua Phase II
2112 Kalakaua Avenue
for
KKO Construction Hawaii Inc.
Honolulu, Oahu, Hawaii

Clayton Project No. 85-98172.00

February 25, 1998

Clayton
ENVIRONMENTAL CONSULTANTS

CONTENTS

Executive Summary

KKO Construction Inc., retained Clayton Environmental Consultants, a division of Clayton Group Services Inc., to conduct a hazardous materials survey for the King Kalakaua Plaza Phase II located at 2112 Kalakaua Avenue, Honolulu, Oahu, Hawaii.

The purpose of the assessment was to sample building materials that will be disturbed during demolition activities. On February 11, 1998, Mr. Raymond Benzing and Mr. Tim Swartz, Industrial Hygienists with Clayton, conducted a walkthrough assessment of the buildings at the subject property, and collected samples of suspect hazardous materials.

Based on our investigation and sample analytical results, Clayton's findings and recommendations are as follows:

Asbestos-Containing Materials (ACM)

Twenty-eight samples of suspect ACM, which included roofing materials, were collected to determine asbestos content. Based on the laboratory analysis, the following materials tested positive for asbestos content: (1) mastic adhesive located under beige 12-inch by 12-inch floor tiles on the mezzanine level, (2) the pitch and gravel flat roof over the kitchen area of Popo's restaurant, and (3) tarpaper under ceramic roof shingles over the Popo's dining area. These materials were observed in good condition and are classified as Category I nonfriable ACM. Because this type of ACM is not regulated, no special abatement procedures are required by the State of Hawaii Department of Health, asbestos branch prior to demolition.

However, during the removal of Category I nonfriable asbestos, air monitoring should be conducted by a qualified industrial hygienist to ensure that levels of airborne asbestos (if any) during demolition are within Hawaii Occupational Safety and Health (HIOSH) permissible exposure limits for the demolition contractor's employees.

Lead-Based Paint (LBP)

Seven representative samples of paint were collected from predominant building components on interior and exterior portions of the buildings. Lead was reported at concentrations below the method detection limit of 0.01% and/or the HUD definition of 0.5% lead by weight for LBP classification.

Fixture Inventory

Approximately 100 light ballasts, 8 capacitors and 200 fluorescent light tubes were inventoried at the subject property. According to the Toxic Substance Control Act

(TSCA) the light ballasts are considered small capacitors. According to TSCA regulations (40 CFR 766.60), the disposal of large quantities (greater than 25) of small capacitors by commercial and industrial activities poses an environmental risk. USEPA encourages a collection and disposal program that would result in small capacitors going to an approved landfill or incinerator for disposal.

Because 108 or more small capacitors and 200 fluorescent tubes were observed at the subject site, Clayton recommends that the light ballasts and capacitors located throughout the facility be removed by a qualified contractor to comply with regulatory requirements. Since fluorescent light tubes may contain varying amount of mercury, the tubes should also be disposed at a metal recycling facility or in accordance with regulatory requirements.

The freezer and refrigerator units in Popo's kitchen may contain chlorofluorocarbon (CFC) refrigerants. These units should be inspected by a hazardous waste removal contractor or refrigeration electrician to determine if CFC's may be contained in the units. If they are determined to contain CFC refrigerants, the CFCs should be removed and properly disposed prior to demolition.

1.0 INTRODUCTION

KKO Construction Hawaii Inc., retained Clayton Environmental Consultants, a division of Clayton Group Services Inc. to conduct a hazardous waste assessment survey for the King Kalakaua II project located at 2112 Kalakaua Avenue, Honolulu, Oahu, Hawaii. The scope of services provided by Clayton is described in our Proposal No. 98-HI-50391, dated February 6, 1998. Authorization to proceed was given by signed proposal dated February 9, 1998.

The purpose of the assessment was to sample building materials for asbestos and lead content. In addition, light fixtures were inventoried to determine disposal options for the ballasts and fluorescent tubes. On February 11, 1998, Mr. Raymond Benzing and Mr. Tim Swartz, Industrial Hygienists with Clayton, conducted a walkthrough assessment of the buildings, which included the rooftops of each structure at the subject property.

Bulk suspect asbestos and lead-based paint (LBP) samples that were collected from the buildings were shipped to EMSL Analytical, Inc. laboratory, located in San Mateo, California. The asbestos samples were analyzed for asbestos content using the Environmental Protection Agency (EPA)-recommended standard method of polarized light microscopy (PLM) for determining asbestos fibers in bulk materials. Paint samples were analyzed for total lead using EPA Method 7420.

2.0 DESCRIPTION OF FACILITY

The King Kalakaua Plaza II is located at the former Popo's Mexican Restaurant and Bar and South Seas Village property at 2112 Kalakaua Avenue. The property consists of three structures with an asphalt paved parking lot located at the northeastern (rear) portion of the parcel.

The northernmost structure is occupied by a restaurant and kitchen (formerly Popo's). A second story mezzanine storage area with restroom is situated at the northeast corner of the building. The second structure is occupied by the former bar. The third structure is occupied by vendor carts used for the former South Seas Village. The three structures are comprised of concrete, stucco and wooden walls. The restaurant building is covered by a ceramic tile roof over the dining area, and a pitch and gravel roof over the kitchen area. The remaining buildings are covered with wooden shake roofs. Walkways connect the restaurant, bar and South Seas Village buildings.

2.1 DESCRIPTION OF ASBESTOS ASSESSMENT

During Clayton's onsite inspection, suspect asbestos-containing material (ACM) was identified and a minimum of one representative sample of each material was collected for PLM analysis. Suspect ACM may include ceiling and floor tile, pipe and boiler insulation, spray-applied plaster, and various other building materials. Suspect materials identified included: (1) interior and exterior stucco plaster walls, (2) ceramic floor tile grout, (3) gypsum wall/ceiling board with joint compound, (4) floor tile and associated mastic and (5) roofing materials. A total of 28 samples were collected. According to federal and state regulations, a material is considered asbestos-containing *if it contains at least one percent (%) asbestos fibers.*

2.2 DESCRIPTION OF LEAD-BASED PAINT ASSESSMENT

Interior and exterior paint chips from predominant painted surfaces of the structures were collected to assess the presence of lead. According to the Department of Housing and Urban Development (HUD) guidelines, a paint sample is considered lead-based when it contains 0.5% or more lead by weight.

A total of seven paint samples were collected from interior and exterior building surfaces. During the inspection, the paint was observed in good condition with minimal surface peeling, cracking or delamination.

2.3 FIXTURE INVENTORY

During the assessment of the facility, light fixtures were inventoried and inspected for the presence of ballasts and fluorescent tubes. The inspection indicated approximately 100 ballasts, 5 power capacitors (for the outside lighting system) and three refrigerant compressor capacitors (on the roof). Several of the ballasts were inspected by Clayton. The inspection revealed that the ballasts appeared old with no "Non-PCB" labeling observed. Approximately 200 fluorescent light tubes were also noted by Clayton.

Many fluorescent light ballasts manufactured prior to 1980 may contain polychlorinated biphenyls (PCBs). According to TSCA, the fluorescent light tubes are considered small capacitors. The fluorescent light ballasts at the subject property should be considered PCB-containing unless labeling states that they are non-PCB units. The fluorescent tubes may contain varying amounts of mercury.

The freezer and refrigerator units in Popo's kitchen may contain chlorofluorocarbon (CFC) refrigerants. These units should be inspected by a hazardous waste removal contractor or refrigeration electrician to determine if CFC's may be contained in the units. If they are determined to contain CFC refrigerants, the CFCs should be removed and properly disposed prior to demolition.

3.0 SURVEY RESULTS

3.1 RESULTS OF ASBESTOS ASSESSMENT

The following table shows suspect ACM sampled, material description/location, PLM analytical results, approximate quantity and sample identification (ID) numbers.

Asbestos Assessment Results

Material Description and Location	% and Type of Asbestos	Approximate Quantity in Square Feet	Sample ID Numbers
stucco plaster on interior walls	ND	10,000	2263-2265
stucco plaster on exterior walls	ND	10,000	2266-2268
ceramic floor tile grout in dining area	ND	600	2269
gypsum wall/ceiling board with joint compound in kitchen and mezzanine	ND	15,000	2270-2272
12-inch by 12-inch beige floor tile and mastic on mezzanine level	1-10 (mastic only)	325	2273
pitch and gravel roofing over kitchen area	1-10 Chrysotile	2,200	2274-2276
tar paper between wood shingles on pitched roofs	ND	8,000	2277-2279
roof covering on parapet sides	ND	160	2280
tar paper under ceramic roof shingles	1-15 Chrysotile	1,200	2281-2283
brushed-on tar on vent pipes and air conditioning lines	ND	25	2284-2286
sheetrock located on pitched roof between brown shake and wood shingles	ND	8,000	2287
ceramic floor tile grout in South Seas Village area	ND	7,000	2288

Asbestos Assessment Results (continued)

Material Description and Location	% and Type of Asbestos	Approximate Quantity in Square Feet	Sample ID Numbers
textured waterproof coating on kitchen floor	ND	1,000	2289
tar coating on dish water lines in kitchen	ND	20 (linear feet)	2290

ND: None detected

Based on PLM analytical results, the following materials tested positive for asbestos content:

- mastic located under the 12-inch by 12-inch beige floor tiles on mezzanine level
- pitch and gravel roofing material located over Popo's kitchen area
- tar paper under ceramic roof shingles located over Popo's dining area

These materials were observed in good condition and classified as Category I nonfriable ACM. These materials need not be removed if they are not sanded, ground, drilled, or subjected to any other process that would render the materials friable. A friable ACM is defined as a material containing more than one percent asbestos that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure.

The results of the asbestos analysis from EMSL Analytical, Inc. laboratory are included in Appendix A.

3.2 RESULTS OF LEAD-BASED PAINT (LBP) ASSESSMENT

The following table shows the painted building components sampled, paint condition, lead content, and sample ID numbers.

LBP Assessment Results

Location	Painted Component	Condition	Lead Content (% by weight)	Sample ID Numbers
Popo's dining room	beige paint on interior walls	good	<0.010	P-01
Popo's kitchen	beige paint on sheetrock walls	good	<0.010	P-02
Popo's dining room	brown paint on windows, doors and trim	good	0.039	P-03
Popo's restaurant	beige exterior paint on stucco walls	good	<0.010	P-04
metal railings in front of Popo's	beige paint on metal	good	<0.010	P-05
Bar	brown paint on windows and trim	good	<0.010	P-06
Popo's kitchen	brown exterior paint on building	good	<0.020	P-07

LOD: 0.01% lead by weight, limit of detection for analytical method

Lead was reported in two of the seven samples at 0.039 % and 0.020 % lead by weight. Five samples reported a lead concentration below the method detection limit of 0.01%. The reported concentrations are below the HUD definition of 0.5% lead by weight for the samples analyzed.

The results of the lead analysis from EMSL Analytical, Inc. laboratory are included in Appendix B.

4.0 FINDINGS AND RECOMMENDATIONS

Suspect ACM and LBP samples were collected from the buildings prior to demolition activities.

Twenty-eight samples of suspect ACM, which included roofing materials, were collected to determine asbestos content. Based on the laboratory analysis, the following materials tested positive for asbestos content: (1) mastic adhesive located under beige 12-inch by 12-inch floor tiles on the mezzanine level, (2) the pitch and gravel flat roof over the kitchen area of Popo's, and (3) tarpaper under ceramic roof shingles over the Popo's dining area. These materials were observed in good condition and are classified as Category I nonfriable ACM. Because this type of ACM is not regulated, no special abatement procedures are required by the State of Hawaii Department of Health, asbestos branch prior to demolition.

However, during the removal of Category I nonfriable asbestos, air monitoring should be conducted by a qualified industrial hygienist to ensure that levels of airborne asbestos (if any) during demolition are within Hawaii Occupational Safety and Health (HIOSH) permissible exposure limits for the demolition contractor's employees.

Seven representative samples of paint were collected from predominant building components on interior and exterior portions of the buildings. Lead was reported at concentrations below the method detection limit of 0.01% or the HUD definition of 0.5% lead by weight for LBP classification.

Approximately 100 light ballasts, 8 capacitors and 200 fluorescent light tubes were inventoried at the subject property. According to the Toxic Substance Control Act (TSCA) regulations (40 CFR 761.10), the disposal of large quantities (greater than 25) of small capacitors by commercial and industrial activities poses an environmental risk. The light ballasts are considered small capacitors under TSCA. USEPA encourages a collection and disposal program that would result in small capacitors going to an approved landfill or incinerator for disposal.

Because 108 or more small capacitors and 200 fluorescent tubes were observed at the subject site, Clayton recommends that the light ballasts and capacitors located throughout the facility be removed by a qualified contractor to comply with regulatory requirements. Since light tubes may contain mercury, the tubes should be disposed at a metal recycling facility or in accordance with regulatory requirements.

The freezer and refrigerator units in Popo's kitchen may contain chlorofluorocarbon (CFC) refrigerants. These units should be inspected by a hazardous waste removal contractor or refrigeration electrician to determine if CFC's may be contained in the units. If they are determined to contain CFC refrigerants, the CFCs should be removed and properly disposed prior to demolition.

5.0 LIMITATIONS

The information and opinions rendered in this report are exclusively for use by KKO Construction. Clayton Environmental Consultants, Inc. will not distribute this report without your written consent except as may be required by law or court order. The information and opinions expressed in this report are given in response to our limited assignment and should be evaluated and implemented only in light of that assignment. We accept the responsibility for the competent performance of our duties in executing the assignment and preparing this report in accordance with the normal standards of our profession but disclaim any responsibility for consequential damages.

This report prepared by: ______________________
Raymond Benzing
EPA Accredited Project Designer
Honolulu Regional Office

This report reviewed by: ______________________
Tim Swartz
EPA Accredited Building Inspector
Honolulu Regional Office

This report reviewed by: ______________________ For:
Daniel P. Ford, R.G.
Director
Honolulu Regional Office

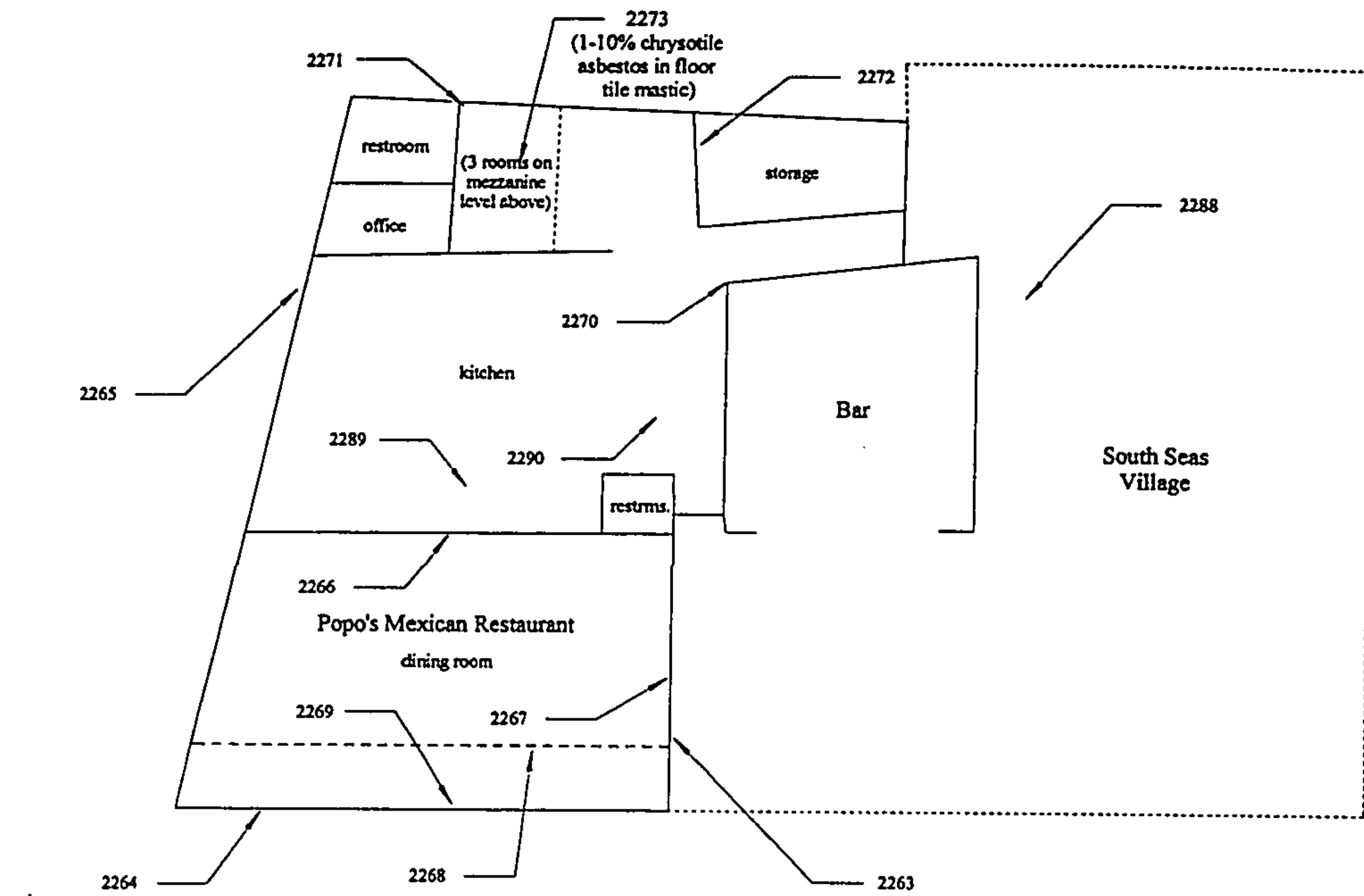
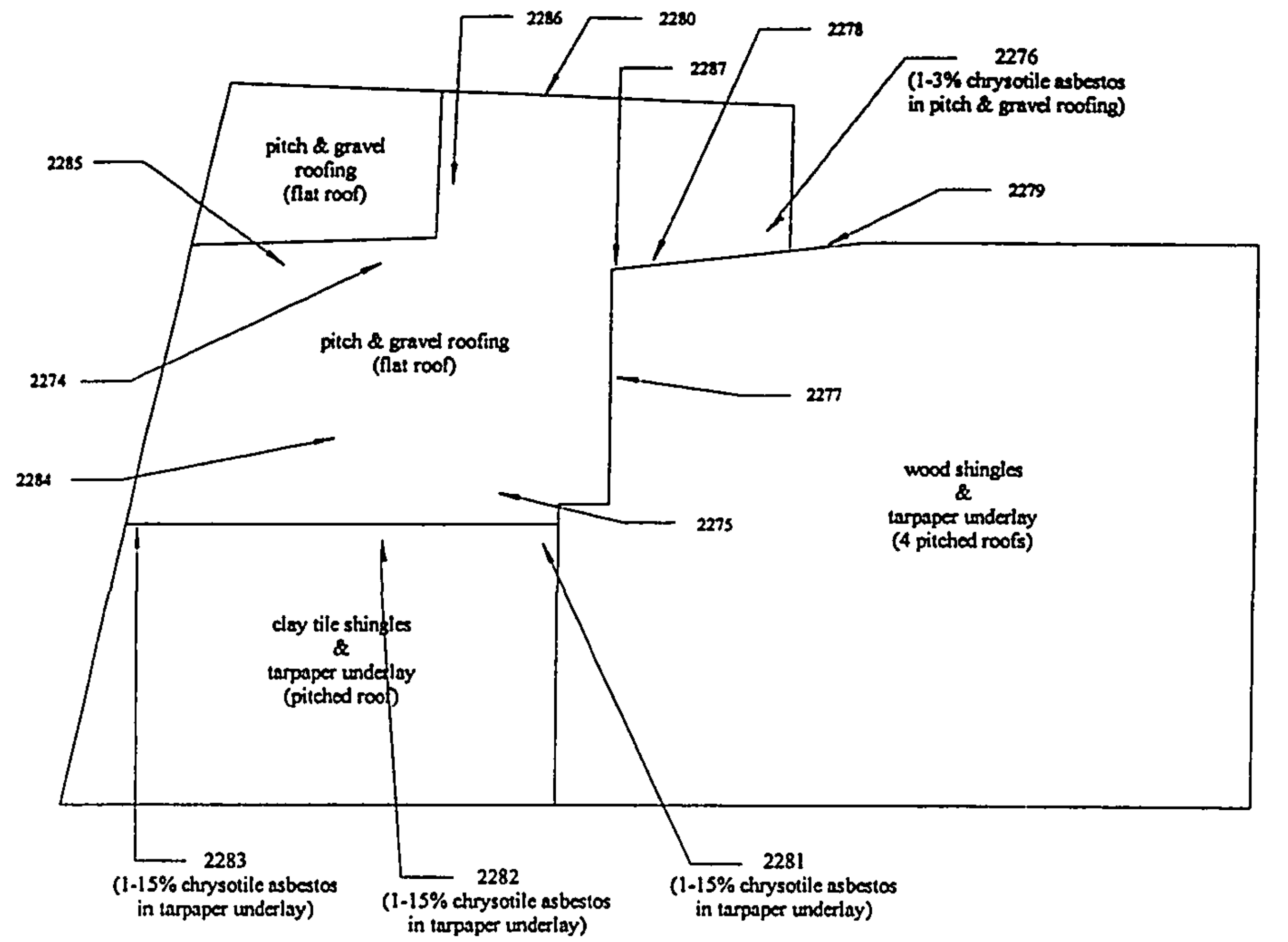


Figure 1 Floor Plan with Sample Locations	Clayton ENVIRONMENTAL CONSULTANTS	Suspect ACM Sample Locations - 2112 Kalakaua Ave., Honolulu, Hawaii	
		Clayton Project No. 85-98172.00	Construction Management & Development, Inc.

Clayton ENVIRONMENTAL CONSULTANTS

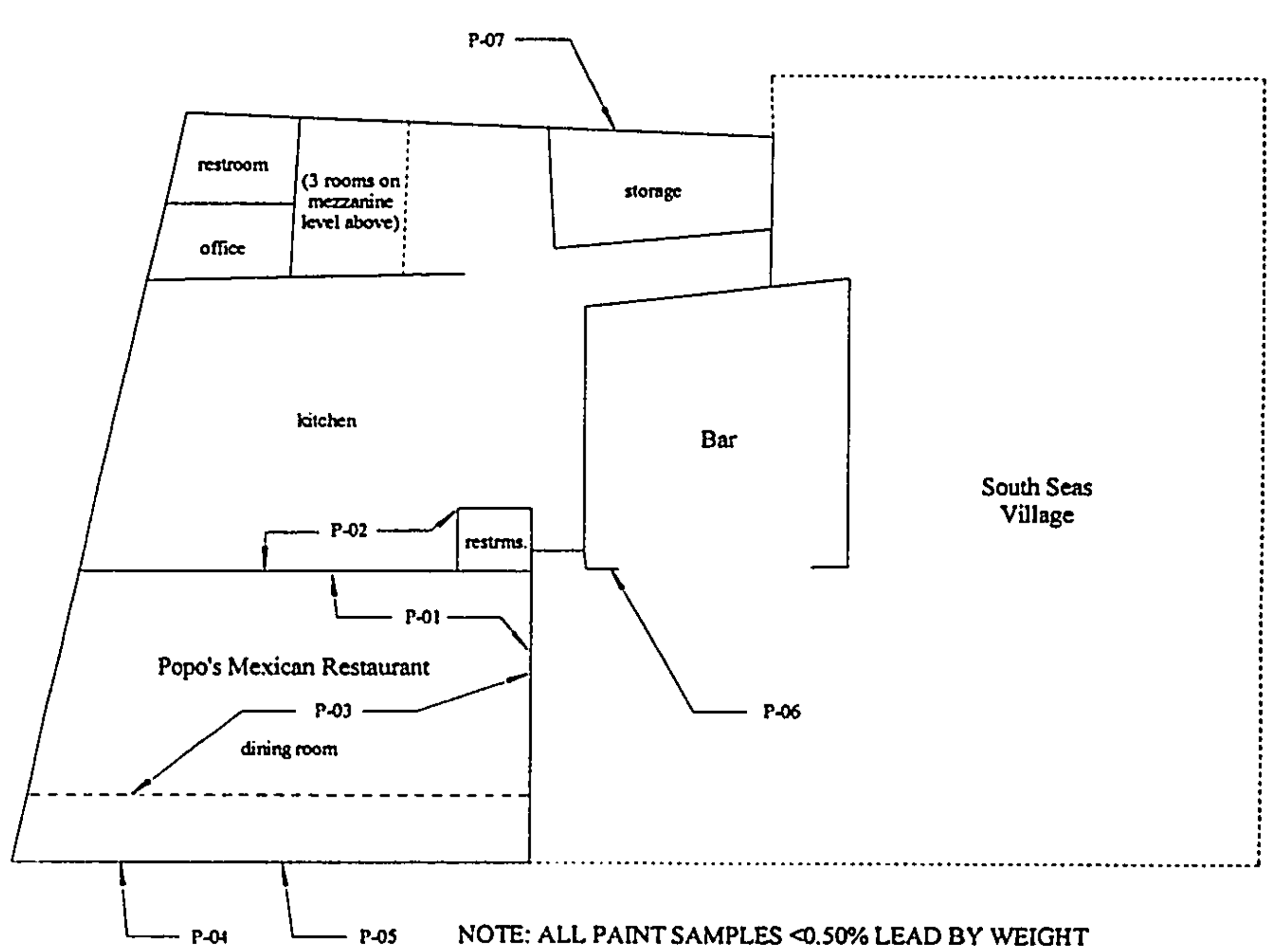
APPENDIX A
SAMPLE LOCATIONS

0000 0005 0623



(not to scale)

Figure 2 Roof Plan with Sample Locations	Clayton ENVIRONMENTAL CONSULTANTS	Suspect ACM Sample Locations - 2112 Kalakaua Ave., Honolulu, Hawaii	
		Clayton Project No. 85-98172.00	Construction Management & Development, Inc.



NOTE: ALL PAINT SAMPLES <0.50% LEAD BY WEIGHT

(not to scale)

Figure 3 Floor Plan with Sample Locations	Clayton ENVIRONMENTAL CONSULTANTS	Suspect LBP Sample Locations - 2112 Kalakaua Ave., Honolulu, Hawaii	
		Clayton Project No. 85-98172.00	Construction Management & Development, Inc.

Clayton
ENVIRONMENTAL CONSULTANTS

APPENDIX B

LABORATORY ANALYTICAL RESULTS FOR ASBESTOS

02/13/1998 17:48 4155785402 EMSL ANALYTICAL SM PAGE 01

PLM Analysis Worksheet

Client: Clayton Environmental Consultants
Address: Honolulu Regional Office
970 North Kalaheo Ave., Suite C-316
Kailua, HI 96734
Fax: (808) 537 - 4084

Logged: 2/13/98
Date/Time Due: 2/13/98 9:00 AM
TAT: Same Day

Special Handling

Billing Number
CA98568

Project: Proj# 85-98172.00

Appearance				Treatment	Asbestos Results	Fibrous	Non-Fibrous
1 Brown 2 Gray 3 Tan 4 White 5 Red	6 Various 7 Black 8 Silver 9 Blue 0 Orange	1 Fibrous 2 Non-Fibrous 3 Other	1 Homogeneous 2 Heterogeneous 3 Other 4 Layers (#)	1. Teased 2. Crushed 3. Dissolved 4. Ashed	1. Chrysotile 2. Amosite 3. Anthophyllite 4. Tremolite 5. Actinolite 6. Crocidolite 0. None Detected	1. Cellulose 2. Glass 3. Min. Wool 4. Synthetic 5. Other 6. Wollastonite 7. Hair	1. Quartz 2. Mica 3. Gypsum 4. Cal. Carbonate 5. Matrix 6. Perlite 7. Other

Optical Properties

Sample	Location	Appearance	Treatment	% ASBESTOS	Fibrous Type	Fibrous %	Non-Fibrous Type	Non-Fibrous %	# Layers
2263		3	2	0			4	75	
		2					7	25	
		1							
2264		3	2	0			4	75	
		2					7	25	
		1							
2265		2	0	0			4	75	
		2					7	25	
		1							
2266		3	2	0			3	50	
		2					4	40	
		1					7	10	
2267		3	2	0			3	50	
		2					4	40	
		1					7	10	
2268		3	2	0			3	50	
		2					4	40	
		1					7	10	
2269		2	12	0	1	10	3	50	
		1					4	30	
		3					7	10	
2270		3	1	0	1	70	3	50	
		1			2	10	7	20	
		1							

Analyst: [signature] Date: 2/13/98 Computer: ______ Date: ______

02/13/1998 17:48 4155785402 EMSL ANALYTICAL SM PAGE 02

PLM Analysis Worksheet

Client: Clayton Environmental Consultants
Address: Honolulu Regional Office
970 North Kalaheo Ave., Suite C-316
Kailua, HI 96734
Fax: (808) 537 - 4084

Logged: 2/13/98
Date/Time Due: 2/13/98 9:00 AM
TAT: Same Day

Special Handling

Billing Number
CA98568

Project: Proj# 85-98172.00

Appearance: 1. Brown 2. Gray 3. Tan 4. White 5. Red 6. Yellow 7. Black 8. Silver 9. Blue 0. Orange; 1. Fibrous 2. Non-Fibrous 3. Other; 1. Homogeneous 2. Heterogeneous 3. Other 4. Layers (#)
Treatment: 1. Teased 2. Crushed 3. Dissolved 4. Ashed
Asbestos Results: 1. Chrysotile 2. Amosite 3. Anthophyllite 4. Tremolite 5. Actinolite 6. Crocidolite 8. None Detected
Fibrous: 1. Cellulose 2. Glass 3. Min. Wool 4. Synthetic 5. Other 6. Wollastonite 7. Hair
Non-Fibrous: 1. Quartz 2. Mica 3. Gypsum 4. Cal. Carbonate 5. Matrix 6. Perlite 7. Other

Sample	Location	Appearance	Treatment	% ASBESTOS	Fibrous Type	Fibrous %	Non-Fibrous Type	Non-Fibrous %	# Layers	Optical Properties
2271		3 / 1	1	0	1 2	15 5	3 7	70 10		
2272		3 / 1	1	0	1 2	15 5	3 7	60 20		
2273 T		3 / 2 / 1	2	1 <1			4 7	75 25		
— M		7 / 1	3	1_10	1	5	7	85		
2274 _		72 / 1	3	0	2	25	7	75		
2275 -		7 / 1	3	0	2	20	7	80		
2276			3	1_3	2	20	7	78		
2277		7 / 1	3	0	1	40	7	60		

Analyst: TP Date: 2/13 Computer: ______ Date: ______

EMSL Analytical, Inc., 1720 S. Amphlett Blvd., Suite 130, San Mateo, CA 94402

02/13/1998 17:48 4155785402 EMSL ANALYTICAL SM PAGE 03

PLM Analysis Worksheet

Client: Clayton Environmental Consultants
Address: Honolulu Regional Office
970 North Kalaheo Ave., Suite C-316
Kailua, HI 96734
Fax: (808) 537 - 4084

Logged: 2/13/98
Date/Time Due: 2/13/98 9:00 AM
TAT: Same Day

Special Handling

Billing Number
CA98568

Project: Proj# 85-98172.00

Sample	Location	Appearance	Treatment	% ASBESTOS	Fibrous Type	Fibrous %	Non-Fibrous Type	Non-Fibrous %	# Layers	Optical Properties
2278		7 / 1	13	0	1	40	7	60		
2279		7 / 1	13	0	1	50	7	50		
2280		72 / 1	31	0	2	25	7	75		
2281		7 / 1	31	1-15	1 2	15 15	7	55		
2282		73 / 1	31	1-15	1	40	7	45		
2283		7 / 1	31	1-15	1	30	7	55		
2284		7 / 2	3	0			7	100		
2285		7 / 0 / 1	3	0			7	100		

Analyst: TP Date: 2/13/98 Computer: ______ Date: ______

EMSL Analytical, Inc., 1720 S. Amphlett Blvd., Suite 130, San Mateo, CA 94402

PLM Analysis Worksheet

Client: Clayton Environmental Consultants
Address: Honolulu Regional Office
970 North Kalaheo Ave., Suite C-316
Kailua, HI 96734
Fax: (808) 537 - 4084

Logged: 2/13/98
Date/Time Due: 2/13/98 9:00 AM
TAT: Same Day

Special Handling

Billing Number: CA98568

Project: Proj# 85-98172.00

Sample	Location	Appearance	Treatment	% ASBESTOS	Fibrous Type	Fibrous %	Non-Fibrous Type	Non-Fibrous %	# Layers	Optical Properties
2286		7 / 2	3	Ø			7	10		
2287		3 / 1	2	Ø	1	10	3 / 7	75 / 15		
2288		1 / 2 / 2	2	Ø			1 / 7	20 / 80		
2289		1 / 7 / 2	2	Ø	1	2	1 / 7	20 / 78		
2290		4 / 1	3	Ø	1	10	7	90		

Analyst: [signature] Date: 2/13/98 Computer: ________ Date: ________

EMSL Analytical, Inc., 1720 S. Amphlett Blvd., Suite 130, San Mateo, CA 94402

EMSL Analytical, Inc.

CHAIN OF CUSTODY

Asbestos

EMSL Representative: Connie Frasca
Your Company Name: Clayton Environmental Cons. Honolulu Regional Office
Street: 970 North Kalaheo Ave.
Box #: Suite C-316
City/State: Kailua, HI Zip 96734

EMSL-Bill to: Same
Street:
Box #:
City/State: Zip:

Phone Results to: Name
Telephone #: (808) 531-6708
Fax Results to: Name Tim Swartz
Fax Number: (808) 537-4084
Project Name/Number: 85-98172.00
Purchase Order #:

MATRIX

☐ Air ☑ Bulk ☐ Wipe ☐ Floor Tile ☐ Drinking Water ☐ Wastewater ☐ Soil ☐ Dust

TURNAROUND

☐ 6-10 Days ☐ 5 Days ☐ 72 Hours ☐ 48 Hours ☐ 24 Hour ☐ 12 Hour ☑ Same Day* ☐ 6 Hours
*S.D. - A.M. delivery by Fed. Ex.-Results by Mid-night or earlier

PCM
☐ NIOSH 7400
☐ OSHA
☐ Other:

PLM
☑ EPA 600
☐ NOB
☐ Point Count
☐ Other:

EM
☐ Qualitative
☐ Quantitative

TEM AIR
☐ AHERA
☐ NIOSH 7402
☐ Level I
☐ Level II

TEM BULK
☐ Drop Mount (Qualitative)
☐ Chatfield
☐ Chatfield / SEM QC
☐ Conventional (Quantitative)
☐ EMSL Method
☐ NOB
☐ NOB / SEM QC
☐ Micro Vac - Quantitative
☐ Micro Vac - Qualitative

TEM WATER
☐ Wastewater
☐ Drinking Water EPA 100.2
☐ Water - NY Wastewater
☐ Water-NY Drinking Water

TEM WIPE
☐ Quantitative
☐ Qualitative

XRD
☐ Asbestos
☐ Silica

OTHER
☐

Client Sample # (s) 2263 - 2290 Total Samples: 28
Relinquished: [signature] Date: 2-11-98 Time: 1600
Received: [signature] Date: 2/13/98 Time: 9:20
Received: Date: Time:

0000 0005 0626

0000 0005 0627

Clayton ENVIRONMENTAL CONSULTANTS

APPENDIX C

LABORATORY ANALYTICAL RESULTS
FOR LEAD-BASED PAINT

FEB-13-1998 17:16 CLAYTON ENVIRONMENTAL 206 763 4189 P.01/02

EMSL ANALYTICAL CHAIN OF CUSTODY LEAD

Date: EMSL Representative: Connie Frasca Project Name/No.: 85-99172.80 P.O.#: —
Company Name: Clayton Environmental Consult EMSL Bill to: Same
Street: 970 N. Kalaheo Ave. Street:
Box #: Suite C-316 Box #:
City/State: Kailua, Hawaii Zip: 96734 City/State: Zip:
Phone Results to: (Name) Telephone: (808) 531-6708
Fax Results to: (Name) Tim Svartz Fax #: (808) 537-4084

MATRIX	METHOD	INSTRUMENT	Media	TAT
Lead Chips*	AOAC 5.009 (974.02) or SW846-7420	Flame Atomic Absorption	0.01% **	Same day
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil *	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	10 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	
	or SW846-6010	ICP	0.1 mg/l (ppm)	
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil *			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check State Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	

TAT (Turnaround) - Same day, 24 hours, 48 hours, 72 hours, 4 Days, 5 Days, 6-10 Days
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	LAB #
P-01	Beige on plaster walls	
P-02	Beige on sheetrock	
P-03	Dark brown on trim	
P-04	Beige on exterior walls	
P-05	Beige on ext. ceilings	
P-06	Brown on trim	
P-07	Brown on ... walls	

Relinquished By: (Person) Date: 2-11-98
Received at EMSL By: Date:
Received at EMSL By: Date:

Sheet1

Preliminary Results for Lead in Paint Chips

2/13/98

EMSL Analytical, Inc.
1720 O. Amphlott Blvd. Suite 130
San, Mateo, CA 94402

Client: Clayton Environmental Project: 85-98172.00

Sample ID	Sample Weight	Sample Volume	Dilution	Concentration	Results	
					ug/g (PPM)	WT %
P-01	0.2060	[illegible]	1	0.2	48.5	<0.010
P-02	0.1850	50	1	0.2	54.1	<0.010
[illegible]	0.1935	50	1	1.5	387.6	0.039
P-04	0.2100	50	1	0.2	47.6	<0.010
P-05	0.1920	50	1	0.3	78.1	<0.010
[illegible]	0.1800	50	1	0.3	83.3	<0.010
P-07	0.2050	50	1	0.8	195.1	0.020

Clayton
ENVIRONMENTAL CONSULTANTS

APPENDIX D

PHOTOGRAPHS

Clayton Project No.	Description	South Seas Village Building Entrance	
	Site Name	King Kalakaua Plaza II	Photo Date
85-98172.00	Client	KKO Construction Hawaii Inc.	Feb. 11, 1998

Clayton Project No.	Description	Popo's Restaurant Entrance	
	Site Name	King Kalakaua Plaza II	Photo Date
85-98172.00	Client	KKO Construction Hawaii Inc.	Feb. 11, 1998

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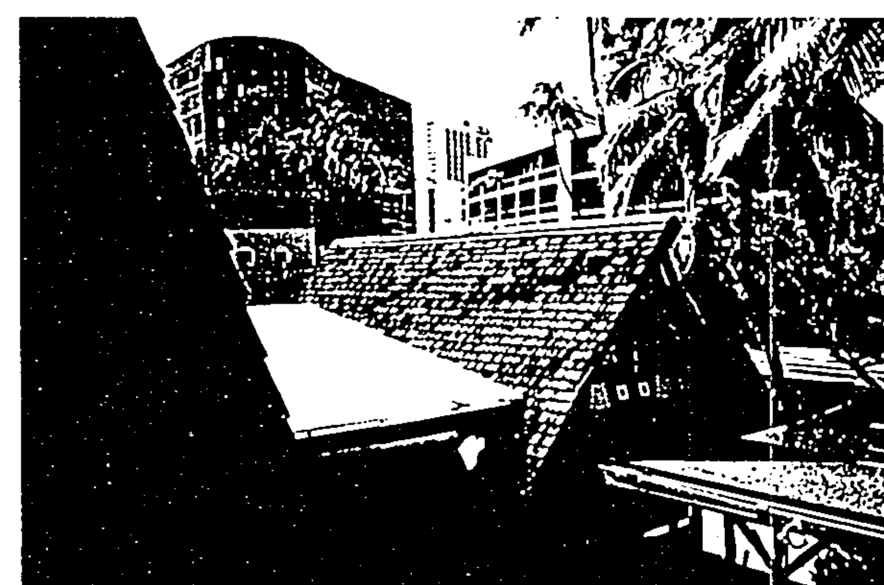
Clayton Project No.	Description	Kitchen with fluorescent light fixtures on ceiling	
	Site Name	King Kalakaua Plaza II	Photo Date
85-98172.00	Client	KKO Construction Hawaii Inc	Feb 11, 1998

Clayton Project No.	Description	Flat pitch and gravel roof above kitchen	
	Site Name	King Kalakaua Plaza II	Photo Date
85-98172.00	Client	KKO Construction Hawaii Inc	Feb 11, 1998

Clayton Project No.	Description	Ceramic shingle roof over dining room	
	Site Name	King Kalakaua Plaza II	Photo Date
85-98172.00	Client	KKO Construction Hawaii Inc	Feb 11, 1998



Clayton Project No.	Description	Wood shake roof over South Seas Village	
	Site Name	King Kalakaua Plaza II	Photo Date
85-98172.00	Client	KKO Construction Hawaii Inc	Feb 11, 1998

0000 0005 0631

Honolulu Regional Office

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Hazardous Materials Assessment Survey for Six Structures at the King Kalakaua II Site (Phase II) for Kalakaua Southseas Owners, LLC Honolulu, Oahu, Hawaii

Clayton Project No. 85-98261.00

July 17, 1998

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CONTENTS

Executive Summary

Kalakaua Southseas Owners, LLC, retained Clayton Environmental Consultants, a division of Clayton Group Services Inc., to conduct a hazardous materials survey for the King Kalakaua II site (Phase II) located in Honolulu, Oahu, Hawaii.

The purpose of the assessment was to sample building materials for asbestos and lead content. In addition, light fixtures were inventoried to determine disposal options for the suspect polychlorinated biphenyl (PCB) ballasts and fluorescent light tubes. On June 30 and July 1, 1998, Mr. Raymond Benzing and Mr. Tim Swartz, Industrial Hygienists with Clayton, conducted a walkthrough assessment of the structures at the subject property, and collected samples of suspect hazardous materials.

Suspect asbestos-containing materials (ACM) and lead-base paint (LBP) samples were collected from six structures located at the project site prior to demolition activities. According to federal and state regulations, a material is considered asbestos containing if it contains at least one percent (1%) asbestos fibers. The EPA defines LBP as a paint which contains 0.5% or greater lead by weight. Five previous assessments were performed for the subject property and were reviewed by Clayton prior to the assessment.

Based on our investigation, sample analytical results and review of previous reports, Clayton's findings and recommendations are as follows:

Asbestos-Containing Materials (ACM)

Building 1

Mudded joint packing located on hot water pipes, roofing materials and drywall located on the second floor (south wall) contain asbestos above 1 %. These materials were categorized as friable or have the potential to become friable during building demolition activities.

Clayton recommends that the insulated mudded joint packing, linoleum, drywall, raised roof, silver painted material on the southern portion of the roof, and multi-layer tar material on the chimney floor (roof area) be removed by a licensed EPA-accredited contractor.

Building 2, Building 3, Building 4 and Building 5

These buildings contain floor tiles with mastic and roofing materials with asbestos concentrations above 1%. However, these materials are classified as Category I nonfriable and are unlikely to become friable during building demolition activities.

Building 6

This building contains acoustical ceiling plaster located in three apartments (3-story wing). The material is considered friable with asbestos concentrations reported above 1%. The building also contains Category I non-friable asbestos materials with asbestos concentrations greater than 1%.

Clayton recommends that the acoustical ceiling plaster located in the three-story apartment wing of the building be removed using a licensed EPA-accredited asbestos abatement contractor. The floor tiles located in the building are considered Category I non-friable. Therefore, the floor tiles may remain in place during demolition activities.

During removal of ACM from the buildings, air monitoring should be conducted by a qualified industrial hygienist to ensure that levels of airborne asbestos during removal are within EPA and Hawaii Occupational Safety and Health (HIOSH) permissible exposure limits for the demolition contractor's employees and general public. Ambient air monitoring in the area surrounding the buildings during demolition with Category I and II nonfriable asbestos should be performed to measure airborne fiber concentrations and to verify that they are below regulatory exposure limits.

Lead-Based Paint (LBP)

Representative samples of paint were collected from predominant painted surfaces on interior and exterior portions of the buildings. Lead was reported at concentrations ranging from below the method detection limit of 0.01% to 20.700 % lead by weight.

LBP in poor condition was identified in the following areas:

- Building 1 - Silver-brown paint on second floor exterior roof area, southwest wall
- Building 2 - Dark brown paint on second Floor walkway guard rail
- Building 2 - Brown-beige paint on former Physique shop, exterior, underside of stairs
- Building 6 - Reddish-brown paint on third floor, stair railing front of Unit 3B

Clayton recommends that paint in poor condition be removed prior to building demolition. Poor condition is defined as paint that is peeling, flaking or delaminating from the building substrate. During LBP removal activities, representative samples of the LBP debris should be sampled and analyzed for hazardous waste characterization and landfill disposal.

Fixture Inventory

Fluorescent light fixtures and equipment capacitors were identified in Building 1 and Building 6. According to the Toxic Substance Control Act (TSCA), the light ballasts are considered small capacitors. TSCA regulations (40 CFR 766.60) state that the disposal of large quantities (greater than 25) of small capacitors by commercial and industrial activities poses an environmental risk. USEPA encourages a collection and disposal program that would result in small capacitors going to an approved landfill or incinerator for disposal.

Clayton recommends that the light ballasts and capacitors located throughout Building 1 and Building 6 be removed by a qualified contractor to comply with regulatory requirements. Since fluorescent light tubes may contain varying amount of mercury, the tubes should also be disposed at a metal recycling facility or in accordance with regulatory requirements.

Chlorofluorocarbon-Containing Equipment

The freezer and refrigerator units located in Canlis Restaurant, Hula's Bar and Banana's Restaurant may contain chlorofluorocarbon (CFC) refrigerants. These units should be inspected by a hazardous waste removal contractor or refrigeration electrician to determine if CFC's may be contained in the units. If they are determined to contain CFC refrigerants, the CFCs should be removed and properly disposed prior to demolition.

1.0 INTRODUCTION

Kalakaua Southseas Owners, LLC, retained Clayton Environmental Consultants, a division of Clayton Group Services Inc. to conduct a hazardous waste assessment survey of six structures at the King Kalakaua II site (Phase II) located in Honolulu, Oahu, Hawaii. The scope of services provided by Clayton is described in our Proposal No. 98-HI-50537, dated June 22, 1998. Authorization to proceed was given by faxed memorandum dated June 25, 1998.

The purpose of the assessment was to sample building materials for asbestos and lead content. In addition, light fixtures were inventoried to determine disposal options for the suspect PCB ballasts and fluorescent tubes.

Bulk suspect asbestos and lead-based paint (LBP) samples that were collected from the buildings were shipped to EMSL Analytical, Inc. laboratory, located in San Mateo, California. The asbestos samples were analyzed for asbestos content using the Environmental Protection Agency (EPA)-recommended standard method of polarized light microscopy (PLM) for determining asbestos fibers in bulk materials. Paint samples were analyzed for total lead using EPA Method 7420.

2.0 DESCRIPTION OF FACILITY

The King Kalakaua Plaza II property encompasses a group of six buildings located in a two block area. The buildings are located between Kuhio Avenue and Kalakaua Avenue, east of Kalaimoku Street to the Food Pantry property. A brief description of each building is summarized in the following table:

Building Number	Description	Tax Map Key Numbers	Address	Approximate Square Footage
1	Canalis Restaurant	2-6-18-10 Lot 1	2100 Kalakaua Avenue	6,000
2	Hula's Bar, Trixx & Treat Bar and Banana's Restaurant	2-6-18-73 Lot B and A-1, 2-6-18-52 Lot 155A-2, 2-6-18-55 Lot 12	2103 Kuhio Avenue	5,000

Building Number	Description	Tax Map Key Numbers	Address	Approximate Square Footage
3	Two-story masonry structure (Bobby's Seafood and Cafe Valentino's')	2-6-18-64 Lot 15	2139-B Kuhio Avenue	4,000
4	Two-story masonry structure (80% Straight and Mitch Milano's Bar)	2-6-18-63 Lot 16	2139-D Kuhio Avenue	4,000
5	Two-story masonry structure (Hernando's Bar and retail spaces)	2-6-18-62 Lot 13 and 14	2139-C Kuhio Avenue	4,000
6	Apartment Building with a two-story wing and a three-story wing	2-6-18-42 Lot 235	2114 Lauula Street	6,000

A building site layout is shown on the Figure in Appendix A.

2.1 BACKGROUND

Four Phase I environmental site assessment reports and one asbestos and LBP assessment survey were reviewed by Clayton prior to conducting the assessment. Specifically, Clayton used the asbestos and LBP assessment performed by Muranaka Environmental Consultants (MEC) for information on ACM and LBP previously identified from the subject property. Based on these reports, Clayton performed an assessment survey to identify hazardous materials not identified in the previous reports and to quantify the identified ACM.

2.2 DESCRIPTION OF ASBESTOS ASSESSMENT

On June 30 and July 1, 1998, Mr. Raymond Benzing and Mr. Tim Swartz, Industrial Hygienists with Clayton, conducted a walkthrough assessment of the structures. Mr. Walt Harrison, Maintenance Supervisor for the property, escorted Clayton and provided building access.

During Clayton's onsite inspection, suspect asbestos-containing materials (ACM) were identified and a minimum of one representative sample of each material was collected for PLM analysis. Suspect ACM may include ceiling and floor tile, pipe and boiler insulation, spray-applied plaster, and various other building materials. Suspect materials identified included: (1) floor tile and mastic, (2) leveling compound,

(3) insulated pipe coverings, and (4) roofing materials. A total of 24 samples were collected. According to federal and state regulations, a material is considered asbestos-containing if it contains at least one percent (1%) asbestos fibers.

2.3 DESCRIPTION OF LEAD-BASED PAINT ASSESSMENT

Interior and exterior paint chips from predominant painted surfaces in poor condition were collected to assess the presence of lead. According to the Department of Housing and Urban Development (HUD) guidelines, a paint sample is considered lead-based when it contains 0.5% or more lead by weight. The EPA uses the HUD guideline definition to also define LBP.

Two paint samples were collected from interior and exterior building surfaces. During the inspection, the paint collected was observed in poor condition with surface peeling, cracking or delaminating.

3.0 SURVEY RESULTS

3.1 RESULTS OF ASBESTOS ASSESSMENT

The following table shows building and location of the suspect ACM sampled, PLM analytical results, and sample identification (ID) numbers identified by Clayton.

Asbestos Assessment Results

Building and Location	Material Description	% and Type of Asbestos	Sample ID Numbers
Building 6- Two-story apartment building	Leveling compound under floor tile	ND	2440
Building 6 - Three-story apartment building	spray-applied acoustic plaster	2% Chrysotile	2441
Building 6 - Three-story apartment building	9-inch by 9-inch tan floor tile and mastic	10% Chrysotile (Tile only)	2442
Building 6 - Roof of two-story apartment building	Green sand covered tar paper	ND	2443

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Building and Location	Material Description	% and Type of Asbestos	Sample ID Numbers
Building 5 - Unit 110	12-inch by 12-inch brown floor tile and mastic	10% Chrysotile	2444
Building 5 - Unit 111	12-inch by 12-inch red brick patterned floor tile	2% Chrysotile	2445
Building 5 - Walls throughout	Sheetrock/joint compound	ND	2446
Building 1 - Hot water room	pipe covering on pipes	ND	2447
Building 1 - Hot water room	mudded joints on pipes	15% Chrysotile 30% Amosite	2448
Building 1 - Kitchen walls	Ceramic wall tile grout	ND	2448
Building 1 - Under wall tiles	Ceramic wall tile cement	ND	2449
Building 1 - Second floor south wall	Joint tape/compound on drywall	ND	2450
Building 1 - Second floor south wall	drywall	ND	2451
Building 1 - Grill pit exhaust chimney exterior walls	Tar paper	ND	2452
Building 1 - Grill pit exhaust chimney interior walls	Hard plaster	ND	2453
Building 4 - Unit 108A & B	Mastic under 12- inch by 12-inch black floor tile	ND	2454

Building and Location	Material Description	% and Type of Asbestos	Sample ID Numbers
Building 4 - Unit 108 restroom	9-inch by 9-inch grey floor tile and mastic under black & white floor tiles	ND	2455
Building 4 - Sports Bar	Ceramic wall tile grout	ND	2456
Building 2 - Unit 113	12-inch by 12-inch beige floor tile	ND	2457
Building 2 - Unit 110	12-inch by 12-inch white floor tile	ND	2458
Building 2 - Unit 111	12-inch by 12-inch wood tone floor tile	ND	2459
Building 2 - Unit 215 A	Dark grey sheet flooring in restroom	ND	2460
Building 2 - Roy Ventner's rest room	Tan floor covering with red paper covering	ND	222461
Building 2 - Second floor rest room of Trixx and Treats	12-inch by 12-inch gold floor tile and mastic	3% Chrysotile	2462

ND: None detected

Based on PLM analytical results, the following materials tested positive for asbestos content:

Building 1

- mudded joints on hot water pipes located in the hot water room

Building 2

- 12-inch by 12-inch gold floor tile located in the second floor rest room of Trixx & Treat Bar

Building 5

- 12-inch by 12-inch brown floor tile and mastic located in Unit 110
- Red brick patterned floor tile located in Unit 111

Building 6

- 9-inch by 9-inch tan floor tile located throughout apartments 2A and 3A in the three story building wing
- Spray-applied acoustical ceiling plaster located in the three units (2A, 3A and 3B) of the three story building wing

The spray-applied acoustical ceiling plaster located in Building 6 and mudded joint packings located in Building 1 contain friable asbestos and were observed in fair condition with small areas of localized damage. Friable ACM is defined as a material containing more than one percent asbestos that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure.

The other materials sampled and identified as ACM during Clayton's assessment were observed in good condition and classified as Category I and II nonfriable ACM.

The results of the asbestos analysis from EMSL Analytical, Inc. laboratory are included in Appendix A.

3.2 RESULTS OF LEAD-BASED PAINT (LBP) ASSESSMENT

During Clayton's assessment of the property, predominate building components not identified in the previous assessment reports were sampled by Clayton. Based on the assessment, two samples of paint from areas in poor condition that were not previously sampled were collected. The two samples reported concentrations below 0.5% lead by weight which is the level the Environmental Protection Agency (EPA) uses to define LBP.

Although Clayton's sampling and analysis did not identify LBP in poor condition, LBP identified in MEC's report was assessed during Clayton's onsite inspection. The LBP found in poor condition included the following:

- Building 1 - Silver-brown paint on second floor exterior roof area, southwest wall

- Building 2 - Dark brown paint on second Floor walkway guard rail

- Building 2 - Brown-beige paint on former Physique shop, exterior, underside of stairs

- Building 6 - Reddish-brown paint on third floor, stair railing front of Unit 3B

The results of the lead analysis from EMSL Analytical, Inc. laboratory are included in Appendix B.

3.3 FIXTURE INVENTORY

During the assessment of the facility, light fixtures were inventoried and inspected for the presence of suspect PCB ballasts and fluorescent light tubes. The inspection revealed two buildings which contained significant numbers of fluorescent light fixtures.

Building 1 (Canlis Building) - Approximately 100 fluorescent light fixtures with ballasts were observed throughout the building. Many fixtures were stored on the second floor. In addition, suspect PCB power capacitors and refrigerant compressor capacitors were observed in the hot water room located on the second floor.

Building 6 (Apartment Building) - Florescent light fixtures were observed in each unit of the two and three-story wings.

Florescent light fixtures were also observed in the remaining four buildings. Many of the fixtures appeared new or were labeled "No PCBs." In addition, each building contained less than 25 fluorescent light fixtures. The EPA recommends disposing of ballasts in excess of 25 units at an approved landfill.

Many fluorescent light ballasts manufactured prior to 1980 may contain polychlorinated biphenyls (PCBs). According to TSCA, the light ballasts are considered small capacitors. The ballasts at the subject property should be considered PCB-containing unless labeling states that they are non-PCB units. The fluorescent light tubes may contain varying amounts of mercury.

3.4 CHLOROFLUOROCARBON REFRIGERANTS

The freezer and/or refrigerator units in the Canlis Restaurant, Banana's Restaurant and Hula's Bar located in Building 1 and Building 2, may contain chlorofluorocarbon (CFC) refrigerants. These units should be inspected by a hazardous waste removal contractor or refrigeration electrician to determine if CFC's may be contained in the units. If they are determined to contain CFC refrigerants, the CFCs should be removed and properly disposed prior to demolition.

4.0 FINDINGS AND RECOMMENDATIONS

4.1 ASBESTOS

Suspect ACM and LBP samples were collected from the six structures located at the project site that are scheduled for demolition. Five previous assessments were conducted at the subject property and were reviewed by Clayton prior to the assessment. Clayton performed an inspection of the property and collected samples of suspect asbestos and LBP that were not sampled during the previous assessments. Clayton collected 24 samples of suspect ACM

The following table summarizes asbestos identified by Clayton and previous assessments at the subject property:

**Summary of Asbestos Identified
Building 1 (Canlis Restaurant)**

Material Description	Location	Asbestos percent and type	Condition	Approximate Quantity in Ft^2
Yellow-green linoleum	Stairway to second floor and landing area	30% Chrysotile	Fair	450
Mastic under yellow-green linoleum	Stairway to second floor and landing	5% Chrysotile	Good	450
Tan linoleum	Second floor, southeast corner	30% Chrysotile	Fair	100

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Material Description	Location	Asbestos percent and type	Condition	Approximate Quantity in Ft^2
Drywall	Second floor near south wall	2% Chrysotile	Fair	400
Tile grout	Kitchen wall near office	1% Chrysotile	Good	1,200
Insulation-mudded joint packing	Hot water room on hot water elbows	15% Chrysotile 25% Amosite	Poor	8, 4-inch elbows
Silver-painted material	South portion of roof on CMU wall	9% Chrysotile	Good	500
Multi-layered tar paper	Raised roof, southeast side	5% Chrysotile	Good	1,800
Multi-layered tar material	Roof of building on chimney floor	20% Chrysotile	Fair	125

Clayton recommends that the mudded joint packing, linoleum, drywall, raised-roof, silver painted material on southern roof, and multi-layer tar material on the chimney floor (roof area) be removed by a licenced EPA-accredited asbestos abatement contractor.

The kitchen tile grout is considered Category II Non-friable. Clayton recommends that the kitchen tile grout be throughly wetted prior to and during building demolition activities.

Summary of Asbestos Identified
Building 2

Material Description	Location	Asbestos percent and type	Condition	Approximate Quantity in Ft^2
12-inch by 12-inch gold floor tile and mastic	Trixx & Treats, second floor restroom	3% Chrysotile	Good	150

ACM in Building 2 was estimated at less that 160 square feet and is classified as category I Non-friable asbestos. Clayton recommends that the material be throughly wetted prior to and during building demolition activities.

Summary of Asbestos Identified
Building 3

Material Description	Location	Asbestos percent and type	Condition	Approximate Quantity in Ft^2
Green floor tiles	Second Floor women's restroom located under white sheet vinyl	15% Chrysotile	Good	50
Black Tar paper	Second floor women's restroom located under green floor tiles	10% Chrysotile	Good	50

Asbestos in Building 3 was estimated at less that 160 square feet and is classified as Category I Non-friable asbestos. Clayton recommends that the material be thoroughly wetted prior to and during building demolition activities.

Summary of Asbestos Identified
Building 4

Material Description	Location	Asbestos percent and type	Condition	Approximate Quantity in Ft^2
White, Black, pale grey and dark green by 12-inch by 12-inch floor tiles	Second Floor 80% Straight	5% Chrysotile	Good	200

ACM in Building 4 is classified as Category I Non-friable asbestos. Clayton recommends that the material be throughly wetted prior to and during building demolition activities.

Summary of Asbestos Identified
Building 5

Material Description	Location	Asbestos percent and type	Condition	Approximate Quantity in Ft^2
Green 9-inch by 9-inch floor tile	Suite 214 restroom	5% Chrysotile	Good	50
Brown 9-inch by 9-inch floor tile	Suite 214 Kitchen	3% Chrysotile	Good	50
Brown 9-inch by 9-inch floor tile (painted red)	Suite 110	10% Chrysotile	Good	60
Red brick patterned 12-inch by 12-inch floor tile	Suite 111	2% Chrysotile	Good	400

Material Description	Location	Asbestos percent and type	Condition	Approximate Quantity in Ft^2
Tar surrounding vent pipes	Hernando's roof	15% Chrysotile	Good	10

ACM in Building 5 is classified as Category I Non-friable asbestos. Clayton recommends that the material be throughly wetted prior to and during building demolition activities.

Summary of Asbestos Identified
Building 6

Material Description	Location	Asbestos percent and type	Condition	Approximate Quantity in Ft^2
Green 9-inch by 9-inch floor tiles	Throughout 2-story apartment building in closets	4% Chrysotile	Good	200
Brown 12-inch by 12-inch floor tiles	Unit C - rest room	2% Chrysotile	Good	50
Green sand coated rolled roofing felt-multi layered tar paper	Roof of 2-story apartment building- south side	5% Chrysotile	Good	900
spray-applied acoustical ceiling plaster	Ceiling of apartment 2A, #A and 3B	2% Chrysotile	Fair	1,600
Tan 9-inch by 9-inch floor tiles	Throughout Unit 2A	10% Chrysotile	Good	800

Material Description	Location	Asbestos percent and type	Condition	Approximate Quantity in Ft^2
White 12-inch by 12-inch floor tiles	Unit 3B bedroom	5% Chrysotile	Good	150

Clayton recommends that the acoustical ceiling plaster located in the three-story apartment wing of the building be removed by a licensed EPA-accredited asbestos abatement contractor. The floor tiles located in the building are considered Category I Non-friable and should be thoroughly wetted (but not removed) prior to and during demolition activities.

During removal of ACM from the buildings, air monitoring should be conducted by a qualified industrial hygienist to ensure that levels of airborne asbestos during removal are within EPA and Hawaii Occupational Safety and Health (HIOSH) permissible exposure limits (PELs) for the demolition contractor's employees and general public. Ambient air monitoring in the area surrounding the buildings during demolition with Category I and II nonfriable asbestos should be performed to measure fiber concentrations and to verify that they are below the PELs.

4.2 LEAD-BASED PAINT

Representative samples of paint were collected from predominant building components on interior and exterior portions of the buildings. Base on MECs assessment report, lead was reported at concentrations ranging from below the method detection limit of 0.01% to 20.700 % lead by weight. The EPA defines LBP as containing 0.5% or greater lead by weight.

The following table summarizes LBP above 0.05% lead by weight in samples collected from the property.

Summary of Lead-Based Paint Assessment

Material Description	Location	Lead Content in Weight Percent	Condition of Paint
Orange metal	Building 1 - ground level, kitchen beam	20.7	Fair

Material Description	Location	Lead Content in Weight Percent	Condition of Paint
Multi-layered silver/brown/CMU	Building 1 - Second floor exterior roof area, southwest wall facing Kalakaua Avenue	2.110	Poor
Multi-layered cream/brown/metal	Building 1 - Second Floor exterior roof area, southwest wall facing Kalakaua Avenue	1.135	Good
Dark brown/wood	Building 2 - Second Floor walkway guard rail	0.578	Poor
Yellow/wood	Building 2 - Second floor walkway wall	17.600	Fair
Brown/wood	Building 2 -Trixx Bar, exterior window frame, southeast wall	11.100	Good
Multi-layered brown/beige/wood	Building 2 - Former Physique shop, exterior, underside of stairs	1.045	Poor
Multi-layered white/yellow concrete	Building 4 - 80% Straight shop, exterior wall, north side, by north west corner	0.870	Fair
Multi-layered dark brown/yellow concrete	Building 4 - 80% Straight shop, exterior wall, west side	1.101	Fair

Material Description	Location	Lead Content in Weight Percent	Condition of Paint
Multi-layered pale brown/pale yellow/wood	Building 4 - 80% Straight shop, under-side of lanai	0.850	Fair
Multi-layered dark green/yellow/grey/ plaster	Building 4 - Max Bravo's exterior wall	1.735	Fair
Multi-layered reddish/brown/ orange/metal	Building 6 - third floor, stair railing front of Unit 3B	20.550	Poor

Clayton recommends that paint in poor condition be removed prior to building demolition. Poor condition is defined as paint that is peeling, flaking or delaminating from the building substrates. During LBP removal activities, representative samples of the LBP debris must be sampled and analyzed for hazardous waste characterization and landfill disposal.

4.3 PCB-CONTAINING LIGHT FIXTURES AND CAPACITORS

Fluorescent light fixtures and equipment capacitors were identified in Building 1 and Building 6. According to the Toxic Substance Control Act (TSCA) regulations (40 CFR 761.10), the disposal of large quantities (greater than 25) of small capacitors by commercial and industrial activities poses an environmental risk. The light ballasts are considered small capacitors under TSCA. USEPA encourages a collection and disposal program that would result in small capacitors going to an approved landfill or incinerator for disposal.

Clayton recommends that the light ballasts and capacitors located throughout Building 1 and Building 6 be removed by a qualified contractor to comply with regulatory requirements. Since light tubes may contain mercury, the tubes should be disposed at a metal recycling facility or in accordance with regulatory requirements.

4.4 CHLOROFLUOROCARBON

The freezer and refrigerator units located in Canlis Restaurant, Hula's Bar and Banana's Restaurant may contain chlorofluorocarbon (CFC) refrigerants. These units should be inspected by a hazardous waste removal contractor or refrigeration electrician to determine if CFC's may be contained in the units. If they are determined to contain CFC refrigerants, the CFCs should be removed and properly disposed prior to demolition.

5.0 LIMITATIONS

The information and opinions rendered in this report are exclusively for use by Kalakaua Southseas Owners, LLC. Clayton Environmental Consultants, Inc. will not distribute this report without your written consent except as may be required by law or court order. The information and opinions expressed in this report are given in response to our limited assignment and should be evaluated and implemented only in light of that assignment. We accept the responsibility for the competent performance of our duties in executing the assignment and preparing this report in accordance with the normal standards of our profession but disclaim any responsibility for consequential damages.

This report prepared by: ______________________
Raymond Benzing
EPA Accredited Project Designer
Honolulu Regional Office

This report reviewed by: ______________________
Tim Swartz
EPA Accredited Building Inspector
Honolulu Regional Office

Clayton
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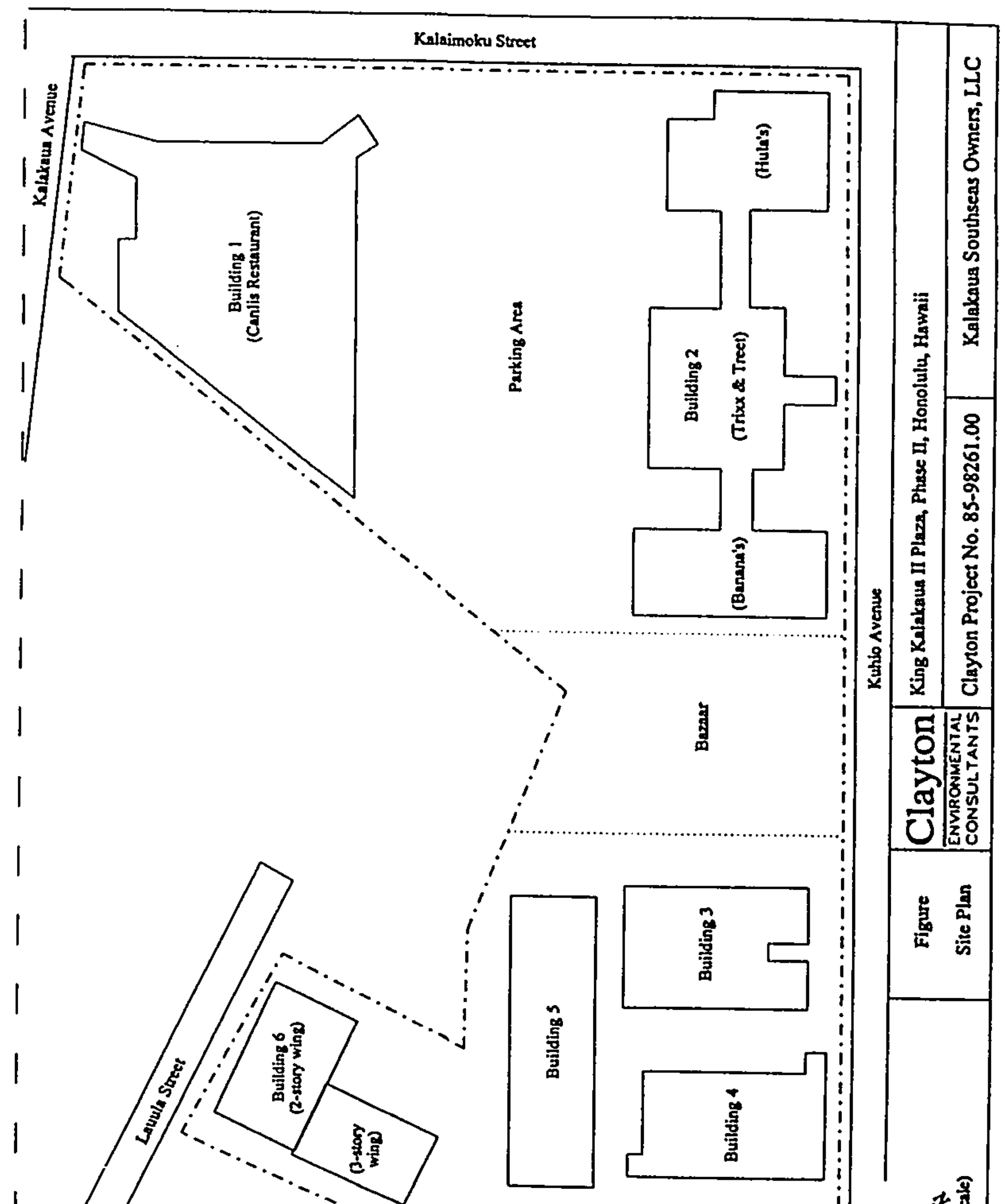
APPENDIX A

SITE PLAN



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APPENDIX B

LABORATORY ANALYTICAL RESULTS FOR ASBESTOS

PLM Analysis Worksheet

Client: Clayton Environmental Consultants
Address: Honolulu Regional Office
970 North Kalaheo Ave., Suite C-316
Kailua, HI 96734
Fax: (808) 537-4084

Logged: 7/6/98
Date/Time Due: 7/6/98 9:00 AM
TAT: 1 Day

Special Handling

Billing Number: CA984065

Project: 85-98261.00

Sample	Location	Appearance	Treatment	% ASBESTOS	Fibrous Type	Fibrous %	Non-Fibrous Type	Non-Fibrous %
2440		42 / 2 / 1	2	0			4 / 7	75 / 25
2441		3 / 2 / 1	2	1-2			2 / 7	30 / 68
2442	-T	1 / 21 / 1	2	1-10			4 / 7	78 / 20
	-M	7 / 1 / 1	3	0	1	15	7	85
2443		7 [illegible] / 1 / 1	31	0	1	40	7	60
2444		red / 21 / 1	1	1-10			4 / 7	58 / 40
2445		red / 2 / 1	2	1-2			4 / 7	78 / 22
2446		42 / 2 / 1	2	0			4 / 3 / 7	10 / 40 / 50

Analyst: [signature] Date: 7/07/98 Computer

PLM Analysis Worksheet

Client: Clayton Environmental Consultants
Address: Honolulu Regional Office
970 North Kalaheo Ave., Suite C-316
Kailua, HI 96734
Fax: (808) 537 - 4084

Logged: 7/6/98 TAT: 1 Day
Date/Time Due: 7/6/98 9:00 AM

Special Handling

Billing Number CA984065

Project: 85-98261.00

Appearance: 1 Brown, 2 Grey, 3 Tan, 4 White, 5 Red, 6 Yellow, 7 Black, 8 Silver, 9 Blue, 0 Orange; 1 Fibrous, 2 Non-Fibrous, 3 Other; 1 Homogeneous, 2 Nonhomogeneous, 3 Other, 4 Layers (#)
Treatment: 1 Teased, 2 Crushed, 3 Dissolved, 4 Ashed
Asbestos Results: 1 Chrysotile, 2 Amosite, 3 Anthophyllite, 4 Tremolite, 5 Actinolite, 6 Crocidolite, 9 None Detected
Fibrous: 1 Cellulose, 2 Glass, 3 Min. Wool, 4 Synthetic, 5 Other, 6 Wollastonite, 7 Hair
Non-Fibrous: 1 Quartz, 2 Mica, 3 Gypsum, 4 Cal. Carbonate, 5 Matrix, 6 Perlite, 7 Other

Sample	Location	Appearance	Treatment	% ASBESTOS	Fibrous Type	Fibrous %	Non-Fibrous Type	Non-Fibrous %	Non-Asb. Char	Optical Properties
2447		3 2 1	2	Ø			6 7	80 20		
2448		3 1	1	1-15 8-30	3	15	7	40		
2449		4 2 1	2	Ø			4 7	8 5		
2450		3 2 1	2	Ø			2 3 7	15 40 5		
2451		31 1 1	21	Ø 1<1	1	10	3 4 7	40 40 5		
2452		31 1	1	Ø	1	15	3 7	70 15		
2453		7 2	3	Ø			7	100		
2454		3 2 1	2	Ø	1	2	3 4 7	40 40 18		

Analyst: [signature] Date: 7/07/98 Computer: ______ Date: ______

PLM Analysis Worksheet

Client: Clayton Environmental Consultants
Address: Honolulu Regional Office
970 North Kalaheo Ave., Suite C-316
Kailua, HI 96734
Fax: (808) 537 - 4084

Logged: 7/6/98 TAT: 1 Day
Date/Time Due: 7/6/98 9:00 AM

Special Handling

Billing Number CA984065

Project: 85-98261.00

Sample	Location	Appearance	Treatment	% ASBESTOS	Fibrous Type	Fibrous %	Non-Fibrous Type	Non-Fibrous %	Non-Asb. Char	Optical Properties
2455		1 2 1	2	Ø			4 7	40 60		
2456	-T	3 2 1	2	Ø			4 7	70 30		
	-M	7 1 1	31	Ø	1	30	7	70		
2457		4 2 1	2	Ø			4 7	50 50		
2458		7 1 1	21	Ø	1	60	4 7	30 10		
2459	-T	3 2 1	2	Ø	1	3	4 7	70 27		
	-M	7 2 1	2	Ø	1	3	7	97		
2460	-T	3 2 1	2	Ø			4 7	75 25		

Analyst: [signature] Date: 7/07/98 Computer: ______ Date: ______

0000 0005 0656

PLM Analysis Worksheet

Client: CLAYTON
Address:
Fax:
Project:

Logged:
Date/Time Due: 9:00 AM
TAT: 1 Day

Special Handling

Billing Number: CA984065

Sample	Location	Appearance	Treatment	% ASBESTOS	Fibrous Type	Fibrous %	Non-Fibrous Type	Non-Fibrous %	Non-Asb. Char	Optical Properties
2460-	M	1 2 1	2	0			7	10		
2461		3 1 4	1	0	1 2	30 5	7	65	2	
2462-	Tile	3 2 1	2	0			4 7	[illegible]		
	- Red Matt.	57 1 1	1	0	1	90	7	10		
2463		3 2 4	2	1.3			4 7	70 27	2	

Analyst: ______ Date: ______ Computer: ______ Date: ______

ASBESTOS BULK SAMPLING DATA SHEET

Field Inspector: SWAETZ
Date: 7/1/98

Sample No.	Bldg. Name/No.	Material Description	Material Location	Photo I.D.
2440	Apt. Bldg.	leveling cmpd. under 12" f.t.	2-story Apt. Complex - Unit 2114	
441	↓	SAP	3-story Apt. 2116A -	
42	↓	9" tan f.t./mastic	↓	
43	↓	Green sand/tarpaper roof	2-story Apt.	
44	Bldg. C	Brown floor tile/mastic painted red	1st Flr. - Maint. Shed (Unit 110)	
45	↓	Red Brick pattern floor tile	↓ - Unit 111	
46	↓	Sheetrock/jnt. cmpd	↓ - Hernando's (Funeral) (Units 112-114)	
47	Canlis	Mag. pipe covering on	HWS/R, 1st + 2nd Flr., E. end of Bldg.	~30'
48	↓	Mudded joints on HWS/R	↓ ↓ -	8 - 4" 1 - 4"
49	↓	Ceramic wall tile grout	1st Flr. kitchen walls	
50	↓	" " Cement	under wall tiles (white) ↓	
51	↓	Joint tape/compound on drywall	2nd Floor, S. wall	
52	↓	drywall (sheetrock)	↓	
53	↓	~~Hard plaster~~/Tarpaper Exterior walls	↓ Grill at exhaust chimney	
54	↓	Hard Plaster on Interior walls	↓	
55	Bldg. D	Mastic under 12" black f.t.	Max Bravo's (Units 108A + B)	
56	↓	9"x9" gray f.t./mastic	↓ restrm. (under 12" white/black)	
57	↓	Ceramic wall tile grout in kitchen of	Mitch Miane's Sports Bar	~240 sf
58	Bldg. A	12"x12" beige f.t. in central	garage, on Diam. Hd. side ~150 sf, Unit 113	Unit
59	↓	12"x12" white f.t.	Unit 110 under carpet	~150 sf
60	↓	12"x12" wood tone f.t.	↓ 111 ↓	~150 sf
61	↓	Dark gray sheet flooring in restrm. - Haw. Antiques - Unit 215A ~50 sf		
62	Bldg. 2109	Tan f.t. w/red paper covering	Roy Ventura's restroom ~50 sf	
63	↓	12" gold f.t./mastic	Restrm. on 2nd Flr. Trick + Treats ~80 sf	
64				
5				
66				

0000 0005 0657

EMSL Analytical, Inc.

CHAIN OF CUSTODY

Asbestos

MSL Representative: Connie Frasca

our Company Name: Clayton Environmental Cons. Honolulu Regional Office

EMSL-Bill to: Same

reet: 970 North Kalaheo Ave.

ox #: Suite C-316

ty/State: Kailua, HI Zip 96734

Street: Same

Box #:

City/State: Zip:

one Results to: Name

Telephone #: (808) 531-5708

Fax Results to: Name Ray Benzing

Fax Number: (808) 537-4084 ✓

ject Name/Number: 85-98261.00

Purchase Order #:

MATRIX

Air ☐ Floor Tile ☐ Soil
Bulk ☐ Drinking Water ☐ Dust
Wipe ☐ Wastewater

TURNAROUND

☐ 6-10 Days ☐ 72 Hours ☒ 24 Hour ☐ Same Day*
☐ 5 Days ☐ 48 Hours ☐ 12 Hour ☐ 6 Hours
*S.D. - A.M. delivery by Fed. Ex.-Results by Mid-night or earlier

IOSH 7400
SHA
ther:

TEM AIR
☐ AHERA
☐ NIOSH 7402
☐ Level I
☐ Level II

TEM WATER
☐ Wastewater
☐ Drinking Water EPA 100.2
☐ Water - NY Wastewater
☐ Water-NY Drinking Water

A 600
)B
int Count
ter:

TEM BULK
☐ Drop Mount (Qualitative)
☐ Chatfield
☐ Chatfield / SEM QC
☐ Conventional (Quantitative)
☐ EMSL Method
☐ NOB
☐ NOB / SEM QC
☐ Micro Vac - Quantitative
☐ Micro Vac - Qualitative

TEM WIPE
☐ Quantitative
☐ Qualitative

XRD
☐ Asbestos
☐ Silica

OTHER
☐

litative
ntitative

Sample # (s) 2440 - 2463 Total Samples: 24

ished: [signature] Date: 7/2/98 Time:

d: Date: Time:

d:

APPENDIX C

LABORATORY ANALYTICAL RESULTS FOR LEAD-BASED PAINT

EMSL

Clayton Environmental Consultants
Honolulu Regional Office
970 North Kalaheo Ave., Suite C-316
Kailua, HI 96734

7/6/98
Reference Number: CA954132
Attention: Tim Swartz

ATOMIC ABSORPTION SPECTROMETRY (AAS) LEAD (Pb) IN PAINT SAMPLES METHOD SW846-3050-7420

PROJECT: 85-98261.00

Sample ID	Sample Weight	Volume	Dilution	Concentration	Results	
	g	ml	Factor	mg/l	mg/kg (ppm)	% weight
LP-1	0.0444	50	1	1.0	1126	0.113
LP-2	0.0629	50	1	3.4	2703	0.270
EMSL BLANK	0	50	1	0	N/A	<10 µg

mg/kg=milligrams per kilogram
ppm=parts per million

Analyst

Approved Signature

ACCREDITATIONS: NVLAP #101048-03, CA ELAP #1620, AIHA ELPAT/PAT #11128

0000 0005 0659

ISL ANALYTICAL CHAIN OF CUSTODY LEAD

e: ______ EMSL Representative: Connie Frasca Project Name/No.: 85-9826l P.O.#: ______
npany Name: Clayton Environmental EMSL-Bill to: ______
eet: 970 · North Kalaheo C-316 Street: Same
#: ______ Box #: ______
/State: Kailua, Hi. Zip: 96734 City/State: ______ Zip: ______
ne Results to: (Name) ______ Telephone: 808 - 531-6708
Results to: (Name) Ray Benzing Fax #: 808 - 537-4084

MATRIX	METHOD	INSTRUMENT	mdls	TAT
d Chips*	AOAC 5.009 (974.02) or SW846-7420	Flame Atomic Absorption	0.01% ++	24 HRS
d Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
d Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg.kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	10 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
d in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
P Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	
	or SW846-6010	ICP	0.1 mg/l (ppm)	
d in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
d Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
d Soil +			0.3 mg/kg (ppm) soil	
d in Drinking Water (check Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	

TAT (Turnaround) - Same day, 24 hours, 48 hours, 72 hours, 4 Days, 5 Days, 6-10 Days
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	LAP #
CP-1	King Kalakaua II - phase II	
CP-2	" " "	

nquished By: (Person) [signature] Date: 7/2/98
ceived at EMSL By: K. [signature] 10:30am Date: 7/6/98
ceived at EMSL By: ______ Date: ______

Note: Please duplicate this form and use additional sheets if necessary

8. REFERENCES

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Appendix B

KING KALAKAUA PLAZA PHASE II SURVEY OF EXISTING TREES ON PROPERTY

KING KALAKAUA PLAZA PHASE II

Survey of Existing Trees on Property

TREE NO.	SPECIES	CALIPER (Inches)	HEIGHT (Feet)	SPREAD (Feet)	NOTES
1	Banyan	66	40	40	
2	MacArthur Palm		10		
3	MacArthur Palm		10		
4	MacArthur Palm		10		
5	Brassaia	8	15	5	
6	Banyan	90	60	60	
7	Coconut		6		
8	Plumeria	8	12	12	
9	Plumeria	12	15	15	
10	Plumeria	12	15	15	
11	Coconut		35		
12	Coconut		50		
13	Coconut		50		
14	Coconut		50		
15	Money Tree	36	15	10	Multi trunk
16	Coconut		40		
17	Coconut		40		
18	Coconut		40		
19	Banyan	18	25	25	
20	Brassaia	18	20	15	
21	Brassaia	6	15	8	
22	Banyan	10	15	15	
23	Alexander Palm		8		
24	Alexander Palm		8		
25	Alexander Palm		8		
26	Alexander Palm		8		
27	Alexander Palm		8		
28	Alexander Palm		8		
29					
30	MacArthur Palm	<6			
31	MacArthur Palm	<6			
32	MacArthur Palm	<6			
33	MacArthur Palm	<6			
34	MacArthur Palm	<6			
35	MacArthur Palm	<6			
36	MacArthur Palm	<6			
37	Banyan	24	20	20	
38	Manila Palm		8		
39	Manila Palm		8		
40	Manila Palm		8		
41	Manila Palm		8		
42	Manila Palm		8		
43	Manila Palm		8		
44	White Bird of Paradise		8		

KING KALAKAUA PLAZA PHASE II

Survey of Existing Trees on Property

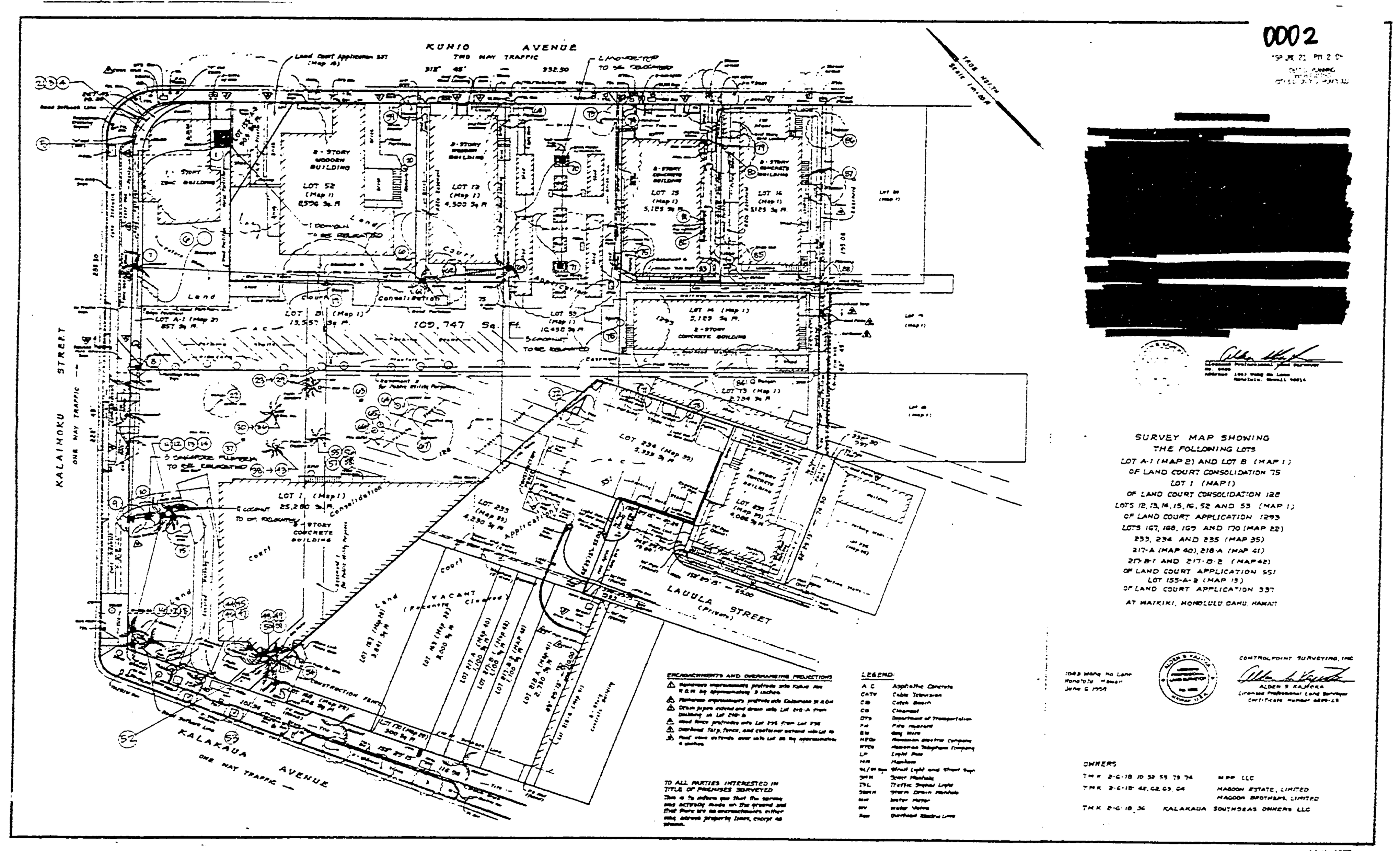
TREE NO.	SPECIES	CALIPER (Inches)	HEIGHT (Feet)	SPREAD (Feet)	NOTES
45	White Bird of Paradise		10		
46	White Bird of Paradise		10		
47	White Bird of Paradise		15		
48	Coconut		50		
49	Coconut		50		
50	Coconut		40		
51	Coconut		25		
52	Date Palm		25		
53	Brassaia	12	20	8	
54	Pink Tacoma	12	25	10	
55	Alexander Palm		10		
56	Alexander Palm		10		
57	Alexander Palm		10		
58	Alexander Palm		10		
59	Plumeria	18	20	20	Multi trunk
60	Banyan	24	20	20	Multi trunk
61	Coconut		40		
62	Brassaia	15	18	15	
63	Banyan	24	20	20	
64	Fern Tree	<6			
65	Fern Tree	<6			
66	Fern Tree	<6			
67	Banyan	24	20	20	
68	Plumeria	12	20	20	
69	Coconut		50		
70	Monkey Pod	30	25	30	
71	Monkey Pod	30	25	30	
72	Tulip Wood	6	15	10	
73	Plumeria	6	15	10	
74	Plumeria	6	15	10	
75	Plumeria	15	20	20	
76	Opiuma	48	30	30	
77	Tulip Wood	<6			
78	Tulip Wood	<6			
79	Pink Tacoma	24	20	10	
80	Pink Tacoma	24	20	15	
81	Pink Tacoma				Dead
82	Pink Tacoma	18	20	15	
83	Plumeria	6	10	10	
84	Banyan	24	25	30	
85	Brassaia	24	20	15	
86	Brassaia	24	20	15	Not on Property
87	Brassaia	24	20	15	Not on Property
88	Plumeria				Not on Property

OVERSIZED DRAWING/MAP

PLEASE SEE 35MM ROLL

0002

RECEIVED AS
FOLLOWS



Appendix C

TRAFFIC IMPACT REPORT FOR THE PROPOSED KING KALAKAUA PLAZA PHASE II

Prepared by Wilson Okamoto & Associates, Inc,
September 1998
Revised November 1998

0000 0005 0674

TRAFFIC IMPACT REPORT

FOR THE PROPOSED

KING KALAKAUA PLAZA

PHASE II

Prepared for:

Kalakaua Southseas Owners, LLC

Prepared by:

Wilson Okamoto & Associates, Inc.

August 1998
Revised November 1998

TABLE OF CONTENTS

LIST OF EXHIBITS

1. INTRODUCTION

1.1. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the proposed King Kalakaua Plaza, Phase II development. The project will be located in Waikiki fronting Kalaimoku Street, Kalakaua Avenue, and Kuhio Avenue. Access will be off Kuhio Avenue within the project frontage.

1.2. Scope of Study

This report presents the findings and conclusion of the traffic study, the scope of which includes:

- Description of the proposed project.
- Evaluation of existing roadway and traffic operations in the vicinity.
- Analysis of future roadway and traffic conditions without the proposed project.
- Analysis and development of trip generation characteristics for the proposed project.
- Superimposing site-generated traffic over future traffic conditions.
- The identification and analysis of traffic impacts resulting from the proposed project.
- Recommendations for improvements, if warranted, that would mitigate the traffic impacts resulting from the proposed project.

2. PROJECT DESCRIPTION

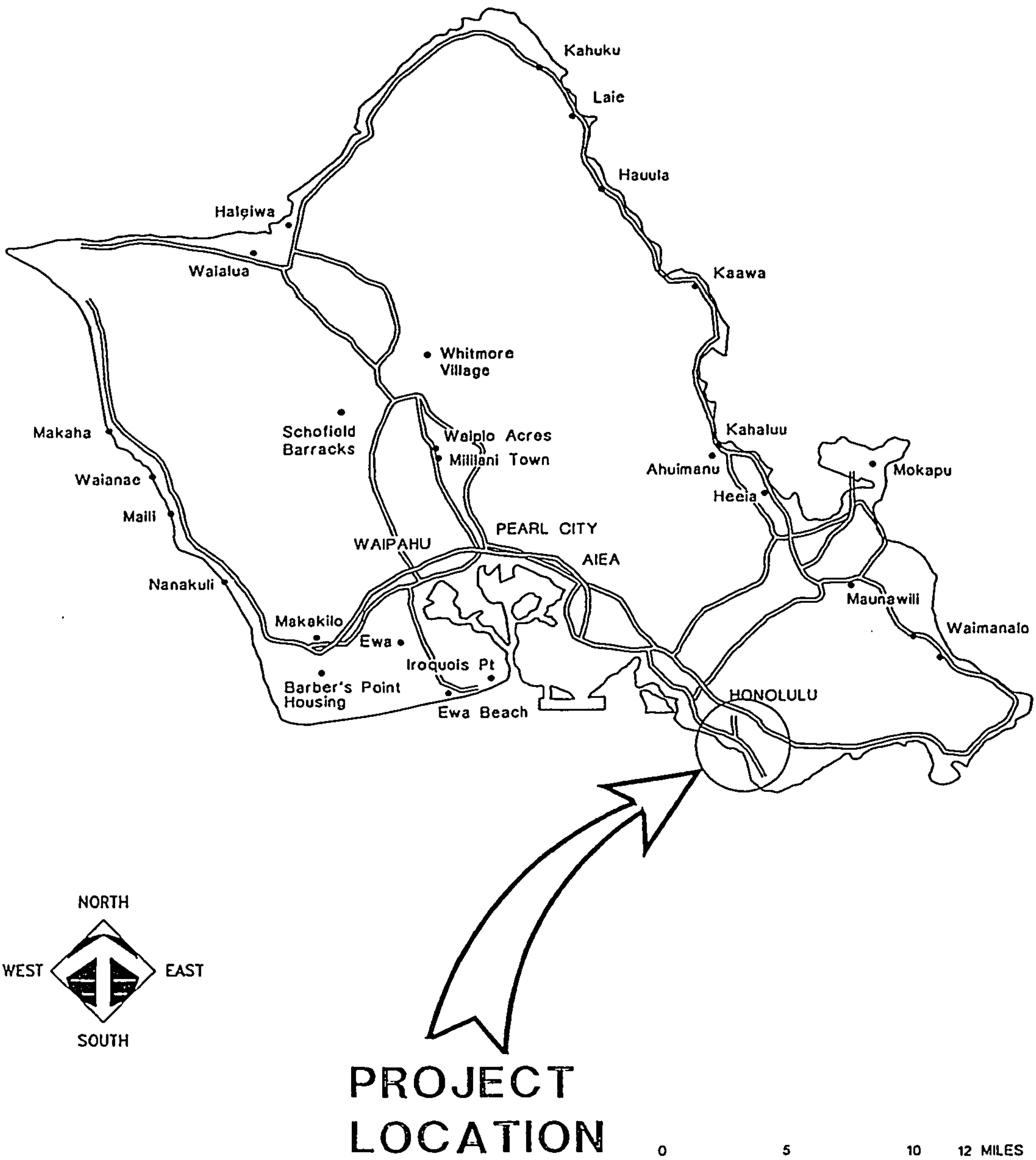
2.1. Location

The project is located in Waikiki on the island of Oahu as shown on Exhibit 1. The site is bounded by Kalakaua Avenue to the south, Kalaimoku Street to the west, Kuhio Avenue to the north, and existing parcels to the east. The 109,357 square-foot project site is further identified as a consolidation of Tax Map Keys: 2-6-18: 10, 36, 42, 52, 55, 62, 63, 64, 73, and 74.

King Kalakaua Plaza, Phase II will consist of approximately 320 feet of frontage on the south side of Kuhio Avenue, 290 feet of frontage on the east side of Kalaimoku Street, and 210 feet of frontage on the north side of Kalakaua Avenue. The project site is east of the existing King Kalakaua Plaza development as shown on Exhibit 2.

2.2. Project Characteristics

King Kalakaua Plaza, Phase II will be situated on a site with corners at the intersections of Kalaimoku Street with Kalakaua Avenue and Kuhio Avenue. The development is expected to include a total of approximately 261,125 square feet of



WILSON OKAMOTO & ASSOCIATES, INC. ENGINEERS – PLANNERS 1907 S. BERETANIA STREET HONOLULU, HAWAII 96826	KING KALAKAUA PLAZA PHASE TWO LOCATION MAP	EXHIBIT 1

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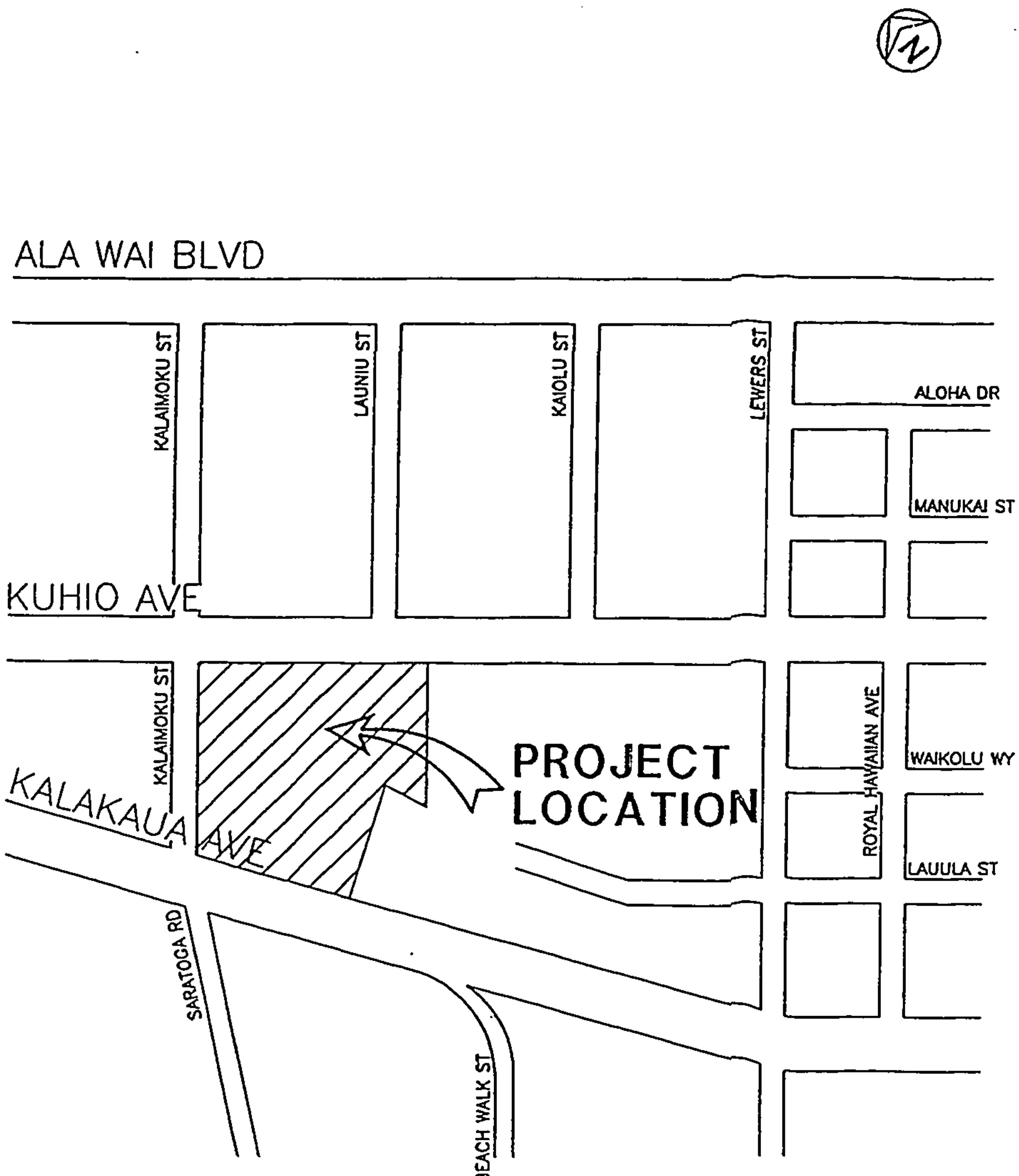

WILSON OKAMOTO & ASSOCIATES, INC. ENGINEERS - PLANNERS 1907 S. BERETANIA STREET HONOLULU, HAWAII 96826	KING KALAKAUA PLAZA PHASE TWO VICINITY MAP	EXHIBIT 2

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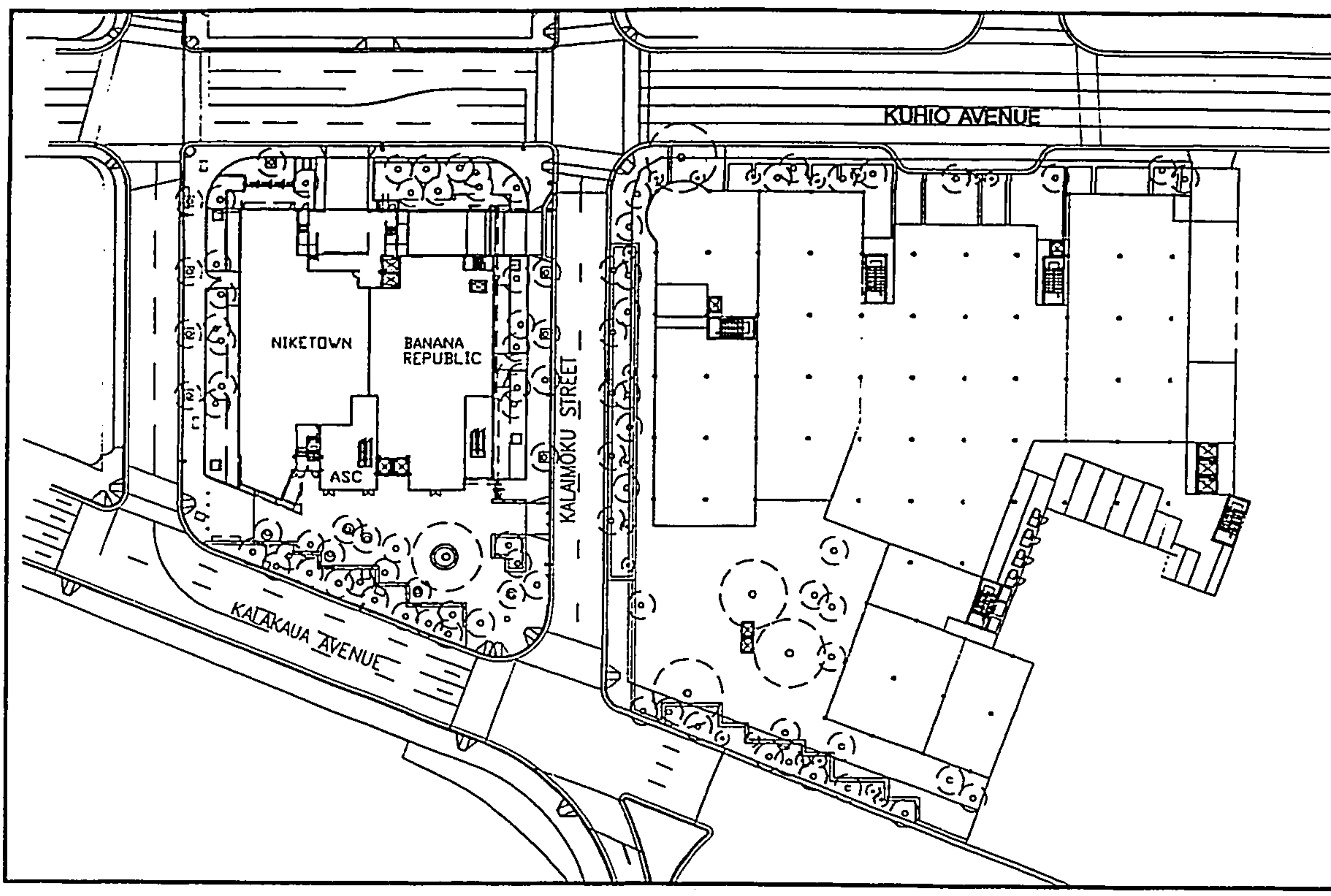

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KING KALAKAUA PLAZA PHASE TWO

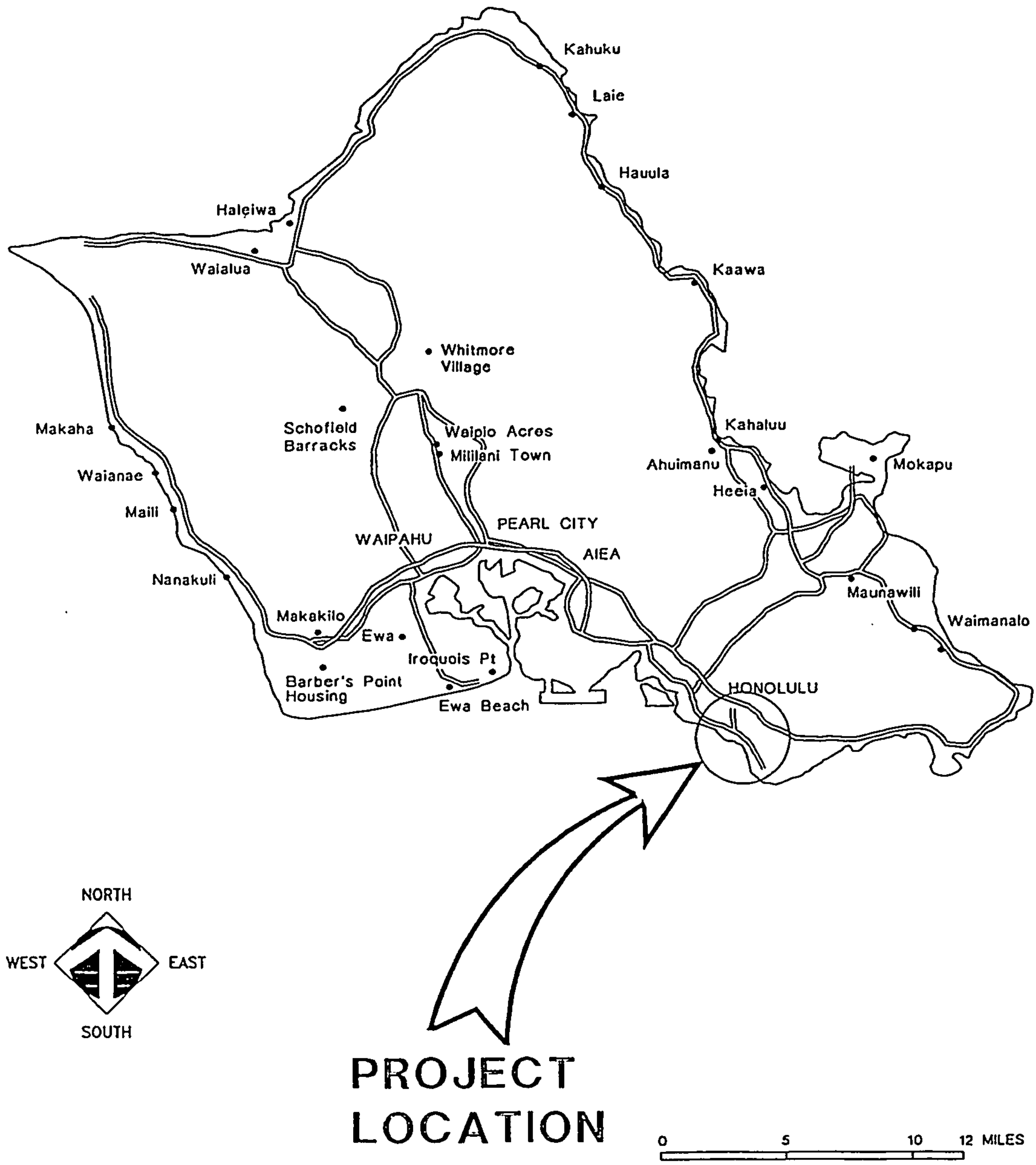
PROJECT SITE PLAN

EXHIBIT

3

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING



WILSON OKAMOTO & ASSOCIATES, INC. ENGINEERS - PLANNERS 1907 S. BERETANIA STREET HONOLULU, HAWAII 96826	KING KALAKAUA PLAZA PHASE TWO LOCATION MAP	EXHIBIT 1

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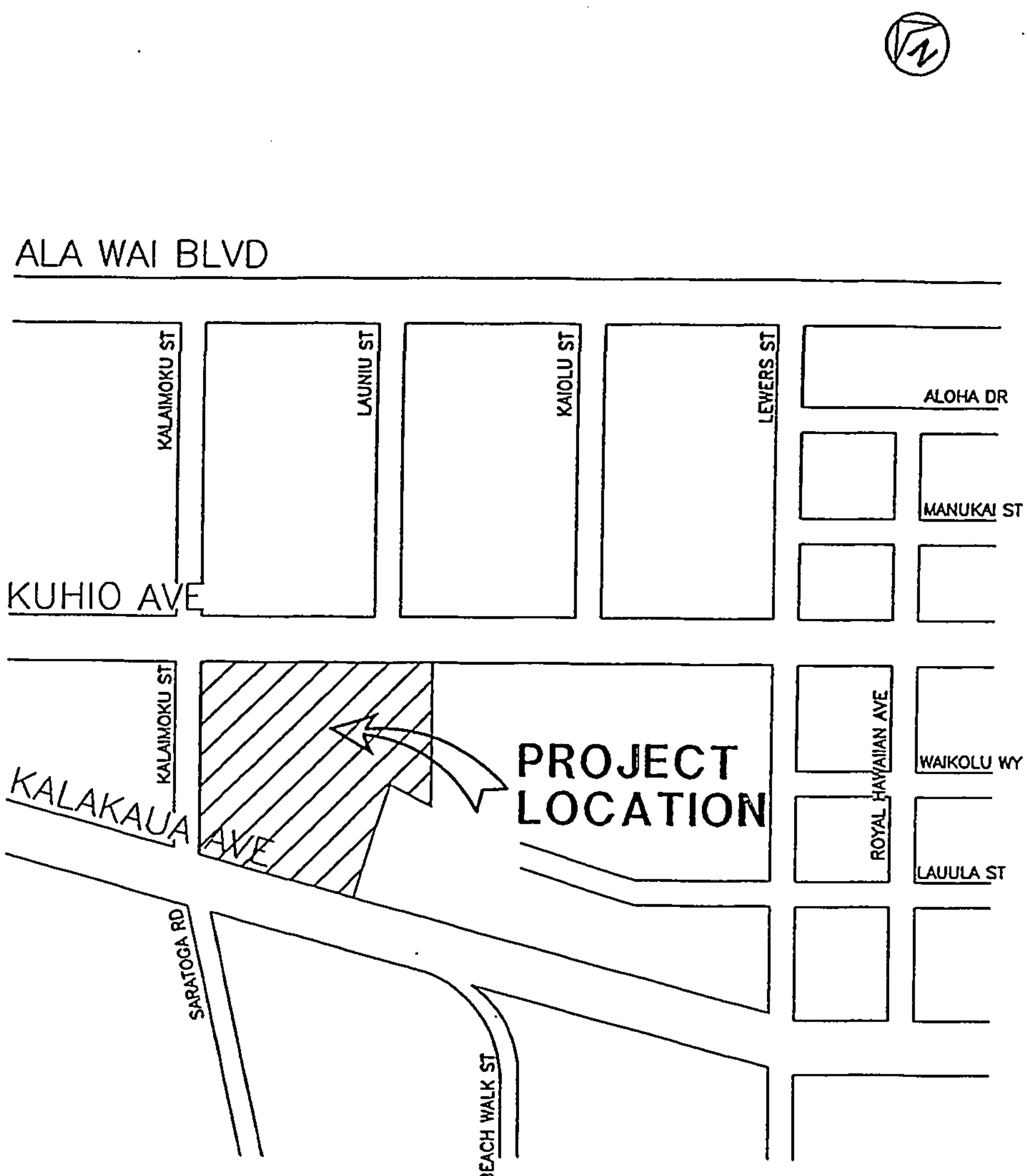

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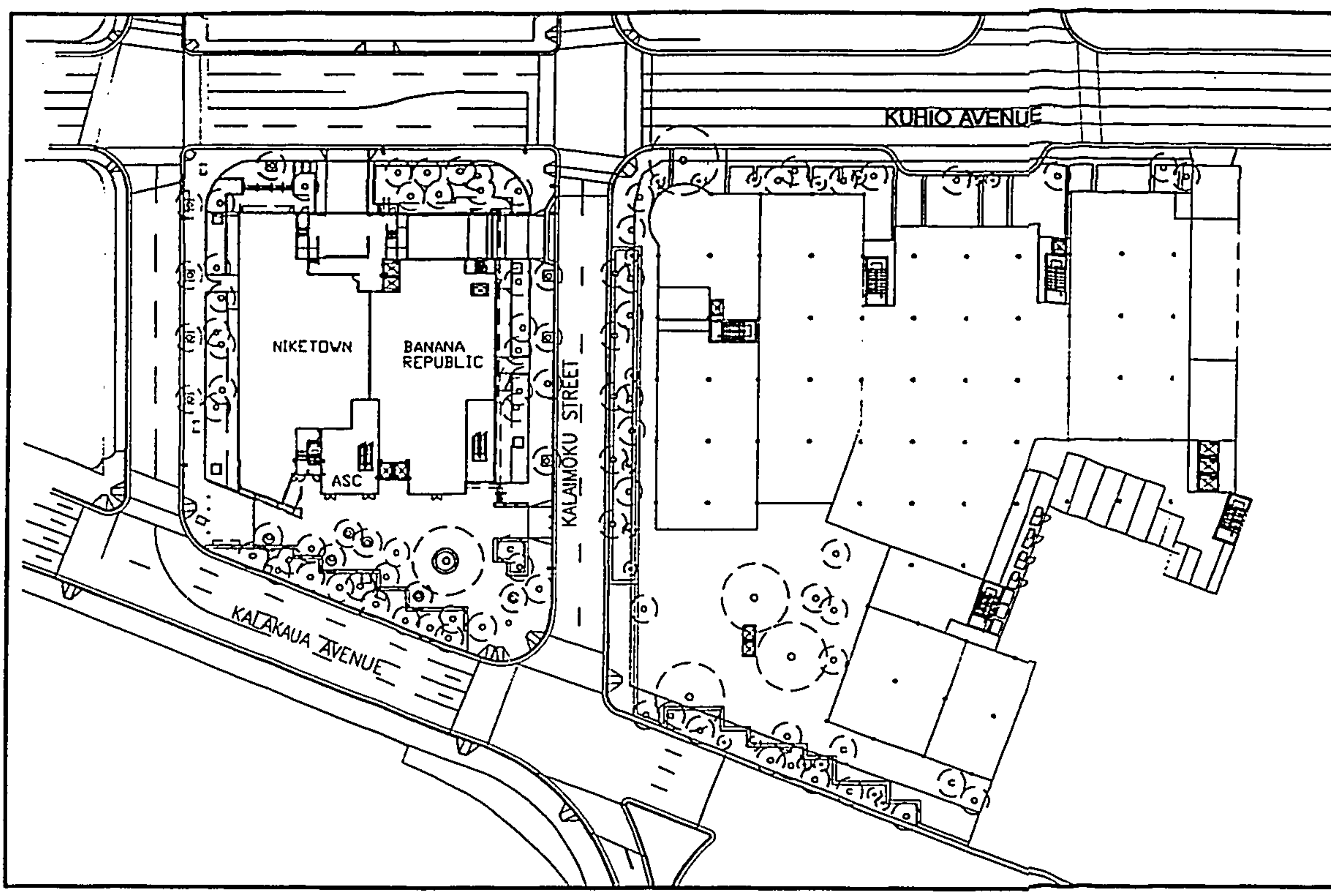

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KING KALAKAUA PLAZA PHASE TWO

PROJECT SITE PLAN

EXHIBIT

3

retail/commercial space on five building levels. One level of underground parking will accommodate a total of 307 parking stalls. Seventy seven parking stalls will be available for use by the proposed project at the existing King Kalakaua Plaza, for a total of 389 parking stalls available between the two phases. King Kalakaua Plaza, Phase II is expected to be completed and occupied by the Year 2001. Exhibit 3 shows the development site plan.

3. EXISTING CONDITIONS

3.1. General

Traffic in the Waikiki area is stimulated by both the visitor industry and the overall growth of Oahu. While Waikiki, in general, has experienced minimal growth in recent years, notable projects in the vicinity include King Kalakaua Plaza and the Hawaii Convention Center. The project site, comprised of 10 adjoining parcels, is currently unoccupied and includes the abandoned structures of the former Canlis Restaurant, apartment buildings, and other smaller buildings. The proposed King Kalakaua Plaza, Phase II would replace existing commercial activities along the north side of Kalakaua Avenue., east side of Kalaimoku Street and south side of Kuhio Avenue along the project frontages.

3.2. Area Roadway System

Kalakaua Avenue, is a four-lane, one-way, City and County of Honolulu roadway oriented in the east-west direction and runs near the coastline in Waikiki. Kalakaua Avenue provides access to the major hotels, parks, and tourist-oriented and resort areas. Kalakaua Avenue forms the eastbound component of a one-way couplet system with Ala Wai Boulevard as the westbound component located further north of the project site. At the intersection with Kalaimoku Street, Kalakaua Avenue serves through-traffic movements as well as left-turn traffic movements to northbound Kalaimoku Street and right-turn traffic movements to southbound Saratoga Road. Fronting the project site, Kalakaua Avenue has a curb-to-curb width of approximately 47 feet within a 90-foot right-of-way. The intersection of Kalakaua Avenue and Kalaimoku Street/Saratoga Road is controlled by a two-phase traffic signal system.

Kuhio Avenue is a four-lane, two-way, City and County of Honolulu roadway oriented in the east-west direction and traverses the majority of Waikiki's length. Kuhio Avenue extends from Kapahulu Avenue to the east and intersects with Kalakaua Avenue further west of the project site. The roadway has a curb-to-curb width of approximately 56 feet within a 70-foot right-of-way fronting the project site. Through the Waikiki area, Kuhio Avenue provides an alternate east-west route to the couplet system of Kalakaua Avenue and Ala Wai Boulevard. Left-turn storage lanes on Kuhio Avenue are provided at the major intersections with a posted speed limit of 25 miles per hour (mph) in the project vicinity. The intersection of Kuhio Avenue and Kalaimoku Street is also controlled by a two-phase traffic signal system.

Kalaimoku Street is a two-lane, one-way, City and County of Honolulu roadway that serves northbound traffic between Kalakaua Avenue and Ala Wai Boulevard. Fronting the project site, Kalaimoku Street has a curb-to-curb width of approximately 32 feet within a 60-foot right-of-way. It intersects Kuhio Avenue and permits left-, through-, and right-turn movements on the northbound approach to the intersection. The posted speed limit of Kalaimoku Street in the project vicinity is 25 mph.

Lewers Street is a two-lane, one way, City and County of Honolulu roadway between Kalakaua Avenue and Ala Wai Boulevard that serves northbound traffic. This roadway intersects with Kuhio Avenue and permits left-, through-, and right-turn movements on the northbound approach of the intersection. The posted speed limit of Lewers Street in the project vicinity is 25 mph.

3.3. Traffic Volumes and Conditions

3.3.1. General

3.3.1.1. Field Investigation

Field investigations were conducted on August 26 and 27, 1998 and consisted of a manual turning movement traffic count survey. The traffic count survey was conducted between the morning peak hours of 7:00 AM and 9:00 AM, and afternoon peak hours of 4:00 PM and 6:00 PM at the following intersections:

- Kalakaua Avenue and Kalaimoku Street/Saratoga Road
- Kuhio Avenue and Kalaimoku Street
- Kuhio Avenue at Lewers Street

Appendix A includes the existing traffic count data.

3.3.1.2. Capacity Analysis Methodology

The highway capacity analysis performed for this assessment is based upon procedures presented in the "Highway Capacity Manual", Special Report 209, Transportation Research Board, Third Edition, 1994, and the "Highway Capacity Software", developed by the Federal Highway Administration.

Traffic operations at intersections are evaluated using the concept of Level of Service (LOS). LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are categorized by designations LOS "A" through "F"; LOS "A" representing an ideal or excellent operating condition and LOS "F", an unacceptable operating condition. LOS "B" through LOS "E" represent operating conditions in between. The LOS definitions are included in Appendix B.

"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road theoretical carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or very near to capacity. A v/c ratio of greater than 1.00 indicates that the projected traffic demand exceeds the road's theoretical carrying capacity.

3.3.2. Existing Peak Hour Traffic

3.3.2.1. General

Exhibits 4 and 5 show the existing AM and PM peak hour traffic volumes and operating conditions. The AM peak hour of traffic generally occurs between 8:00 AM and 9:00 AM, and the PM peak hour of traffic generally occurs between 4:00 PM and 5:00 PM. The analysis is based on these commuter peak hour time periods to identify the traffic impacts resulting from the proposed King Kalakaua Plaza, Phase II development. LOS calculations are included in Appendix C.

3.3.2.2. AM Peak Hour

3.3.2.2.1. Kalakaua Avenue and Kalaimoku Street/Saratoga Road

During the AM peak hour of traffic, the intersection of Kalakaua Avenue with Kalaimoku Street and Saratoga Road operates at an overall LOS "B". Although relatively heavy, vehicular traffic flow on Kalakaua Avenue generally operates well during the AM peak hour of traffic. Kalakaua Avenue, just west of Kalaimoku Street, carries a total of 2,009 vehicles eastbound and operates at LOS "B" with a v/c ratio of 0.37. During the AM peak hour of traffic, a total of 46 vehicles were recorded turning left on to Kalaimoku Street while a total of 141 vehicles were recorded turning right on to Saratoga Road.

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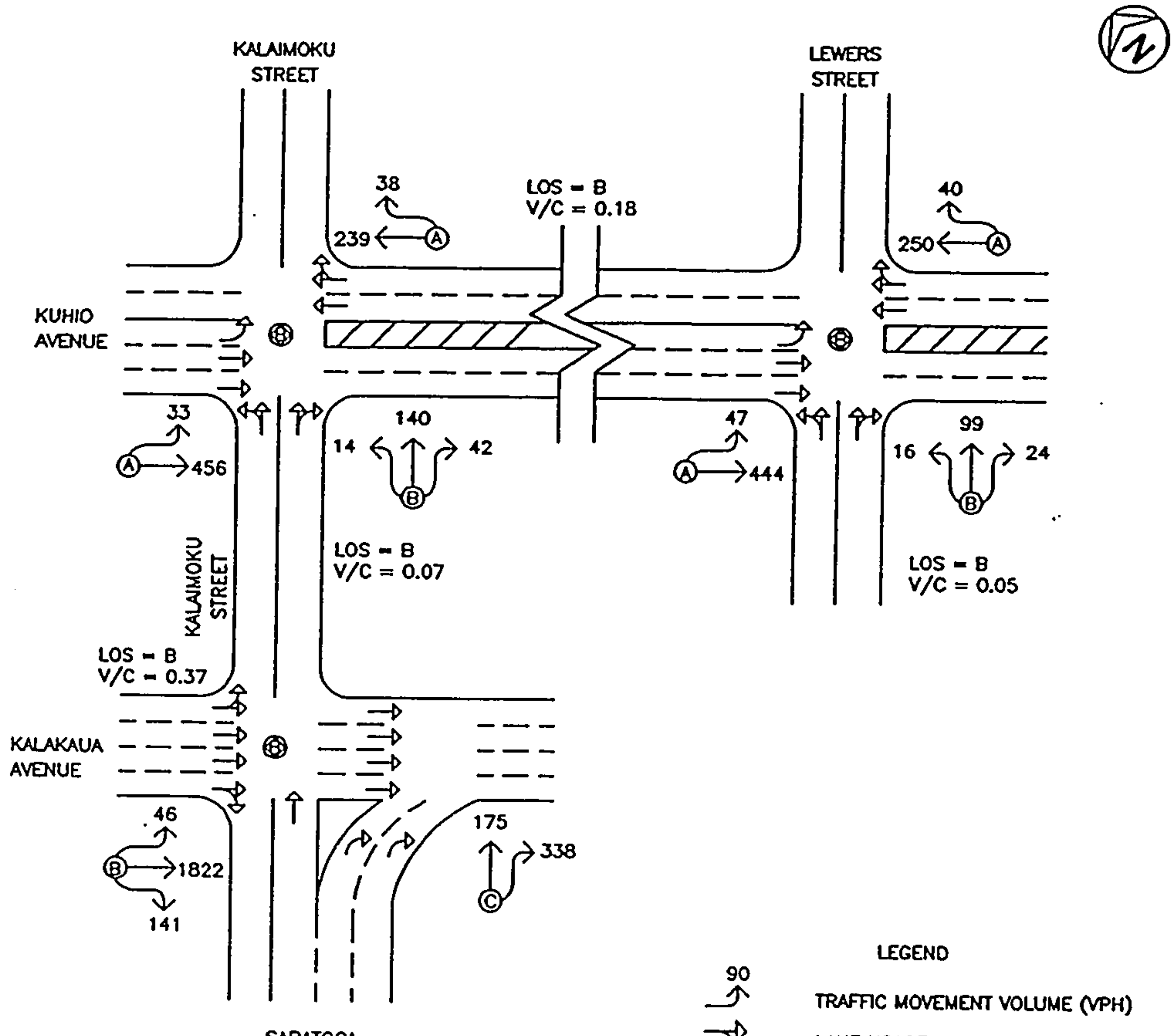

LEGEND

90	TRAFFIC MOVEMENT VOLUME (VPH)
	LANE USAGE
LOS	LEVEL OF SERVICE (MULTI-LANE HWY)
V/C	VOLUME-TO-CAPACITY RATIO
Ⓐ	APPROACH LEVEL OF SERVICE
Ⓐ	INTERSECTION LEVEL OF SERVICE

DATE OF COUNT: AUGUST 26 & 27, 1998

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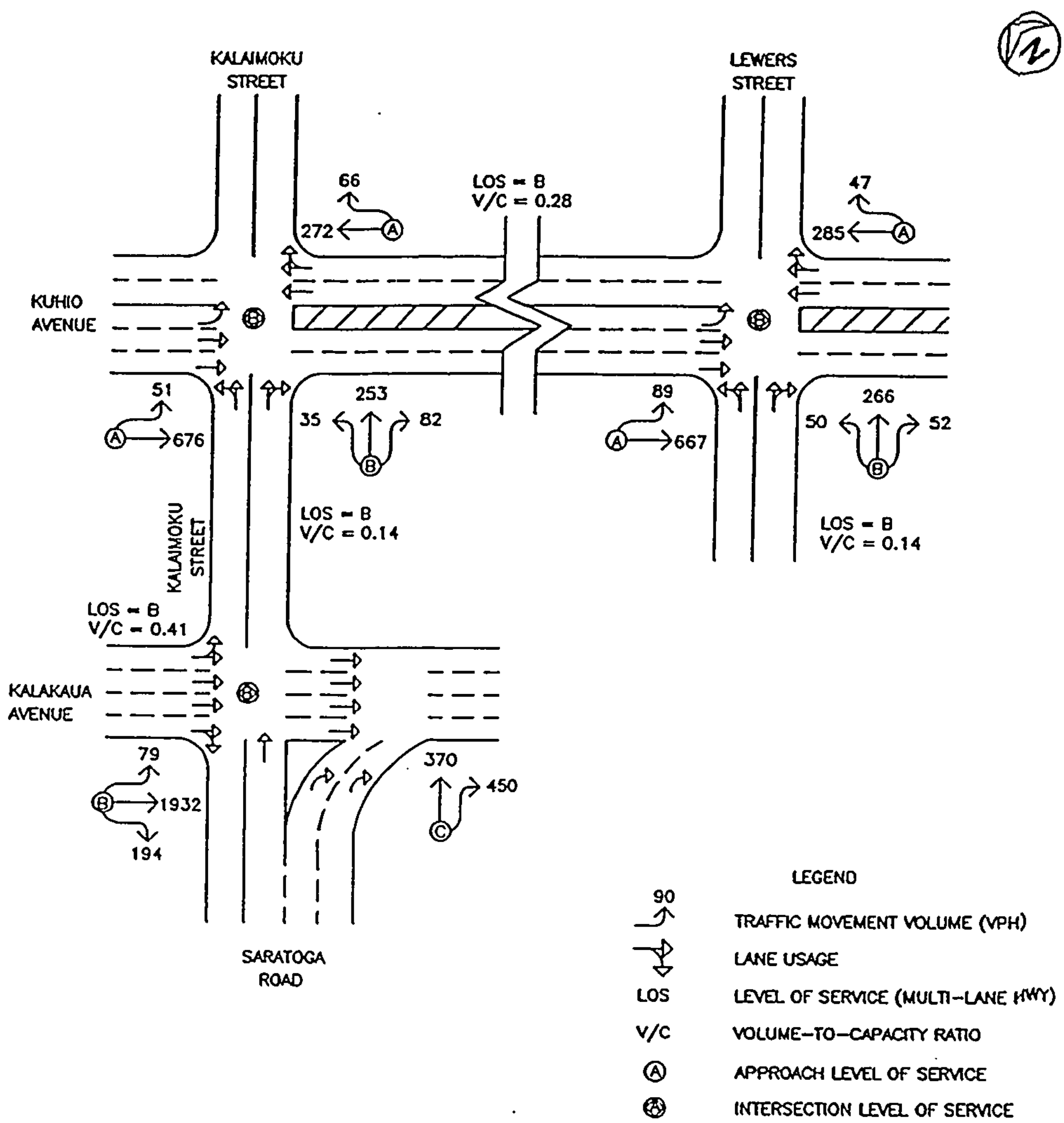
KING KALAKAUA PLAZA PHASE TWO

EXISTING AM PEAK HOUR TRAFFIC

EXHIBIT 4



DATE OF COUNT: AUGUST 26 & 27, 1998

WILSON OKAMOTO & ASSOCIATES, INC. ENGINEERS - PLANNERS 1907 S. BERETANIA STREET HONOLULU, HAWAII 96826	KING KALAKAUA PLAZA PHASE TWO EXISTING PM PEAK HOUR TRAFFIC	EXHIBIT 5

3.3.2.2.2. Kuhio Avenue and Kalaimoku Street

The intersection of Kuhio Avenue and Kalaimoku Street operates at an overall LOS "B" during the AM peak hour of traffic. At this intersection, Kalaimoku Street, just south of Kuhio Avenue, carries a total of 196 vehicles northbound and operates at LOS "B" with a v/c ratio of 0.07. The northbound approach operates at LOS "B" while the eastbound and westbound approaches both operate at LOS "A". Kuhio Avenue, just east of Kalaimoku Street, carries 775 vehicles, 498 vehicles eastbound and 277 vehicles westbound. This section of roadway operates at LOS "B" at a v/c ratio of 0.18.

3.3.2.2.3. Kuhio Avenue and Lewers Street

The intersection of Kuhio Avenue and Lewers Street operates well during the AM peak hour of traffic at an overall LOS "B". Lewers Street, just south of Kuhio Avenue, carries a total of 139 vehicles northbound and operates at LOS "B" at a v/c ratio of 0.05. Both the westbound and eastbound intersection approaches of Kuhio Avenue operate at LOS "A".

3.3.2.3. PM Peak Hour

3.3.2.3.1. Kalakaua Avenue and Kalaimoku Street/Saratoga Road

During the PM peak hour of traffic, the Kalakaua Avenue/Kalaimoku Street/Saratoga Road intersection operates at an overall LOS "B". Kalakaua Avenue, just west of Kalaimoku Street carries a total of 2,205 vehicles and operates at LOS "B" at a v/c ratio of 0.41. At this intersection, the eastbound approach of Kalakaua Avenue operate at LOS "B". Seventy-nine vehicles on Kalakaua Avenue were recorded turning left on to Kalaimoku Street with 194 vehicles turning right on to Saratoga Road during the PM peak hour of traffic

3.3.2.3.2. Kuhio Avenue and Kalaimoku Street

The intersection of Kuhio Avenue and Kalaimoku Street operates well at an overall LOS "B" during the PM peak hour of traffic. At this intersection, both approaches of Kuhio Avenue operate well at LOS "A". Kalaimoku Street, just south of Kuhio

Avenue, carries a total of 370 vehicles northbound and operates at LOS "B" at a v/c ratio 0.14. Kuhio Avenue, just east of Kalaimoku Street, carries a total of 1,034 vehicles, 307 vehicles westbound and 727 vehicles eastbound. The westbound and eastbound approaches operate at LOS "A".

3.3.2.3.3. Kuhio Avenue and Lewers Street

The intersection of Kuhio Avenue and Lewers Street operates well during the PM peak hour of traffic at an overall LOS "B". The eastbound and westbound approaches of Kuhio Avenue operate at LOS "A". Lewers Street, just south of Kuhio Avenue, carries 368 vehicles northbound and operates at LOS "B" with a v/c ratio of 0.14. Fifty vehicles were recorded turning left and 52 vehicles turned right during the PM peak hour of traffic.

3.3.2.4. Public Transportation

The project is not anticipated to significantly increase the number of public transit trips made to or from the Waikiki Area and should not require an increase in transit service. However, the project may require the permanent relocation of an existing bus stop located on the east side of Kalaimoku Street along the project frontage. Adequate waiting areas for bus patrons and provisions of bus shelters along with appropriate furniture should be coordinated with the City and County of Honolulu, Department of Transportation Services. A temporary bus stop location may also need to be provided during construction of the project.

Existing trolley routes in Waikiki may be modified to serve passengers to and from the project site. To maintain traffic flow on the surrounding streets, the trolley stop should be located within the project site to avoid conflicts with vehicular and pedestrian traffic on the city streets and sidewalks. Similarly, the proposed project may be used as a tour bus stop for shopping trips but would be limited to a maximum of one bus per hour. During the peak hours of operation, one tour bus entering the facility should not have a significant impact on traffic operations in the vicinity provided that bus unloading and loading operations do not impede vehicular traffic on the surrounding streets.

4. PROJECTED TRAFFIC CONDITIONS

4.1. Site-Generated Traffic

4.1.1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted methods developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 5th Edition, 1991". The ITE trip rates are developed empirically, by correlating vehicle trip generation data with various land use characteristics. Several factors involved in the traffic forecasts, such as the specific type of uses in the retail/commercial complex, had not been finalized at the time of the traffic assessment. For the purpose of this assessment, however, the ITE trip rates for a community shopping center were used to represent the project. This trip rate reflects a mix of retail stores, restaurants, and service establishments. The shopping center rate would provide a higher estimate of trips during the peak commute hours than other potential or contemplated retail use.

The number of vehicle trips entering or exiting a commercial development include both new vehicle trips and additional stops by vehicles that would be traveling through the area whether or not the project is developed. These additional stops, referred to as pass-by trips, occur primarily for retail and service uses. The ITE trip generation reference provides a methodology for estimating the proportion of the generated vehicle trip ends that are pass-by trips. For a 261,125 square-foot retail complex, approximately 30% of the site-generated trips would typically be pass-by trips. For the development of retail uses, the traffic forecasts reflect this pass-by rate. An additional 30% of the trips are assumed to be walk-ins by persons staying or residing in Waikiki hotels or working near the project site. Both of these factors were applied to the afternoon commute peak hour. The morning peak hour includes only the walk-in factor.

The trip generation rates and the resultant number of additional vehicle trips entering or exiting the project site during the morning and afternoon commute peak hours are presented in Table 1. The figures indicate additional trips on the adjacent streets during both peak hours. There would be an additional number (364 vehicles), equivalent to 30% of the afternoon peak hour trips to and from the retail complex, that would be an added stop by vehicles passing by the site.

TABLE 1. PROJECT VEHICLE TRIP GENERATION SUMMARY (PEAK COMMUTER PERIODS)

Trip Characteristic	AM Commuter Peak Hour			PM Commuter Peak Hour		
	To Project	From Project	Total	To Project	From Project	Total
Vehicle Trip Ends	180	106	286	605	605	1,210
Trip Rate	0.69	0.41	1.10	2.32	2.32	4.64
Pass-by Trips	-	-	-	(182)	(182)	(364)
Walk-ins	(54)	(32)	(86)	(182)	(182)	(364)
Net Increase at site	126	74	200	241	241	482

To evaluate traffic conditions during the AM and PM peak traffic generation hours of the project, ITE trip generating factors for a Specialty Retail Center were used and superimposed over projected peak commuter periods of the adjacent street. The resulting traffic volumes at each study intersection would represent a "worst-case" traffic condition since the AM and PM peak commuter periods of the adjacent streets are not expected to coincide with peak traffic generating periods of the retail/commercial project. Table 2 shows the trip generation rates and the resultant number of additional vehicle trips entering or exiting the project site during the morning and afternoon peak hours of generator.

TABLE 2. PROJECT VEHICLE TRIP GENERATION SUMMARY (PEAK GENERATION PERIODS)

Trip Characteristic	AM Peak Hour of Generator			PM Peak Hour of Generator		
	To Project	From Project	Total	To Project	From Project	Total
Vehicle Trip Ends	804	870	1,674	734	553	1,287
Trip Rate	3.08	3.33	6.41	2.81	2.12	4.93
Pass-by Trips	(241)	(261)	(502)	(220)	(166)	(386)
Walk-ins	(241)	(261)	(502)	(220)	(166)	(386)
Net Increase at site	322	348	670	294	221	515

4.1.2. Trip Distribution

The directional distribution and traffic routing of the site-generated trips were based on the present traffic patterns in the Waikiki area. The 200 and 482 trips generated by the site in the morning and afternoon commuter peak hours, respectively, were assumed to represent a net increase in traffic on the area street system during that time period. Similarly, the morning and afternoon peak hours of generation trips of 670 and 515, respectively, represent a net increase in traffic demand on the area street system during peak traffic generation periods. A direct access to the proposed project would be on Kuhio Avenue with an on-site drop-off area located on the Kalaimoku Street side of the project. All vehicular trips entering/exiting the project site are assumed to enter via the Kuhio Avenue access, of which 10% is assumed to use the drop-off area.

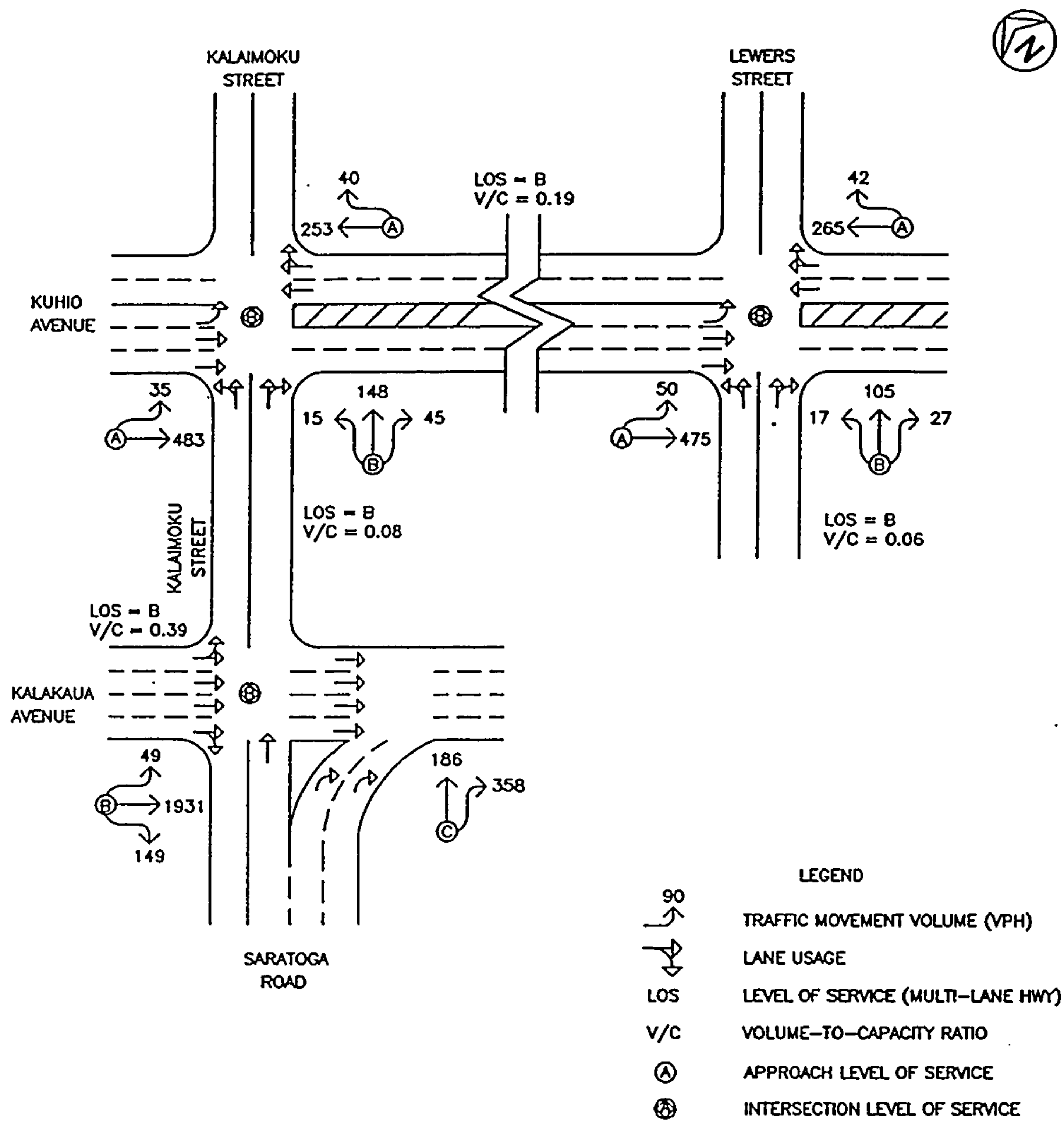
4.2. Through Traffic Forecasting Methodology

The Oahu Regional Transportation Plan, prepared for the Oahu Metropolitan Planning Organization, forecasts an average increase in daily visitor or tourist vehicle trips of approximately 1.7% per year from 1990 to 2020. By contrast, historic traffic count data for the State Department of Transportation (SDOT) count station at the intersection of Kalakaua Avenue and Ala Moana Boulevard indicates a decrease of approximately 2.0% per year on Kalakaua Avenue.

For this study, and average increase of 2.0% per year was used to forecast Year 2001 peak hour traffic volumes without the project, which is slightly higher than the anticipated long-term growth rate. The resultant 6.0% increase should provide a conservative forecast for most of the study intersections during this period. The growth factor was applied to all traffic movements at the study intersections surrounding the project site.

4.3. Total Traffic Volumes Without Project

Exhibits 6 and 7 show the Year 2001 projected AM and PM peak hour traffic conditions without the development of King Kalakaua Plaza, Phase II. The intersection Level of Service for the study intersections are included in the following Table 3. The calculations are included in Appendix D.



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KING KALAKAUA PLAZA PHASE TWO

YEAR 2001 AM PEAK HOUR TRAFFIC WITHOUT PROJECT

EXHIBIT

6

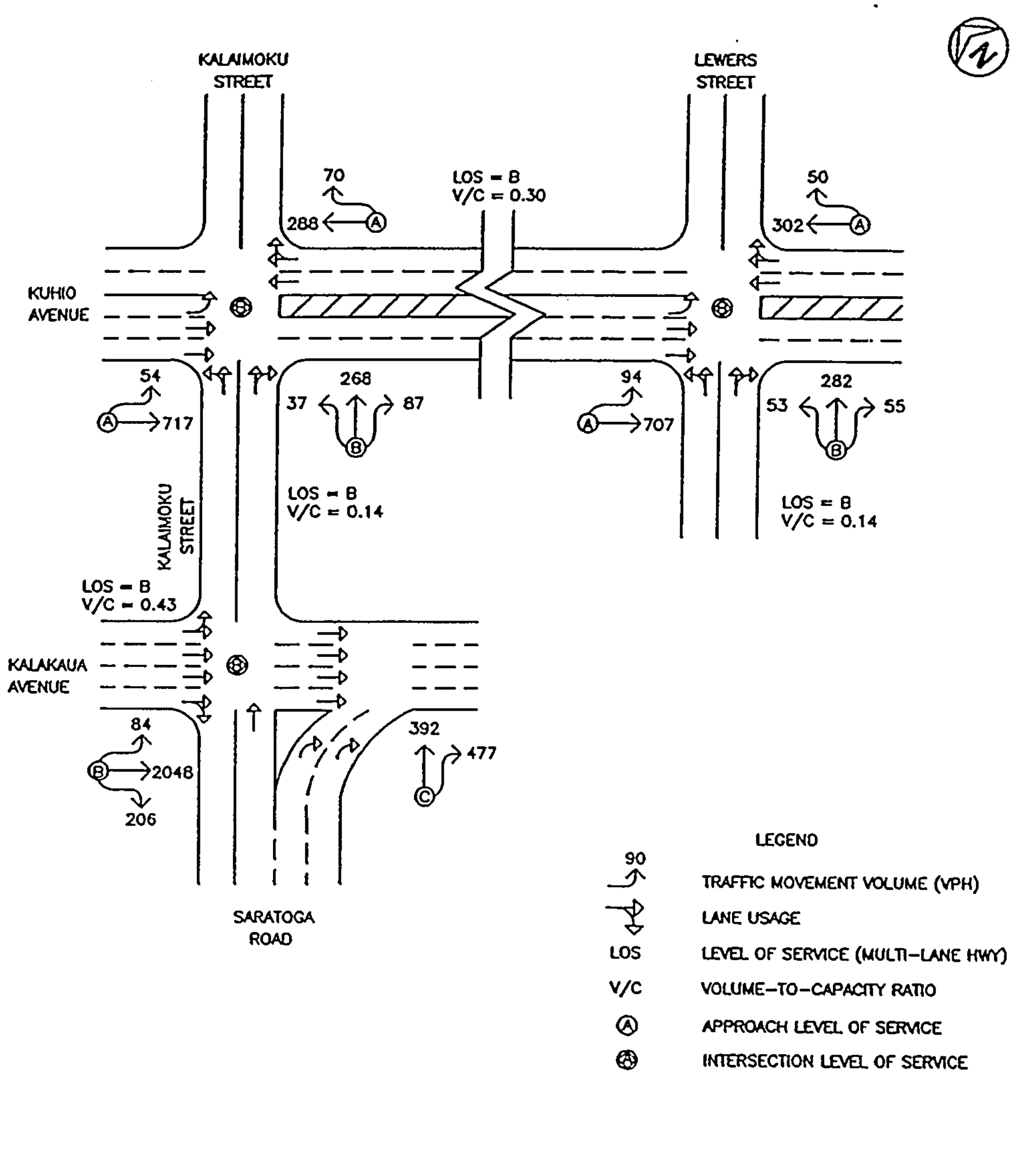

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TABLE 3. YEAR 2001 OVERALL INTERSECTION LOS WITHOUT PROJECT

Intersection	AM Peak		PM Peak	
	Existing (v/c)	Year 2001 Without Project (v/c)	Existing (v/c)	Year 2001 Without Project (v/c)
Kalakaua Avenue and Kalaimoku Street	B (0.585)	B (0.619)	B (0.656)	B (0.700)
Kuhio Avenue and Kalaimoku Street	B (0.281)	B (0.298)	B (0.415)	B (0.440)
Kuhio Avenue and Lewers Street	B (0.233)	B (0.249)	B (0.429)	B (0.456)

Table 3 above compares traffic operations between existing and projected Year 2001 conditions without the proposed development. There are no significant changes in the operating levels of service for each of the individual approaches to the study intersections. Since the traffic projection represents a three-year forecast to the horizon Year 2001, the 2.0% per year forecast would result in minimal external traffic volume growth.

4.4. Total Traffic Volumes With Project

Exhibits 8 and 9 show the Year 2001 cumulative AM and PM commuter peak hour traffic conditions resulting from the projected external traffic and the development of King Kalakaua Plaza, Phase II. The intersection LOS designation and analysis are based on existing roadway geometric and signalized intersection conditions. The traffic impacts resulting from King Kalakaua Plaza, Phase II are addressed in the following section.

Exhibits 10 and 11 show the Year 2001 cumulative traffic conditions for AM and PM peak hours of project generation. These cumulative volumes represent "worst-case" traffic conditions by estimating the project's morning and afternoon peak traffic generation superimposed over projected commuter peak hours of traffic.

5. TRAFFIC IMPACT ANALYSIS

The traffic conditions at the study intersections for the AM and PM commuter peak hours of traffic with the project are compared with existing and projected without project conditions. The intersection operating conditions are summarized in Table 4. Vehicle delays and intersection Levels of Service calculations are included in Appendix E.

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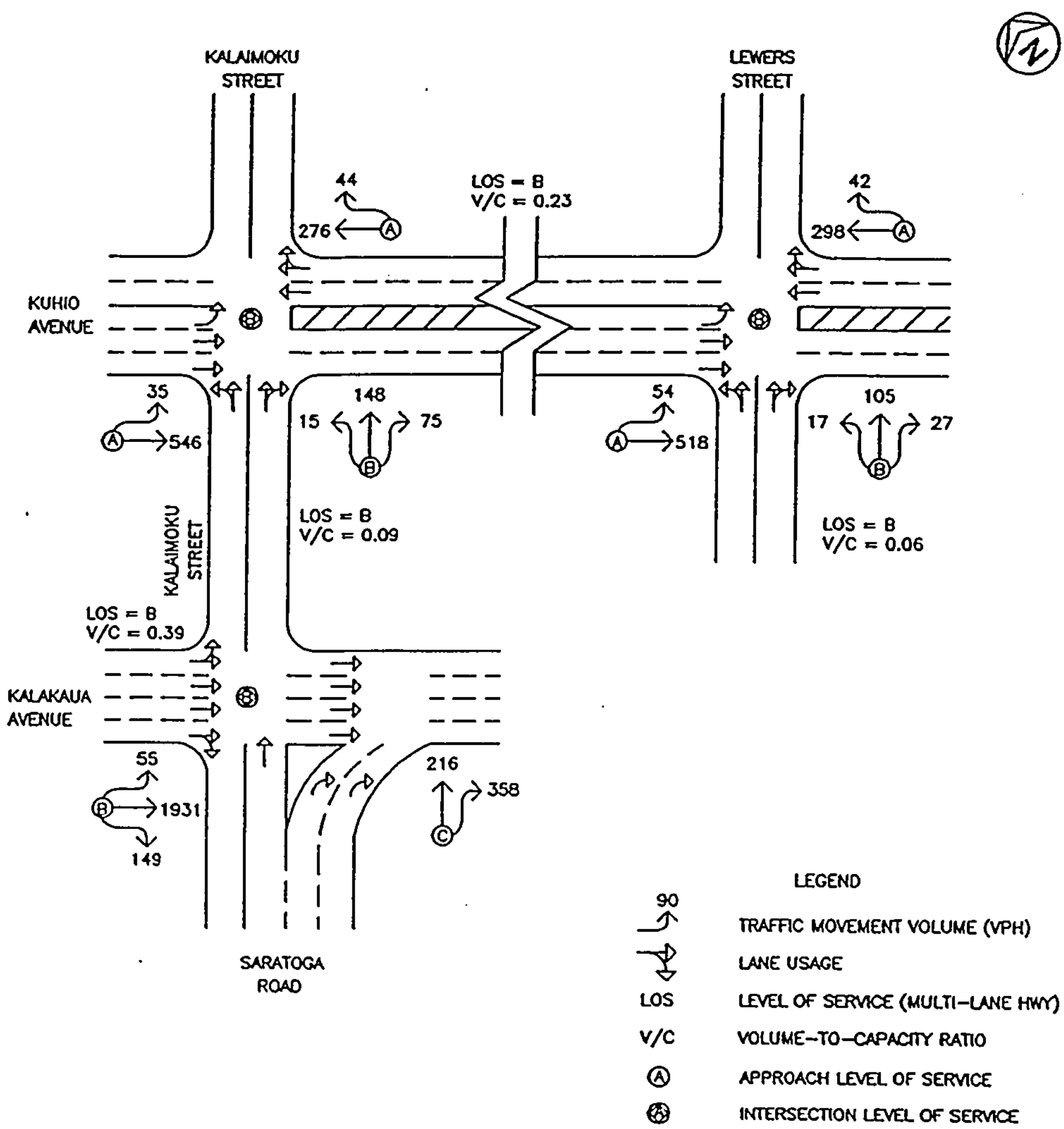

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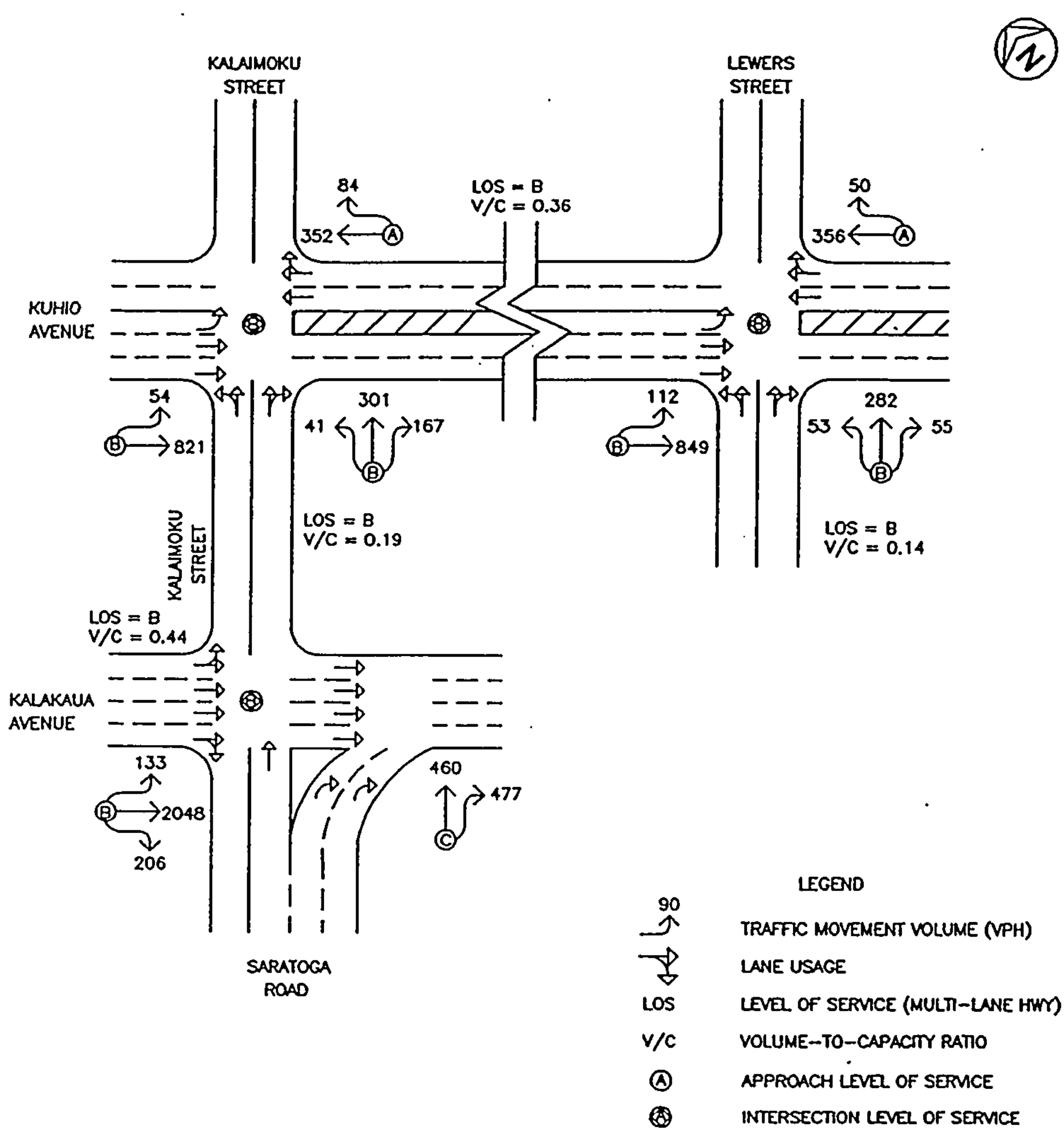

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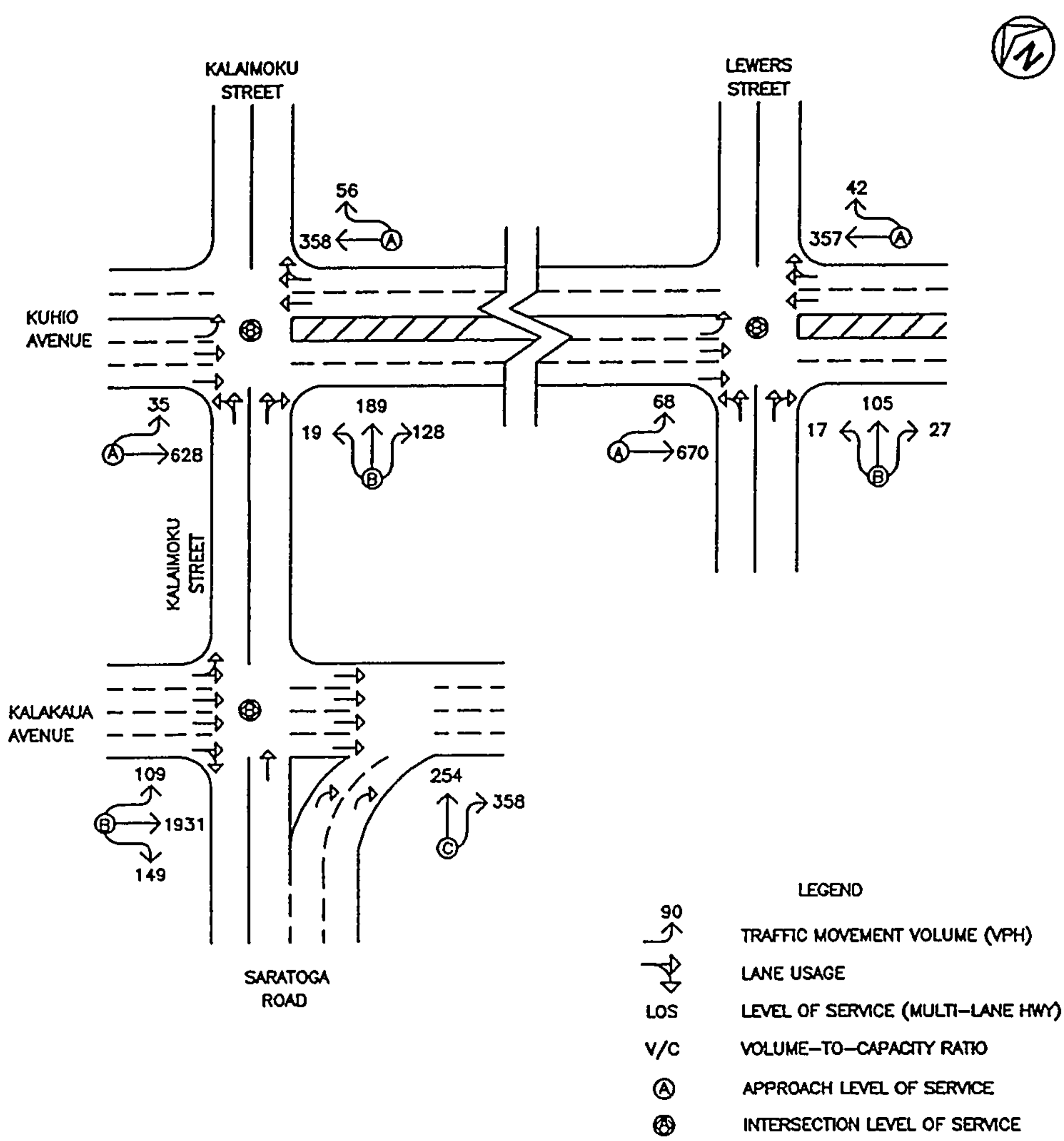

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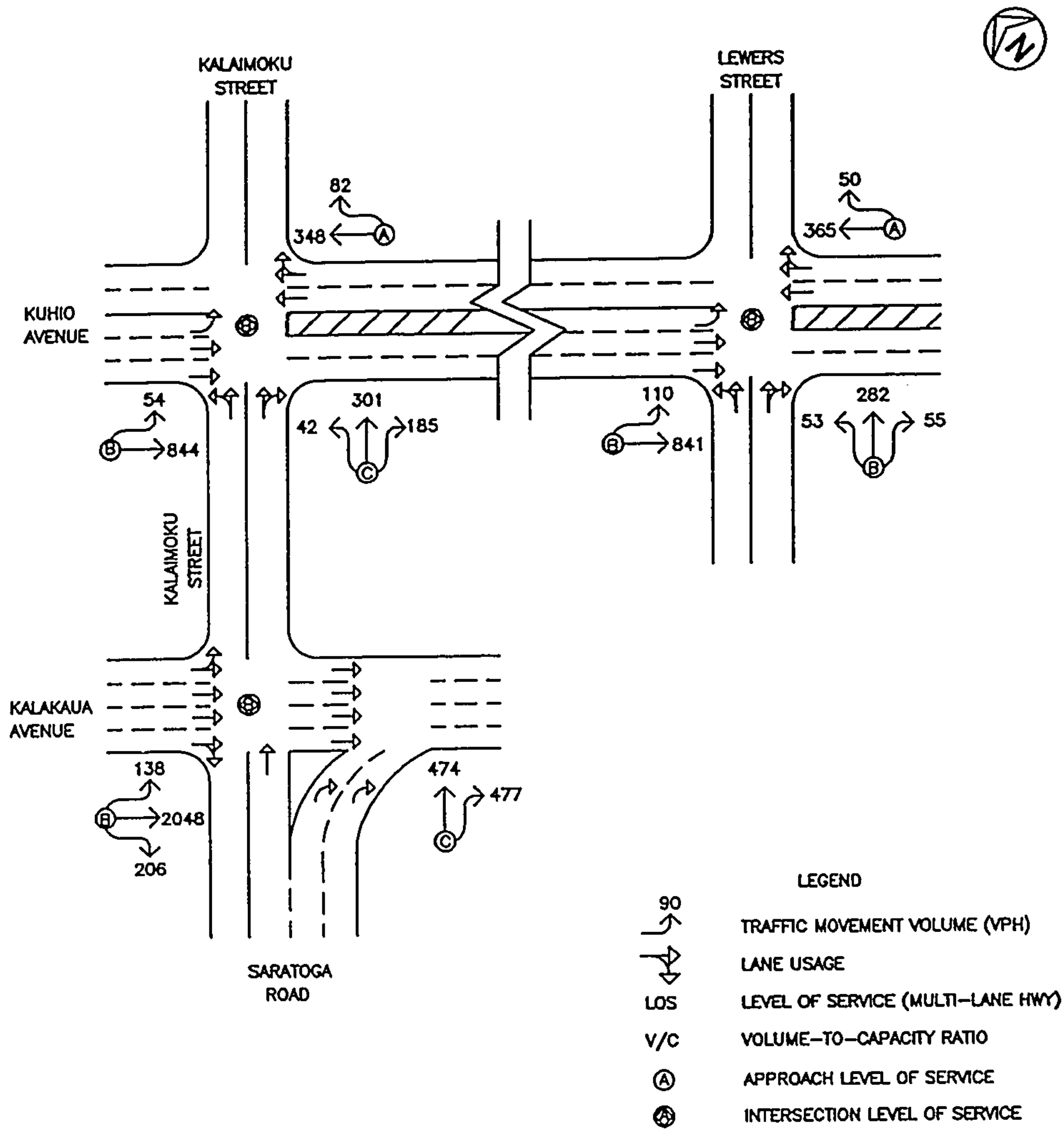
KING KALAKAUA PLAZA PHASE TWO

YEAR 2001 AM PEAK HOUR GENERATOR

EXHIBIT 10



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KING KALAKAUA PLAZA PHASE TWO

YEAR 2001 PM PEAK HOUR GENERATOR

EXHIBIT

11

TABLE 4. OVERALL LOS COMPARISON AT STUDY INTERSECTIONS DURING PEAK COMMUTER PERIODS

Intersection	AM Commuter Peak Hour			PM Commuter Peak Hour		
		Year 2001			Year 2001	
	Existing (v/c)	Without Project (v/c)	With Project (v/c)	Existing (v/c)	Without Project (v/c)	With Project (v/c)
Kalakaua Avenue and Kalaimoku Street	B (0.585)	B (0.619)	B (0.620)	B (0.656)	B (0.700)	B (0.758)
Kuhio Avenue and Kalaimoku Street	B (0.281)	B (0.298)	B (0.340)	B (0.415)	B (0.440)	B (0.541)
Kuhio Avenue and Lewers Street	B (0.233)	B (0.249)	B (0.267)	B (0.429)	B (0.456)	B (0.513)

Table 4 suggests minor changes in the overall operating conditions at the study intersections. The operating conditions of individual approaches or movements also show minimal operational changes from without project and existing conditions. The v/c ratios indicate that the study intersections will be operating well below capacity.

The traffic conditions at the study intersections for the AM and PM peak project generation periods are also compared with existing and projected without project conditions. The intersection operating conditions are summarized in Table 5. The LOS calculations are included in the Appendix.

TABLE 5. OVERALL LOS COMPARISON AT STUDY INTERSECTIONS DURING PEAK PROJECT GENERATION PERIODS

Intersection	AM Peak Hour of Generator			PM Peak Hour of Generator		
		Year 2001			Year 2001	
	Existing (v/c)	Without Project (v/c)	With Project (v/c)	Existing (v/c)	Without Project (v/c)	With Project (v/c)
Kalakaua Avenue and Kalaimoku Street	B (0.585)	B (0.619)	B (0.628)	B (0.656)	B (0.700)	B (0.770)
Kuhio Avenue and Kalaimoku Street	B (0.281)	B (0.298)	B (0.419)	B (0.415)	B (0.440)	B (0.561)
Kuhio Avenue and Lewers Street	B (0.233)	B (0.249)	B (0.331)	B (0.429)	B (0.456)	B (0.510)

The traffic conditions during peak hours of generation show minimal changes in the operating characteristics of the study intersections. The intersections would all operate at satisfactory levels of service.

6. RECOMMENDATIONS

6.1. Maintain sufficient sight distances for motorists to safely enter and exit the project access driveway.
6.2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
6.3. Provide adequate turn-around area for service, delivery and refuse collection vehicles to maneuver on the project property. Avoid vehicle reversing maneuvers on City streets.
6.4. Provide sufficient driveway width to accommodate safe vehicle ingress and egress.
6.5. Provide sufficient turning radii for drop-off and/or trolley stops.

7. CONCLUSIONS

By implementing the above recommendations, the proposed King Kalakaua Plaza, Phase II would not have a significant impact on traffic operations in the vicinity of the project site. Notably, the assumption used in this traffic study were conservative regarding growth in external traffic unrelated to the proposed project. Moreover, pedestrian activity or walk-ins from areas within Waikiki are anticipated to represent a larger portion of the project trip generation than assumed in this projection. Still another consideration is that much of the vehicular trip generation activity of the project would occur during off-peak hours. However, even with the projected peak generation volumes superimposed over morning and afternoon peak commuter periods, the project is not expected to significantly impact traffic operations in the vicinity.

0000 0005 0704,

APPENDIX A

EXISTING TRAFFIC COUNT DATA

JAMAR Technologies, Inc.
Traffic Counting Equipment & Supplies
2031 Stout Drive, Suite 4
Ivyland, PA 18974

Weather : CLEAR
Counter : D1-0528/D1-769
Counted by: CATHY/RICK

Site Code : 00000003
Start Date: 08/27/98
File I.D. : KUNLEVA
Page : 1

Vehicle group 1

	LEVERS ST Southbound				KUNIO AVE Westbound				LEVERS ST Northbound				KUNIO AVE Eastbound				
Date 08/27/98	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Total
07:00	0	0	0	0	0	58	8	0	3	11	6	0	8	73	0	0	167
07:15	0	0	0	0	0	50	12	0	4	11	7	0	8	93	0	0	185
07:30	0	0	0	0	0	62	7	0	2	9	8	0	11	98	0	0	197
07:45	0	0	0	0	0	60	11	0	6	14	4	0	3	121	0	0	219
Hr Total	0	0	0	0	0	230	38	0	15	45	25	0	30	385	0	0	768
08:00	0	0	0	0	0	54	7	0	6	23	4	0	9	113	0	0	216
08:15	0	0	0	0	0	55	7	0	7	24	7	0	9	119	0	0	228
08:30	0	0	0	0	0	69	14	0	1	25	10	0	19	111	0	0	249
08:45	0	0	0	0	0	72	12	0	2	27	3	0	10	101	0	0	227
Hr Total	0	0	0	0	0	250	40	0	16	99	24	0	47	444	0	0	920
TOTAL	0	0	0	0	0	480	78	0	31	144	49	0	77	829	0	0	1688

Peak Hour Analysis By Individual Approach for the Period: 07:00 to 09:00 on 08/27/98

Peak start	08:00				08:00				08:00				07:45			
Volume	0	0	0	0	0	250	40	0	16	99	24	0	40	464	0	0
Percent	0%	0%	0%	0%	0%	86%	14%	0%	12%	71%	17%	0%	8%	92%	0%	0%
Pk total	0				290				139				504			
Highest	07:00				08:45				08:15				08:30			
Volume	0	0	0	0	0	72	12	0	7	24	7	0	19	111	0	0
Hi total	0				84				38				130			
PHF	.0				.86				.91				.97			

Peak Hour Analysis By Entire Intersection for the Period: 07:00 to 09:00 on 08/27/98

Peak start	08:00				08:00				08:00				08:00			
Volume	0	0	0	0	0	250	40	0	16	99	24	0	47	444	0	0
Percent	0%	0%	0%	0%	0%	86%	14%	0%	12%	71%	17%	0%	10%	90%	0%	0%
Pk total	0				290				139				491			
Highest	07:00				08:45				08:15				08:30			
Volume	0	0	0	0	0	72	12	0	7	24	7	0	19	111	0	0
Hi total	0				84				38				130			
PHF	.0				.86				.91				.94			

0000 0005 0705

JAMAR Technologies, Inc.
Traffic Counting Equipment & Supplies
2031 Stout Drive, Suite 4
Ivyland, PA 18974

ather : CLEAR
nter : 01-0526/01-0528
nted by: MISAKO/CATHY

Site Code : 00000001
Start Date: 08/26/98
File I.D. : KALKUNA
Page : 1

Vehicle group 1

	KALAINOKU ST Southbound				KUHIO AVE Westbound				KALAINOKU ST Northbound				KUHIO AVE Eastbound				
	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Total
:e 08/26/98																	
.00	0	0	0	0	0	44	6	0	3	28	8	0	4	95	0	0	188
:15	0	0	0	0	0	54	15	0	2	32	5	0	3	114	0	0	225
:30	0	0	0	0	0	62	14	0	5	28	6	0	6	128	0	0	249
:45	0	0	0	0	0	66	9	0	3	38	16	0	11	127	0	0	270
Total	0	0	0	0	0	226	44	0	13	126	35	0	24	464	0	0	932
00	0	0	0	0	0	51	10	0	5	42	10	0	8	98	0	0	224
15	0	0	0	0	0	60	5	0	1	32	10	0	8	103	0	0	219
30	0	0	0	0	0	56	8	0	6	45	11	0	16	126	0	0	268
45	0	0	0	0	0	55	8	0	12	35	16	0	16	128	0	0	270
Total	0	0	0	0	0	222	31	0	24	154	47	0	48	455	0	0	981
TAL*	0	0	0	0	0	448	75	0	37	280	82	0	72	919	0	0	1913

k Hour Analysis By Individual Approach for the Period: 07:00 to 09:00 on 08/26/98

k start	08:00				07:15				08:00				08:00			
ume	0	0	0	0	0	233	48	0	24	154	47	0	48	455	0	0
cent	0%	0%	0%	0%	0%	83%	17%	0%	11%	68%	21%	0%	10%	90%	0%	0%
total	0				281				225				503			
hest	07:00				07:30				08:45				08:45			
ume	0	0	0	0	0	62	14	0	12	35	16	0	16	128	0	0
total	0				76				63				144			
	.0				.92				.89				.87			

k Hour Analysis By Entire Intersection for the Period: 07:00 to 09:00 on 08/26/98

k start	08:00				08:00				08:00				08:00			
ume	0	0	0	0	0	222	31	0	24	154	47	0	48	455	0	0
cent	0%	0%	0%	0%	0%	88%	12%	0%	11%	68%	21%	0%	10%	90%	0%	0%
total	0				253				225				503			
hest	07:00				08:15				08:45				08:45			
ume	0	0	0	0	0	60	5	0	12	35	16	0	16	128	0	0
total	0				65				63				144			
	.0				.97				.89				.87			

JAMAR Technologies, Inc.
Traffic Counting Equipment & Supplies
2031 Stout Drive, Suite 4
Ivyland, PA 18974

Weather : CLEAR
Counter : 01-768/01-769
Counted by: RICK/JEFF

Site Code : 00000002
Start Date: 08/26/98
File I.D. : KALKALA)
Page : 1

Vehicle group 1

	KALAINOKU ST Southbound				KALAKAUA AVE Westbound				SARATOGA RD Northbound				KALAKAUA AVE Eastbound				
	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Total
Date 08/26/98																	
07:00	0	0	0	0	0	0	0	0	0	29	63	0	5	330	30	0	457
07:15	0	0	0	0	0	0	0	0	0	34	60	0	9	448	19	0	570
07:30	0	0	0	0	0	0	0	0	0	36	79	0	6	472	49	0	642
07:45	0	0	0	0	0	0	0	0	0	49	81	0	8	519	29	0	686
Hr Total	0	0	0	0	0	0	0	0	0	148	283	0	28	1769	127	0	2355
08:00	0	0	0	0	0	0	0	0	0	48	83	0	19	431	31	0	612
08:15	0	0	0	0	0	0	0	0	0	42	95	0	13	400	32	0	582
08:30	0	0	0	0	0	0	0	0	0	57	71	0	15	416	47	0	606
08:45	0	0	0	0	0	0	0	0	0	62	66	0	6	455	33	0	622
Hr Total	0	0	0	0	0	0	0	0	0	209	315	0	53	1702	143	0	2422
TOTAL	0	0	0	0	0	0	0	0	0	357	598	0	81	3471	270	0	4777

Peak Hour Analysis By Individual Approach for the Period: 07:00 to 09:00 on 08/26/98

Peak start	08:00				08:00				07:45				07:15			
Volume	0	0	0	0	0	0	0	0	0	196	330	0	42	1870	128	0
Percent	0%	0%	0%	0%	0%	0%	0%	0%	0%	37%	63%	0%	2%	92%	6%	0%
Pk total	0				0				526				2040			
Highest	07:00				07:00				08:15				07:45			
Volume	0	0	0	0	0	0	0	0	0	42	95	0	8	519	29	0
Hi total	0				0				137				556			
PHF	.0				.0				.96				.92			

Peak Hour Analysis By Entire Intersection for the Period: 07:00 to 09:00 on 08/26/98

Peak start	07:30				07:30				07:30				07:30			
Volume	0	0	0	0	0	0	0	0	0	175	338	0	46	1822	141	0
Percent	0%	0%	0%	0%	0%	0%	0%	0%	0%	34%	66%	0%	2%	91%	7%	0%
Pk total	0				0				513				2009			
Highest	07:00				07:00				08:15				07:45			
Volume	0	0	0	0	0	0	0	0	0	42	95	0	8	519	29	0
Hi total	0				0				137				556			
PHF	.0				.0				.94				.90			

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JAMAR Technologies, Inc.
Traffic Counting Equipment & Supplies
2031 Stout Drive, Suite 4
Ivyland, PA 18974

ather : CLEAR
nter : D1-526/D1-528
nted by: RICK/CATHY

Site Code : 00000003
Start Date: 08/27/98
File I.D. : KUHLEVP
Page : 1

Vehicle group 1

	LEVERS ST Southbound				KUNIO AVE Westbound				LEVERS ST Northbound				KUNIO AVE Eastbound				
	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Total
te 08/27/98																	
:00	0	0	0	0	0	83	11	0	20	91	17	0	17	157	0	0	396
:15	0	0	0	0	0	71	12	0	7	63	12	0	27	144	0	0	336
:30	0	0	0	0	0	66	13	0	6	50	7	0	22	166	0	0	330
:45	0	0	0	0	0	65	11	0	17	62	16	0	23	200	0	0	394
Total	0	0	0	0	0	285	47	0	50	266	52	0	89	667	0	0	1456
:00	0	0	0	0	0	95	12	0	15	54	18	0	25	165	0	0	384
:15	0	0	0	0	0	71	10	0	19	71	15	0	27	149	0	0	362
:30	0	0	0	0	0	79	26	0	13	54	9	0	36	173	0	0	390
:45	0	0	0	0	0	60	11	0	22	60	10	0	21	162	0	0	346
Total	0	0	0	0	0	305	59	0	69	239	52	0	109	649	0	0	1482
OTAL*	0	0	0	0	0	590	106	0	119	505	104	0	198	1316	0	0	2938

ak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 08/27/98

ak start	17:00				16:45				16:00				16:45			
lume	0	0	0	0	0	310	59	0	50	266	52	0	111	687	0	0
rcent	0%	0%	0%	0%	0%	84%	16%	0%	14%	72%	14%	0%	14%	86%	0%	0%
total	0				369				368				798			
ghest	16:00				17:00				16:00				16:45			
lume	0	0	0	0	0	95	12	0	20	91	17	0	23	200	0	0
total	0				107				128				223			
f	.0				.86				.72				.89			

ak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 08/27/98

ak start	16:45				16:45				16:45				16:45			
lume	0	0	0	0	0	310	59	0	64	241	58	0	111	687	0	0
rcent	0%	0%	0%	0%	0%	84%	16%	0%	18%	66%	16%	0%	14%	86%	0%	0%
total	0				369				363				798			
ghest	16:00				17:00				17:15				16:45			
lume	0	0	0	0	0	95	12	0	19	71	15	0	23	200	0	0
total	0				107				105				223			
f	.0				.86				.86				.89			

JAMAR Technologies, Inc.
Traffic Counting Equipment & Supplies
2031 Stout Drive, Suite 4
Ivyland, PA 18974

Weather : CLEAR
Counter : D1-0528/D1-769
Counted by: MISAKO/CATHY

Site Code : 00000001
Start Date: 08/26/98
File I.D. : KALKUNP
Page : 1

Vehicle group 1

	KALAINOKU ST Southbound				KUNIO AVE Westbound				KALAINOKU ST Northbound				KUNIO AVE Eastbound				
	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Total
Date 08/26/98																	
16:00	0	0	0	0	0	68	27	0	6	87	18	0	18	164	0	0	38[illegible]
16:15	0	0	0	0	0	65	12	0	13	63	22	0	7	149	0	0	331
16:30	0	0	0	0	0	67	14	0	11	64	31	0	14	170	0	0	371
16:45	0	0	0	0	0	72	13	0	5	39	11	0	12	193	0	0	35[illegible]
Hr Total	0	0	0	0	0	272	66	0	35	253	82	0	51	676	0	0	143[illegible]
17:00	0	0	0	0	0	69	5	0	4	56	16	0	14	184	0	0	34[illegible]
17:15	0	0	0	0	0	71	19	0	10	48	9	0	17	160	0	0	33[illegible]
17:30	0	0	0	0	0	58	13	0	11	53	14	0	25	171	0	0	34[illegible]
17:45	0	0	0	0	0	59	14	0	8	35	20	0	15	187	0	0	33[illegible]
Hr Total	0	0	0	0	0	257	51	0	33	192	59	0	71	702	0	0	136[illegible]
TOTAL	0	0	0	0	0	529	117	0	68	445	141	0	122	1378	0	0	280[illegible]

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 08/26/98

Peak start	17:00				16:00				16:00				16:45			
Volume	0	0	0	0	0	272	66	0	35	253	82	0	68	708	0	0
Percent	0%	0%	0%	0%	0%	80%	20%	0%	9%	68%	22%	0%	9%	91%	0%	0%
Pk total	0				338				370				776			
Highest	16:00				16:00				16:00				16:45			
Volume	0	0	0	0	0	68	27	0	6	87	18	0	12	193	0	0
Hi total	0				95				111				205			
PHF	.0				.89				.83				.95			

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 08/26/98

Peak start	16:00				16:00				16:00				16:00			
Volume	0	0	0	0	0	272	66	0	35	253	82	0	51	676	0	0
Percent	0%	0%	0%	0%	0%	80%	20%	0%	9%	68%	22%	0%	7%	93%	0%	0%
Pk total	0				338				370				727			
Highest	16:00				16:00				16:00				16:45			
Volume	0	0	0	0	0	68	27	0	6	87	18	0	12	193	0	0
Hi total	0				95				111				205			
PHF	.0				.89				.83				.89			

0000 0005 0707

JAMAR Technologies, Inc.
Traffic Counting Equipment & Supplies
2031 Stout Drive, Suite 4
Ivyland, PA 18974

eather : CLEAR
ounter : D1-0526/D1-0768
ounted by: RICK/JEFF

Site Code : 00000002
Start Date: 08/26/98
File I.D. : KALKALP30
Page : 1

Vehicle group 1

	KALAIMOKU ST Southbound				KALAKAUA AVE Westbound				SARATOGA RD Northbound				KALAKAUA AVE Eastbound				
	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Left	Thru	Right	Other	Total
ate 08/26/98																	
6:00	0	0	0	0	0	0	0	0	0	109	101	0	19	518	52	0	799
6:15	0	0	0	0	0	0	0	0	0	95	132	0	13	461	50	0	751
6:30	0	0	0	0	0	0	0	0	0	103	95	0	26	454	54	0	732
6:45	0	0	0	0	0	0	0	0	0	63	122	0	21	499	38	0	743
r Total	0	0	0	0	0	0	0	0	0	370	450	0	79	1932	194	0	3025
7:00	0	0	0	0	0	0	0	0	0	92	63	0	16	497	29	0	697
7:15	0	0	0	0	0	0	0	0	0	78	92	0	11	497	31	0	709
7:30	0	0	0	0	0	0	0	0	0	78	132	0	18	510	39	0	777
7:45	0	0	0	0	0	0	0	0	0	62	116	0	9	458	44	0	689
r Total	0	0	0	0	0	0	0	0	0	310	403	0	54	1962	143	0	2872
TOTAL*	0	0	0	0	0	0	0	0	0	680	853	0	133	3894	337	0	5897

eak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 08/26/98

eak start	17:00				17:00				16:00				16:45			
olume	0	0	0	0	0	0	0	0	0	370	450	0	66	2003	137	0
ercent	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	55%	0%	3%	91%	6%	0%
k total	0				0				820				2206			
ighest	16:00				16:00				16:15				17:30			
olume	0	0	0	0	0	0	0	0	0	95	132	0	18	510	39	0
i total	0				0				227				567			
HF	.0				.0				.90				.97			

eak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 08/26/98

eak start	16:00				16:00				16:00				16:00			
olume	0	0	0	0	0	0	0	0	0	370	450	0	79	1932	194	0
ercent	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	55%	0%	4%	88%	9%	0%
k total	0				0				820				2205			
ighest	16:00				16:00				16:15				16:00			
olume	0	0	0	0	0	0	0	0	0	95	132	0	19	518	52	0
i total	0				0				227				589			
HF	.0				.0				.90				.94			

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

I. LEVEL-OF-SERVICE CRITERIA FOR MULTILANE HIGHWAY

Level of Service (LOS) criteria for multilane highways are defined in terms of density. Density is a measure which quantifies the proximity to other vehicles in the traffic stream. It expresses the degree of maneuverability within the traffic stream.

Level of service criteria depend on the free-flow speed of the highway element being studied. A "highway element" can be an isolated geometric element, such as a curve of grade of significant length having a reduced design speed, or a series of such geometric elements that affect the operation of a longer segment of highway.

Level of Service A describes completely free-flow conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway and driver preferences. Vehicles are spaced at an average of 440 feet, or 22 car-lengths, at a maximum density of 12 pc/mi/ln. The ability to maneuver within the traffic stream is high. Minor disruptions to flow are easily absorbed at this level without a change in travel speed.

Level of Service B is also indictive of free flow, although the presence of other vehicles begins to be noticeable. Average travel speeds are somewhat diminished from LOS A, but drivers have slightly less freedom to maneuver. Vehicles are spaced at an average of approximately 264 feet, or 13 car-lengths, at a maximum density of 20 pc/mi/ln. Minor disruptions are still easily absorbed at this level, although local deterioration in LOS will be more obvious.

Level of service C represents a range in which the influence of traffic density on operations become marked. The ability to maneuver within the traffic stream, is now clearly affected by the presence of other vehicles. Average travel speeds begin to show some reduction for multilane highways with free-flow speeds over 50 mph. The average spacing of vehicles is reduced to approximately 189 feet, at a maximum density of 28 pc/mi/ln. Minor disruptions may be expected to cause serious local deterioration in service, and queues may form behind any significant disruption.

Level of Service D represents a range in which ability to maneuver are severely restricted because of traffic congestion. Travel speed begins to be reduced by increasing volumes. The average spacing of vehicles is 155 feet at a maximum density of 34 pc/mi/ln. Only the most minor of disruptions can be absorbed without the formation of extensive queues and the deterioration of service to LOS E and LOS F.

Level-of-Service E represents operations at or near capacity and is quite unstable. The densities at LOS E vary depending upon the free-flow speed. At LOS E, vehicles are operating with the minimum spacing at which uniform flow can be maintained. Thus, as the limits for the level of service are approached, disruptions cannot be damped ore readily dissipated, and most disruptions will cause queues to form and service to deteriorate to LOS F. For the majority of multi-lane highways with free-flow speeds between 45 and 60 mph, passenger-car speeds at capacity range from 40 to 55 mph but are highly variable and unpredictable within that range.

Level of Service F represents forced or breakdown flow. It occurs either at a point where vehicles arrive at a rate greater than the rate at which they are discharged or at a point on a planned facility where forecast demand exceeds computed capacity. Although operations at such points (and on sections immediately downstream) will appear to be at capacity, queues are highly unstable, with vehicles experiencing brief periods of movement followed by stoppages. Average travel speeds with queues are generally less than 30 mph. Note that the term "LOS F" may be used to characterize both the point of the breakdown and the operating conditions within the queue. It must be remembered, however, that it is the point of breakdown that causes the queue to form and that operations within the queue are generally not related to defects along the highway segment over which the queue extends. Chapters 3 and 6 contain more detailed discussions of the use and application of LOS F and of the analysis of breakdown conditions.

2. LEVEL OF SERVICE OF SIGNALIZED INTERSECTIONS

Level of service for signalized intersections is defined in terms of delay. Delay is a measure of driver discomfort, frustration, fuel consumption and lost travel time. Specifically, level-of-service criteria are stated in terms of the average stopped delay per vehicle for a 15-minute analysis period. The criteria are given in Table A-1.

Table A-1. Level-of Service Criteria for Signalized Intersections

Level of Service	Stopped Delay for Vehicle (SEC)
A	≤ 5.0
B	5.0 TO 15.0
C	15.0 TO 25.0
D	25.0 TO 40.0
E	40.0 TO 60.0
F	> 60.0

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

Level-of-service A describes operations with very low delay, up to 5.0 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level-of-service B describes operations with delay greater then 5.0 and up to 15.0 seconds per vehicle. These higher delays may result from fair progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

Level-of-service C describes operations with delay greater than 15.0 and up to 25.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level-of-service D describes operations with delay greater than 25.0 and up to 40.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level-of-service E describes operations with delay greater than 40.0 and up to 60.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths and high v/c ratios. Individual cycle failures are frequent occurrences.

Level-of-service F describes operations with delay in excess of 60.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over saturation, i.e. when arrival flow exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

APPENDIX C

LEVEL OF SERVICE ANALYSES
EXISTING CONDITIONS

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f       08-27-1998
                 Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                    (N-S) LEWERS ST
Analyst: CK                                 File Name: KUHLEWA.HC9
Area Type: Other                            8-27-98 7-9 AM
=======================================================================
            |   Eastbound    |   Westbound    |   Northbound   |   Southbound
            |  L    T    R   |  L    T    R   |  L    T    R   |  L    T    R
            | ---- ---- ---- | ---- ---- ---- | ---- ---- ---- | ---- ---- ----
No. Lanes   |  1    2    0   |  0    2  < 0   |  0  > 2  < 0   |  0    0    0
Volumes     |   47  444      |       250   40 |   16   99   24 |
Lane W (ft) |12.0 12.0       |      12.0      |      12.0      |
RTOR Vols   |              0 |              4 |              6 |
Lost Time   |3.00 3.00       |      3.00 3.00 |3.00 3.00 3.00  |
-----------------------------------------------------------------------
                              Signal Operations
Phase Combination 1    2    3    4  |              5    6    7    8
EB  Left          *                 |NB  Left      *
    Thru          *                 |    Thru      *
    Right                           |    Right     *
    Peds                            |    Peds
WB  Left                            |SB  Left
    Thru          *                 |    Thru
    Right         *                 |    Right
    Peds                            |    Peds
NB  Right                           |EB  Right
SB  Right                           |WB  Right
Green          40.0A                |Green    20.0A
Yellow/AR       5.0                 |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                     Intersection Performance Summary
     Lane   Group:   Adj Sat    v/c     g/C                  Approach:
     Mvmts   Cap      Flow     Ratio   Ratio   Delay  LOS   Delay  LOS
     -----   ----   -------    -----   -----   -----  ---   -----  ---
EB   L        556      926    0.090   0.600     3.8   A      4.3    A
     T       1751     2918    0.283   0.600     4.4   A
WB   TR      1775     2958    0.197   0.600     4.1   A      4.1    A
NB   LTR     1119     3561    0.137   0.314    11.1   B     11.1    B
               Intersection Delay =   5.2 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.233
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        08-26-1998
                 Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                    (N-S) KALAIMOKU ST
Analyst: CK                                 File Name: KALKUHA.HC9
Area Type: Other                            8-26-98 7-9 AM
=======================================================================
               |   Eastbound   |   Westbound   |  Northbound   |  Southbound   |
               |  L    T    R  |  L    T    R  |  L    T    R  |  L    T    R  |
               | ---- ---- ----| ---- ---- ----| ---- ---- ----| ---- ---- ----|
No. Lanes      |  1    2    0  |  0    2  < 0  |  0  > 2  < 0  |  0    0    0  |
Volumes        |   33  456     |       239   38|   14  140   42|
Lane W (ft)    | 12.0 12.0     |      12.0     |      12.0     |
RTOR Vols      |              0|              4|              4|
Lost Time      | 3.00 3.00     |      3.00 3.00| 3.00 3.00 3.00|
-----------------------------------------------------------------------
                           Signal Operations
Phase Combination 1     2     3     4  |              5     6     7     8
EB  Left          *                    |NB  Left      *
    Thru          *                    |    Thru      *
    Right                              |    Right     *
    Peds                               |    Peds
WB  Left                               |SB  Left
    Thru          *                    |    Thru
    Right         *                    |    Right
    Peds                               |    Peds
NB  Right                              |EB  Right
SB  Right                              |WB  Right
Green          40.0A                   |Green     20.0A
Yellow/AR       5.0                    |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                   Intersection Performance Summary
     Lane   Group:   Adj Sat    v/c     g/C                    Approach:
     Mvmts   Cap      Flow     Ratio   Ratio   Delay   LOS    Delay   LOS
     -----  ----    -------    -----   -----   -----   ---    -----   ---
EB   L       577       962     0.066   0.600     3.8    A       4.4    A
     T      1780      2967     0.312   0.600     4.5    A
WB   TR     2053      3421     0.152   0.600     4.0    A       4.0    A
NB   LTR    1058      3365     0.221   0.314    11.4    B      11.4    B
             Intersection Delay =   5.8 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.281
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        08-26-1998
                 Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KALAKAUA AVE                 (N-S) KALAIMOKU/SARATOGA
Analyst: CK                                 File Name: KALKALA.HC9
Area Type: Other                            8-26-98 7-9 AM
=======================================================================
               |   Eastbound   |   Westbound   |  Northbound   |  Southbound   |
               |  L    T    R  |  L    T    R  |  L    T    R  |  L    T    R  |
               | ---- ---- ----| ---- ---- ----| ---- ---- ----| ---- ---- ----|
No. Lanes      |  0  > 4  < 0  |  0    0    0  |  0    1    2  |  0    0    0  |
Volumes        |   46 1822  141|               |       175  338|
Lane W (ft)    |      12.0     |               |      12.0 12.0|
RTOR Vols      |             10|               |              0|
Lost Time      | 3.00 3.00 3.00|               |      3.00 3.00|
-----------------------------------------------------------------------
                           Signal Operations
Phase Combination 1     2     3     4  |              5     6     7     8
EB  Left          *                    |NB  Left
    Thru          *                    |    Thru      *
    Right         *                    |    Right     *
    Peds                               |    Peds
WB  Left                               |SB  Left
    Thru                               |    Thru
    Right                              |    Right
    Peds                               |    Peds
NB  Right                              |EB  Right
SB  Right                              |WB  Right
Green          50.0A                   |Green     20.0A
Yellow/AR       5.0                    |Yellow/AR 5.0
Cycle Length:  80 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                   Intersection Performance Summary
     Lane   Group:   Adj Sat    v/c     g/C                    Approach:
     Mvmts   Cap      Flow     Ratio   Ratio   Delay   LOS    Delay   LOS
     -----  ----    -------    -----   -----   -----   ---    -----   ---
EB   LTR    4248      6536     0.575   0.650     5.2    B       5.2    B
NB   T       418      1520     0.445   0.275    16.0    C      17.0    C
     R       670      2435     0.608   0.275    17.5    C
             Intersection Delay =   7.5 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.585
-----------------------------------------------------------------------
```

1985 HCM:MULTILANE HIGHWAYS

```
FACILITY SECTION..... KALAKAUA W KALAIMOKU
ANALYST.............. PP
TIME OF ANALYSIS..... AM PEAK
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KALWKALXA.
```

A) ADJUSTMENT FACTORS

```
PERCENTAGE OF TRUCKS................ 0  (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH).................. 50
PEAK HOUR FACTOR.................... .9
DRIVER POPULATION FACTOR............ 1  (WEEKDAY/COMMUTER)
LANE WIDTH (FT)..................... 12
OBSTRUCTIONS........................ NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY........... SUBURBAN, UNDIVIDED
```

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

```
NO. OF LANES.................... 4
INPUT VOLUME.................... 2009
V/C RATIO....................... .37
LEVEL OF SERVICE................B
MAX. SERVICE FLOW RATE (pcphpl).. 705
SPEED (mph)..................... 42
DENSITY (pcpmpl)................ 18
```

1985 HCM:MULTILANE HIGHWAYS

```
FACILITY SECTION..... ALAIMOKU S OF KUHIO
ANALYST.............. PP
TIME OF ANALYSIS..... AM PEAK
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KASKUXA.
```

A) ADJUSTMENT FACTORS

```
PERCENTAGE OF TRUCKS................ 0  (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH).................. 50
PEAK HOUR FACTOR.................... .9
DRIVER POPULATION FACTOR............ 1  (WEEKDAY/COMMUTER)
LANE WIDTH (FT)..................... 12
OBSTRUCTIONS........................ NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY........... SUBURBAN, UNDIVIDED
```

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

```
NO. OF LANES.................... 2
INPUT VOLUME.................... 196
V/C RATIO....................... .07
LEVEL OF SERVICE................B
MAX. SERVICE FLOW RATE (pcphpl).. 137
SPEED (mph)..................... 47
DENSITY (pcpmpl)................ 3
```

```
1985 HCM:MULTILANE HIGHWAYS
*************************************************************

   FACILITY SECTION..... KUHIO E OF KALAIMOKU
   ANALYST.............. PP
   TIME OF ANALYSIS..... AM PEAK
   DATE OF ANALYSIS..... 08-28-1998
   OTHER INFORMATION.... KUEKAXA

A) ADJUSTMENT FACTORS
   -----------------------------------------------------------
   PERCENTAGE OF TRUCKS................. 0  (TYPICAL - 200 #/HP)
   PERCENTAGE OF BUSES.................. 2
   PERCENTAGE OF RECREATIONAL VEHICLES.. 0
   DESIGN SPEED (MPH)................... 50
   PEAK HOUR FACTOR..................... .9
   DRIVER POPULATION FACTOR............. 1  (WEEKDAY/COMMUTER)
   LANE WIDTH (FT)...................... 12
   OBSTRUCTIONS......................... NO
   DISTANCE (FT) FROM ROADWAY EDGE...... 6
   TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS
   -----------------------------------------------------------
                   E      E      E      f      f      f      f
   TERRAIN TYPE    T      B      R      HV     w      p      E
   ------------  -----  -----  -----  -----  -----  -----  -----
          LEVEL   1.7    1.5    1.6   0.99   1.00   1.00   0.80

C) OPERATIONAL ANALYSIS RESULTS
   ******************************

   NO. OF LANES..................... 2
   INPUT VOLUME..................... 498
   V/C RATIO........................ .18
   LEVEL OF SERVICE.................B
   MAX. SERVICE FLOW RATE (pcphpl).. 349
   SPEED (mph)...................... 45
   DENSITY (pcpmpl)................. 9
```

```
1985 HCM:MULTILANE HIGHWAYS
*************************************************************

   FACILITY SECTION..... LEWERS S OF KUHIO
   ANALYST.............. PP
   TIME OF ANALYSIS..... AM PEAK
   DATE OF ANALYSIS..... 08-28-1998
   OTHER INFORMATION.... LESKUXA.

A) ADJUSTMENT FACTORS
   -----------------------------------------------------------
   PERCENTAGE OF TRUCKS................. 0  (TYPICAL - 200 #/HP)
   PERCENTAGE OF BUSES.................. 2
   PERCENTAGE OF RECREATIONAL VEHICLES.. 0
   DESIGN SPEED (MPH)................... 50
   PEAK HOUR FACTOR..................... .9
   DRIVER POPULATION FACTOR............. 1  (WEEKDAY/COMMUTER)
   LANE WIDTH (FT)...................... 12
   OBSTRUCTIONS......................... NO
   DISTANCE (FT) FROM ROADWAY EDGE...... 6
   TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS
   -----------------------------------------------------------
                   E      E      E      f      f      f      f
   TERRAIN TYPE    T      B      R      HV     w      p      E
   ------------  -----  -----  -----  -----  -----  -----  -----
          LEVEL   1.7    1.5    1.6   0.99   1.00   1.00   0.80

C) OPERATIONAL ANALYSIS RESULTS
   ******************************

   NO. OF LANES..................... 2
   INPUT VOLUME..................... 139
   V/C RATIO........................ .05
   LEVEL OF SERVICE.................B
   MAX. SERVICE FLOW RATE (pcphpl).. 97
   SPEED (mph)...................... 47
   DENSITY (pcpmpl)................. 2
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        08-28-1998
                Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                 (N-S) LEWERS ST
Analyst: CK                              File Name: KUHLEWP.HC9
Area Type: Other                         8-27-98 4-6 PM
=======================================================================
               |   Eastbound    |   Westbound    |   Northbound   |   Southbound   |
               |  L    T    R   |  L    T    R   |  L    T    R   |  L    T    R   |
               | ---- ---- ---- | ---- ---- ---- | ---- ---- ---- | ---- ---- ---- |
No. Lanes      |  1    2    0   |  0    2  < 0   |  0  > 2  < 0   |  0    0    0   |
Volumes        |  89  667       |      285   47  |  50  266   52  |                |
Lane W (ft)    |12.0 12.0       |      12.0      |      12.0      |                |
RTOR Vols      |             0  |            5   |            5   |                |
Lost Time      |3.00 3.00       |      3.00 3.00 |3.00 3.00 3.00  |                |
-----------------------------------------------------------------------
                          Signal Operations
Phase Combination 1    2    3    4  |               5    6    7    8
EB  Left          *                 |NB  Left       *
    Thru          *                 |    Thru       *
    Right                           |    Right      *
    Peds                            |    Peds
WB  Left                            |SB  Left
    Thru          *                 |    Thru
    Right         *                 |    Right
    Peds                            |    Peds
NB  Right                           |EB  Right
SB  Right                           |WB  Right
Green           40.0A               |Green     20.0A
Yellow/AR        5.0                |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                    Intersection Performance Summary
     Lane  Group:  Adj Sat   v/c     g/C                     Approach:
     Mvmts   Cap     Flow   Ratio   Ratio   Delay   LOS   Delay   LOS
     -----  ----   -------  -----   -----   -----   ---   -----   ---
EB   L       528      880   0.199   0.600     4.1    A      4.8    A
     T      1990     3316   0.414   0.600     4.9    A
WB   TR     1884     3139   0.202   0.600     4.1    A      4.1    A
NB   LTR    1152     3664   0.458   0.314    12.6    B     12.6    B
               Intersection Delay =   6.9 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.429
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        08-27-1998
                Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                 (N-S) KALAIMOKU ST
Analyst: CK                              File Name: KALKUHP.HC9
Area Type: Other                         8-26-98 4-6 PM
=======================================================================
               |   Eastbound    |   Westbound    |   Northbound   |   Southbound   |
               |  L    T    R   |  L    T    R   |  L    T    R   |  L    T    R   |
               | ---- ---- ---- | ---- ---- ---- | ---- ---- ---- | ---- ---- ---- |
No. Lanes      |  1    2    0   |  0    2  < 0   |  0  > 2  < 0   |  0    0    0   |
Volumes        |  51  676       |      272   66  |  35  253   82  |                |
Lane W (ft)    |12.0 12.0       |      12.0      |      12.0      |                |
RTOR Vols      |             0  |            7   |            8   |                |
Lost Time      |3.00 3.00       |      3.00 3.00 |3.00 3.00 3.00  |                |
-----------------------------------------------------------------------
                          Signal Operations
Phase Combination 1    2    3    4  |               5    6    7    8
EB  Left          *                 |NB  Left       *
    Thru          *                 |    Thru       *
    Right                           |    Right      *
    Peds                            |    Peds
WB  Left                            |SB  Left
    Thru          *                 |    Thru
    Right         *                 |    Right
    Peds                            |    Peds
NB  Right                           |EB  Right
SB  Right                           |WB  Right
Green           40.0A               |Green     20.0A
Yellow/AR        5.0                |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                    Intersection Performance Summary
     Lane  Group:  Adj Sat   v/c     g/C                     Approach:
     Mvmts   Cap     Flow   Ratio   Ratio   Delay   LOS   Delay   LOS
     -----  ----   -------  -----   -----   -----   ---   -----   ---
EB   L       519      866   0.110   0.600     3.9    A      4.7    A
     T      2023     3372   0.394   0.600     4.8    A
WB   TR     1849     3082   0.211   0.600     4.2    A      4.2    A
NB   LTR    1008     3208   0.454   0.314    12.6    B     12.6    B
               Intersection Delay =   6.7 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.415
-----------------------------------------------------------------------
```

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4f 08-28-1998
Center For Microcomputers In Transportation

Streets: (E-W) KALAKAUA AVE (N-S) KALAIHOKU/SARATOGA
Analyst: CK File Name: KALKALP.HC9
Area Type: Other 8-26-98 4-6 PM

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	> 4	< 0	0	0	0	0	1	2	0	0	0
Volumes	79	1932	194					370	450			
Lane W (ft)		12.0						12.0	12.0			
RTOR Vols			20						0			
Lost Time	3.00	3.00	3.00					3.00	3.00			

Signal Operations

Phase Combination		1	2	3	4
EB	Left	*			
	Thru	*			
	Right	*			
	Peds				
WB	Left				
	Thru				
	Right				
	Peds				
NB	Right				
SB	Right				
Green		45.0A			
Yellow/AR		5.0			

		5	6	7	8
NB	Left				
	Thru	*			
	Right	*			
	Peds				
SB	Left				
	Thru				
	Right				
	Peds				
EB	Right				
WB	Right				
Green		25.0A			
Yellow/AR		5.0			

Cycle Length: 80 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	Approach: LOS
EB	LTR	4194	7139	0.609	0.587	7.0	B	7.0	B
NB	T	558	1652	0.737	0.338	18.6	C	16.4	C
	R	971	2878	0.582	0.338	14.8	B		

Intersection Delay = 9.6 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.656

1985 HCM:MULTILANE HIGHWAYS

FACILITY SECTION..... KALAKAUA W KALAIHOKU
ANALYST.............. PP
TIME OF ANALYSIS..... PM PEAK
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KAWKAXP.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

NO. OF LANES..................... 4
INPUT VOLUME..................... 2205
V/C RATIO........................ .41
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 773
SPEED (mph)...................... 42
DENSITY (pcpmpl)................. 20

1985 HCM:MULTILANE HIGHWAYS
****

FACILITY SECTION..... KALAIMOKU S OF KUHIO
ANALYST.............. PP
TIME OF ANALYSIS..... PM PEAK
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KASKUXP.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS
****

NO. OF LANES..................... 2
INPUT VOLUME..................... 370
V/C RATIO........................ .14
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 260
SPEED (mph)...................... 46
DENSITY (pcpmpl)................. 7

1985 HCM:MULTILANE HIGHWAYS
****

FACILITY SECTION..... KUHIO E OF KALAIMOKU
ANALYST.............. PP
TIME OF ANALYSIS..... PM PEAK
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KUEKAXP

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS
****

NO. OF LANES..................... 2
INPUT VOLUME..................... 758
V/C RATIO........................ .28
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 532
SPEED (mph)...................... 44
DENSITY (pcpmpl)................. 13

```
1985 HCM:MULTILANE HIGHWAYS
****************************************************************

   FACILITY SECTION..... LEWERS S OF KUHIO
   ANALYST.............. PP
   TIME OF ANALYSIS..... PM PEAK
   DATE OF ANALYSIS..... 08-28-1998
   OTHER INFORMATION.... LESKUXP

A) ADJUSTMENT FACTORS
   -------------------------------------------------------------
   PERCENTAGE OF TRUCKS................ 0  (TYPICAL - 200 #/HP)
   PERCENTAGE OF BUSES................. 2
   PERCENTAGE OF RECREATIONAL VEHICLES.. 0
   DESIGN SPEED (MPH).................. 50
   PEAK HOUR FACTOR.................... .9
   DRIVER POPULATION FACTOR............ 1  (WEEKDAY/COMMUTER)
   LANE WIDTH (FT)..................... 12
   OBSTRUCTIONS........................ NO
   DISTANCE (FT) FROM ROADWAY EDGE..... 6
   TYPE OF MULTILANE HIGHWAY........... SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS
   -------------------------------------------------------------
                   E      E      E      f      f      f      f
   TERRAIN TYPE     T      B      R     HV      w      p      E
   ------------ -----  -----  -----  -----  -----  -----  -----
          LEVEL   1.7    1.5    1.6   0.99   1.00   1.00   0.80

C) OPERATIONAL ANALYSIS RESULTS
   *******************************

   NO. OF LANES..................... 2
   INPUT VOLUME..................... 368
   V/C RATIO........................ .14
   LEVEL OF SERVICE.................B
   MAX. SERVICE FLOW RATE (pcphpl).. 258
   SPEED (mph)...................... 46
   DENSITY (pcpmpl)................. 7
```

APPENDIX D

LEVEL OF SERVICE ANALYSES
FOR YEAR 2001 WITHOUT PROJECT

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f       08-27-1998
                 Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                    (N-S) LEWERS ST
Analyst: CK                                 File Name: KUHLEWAP.HC9
Area Type: Other                            8-27-98 7-9 AM
Comment: YEAR 2001 W/OUT PROJECT
=======================================================================
            |   Eastbound    |   Westbound    |   Northbound   |   Southbound   |
            |  L    T    R   |  L    T    R   |  L    T    R   |  L    T    R   |
            | ---- ---- ---- | ---- ---- ---- | ---- ---- ---- | ---- ---- ---- |
No. Lanes   |  1    2    0   |  0    2  < 0   |  0  > 2  < 0   |  0    0    0   |
Volumes     |  50  475       |      265   42  |  17  105   27  |                |
Lane W (ft) |12.0 12.0       |      12.0      |      12.0      |                |
RTOR Vols   |            0   |             4  |             8  |                |
Lost Time   |3.00 3.00       |      3.00 3.00 |3.00 3.00 3.00  |                |
-----------------------------------------------------------------------
                              Signal Operations
Phase Combination 1     2     3     4  |        5     6     7     8
EB  Left          *                    |NB  Left     *
    Thru          *                    |    Thru     *
    Right                              |    Right    *
    Peds                               |    Peds
WB  Left                               |SB  Left
    Thru          *                    |    Thru
    Right         *                    |    Right
    Peds                               |    Peds
NB  Right                              |EB  Right
SB  Right                              |WB  Right
Green           40.0A                  |Green    20.0A
Yellow/AR        5.0                   |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                    Intersection Performance Summary
      Lane  Group:  Adj Sat   v/c     g/C                 Approach:
      Mvmts   Cap     Flow   Ratio   Ratio   Delay  LOS   Delay  LOS
      -----   ----  -------  -----   -----   -----  ---   -----  ---
EB    L        538     896   0.099   0.600     3.8   A      4.4   A
      T       1751    2918   0.303   0.600     4.5   A
WB    TR      1775    2958   0.208   0.600     4.1   A      4.1   A
NB    LTR     1118    3558   0.146   0.314    11.1   B     11.1   B
              Intersection Delay =   5.3 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.249
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f       08-27-1998
                Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                (N-S) KALAIMOKU ST
Analyst: CK                             File Name: KALKUHAP.HC9
Area Type: Other                        8-26-98 7-9 AM
Comment: YEAR 2001 W/OUT PROJECT
=======================================================================
            |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
            |  L    T    R |  L    T    R |  L    T    R |  L    T    R |
            | ---- ---- ---| ---- ---- ---| ---- ---- ---| ---- ---- ---|
No. Lanes   |  1    2    0 |  0    2 <  0 |  0 >  2 <  0 |  0    0    0
Volumes     |  35  483     |      253   40| 15  148   45 |
Lane W (ft) |12.0 12.0     |     12.0     |     12.0     |
RTOR Vols   |            0 |            4 |            5 |
Lost Time   |3.00 3.00     |     3.00 3.00|3.00 3.00 3.00|
-----------------------------------------------------------------------
                          Signal Operations
Phase Combination 1    2    3    4 |              5    6    7    8
EB  Left          *                |NB  Left      *
    Thru          *                |    Thru      *
    Right                          |    Right     *
    Peds                           |    Peds
WB  Left                           |SB  Left
    Thru          *                |    Thru
    Right         *                |    Right
    Peds                           |    Peds
NB  Right                          |EB  Right
SB  Right                          |WB  Right
Green          40.0A               |Green     20.0A
Yellow/AR       5.0                |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                  Intersection Performance Summary
     Lane   Group:  Adj Sat   v/c     g/C                   Approach:
     Mvmts   Cap     Flow    Ratio   Ratio   Delay  LOS   Delay   LOS
     -----  ----   -------   -----   -----   -----  ---   -----   ---
EB   L       562      936    0.073   0.600    3.8    A     4.5     A
     T      1780     2967    0.331   0.600    4.6    A
WB   TR     2053     3421    0.161   0.600    4.0    A     4.0     A
NB   LTR    1058     3366    0.233   0.314   11.5    B    11.5     B
            Intersection Delay =   5.8 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.298
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f       08-27-1998
                Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KALAKAUA AVE             (N-S) KALAIMOKU/SARATOGA
Analyst: CK                             File Name: KALKALAP.HC9
Area Type: Other                        8-26-98 7-9 AM
Comment: YEAR 2001 W/OUT PROJECT
=======================================================================
            |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
            |  L    T    R |  L    T    R |  L    T    R |  L    T    R |
            | ---- ---- ---| ---- ---- ---| ---- ---- ---| ---- ---- ---|
No. Lanes   |  0 >  4 <  0 |  0    0    0 |  0    1    2 |  0    0    0
Volumes     |  49 1931  149|              |      186  358|
Lane W (ft) |     12.0     |              |     12.0 12.0|
RTOR Vols   |           15 |              |            0 |
Lost Time   |3.00 3.00 3.00|              |     3.00 3.00|
-----------------------------------------------------------------------
                          Signal Operations
Phase Combination 1    2    3    4 |              5    6    7    8
EB  Left          *                |NB  Left
    Thru          *                |    Thru      *
    Right         *                |    Right     *
    Peds                           |    Peds
WB  Left                           |SB  Left
    Thru                           |    Thru
    Right                          |    Right
    Peds                           |    Peds
NB  Right                          |EB  Right
SB  Right                          |WB  Right
Green          50.0A               |Green     20.0A
Yellow/AR       5.0                |Yellow/AR 5.0
Cycle Length:  80 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                  Intersection Performance Summary
     Lane   Group:  Adj Sat   v/c     g/C                   Approach:
     Mvmts   Cap     Flow    Ratio   Ratio   Delay  LOS   Delay   LOS
     -----  ----   -------   -----   -----   -----  ---   -----   ---
EB   LTR    4250     6538    0.608   0.650    5.4    B     5.4     B
NB   T       418     1520    0.474   0.275   16.3    C    17.5     C
     R       670     2435    0.644   0.275   18.0    C
            Intersection Delay =   7.8 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.619
-----------------------------------------------------------------------
```

1985 HCM:MULTILANE HIGHWAYS

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*****************************************************************
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FACILITY SECTION..... KALAKAUA W KALAIMOKU
ANALYST.............. PP
TIME OF ANALYSIS..... AM W/O
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KAWKAIA.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

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********************************
```

NO. OF LANES...................... 4
INPUT VOLUME...................... 2129
V/C RATIO......................... .39
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 747
SPEED (mph)....................... 42
DENSITY (pcpmpl).................. 19

1985 HCM:MULTILANE HIGHWAYS

```
*****************************************************************
```

FACILITY SECTION..... KALAIMOKU S OF KUHIO
ANALYST.............. PP
TIME OF ANALYSIS..... AM PEAK
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KASKUIA.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

```
********************************
```

NO. OF LANES...................... 2
INPUT VOLUME...................... 208
V/C RATIO......................... .08
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 146
SPEED (mph)....................... 47
DENSITY (pcpmpl).................. 4

```
1985 HCM:MULTILANE HIGHWAYS
****************************************************************

   FACILITY SECTION..... KUHIO E OF KALAIMOKU
   ANALYST.............. PP
   TIME OF ANALYSIS..... AM W/O
   DATE OF ANALYSIS..... 08-28-1998
   OTHER INFORMATION.... KUEKAIA.

A) ADJUSTMENT FACTORS
   -------------------------------------------------------------
   PERCENTAGE OF TRUCKS................ 0  (TYPICAL - 200 #/HP)
   PERCENTAGE OF BUSES................. 2
   PERCENTAGE OF RECREATIONAL VEHICLES.. 0
   DESIGN SPEED (MPH).................. 50
   PEAK HOUR FACTOR.................... .9
   DRIVER POPULATION FACTOR............ 1  (WEEKDAY/COMMUTER)
   LANE WIDTH (FT)..................... 12
   OBSTRUCTIONS........................ NO
   DISTANCE (FT) FROM ROADWAY EDGE...... 6
   TYPE OF MULTILANE HIGHWAY........... SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS
   -------------------------------------------------------------
                    E      E      E      f      f      f      f
   TERRAIN TYPE     T      B      R      HV     w      p      E
   ------------  -----  -----  -----  -----  -----  -----  -----
          LEVEL   1.7    1.5    1.6   0.99   1.00   1.00   0.80

C) OPERATIONAL ANALYSIS RESULTS
   ********************************

   NO. OF LANES..................... 2
   INPUT VOLUME..................... 528
   V/C RATIO........................ .19
   LEVEL OF SERVICE.................B
   MAX. SERVICE FLOW RATE (pcphpl).. 370
   SPEED (mph)...................... 45
   DENSITY (pcpmpl)................. 9
```

```
1985 HCM:MULTILANE HIGHWAYS
****************************************************************

   FACILI,Y SECTION..... LEWERS S OF KUHIO
   ANALYST.............. PP
   TIME OF ANALYSIS..... AM W/O
   DATE OF ANALYSIS..... 08-28-1998
   OTHER INFORMATION.... LESJUIA.

A) ADJUSTMENT FACTORS
   -------------------------------------------------------------
   PERCENTAGE OF TRUCKS................ 0  (TYPICAL - 200 #/HP)
   PERCENTAGE OF BUSES................. 2
   PERCENTAGE OF RECREATIONAL VEHICLES.. 0
   DESIGN SPEED (MPH).................. 50
   PEAK HOUR FACTOR.................... .9
   DRIVER POPULATION FACTOR............ 1  (WEEKDAY/COMMUTER)
   LANE WIDTH (FT)..................... 12
   OBSTRUCTIONS........................ NO
   DISTANCE (FT) FROM ROADWAY EDGE...... 6
   TYPE OF MULTILANE HIGHWAY........... SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS
   -------------------------------------------------------------
                    E      E      E      f      f      f      f
   TERRAIN TYPE     T      B      R      HV     w      p      E
   ------------  -----  -----  -----  -----  -----  -----  -----
          LEVEL   1.7    1.5    1.6   0.99   1.00   1.00   0.80

C) OPERATIONAL ANALYSIS RESULTS
   ********************************

   NO. OF LANES..................... 2
   INPUT VOLUME..................... 149
   V/C RATIO........................ .06
   LEVEL OF SERVICE.................B
   MAX. SERVICE FLOW RATE (pcphpl).. 105
   SPEED (mph)...................... 47
   DENSITY (pcpmpl)................. 3
```

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4f 08-28-1998
Center For Microcomputers In Transportation

Streets: (E-W) KUHIO AVE (N-S) LEWERS ST
Analyst: CK File Name: KUHLEWPP.HC9
Area Type: Other 8-27-98 4-6 PM
Comment: YEAR 2001 W/OUT PROJECT

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	2	0	0	2 <	0	0 >	2 <	0	0	0	0
Volumes	94	707			302	50	53	282	55			
Lane W (ft)	12.0	12.0			12.0			12.0				
RTOR Vols			0			5			6			
Lost Time	3.00	3.00			3.00	3.00	3.00	3.00	3.00			

Signal Operations

Phase Combination	1	2	3	4
EB Left	*			
Thru	*			
Right				
Peds				
WB Left				
Thru	*			
Right	*			
Peds				
NB Right				
SB Right				
Green	40.0A			
Yellow/AR	5.0			

	5	6	7	8
NB Left	*			
Thru	*			
Right	*			
Peds				
SB Left				
Thru				
Right				
Peds				
EB Right				
WB Right				
Green	20.0A			
Yellow/AR	5.0			

Cycle Length: 70 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	507	846	0.219	0.600	4.2	A	4.9	A
	T	1990	3316	0.439	0.600	5.0	A		
WB	TR	1883	3138	0.215	0.600	4.2	A	4.2	A
NB	LTR	1152	3665	0.487	0.314	12.8	B	12.8	B

Intersection Delay = 7.0 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.456

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4f 08-27-1998
Center For Microcomputers In Transportation

Streets: (E-W) KUHIO AVE (N-S) KALAIHOKU ST
Analyst: CK File Name: KALKUHPP.HC9
Area Type: Other 8-26-98 4-6 PM
Comment: YEAR 2001 W/OUT PROJECT

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	2	0	0	2 <	0	0 >	2 <	0	0	0	0
Volumes	54	717			288	70	37	268	87			
Lane W (ft)	12.0	12.0			12.0			12.0				
RTOR Vols			0			7			9			
Lost Time	3.00	3.00			3.00	3.00	3.00	3.00	3.00			

Signal Operations

Phase Combination	1	2	3	4
EB Left	*			
Thru	*			
Right				
Peds				
WB Left				
Thru	*			
Right	*			
Peds				
NB Right				
SB Right				
Green	40.0A			
Yellow/AR	5.0			

	5	6	7	8
NB Left	*			
Thru	*			
Right	*			
Peds				
SB Left				
Thru				
Right				
Peds				
EB Right				
WB Right				
Green	20.0A			
Yellow/AR	5.0			

Cycle Length: 70 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	498	830	0.122	0.600	3.9	A	4.8	A
	T	2023	3372	0.418	0.600	4.9	A		
WB	TR	1849	3081	0.224	0.600	4.2	A	4.2	A
NB	LTR	1008	3208	0.481	0.314	12.8	B	12.8	B

Intersection Delay = 6.8 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.440

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4f 08-28-1998
Center For Microcomputers In Transportation

Streets: (E-W) KALAKAUA AVE (N-S) KALAIMOKU/SARATOGA
Analyst: CK File Name: KALKALPP.HC9
Area Type: Other 8-26-98 4-6 PM
Comment: YEAR 2001 W/OUT PROJECT

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	> 4	< 0	0	0	0	0	1	2	0	0	0
Volumes	84	2048	206					392	477			
Lane W (ft)		12.0						12.0	12.0			
RTOR Vols			21						0			
Lost Time	3.00	3.00	3.00					3.00	3.00			

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	*				NB Left				
Thru	*				Thru	*			
Right	*				Right	*			
Peds					Peds				
WB Left					SB Left				
Thru					Thru				
Right					Right				
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	45.0A				Green	25.0A			
Yellow/AR	5.0				Yellow/AR	5.0			

Cycle Length: 80 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	Approach: LOS
EB	LTR	4154	7071	0.653	0.587	7.4	B	7.4	B
NB	T	558	1652	0.782	0.338	20.3	C	17.3	C
	R	971	2878	0.617	0.338	15.2	C		

Intersection Delay = 10.1 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.700

1985 HCM:MULTILANE HIGHWAYS

FACILITY SECTION..... KALAKAUA W KALAIMOKU
ANALYST.............. PP
TIME OF ANALYSIS..... PM W/O
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KAWKAIP.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................ 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH).................. 50
PEAK HOUR FACTOR.................... .9
DRIVER POPULATION FACTOR............ 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)..................... 12
OBSTRUCTIONS........................ NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY........... SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

NO. OF LANES..................... 4
INPUT VOLUME..................... 2338
V/C RATIO........................ .43
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 820
SPEED (mph)...................... 41
DENSITY (pcpmpl)................. 21

1985 HCM:MULTILANE HIGHWAYS
****

FACILITY SECTION..... KALAIMOKU S OF KUHIO
ANALYST.............. PP
TIME OF ANALYSIS..... PM PEAK
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KASKU1P.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS
****

NO. OF LANES..................... 2
INPUT VOLUME..................... 392
V/C RATIO........................ .14
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 275
SPEED (mph)...................... 46
DENSITY (pcpmpl)................. 7

1985 HCM:MULTILANE HIGHWAYS
****

FACILITY SECTION..... KUHIO E OF KALAIMOKU
ANALYST.............. PP
TIME OF ANALYSIS..... PM W/O
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KUEKA1P.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS
****

NO. OF LANES..................... 2
INPUT VOLUME..................... 804
V/C RATIO........................ .3
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 564
SPEED (mph)...................... 44
DENSITY (pcpmpl)................. 14

0000 0005 0725

1985 HCM:MULTILANE HIGHWAYS

```
FACILITY SECTION..... LEWERS S OF KUHIO
ANALYST.............. PP
TIME OF ANALYSIS..... PM W/O
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... LESKUIP.
```

A) ADJUSTMENT FACTORS

```
PERCENTAGE OF TRUCKS................. 0  (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1  (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED
```

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

```
NO. OF LANES..................... 2
INPUT VOLUME..................... 390
V/C RATIO........................ .14
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 274
SPEED (mph)...................... 46
DENSITY (pcpmpl)................. 7
```

APPENDIX E

LEVEL OF SERVICE ANALYSES
FOR YEAR 2001 WITH PROJECT

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4f 08-28-1998
Center For Microcomputers In Transportation

Streets: (E-W) KUHIO AVE (N-S) LEWERS ST
Analyst: CK File Name: KUHLEWAW.HC9
Area Type: Other 8-27-98 7-9 AM
Comment: YEAR 2001 W/ PROJECT

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	0	2 <	0	0 >	2 <	0	0	0	0
Volumes	54	518			298	42	17	105	27			
Lane W (ft)	12.0	12.0			12.0			12.0				
RTOR Vols			0			4			8			
Lost Time	3.00	3.00			3.00	3.00	3.00	3.00	3.00			

Signal Operations

Phase Combination	1	2	3	4
EB Left	*			
Thru	*			
Right				
Peds				
WB Left				
Thru	*			
Right	*			
Peds				
NB Right				
SB Right				
Green	40.0A			
Yellow/AR	5.0			

	5	6	7	8
NB Left	*			
Thru	*			
Right	*			
Peds				
SB Left				
Thru				
Right				
Peds				
EB Right				
WB Right				
Green	20.0A			
Yellow/AR	5.0			

Cycle Length: 70 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	502	836	0.114	0.600	3.9	A	4.5	A
	T	1751	2918	0.331	0.600	4.6	A		
WB	TR	1778	2964	0.231	0.600	4.2	A	4.2	A
NB	LTR	1118	3558	0.146	0.314	11.1	B	11.1	B

Intersection Delay = 5.3 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.267

```
HCM: SIGNALIZED INTERSECTION SUMMARY    Version 2.4f        08-28-1998
                  Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                (N-S) KALAIHOKU ST
Analyst: CK                             File Name: KALKUHAW.HC9
Area Type: Other                        8-26-98 7-9 AM
Comment: YEAR 2001 W/ PROJECT
=======================================================================
              |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
              |  L    T    R  |  L    T    R  |  L    T    R  |  L    T    R  |
              | ---- ---- ----| ---- ---- ----| ---- ---- ----| ---- ---- ----|
No. Lanes     |  1    2    0  |  0    2  < 0  |  0  > 2  < 0  |  0    0    0
Volumes       |  35  546      |      276   44 |  15  148   75 |
Lane W (ft)   |12.0 12.0      |     12.0      |     12.0      |
RTOR Vols     |            0  |            4  |            8  |
Lost Time     |3.00 3.00      |     3.00 3.00 |3.00 3.00 3.00 |
-----------------------------------------------------------------------
                          Signal Operations
Phase Combination 1    2    3    4  |                5    6    7    8
EB  Left          *                 |NB  Left        *
    Thru          *                 |    Thru        *
    Right                           |    Right       *
    Peds                            |    Peds
WB  Left                            |SB  Left
    Thru          *                 |    Thru
    Right         *                 |    Right
    Peds                            |    Peds
NB  Right                           |EB  Right
SB  Right                           |WB  Right
Green           40.0A               |Green    20.0A
Yellow/AR        5.0                |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                 Intersection Performance Summary
    Lane   Group:  Adj Sat   v/c     g/C                   Approach:
    Mvmts   Cap     Flow    Ratio   Ratio   Delay  LOS   Delay   LOS
    -----  ----   -------   -----   -----   -----  ---   -----   ---
EB  L       535      892    0.077   0.600    3.8    A     4.7     A
    T      1780     2967    0.375   0.600    4.7    A
WB  TR     2052     3419    0.176   0.600    4.0    A     4.0     A
NB  LTR    1023     3256    0.274   0.314   11.7    B    11.7     B
               Intersection Delay =   6.0 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)     = 0.340
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY    Version 2.4f        08-28-1998
                  Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KALAKAUA AVE             (N-S) KALAIHOKU/SARATOGA
Analyst: CK                             File Name: KALKALAW.HC9
Area Type: Other                        8-26-98 7-9 AM
Comment: YEAR 2001 W/ PROJECT
=======================================================================
              |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
              |  L    T    R  |  L    T    R  |  L    T    R  |  L    T    R  |
              | ---- ---- ----| ---- ---- ----| ---- ---- ----| ---- ---- ----|
No. Lanes     |  0  > 4  < 0  |  0    0    0  |  0    1    2  |  0    0    0
Volumes       |  55 1931  149 |               |      216  358 |
Lane W (ft)   |     12.0      |               |     12.0 12.0 |
RTOR Vols     |           15  |               |            0  |
Lost Time     |3.00 3.00 3.00 |               |     3.00 3.00 |
-----------------------------------------------------------------------
                          Signal Operations
Phase Combination 1    2    3    4  |                5    6    7    8
EB  Left          *                 |NB  Left
    Thru          *                 |    Thru        *
    Right         *                 |    Right       *
    Peds                            |    Peds
WB  Left                            |SB  Left
    Thru                            |    Thru
    Right                           |    Right
    Peds                            |    Peds
NB  Right                           |EB  Right
SB  Right                           |WB  Right
Green           50.0A               |Green    20.0A
Yellow/AR        5.0                |Yellow/AR 5.0
Cycle Length:  80 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                 Intersection Performance Summary
    Lane   Group:  Adj Sat   v/c     g/C                   Approach:
    Mvmts   Cap     Flow    Ratio   Ratio   Delay  LOS   Delay   LOS
    -----  ----   -------   -----   -----   -----  ---   -----   ---
EB  LTR    4249     6538    0.610   0.650    5.4    B     5.4     B
NB  T       418     1520    0.550   0.275   17.2    C    17.7     C
    R       670     2435    0.644   0.275   18.0    C
               Intersection Delay =   7.9 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)     = 0.620
-----------------------------------------------------------------------
```

```
1985 HCM:MULTILANE HIGHWAYS
*************************************************************

   FACILITY SECTION..... KALAKAUA W KALAIMOKU
   ANALYST.............. PP
   TIME OF ANALYSIS..... AM WITH
   DATE OF ANALYSIS..... 08-28-1998
   OTHER INFORMATION.... KAWKA2A.

A) ADJUSTMENT FACTORS
   ----------------------------------------------------------
   PERCENTAGE OF TRUCKS................. 0  (TYPICAL - 200 #/HP)
   PERCENTAGE OF BUSES.................. 2
   PERCENTAGE OF RECREATIONAL VEHICLES.. 0
   DESIGN SPEED (MPH)................... 50
   PEAK HOUR FACTOR..................... .9
   DRIVER POPULATION FACTOR............. 1  (WEEKDAY/COMMUTER)
   LANE WIDTH (FT)...................... 12
   OBSTRUCTIONS......................... NO
   DISTANCE (FT) FROM ROADWAY EDGE...... 6
   TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS
   ----------------------------------------------------------
                    E      E      E      f      f      f      f
   TERRAIN TYPE     T      B      R      HV     w      p      E
   ------------   -----  -----  -----  -----  -----  -----  -----
          LEVEL    1.7    1.5    1.6   0.99   1.00   1.00   0.80

C) OPERATIONAL ANALYSIS RESULTS
   ******************************

   NO. OF LANES..................... 4
   INPUT VOLUME..................... 2135
   V/C RATIO........................ .39
   LEVEL OF SERVICE.................B
   MAX. SERVICE FLOW RATE (pcphpl).. 749
   SPEED (mph)...................... 42
   DENSITY (pcpmpl)................. 19
```

```
1985 HCM:MULTILANE HIGHWAYS
*************************************************************

   FACILITY SECTION..... KALAIMOKU S OF KUHIO
   ANALYST.............. PP
   TIME OF ANALYSIS..... AM WITH
   DATE OF ANALYSIS..... 08-28-1998
   OTHER INFORMATION.... KASKU2A.

A) ADJUSTMENT FACTORS
   ----------------------------------------------------------
   PERCENTAGE OF TRUCKS................. 0  (TYPICAL - 200 #/HP)
   PERCENTAGE OF BUSES.................. 2
   PERCENTAGE OF RECREATIONAL VEHICLES.. 0
   DESIGN SPEED (MPH)................... 50
   PEAK HOUR FACTOR..................... .9
   DRIVER POPULATION FACTOR............. 1  (WEEKDAY/COMMUTER)
   LANE WIDTH (FT)...................... 12
   OBSTRUCTIONS......................... NO
   DISTANCE (FT) FROM ROADWAY EDGE...... 6
   TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS
   ----------------------------------------------------------
                    E      E      E      f      f      f      f
   TERRAIN TYPE     T      B      R      HV     w      p      E
   ------------   -----  -----  -----  -----  -----  -----  -----
          LEVEL    1.7    1.5    1.6   0.99   1.00   1.00   0.80

C) OPERATIONAL ANALYSIS RESULTS
   ******************************

   NO. OF LANES..................... 2
   INPUT VOLUME..................... 238
   V/C RATIO........................ .09
   LEVEL OF SERVICE.................B
   MAX. SERVICE FLOW RATE (pcphpl).. 167
   SPEED (mph)...................... 47
   DENSITY (pcpmpl)................. 4
```

1985 HCM:MULTILANE HIGHWAYS

****

FACILITY SECTION..... KUHIO E OF KALAIMOKU
ANALYST.............. PP
TIME OF ANALYSIS..... AM WITH
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KUEKA2A.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

NO. OF LANES......................... 2
INPUT VOLUME......................... 621
V/C RATIO............................ .23
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 436
SPEED (mph)....................... 45
DENSITY (pcpmpl).................. 11

1985 HCM:MULTILANE HIGHWAYS

****

FACILITY SECTION..... LEWERS S OF KUHIO
ANALYST.............. PP
TIME OF ANALYSIS..... AM WITH
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... LESKU2A.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

NO. OF LANES......................... 2
INPUT VOLUME......................... 149
V/C RATIO............................ .06
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 105
SPEED (mph)....................... 47
DENSITY (pcpmpl).................. 3

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        08-28-1998
                Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KALAKAUA AVE             (N-S) KALAIMOKU/SARATOGA
Analyst: CK                             File Name: KALKALPW.HC9
Area Type: Other                        8-26-98 4-6 PM
Comment: YEAR 2001 W/ PROJECT
=======================================================================
            |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
            |  L   T   R   |  L   T   R   |  L   T   R   |  L   T   R   |
            | ---- ---- ---|---- ---- ----|---- ---- ----|---- ---- ----|
No. Lanes   |  0 > 4  < 0  |  0    0    0 |  0    1    2 |  0    0    0
Volumes     |  133 2048 206|              |      460  477|
Lane W (ft) |      12.0    |              |     12.0 12.0|
RTOR Vols   |           21 |              |             0|
Lost Time   |3.00 3.00 3.00|              |     3.00 3.00|
-----------------------------------------------------------------------
                           Signal Operations
Phase Combination 1    2    3    4  |          5    6    7    8
EB  Left          *                 |NB  Left
    Thru          *                 |    Thru  *
    Right         *                 |    Right *
    Peds                            |    Peds
WB  Left                            |SB  Left
    Thru                            |    Thru
    Right                           |    Right
    Peds                            |    Peds
NB  Right                           |EB  Right
SB  Right                           |WB  Right
Green          45.0A                |Green    25.0A
Yellow/AR       5.0                 |Yellow/AR 5.0
Cycle Length:  80 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                  Intersection Performance Summary
    Lane  Group:  Adj Sat    v/c    g/C                  Approach:
    Mvmts   Cap     Flow    Ratio  Ratio   Delay  LOS  Delay   LOS
    -----  ----  -------   -----  -----   -----  ---  -----   ---
EB  LTR    4151     7066   0.667  0.587     7.5   B     7.5    B
NB  T       558     1652   0.916  0.338    30.8   D    22.4    C
    R       971     2878   0.617  0.338    15.2   C
             Intersection Delay =  11.8 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)     = 0.758
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        08-28-1998
                Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                (N-S) KALAIMOKU ST
Analyst: CK                             File Name: KALKUHPW.HC9
Area Type: Other                        8-26-98 4-6 PM
Comment: YEAR 2001 W/ PROJECT
=======================================================================
            |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
            |  L   T   R   |  L   T   R   |  L   T   R   |  L   T   R   |
            | ---- ---- ---|---- ---- ----|---- ---- ----|---- ---- ----|
No. Lanes   |  1    2    0 |  0    2  < 0 |  0 > 2  < 0  |  0    0    0
Volumes     |   54  821    |      352   84|   41  301 167|
Lane W (ft) |12.0 12.0     |     12.0     |     12.0     |
RTOR Vols   |             0|             8|            17|
Lost Time   |3.00 3.00     |     3.00 3.00|3.00 3.00 3.00|
-----------------------------------------------------------------------
                           Signal Operations
Phase Combination 1    2    3    4  |          5    6    7    8
EB  Left          *                 |NB  Left  *
    Thru          *                 |    Thru  *
    Right                           |    Right *
    Peds                            |    Peds
WB  Left                            |SB  Left
    Thru          *                 |    Thru
    Right         *                 |    Right
    Peds                            |    Peds
NB  Right                           |EB  Right
SB  Right                           |WB  Right
Green          40.0A                |Green    20.0A
Yellow/AR       5.0                 |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                  Intersection Performance Summary
    Lane  Group:  Adj Sat    v/c    g/C                  Approach:
    Mvmts   Cap     Flow    Ratio  Ratio   Delay  LOS  Delay   LOS
    -----  ----  -------   -----  -----   -----  ---  -----   ---
EB  L       427      712   0.143  0.600     4.0   A     5.1    B
    T      2023     3372   0.479  0.600     5.2   B
WB  TR     1850     3083   0.273  0.600     4.3   A     4.3    A
NB  LTR     943     2999   0.661  0.314    14.6   B    14.6    B
             Intersection Delay =   7.7 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)     = 0.541
-----------------------------------------------------------------------
```

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4f 08-28-1998
Center For Microcomputers In Transportation

Streets: (E-W) KUHIO AVE (N-S) LEWERS ST
Analyst: CK File Name: KUHLEWPW.HC9
Area Type: Other 8-27-98 4-6 PM
Comment: YEAR 2001 W/ PROJECT

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	0	2	< 0	0	> 2	< 0	0	0	0
Volumes	112	849			356	50	53	282	55			
Lane W (ft)	12.0	12.0			12.0			12.0				
RTOR Vols			0			5			6			
Lost Time	3.00	3.00			3.00	3.00	3.00	3.00	3.00			

Signal Operations

Phase Combination	1	2	3	4
EB Left	*			
Thru	*			
Right				
Peds				
WB Left				
Thru	*			
Right	*			
Peds				
NB Right				
SB Right				
Green	40.0A			
Yellow/AR	5.0			

	5	6	7	8
NB Left	*			
Thru	*			
Right	*			
Peds				
SB Left				
Thru				
Right				
Peds				
EB Right				
WB Right				
Green	20.0A			
Yellow/AR	5.0			

Cycle Length: 70 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	454	757	0.290	0.600	4.5	A	5.4	B
	T	1990	3316	0.527	0.600	5.5	B		
WB	TR	1888	3146	0.248	0.600	4.3	A	4.3	A
NB	LTR	1152	3665	0.487	0.314	12.8	B	12.8	B

Intersection Delay = 7.0 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.513

1985 HCM:MULTILANE HIGHWAYS

FACILITY SECTION..... KALAKAUA W KALAIMOKU
ANALYST.............. PP
TIME OF ANALYSIS..... PM WITH
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KAWKA2P.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................. 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

NO. OF LANES..................... 4
INPUT VOLUME..................... 2387
V/C RATIO........................ .44
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 837
SPEED (mph)...................... 41
DENSITY (pcpmpl)................. 22

1985 HCM:MULTILANE HIGHWAYS

FACILITY SECTION..... KALAIMOKU S OF KUHIO
ANALYST.............. PP
TIME OF ANALYSIS..... PM WITH
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KASKU2P.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................ 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH).................. 50
PEAK HOUR FACTOR.................... .9
DRIVER POPULATION FACTOR............ 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)..................... 12
OBSTRUCTIONS........................ NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY........... SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

NO. OF LANES.................... 2
INPUT VOLUME.................... 509
V/C RATIO....................... .19
LEVEL OF SERVICE................B
MAX. SERVICE FLOW RATE (pcphpl).. 357
SPEED (mph)..................... 45
DENSITY (pcpmpl)................ 9

1985 HCM:MULTILANE HIGHWAYS

FACILITY SECTION..... KUHIO E OF KALAIMOKU
ANALYST.............. PP
TIME OF ANALYSIS..... PM WITH
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... KUEKA2P.

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS................ 0 (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH).................. 50
PEAK HOUR FACTOR.................... .9
DRIVER POPULATION FACTOR............ 1 (WEEKDAY/COMMUTER)
LANE WIDTH (FT)..................... 12
OBSTRUCTIONS........................ NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY........... SUBURBAN, UNDIVIDED

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS

NO. OF LANES.................... 2
INPUT VOLUME.................... 988
V/C RATIO....................... .36
LEVEL OF SERVICE................B
MAX. SERVICE FLOW RATE (pcphpl).. 693
SPEED (mph)..................... 43
DENSITY (pcpmpl)................ 17

1985 HCM:MULTILANE HIGHWAYS
****

```
FACILITY SECTION..... LEWERS S OF KUHIO
ANALYST.............. PP
TIME OF ANALYSIS..... PM WITH
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... LESKU2P.
```

A) ADJUSTMENT FACTORS

```
PERCENTAGE OF TRUCKS................. 0  (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1  (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED
```

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_W	f_P	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS
****

```
NO. OF LANES...................... 2
INPUT VOLUME...................... 390
V/C RATIO......................... .14
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 274
SPEED (mph)....................... 46
DENSITY (pcpmpl).................. 7
```

0000 0005 0734

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY

SEE FRAME(S) IMMEDIATELY FOLLOWING

1985 HCM:MULTILANE HIGHWAYS
****

```
FACILITY SECTION..... LEWERS S OF KUHIO
ANALYST.............. PP
TIME OF ANALYSIS..... PM WITH
DATE OF ANALYSIS..... 08-28-1998
OTHER INFORMATION.... LESKU2P.
```

A) ADJUSTMENT FACTORS

```
-------------------------------------------------------------
PERCENTAGE OF TRUCKS................. 0  (TYPICAL - 200 #/HP)
PERCENTAGE OF BUSES.................. 2
PERCENTAGE OF RECREATIONAL VEHICLES.. 0
DESIGN SPEED (MPH)................... 50
PEAK HOUR FACTOR..................... .9
DRIVER POPULATION FACTOR............. 1  (WEEKDAY/COMMUTER)
LANE WIDTH (FT)...................... 12
OBSTRUCTIONS......................... NO
DISTANCE (FT) FROM ROADWAY EDGE...... 6
TYPE OF MULTILANE HIGHWAY............ SUBURBAN, UNDIVIDED
```

B) CORRECTION FACTORS

TERRAIN TYPE	E_T	E_B	E_R	f_{HV}	f_w	f_p	f_E
LEVEL	1.7	1.5	1.6	0.99	1.00	1.00	0.80

C) OPERATIONAL ANALYSIS RESULTS
****

```
NO. OF LANES..................... 2
INPUT VOLUME..................... 390
V/C RATIO........................ .14
LEVEL OF SERVICE.................B
MAX. SERVICE FLOW RATE (pcphpl).. 274
SPEED (mph)...................... 46
DENSITY (pcpmpl)................. 7
```

APPENDIX G

LEVEL OF SERVICE ANALYSES
FOR YEAR 2001 PEAK HOUR OF GENERATOR

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f       11-09-1998
              Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KALAKAUA AVE                (N-S) KALAIMOKU/SARATOGA
Analyst: CK                                File Name: KAKA-AM1.HC9
Area Type: Other                           8-26-98 7-9 AM
Comment: YEAR 2001 PEAK HOUR OF GENERATOR
=======================================================================
              |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
              | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
              |---- ---- ---- |---- ---- ---- |---- ---- ---- |---- ---- ---- |
No. Lanes     | 0  > 4  < 0   | 0    0    0   | 0    1    2   | 0    0    0
Volumes       | 109 1931  149|               |      254  358|
Lane W (ft)   |     12.0     |               |     12.0 12.0|
RTOR Vols     |           15|               |            0|
Lost Time     |3.00 3.00 3.00|               |     3.00 3.00|
-----------------------------------------------------------------------
                           Signal Operations
Phase Combination 1     2     3     4 |           5     6     7     8
EB  Left          *                   |NB  Left
    Thru          *                   |    Thru    *
    Right         *                   |    Right   *
    Peds                              |    Peds
WB  Left                              |SB  Left
    Thru                              |    Thru
    Right                             |    Right
    Peds                              |    Peds
NB  Right                             |EB  Right
SB  Right                             |WB  Right
Green           50.0A                 |Green    20.0A
Yellow/AR        5.0                  |Yellow/AR 5.0
Cycle Length:  80 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                  Intersection Performance Summary
     Lane   Group:   Adj Sat    v/c      g/C                  Approach:
     Mvmts   Cap      Flow     Ratio    Ratio   Delay  LOS    Delay  LOS
     -----  ----    -------    -----    -----   -----  ---    -----  ---
EB   LTR    4282      6588     0.621    0.650     5.5   B       5.5   B
NB   T       418      1520     0.646    0.275    18.9   C      18.4   C
     R       670      2435     0.644    0.275    18.0   C
              Intersection Delay =    8.2 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.628
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        11-09-1998
                Center For Microcomputers In Transportation
=========================================================================
Streets: (E-W) KALAKAUA AVE               (N-S) KALAIMOKU/SARATOGA
Analyst: CK                               File Name: KAKA-PM1.HC9
Area Type: Other                          8-26-98 4-6 PM
Comment: YEAR 2001 PEAK HOUR OF GENERATOR
=========================================================================
             |  Eastbound   |  Westbound   |  Northbound  |  Southbound
             | L    T    R  | L    T    R  | L    T    R  | L    T    R
             |---- ---- ----|---- ---- ----|---- ---- ----|---- ---- ----
No. Lanes    | 0  > 4  < 0  | 0    0    0  | 0    1    2  | 0    0    0
Volumes      | 138 2048  206|              |     474  477|
Lane W (ft)  |     12.0     |              |     12.0 12.0|
RTOR Vols    |           21 |              |            0|
Lost Time    |3.00 3.00 3.00|              |     3.00 3.00|
-------------------------------------------------------------------------
                          Signal Operations
Phase Combination 1    2    3    4 |            5    6    7    8
EB  Left          *                |NB  Left
    Thru          *                |    Thru    *
    Right         *                |    Right   *
    Peds                           |    Peds
WB  Left                           |SB  Left
    Thru                           |    Thru
    Right                          |    Right
    Peds                           |    Peds
NB  Right                          |EB  Right
SB  Right                          |WB  Right
Green          45.0A               |Green     25.0A
Yellow/AR       5.0                |Yellow/AR 5.0
Cycle Length:  80 secs  Phase combination order: #1 #5
-------------------------------------------------------------------------
                  Intersection Performance Summary
    Lane  Group:  Adj Sat   v/c     g/C                      Approach:
    Mvmts   Cap     Flow    Ratio   Ratio    Delay   LOS    Delay   LOS
    -----  ----   -------   -----   -----    -----   ---    -----   ---
EB  LTR    4151    7065     0.669   0.587     7.5     B      7.5     B
NB  T       558    1652     0.945   0.338    35.0     D     24.5     C
    R       971    2878     0.617   0.338    15.2     C
              Intersection Delay =  12.4 sec/veh Intersection LOS = B
Lost Time/Cycle, L =    6.0 sec   Critical v/c(x)     = 0.770
-------------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        11-09-1998
                Center For Microcomputers In Transportation
=========================================================================
Streets: (E-W) KUHIO AVE                  (N-S) KALAIMOKU ST
Analyst: CK                               File Name: KAKU-AM1.HC9
Area Type: Other                          8-26-98 7-9 AM
Comment: YEAR 2001 PEAK HOUR OF GENERATOR
=========================================================================
             |  Eastbound   |  Westbound   |  Northbound  |  Southbound
             | L    T    R  | L    T    R  | L    T    R  | L    T    R
             |---- ---- ----|---- ---- ----|---- ---- ----|---- ---- ----
No. Lanes    | 1    2    0  | 0    2  < 0  | 0  > 2  < 0  | 0    0    0
Volumes      |  35  628     |     358   56|  19  189  128|
Lane W (ft)  |12.0 12.0     |     12.0     |     12.0     |
RTOR Vols    |            0 |            6|           13|
Lost Time    |3.00 3.00     |     3.00 3.00|3.00 3.00 3.00|
-------------------------------------------------------------------------
                          Signal Operations
Phase Combination 1    2    3    4 |            5    6    7    8
EB  Left          *                |NB  Left    *
    Thru          *                |    Thru    *
    Right                          |    Right   *
    Peds                           |    Peds
WB  Left                           |SB  Left
    Thru          *                |    Thru
    Right         *                |    Right
    Peds                           |    Peds
NB  Right                          |EB  Right
SB  Right                          |WB  Right
Green          40.0A               |Green     20.0A
Yellow/AR       5.0                |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-------------------------------------------------------------------------
                  Intersection Performance Summary
    Lane  Group:  Adj Sat   v/c     g/C                      Approach:
    Mvmts   Cap     Flow    Ratio   Ratio    Delay   LOS    Delay   LOS
    -----  ----   -------   -----   -----    -----   ---    -----   ---
EB  L       448     746     0.092   0.600     3.8     A      4.9     A
    T      1780    2967     0.430   0.600     5.0     A
WB  TR     2053    3422     0.226   0.600     4.2     A      4.2     A
NB  LTR     995    3166     0.397   0.314    12.3     B     12.3     B
              Intersection Delay =   6.5 sec/veh Intersection LOS = B
Lost Time/Cycle, L =    6.0 sec   Critical v/c(x)     = 0.419
-------------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        11-09-1998
            Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                 (N-S) KALAIMOKU ST
Analyst: CK                              File Name: KAKU-PW1.HC9
Area Type: Other                         8-26-98 4-6 PM
Comment: YEAR 2001 PEAK HOUR OF GENERATOR
=======================================================================
             |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
             | L    T    R  | L    T    R  | L    T    R  | L    T    R  |
             |---- ---- ----|---- ---- ----|---- ---- ----|---- ---- ----|
No. Lanes    | 1    2    0  | 0    2  < 0  | 0  > 2  < 0  | 0    0    0
Volumes      |  54  844     |     348   82|  42  301  185|
Lane W (ft)  |12.0 12.0     |    12.0      |    12.0      |
RTOR Vols    |             0|             8|            19|
Lost Time    |3.00 3.00     |    3.00 3.00|3.00 3.00 3.00|
-----------------------------------------------------------------------
                          Signal Operations
Phase Combination 1     2     3     4 |              5     6     7     8
EB  Left          *                   |NB  Left      *
    Thru          *                   |    Thru      *
    Right                             |    Right     *
    Peds                              |    Peds
WB  Left                              |SB  Left
    Thru          *                   |    Thru
    Right         *                   |    Right
    Peds                              |    Peds
NB  Right                             |EB  Right
SB  Right                             |WB  Right
Green          40.0A                  |Green    20.0A
Yellow/AR       5.0                   |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                  Intersection Performance Summary
     Lane  Group:  Adj Sat    v/c     g/C                   Approach:
     Mvmts  Cap     Flow     Ratio   Ratio   Delay   LOS   Delay   LOS
     -----  ----   -------   -----   -----   -----   ---   -----   ---
EB   L       433     721     0.141   0.600    4.0     A     5.2     B
     T      2023    3372     0.492   0.600    5.3     B
WB   TR     1850    3083     0.269   0.600    4.3     A     4.3     A
NB   LTR     932    2964     0.692   0.314   15.1     C    15.1     C
             Intersection Delay =    7.9 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)     = 0.561
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f        11-09-1998
            Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                 (N-S) LEWERS ST
Analyst: CK                              File Name: KULE-AW1.HC9
Area Type: Other                         8-27-98 7-9 AM
Comment: YEAR 2001 PEAK HOUR OF GENERATOR
=======================================================================
             |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
             | L    T    R  | L    T    R  | L    T    R  | L    T    R  |
             |---- ---- ----|---- ---- ----|---- ---- ----|---- ---- ----|
No. Lanes    | 1    2    0  | 0    2  < 0  | 0  > 2  < 0  | 0    0    0
Volumes      |  68  670     |     357   42|  17  105   27|
Lane W (ft)  |12.0 12.0     |    12.0      |    12.0      |
RTOR Vols    |             0|             4|             8|
Lost Time    |3.00 3.00     |    3.00 3.00|3.00 3.00 3.00|
-----------------------------------------------------------------------
                          Signal Operations
Phase Combination 1     2     3     4 |              5     6     7     8
EB  Left          *                   |NB  Left      *
    Thru          *                   |    Thru      *
    Right                             |    Right     *
    Peds                              |    Peds
WB  Left                              |SB  Left
    Thru          *                   |    Thru
    Right         *                   |    Right
    Peds                              |    Peds
NB  Right                             |EB  Right
SB  Right                             |WB  Right
Green          40.0A                  |Green    20.0A
Yellow/AR       5.0                   |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                  Intersection Performance Summary
     Lane  Group:  Adj Sat    v/c     g/C                   Approach:
     Mvmts  Cap     Flow     Ratio   Ratio   Delay   LOS   Delay   LOS
     -----  ----   -------   -----   -----   -----   ---   -----   ---
EB   L       444     740     0.162   0.600    4.0     A     4.9     A
     T      1751    2918     0.428   0.600    5.0     A
WB   TR     1783    2972     0.270   0.600    4.3     A     4.3     A
NB   LTR    1118    3558     0.146   0.314   11.1     B    11.1     B
             Intersection Delay =    5.4 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)     = 0.331
-----------------------------------------------------------------------
```

```
HCM: SIGNALIZED INTERSECTION SUMMARY   Version 2.4f       11-09-1998
              Center For Microcomputers In Transportation
=======================================================================
Streets: (E-W) KUHIO AVE                (N-S) LEWERS ST
Analyst: CK                             File Name: KULE-PW1.HC9
Area Type: Other                        8-27-98 4-6 PM
Comment: YEAR 2001 PEAK HOUR OF GENERATOR
=======================================================================
           |  Eastbound  |  Westbound  |  Northbound  |  Southbound
           | L    T    R | L    T    R | L    T    R | L    T    R
           |---- ---- ----|---- ---- ----|---- ---- ----|---- ---- ----
No. Lanes  | 1    2    0 | 0    2  < 0 | 0  > 2  < 0 | 0    0    0
Volumes    | 110  841    |     365   50|  53  282   55|
Lane W (ft)|12.0 12.0    |     12.0    |      12.0   |
RTOR Vols  |            0|            5|             6|
Lost Time  |3.00 3.00    |     3.00 3.00|3.00 3.00 3.00|
-----------------------------------------------------------------------
                            Signal Operations
Phase Combination 1     2     3     4 |           5     6     7     8
EB  Left          *                   |NB  Left   *
    Thru          *                   |    Thru   *
    Right                             |    Right  *
    Peds                              |    Peds
WB  Left                              |SB  Left
    Thru          *                   |    Thru
    Right         *                   |    Right
    Peds                              |    Peds
NB  Right                             |EB  Right
SB  Right                             |WB  Right
Green           40.0A                 |Green     20.0A
Yellow/AR        5.0                  |Yellow/AR 5.0
Cycle Length:  70 secs  Phase combination order: #1 #5
-----------------------------------------------------------------------
                  Intersection Performance Summary
     Lane  Group:  Adj Sat   v/c     g/C                  Approach:
     Mvmts   Cap    Flow    Ratio   Ratio   Delay  LOS   Delay  LOS
     -----  ----  -------   -----   -----   -----  ---   -----  ---
EB   L       446      744   0.289   0.600     4.5   A     5.4    B
     T      1990     3316   0.522   0.600     5.5   B
WB   TR     1888     3147   0.254   0.600     4.3   A     4.3    A
NB   LTR    1152     3665   0.487   0.314    12.8   B    12.8    B
               Intersection Delay =   7.0 sec/veh Intersection LOS = B
Lost Time/Cycle, L =   6.0 sec   Critical v/c(x)    = 0.510
-----------------------------------------------------------------------
```

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Appendix D

ARCHAEOLOGICAL ASSESSMENT OF KING KALAKAUA PLAZA PHASE II WAIKIKI, ISLAND OF OAHU (TMK 2-6-18:10, 36, 42, 52, 55, 62, 63, 64, 73 & 74)

Prepared by Cultural Surveys Hawaii
August 1998

ARCHAEOLOGICAL ASSESSMENT OF KING KALAKAUA PLAZA PHASE II, WAIKĪKĪ, ISLAND OF O`AHU, (TMK 2-6-18:10, 36, 42, 52, 55, 62, 63, 64, 73 & 74)

by

Hallett H. Hammatt, Ph.D.
and
Rodney Chiogioji, B.A.

Prepared for

WILSON OKAMOTO & ASSOCIATES, INC.

Cultural Surveys Hawaii
August 1998

TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

A. Project Description

At the request of Wilson Okamoto & Associates, Inc., Cultural Surveys Hawaii has conducted an archaeological assessment of a 109,747 sq. foot parcel (TMK 2-6-18:10, 36, 42, 52, 55, 62, 63, 64, 73 & 74) in Waikīkī, on the island of O`ahu (Figure 1). The parcel is irregularly shaped and comprises the *`ewa* portion of the block bounded by Kalaimoku Street, Kuhio Avenue, Lewers Street and Kalakaua Avenue. The parcel was formerly occupied by a parking lot, an apartment building, and several commercial buildings - including those which formerly housed the Canlis Charcoal Broiler restaurant and Hula's Bar and Lei Stand.

B. Scope of Work

The scope of the work for the archaeological assessment comprised:

1. Historic background research including study of historic maps, archival documents, previous archaeological and historical studies, Land Commission Award records and other sources for the purpose of identifying existing and potential archaeological and historic sites. Particular emphasis was placed on identifying areas in which archaeological materials could be encountered during future development.

2. Assessment of possible historic buildings on the parcel.

3. Field inspection to document current conditions and existing structures.

4. Preparation of a report which details the results of the historic background research, the building assessment, and fieldwork; and which presents recommendations on archaeological mitigation measures appropriate to future development of the parcel.

C. Work Accomplished

Field inspection of the project area was accomplished on August 23, 1998.

Background research included: a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources; review of documents at Hamilton Library of the University of Hawai`i, the Hawai`i State Archives, the Mission Houses Museum Library, the Hawai`i Public Library, and the Archives of the Bishop Museum; study of historic photographs at the Hawai`i State Archives and the Archives of the Bishop Museum; and study of historic maps at the Survey Office of the Department of Land and Natural Resources.

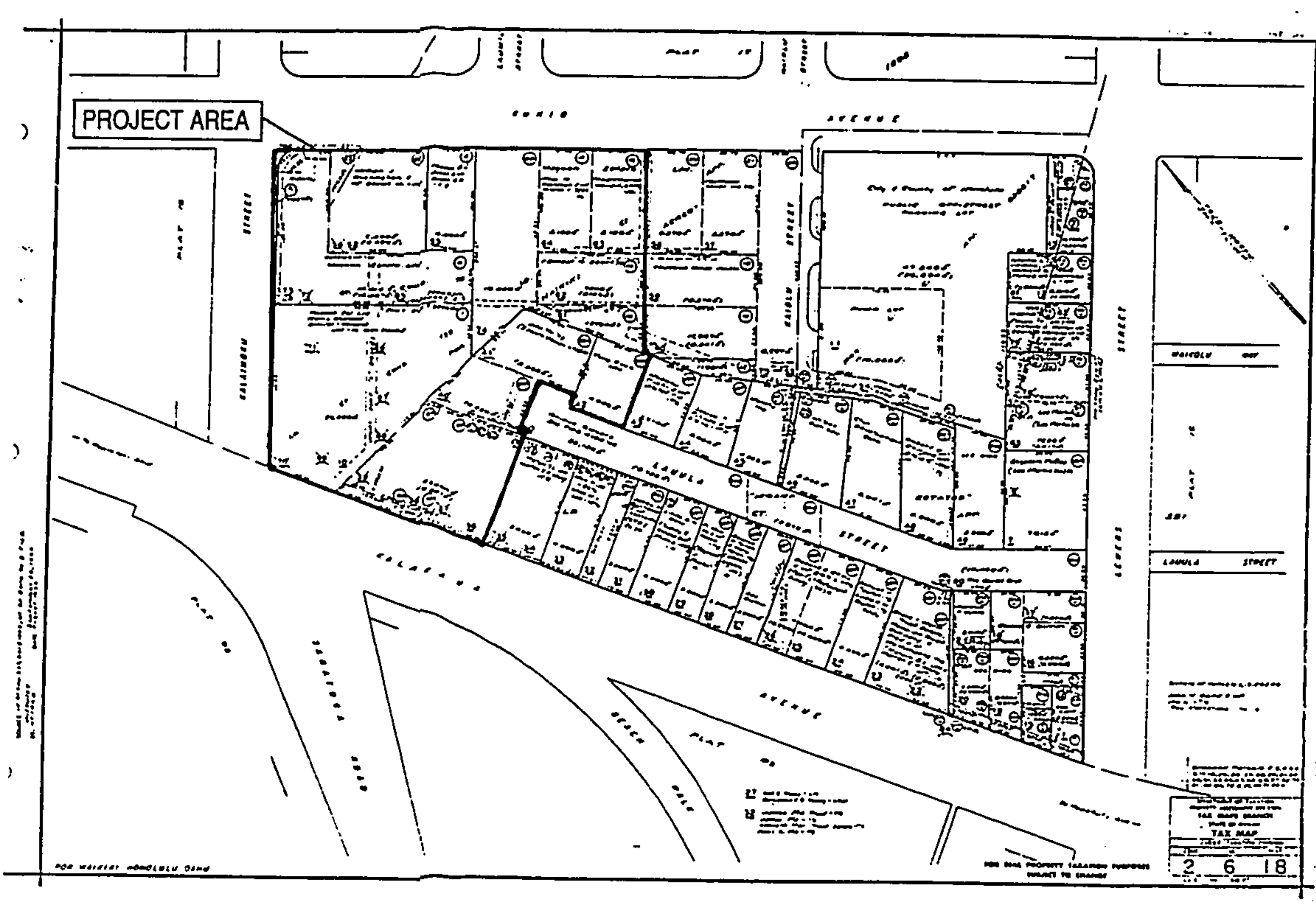

Figure 1 Tax map showing project area (TMK 2-16-18:10, 36, 42, 52, 55, 62, 63, 64, 73 & 74)

II. WAIKĪKĪ AND THE PRESENT PROJECT AREA: CULTURAL AND HISTORICAL DOCUMENTATION

This section begins with a review of the available documentary evidence for the general character of the area presently identified as Waikīkī as it had evolved in the years before western contact in the later 18th century. The development of Waikīkī lands adjacent to and including the present project area during the 19th century and into the early 20th century was recorded in increasingly detailed documentation - including government records and maps. Finally, during subsequent decades of the 20th century, abundant documentation of Waikīkī allows a more precise focus on development of the project area itself.

A. *Pre-contact to 1800s*

Waikīkī, by the time of the arrival of Europeans in the Hawaiian Islands during the late eighteenth century, had long been a center of population and political power on O`ahu. According to Martha Beckwith (1940), by the end of the fourteenth century Waikīkī had become "the ruling seat of the chiefs of Oahu." The preeminence of Waikīkī continued into the eighteenth century and is betokened by Kamehameha's decision to reside there upon wresting control of O`ahu by defeating the island's chief, Kalanikupule. The nineteenth century Hawaiian historian John Papa I`i (1959), himself a member of the *ali`i*, described the king's Waikīkī residence:

> Kamehameha's houses were at Puaaliilii, makai of the old road, and extended as far as the west side of the sands of Apuakehau. Within it was Helumoa where Kaahumanu *ma* went to while away the time. The king built a stone house there, enclosed by a fence.

I`i further noted that the "place had long been a residence of chiefs. It is said that it had been Kekuapoi's home, through her husband Kahahana, since the time of Kahekili."

Chiefly residences, however, were only one element of a complex of features - sustaining a large population - that characterized Waikīkī up to pre-contact times. Beginning in the fifteenth century, a vast system of irrigated taro fields was constructed, extending across the littoral plain from Waikīkī to lower Manoa and Palolo valleys. This field system - an impressive feat of engineering the design of which is traditionally attributed to the chief Kalamakua - took advantage of streams descending from Makiki, Manoa and Palolo valleys which also provided ample fresh water for the Hawaiians living in the *ahupua`a*. Water was also available from springs in nearby Mo`ili`ili and Punahou. Closer to the Waikīkī shoreline, coconut groves and fishponds dotted the landscape. A sizeable population developed amidst this Hawaiian-engineered abundance. Captain George Vancouver, arriving at "Whyteete" in 1792, captured something of this profusion in his journals:

> On shores, the villages appeared numerous, large, and in good repair; and the surrounding country pleasingly interspersed with deep, though not extensive valleys; which, with the plains near the sea-side, presented a high degree of cultivation and fertility.
>
> [Our] guides led us to the northward through the village, to an exceedingly well-made causeway, about twelve feet broad, with a ditch on each side.

> This opened our view to a spacious plain, which, in the immediate vicinity of the village, had the appearance of the open common fields in England; but, on advancing, the major part appeared to be divided into fields of irregular shape and figure, which were separated from each other by low stone walls, and were in a very high state of cultivation. These several portions of land were planted with the eddo or *taro* root, in different stages of inundation; none being perfectly dry, and some from three to six or seven inches under water. The causeway led us near a mile from the beach, at the end of which was the water we were in quest of. It was a rivulet five or six feet wide, and about two or three feet deep, well banked up, and nearly motionless; some small rills only, finding a passage through the dams that checked the sluggish stream, by which a constant supply was afforded to the *taro* plantations.
>
> [We] found the plain in a high state of cultivation, mostly under immediate crops of *taro*; and abounding with a variety of wild fowl, chiefly of the duck kind...The sides of the hills, which were at some distance, seemed rocky and barren; the intermediate vallies, which were all inhabited, produced some large trees, and made a pleasing appearance. The plain, however, if we may judge from the labour bestowed on their cultivation, seemed to afford the principal proportion of the different vegetable productions on which the inhabitants depend for their subsistence (Vancouver, 1798: I, 161-164).

Further details of the exuberant life that must have characterized the Hawaiians use of the lands that included the *ahupua`a* of Waikīkī are given by Archibald Menzies, a naturalist accompanying Vancouver's expedition:

> The verge of the shore was planted with a large grove of cocoanut palms, affording a delightful shade to the scattered habitations of the natives. Some of those near the beach were raised a few feet from the ground upon a kind of stage, so as to admit the surf to wash underneath them. We pursued a pleasing path back to the plantation, which was nearly level and very extensive, and laid out with great neatness into little fields planted with taro, yams, sweet potatoes and the cloth plant. These, in many cases, were divided by little banks on which grew the sugar cane and a species of *Draecena* without the aid of much cultivation, and the whole was watered in a most ingenious manner by dividing the general stream into little aqueducts leading in various directions so as to be able to supply the most distant fields at pleasure, and the soil seemed to repay the labour and industry of these people by the luxuriancy of its productions. Here and there we met with ponds of considerable size, and besides being well stocked with fish, they swarmed with water fowl of various kinds such as ducks, coots, water hens, bitterns, plovers and curlews. (Menzies 1920:23-24)

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CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY

SEE FRAME(S) IMMEDIATELY FOLLOWING

> This opened our view to a spacious plain, which, in the immediate vicinity of the village, had the appearance of the open common fields in England; but, on advancing, the major part appeared to be divided into fields of irregular shape and figure, which were separated from each other by low stone walls, and were in a very high state of cultivation. These several portions of land were planted with the eddo or *taro* root, in different stages of inundation; none being perfectly dry, and some from three to six or seven inches under water. The causeway led us near a mile from the beach, at the end of which was the water we were in quest of. It was a rivulet five or six feet wide, and about two or three feet deep, well banked up, and nearly motionless; some small rills only, finding a passage through the dams that checked the sluggish stream, by which a constant supply was afforded to the *taro* plantations.
>
> [We] found the plain in a high state of cultivation, mostly under immediate crops of *taro*; and abounding with a variety of wild fowl, chiefly of the duck kind...The sides of the hills, which were at some distance, seemed rocky and barren; the intermediate vallies, which were all inhabited, produced some large trees, and made a pleasing appearance. The plain, however, if we may judge from the labour bestowed on their cultivation, seemed to afford the principal proportion of the different vegetable productions on which the inhabitants depend for their subsistence (Vancouver, 1798: I, 161-164).

Further details of the exuberant life that must have characterized the Hawaiians use of the lands that included the *ahupua`a* of Waikīkī are given by Archibald Menzies, a naturalist accompanying Vancouver's expedition:

> The verge of the shore was planted with a large grove of cocoanut palms, affording a delightful shade to the scattered habitations of the natives. Some of those near the beach were raised a few feet from the ground upon a kind of stage, so as to admit the surf to wash underneath them. We pursued a pleasing path back to the plantation, which was nearly level and very extensive, and laid out with great neatness into little fields planted with taro, yams, sweet potatoes and the cloth plant. These, in many cases, were divided by little banks on which grew the sugar cane and a species of *Draecena* without the aid of much cultivation, and the whole was watered in a most ingenious manner by dividing the general stream into little aqueducts leading in various directions so as to be able to supply the most distant fields at pleasure, and the soil seemed to repay the labour and industry of these people by the luxuriancy of its productions. Here and there we met with ponds of considerable size, and besides being well stocked with fish, they swarmed with water fowl of various kinds such as ducks, coots, water hens, bitterns, plovers and curlews. (Menzies 1920:23-24)

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However, the traditional Hawaiian focus on Waikīkī as a center of chiefly and agricultural activities on southeastern O`ahu was soon to change - disrupted by the same Euro-American contact which produced the first documentation (including the records cited above) of that traditional life. The *ahupua`a* of Honolulu - with the only sheltered harbor on O`ahu - became the center for trade with visiting foreign vessels, drawing increasing numbers of Hawaiians away from their traditional environments. The shift in pre-eminence is illustrated by the fact that Kamehameha moved his residence from Waikīkī to Honolulu. Indeed, by 1828, Levi Chamberlain describing a journey into Waikīkī would note:

> Our path led us along the borders of extensive plats of marshy ground, having raised banks on one or more sides, and which were once filled with water, and replenished abundantly with esculent fish; but now overgrown with tall rushes waving in the wind. The land all around for several miles has the appearance of having once been under cultivation. I entered into conversation with the natives respecting this present neglected state. They ascribed it to the decrease of population (Chamberlain 1957:26).

Tragically, the depopulation of Waikīkī was not simply a result of the attractions of Honolulu (where, by the 1820s, the population was estimated at 6,000 to 7,000) but also of the European diseases that had devastating effects upon the Hawaiian populace.

The depopulation of Waikiki, however, was not total and the *ahupua`a* continued to sustain Hawaiians living traditionally into the nineteenth century. Land Commission Award records from the 1850s document awardees continuing to maintain fishponds and irrigated and dry-land agricultural plots though on a greatly reduced scale than had been possible previously with adequate manpower.

An 1881 map of Waikīkī shows a network of fishponds *makai* of the government road (route of the present Kalakaua Ave.) in the present F.t DeRussy area (Figure 2). The map indicates that a stream or *`auwai* (ditch)- which fed the fishponds - coursed within the *`ewa* side of the project area. (This *`auwai* was entered on the State Inventory of Historic Places as site 50-80-14-4970 during archaeological study at Ft. DeRussy; see Section III below.) The map also indicates that, at the Mahele, portions of the present project area were awarded to William C. Lunalilo (LCA 8559B:29) and to Kauhao (LCA 6386:7). Documents associated with these awards do not reveal what specific activities or land usages were occurring on these parcels at mid-19th century.

Waikīkī was becoming a popular site among foreigners - mostly American - who had settled on O`ahu; an 1865 article in the Pacific Commercial Advertiser mentioned a small community that had developed along the beach. The area continued to be popular with the ali`i - the Hawaiian royalty - and several notables had residences there. Other developments during the second half of the nineteenth century - prefiguring the changes that would alter the landscape of Waikīkī during this century - include the improvement of the road connecting Waikīkī to Honolulu (the route of the present Kalakaua Ave.), the building of a tram line between the two areas, and the construction of Kapiolani Park.

Traditional land-uses were abandoned or modified. By the end of the nineteenth century most of the fish ponds that had previously proliferated had been neglected and allowed to deteriorate. The remaining taro fields were planted in rice to supply the growing numbers of

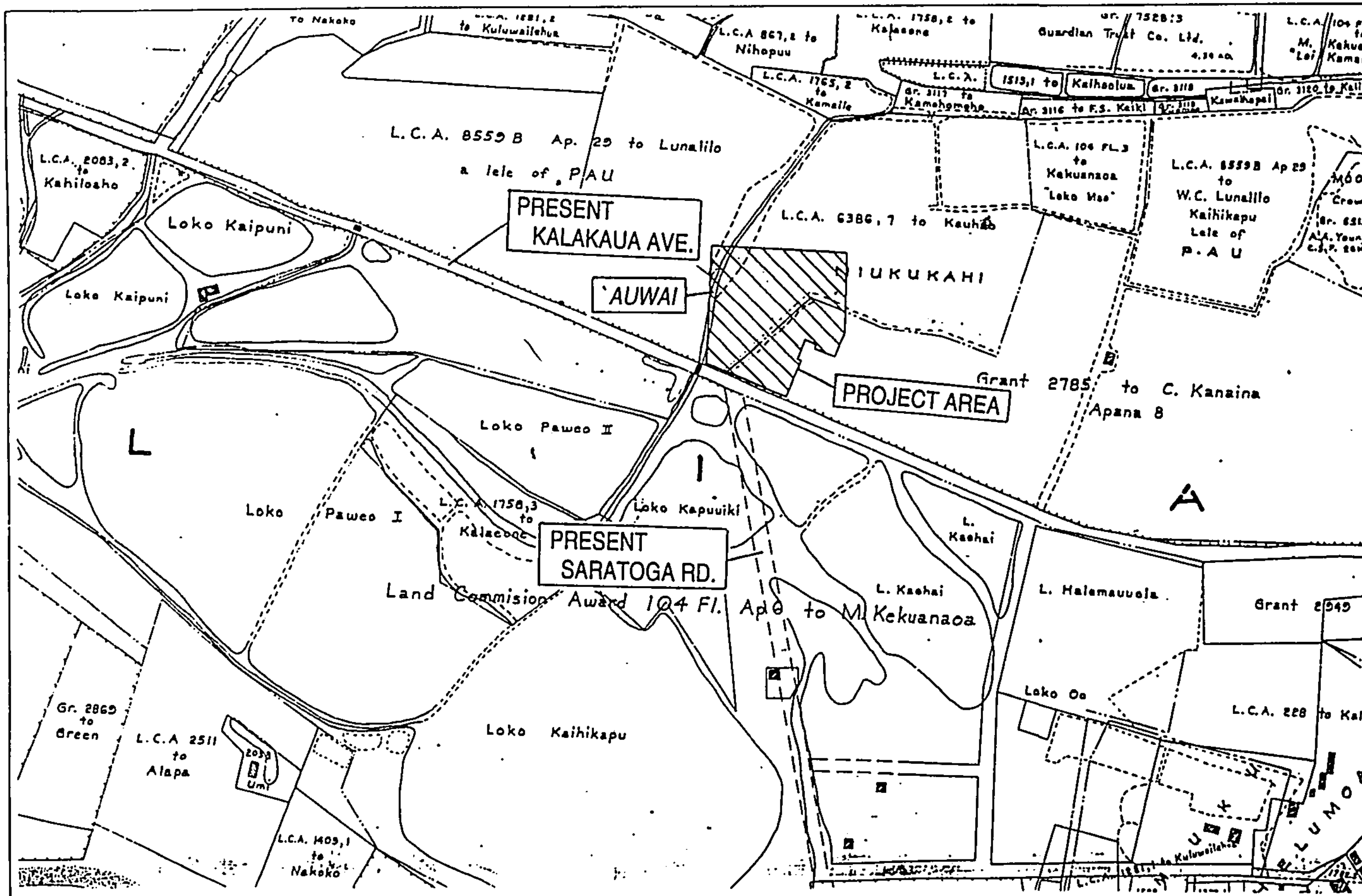

Figure 2 Portion of 1881 map by S.E. Bishop with location of present project area and `*auwai* (State site 50-80-14-4970) indicated

immigrant laborers imported from China and Japan, and for shipment to the west coast of the United States. An 1897 map of Honolulu shows rice fields extending across the plain of Honolulu, and the expanding grid of streets surrounding Waikīkī (Figure 3). The map also indicates that the present project area and the lands immediately surrounding - including the adjacent fishponds - remained undeveloped near the end of the 19th century.

B. 1900 to 1920s

During the first decade of the 20th century, the U.S. War Department acquired more than 70 acres in the Kālia portion of Waikīkī for the establishment of a military reservation called Ft. DeRussy, named in honor of Brig. Gen. R.E. DeRussy of the Army Corps of Engineers.

> On 12 November 1908, a detachment of the 1st Battalion of Engineers from Fort Mason, California, occupied the new post...
>
> Between 1909 and 1911 the engineers were primarily occupied with mapping the island of O`ahu. At DeRussy other activities also had to be attended to - especially the filling of a portion of the fish ponds which covered most of the Fort. This task fell to the Quartermaster Corps, and they accomplished it through the use of an hydraulic dredger which pumped fill from the ocean continuously for nearly a year in order to build up an area on which permanent structures could be built. Thus the Army began the transformation of Waikīkī from wetlands to solid ground. (Hibbard and Franzen 1986:79)

A map of O`ahu based on military surveys between 1909 and 1913 shows that much of the Kālia land, now identified as Ft. DeRussy has been filled, and many structures now cover the Waikīkī landscape *makai* of Kalakaua Ave (Figure 4). The map also presents a more detailed picture of the present project area than that recorded in the earlier maps discussed above. It suggests that, in addition to the *`auwai* (ditch) there was a pond and marshy fields located within the project area. These features appeared to have remained intact into the second decade of the 20th century.

However, during the 1920s the project area would be transformed when the construction of the Ala Wai Drainage Canal - begun in 1921 and completed eight years later - resulted in the draining and filling in of the remaining ponds and irrigated fields of Waikīkī. The canal was one element of a plan to urbanize Waikīkī and the surrounding districts:

> The [Honolulu city] planning commission began by submitting street layout plans for a Waikiki reclamation district. In January 1922 a Waikiki improvement commission resubmitted these plans to the board of supervisors, which, in turn, approved them a year later. From this grew a wider plan that eventually reached the Kapahulu, Moiliili, and McCully districts, as well as lower Makiki and Manoa...
>
> The standard plan for new neighborhoods, with allowances for local terrain, was to be that of a grid, with 80-foot-wide streets crossing 70-foot-wide avenues at right angles so as to leave blocks of house lots about 260 by 620 feet. Allowing for a 10-foot-wide sidewalk and a 10-foot right-of-way [alley] down the center of each block, there would be twenty house lots, each about 60 by 120 feet, in each block. (Johnson 1991:311)

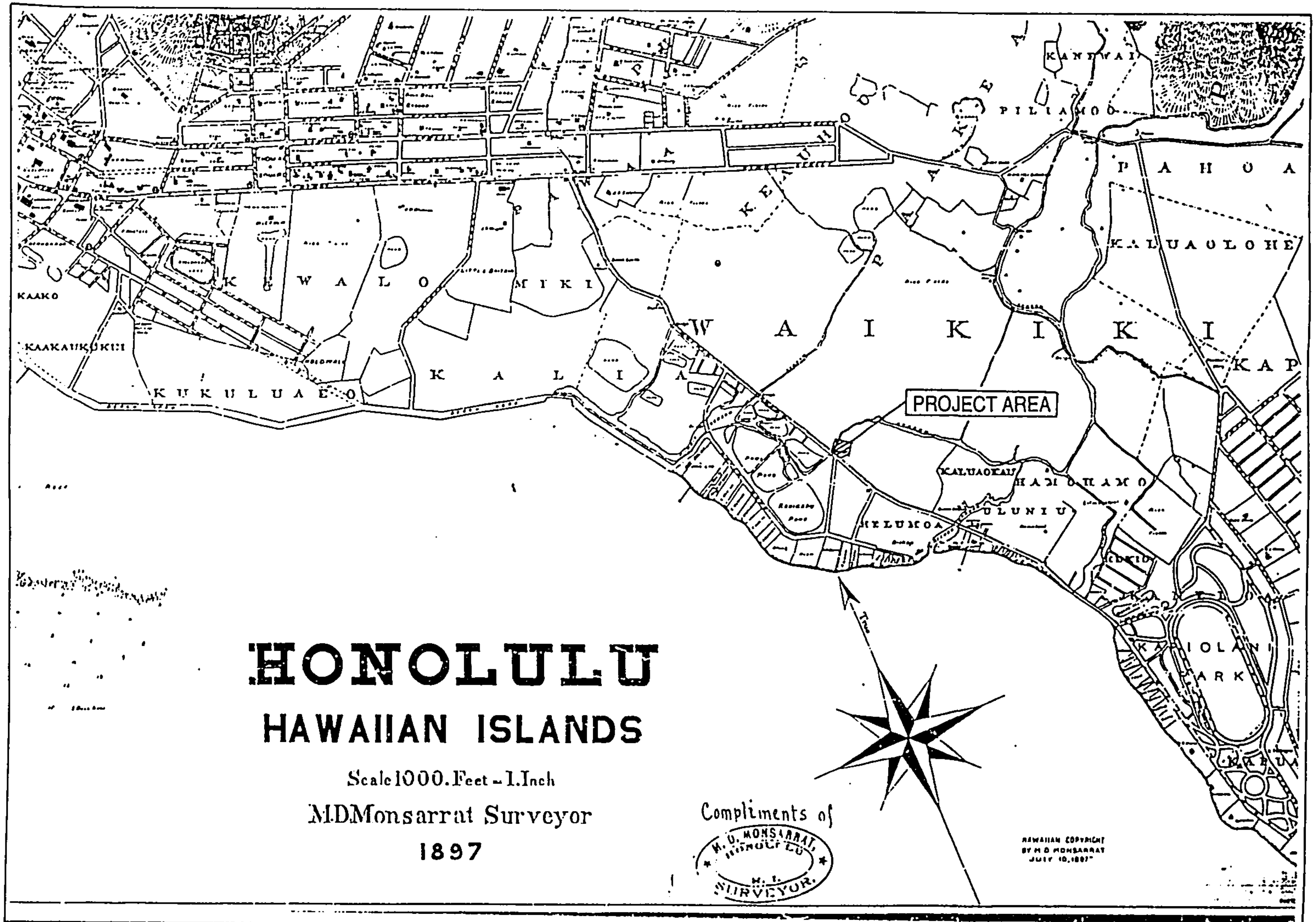

Figure 3 Portion of 1897 map by M.D. Monsarrat with location of present project area indicated

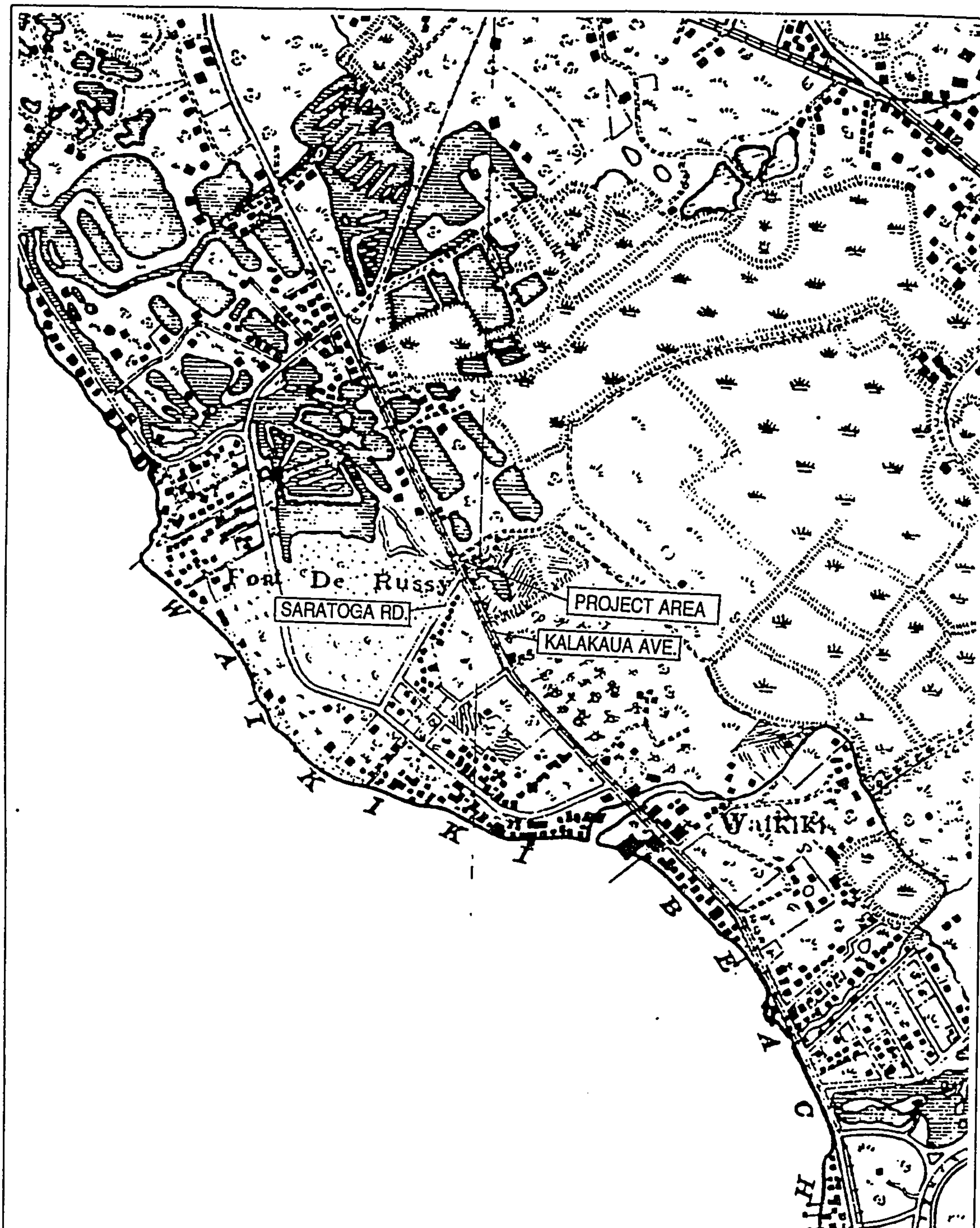

Figure 4 Portion of U.S. Army Engineers map, based on military surveys from 1909 to 1913, showing Fort DeRussy with location of present project area indicated

An aerial photograph of the late 1920s shows the new canal and the filled-in lands of Waikīkī, including the present project area, overlaid with the new gridwork of streets (Figures 5 & 6). The photograph indicates that there were no structures on the project area in the late 1920s. A line of vegetation shown cutting across the project area is likely a remnant marking the route of the *`auwai* (ditch) that formerly drained into the fishponds at Ft. DeRussy.

A 1927 Sanborn Fire Insurance map shows the new block defined by Kalakaua and Kuhio avenues and Kalaimoku and Lewers streets (Figure 7). The map confirms that no buildings had yet been constructed within the present project area. The only structure located on the block is a "sewerage pump" located outside the project area.

C. Late 1920s to Present - Historic Building Review

By the latter 1940s, following World War II, the portion of Waikīkī which includes the present project area was covered by a mix of commercial and residential buildings. A *ca.* 1945 photograph shows the southwest corner of the project area at Kalaimoku St. and Kalakaua Ave. (Figure 8). This portion of the project area contained, in the 1940s, a parking lot and a taxi stand shelter (shown in the right foreground). Also within the project area are one-story wooden buildings whose roofs are just visible above the fence behind the parking lot. Outside the project area, on the *`ewa* side of Kalaimoku St., is the Kuhio Theater which was constructed in 1942.

A 1951 Sanborn Fire Insurance map identifies the buildings and features present on the project area at mid-century (Figure 9). The map shows the parking lot and taxi stand (on the present site of the former Canlis Charcoal Broiler restaurant) seen in the *ca.* 1945 photograph. The map indicates a restaurant on Kalakaua Ave. (at TMK 2-6-18:36) which is no longer extant. Along the portion of the project area fronting Kuhio Ave. are one-story wooden buildings identified as a store and dwelling units (at TMK 2-6-18:73, 52 & 55). None of these structures remain.

Further along Kuhio Ave., in the east portion of the project area are three two-story concrete apartment buildings (at TMK 2-6-18:62, 63 & 64). A fourth two-story concrete apartment building is shown in the project area (at TMK 2-6-18:42), fronting the present Lauulu St. (which is identified on the map as Lauulu Place). These four concrete buildings remain standing in the project area. A review of city and county records indicates that the building on Lauulu St. (TMK 2-6-18:42) was constructed in 1942 and that additions were made in the 1960s. The building fronting Kuhio Ave. (at TMK 2-6-18:64) - identified on the fire insurance map as containing four apartments - was constructed in 1947; additions and renovations were made in 1967 and 1987 when the building was converted to commercial use. The adjacent building on Kuhio Ave.(at TMK 2-6-18:63) - identified on the map as containing 12 apartments - was constructed between 1948 and 1949; additions and renovations were made in 1958, 1962 and 1982 when the building was converted to commercial use. The building between Kuhio Ave. and Lauulu St. (at TMK 2-6-18:62) - identified as containing ten apartments - was constructed in 1947; additions were made in 1983 when the building was converted to commercial use.

Two well-known structures and business establishments were added to the project area since the early 1950s when the fire insurance map was drawn. In 1946 the restauranteur Peter Canlis opened the first Canlis Charcoal Broiler in Waikīkī at the Kuhio Beach end of Kalakaua Avenue, on what would later become the site of the Waikiki Biltmore Hotel (which was demolished in 1974). Canlis relocated his restaurant to 2100 Kalakaua Ave.- within the present project area - in 1954. The new restaurant was designed by the firm of Wimberley and Cook, at

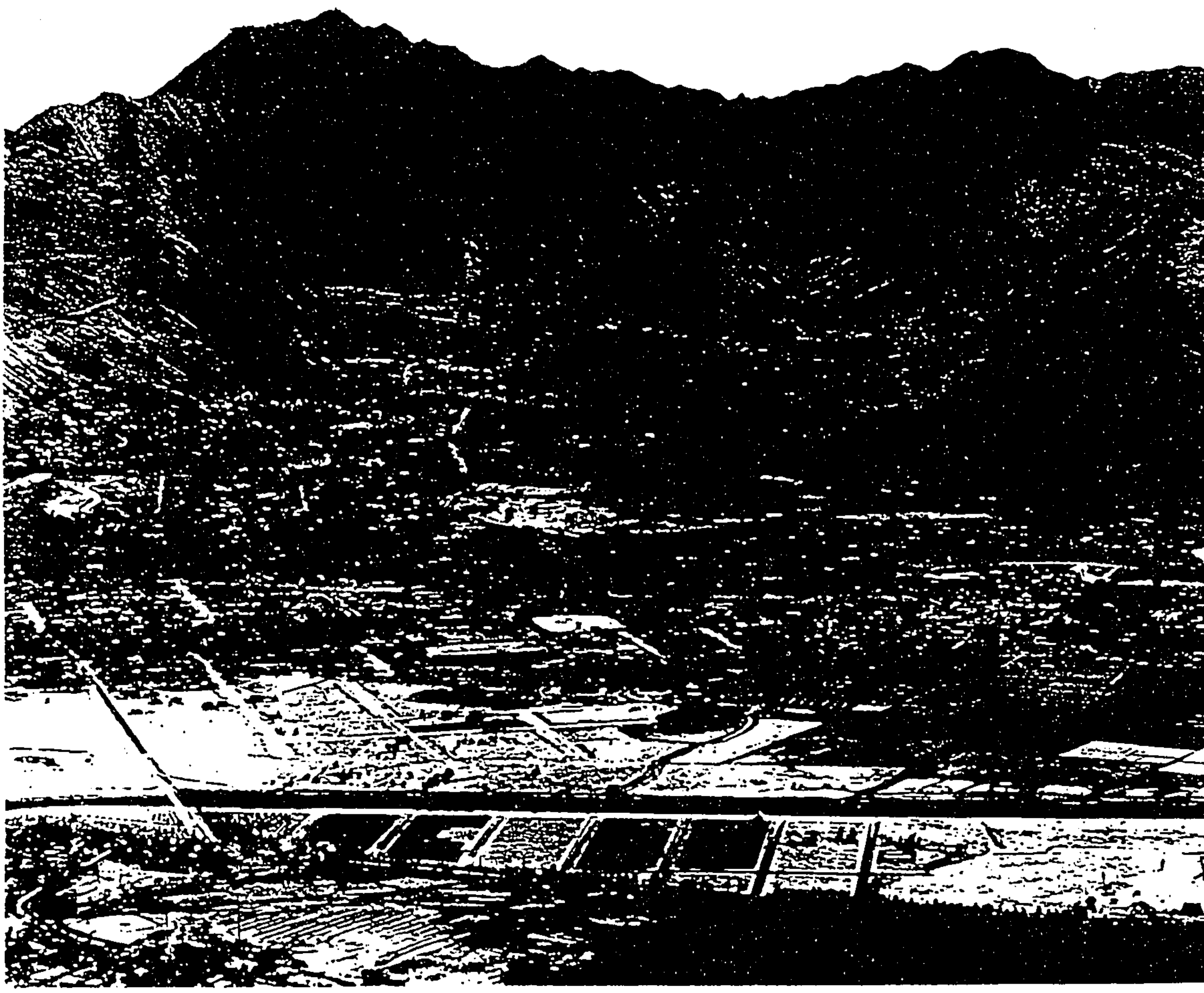

Figure 5 Aerial photograph - *ca.* late 1920s - showing the newly-constructed Ala Wai Drainage Canal (Bishop Museum Archives)

Figure 6 Enlarged portion of aerial photograph - *ca.* late 1920s - indicating location of the project area and possible remnant of the *auwai* that formerly flowed into the present Ft. DeRussy grounds (Bishop Museum Archives)

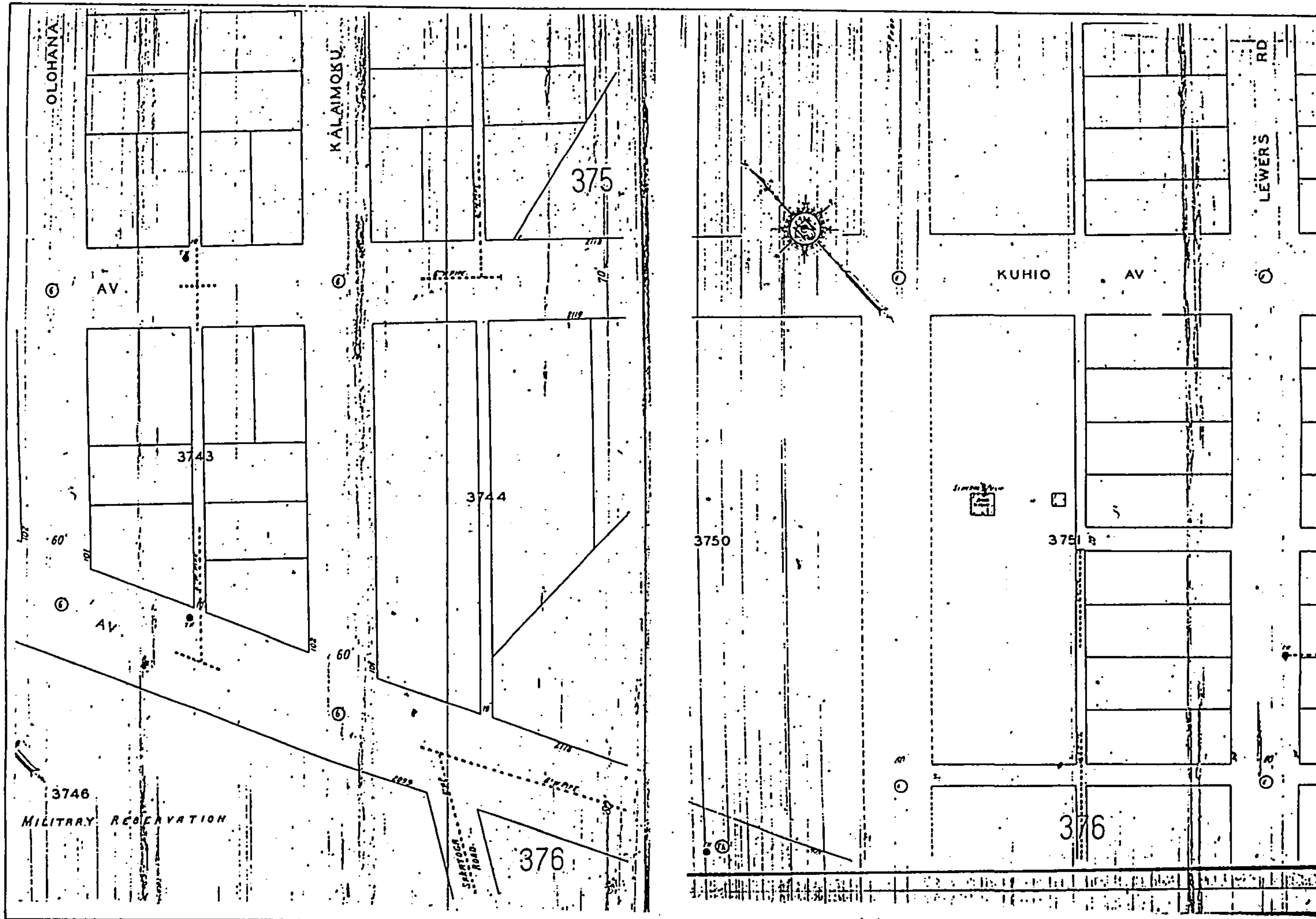

Figure 7 1927 Sanborn Fire Insurance map showing newly-created block bounded by Kalakaua and Kuhio avenues and Kalaimoku and Lewers streets

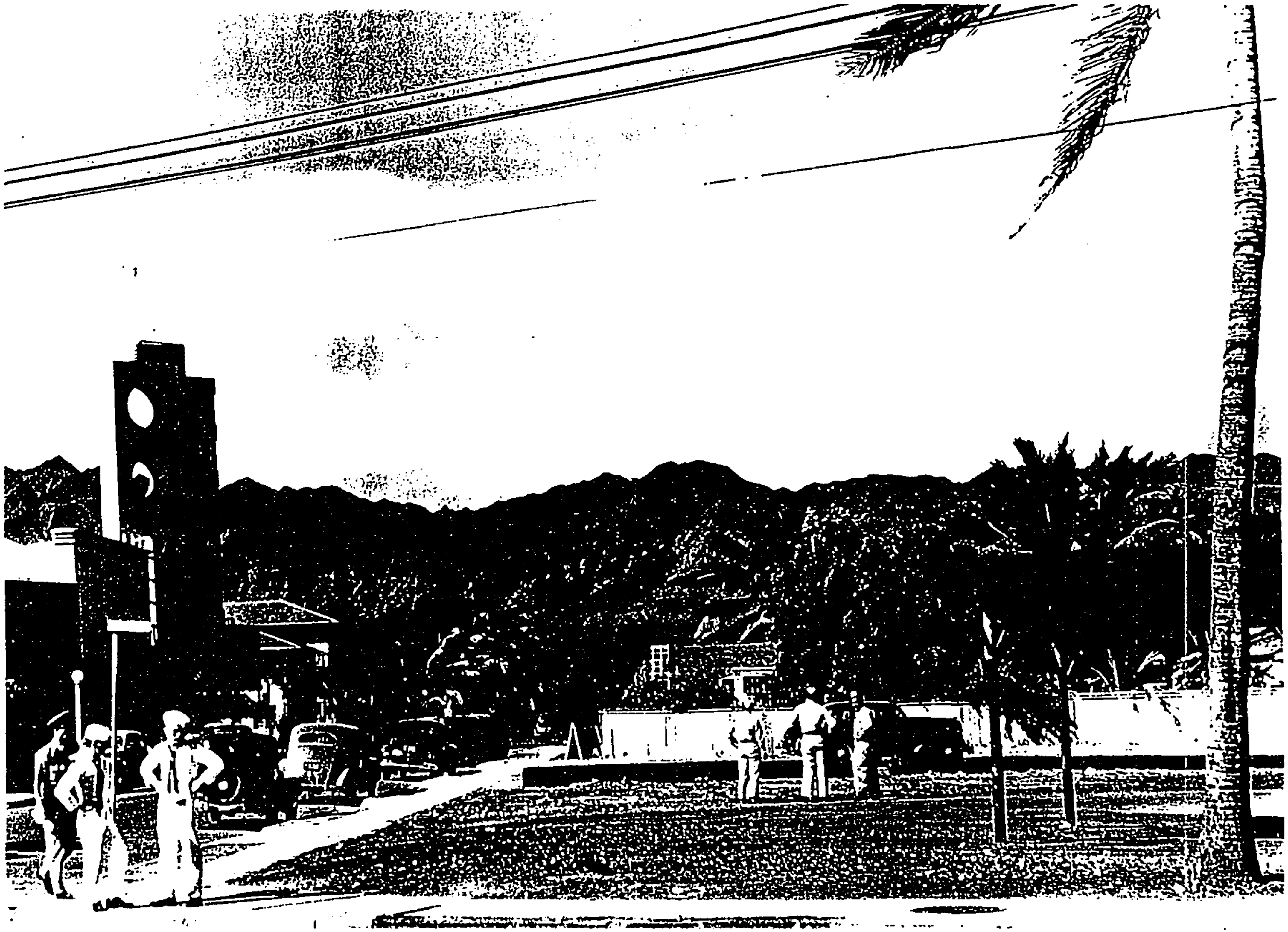

Figure 8 Corner of Kalaimoku St. and Kalakaua Ave., *ca.* 1945 (Bishop Museum Archives)

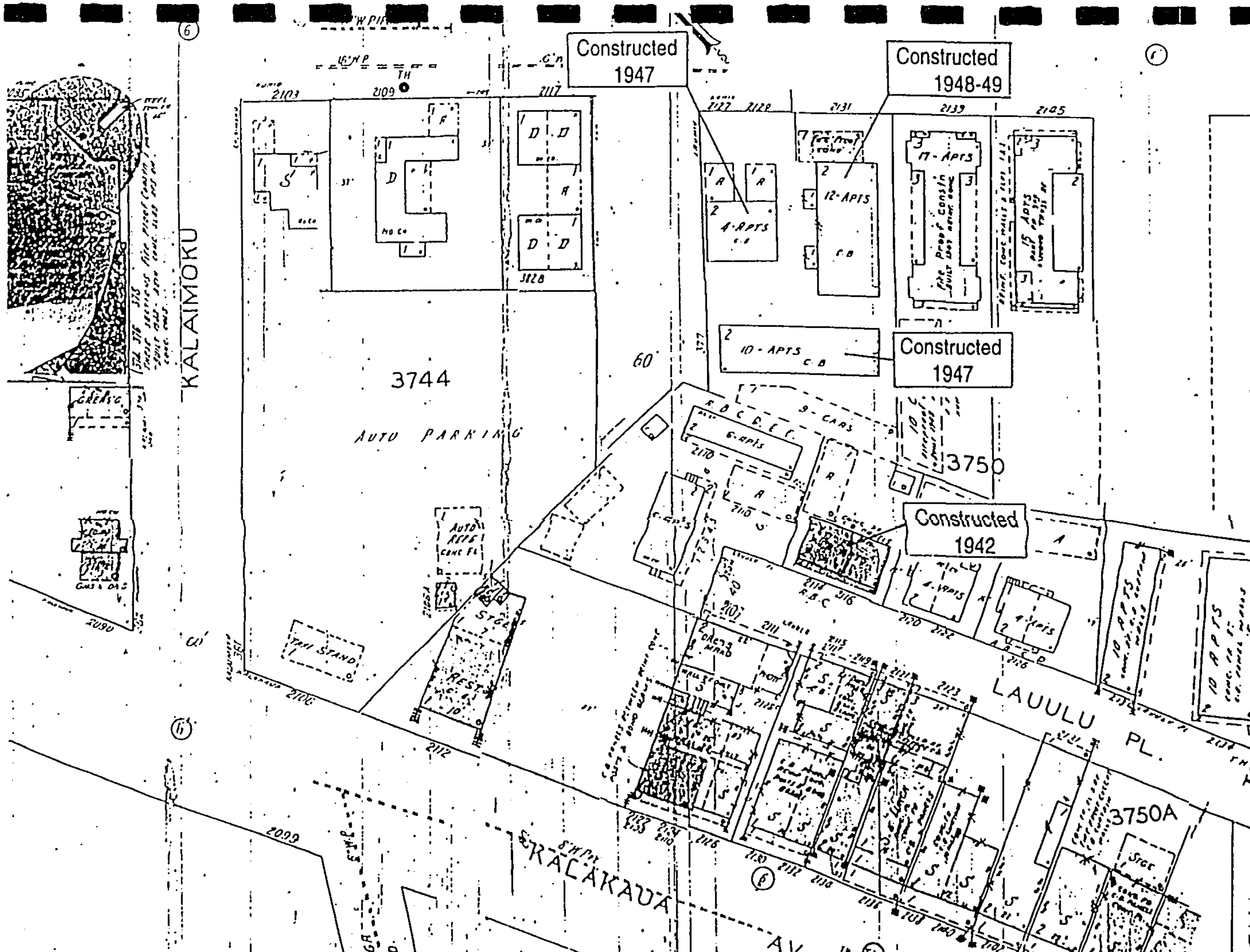

Figure 9 1951 Sanborn Fire Insurance map showing block bounded by Kalakaua and Kuhio avenues, and Kalaimoku and Lewers streets with construction dates of buildings currently in project area a cost of $250,000. The restaurant continued in operation until 1989. The building subsequently served as a Honolulu Police Department sub-station.

In 1974, Hula's Bar & Lei Stand opened at the *makai*-Diamond Head corner of Kuhio Ave. and Kalaimoku St. (at TMK 2-6-18:73). It replaced a laundromat and food stand which were then operating on the parcel. It remained in operation until its closing this year.

The only structures within the project area that are older than fifty years - and may thus be of historic concern - are the four concrete, former apartment buildings constructed in the 1940s. However, the subsequent additions and renovations to these buildings since their construction may have lessened their historic value.

An additional concern has been raised over the historic status of the Canlis Charcoal Broiler building, though the building itself is less than fifty years old. This concern has been expressed in an August 3, 1998 letter from Don Hibbard, Administrator of the State Historic Preservation Division, to the Department of Planning and Permitting, City and County of Honolulu (see Appendix). The letter notes that the "majority of the structures over 50 years [within the present project area] do not appear to have retained their historic integrity." However, the

> Canlis Restaurant Building, while not quite 50 years old, has exceptional significance as one of the few intact examples left in Hawaii of the once popular restaurant trend and unique building type...
>
> According to the Land Use Ordinance 7.80-3(c) "Development should preserve, maintain and enhance historic properties whenever possible." Therefore, we request that the demolition of the Canlis building be deferred until the entire development project is submitted so that we can better ascertain the potential of retaining Canlis.

The letter concludes with the suggestion that "there are other design possibilities where Canlis, with its strong sense of place, can be utilized in the development."

III. PREVIOUS ARCHAEOLOGICAL RESEARCH

Before the 1980s the majority of the information concerning Waikīkī from previous archaeological sources centered on human burials inadvertently excavated during construction activities. In 1901, while digging a sewer line at the James B. Castle property near Diamond Head (in the environs of the present Elks Club), the remains of at least four adult Hawaiians were unearthed along with "a number of conical teeth of whale teeth, a number of round glass beads of large size, and a small sized niho-palaoa, such as was generally appropriated to the use of the chiefs" (Emerson 1902:19).

In the 1920s and 30s the first systematic archaeological survey of O`ahu was conducted by J.C. McAllister (1930). He recorded four heiau, three of which were located at the mauka reaches of Waikīkī *ahupua`a* in lower Manoa Valley. The fourth heiau - Papaenaena - was located at the foot of Diamond Head crater in the environs of the present Hawaii School for Girls. Papaenaena heiau is traditionally associated with Kamehameha I who was said to have visited the heiau before setting off to battle for Niihau and Kauai in 1804. Five years later, according to John Papa Ī`i, Kamehameha placed at Papaenaena the remains of an adulterer - "all prepared in the customary manner of that time" (Ī`i 1959:50-51).

During the 1960s through the 1970s inadvertent burial finds were reported at construction sites stretching from the Fort DeRussy area to the foot of Diamond Head crater. In 1961 a human burial and a nineteenth century trash pit were unearthed during construction on Saratoga Road adjacent to Fort DeRussy. In 1963 human burials were discovered during construction activities at 2431 Prince Edward Street and at the site of the present Outrigger Canoe Club across from Kapiolani Park. Among the twenty-five burials - excavated by the Bishop Museum - were several discovered in flexed (with knees drawn up to the chin) or semi-flexed positions, traditional Hawaiian burial postures.

Sand dune burials - another traditional Hawaiian mortuary practice - were revealed in 1964 as beach sand fronting the Surfrider Hotel shifted and eroded.

The remains of six burials - five of apparent prehistoric or early historic age and one of more recent date - were unearthed in 1976 during construction of the Hale Koa Hotel adjacent to the Hilton Hawaiian Village Hotel.

In 1980, three burials were exposed at the Hilton Hawaiian Village itself during construction of the hotel's Tapa Tower. Earl Neller of the (then named) State Historic Preservation Program was called in upon discovery of the burials and conducted fieldwork limited to three brief inspections of the project area. Neller's (1980) report noted:

> The bones from three Hawaiian burials were partially recovered; one belonged to a young adult male, one a young adult female, and one was represented by a single bone. An old map showed that rapid shoreline accretion had occurred in the area during the 1800s, and that the beach in the construction area was not very old. It is possible the burials date back to the smallpox epidemic of 1853. It is likely that burials will continue to be found in the area. It is also possible that early Hawaiian sites exist farther inland, beneath Moiliili, adjacent to where the shoreline would have been 1000 years ago. (Neller 1980:5)

Neller also documented the presence of trash pits, including one from the 1890s which contained "a large percentage of luxury items, including porcelain tablewares imported from China, Japan, the United States, and Europe" (*ibid*:5). He further notes:

> It is suspected that other important historic archaeological sites exist in the highly developed concrete jungle of Waikiki, with discrete, dateable trash deposits related to the different ethnic and social groups that occupied Waikiki over the last 200 years. (*ibid*:5)

Between December 1981 and February 1982, archaeologists from the Bishop Museum led by Bertell Davis conducted a program of excavations and monitoring during construction of the new Halekulani Hotel (Davis 1984). Six human burials were recovered along with "animal burials [and] cultural refuse from prehistoric Hawaiian firepits, and a large collection of bottles, ceramics, and other materials from trash pits and privies dating to the late 19th century" (*ibid.*:i). Age analysis of volcanic glass recovered from the site led Davis to conclude: "For the first time we can now empirically date...settlement in Waikīkī to no later than the mid-1600s" (*ibid.*:i). Just as significant to Davis was the collection of historic era material at the Halekulani site; he states:

> [The] Halekulani excavations clearly demonstrate...that there is a definite need to consider historic-period archaeology as a legitimate avenue of inquiry in Hawaiian research. Furthermore, archaeology in the urban context can yield results every bit as significant as in less developed areas. Development in the 19th and early 20th centuries clearly has not destroyed all archaeological resources in Waikiki, Honolulu, or in any of the other urbanized areas of Hawai`i. (*ibid.*:i)

From January through December of 1983, Earl Neller of the State Historic Preservation Office conducted archaeological fieldwork during construction of the Lili`uokalani Gardens condominium on Paoakalani Street. The bones of seven individuals - all from prehistoric Hawaiian graves - were recovered at the site. Neller's report noted:

> Queen Lili`uokalani had a bungalow at the project site, and broken glass and ceramic were collected that once was used by the Queen and her guests. There is a deeply buried cultural layer at the site that is older than the graves. (Neller 1984:i)

Neller recommended further work to develop a full-scale study of the material collected at the site; unfortunately, no such study was ever produced.

During 1985 and 1986 archaeologists from Paul H. Rosendahl, Ph. D. Inc. conducted archaeological monitoring at the site of the Mechanical Loop Project at the Hilton Hawaiian Village, Waikiki. Much of this project area was disturbed by historic and modern construction and modification. Fifteen subsurface features were uncovered during the monitoring all of which were determined to be historic trash pits or trenches. The dating of these features was based on dating the artifactual material they contained. All 15 features are thought to post-date 1881 based on this artifact analysis. The 3 partial burials reported by Neller (1980) were found within this project area (see above). No further burials were encountered during the PHRI field work (Hurlbert, et. al. 1992).

In 1987 State Historic Preservation Office archaeologists recovered a human burial at Kalakaua Avenue during renovation work on the Moana Hotel.

During 1988 the Moana Hotel Historical Rehabilitation Project (Simmons et. al. 1991) encountered human remains that amounted to at least 17 individuals. Based on stratigraphic association these burials were interred over time as the land form at the site changed. The sediment surrounding these burials yielded traditional midden and artifact assemblages. The burials and human remains were found in the Banyan Court and beneath the hotel itself.

In 1989 skeletal remains were unearthed on the grounds of the Ala Wai Golf Course during digging of an electrical line trench for a new sprinkler system. The trench had exposed a pit containing two burials (Bath and Kawachi 1989: 2). The report suggests that one of the burials may have been disturbed earlier during grading for the Territorial Fair Grounds. The osteological analysis included in the report concludes that both sets of remains "appear ancient." (*Ibid.:2*)

Davis' (1989, 1991) excavation and monitoring work at Fort DeRussy documented substantial subsurface archaeological deposits--prehistoric, historic, and modern. These deposits included buried fishpond sediments, *`auwai* sediments, midden and artifact enriched sediments, structural remains such as post holes and fire pits, historic trash pits, and a human burial. Davis' (1991) report documents human activity in the Fort DeRussy beach front area from the 16th century to the present.

The work at Fort DeRussy continued in 1992 when BioSystems researchers built upon Davis' work (Simmons 1995). BioSystems research documents the development and expansion of the fishpond and *`auwai* (ditch) system in this area. (The *`auwai* system was entered on the State Inventory of Historic Places (SIHP) as State Site 50-80-14-4970. As indicated on the 1881 map by S.E. Bishop discussed above (see Figure 2), this *`auwai* enters the Ft. DeRussy grounds through the present project area.) Remains of the fishpond and *`auwai* deposits, as well as habitation deposits were documented below modern fill deposits. This research, along with that of Davis (1991) clearly demonstrates that historical document research can be an effective guide to locating late prehistoric/early historic subsurface deposits, even amidst the development of Waikiki.

The realignment of Kalia Road at Fort DeRussy in 1993 uncovered approximately 40 human burials. A large majority of these remains were recovered in a large communal burial feature (Carlson *et. al.* 1994). The monitoring and excavations associated with this realignment uncovered a cultural enriched layer which contained post holes.

On April 28, 1994 an inadvertent burial discovery was made during excavation for a water line at the intersection of Kalakaua Ave. and Kuamo'o St. (just *mauka* of Ft. DeRussy and two blocks northwest of the present project area). These remains represented a single individual (McMahon 1994).

Another inadvertent discovery of human remains occurred in April of 1995 at the site of the Waikiki Sunset Hotel (Jourdane 1995). The remains appeared to be a single individual.

In 1996 Pacific Legacy, Inc. conducted an archaeological inventory survey of the block bounded by Kalakau Ave., Kuhio Ave., Olohana St., and Kalaimoku St. (Cleghorn 1996). This parcel is located immediately adjacent to (on the *`ewa* side of) the present project area. The survey included excavation of seven backhoe trenches. The subsurface testing indicated that

> ...this area was extremely wet and probably marshy. This type of environment was not conducive for traditional economic practices...The current project area appears to have been unused because it was too wet and marshy.
>
> Several peat deposits, containing the preserved remains of organic plant materials were discovered and sampled. These deposits have the potential to add to our knowledge of the paleoenvironment of the area. (Cleghorn 1996:15)

The report concluded that no further archaeological investigations of the parcel were warranted since "no potentially significant traditional sites or deposits were found" but cautioned of the "possibility, however remote in this instance, that human burials may be encountered during large scale excavations" (*Ibid.*:15).

IV. FIELD INSPECTION RESULTS

Field inspection of the project area was accomplished on August 23, 1998. The entire project area was accessible to investigation as all commercial activities have been terminated. Current conditions were documented by field notes and photographs (Figures 10-15).

A. Archaeological Sites

No surface archaeological sites or features were evident within the project area which, as has been documented in this report, comprises entirely landfill material imported during the 1920s. No surface evidence of the *`auwai* (ditch) which, as was also documented in this report, formerly coursed through the *`ewa* side of the project area, and which was recorded as State Site 50-80-14-4970 during archaeological study within the Ft. DeRussy grounds.

B. Building Assessment

The only structures observed within the project which appear on the 1951 Sanborn Fire Insurance map (see Figure 9 above) were four concrete, two-story, former apartment buildings located between Kuhio Ave. and Lauulu St. (TMK 2-6-18:42, 62, 63, & 64). These buildings were constructed between 1942 and 1948 but have all since been added to and renovated for commercial usage (Figures 14 & 15). These additions and renovations have compromised their historical integrity.

The Canlis Charcoal Broiler building, constructed in 1954, continues to occupy the west corner of the project area at the intersection of Kalaimoku St. and Kalakaua Ave. (Figure 12). As was noted above, the restaurant closed in 1989. Though it subsequently served for a period as a police substation, the building was observed to be little changed from its appearance in photographs taken at the height of the restaurant's popularity.

Figure 10 East portion of project area along Kuhio Ave. showing two-story concrete buildings; view west

Figure 11 Concrete buildings on Kuhio Ave.; view southeast

Figure 12 Concrete buildings in east portion of project area; view east

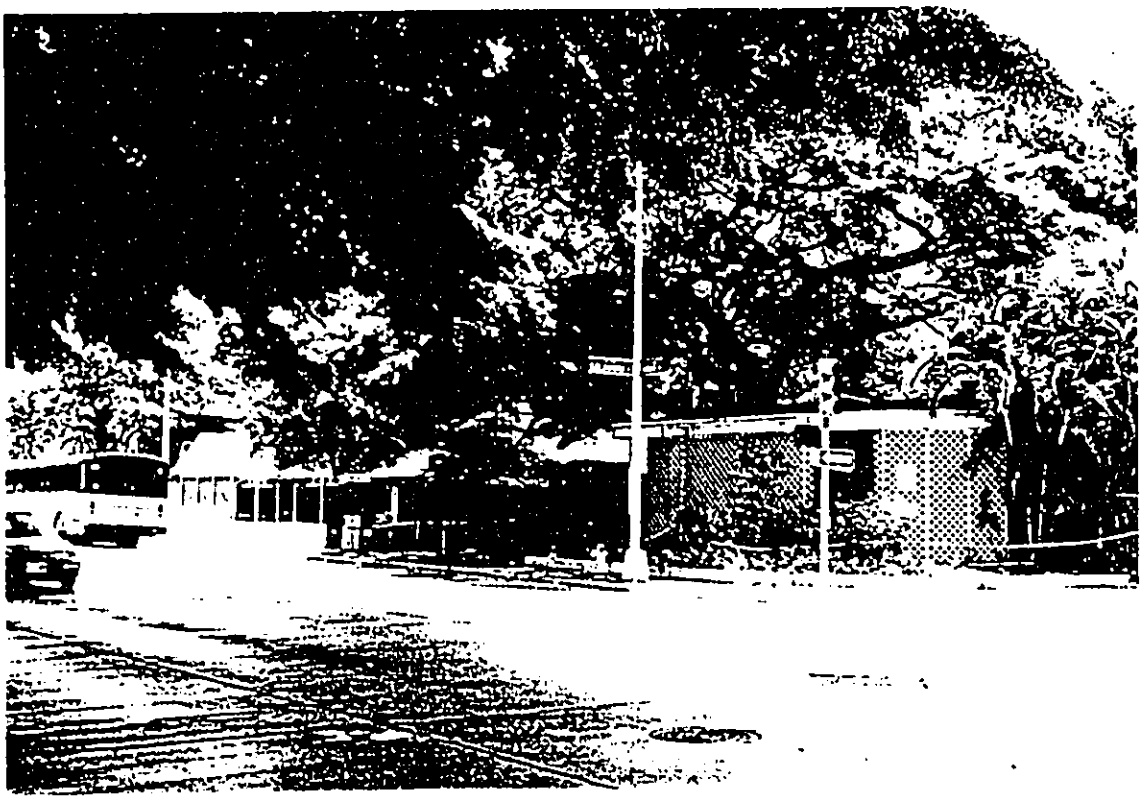

Figure 13 Project area at corner of Kuhio Ave. and Kalaimoku St.; view southeast

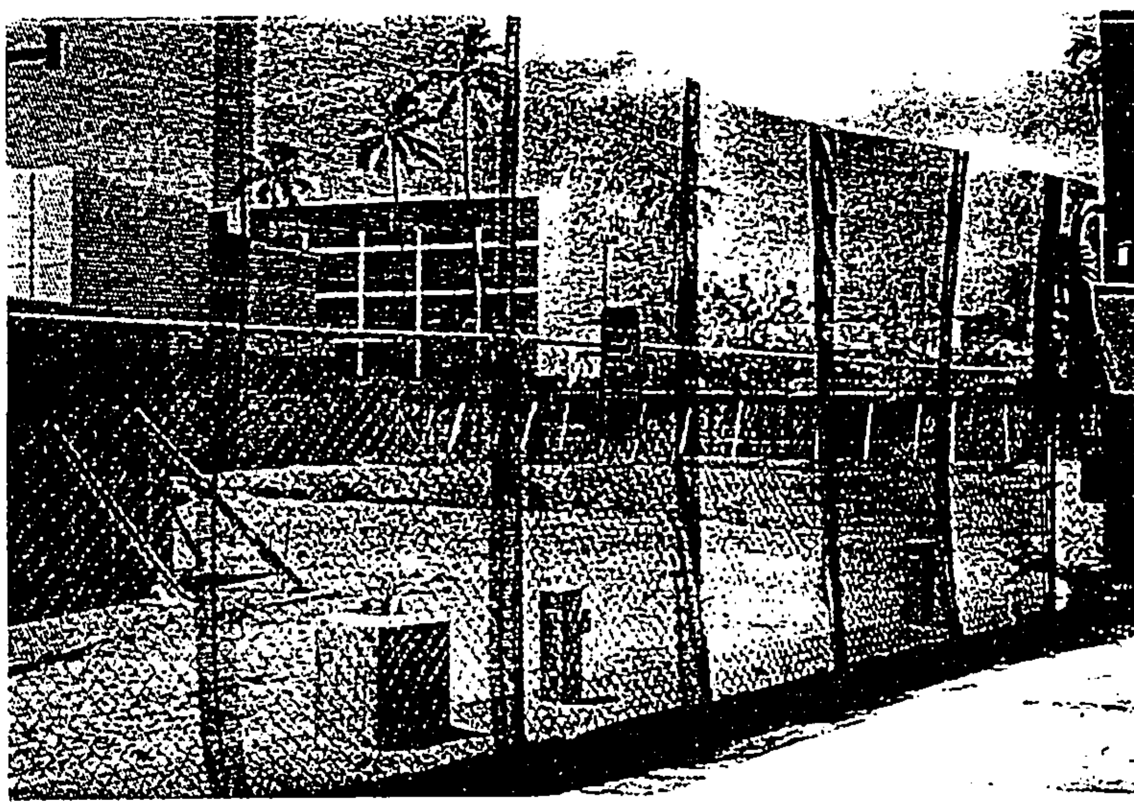

Figure 14 Empty lot (TMK 2-6-18:36) at south corner of project area; view south

Figure 15 Canlis Charcoal Broiler building at west corner of project area; view east

V. SUMMARY AND RECOMMENDATIONS

A. Summary

Archaeological Concerns

The *ahupua`a* of Waikīkī in the centuries before the arrival of Europeans was a well-used locale with abundant natural and cultivated resources - including an expansive system of irrigated taro fields - supporting a large population that included the highest-ranking ali`i. In the nineteenth century, after a period of depopulation and desuetude, Waikīkī was reanimated by the Hawaiian *ali`i* and the foreigners residing there and by the farmers continuing to work the irrigated field system which had been converted from taro to rice. This farming continued up to the first decades of this century until the Ala Wai Canal drained the remaining ponds and irrigated fields.

The present project area comprises land created and filled during the 1920s in conjunction with the construction of the Ala Wai Canal. The land fill operations have obscured all traces of any archaeological features within the project area predating the 1920s. However, historic documents and maps, and previous archaeological research, indicate that the project area was most likely a marshy field (with perhaps an associated pond) located just *mauka* of an extensive network of fishponds that covered the present Ft. DeRussy grounds. An *`auwai* (ditch) that fed the Ft. DeRussy fishponds ran through the *`ewa* side of the project area. (This *`auwai* was entered on the State Inventory of Historic Places as site no. 50-80-14-4970 during archaeological study within the Ft. DeRussy grounds.)

Archaeological reports have documented human burials - both pre-contact Hawaiian and historic - throughout the breadth of Waikiki--as far *mauka* as the Ala Wai Golf Course. Especially relevant to the present project area are several burials that have been encountered within the grounds of Ft. DeRussy and of adjacent hotels. A burial, encountered during excavation for a water line, has also been documented at the intersection of Kuamoo St. and Kuhio Ave., two blocks *`ewa* of the project area.

Several studies have recorded the presence within Waikiki of subsurface cultural deposits of both pre-contact Hawaiian and historic provenance. These deposits had remained intact despite the years of construction activity that have altered the surface of the entire area. The authors of these studies emphasize that the potential for discovering similar intact deposits elsewhere in Waikiki cannot be discounted.

Historic Building Concerns

Only four structures older than fifty years are presently standing within the project area. These four are two-story concrete buildings located between Kuhio Ave. and Lauulu Pl. (TMK 2-6-18:42, 62, 63, & 64). They were formerly apartments constructed between 1942 and 1948 but have all since been added to and renovated for commercial usage. It is suggested that these additions and renovations have compromised the buildings' historical integrity.

Preservation concerns have been expressed over the Canlis Charcoal Broiler building, which was constructed in 1954. The building is discussed in the Recommendations section below.

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CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY

SEE FRAME(S) IMMEDIATELY FOLLOWING

V. SUMMARY AND RECOMMENDATIONS

A. Summary

Archaeological Concerns

The *ahupua`a* of Waikīkī in the centuries before the arrival of Europeans was a well-used locale with abundant natural and cultivated resources - including an expansive system of irrigated taro fields - supporting a large population that included the highest-ranking ali`i. In the nineteenth century, after a period of depopulation and desuetude, Waikīkī was reanimated by the Hawaiian *ali`i* and the foreigners residing there and by the farmers continuing to work the irrigated field system which had been converted from taro to rice. This farming continued up to the first decades of this century until the Ala Wai Canal drained the remaining ponds and irrigated fields.

The present project area comprises land created and filled during the 1920s in conjunction with the construction of the Ala Wai Canal. The land fill operations have obscured all traces of any archaeological features within the project area predating the 1920s. However, historic documents and maps, and previous archaeological research, indicate that the project area was most likely a marshy field (with perhaps an associated pond) located just *mauka* of an extensive network of fishponds that covered the present Ft. DeRussy grounds. An *`auwai* (ditch) that fed the Ft. DeRussy fishponds ran through the *`ewa* side of the project area. (This *`auwai* was entered on the State Inventory of Historic Places as site no. 50-80-14-4970 during archaeological study within the Ft. DeRussy grounds.)

Archaeological reports have documented human burials - both pre-contact Hawaiian and historic - throughout the breadth of Waikiki--as far *mauka* as the Ala Wai Golf Course. Especially relevant to the present project area are several burials that have been encountered within the grounds of Ft. DeRussy and of adjacent hotels. A burial, encountered during excavation for a water line, has also been documented at the intersection of Kuamoo St. and Kuhio Ave., two blocks *`ewa* of the project area.

Several studies have recorded the presence within Waikiki of subsurface cultural deposits of both pre-contact Hawaiian and historic provenance. These deposits had remained intact despite the years of construction activity that have altered the surface of the entire area. The authors of these studies emphasize that the potential for discovering similar intact deposits elsewhere in Waikiki cannot be discounted.

Historic Building Concerns

Only four structures older than fifty years are presently standing within the project area. These four are two-story concrete buildings located between Kuhio Ave. and Lauulu Pl. (TMK 2-6-18:42, 62, 63, & 64). They were formerly apartments constructed between 1942 and 1948 but have all since been added to and renovated for commercial usage. It is suggested that these additions and renovations have compromised the buildings' historical integrity.

Preservation concerns have been expressed over the Canlis Charcoal Broiler building, which was constructed in 1954. The building is discussed in the Recommendations section below.

B. Recommendations

The following recommendations are appropriate to the present project area in Waikīkī:

1) It is likely that intact prehistoric and early contact cultural deposits are lying undisturbed beneath modern fill layers within the project area (as has been documented in adjacent areas of Waikīkī). Also, there is historic evidence indicating the prior existence of a major *`auwai* and possible adjacent *lo`i* (irrigated terraces) in the project area. Therefore, an archaeological inventory survey is recommended. This survey would comprise subsurface testing of the entire project area consisting of a series of backhoe trenches. Particular attention would be given to locating the `auwai (State site 50-80-14-4970) along the west side of the project area.

2) If major findings are encountered during subsurface testing, preparation of a mitigation plan would be appropriate. This plan would be reviewed and approved by the State Historic Preservation Division (SHPD).

3) An additional concern is the possible presence of burials. If burials are encountered during the subsurface testing, the Burials Program of the SHPD should be notified to determine appropriate treatment. Provision should also be made for treatment of unanticipated finds during construction excavation.

4) Structures in the project area over fifty years old do not appear to have retained their historical integrity, as noted in the SHPD letter of August 3, 1998 (see Appendix) discussed in this report. However, the letter also notes the department's concern with the Canlis Charcoal Broiler building, citing "its exceptional significance as one of the few intact examples left in Hawaii of the once popular restaurant trend and unique building type." Because of this concern, it is recommended that further consultation with the SHPD be pursued before development plans are finalized.

VI. REFERENCES

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APPENDIX

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BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT COLOMA-AGARAN

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

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

August 3, 1998

Ms. Jan Naoe Sullivan
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

LOG NO: 22008
DOC NO: 9808tm01
Architecture

Dear Ms. Sullivan:

SUBJECT: **Special District Permit Application**
File Number: 98/WSD-21
Demolition of Buildings at 2100 Kalakaua Ave.
Including Former Canlis Restaurant Building
TMK: 2-6-18:10, 42, 52, 55, 62, 63, 64, 73 & 74,
Waikiki, Honolulu, Oahu

Thank you for transmitting the above permit application. While the majority of the structures over 50 years do not appear to have retained their historic integrity, we believe the Canlis Restaurant Building, while not quite 50 years old, has exceptional significance as one of the few intact examples left in Hawaii of the once popular restaurant trend and unique building type. The building was included in the Whitney Museum traveling exhibit to Russia as an exemplary example of American architecture and is a rare example of architecture that displays a sense of place in Hawaii.

According to the Land Use Ordinance 7.80-3(c) "Development should preserve, maintain and enhance historic properties whenever possible." Therefore, we request that the demolition of the Canlis building be deferred until the entire development project is submitted so that we can better ascertain the potential of retaining Canlis. We believe there are other design possibilities where Canlis, with its strong sense of place, can be utilized in the development.

Thank you for the opportunity to comment. Should you have further questions, please feel free to call Tonia Moy at 587-0005.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

TM:je

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1998-10-23-OA-FEA - King Street Apartments

FINAL ENVIRONMENTAL ASSESSMENT
AND
FINDING OF NO SIGNIFICANT IMPACT
(F.O.N.S.I.)

FOR

THE KING STREET APARTMENTS

AN ELDERLY LOW INCOME RENTAL HOUSING DEVELOPMENT PROJECT

"A Facility for Aging in Place"

AT
1239 SOUTH KING STREET
HONOLULU, HAWAII
T.M.K. : 2-3-12:44

ACCEPTING AGENCY

HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII
(Formerly the Housing Finance and Development Corporation)

677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813

CONTACT PERSON
GARY S. FURUTA, PROJECT MANAGER
Hawaii Housing Development Corporation
725 Kapiolani Blvd., Suite C-103
Honolulu, Hawaii 96813

October 1998

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ENVIRONMENTAL ASSESSMENT
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Hawaii Housing Development Corporation
725 Kapiolani Blvd., Suite C-103
Honolulu, Hawaii 96813

October 1998

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I. INTRODUCTION

The Hawaii Housing Development Corporation (HHDC) proposes to develop an affordable rental housing project for low income elderly, on a 18,963 sq. ft. parcel in urban Honolulu. It intends to utilize whatever rental housing assistance programs available, e.g., tax credits, waivers, grants, below market financing, technical assistance, etc. to complete the project.

With the consideration that funding will require tax credits from the State of Hawaii to assure affordable rental rates, the project is subject to the Hawaii State Environmental Impact Review process, as stipulated by Chapter 343, Hawaii Revised Statutes, and Chapter 200, Title 11 Administrative Rules.

This Environmental Assessment document is prepared according to guidelines provided by the Office of Environmental Quality Control, and with the assistance of its staff.

In accordance with the guidelines, the Housing and Community Development Corporation of Hawaii (formerly the Housing Finance and Development Corporation) is the Accepting Agency.

HHDC is a nonprofit organization created by the Hawaii Community Foundation and other grantmakers to develop low income, affordable rental housing on an ongoing basis. Its Directors are made up of influential and successful business people in the community, coming from both the public and private sectors. Their experience is varied, e.g., bankers, union officers, legislators, government administrators, developers, affordable housing coalition members, etc. .

HHDC was instrumental with the development of the Birch Street Apartments, a 52 unit, two-bedroom, affordable rental project for low income families, that is currently under construction on a site adjacent to the proposed project.

HHDC intends to develop the King Street Apartments, a 91 unit, one-bedroom, affordable rental project for the low income elderly.

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II. GENERAL INFORMATION

A.	<u>ACCEPTING AGENCY:</u>	*Housing and Community Development Corporation of Hawaii (formerly the Housing Finance and Development Corporation) 677 Queen Street, Suite 300 Honolulu, Hawaii 96813*
	Principal Contact Person:	*Hawaii Housing Development Corporation (HHDC) C/o Gary S. Furuta 725 Kapiolani Boulevard, Suite C-103 Honolulu, Hawaii 96813 Phone: 596-2120 (Fax: 395-1520)*
B.	<u>ADDRESS:</u>	*1239 South King Street*
C.	<u>TAX MAP KEY:</u>	*2 - 3 - 12 : 44*
D.	<u>LAND AREA:</u>	*0.435 Acres (18,963 s.f.)*
E.	<u>LAND OWNER / LESSOR:</u>	*Pacific Century Trust (PCT), As Trustee for Hawaii Community Foundation (HCF) Okumura Family Trust P.O. Box 3170 Honolulu, Hawaii 96813 (Hawaii Housing Development Corporation has an option to purchase)*
F.	<u>STATE LAND USE DESIGNATION:</u>	*Urban*
G.	<u>DEVELOPMENT PLAN DESIGNATION:</u>	*Commercial*
H.	<u>ZONING (LUO):</u>	*BMX-3 Community Business Mixed Use District*
I.	<u>HEIGHT LIMIT:</u>	*150 feet maximum*

J. STREET SETBACKS: *Dwellings - Front :10 feet*
Multifamily- Side & Rear: 10 feet

K. HISTORIC PROPERTIES: *None*

L. SHORELINE MANAGEMENT AREA: *Not Applicable*

M. FLOOD ZONE: *ZONE "X"; outside 500 year flood zone; There have been no registered complaints regarding flood damage.*

N. TSUNAMI INUNDATION ZONE: *The site is located outside of the Tsunami Inundation Zone.*

O. EXISTING USE(S): *The site is currently occupied by a Texaco service station.*

P. SURROUNDING USE(S): *Mauka: Commercial*
Diamond Head: Commercial
Makai: Apartment/Residential
Ewa: Commercial

Q. AGENCIES CONSULTED IN MAKING THIS ENVIRONMENTAL ASSESSMENT:

The following agencies and organizations were invited to provide comment on the proposed action:

DEPARTMENT OF LAND UTILIZATION
City and County of Honolulu

DEPARTMENT OF PUBLIC WORKS
City and County of Honolulu

DEPARTMENT OF WASTEWATER MANAGEMENT
City and County of Honolulu

FIRE DEPARTMENT
City and County of Honolulu

DEPARTMENT OF TRANSPORTATION SERVICES
City and County of Honolulu

BOARD OF WATER SUPPLY
City and County of Honolulu

BUILDING DEPARTMENT
City and County of Honolulu

DEPARTMENT OF PARKS AND RECREATION
City and County of Honolulu

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
City and County of Honolulu

POLICE DEPARTMENT
City and County of Honolulu

NEIGHBORHOOD BOARD #11 (ALA MOANA/KAKAAKO)
c/o Neighborhood Board Commission

STATE HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND & NATURAL RESOURCES
State of Hawaii

The letters of review and comment from the above agencies are included in Attachment "H" with the corresponding response in Attachment "I".

R. SUMMARY OF REQUIRED APPROVALS AND PERMITS:

1. EXEMPTIONS UNDER PROVISIONS OF CHAPTER 201G, HRS (Hawaii Revised Statutes):

   The applicant has submitted an application to the City and County of Honolulu, for City Council approval of exemptions requested under provisions of Chapter 201G, HRS.

2. BUILDING PERMITS:

   Upon approval of the exemptions requested under the provisions of

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Chapter 201G by resolution of the City Council of Honolulu, the applicant will have construction documents prepared and submitted to the Department of Planning and Permitting of the City and County of Honolulu for review and approval.

III. DESCRIPTION OF THE PROPOSED ACTION

The site is a 18,963 square foot parcel located in the central urban core of Honolulu, in the Makiki/McCully district, approximately one block Diamond Head of the Piikoi and South King Street intersection. It fronts both South King and Alder Streets. It is in the most densely populated area of the State which is in a generational transition from a single family to a multifamily neighborhood.

The proposed project is intended to provide the elder generation an opportunity to continue residence in the neighborhood.

The area is among the most popular and convenient on Oahu. It is in close proximity to downtown, Ala Moana Shopping Center and the Queen's Medical Center. The site is located along major streets, near major bus routes and has easy access to the freeway on-ramps at Lunalilo Street.

Across South King Street are Zippy's and Wisteria restaurants. At the corner of South King and Alder Streets is the Golden Duck Chinese Restaurant.

Adjacent to the site on Birch Street, there is a nine-story residential condominium building, a small office building, a residential apartment building, single family homes and an affordable 52 two bedroom unit, eight-story apartment building under construction.

The parcel is located within one block of Sheridan Park, a municipal public park with amenities that include play courts, picnic areas, play equipment, and more important with regard to the proposed elderly project, shade rimmed open space.

The site is currently occupied by a Texaco service station that includes a paved parking area along Alder Street. The tenant is currently on a month to month lease. Under the provisions of its current lease, the tenant, Texaco, is required to clean up any contamination it may have caused.

In anticipation of the expiration of their lease, Texaco has initiated a Preliminary Site Assessment Phase II Report in preparation of any remediation and/or mitigating measures that may be required upon demolition of the existing facility.

The service station, paved parking area, all site improvements including underground storage tanks will be completely removed by demolition, including any remediation and/or mitigation of any hazardous materials or contaminated soil.

The site is essentially a flat lot, with a slight down slope from mauka to makai.

The site has a Land Use Ordinance (LUO) designation for: Business-Mixed Use (BMX-3), which designates "Dwellings, multifamily" as an Allowable Use. According to LUO provisions the maximum floor area ratio (including open space bonuses) available for a BMX-3 district parcel is x.3.5. For this 18, 963 sq. ft. parcel, this calculates to a maximum floor area of: 66,370 sq. ft.

The King Street Apartments project will be 47,407 sq. ft. or approximately 70% of the maximum allowable density.

The project will be an eight-story mid-rise building with 91 one-bedroom rental units for low income elderly. The structure will be of concrete and masonry, extending to a building height of approximately 71' to the roof level. There will be 7 dwelling floors above the main lobby and multi purpose room located at the ground floor. Each dwelling floor is planned to have a lounge or storage/laundry area and up to thirteen (13) typical rental units.

The typical rental units are planned to have one bedroom, with one bath and be approximately 396 s.f. in floor area.

Of the 91 rental units, there will be at least 5 rental units designed and built to comply with the provisions of the Americans with Disabilities Act (ADA). In addition, all units will be designed to be adaptable for accessibility to comply with the Fair Housing Act (FHA).

All the units are intended to be rental for low income elderly residents who earn 50% of the HUD area median annual income or less. The initial rent for the units is anticipated to be $498 per month.

As an elderly living project, the minimum entry age for tenants will be 62, and an assisted living component will be provided on an as needed basis to minimize the maintenance costs for individual residents of the facility. This project will offer an alternative to a full assisted living project where services are paid for by all residents, whether needed or not. The project will try to minimize maintenance costs by developing individual programs of assistance for the seniors as they need it. This allows seniors to select just those services that they need at the time, and provides a wide selection of services to allow them to stay in this facility for as long as possible. The concept of "aging in place" will be promoted and seniors will be able to enjoy the company of friends and neighbors until age and/or illness places them in a position of needing 24-hour care as provided by long term care facilities.

The Catholic Charities Elderly Services, under the auspices of the Catholic Diocese of Honolulu, has a mission to provide needed services to frail elderly individuals living in Honolulu. The purpose of providing these services is to help the individuals to manage living in their own apartments for as long as possible and as independently as possible.

The project will have 30 on-site, at grade parking stalls. As an elderly low income rental project, the HHDC has applied to the City and County of Honolulu, Department of Planning and Permitting, for processing of a Chapter 201G, HRS application to the City Council. The project will have a parking ratio of approximately one stall per three units (1:3), which is more than the accepted parking ratio for elderly communities of one stall per four units (1:4).

The site plan will include private park space areas totaling approximately 4,597 square feet. The park areas will provide the occupants with picnic tables, shaded rest areas, and space for individual gardening.

The proposed development schedule for the project anticipates design, approvals, and funding arrangements to occur through the end of 1998. Construction should begin in January 1999 with completion by the first quarter of the following year. Rental units will be available to the elderly in the first quarter of 2000.

IV. AFFORDABLE RATES PROPOSED

The target rental market for the project is the elderly earning at or below 50% of the Honolulu median annual income.

For the above income range, a maximum tenant's contribution (rent), which includes utilities, has been established by the Department of Housing and Urban Development (HUD) of the Federal Government.

For a low income elderly rental project such as the King Street Apartments, the monthly gross is $606, with a utility allowance of $52 per month. This equates to a net rental income per apartment unit of $554 per month allowed by HUD.

The King Street Apartments' net monthly rent at $498 per month (45% +/- of annual monthly income) will be below that allowed by HUD.

Marketing research has determined that one-bedroom units for the City and County of Honolulu, in mid 1997, had an average rent of $722 per month, with a median rent of $700 per month, or about 60% of the HUD area median annual income. The market demand is high and affordable one-bedroom rental units are readily occupied. With regard to specifically elderly one-bedroom rental units, the availability is virtually nonexistent and the elderly are paying considerably higher rents to remain in the urban core. Even in this market, the projected monthly rent of $498 for the King Street Apartments, is below the market in urban Honolulu area for comparable new units.

V. IMPACTS TO EXISTING CONDITIONS

Based on the current stage of the design of the project, preliminary research and review has determined that the proposed project will have the following impact to existing conditions:

A. PHYSICAL SERVICES:

1. *Water:* *Estimating the water use with reference to the adjacent Birch Street Apartments, the projected domestic water use is: 28,300 gallons per day, with landscaping use projected for: 220 gallons per day, totaling approximately 28,520 gpd.*

   There are 8" lines on Birch and Alder Streets and 12" lines on South King and Elm Streets.

   The Board of Water Supply has determined that the existing water system is presently adequate to accommodate the proposed apartment building.

   No off-site water improvements will be required.

   In addition, the design of the project will incorporate water efficient low flush toilet fixtures, low flow shower heads and sink faucets, for water conservation.

   The project will be responsible for payment of the corresponding Water System Facilities Charges and the planning will coordinate the determination and sizing of an appropriate water meter and back flow preventer for the project with the Board of Water Supply.

2. *Sewers:* *With regard to the projected wastewater generation in gallons per day(gpd) from the project, the accepted standards include:*

   85 gpd per occupant.
   50 gpd per laundry machine
   15 gpd per staff member

   With regard to the above, the projections for the proposed project include:

A maximum residency of two occupants per unit (182 tenants) would be: <u>*15,470 gpd,*</u>
Ten laundry machines would be: <u>*500 gpd,*</u>
and,
An approximate staff of 6, would be: <u>*90 gpd.*</u>

Total wastewater generation is projected to be approximately: <u>*16,060 gpd*</u>*.*

There are 6" and 8" sewer lines on Birch Street, a 12" sewer line on South King street, and a 6" sewer line on Elm Street.

The Department of Wastewater Management has approved a Sewer Connection Application for the proposed project, provided a connection is made to the existing Alder Street sewer line. A 6" sewer line of approximately 225 ft. will be required on Alder Street.

The project will also be responsible for payment of the Wastewater System Facility Charge.

As noted earlier, the design of the project will incorporate water efficient low flush toilet fixtures, low flow shower heads and sink faucets, for water conservation

3. Access: *The property has frontages on two city streets. South King Street is one way (five lanes) in the Diamond Head direction with parking on both sides. Alder Street is one-way in the makai direction with parking on one side. No off-site roadwork will be required.*

Also, no easements or additional acquisitions are required for access. The project is situated near bus routes and has easy access to the freeway and major streets, e.g., South King, Elm and Piikoi Streets.

A Traffic Impact Assessment Report, prepared by Pacific Planning & Engineering, Inc., indicates that the proposed elderly rental project will have less of an impact to current traffic than the existing Texaco Station. The report states that the proposed project will have less impact to traffic *than other comparable allowable developments, such as market condominiums (130+/- units), or a 66,000 sq. ft. office retail building which could be built on the site. The report also states that elderly projects need considerably less parking than other projects according to accepted national and local standards.*

The development of the design will address comments received from the Department of Transportation Services regarding:

Site improvements, such as landscaping and fence walls, will be designed to assure clear sight lines for vehicles and pedestrians at all driveways.

New driveways will be designed to not exceed 5% slope.

Abandoned driveways will be reconstructed for sidewalks, curbs, and gutters to match adjacent existing conditions, as well as according to the standard details of the Department of Public Works.

The site will be planned to allow on-site maneuvering for loading spaces and all parking stalls.

Parking entry controls, if planned, will be positioned to allow queuing of vehicles entering the site to clear the public street.

Planning for the site should include an increase of the property line radius at the intersections of the South King and Alder Streets from 20 feet to 30 feet.

A traffic control/detour plan, including affected traffic signs and pavement markings on both side of each affected street, will be submitted to the Department of Transportation Services for their review and approval.

4. Drainage: *The existing site topography is essentially a pad lot. The parcel has street frontages on two sides. The streets are fully improved city streets with curbs and gutters. No off-*

site drainage work is expected.

The development of the design will address comments received from the Department of Public Works regarding:

1. Compliance with City Ordinance 96-34 to control peak runoff from the site during the construction period of the project.

   The project will address City Ordinance 96-34, regarding limiting the runoff from the site to its present levels through the design of drainage flow to landscaped areas within and around the perimeter of the site. The Project will have approximately 4,597 square feet of private park land provided in three areas on site, and landscaped yards around the majority of the perimeter of the site. These areas will be used as destination for drainage runoff and increase the "Time of Concentration" for percolation before reaching the property line.

2. Street frontage repair and/or reconstruction to comply with City Standards and the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

   The design of the project will included appropriate construction details regarding street front improvements, such as gutter, curbs, sidewalks, and dropped curb driveways from the four-county STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION. The design will also include any applicable ADAAG provisions relating to accessible routes including such items as curb ramps, and ramps.

3. Best Management Practices (BMPs) during construction to minimize erosion and sediment runoff.

   The construction documents will be prepared to

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direct the Construction Contractor to include dust barriers and silt fences around the perimeter of the site to prevent erosion and sediment runoff. He will also be directed to provide a 6" thick gravel surfaced ingress and egress driveway to minimize site debris from leaving the site.

4. Direct storm water runoff from paved areas to planted areas to minimize discharge of pollutants into the City's drainage system.

The design of the site will direct paved area runoff into planting areas in response to compliance with City Ordinance 96-34, and will also consider any other measures, including retention areas or sumps, to minimize discharge into the City's storm drainage system.

5. *Police:* *The project site will be serviced as needed by patrol officers from the main police station on Beretania Street.*

The Police Department's review of the draft Environmental Assessment has determined that this project should have no significant impact on their operations.

6. *Fire:* *There is an existing fire hydrant at the project street frontage on King Street, and another across the project street frontage on Alder Street.*

Engine Company No. (2) Pawaa Station, located at Makaloa and Kaheka Street, is within .5 miles and 5 minutes from the site and will be the first station responding to an alarm, with Engine Company (3) Makiki Station, at Wilder and Piikoi Streets, as well as Engine Company (9) Kakaako Station, at Mission and Queen Streets providing back up services as needed.

In conclusion to their review of the Draft Environmental Assessment, the Fire Department forsees no adverse impact relating to the proposed use of the property.

7. *Utilities:*

a. Electric: The Hawaiian Electric Company (HECO) has existing power lines in the area and the applicant will coordinate development of the project with HECO to assure that the power will be adequate to support the proposed rental apartment project.

In addition, the design of the project will consider incorporating energy efficient design including solar panels as an alternate energy source, and compact flourescent light fixtures in the common areas for energy conservation.

The project will also be design to maximize the use of natural cross ventilation into the apartments, to minimize the need for individual air conditioning units.

b. Telephone: The GTE Hawaiian Telephone Company has existing service lines in the area. It is expected that these existing lines will be used to service the proposed apartment project. No off-site work is expected.

c. Cable: Cable television service is provided to buildings and dwellings in the surrounding area and arrangements will be made with the appropriate vendor to provide cable service to this project. No off-site work is expected.

8. Parks and Recreation:

The Project is located within one block of Sheridan Park, a municipal public park with amenities that include play courts, picnic areas, play equipment, and shade rimmed open space.

The design of the Project will address comments received from the Department of Parks and Recreation regarding:

1. The impact of the project on recreational facilities in the Makiki/McCully area.

In addition to the close proximity to the Sheridan

Municipal Park, the project will include three separate on site private park areas totaling 4,597 square feet for the use of the residents. These on-site recreational areas will relieve the residents use of the municipal facilities.

Elderly use of the municipal park is expected to be passive in nature consisting of walking and sitting in the shaded areas of the park. It is not anticipated that the elderly residents of the project will monopolized the courts or play areas of the park. These facilities will continue to be available to, while shared with, the neighborhood.

2. Compliance with the City and County of Honolulu's Park Dedication Ordinance No. 4621, and street tree requirements.

The project has applied to the Department of Planning and Permitting requesting an exemption from the park dedication requirements under the provision of Chapter 201G HRS.

The project will comply with street tree requirements of the City and County of Honolulu.

B. <u>ECONOMIC:</u>

According to the Market Study of Elderly Housing, prepared by SMS Research & Marketing Services Inc., the availability of elderly housing is low, and demand is high. The Study provided as an example, the recently completed Kulana Hale in Kakaako. It was developed as an elderly project, targeting tenants at 50% and 60% of the area median income. All of the 50% units have been rented, and the 60% units are currently being rented. The Study states that there is a high demand for elderly housing within the urban core. It is the conclusion of the Study that the proposed King Street Apartments is well designed to respond to that demand.

As a rental apartment development, the project will have a secondary effect on economic growth by providing development related work for architects, engineers, etc., as well as short-term construction jobs. The project will provide long term employment for maintenance personnel, and *possibly security guards, as well as service industry jobs to support the rental tenants and their facilities such as the common laundry and landscaping.*

As an elderly rental development, case workers will be stationed on-site to care for the tenants. Care services, including bathing, housecleaning, counseling, food services, etc., will be available to the building occupants, either through employment or independent contractors.

The project will provide housing for at least 91 elderly residents of the community, who will continue to make use of the numerous retail, restaurant, and service establishments in the area.

Short term impacts include the use of adjoining retail and restaurant establishments by the construction personnel during the anticipated 15 months of construction. The project may also provide a corresponding economic stimulus to the communities where the construction personnel live and will spend their earnings.

The project will be financed principally from state grants and loans from the State of Hawaii Rental Housing Trust Fund (RHTF) and the Hawaii Development Revolving Fund (HDRF), federal and state low-income housing tax credits, as well as interim low cost construction loans through local financial institutions. These funding sources are made available by the State of Hawaii to promote the development of affordable low income housing through the Housing and Community Development Corporation of Hawaii (HCDCH).

C. <u>SOCIAL:</u>

The McCully/Makiki area is older and more developed than newer outer urban areas, and has a considerable number of elderly residents. The elderly tend to want to remain in their familiar neighborhood.

The project is intended to provide 91 affordable one-bedroom rental housing units for low income elderly in the urban core. The community is in a generational transition from a single family to a multi-family neighborhood. The proposed project is intended to provide the elder generation an opportunity to continue residence in the neighborhood.

The proposed project not only provides an opportunity for a good location for the elderly to live, but also assures the affordability they may need for *a quality lifestyle. The project provides affordability through the proposed rent of $498 per month, as compared to market rates in the range of $700 per month.*

The project is arranging with Catholic Charities Elderly Services under the auspices of the Catholic Diocese of Honolulu, to provide needed services to the tenants. The Catholic Charities Elderly Services is expected to have the following services available:

1. *Case Management - which is the comprehensive, holistic approach to the planning and delivery of services to meet the client's needs.*

2. *Set up classes for social, educational, and/or health needs - to prevent the social isolation of the residents and to foster preventive measures for health related areas.*

3. *Chore services, such as light housekeeping.*

4. *Transportation - to doctors, other medical entitlement, or financial appointments.*

5. *Shopping service - assist clients by doing their marketing (food shopping) or other shopping for them.*

6. *Money management - help with direct deposits, check writing and bill paying.*

7. *Arrange for personal care or health related needs - including assistance in bathing and other daily hygiene requirements, nurse monitoring and other daily activities with which a resident requires assistance. This may also include having doctors, nurses, and other health practitioners come to the site to speak or to provide health related services, including blood pressure and cholesterol screening, and podiatry services.*

8. *Establish linkage with other agencies and service providers in the community.*

9. *Develop a directory of providers for use by the staff and residents and referring and linking residents to service providers in the community.*

10. *Educate residents on service availability, application procedures*

(including food stamps, rent rebates, Supplementary Social Security Income, Medicare, prescription assistance, energy assistance, etc.) client rights, and other relevant issues.

11. Develop case plans in coordination with assessment services.

12. Monitor the ongoing provision of services from community agencies.

13. Set up volunteer support programs with service organizations.

14. Help residents build informal support networks with other residents, family and friends.

15. Educate project staff on issues related to aging in place and service coordination.

16. Assess residents' functional abilities so that the appropriate case plans can be developed.

17. Increase social interactions among residents, and decrease isolation by some, through the promotion of social activities and encouraging greater participation by all residents.

D. ENVIRONMENTAL:

1. Historic and Archaeological Resources:

   The State Historic Preservation Division, of the Department of Land and Natural Resources, has determined that the proposed project is located on land which has been extensively developed and altered making it unlikely that subsurface historic sites would be found. It believes that this project will have "no effect" on historic sites.

   In addition to the above, the project plans will be prepared to direct the Construction Contractor to stop work and notify the State Historic Preservation Division should any historic sites, including human burial, be uncovered during routine construction activities.

2. Natural Resources:

   a. Water Sources: The project does not anticipate impacting the water table in the area.

Subsurface conditions presented through test borings for the Foundation Investigation Report prepared by Ernest K Hirata & Associates, Inc., of the adjacent Birch Street Apartments, indicated subsurface water at approximately 8.5 to 9.5 feet below grade.

The proposed foundation system, anticipated to be spread footings with 15 foot piles, will not adversely impact the area water sources. Parking will be at grade.

b. *Flood Plain:* *The project is in ZONE X, outside the 500 year flood zone.*

c. *Wetlands:* *The project site is in the urban core and does not involve wetland areas.*

d. *Coastal Zone:* *The project site is not in within the coastal zone management area or the City's Special Management Area.*

e. *Flora and Fauna:* *The project site is in the urban core and does not contain any wildlife habitats or rare or endangered flora and fauna.*

f. *Agricultural Lands:* *The project site is in the urban core and designated for urban and apartment use. The proposed project will not impact agricultural lands or lands with potential agricultural use.*

3. *Noise:*

Short term noise impacts at construction sites are a normal and expected result of construction activity. The State Department of Health administers rules and regulations relating to the hours during which construction is permitted and the noise levels permitted during those hours. The Construction Contractor will be required to apply for a permit from the State Department of Health regarding regulatory limits for noise from construction activities.

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The Construction Contractor will also coordinate the anticipated pile driving operations with the Noise and Radiation Branch of the Department of Health.

Long term noise impact from the proposed project is expected to be minimal.

4. *Air Quality:*

   Short term impacts to air quality are primarily relating to expected dust generated by construction activity. The Construction Contractor will be directed to take dust control measures during the construction period to minimize or eliminate any negative impact to air quality.

   Long term impact to air quality is anticipated to be minimal.

5. *Resource Conservation Measures:*

   The project will be designed to be environmentally sensitive by including non polluting waste water systems involving connection to the available municipal sewer system.

   The project will include water conservation elements with regard to low-flush toilets, low flow plumbing fixtures, and an efficient irrigation system including drip distribution.

   The building will have energy efficient lighting fixtures, such as compact fluorescent lights in the common areas, low voltage landscaping and walkway lighting. Solar panels will be considered in the design for hot water generation, and as an alternate energy source.

   In addition, the design will maximize the opportunity for cross natural ventilation for the dwelling units, to allow further conservation of energy otherwise needed for individual air conditioning units.

VI. MAJOR ENVIRONMENTAL CONCERNS

Based on the Environmental Site Assessment - Phase 1 report prepared for Bishop Trust Company Ltd. by R.M. Towill Corporation, dated September 1991, the property was previously used for residential purposes until 1961 when the property was improved for the current use as a Texaco service station. The report concludes that "...Although there were no signs of surficial contamination, the previous use of the site as a service station suggests the potential for subsurface contamination...".

Under the provisions of its current lease, Texaco is required to clean up any contamination it may have caused.

In its lease with Pacific Century Trust (PCT), Texaco as Lessee is required to:

> "....keep the demised premises and all improvements thereon in a strictly clean and sanitary condition, and will observe and perform and comply with all laws, ordinances, rules, and regulations of the health or other governmental authorities applicable to said premises... and will make good at its own cost and expense all defects of which notice shall be given...".

The lease further states that:

> "...if Lessor, prior to the termination thereof, shall so request, Lessee shall remove at its own expense all improvements erected by it on the demised premises and restore the premises to a clean and level condition...".

In response to the possible expiration of their month to month lease, Texaco initiated a Preliminary Site Assessment Phase II Report, dated January 1997, prepared by Walker Consultants, Ltd. of Honolulu. The preparation of the report included a soil gas survey of 19 locations on the site, soils sampling and monitoring of 8 ground water wells, as well as 2 rounds of ground water sampling.

The report concluded that:

> "...the chemical composition of the soil vapor samples indicates that any past release of gasoline has been naturally degraded into compounds that are shorter than gasoline range impacts. Analytical results for all of the soils and groundwater samples are well below their respective DOH Tier SALS and GALs, indicating that there are no ongoing releases."

On March 25, 1997, Texaco submitted the report to the State of Hawaii Department of Health, Environmental Management Division, Solid and Hazardous Waste Branch, with a request for a "No Further Action Required" *designation.*

On May 30, 1997, The State of Hawaii responded that they "...have no further questions regarding the no further action request and removal of the release identification number." *Mr. Jose Ruiz of the DOH Underground Storage Tank Section, confirmed for this Environmental Assessment, that the State had accepted the report that the site had no significant contaminants, and determined that the site is "clean".*

Additionally, the project has been designed to minimize any impact to the existing subsurface soils conditions on the project site. The design allows for maximum access to the project's site during construction and even after completion of the proposed project, in the event any contamination is detected.

All construction, except for normal foundation work, will be at grade or above grade. The proposed project is not anticipated to disturb the existing subsurface soil conditions.

VII. MAJOR ALTERNATIVES CONSIDERED

Landowners, including the current Trustee owner, have the responsibility to seek the highest and best use of the property.

The major alternative uses considered for the property include:

CONTINUED USE:

This alternative involves the continuation of its current use, as an: Automotive Service Station.

The land owner, Pacific Century Trust (PCT) as Trustee of the Hawaii Community Foundation Trust - Okumura Family Fund, did not desire to have a property used as a service station in its permanent portfolio, and offered the property for sale. They approached the current tenant, Texaco Refining and Marketing, to offer the first right of purchase to them to convert their month-to month lease to ownership. Texaco has indicated that they have no intention to purchase the property for their continued use and will vacate the property should the opportunity of another use be available.

Should another vendor become available, the site could be re-tenanted for the continued use as a service station. However this use is not consistent with the interest of both the PCT and HHDC who has an option to purchase the property. The service station use does not maximizing utilization of the property, and can create liability and expenses to the owner with the handling of potentially hazardous materials.

DISUSE:

As an alternative, the site may also be cleared of its current use and essentially no development of the property may occur. The land will lay fallow.

This alternative is not in the interest of the PCT, or future owner, to seek the highest and best use of the property.

IMPROVED USE:

The maximum potential for the improvement of the property is directly related to the maximum allowable floor area available on the parcel. According to the LUO designation for Business-Mixed Use (BMX-3), the maximum allowable floor area (including open space bonuses) available on the parcel is x.3.5. For this 18, 963 *sq. ft. parcel, the maximum floor area calculates to 66,370 sq. ft..*

The BMX-3 designation intends the parcel to be used for a variety of "Allowable Uses" according to the provisions of the LUO. The most pertinent use for this parcel includes:

> *OFFICE BUILDINGS.*
> *or,*
> *DWELLINGS, MULTI-FAMILY. Within this permitted use, a residential development as an alternate use may be considered, both for market residential (condominium) and low income affordable (rental).*

With regard to the above alternatives, use for an Office Building is not anticipated to be advantageous with the current overabundance of office space throughout the city.

The direction for the highest and best use of the property leads significantly toward residential use.

With regard to "for sale" market condominiums, the overabundance of existing condominium units on the market makes condominium development unfeasible.

According to the Market Study of Elderly Housing, prepared by SMS Research & Marketing Services, Inc., with the substantially limited availability of elderly housing in general, and affordable rentals in particular, it is apparent in the report that maximum and best use of the parcel is to provide affordable, one-bedroom rental units for low income elderly at the targeted rental market range.

It is the conclusion of the marketing report, and the position of this assessment, that the proposed affordable elderly rental project is significantly better than the current continued use of the parcel as an automotive service station, the disuse of the parcel, or the improved use as an office building or market residential (condominium).

VIII. MITIGATION MEASURES

Few potential adverse impacts to the area are expected to result from the implementation of the proposed project.

SHORT TERM

Immediate short term mitigation measures will respond to the demolition and removal of the tenant's improvements currently on the site, including structural demolition, removal of underground storage tanks, as well as remediation of any hazardous materials generated by the tenants occupancy.

The lease provisions between the landowner and the tenant, clearly define the responsibility for the removal of hazardous materials prior to the return of the site by the tenant. The tenant has indicated that they will completely fulfill their responsibility according to regulations of the State of Hawaii regarding the proper removal and disposal of hazardous materials.

The short term mitigation measures at the start of the construction period will respond to adverse conditions generated by the initial construction phase such as on-site grading and movement of vehicles within the project site.

The Construction Contractor will be required to install silt fences and site drainage controls to prevent erosion and off-site runoff.

The short term mitigation measures for the duration of the construction period will respond to adverse conditions generated by the continuing construction of the project including activities that will generate localized noise and dust.

Impacts from the noise and exhaust emissions of the construction vehicles will be mitigated by the mufflers and filters on the construction equipment and restricting the use of construction equipment to daylight hours.

Mitigating measures in response to adverse impacts to air quality would include minimizing the amount of dust generating materials and activities, providing an adequate water source at the site prior to startup of construction activities, frequent watering of unpaved areas, and the installation of dust screens to limit fugitive dust from the site.

The Construction Contractor will be required to provide adequate dust control measures during the weekends, after hours, and prior to daily start up of construction activities, as well as controlling dust generated by debris being *hauled away from the site.*

In addition, the Construction Contractor will be required to apply for permits from the Department of Health and comply with noise and dust control regulations.

In response to the community concerns regarding limited street parking, the Construction Contractor will be required to provide loading and parking areas on-site, as well as alternate parking sites for the construction personnel, during the construction of the project.

The Construction Contractor will be responsible to provide for the safety of the pedestrian public along the street front of the project site, including barricades and signage.

The Construction Documents will include a traffic control plan for any work affecting the street frontage areas of the project, and the Construction Contractor will be required to follow City regulations for street and sidewalk closures during the period of construction, and provide the necessary traffic control devices required to minimize the disruption of vehicular, as well as pedestrian movement.

He will also be responsible for the security of the site itself, and the construction materials on-site, from theft or vandalism during off-hours with patrolling guards, or electronic warning systems.

LONG TERM

Long term impacts from the development of the project are expected to produce minimal impacts to the adjacent residential and commercial property owners. Appropriate engineering and design measures will ensure adequate drainage and irrigation of the site after the completion of the project.

The proposed project is not expected to have any impact on the micro-climate of the area or region. The planned height of the structure will not be tall enough to significantly affect existing wind patterns. No specific, important, nor predominant natural feature is visually associated with the project site.

The project does not anticipate to impact on the limited street parking in the area. As an elderly facility for residents at least 62 years old, it is expected that many of the residents will enlist the convenience of public transportation. The project has applied to the Department of Planning and Permitting requesting an exemption from parking requirements under the provisions of Chapter 201G

HRS. The project will have 30 parking stalls for a parking ratio of approximately one stall per three units (1:3), which is more that the accepted parking ratio for similar elderly communities of one stall per four units (1:4). Additional parking will be a priority as the design of the project develops.

There will be a long term benefit to the area with the establishment of site landscaping to aesthetically integrate the project into the surrounding neighborhood.

The proposed project will also provide long term improvement to the quality of the environment in the area with the discontinuance of the current use as a service station.

An implementation of the measures listed above, should be appropriate to minimize, if not eliminate, any adverse impact to the environment of the proposed project.

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IX. MAJOR EXEMPTIONS REQUESTED UNDER PROVISIONS OF CHAPTER 201G HRS

The project has submitted an application to the City and County of Honolulu for City Council approval of the following requested exemptions:

A. *Exemption from Chapter 21, Article 5, Section 21-3.70-2, ROH, Land Use Ordinance, Ordinance No. 86-96, as amended, to allow the provision of 30 parking stalls for the proposed 91-unit, affordable, elderly apartment rental development instead of 101 stalls.*

B. *Exemption from Chapter 21, Article 5, Section 21-5.90-3(b), ROH, Land Use Ordinance, Ordinance No. 86-96, as amended, to allow:*
   a. *A front yard of approximately 5 feet for about a 16-foot section.*
   b. *A front yard of about 9 feet for about a 42-foot section along Alder Street.*
   c. *A side yard along the south property line of approximately 3 feet for about a 96-foot section.*

C. *Exemption from Chapter 21, Article 5, Section 21-5.90-3(d)(2)(B), ROH, Land Use Ordinance, Ordinance No. 86-96, as amended, to allow:*
   a. *A portion of the building to encroach into the transitional height setback for about a 17-foot section, including the elevator shaft and a portion of the elevator lobby, along the south property line with a 3-foot transitional height setback instead of a 13-foot transitional height setback from the 40-foot elevation level up to the top of the structure at 70 feet, 6 inches.*
   b. *A portion of the building to encroach into the transitional height setback for about a 7-foot section, a portion of the corridor, along the south property line with a 12-foot transitional height setback instead of a 13-foot transitional height setback from the 40-foot elevation level up to the top of the structure at 70 feet, 6 inches .*

D. *Exemption from the Park Dedication requirements, Chapter 22, Article 7, ROH to allow the provision of 4,597 square feet of private park land provided in three areas, the 935 square foot Victory Gardens, the 1,310 square foot Terrace area and the 2,352 square foot Private Park, including the construction of benches, tables, and barbeque areas, instead of 6,637 square feet of park and playground.*

E. *Exemption from Chapter 18, Article 6, Section 18-6.2, ROH, Building Permit Fees, as amended, to allow exemption of the fees for building* *permits.*

F. *Exemption from the payment of Real Property Taxes, in accordance with Chapter 8, Article 10, Section 8-10.20 ROH, real Property Tax Building Permit Fees - Exemption - Low-income and Moderate income housing, as amended.*

X. COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT

The applicant has received comments, regarding the draft of this Environmental Assessment from the following:

Agencies:

DEPARTMENT OF LAND UTILIZATION
City and County of Honolulu

DEPARTMENT OF PUBLIC WORKS
City and County of Honolulu

DEPARTMENT OF WASTEWATER MANAGEMENT
City and County of Honolulu

FIRE DEPARTMENT
City and County of Honolulu

DEPARTMENT OF TRANSPORTATION SERVICES
City and County of Honolulu

BOARD OF WATER SUPPLY
City and County of Honolulu

BUILDING DEPARTMENT
City and County of Honolulu

DEPARTMENT OF PARKS AND RECREATION
City and County of Honolulu

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
City and County of Honolulu

POLICE DEPARTMENT
City and County of Honolulu

NEIGHBORHOOD BOARD #11 (ALA MOANA/KAKAAKO)
c/o Neighborhood Board Commission

STATE HISTORIC PRESERVATION DIVISION,
DEPARTMENT OF LAND & NATURAL RESOURCES
State of Hawaii

OFFICE OF ENVIRONMENTAL QUALITY CONTROL
State of Hawaii

Public:

COUNCIL MEMBER Andy Mirikitani
City Council, District V

XI. SIGNIFICANCE CRITERIA

According to the Department of Health Administrative Rules (Title 11- Chapter 200-12), the applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects, and its short and long tem effects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant environmental impact will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

(1) **Involves an irrevocable commitment to loss or destruction of any natural or cultural resources;**

The proposed project will replace an existing Texaco service station.

The site has a Land Use Ordinance (LUO) designation for: Business-Mixed Use (BMX-3), which designates "Dwellings, multi-family" as an Allowable Use. According to LUO provisions the maximum floor area ratio (including open space bonuses) available for a BMX-3 district parcel is x.3.5. For this 18, 963 sq. ft. parcel, the maximum floor area calculates to be: 66,370 sq. ft.

The King Street Apartments project will be 47,407 sq. ft. or approximately 70% of the maximum allowable density.

No significant or historic sites are known to exist within the project site. Should any archaeologically significant artifacts, bones, or other indicators of previous on-site activity be uncovered during the construction of the project, their treatment will be conducted in strict compliance with the requirements of the Department of Land and Natural Resources.

The proposed project does not involve a loss or destruction of any natural or cultural resource.

(2) **Curtails the range of beneficial uses of the environment;**

The use of the property is designated to be residential in general and specifically allows: multi-family.

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The proposed project is consistent with the continued beneficial use of the property as multi-family residential.

The proposed project does not curtail the range of beneficial uses to the environment.

(3) **Conflicts with the state's long term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions or executive orders;**

The proposed project is consistent with the Environmental Policies established in Chapter 344, HRS, and the National Environmental Policy Act, and has not been subjected to any court decisions or executive orders.

(4) **Substantially affects the economic or social welfare of the community or State;**

The proposed project will have a short term beneficial affect on the economic welfare of the community for the employment of construction workers as well as the support of materials providers.

The proposed project is intended to be an affordable rental project for low income elderly residents who earn 50% of the HUD area median annual income or less. The project is responsive to the existing need for affordable senior housing.

The proposed project does not negatively affect the economic or social welfare of the community or state.

(5) **Substantially affects Public Health;**

The proposed project will have short term significant impact to the public health of the immediate area surrounding the site due to construction activities.

Equipment and construction activities generating noise, such as specifically pile driving, will be scheduled to be least disruptive to surrounding properties and will be monitored to comply with Department of Health regulations.

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Dust and other airborne debris will be minimized during the construction period with the use of tarps and water spray. No exposed trash containers will be allowed, and the construction site will be cleaned of debris on a regular schedule to avoid accumulation.

The proposed project anticipates no long term negative effects to the public health, and will be significantly positive in terms of providing safe, decent and affordable senior housing.

(6) **Involves substantial secondary impacts, such as population changes or effects on public facilities;**

The proposed project is within the planned land uses of the City and County of Honolulu, and the State of Hawaii.

The proposed project has been reviewed by governing agencies regarding utilities services such as wastewater and water service, as well as other public facilities such as traffic, police and fire. All reviewing agencies have provided their concurrence with the intent of the proposed project.

The proposed project does not involve substantial secondary impacts, such as population changes or infrastructure demands.

(7) **Involves a substantial degradation of environmental quality;**

The proposed project will utilize existing urban land for the development of a multi-family apartment building for the low income elderly. The proposed use is consistent with the current multi-family residential buildings surrounding the site.

The proposed project is not anticipated to provide a substantial degradation of the environmental quality of the area.

(8) **Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment of large actions;**

The proposed project is intended to reduce the critical need for affordable rental housing for the low income elderly of the State of Hawaii and City and County of Honolulu. As a multi family, mid rise structure, the proposed project will provide the best use of the existing site with regard to reducing the need for affordable rental housing.

The King Street corridor is City zoned to be Business Mixed Use, which includes residential apartments. The project is compatible to the long term intention of the City and good planning.

The project intends to continue the diversity of residential use in the area. The residential community is in transition from single family dwellings to multi-family apartments and condominiums. The adjacent Birch Street Apartments project, as a housing project for low income families in the area, is on the site of a previously residential facility for young orphaned boys and girls. It is currently under construction for a mid-rise, multi-family affordable rental housing project. A nine story apartment condominium was built across the street on the Diamond Head side of Birch Street. Other nearby affordable projects, e.g., Kulana Hale, etc, also have just been completed.

The area is zoned by city ordinance for mid and high rise mixed (business/residential) and apartment (residential) use.

A Market Study of Elderly Housing, prepared for the proposed project, has determined that the proposed King Street Apartments is consistent with the residential character of the neighborhood, and will provide direly needed additional affordable housing for the state.

A Traffic Impact Assessment Report, prepared for the proposed project, has determined that the elderly housing project will not significantly impact the street parking or the traffic of the neighborhood. Elderly residential projects are generally accepted to need only 1 stall per 4 units. The proposed project will have a parking to unit ratio of 1 stall to 3 units, which will provide relief to any impact the proposed project may have to street parking in the area. With respect to traffic, the report indicates that the proposed project will generate less traffic than the site's current use as a service station.

The proximity of the proposed project to major municipal bus routes, will allow the elderly residents convenient use of transportation service independent of individual vehicles, which will minimize any impact the proposed project will have to traffic in the area.

Additionally, by replacing a potentially hazardous use of the service station, with an affordable elderly rental housing project will only reduce any adverse impact to the environment of the immediate area.

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The current environment of the project is multi-family residential, and the proposed project is consistent and compatible with that environment.

The proposed project will not have a considerable effect on the environment, and will not require a commitment for larger actions.

(9) **Substantially affects a rare, threatened, or endangered species, or its habitat.**

There are no rare, threatened or endangered species, or their habitat on the site of the proposed project.

The proposed project will not affect rare, threatened, or endangered species or their habitat.

(10) **Detrimentally affects air or water quality or ambient noise levels;**

The proposed project will have a short term impact to the air quality of the immediate area surrounding the site due to exhaust emissions from equipment, dust and other airborne debris generated from construction activities.

The impact of exhaust emissions will be minimized with the use of filters and other improvements to limit exhaust emissions. Dust and other airborne debris will be minimized during the construction period with the use of tarps and water spray.

The proposed project site has no accessible water sources, and the proposed project is not anticipated to affect the subterranean water quality.

The proposed project will have a short term impact to ambient noise levels of the immediate area surrounding the site due to construction activities.

Equipment and construction activities generating noise will be scheduled to be least disruptive to surrounding properties and will be monitored to comply with Department of Health regulations.

The proposed project anticipates no long term detrimental effects to the air or water quality or ambient noise levels of the site.

(11) **Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;**

The site of the proposed project is located in the central Makiki district, approximately 3/4 miles from the ocean at Ala Moana Beach Park. The site is not located in a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water or coastal waters, and the proposed project will not provide any adverse affect.

The proposed project will not affect an environmentally sensitive area, such as a flood plain, tsunami zone, erosion prone area, geologically hazardous land, estuary, fresh water area, or coastal waters.

(12) **Substantially affects scenic vistas and view planes identified in county or state plans or studies;**

The proposed project is not located in any special design district that may have provisions for scenic vistas and view planes.

The approximate 71' height of the proposed project is within the 150' maximum height limitation of the BMX-3 Business Mixed Use Zoning District. The design height is comparable to several surrounding existing multi-family structures, and is not intended to be detrimental to their orientation to a view.

(13) **Requires substantial energy consumption.**

The proposed project has been reviewed by the electric utility company, and has been determined to be within power availability.

The multi-family apartment building will be designed to incorporate energy efficient design for energy conservation, but more specifically to allow cost control and reduction of maintenance fees for the benefit of the residents.

The project will include water conservation elements with regard to low-flush toilets, low flow plumbing fixtures, and an efficient irrigation system including drip distribution.

The building will have energy efficient lighting fixtures, such as *compact fluorescent lights in the common areas, low voltage landscaping and walkway lighting. Solar panels will be considered in the design for hot water generation, and as an alternate energy source.*

In addition, the design will maximize the opportunity for cross natural ventilation for the dwelling units, to allow further conservation of energy otherwise needed for individual air conditioning units.

XII. DETERMINATION

Based on a review of the Significance Criteria in the preceding section, we have determined a: FINDING OF NO SIGNIFICANT IMPACT (FONSI) for the proposed affordable rental apartment development, planned as the KING STREET APARTMENTS.

0000 0005 0824

ATTACHMENT "A"

PROJECT TEAM

PROJECT TEAM

Selection of the project team is being made to facilitate the development and processing of the project. Team members are a permanent part of the community and represent both large and small business and community groups. They have expertise and years of experience in the development, design, construction, management and rental businesses. The project team will have the capability to expeditiously design, process approvals for financing and building, construct and rent the project in a timely manner.

The following highlight some of the key project team members:

<u>DEVELOPER/OWNER</u>. The Hawaii Housing Development Corporation ("HHDC") is a non-profit organization created to develop lower income rental housing on an ongoing basis. Its directors are made up of very influential and successful business people in the community, coming from both the public and private sectors. Their experience is varied, e.g., bankers, union officers, legislators, government employees, developers, affordable housing coalition members, etc. Directors with experience in the affordable housing arena include Leonard Hoshijo and Tracy Takano, past and present Housing Representatives for the International Longshore and Warehouse Union. The Union has been involved in building and managing single family affordable housing since the 1950s. It has over 30 projects consisting of over 3,000 affordable residences. Also, Director Wallace J. Inglis' experience includes serving as president of the Coalition for Specialized Housing that developed the 200 unit Hale Mohalu elderly project. HHDC is the developer of the Birch Street Apartments affordable family rental, adjacent to the King Street Apartments project.

<u>DEVELOPMENT CONSULTANT</u>. Gary Furuta has over 23 years of experience in real estate development and engineering, with knowledge in acquisition, planning, financing, sales and asset management. A considerable amount of his experience has been in a corporate environment where he was responsible for the profitable and efficient management of a company or real estate division. He is HHDC's development coordinator for the adjacent Birch Street Apartments.

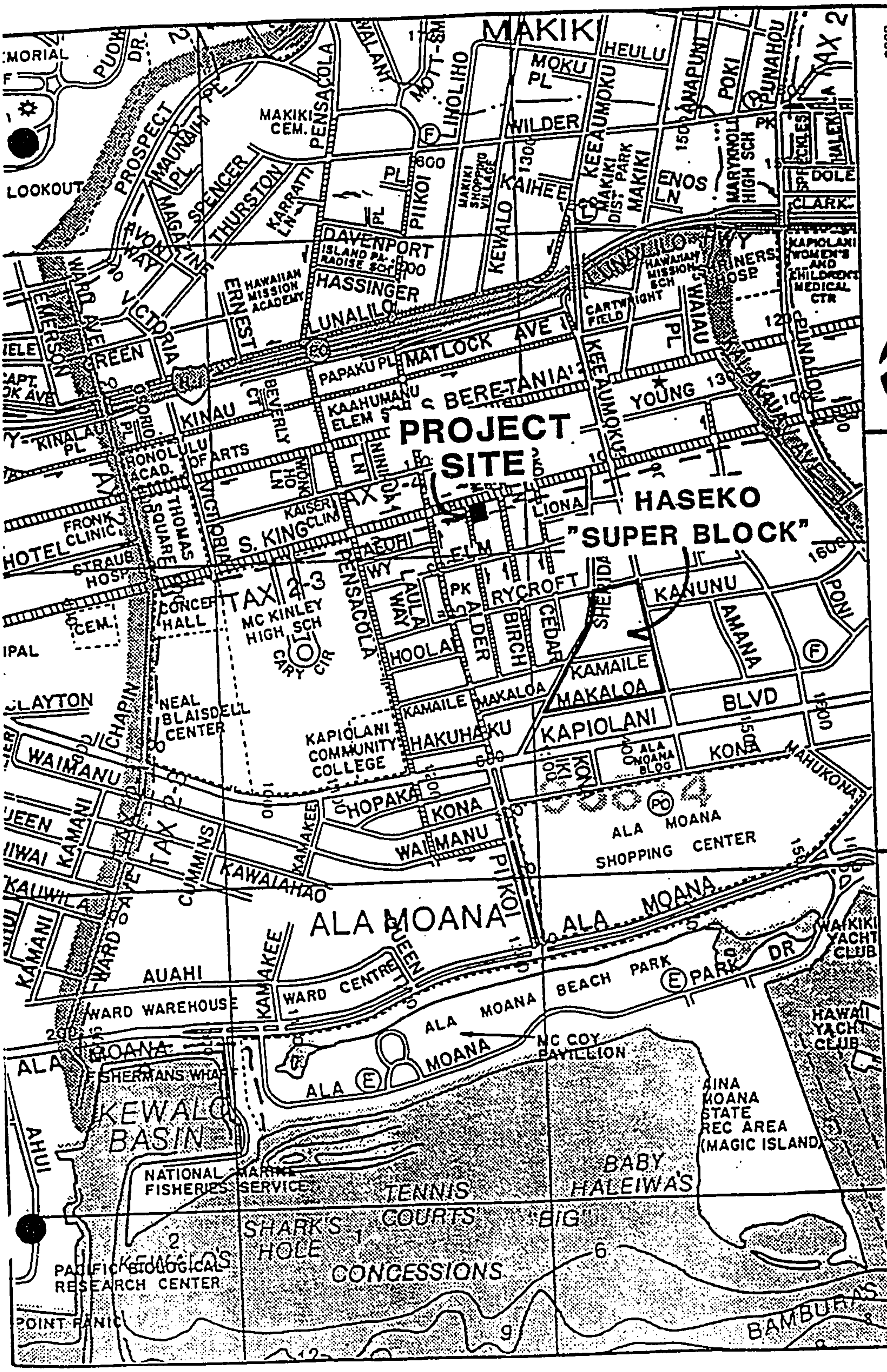
<u>ARCHITECT</u>. Kazutoshi Yato of Kazu Yato, AIA & Associates is a registered architect with over 30 years of experience in architecture and has a considerable amount of knowledge and experience in multi-family mid- and high-rise buildings. Many of Mr. Yato's buildings dot the Honolulu skyline. He has designed both high end market projects as well as several affordable rental projects.

<u>PROPERTY MANAGEMENT</u>. Prudential Locations has over 18 years of experience in Hawaii and is a diversified real estate company. The Property Management Division currently provides management services to over 900 properties, of which one-third are affordable and elderly apartment units.

ATTACHMENT "B"

PROJECT SITE

0000 0005 0827



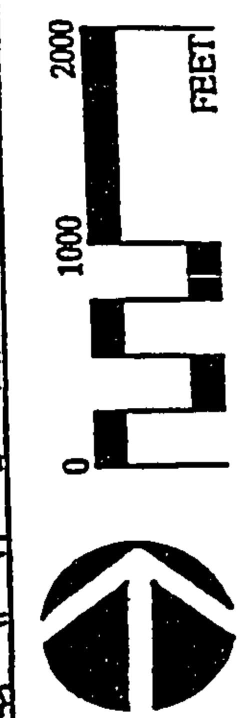


FIGURE 1
VICINITY MAP

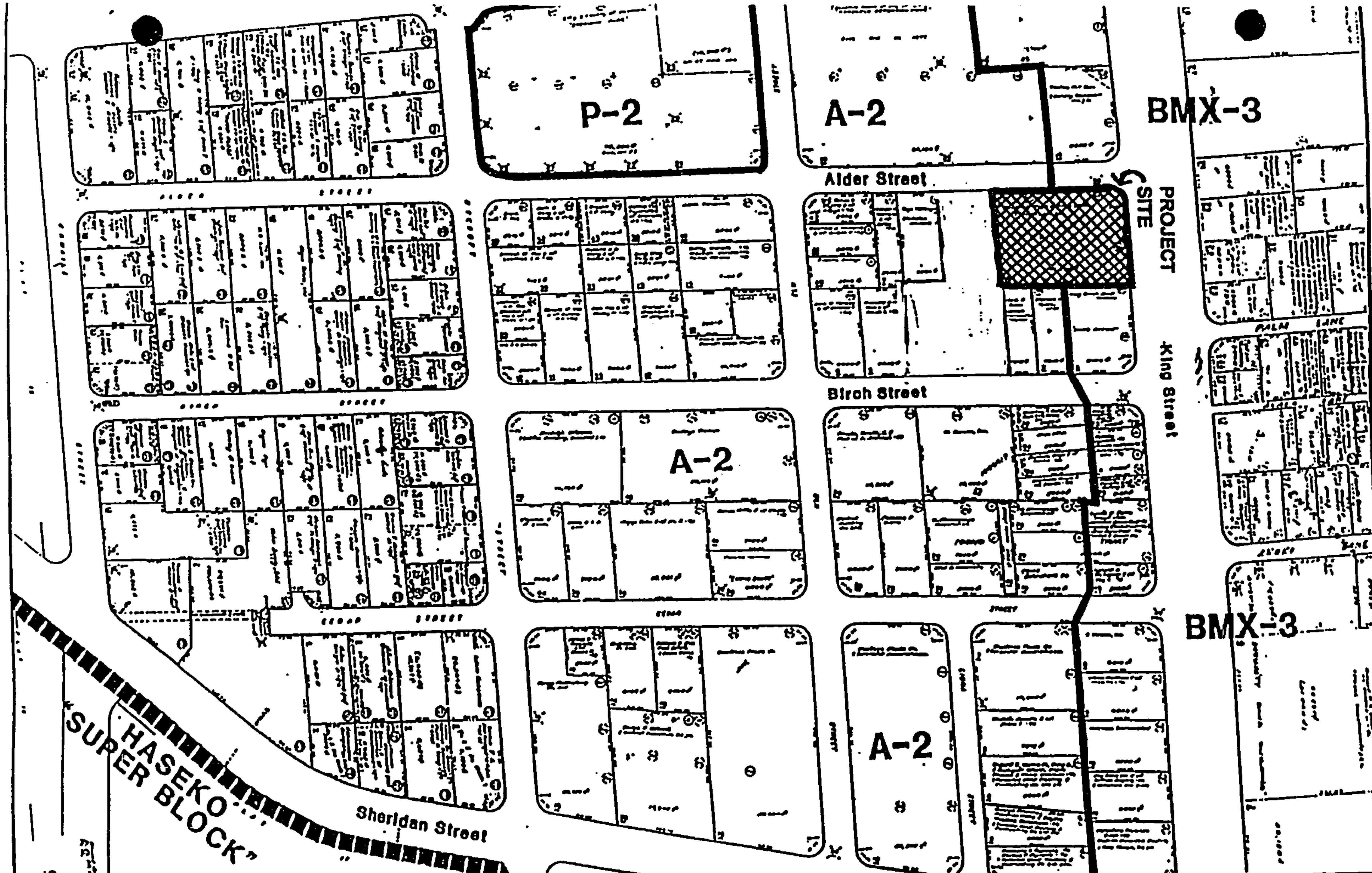
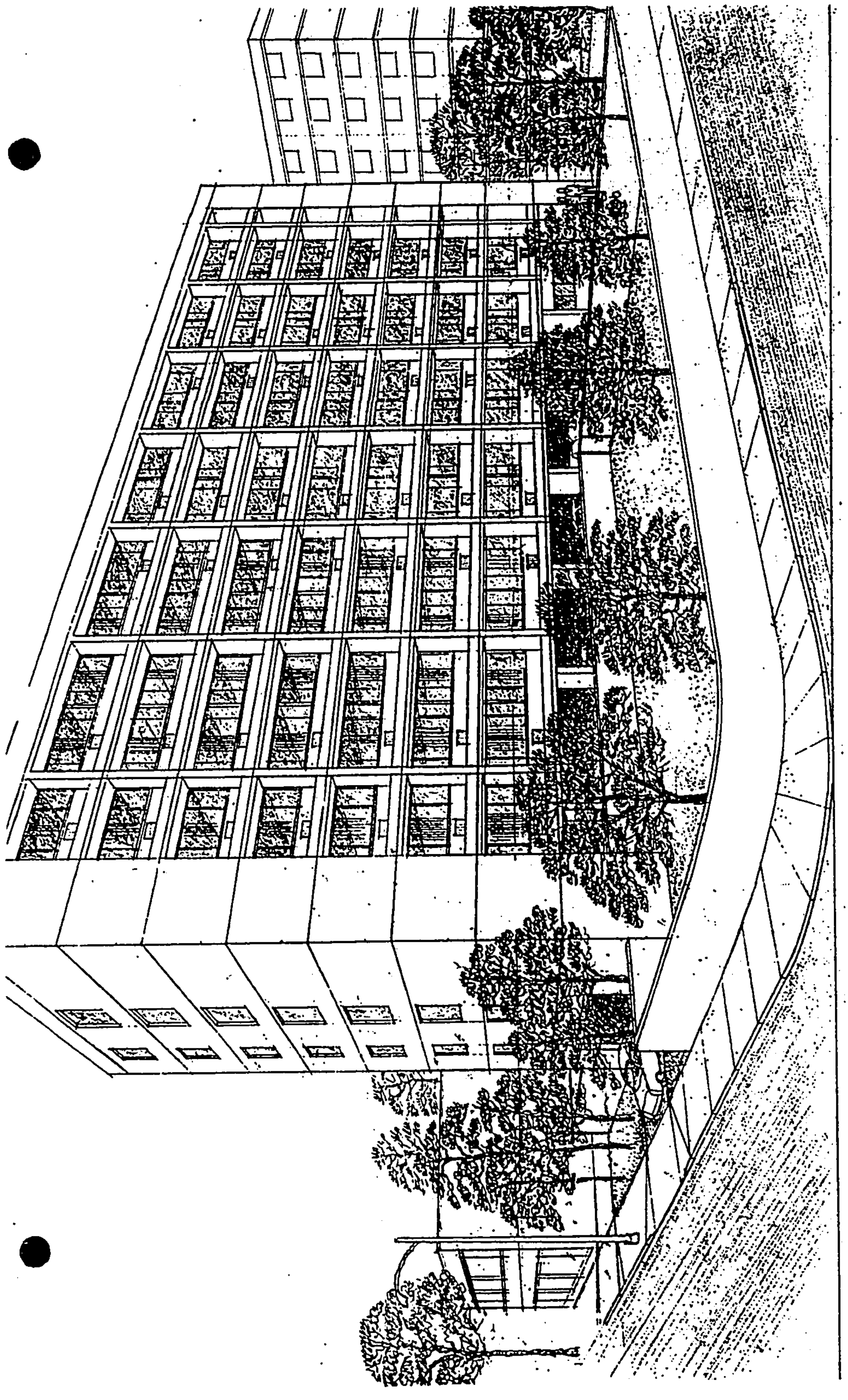


FIGURE 2
ZONING MAP
HIGHEST & BEST USE - PROPERTY
BIRCH & ALDER TMK # 2-3-12-4

0000 0005 0828

ATTACHMENT "C"

PROJECT DESIGN



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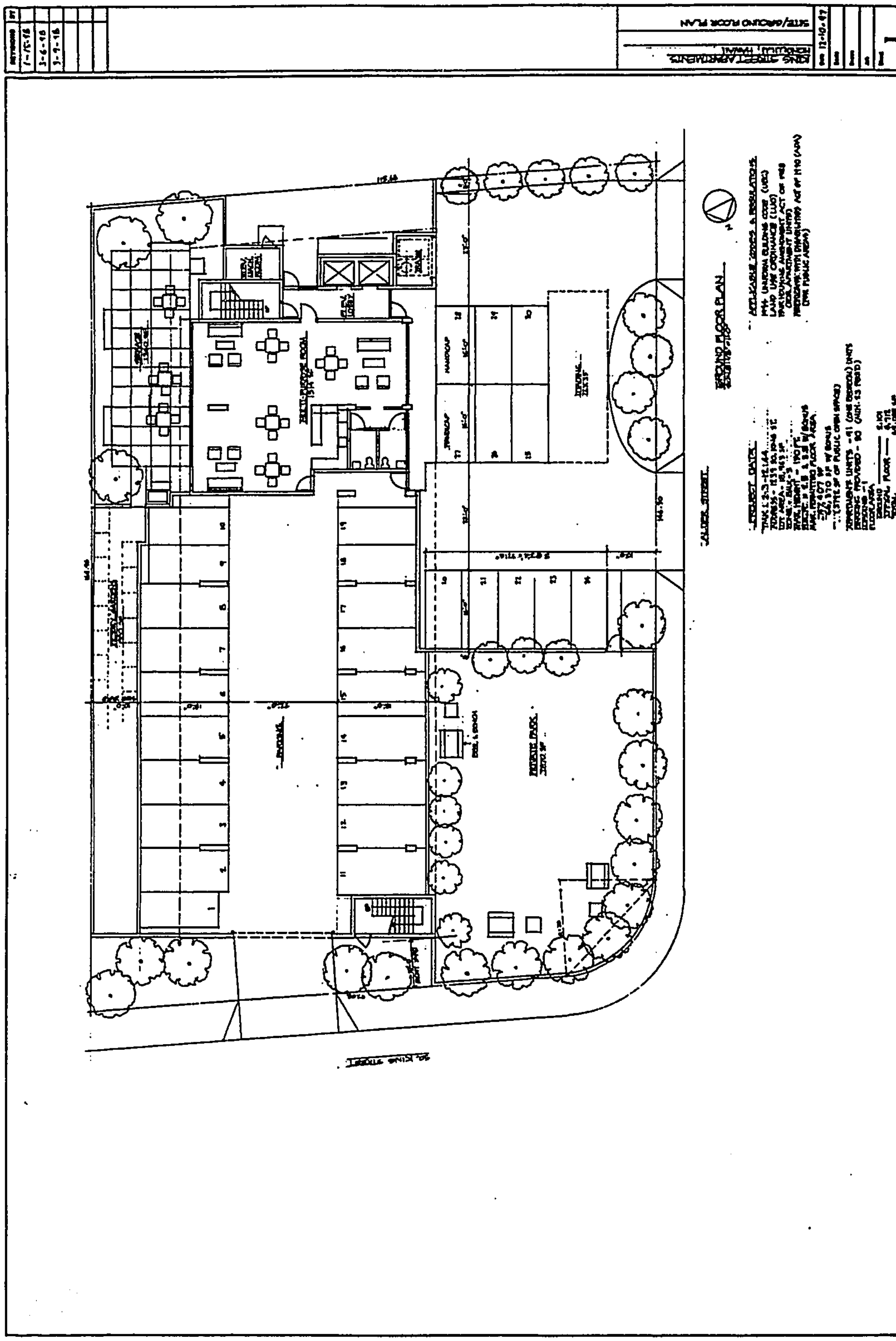

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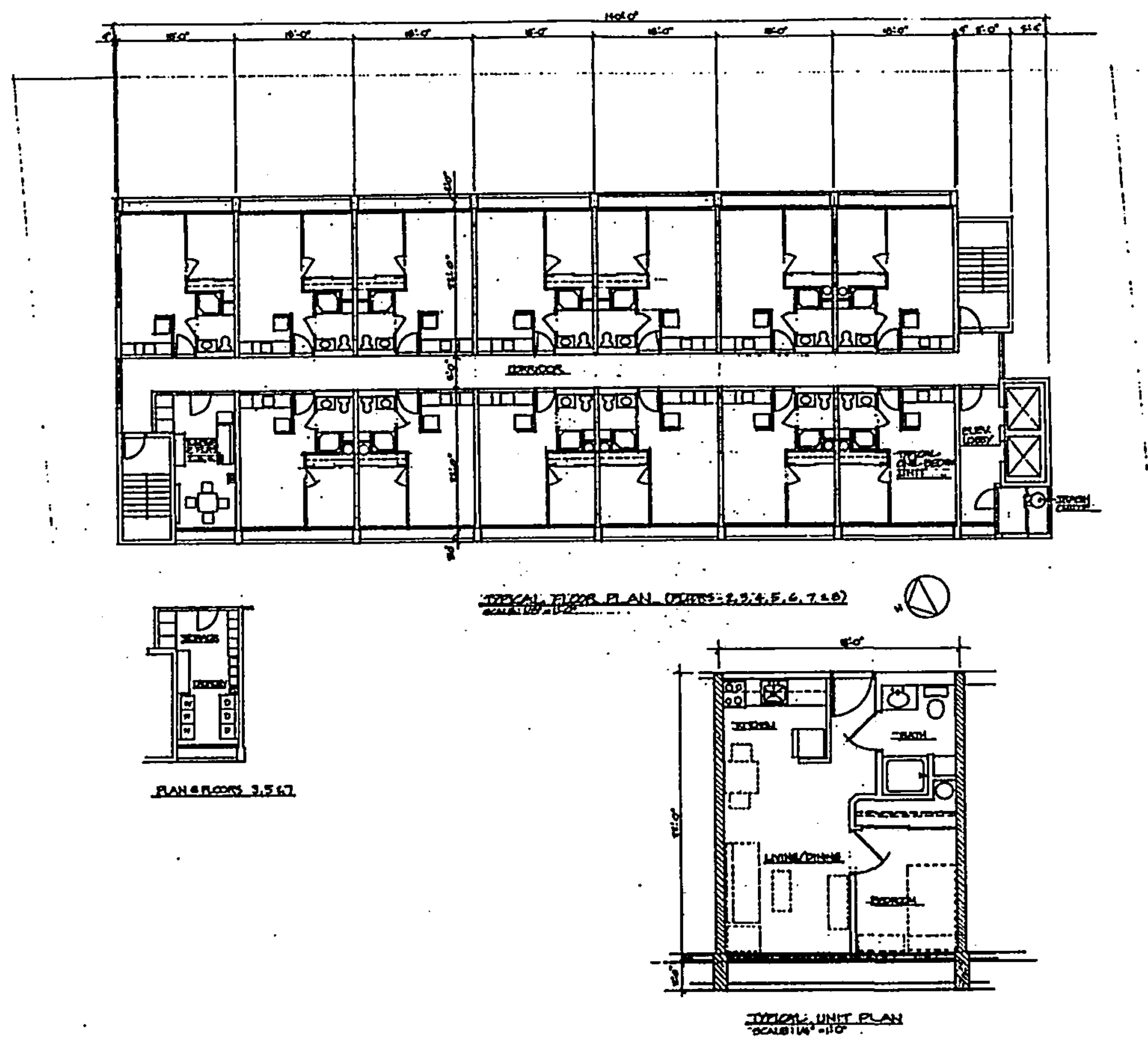


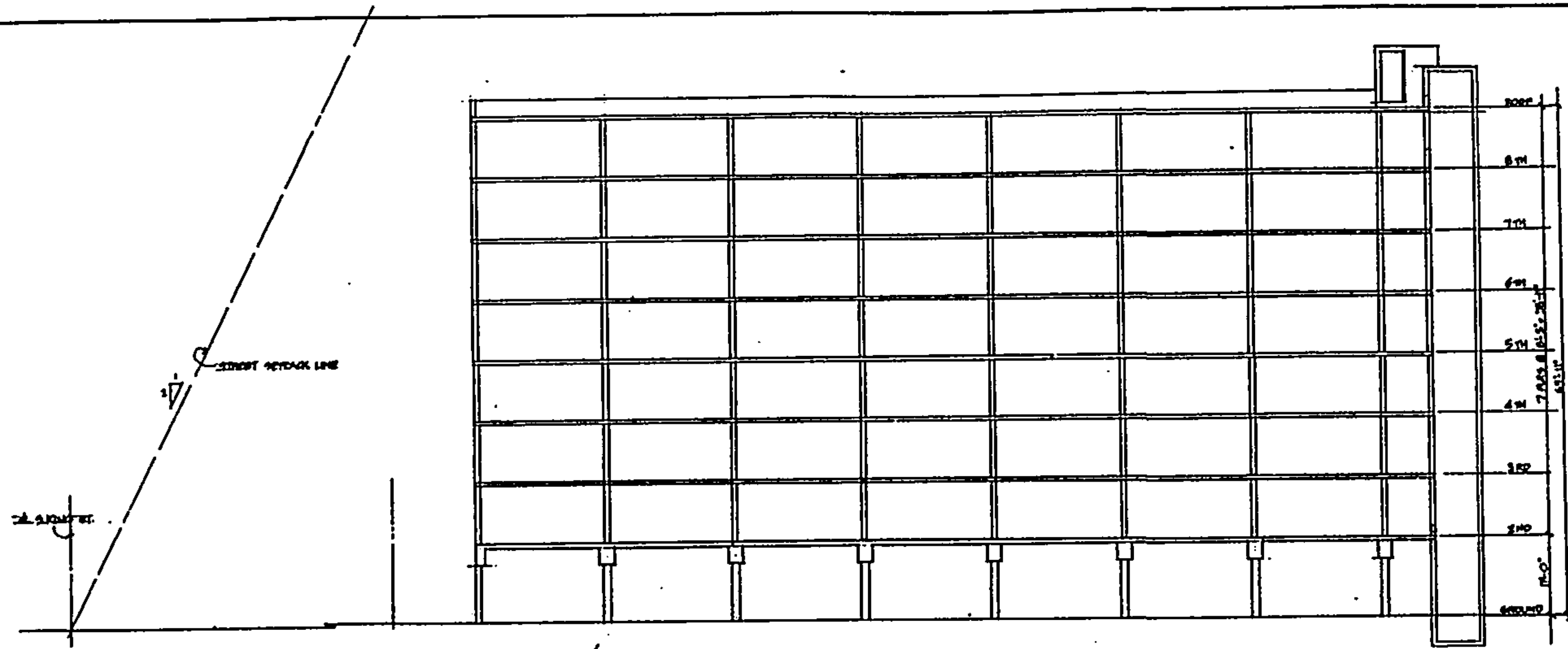
REVISIONS	BY
1-15-98	

KING STREET APARTMENTS
HONOLULU, HAWAII.
TYPICAL FLOOR PLAN

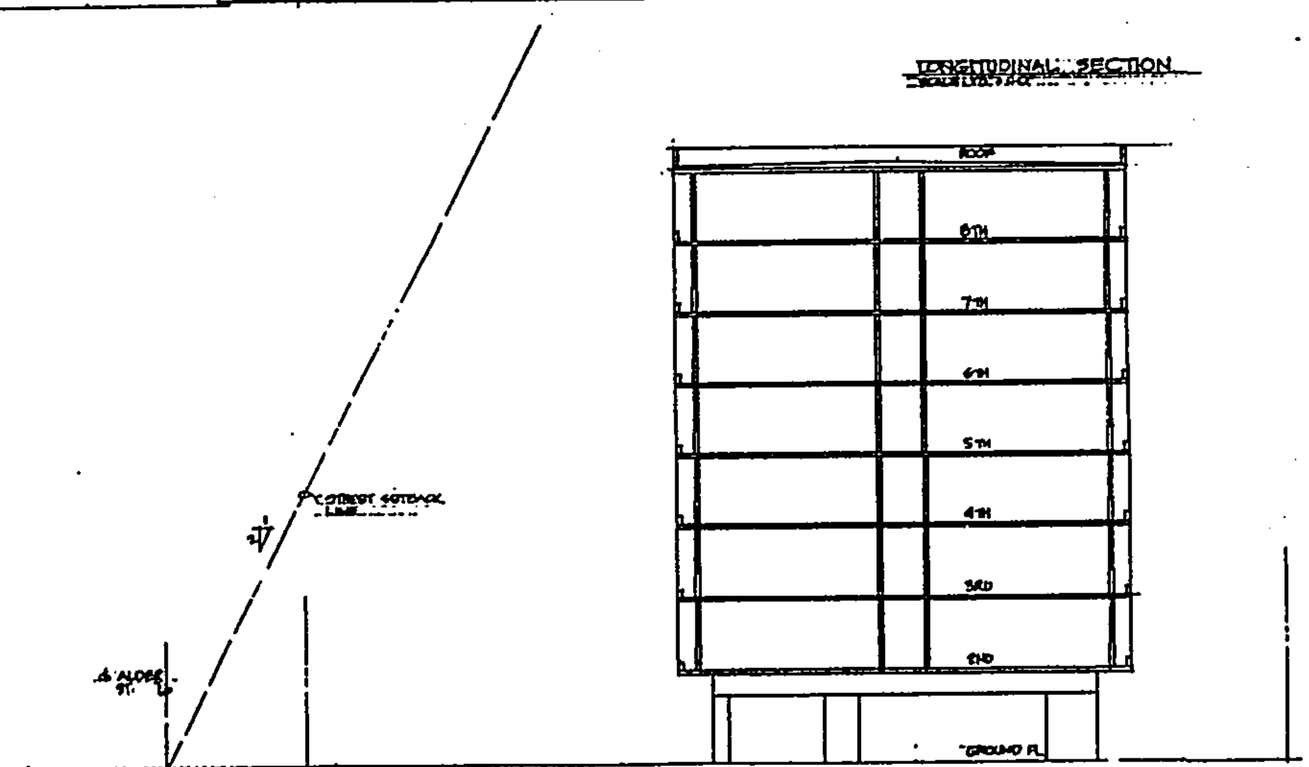
Date 12-10-97

Sheet 2

0000 0005 0833



LONGITUDINAL SECTION



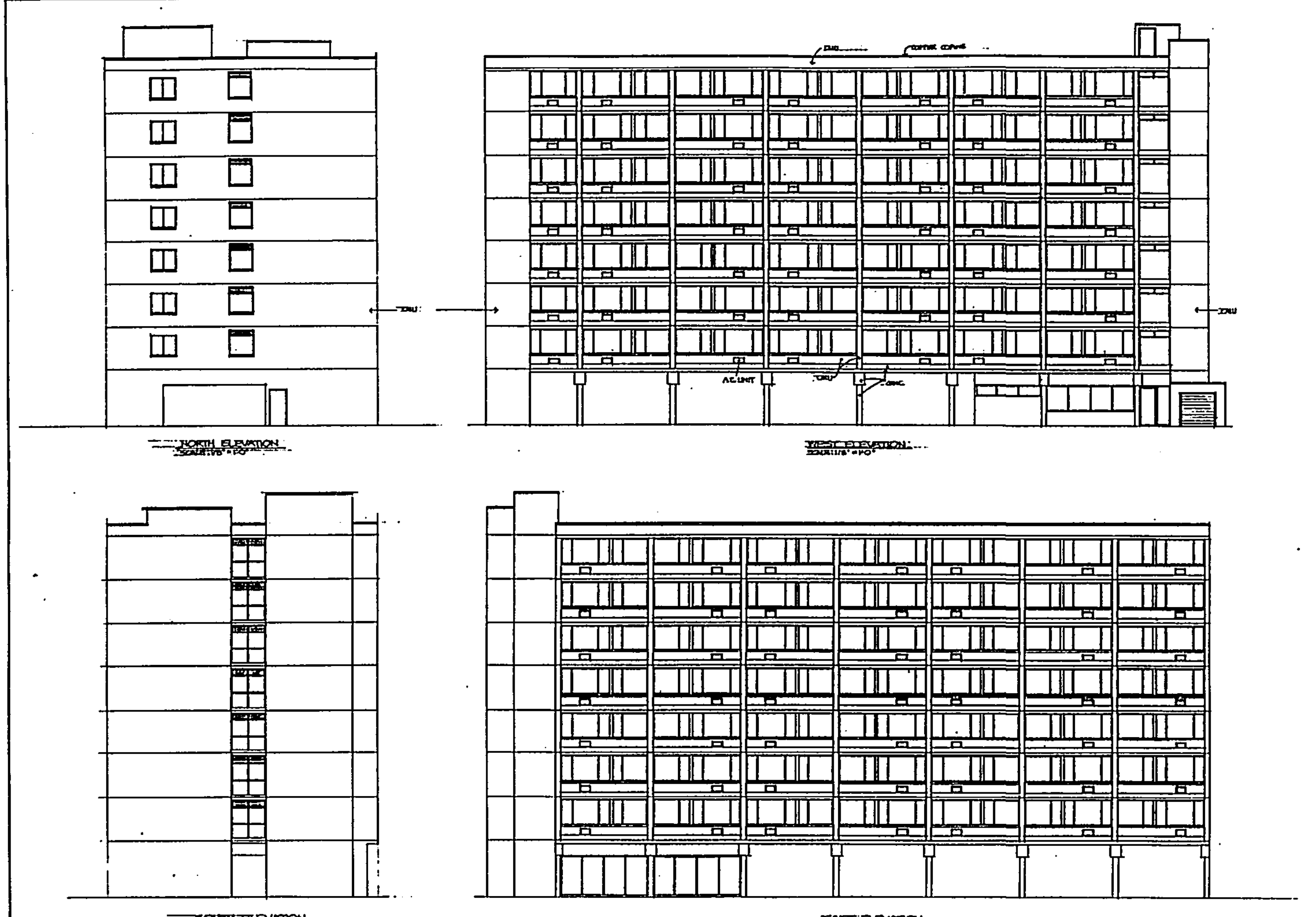
CROSS SECTION

REVISIONS	BY
1-15-98	

KING STREET APARTMENTS
HONOLULU, HAWAII
BUILDING SECTIONS

Date 12-18-97
Scale
Drawn
Job
Sheet 3

0000 0005 0834



REVISIONS	BY
1-15-48	

KING STREET APARTMENTS
HONOLULU, HAWAII
EXTERIOR ELEVATIONS

Date	12-10-47
Scale	
Drawn	
Job	
Sheet	4

ATTACHMENT "D"

PRO FORMA PROJECT FINANCING

0000 0005 0836

FINANCING – PRO FORMA USES

USES	AMOUNT
LAND ACQUISITION (FEE SIMPLE)	$2,550,000
CONSTRUCTION	$8,033,169
FINANCING	$866,626
OTHER	$3,168,660
TOTAL PROJECT	$14,618,455

FINANCING -- PRO FORMA SOURCES

SOURCES	INTERIM	PERMANENT
EQUITY	$125,000	$125,000
RHTF-CBG	$50,000	$50,000
HDRF	$250,000	0
RHTF-PA	$4,550,000	$4,550,000
PRE-DEVELOPMENT & CONSTRUCTION	$9,643,455	0
FEDERAL/STATE TAX CREDIT EQUITY	0	$7,450,246
TAKEOUT	0	$2,443,209
	$14,618,455	$14,618,455

Legend.
RHTF-CBG: Rental Housing Trust Fund Capacity Building Grant
HDRF: Hawaii Development Revolving Fund
RHTF-PA: RHTF Project Award

0000 0005 0838

ATTACHMENT "E"

ENVIRONMENTAL SITE ASSESSMENT
PHASE II
&
DEPARTMENT OF HEALTH
LETTER, DATED MAY 30, 1997

0000 0005 0839

NJAMIN J. CAYETANO
OVERNOR OF HAWAII

LAWRENCE MIIKE
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
ENVIRONMENTAL MANAGEMENT DIVISION
SOLID AND HAZARDOUS WASTE BRANCH
919 ALA MOANA BLVD., #212
HONOLULU, HAWAII 96814

In reply, please refer to:
EMD/SHW

May 30, 1997

U0551JAR

Mr. Michael W. Condon, R.G.
Texaco Refining and Marketing Inc.
3400 188th Street SW
Suite 630
Lynwood, WA 98037

1239 S. King St.
61-100-0090

Dear Mr. Condon:

Subject: King Street Texaco
Facility I.D. 9-100340/ Release I.D. 960004

We have reviewed the "Preliminary Site Assessment Report" dated January 1997 and prepared by Walker Consultants, Ltd., regarding the environmental condition of the property in response to a possible lease expiration at the subject location.

Please note that the above document has been included as part of the facility's file which is available for the public to review.

Based on the information provided, we have no further questions regarding the no further action request and removal of release identification number. However, you should be aware that if future evidence indicates that there may be contamination from the UST at the site that exceeds our recommended cleanup criteria, additional investigative and cleanup actions may be required.

Should you have any questions regarding this letter, please contact Mr. Jose Ruiz of our Underground Storage Tank Section at 586-4226.

Sincerely,

STEVEN Y. K. CHANG, P.E., ~~CHIEF~~
Solid and Hazardous Waste Branch

SYKC:JR:sc

c: Norwood Scott, EPA Region IX, San Francisco

Texaco Refining
and Marketing Inc

3400 188th Street SW
Suite 630
Lynnwood WA 98037

March 25, 1997

ENV - SERVICE STATION
Report Transmittal, Closure Request
King Street Texaco, Texaco Location #61-100-0090, 1239 S. King Street, Honolulu, HI
DOH Facility ID# 9 -100340
Release ID# 960004

Mr. Steven Y. K. Chang
State of Hawaii Department of Health
Environmental Management Division
Solid and Hazardous Waste Branch, Room 212
919 Ala Moana Blvd.
Honolulu, HI 96814-4912

Dear Mr. Chang:

Enclosed please find a copy of the "Preliminary Site Assessment Report" for the above-referenced Texaco station. This report was prepared by Texaco's consultant, Walker Consultants, Ltd. of Honolulu.

The activities described in the report were conducted between September, 1995 and July, 1996. These activities were undertaken to assess the environmental condition of the property in response to a possible lease expiration, and were not the result of any known or suspected release. Major activities conducted included the following:

conducting a soil gas survey at 19 locations on the site

collecting soil samples and installating eight groundwater monitoring wells

two rounds of groundwater sampling

The soil vapor samples collected contained Total Volatile Hydrocarbons (TVH) of up to 45,600 ppmv. However, upon further examination, it was determined that the detected TVH was composed almost entirely of methane through pentane. This would suggest that the TVH is either biogenic in origin, or is the result of natural degradation of historic gasoline impacts.

Groundwater was encountered at a depth of approximately 12 feet below grade, with groundwater gradient being nearly horizontal but somewhat irregular. Field measurements and regional groundwater utility data indicate that the DOH Tier I soil action levels (SALs) and groundwater action levels (GALs) are appropriate for this site. Of the sixteen soil samples analyzed for TPH-as-gasoline (TPH-G), TPH-as-oil (TPH-O), and benzene, toluene, ethylbenzene, and xylenes (BTEX), only one sample contained a detectable concentration of any of these compounds or chemicals, that being 8 mg/kg TPH-G.

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Of the fifteen groundwater samples collected and analyzed from the two sampling events, the highest respective BTEX concentrations encountered were 0.199, 0.084, 0.018, and 0.039 mg/L. These concentrations are all well below their respective Tier I GALs.

In summary, the chemical composition of the soil vapor samples indicates that any past release of gasoline has been naturally degraded into compounds that are shorter than gasoline range impacts. Analytical results for all of the soil and groundwater samples are well below the respective DOH Tier I SALs and GALs, indicating that there are no ongoing releases. With these facts in mind, Texaco feels that further environmental activity on this site is not warranted. A No Further Action Required designation from the Hawaii Department of Health, and removal of the site from the Active LUST listing, is hereby requested.

If you have any questions or comments, please feel free to contact me at (206) 774-6090, extension 226.

Sincerely,

Michael W. Condon, R.G.
Project Manager
Texaco EH&S

MWC:mwc
p:\lynnwood\mwc\hawaii\1239king\rptcvr.doc

enclosure

KTJewett-File(w/enclosure)

PR: TAJ

0000 0005 0842

PRELIMINARY SITE ASSESSMENT REPORT

Post-it Fax Note 7673 | Date 4-2 | # of pages 16
To Paul Morimoto
Fax# FYI Only
From G... Excerpts
Phone# 596-2120 from Phase II Environ.

Prepared for

TEXACO ENVIRONMENT, HEALTH & SAFETY

At

KING STREET TEXACO (LOCATION #61-100-90)
1239 SOUTH KING STREET
HONOLULU, HAWAII 96814
TMK No. 2-3-12:44
DOH UST FACILITY ID No. 9-100340

JANUARY 1997

Prepared by

WALKER CONSULTANTS, LTD.
PO BOX 4998, HILO, HAWAII 96720
(808) 966-7481 FAX (808) 966-6509

0000 0005 0843

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LIST OF ABBREVIATIONS AND ACRONYMS

µg/kg	micrograms per kilogram (approximate parts per billion)
µohms	micro-ohms
APCL	Applied P & Ch Laboratory (Chino, California)
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
BWS	Honolulu Board of Water Supply
CFR	Code of Federal Regulations
CO_2	carbon dioxide
DLNR	Hawaii Department of Land and Natural Resources
DOH	Hawaii Department of Health
EH&S	Texaco Environment, Health & Safety
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GALs	DOH Groundwater Action Levels
HAR	Hawaii Administrative Rules
LUFT	California Leaking Underground Fuel Tank
makai	coastward or near-coastal
mauka	inland or toward the mountains
mg/kg	milligrams per kilogram (approximate parts per million)
mg/L	milligrams per liter (approximate parts per million)
MSL	mean sea level
NA	not analyzed
NCA	North Creek Analytical
ND	not detected
NGAL	No Groundwater Action Levels
O_2	oxygen
ppmv	parts per million volumetric
PQL	Practical Quantitation Limit
QA/QC	quality assurance/quality control
SAL	DOH Tier 1 Soil Action Level
TEG Hawaii	Transglobal Environmental Geochemistry Hawaii (Honolulu)
TES	Texaco Environmental Services (a predecessor to EH&S)
TMK	Tax Map Key
TPH-G	total petroleum hydrocarbons as gasoline or TPH-Gasoline
TPH-O	total petroleum hydrocarbons as oil or TPH-Oil
TRMI	Texaco Refining & Marketing Inc.
TVH	total volatile hydrocarbons
UG	underground
UH	University of Hawaii
UIC	Underground Injection Control
UST	underground storage tank

WCL	Walker Consultants, Ltd.
WTPH	Washington Total Petroleum as Hydrocarbons Method

EXECUTIVE SUMMARY

Walker Consultants, Ltd. (WCL) has prepared this report for Texaco Environment, Health & Safety (EH&S) to describe a Phase II Site Assessment that was conducted at the King Street Texaco service station, 1239 South King Street, Honolulu, Hawaii, TMK (Tax Map Key) No. 2-3-12:44 (the Property). This Phase II Site Assessment was undertaken for Texaco Environmental Services (TES, a predecessor to EH&S) as a voluntary action incident to the contemplated termination of its current lease of the Property and consisted of the following: 1) conducting a soil vapor survey, 2) driving soil sampling points, 3) installation of groundwater monitoring wells, and 4) collecting and analyzing soil and groundwater samples.

In plan view, the Property is a rectangular-shaped parcel (excluding a radius at the intersection of South King and Alder Streets) that comprises 18,903 square feet (approximately 0.4 acre). The nearby surrounding area consists of mixed commercial/residential uses. The nearest residences are in an apartment building which adjoins the Property to the southeast.

The service station building, which houses the office, three service bays, a stock room, and restrooms, occupies the center portion of the Property. The service bays are equipped with two in-ground mechanics' lift hoists, and one aboveground mechanics' lift hoist. A metal canopy roof, which is contiguous with the building roof, covers two islands, each containing three gasoline dispensers. A small, narrow curbed planter is located along the northwestern corner of the Property, adjacent to the intersection of South King and Alder Streets. Excluding the small planter, the Property is paved or covered by structures. The Property is fenced along the southern and eastern property lines, but the street frontages are unfenced. Vehicular access to the Property is via four driveways, two from each of the streets.

Excluding a small area near South King Street which slopes gently toward the north, the ground surface onsite slopes gently toward the southwest. Most of the onsite runoff is directed as sheet flow onto Alder Street; and the remainder is directed as sheet flow onto South King Street. The Property is unaffected by runoff from adjoining properties, which apparently discharge onto the streets.

Four currently-used 10,000-gallon single-walled fiberglass gasoline underground storage tanks (USTs) are arranged side-by-side and are located northwest of the dispenser islands. A currently-used 550-gallon single-walled fiberglass used oil UST is located west of the southern service bay. These five currently-used USTs are registered with the Hawaii Department of Health (DOH), UST Facility ID 9-100340. DOH records indicate that all five currently-used USTs are approximately 11 years old and are constructed of lined interior fiberglass/plastic. All four gasoline UST systems passed an annual tank tightness testing performed by NDE Environmental Corporation on September 26, 1995. The used oil tank, however, reportedly failed its annual tank tightness test on September 26, 1995. This prompted exposure of the top of the used oil UST and associated pipes to isolate the pipes and UST prior to retesting. The retesting indicated that the vent pipe was leaking. It was repaired, and the exposure excavation was backfilled and repaved. All five UST systems passed the most recent tank tightness tests in 1996. The five currently-used single-walled fiberglass USTs replaced five single-walled steel USTs (installed in 1965) which were previously located in approximately the same locations as the currently-used USTs.

Prior to commencement of field activities at the Property, a site-specific Health and Safety Plan was prepared. Additionally, the locations of the USTs and underground (UG) utilities and structures at the Property were identified. The soil gas probe and soil sampling point/groundwater monitoring well locations were selected so as to avoid encountering the USTs, and UG utilities and structures.

The soil vapor survey was conducted to provide an initial environmental evaluation of the Property, and it was intended to optimize locations of soil sampling points/groundwater monitoring wells. On September 25, 1995, Transglobal Environmental Geochemistry (TEG) Hawaii, also contracted with EH&S, used its truck-mounted, Strataprobe™ direct-push rig to drive the soil vapor probes. The primary focus of the soil vapor survey was the area surrounding the four gasoline USTs in the north-central portion of the Property and the adjacent gasoline dispenser islands. The soil vapor survey was expanded outward from these initial areas to evaluate the lateral extent of the soil vapor impacts. One or two soil vapor samples each (a total of 35 soil vapor samples) were collected from the 19 soil gas probes (SV-1 through SV-19) at depths ranging from 5 to 12.5 feet below ground surface (bgs).

The eight sampling points/wells (MW-1 through MW-8) were located as follows. MW-1 was located as an upgradient (background) well. MW-2 and MW-3 were located to delineate the limits of detectable impacted caprock groundwater in the southern part of the Property. MW-5 through MW-8 were located in the vicinity of the gasoline and used oil USTs and the gasoline dispensers to evaluate conditions in those areas. MW-4 was as near as possible to the western property line to evaluate whether impacted caprock groundwater extended offsite in that direction (MW-8 was also as near as possible to the western property line). The first seven sampling points/wells were installed during late September 1995, and the eighth sampling point/well (MW-8) was installed approximately six months later.

Two soil samples each (a total of 16 soil samples) were collected from the eight soil sampling points at depths ranging from 6 to 13 feet bgs. After collecting the deepest sample, TEG Hawaii used its truck-mounted, direct-push rig and soil sampling system to deepen each of the eight soil sampling points and permit installation of a groundwater monitoring well. The soil sampling system was driven to refusal at depths ranging from approximately 15.5 to 21.5 feet bgs. Owing to caving soil conditions in lower part of each well, a thin-walled steel drive-tube was driven to refusal to allow well installation, after pre-punching the hole using the soil sampling system. Total depths of the eight wells ranged from approximately 15 to 19.7 feet bgs. On October 2, 1995, WCL collected seven caprock groundwater samples, one from each of the first seven wells (MW-1 through MW-7). On July 18, 1996, WCL collected eight caprock groundwater samples, one from each of the eight wells (MW-1 through MW-8).

Twenty-six of the 35 soil vapor samples were analyzed for the following: 1) total volatile hydrocarbons (TVH), including methane; 2) methane as a separate compound; 3) benzene, toluene, ethylbenzene, and xylenes (BTEX); 4) fixed and biogenic gases: oxygen (O_2) and carbon dioxide (CO_2); and 5) the CO_2/O_2 ratio. The 16 soil samples from the soil sampling points were analyzed for total petroleum hydrocarbons as gasoline (TPH-G) and BTEX. Six of the soil samples were also analyzed for TPH-Oil (TPH-O). The seven first-event and eight second-event caprock groundwater samples were analyzed for TPH-G and BTEX. Four first-event and two second-event caprock groundwater samples were also analyzed for TPH-O.

The caprock sediments onsite are estimated to be 500 feet thick. The caprock onsite consists of the following: 1) an upper clayey silt/fine sand unit (basalt pea gravel UST backfill was encountered in one sampling point/well), 2) a well-graded, fine-coarse grained basalt sand unit, and 3) hard coralline sand and gravel unit. Six of the sampling points/wells were driven to refusal in the hard coralline sands and gravels. The permeability of the caprock onsite is judged to range from low to moderate.

Caprock groundwater was encountered in eight monitoring wells onsite. The caprock water table in the eight onsite points/wells ranged from approximately 11.40 to 12.63 feet bgs, equivalent to elevations ranging from approximately 1.62 to 1.76 feet above MSL in MW-1 through MW-7 (water table elevations could not be calculated for MW-8 because its well-head elevation was not surveyed). These water table elevations indicate that the water table is nearly horizontal but is slightly irregular including a slight depression at MW-4. There is, however, no discernible hydraulic gradient onsite; the hydraulic gradient and flow direction for the local caprock aquifer are presumed to be south-southwesterly (makai or coastward). Because the Property is approximately 0.8 mile from the coast, water levels in the caprock aquifer fluctuate tidally. In the eight onsite wells, the observed tidal fluctuations range from 0.1 to 0.5 foot.

The following are concluded, based on: 1) field observations during the soil vapor survey, soil sampling, monitoring well installation, and caprock groundwater sampling; 2) laboratory analytical results of soil vapor samples, soil samples, and caprock groundwater samples; and 3) interpretations based on the above data and field observations.

1. The seven soil vapor samples having the highest TVH concentrations were capillary fringe samples from the seven probes which were nearest to the gasoline USTs.
2. To the east and south of the impacted area, the outermost probes satisfactorily evaluated the extent of the soil vapor impacts. To the west and north of the gasoline USTs, the deeper soil vapor samples from the probes near the western and northern property lines were significantly impacted by TVH which is, however, nearly all methane through pentane.
3. Elevated CO_2/O_2 ratios and CO_2 concentrations, together with low O_2 concentrations, occur in ten soil vapor samples that have or that are adjacent to samples having the seven highest TVH concentrations. This relationship suggests that there is ongoing naturally-occurring biodegradation (intrinsic bioremediation) of the gasoline impacts present.
4. Chromatograms from laboratory analyses of the 19 soil vapor samples having detected TVH, indicate that the TVH in these samples is nearly all composed of methane through pentane (carbon chains C_1 through C_5). Together with the high CO_2/O_2 ratios in the samples having the higher TVH concentrations, this indicates that intrinsic bioremediation has broken down the longer chain components of the gasoline into short chain components which are nearly all shorter than gasoline-range hydrocarbons.
5. Together with the "not detected" or low soil and caprock groundwater sample analyses from the four groundwater monitoring wells near the gasoline USTs, the associated seven soil vapor sample analyses indicate that the impacts are primarily in vapor phase in the capillary fringe zone and that there are no significant sorbed- or dissolved-phase impacts.
6. In the 16 soil samples, all of the TPH-G, BTEX, and TPH-O concentrations, as well as laboratory reporting limits and PQLs, are less than corresponding DOH Tier 1 Soil Action Levels, indicating that no further assessment and no remediation are necessary.
7. In the 15 caprock groundwater samples, all of the TPH-G, BTEX, and TPH-O concentrations, as well as laboratory reporting limits and practical quantitation limits, are less than corresponding DOH Tier 1 Groundwater Action Levels, indicating that no further assessment and no remediation are necessary.

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PHASE II SITE ASSESSMENT REPORT
Prepared For
TEXACO ENVIRONMENT, HEALTH & SAFETY
At
KING STREET TEXACO
1239 SOUTH KING STREET, HONOLULU, HAWAII
TEXACO LOCATION No. 61-100-90
TMK No. 2-3-12:44
DOH UST FACILITY ID No. 9-100340

Prepared By
WALKER CONSULTANTS, LTD.

JANUARY 1997

1.0 INTRODUCTION

Walker Consultants, Ltd. (WCL) has prepared this Phase II Site Assessment Report for Texaco Environment, Health & Safety (EH&S) to describe a subsurface investigation that was conducted at the King Street Texaco service station, 1239 South King Street, Honolulu, Hawaii, TMK (Tax Map Key) No. 2-3-12:44 (the Property). This Phase II Site Assessment was undertaken for Texaco Environmental Services (TES, a predecessor to EH&S) as a voluntary action incident to the contemplated termination of its current lease of the Property and consisted of the following: 1) conducting a soil vapor survey, 2) driving soil sampling points, 3) installation of groundwater monitoring wells, and 4) collecting and analyzing soil and groundwater samples. This report generally complies with the following: 1) Title 40, Code of Federal Regulations (CFR) Part 280 *Technical Standards and Corrective Actions for Owners and Operators of Underground Storage Tanks*; 2) *Technical Guidance Manual for Underground Storage Tank Closure and Release Response* (Hawaii Department of Health (DOH), August 1992) and DOH Policy Updates; and 3) *Risk-Based Corrective Action and Decision Making at Sites with Contaminated Soil and Groundwater* (DOH, December 1995). Photographs taken during the field investigation are contained in Appendix A.

Prior to the start of field activities, WCL prepared a site-specific Health and Safety Plan (Appendix B) that describes health and safety monitoring, equipment, practices, and procedures used by WCL and Transglobal Environmental Geochemistry (TEG) Hawaii, also contracted with EH&S, during field work.

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION

Located at 1239 South King Street, the King Street Texaco service station is southeast of the intersection of South King and Alder Streets, in the Makiki district of Honolulu (Figure 1). King Street Texaco has occupied the Property since 1965. The nearby surrounding area consists of mixed commercial/residential uses. The nearest residences are in an apartment building which adjoins the Property to the southeast.

In plan view (Figure 2), the Property is a rectangular-shaped parcel (excluding a radius at the intersection) that comprises 18,903 square feet (approximately 0.4 acre). An apartment building and a professional office building adjoin the Property to the east. Adjoining the Property to the south is a parking lot for Home Maluhia. South King and Alder Streets adjoin the Property to the north and west, respectively. Across South King Street to the north are retail shops, professional offices, and restaurants. The Golden Duck (a Chinese restaurant) and Home Maluhia (a juvenile detention home) are across Alder Street to the west.

The service station building, which houses the office, three service bays, a stock room, and restrooms, occupies the center portion of the Property. The service bays are equipped with two in-ground mechanics' lift hoists, and one aboveground mechanics' lift hoist. A metal canopy roof, which is contiguous with the building roof, covers two islands, each containing three gasoline dispensers. A small, narrow curbed planter is located along the northwestern corner of the Property, adjacent to the intersection of South King and Alder Streets. Excluding the small planter, the Property is paved or covered by structures. The Property is fenced along the southern and eastern property lines, but the street frontages are unfenced. Vehicular access to the Property is via four driveways, two from each of the streets.

Excluding a small area near South King Street which slopes gently toward the north, the ground surface onsite slopes gently toward the southwest. Most of the onsite runoff is directed as sheet flow onto Alder Street; and the remainder is directed as sheet flow onto South King Street. The Property is unaffected by runoff from adjoining properties, which apparently discharge onto the streets.

The onsite surface elevations are approximately 14 feet above mean sea level (MSL). Per Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Sheet 120, the Property is within Flood Hazard Zone "X", and is determined to be outside the 500-year flood plain. The Property is approximately 0.6 mile north of (outside) the Civil Defense tsunami ("tidal wave") evacuation zone which extends only several hundred feet mauka (inland) from the coast (GTE Hawaiian Tel, 1995-1996).

2.2 FACILITY AND UNDERGROUND STORAGE TANK INFORMATION

Four currently-used 10,000-gallon single-walled fiberglass gasoline underground storage tanks (USTs) are arranged side-by-side and are located northwest of the dispenser islands. A currently-used 550-gallon single-walled fiberglass used oil UST is located west of the southern service bay. These five currently-used USTs are registered with the DOH, UST Facility ID 9-100340. DOH records indicate that all five currently-used USTs are approximately 11 years old and are constructed of lined interior fiberglass/plastic. All four gasoline UST systems passed an annual tank tightness testing performed by NDE Environmental Corporation on September 26,

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1995 (Appendix C). The used oil tank, however, reportedly failed its annual tank tightness test on September 26, 1995 (Appendix C). This prompted exposure of the top of the used oil UST and associated pipes to isolate the pipes and UST prior to retesting. The retesting indicated that the vent pipe was leaking; it was repaired, and the exposure excavation was backfilled and repaved. All five UST systems reportedly passed the most recent tank tightness tests in 1996, but the test reports were not available for this report. The five currently-used single-walled fiberglass USTs replaced five single-walled steel USTs (installed in 1965) which were previously located in approximately the same locations as the currently-used USTs. The approximate locations of the currently-used USTs, associated pipes, and other pertinent features are depicted on Figure 2.

2.3 Nearby Surface Water Bodies

The nearest permanent surface water body, Makiki Stream, is located approximately 0.4 mile east of the Property (Figure 1). There are no other permanent surface water bodies located within 0.5 mile of the Property. The Pacific Ocean coastline at Ala Moana Park is located approximately 0.8 mile makai of the Property.

2.4 Nearby Water Wells

Introduction

The well information in this section is from the following: 1) Sheet O-13 of the well location map series (Figure 3) and the *Ground Water Index and Summary*, both by the Hawaii Department of Land and Natural Resources (DLNR), and 2) Sheet O-13 of the DOH Underground Injection Control Program map series by the DOH Safe Drinking Water Branch (Figure 4). The locations of nearby offsite wells are depicted on Figures 3 and 4, which are reproductions of portions of the respective Sheets O-13. Data from some of the wells on Figures 3 and 4 are contained on pages 9 through 13 (from the *Groundwater Index and Summary*), and are summarized on a Summary of Nearby Wells, all of which follow Figure 3.

Nearby Offsite Water Wells

There are 15 water wells located within approximately 0.05 to 0.5 mile of the Property. Two of these wells are located mauka of the Property, and are generally upgradient of it, relative to the presumed south-southwesterly (makai or coastward) hydraulic gradient. The remaining 13 wells are located in a presumed hydraulic crossgradient direction.

The nearest water well (state water well number 3-1750-09) is located approximately 0.3 mile southeast of the Property, and is used by the Pagoda Hotel for industrial purposes, and is the only one of the 15 nearby wells that is not sealed (abandoned). The surface elevation for this well is 7 feet above MSL. This well has a 16-inch diameter casing which is 53 feet deep; the top of perforations (bottom of solid casing) is 21 feet below ground surface (bgs), indicating that it taps caprock groundwater. The initial static head in this well is 2.8 above MSL (equivalent to 4.2 feet bgs). The reported chlorides concentration for the water from these wells is 490 mg/L, indicating the caprock groundwater in this well has low salinity.

The 14 other wells located within a 0.5 mile radius of the Property were drilled between 1882 and 1914, and reportedly were sealed (abandoned) between 1924 and 1973. The data for these wells is summarized on Summary of Nearby Wells which follows Figure 3. Surface elevations for these 14 wells ranged from 6 to 41 feet above MSL (ranging from approximately

8 feet lower than to approximately 27 feet higher than surface elevations on the Property). Total depths of these former wells ranged from 277 to 656 feet bgs, and the tops of perforations (bottoms of solid casings) ranged from 237 to 486 feet bgs. The initial static head data indicate that the water levels in these wells ranged from 11.8 to 42 feet above MSL, indicating that in 12 of these 14 wells, the basal groundwater was under artesian conditions. The reported chlorides concentrations for the water from these 14 wells ranged from 48 to 85 mg/L, indicating that it is freshwater.

Nearby Offsite Drinking Water Wells

The nearest drinking water wells are the eight Beretania Pump Station wells (state water well numbers 3-1851-12, -13, -24, and -31 through -35) which are located approximately 0.75 mile northwest of the Property. These eight municipal water supply wells are owned by the Honolulu Board of Water Supply (BWS). Surface elevations for these eight wells range from 14 to 21 feet above MSL (ranging from approximately the same as, to approximately 7 feet higher, than surface elevations on the Property). Total depths of these eight wells range from 533 to 636 feet bgs (equivalent to elevations ranging from 519 to 622 feet below MSL). Tops of perforations (bottoms of solid casings) for the BWS wells range from 465 to 478 feet below MSL (equivalent to 447 to 458 feet bgs). The initial static head data indicate that the water levels in seven of these wells ranges from 23.3 to 32 feet above MSL, indicating that the basal groundwater is under artesian conditions. The reported chlorides concentration for the water from these eight municipal water supply wells is 67 mg/L indicating that it is freshwater. These eight nearby municipal water supply wells are hydraulically crossgradient of the Property.

There is essentially no possibility that conditions on the Property could adversely affect any of these 15 nearby water wells or eight nearby municipal water supply wells because all of these wells are hydraulically upgradient or crossgradient of the Property.

Nearby Offsite Injection Wells

The nearest injection well is injection well number 3-1751-01 (listed on the DLNR's Map Sheet O-13 as state water well number 3-1751-04) which is located approximately 0.6 mile southwest (hydraulically downgradient) of the Property, and is used by the 1350 Ala Moana condominiums as a disposal (injection) well. Other than the ground surface elevation which is 5 feet above MSL, there is no available information regarding this disposal (injection) well. Other injection wells are more than 1 mile from the Property.

2.5 ANNUAL RAINFALL

The annual rainfall is approximately 31 inches (80 cm) on the Property (DOH, December 1995, Revised June 1996).

3.0 SOIL VAPOR SURVEY

3.1 INTRODUCTION

The soil vapor survey was conducted to provide an initial environmental evaluation of the Property. It was intended to optimize locations of soil sampling points/groundwater monitoring wells. Excluding the small amount of drilled cuttings near the top of each soil vapor probe, no soil cuttings were generated because TEG Hawaii's Strataprobe™ soil vapor probe system is a displacement-type system. The field procedures for the soil vapor survey are contained in Appendix D.

3.2 UNDERGROUND UTILITY LOCATION

Prior to commencement of intrusive sampling activities, a site inspection was conducted which indicated that the locations of the USTs, as well as the locations of other underground (UG) utilities and structures at the Property were, for the most part, well identified. The soil vapor probe and soil sampling point/well locations were selected so as to avoid encountering the USTs and UG utilities and structures. Prior to driving the probe and soil sampler, the locations of nearby UG utilities and other UG structures were identified as follows.

1. By obtaining excavation permits and(or) clearances from utility companies and others having UG structures.
2. By reviewing facility plans provided by Texaco Refining & Marketing, Inc. (TRMI).
3. By surficial evaluation of the proposed sampling locations for features such as nearby man-holes, utility vaults, or surface features served by UG utilities.
4. By field screening each location using utility locating devices.

3.3 SOIL VAPOR PROBE INSTALLATION

On September 25, 1995, TEG Hawaii, also contracted with EH&S, used its truck-mounted, Strataprobe™ direct-push rig to drive the soil vapor probes. WCL's geologist selected the locations of the 19 soil vapor probes (designated SV-1 through SV-19) and soil vapor sample collection depths. The primary focus of the soil vapor survey was the area surrounding the four gasoline USTs in the north-central portion of the Property and the adjacent gasoline dispenser islands. The soil vapor survey was expanded outward from these initial areas to evaluate the lateral extent of the soil vapor impacts. Approximate locations of the 19 soil vapor probes are depicted on Figure 5. The field procedures for the soil vapor survey are contained in Appendix D.

3.4 SOIL VAPOR SAMPLE COLLECTION

Two soil vapor samples each were collected from probes SV-1 through SV-16 at approximately 5 and 11 to 12.5 feet bgs, and one sample each was collected from probes SV-17 through SV-19 at approximately 11 to 12 feet bgs. The deeper samples in probes SV-1 through SV-16 and the only samples in SV-17 through SV-19 was collected in the capillary fringe zone. Each soil vapor sample was assigned a unique identifier containing the probe number followed by the approximate sampling depth (e.g., soil vapor sample SV1-5 was collected from soil vapor probe SV-1 at approximately 5 feet bgs). Soil vapor sample collection procedures are contained in Appendix D.

3.5 Soil Vapor Sample Analytical Methods

TEG Hawaii analyzed 26 of the 35 soil vapor samples for the following: 1) total volatile hydrocarbons (TVH), including methane; 2) methane as a separate compound; 3) benzene, toluene, ethylbenzene, and xylenes (BTEX); 4) fixed and biogenic gases: oxygen (O_2) and carbon dioxide (CO_2); and 5) the CO_2/O_2 ratio. The 26 samples analyzed consisted of the capillary fringe zone samples from all 19 probes and the shallower soil vapor samples from the seven probes (SV-1 and SV-6 through SV-12) where the deeper sample was strongly impacted and(or) where field-evident gasoline odors were noted during purging of the shallower sample. The 11 soil vapor samples that were not analyzed consisted of the shallower samples where no field-evident gasoline odors were noted during purging and(or) where the associated deeper samples had no detected impacts. TEG Hawaii's analytical results are summarized below and in Table 1. TEG Hawaii's complete analytical results, together with laboratory quality assurance/quality control (QA/QC) data and Chain-of-Custody records, are contained in Appendix E.

3.6 Soil Vapor Sample Analytical Results

In seven of the soil vapor samples (including the capillary-fringe samples from SV-4, SV-5, SV-14, SV-17, and SV-19), no TVH were detected at 10 parts per million volumetric (ppmv) laboratory detection limits. The TVH concentrations in eight of the remaining 19 samples ranged from 18 to 879 ppmv. In four of the remaining 19 samples, the TVH concentrations ranged from 1,170 to 3,160 ppmv. The TVH concentrations in the last seven samples ranged from 12,700 to 45,600 ppmv; these seven samples were capillary-fringe samples from the seven probes nearest to the gasoline USTs.

In the 12 samples which had TVH concentrations of 38 ppmv or less, no methane was detected at 10 ppmv laboratory detection limits. The methane concentrations ranged from 56 to 832 ppmv in six of the remaining 14 samples which had TVH concentrations ranging from 260 to 3,160 ppmv. The last eight of these 14 samples, which had TVH concentrations of 1,890 and 12,700 to 45,600 ppmv, the methane concentrations were 1,890 and 3,050 to 17,200 ppmv. In 12 of these 14 samples (excluding SV3-11 and SV9-5) having both detected TVH and methane, the methane concentrations correlated well, ranging from approximately 19 to 41 percent of the corresponding TVH concentrations. In SV3-11, the TVH and methane concentrations were each 1,890 ppmv, and in SV9-5, the methane concentration was approximately 71 percent of the corresponding TVH concentration.

In 19 of the 26 samples, no BTEX were detected at 0.100 ppmv laboratory detection limits. No TEX were detected at 0.100 ppmv detection limits in six of the remaining seven samples, in which the benzene concentrations ranged from 0.238 to 2.84 ppmv. In the last sample, SV1-11, no ethylbenzene and no xylenes were detected at 0.100 ppmv detection limits, and the benzene and toluene concentrations were 6.28 and 0.18 ppmv, respectively. Six of the seven samples which contained benzene also had the seven highest TVH concentrations.

In 11 of the 26 samples, the CO_2/O_2 ratios ranged from 1.05 to 6.67, the O_2 concentrations ranged from 1.68 to 7.47 percent, and the CO_2 concentrations ranged from 6.48 to 11.2 percent. Seven of these 11 samples also had the seven highest TVH concentrations. In the remaining 15 samples, the CO_2/O_2 ratios ranged from 0.14 to 0.85, the O_2 concentrations ranged from 8.79 to 17.0 percent, and the CO_2 concentrations ranged from 2.12 to 8.43 percent. Ten of these 15 samples also had TVH concentrations less than 36 ppmv. Seventeen of CO_2/O_2 ratios correlated well with the corresponding TVH concentrations. One group of exceptions were the shallower samples from the three of the seven probes having the highest TVH concentrations and sample SV13-12 (near the front dispenser island); these four samples which had TVH concentrations ranging from 23 to 562 ppmv but had CO_2/O_2 ratios ranging from 1.11 to 3.24. The other group of exceptions were five samples which had TVH concentrations ranging from 879 to 3,160 ppmv but had CO_2/O_2 ratios ranging from 0.17 to 0.66.

The seven samples having the highest TVH concentrations (ranging from 12,700 to 45,600 ppmv) were capillary fringe samples from the seven probes (SV-1, SV-6 through SV-9, SV-11, and SV-12) which were nearest to the gasoline USTs. These seven soil vapor sample analyses indicate that the TVH are likely due to release(s) from the former gasoline USTs for the following reasons: 1) the currently-used gasoline USTs have passed tank tightness tests, and 2) TVH concentrations in these seven samples are relatively uniform on all sides of the gasoline USTs. Together with the "not detected" or low soil and caprock groundwater sample analyses from the four groundwater monitoring wells (MW-5 through MW-8) near the gasoline USTs, these seven soil vapor sample analyses indicate that the impacts are primarily in vapor phase in the capillary fringe zone and that there are no significant sorbed- or dissolved-phase impacts. The elevated CO_2/O_2 ratios and CO_2 concentrations, together with the low O_2 concentrations, occur in ten soil vapor samples that have or that are adjacent to samples having detected the seven highest TVH concentrations. This relationship suggests that there is ongoing naturally-occurring biodegradation (intrinsic bioremediation) of the gasoline impacts present. Chromatograms from laboratory analyses of the 19 soil vapor samples having detected TVH (Appendix D), indicate that the TVH in these samples is nearly all composed of methane through pentane (carbon chains C_1 through C_5). Together with the high CO_2/O_2 ratios in the samples having the higher TVH concentrations, this indicates that intrinsic bioremediation (naturally-occurring biodegradation) has broken down the longer chain components of the gasoline into short chain components which are nearly all shorter than gasoline-range hydrocarbons.

To the east and south of the impacted area, the outermost probes satisfactorily evaluated the extent of the soil vapor impacts. To the west and north of the gasoline USTs, the deeper soil vapor samples from the probes near the western and northern property lines were significantly impacted which is, however, nearly all methane through pentane.

4.0 SOIL SAMPLING, GROUNDWATER MONITORING WELL INSTALLATION, AND CAPROCK GROUNDWATER SAMPLING

4.1 INTRODUCTION

The locations of the eight soil sampling points/groundwater monitoring wells were primarily selected based on the results of the soil vapor survey, but one sampling point/well (MW-6) was located near the used oil UST to evaluate environmental conditions associated with it. In addition, the locations were adjusted where necessary, based on locations of the USTs, as well as other underground utilities and structures. Excluding the small amount of drilled cuttings near the top of each sampling point/well and portions of the soil samples, no soil cuttings were generated because TEG Hawaii's Strataprobe™ soil sampler system is a displacement-type system. The field procedures for the soil sampling, groundwater monitoring well installation and development, and caprock groundwater sampling are contained in Appendix D.

On September 26 through 28, 1995, TEG Hawaii used its truck-mounted, Strataprobe™ direct-push rig to drive the soil sampler for the first seven soil sampling points/groundwater monitoring wells (designated MW-1 through MW-7). On February 2, 1996, TEG Hawaii drove the soil sampler for the eighth sampling point/well, MW-8. In addition to selecting the locations of the eight sampling points/wells, the soil sample collection depths, and the well construction dimensions, WCL's geologist logged the well borings. MW-1 was located as an upgradient (background) well. MW-2 and MW-3 were located to delineate the limits of detectable impacted caprock groundwater in the southern part of the Property. MW-5 through MW-8 were located in the vicinity of the gasoline and used oil USTs and the gasoline dispensers to evaluate conditions in those areas. MW-4 was as near as possible to the western property line to evaluate whether impacted caprock groundwater extended offsite in that direction (MW-8 was also as near as possible to the western property line). Logs and Schematics of Wells MW-1 through MW-8 are contained in Appendix F. Approximate locations of the sampling points/wells are depicted on Figure 6.

4.2 SOIL SAMPLE COLLECTION

A total of 16 soil samples were collected using TEG Hawaii's truck-mounted, direct-push rig, two from each of the eight soil sampling points. The sampling depths were approximately 6 or 6.5 and 11 to 13 feet bgs, with the deepest sample being collected in the capillary fringe zone. Each soil sample was assigned a unique identifier containing the sampling point number followed by the approximate sampling depth (e.g., soil sample MW1-6 was collected from soil sampling point MW-1 at approximately 6 feet bgs). Soil sample collection procedures are contained in Appendix D.

4.3 GROUNDWATER MONITORING WELL INSTALLATION

After collecting the deepest sample, TEG Hawaii used its truck-mounted, direct-push rig and soil sampling system to deepen each of the eight soil sampling points and permit installation of a groundwater monitoring well. The soil sampling system was driven to refusal at depths ranging from approximately 15.5 to 21.5 feet bgs. Owing to caving soil conditions in the lower part of each well, a thin-walled steel drive-tube was driven to refusal to allow well installation, after pre-punching the hole using the soil sampling system. Total depths of the eight wells ranged from approximately 15 to 19.7 feet bgs. In the six wells which were deep enough to permit optimal well screen placement, the screen depth was adjusted so that the 10-foot long screen extended approximately 3 feet above and 7 feet below the static water level in these six wells. Shallow refusal occurred in the two remaining wells (MW-4 and MW-8), and for this reason, the well screen was extended to the total depth of the drive-tube. In MW-4, the 10-foot length of well screen extends approximately 4.75 feet above and 5.25 feet below the static water level, and in MW-8, the 5-foot length of well screen extends approximately 2.1 feet above and 2.9 feet below the static water level.

4.4 Well-Head Survey

On November 22, 1995, the surface elevations of the north sides of the well-head cover rims of MW-1 through MW-7 were surveyed relative to MSL by Wm. Dean Alcon & Associates, licensed surveyors. The surface elevation of the well-head cover rim of MW-8 was not surveyed, because it was installed on February 2, 1996, after the well-head survey. The surface elevations of the north sides of well-head cover rims of MW-1 through MW-7 range from 13.04 to 14.36 feet above MSL (Appendix G).

4.5 Well Development

On September 28, 1995, each of the wells was developed by pumping approximately 8 to 15 gallons of water from it using an air-operated diaphragm pump. Development was continued until the temperature, pH, and conductivity of the discharge water had stabilized between the second and third measurements, and the discharge water was clear or there was no visual improvement in turbidity with continued development (Groundwater Sampling Field Data sheets, Appendix H). The turbidity was also monitored and recorded.

4.6 Caprock Groundwater Sample Collection

On October 2, 1995, WCL collected seven caprock groundwater samples, one from each of the first seven wells (MW-1 through MW-7). The seven first-event caprock groundwater samples were designated MW1-1W through MW7-1W. On July 18, 1996, WCL collected eight caprock groundwater samples, one from each of the eight wells (MW-1 through MW-8). The eight second-event caprock groundwater samples were designated MW1-2W through MW8-2W.

Prior to the first and second caprock groundwater sampling events, a peristaltic pump was used to purge each well of approximately 1.2 and 1 gallons, respectively. Purging was continued until the temperature, pH, and conductivity of the discharge water had stabilized between the second and third measurements, and the discharge water was clear or there was no visual improvement in turbidity with continued development (Groundwater Sampling Field Data sheets, Appendix H). The turbidity was also monitored and recorded.

After purging, the water level was allowed to stabilize, and a caprock groundwater sample was collected from each well. For TPH-G and BTEX analyses of the first-event samples, a stainless-steel bailer was used. For TPH-G and BTEX analyses of the second-event samples, precleaned, single-use polyethylene bailers were used, fitted with a single-use, slow-discharge bottom-emptying device for sampling volatiles. For the TPH-O analyses of four of the first-event samples and the TPH-O analyses of two of the second-event samples, the peristaltic pump was used for sample collection.

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The caprock groundwater samples were each placed in appropriate sample containers which were supplied by the analytical laboratory. Trip and field blanks of distilled water accompanied the samples from the time of collection until received by the analytical laboratory.

4.7 Disposition of Development and Purge Water

Based on the sample analyses, the drummed development and purge water was determined to be nonhazardous. The drummed development/purge water from the well development and the first monitoring event was recycled locally by Industrial Technology. The drummed purge water from the second monitoring event was recycled locally by Allwaste of Hawaii, Inc. Documentation of the local recycling is contained in Appendix H.

5.0 SOIL AND CAPROCK GROUNDWATER SAMPLE ANALYSES

5.1 SOIL SAMPLE LABORATORY ANALYTICAL METHODS

Applied P & Ch Laboratory (APCL) analyzed the 14 soil samples from soil sampling points MW-1 through MW-7 for the following: 1) TPH-Gasoline (total petroleum hydrocarbons as gasoline or TPH-G) using EPA M8015 Method, and 2) BTEX using EPA Method 8020. APCL also analyzed the six soil samples from soil sampling points MW-3, MW-4, and MW-6 for TPH-Motor Oil (TPH-O) using the California Modified-Leaking Underground Fuel Tank (LUFT)/EPA M8015 Method. North Creek Analytical (NCA) analyzed the two soil samples from soil sampling point MW-8 for the following: 1) total petroleum hydrocarbons-gasoline range (TPH-G) using the Washington TPH-G Method, and 2) BTEX using EPA Method 8020. APCL's and NCA's analytical results are summarized below and in Table 2. APCL's and NCA's complete analytical results, together with laboratory QA/QC data and Chain-of-Custody records, are contained in Appendix I.

5.2 SOIL SAMPLE ANALYTICAL RESULTS

No TPH-G were detected at 1 mg/kg laboratory practical quantitation limits (PQLs) in 13 of the soil samples from soil sampling points MW-1 through MW-7, and the TPH-G concentration was 8 mg/kg in remaining sample, MW6-13. No TPH-G were detected at 1.0 mg/kg reporting limits in the two soil samples from the soil sampling point MW-8. No BTEX were detected at 0.005 mg/kg PQLs in the 14 soil samples from soil sampling points MW-1 through MW-7. No BTEX were detected at reporting limits that were 0.050 mg/kg for BTE and 0.10 mg/kg for xylenes in two soil samples from the soil sampling point MW-8. These laboratory analyses, which are consistent with field observations, indicate that there are no significant sorbed-phase gasoline impacts at these two soil sampling points. The three "not detected" TPH-G analyses and one low TPH-G concentration in four capillary fringe soil samples from the sampling points MW-5 through MW-8 which are near the gasoline USTs compared with the high TVH concentrations for the seven capillary fringe soil vapor sample analytical results for the associated soil vapor probes, indicate that there are no significant sorbed-phase gasoline constituents. This relationship suggests by analogy that there are probably no detectable sorbed-phase gasoline constituents present at the other soil vapor probe locations which had lower TVH concentrations.

No TPH-O were detected at 10 mg/kg PQLs in the six soil samples from soil sampling points MW-3, MW-4, and MW-6. These "not detected" laboratory analyses, which are consistent with field observations, indicate that there are no detectable oil impacts in the six soil samples from these three soil sampling points.

The DOH uses comparison of chemical results for any detected analytes with DOH Tier 1 Soil Action Levels (SALs) to determine if further action (investigation and(or) cleanup/remediation) is required. All of the TPH-G, BTEX, and TPH-O concentrations, as well as laboratory reporting limits and PQLs (for "not detected" compounds), are less than corresponding DOH Tier 1 SALs, indicating that no further assessment and no remediation are necessary. The DOH Tier 1 SALs used in this report (Section 6.5) are based on the following: 1) annual rainfall on the Property of less than 80 cm (200 cm), and 2) drinking water source not threatened.

5.3 Caprock Groundwater Sample Laboratory Analytical Methods

APCL analyzed the seven first-event caprock groundwater samples MW1-1W through MW7-1W for the following: 1) TPH-Gasoline (TPH-G) using EPA M8015 Method, and 2) BTEX using EPA Method 8020. APCL also analyzed the four caprock groundwater samples MW1-1W, MW3-1W, MW4-1W, and MW6-1W for TPH-Motor Oil (TPH-O) using the California Modified-Leaking Underground Fuel Tank (LUFT)/EPA M8015 Method. NCA analyzed the eight second-event caprock groundwater samples MW1-2W through MW8-2W for the following: 1) gasoline hydrocarbons (TPH-G) using EPA Method 8015M, and 2) BTEX using EPA Method 8020. NCA also analyzed the two caprock groundwater samples MW4-2W, and MW6-2W for heavy oil range hydrocarbons (TPH-O) using the Washington TPH (WTPH)-418.1 Method. APCL's and NCA's analytical results are summarized below and in Table 3. APCL's and NCA's complete analytical results, together with laboratory QA/QC data and Chain-of-Custody records, are contained in Appendix J.

5.4 First-Event Caprock Groundwater Sample Analytical Results

No TPH-G and no BTEX were detected at respective 0.05 and 0.0005 mg/L laboratory PQLs in the first-event caprock groundwater samples MW1-1W and MW2-1W. In MW3-1W, the respective TPH-G and ethylbenzene concentrations were 0.10 and 0.0008 mg/L, and no benzene, no toluene, and no xylenes were detected at 0.0005 mg/L PQLs. The respective TPH-G, ethylbenzene, and xylenes concentrations were 1.4, 0.018, and 0.0009 mg/L in MW5-1W, and no benzene and no toluene were detected at 0.0005 mg/L PQLs. In MW6-1W, the respective TPH-G, benzene, and ethylbenzene concentrations were 0.21, 0.0056, and 0.0022 mg/L, and no toluene and no xylenes were detected at 0.0005 mg/L PQLs. The respective TPH-G, benzene, ethylbenzene, and xylenes concentrations were 1.1, 0.013, 0.0043, and 0.0010 mg/L in MW7-1W, and no toluene was detected at a 0.0005 mg/L PQL. In MW4-1W, the respective TPH-G, benzene, toluene, ethylbenzene, and xylenes concentrations were 1.5, 0.074, 0.084, 0.0012, and 0.039 mg/L. No TPH-O were detected at 0.5 mg/L PQLs in first-event caprock groundwater samples MW1-1W, MW3-1W, MW4-1W, and MW6-1W.

5.5 Second-Event Caprock Groundwater Sample Analytical Results

No TPH-G, no BTE, and no xylenes were detected at respective 0.0500, 0.000500, and 0.00100 mg/L laboratory reporting limits in the second-event caprock groundwater samples MW1-2W and MW3-2W. In MW2-2W and MW5-2W, the respective TPH-G concentrations were 0.226 and 0.218 mg/L, and no BTE and no xylenes were detected at respective 0.000500 and 0.00100 mg/L reporting limits. The respective TPH-G, benzene, and toluene concentrations were 0.371, 0.0235, and 0.00128 mg/L in MW6-2W, and no benzene and no xylenes were detected at respective 0.000500 and 0.00100 mg/L reporting limits. In MW8-1W, the respective benzene, toluene, and xylenes concentrations were 0.00558, 0.00113, and 0.00255 mg/L, and no TPH-G and no ethylbenzene were detected at respective 0.0500 and 0.000500 mg/L reporting limits. The respective TPH-G, benzene, ethylbenzene, and xylenes concentrations were 1.530, 0.00205, 0.000539, and 0.00124 mg/L in MW7-2W, and no toluene was detected at a 0.000500 mg/L reporting limit. In MW4-2W, the respective TPH-G, benzene, toluene, and xylenes concentrations were 0.969, 0.199, 0.0435, and 0.0121 mg/L, and no ethylbenzene was detected at a 0.000500 mg/L reporting limit. No TPH-O were detected at 1.00 mg/L reporting limits in second-event caprock groundwater samples MW4-2W and MW6-2W.

5.6 DISCUSSION OF CAPROCK GROUNDWATER SAMPLE ANALYTICAL RESULTS

The first-event and second-event caprock groundwater sample analytical results are generally consistent with each other, as well as with field observations and soil vapor sample analytical results. The caprock groundwater sample analytical results indicate the following: 1) the dissolved-phase gasoline impacts are greatest near the gasoline USTs, but even the worst dissolved-phase gasoline impacts are less than DOH Tier 1 Groundwater Action Levels (GALs); and 2) there are no detectable oil impacts in the two caprock groundwater samples analyzed for TPH-O. The DOH uses comparison of laboratory analyses for any detected analytes with DOH Tier 1 GALs to determine if further action (investigation and(or) cleanup/remediation) is required. All of the TPH-G, BTEX, and TPH-O concentrations, as well as laboratory reporting limits and PQLs (for "not detected" compounds), are less than corresponding DOH Tier 1 GALs, indicating that no further assessment and no remediation are necessary. The DOH Tier 1 GALs used in this report (Section 6.5) are based on the following: 1) annual rainfall on the Property of less than 80 cm (200 cm), and 2) drinking water source not threatened.

6.0 ENVIRONMENTAL SETTING

The data in this section was obtained from the results of the onsite subsurface investigation and the following references, except where data has been assumed or estimated, and is consistent with accepted hydrogeologic principles.

1. *Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawai'i*, Mink and Lau, February 1990, Revised (UH Water Resources Center Technical Report No. 179).
2. *Geology of the State of Hawaii*, 2nd ed., Stearns, 1985.
3. *Ground Water Index and Summary*, DLNR, July 14, 1992.
4. *Ground-Water Resources in Southern Oahu, Hawaii*, Visher and Mink, 1964 (U.S. Geological Survey Water-Supply Paper 1778).
5. Underground Injection Control Program Map Sheet O-13, DOH Safe Drinking Water Branch, July 6, 1984.
6. *Volcanoes in the Sea*, The Geology of Hawaii, 2nd ed., MacDonald, *et al.*, 1990.

6.1 GEOLOGY

The Property is located near the south-center of the coastal plane of Oahu which is underlain by sediments (caprock) of Holocene to Pleistocene geologic age which was eroded from the Koolau Range. The caprock is a wedge-shaped unit which thickens coastward; it is estimated to be 500 feet thick onsite. Regionally, the caprock is primarily composed of alluvial and marine silts, clays, gravels, sands, and calcareous coral reef deposits, as well as deeply weathered basalt, which have variable, though generally low, permeabilities. The caprock is underlain by basalt flows of Tertiary geologic age from the Koolau range. Taken as a whole, the caprock deposits are considerably less permeable than the surrounding and underlying, generally highly permeable, basalt lavas.

Subsurface earth materials encountered in the eight soil sampling points/wells on the Property consisted the following:

1. Asphalt pavement or concrete slabs underlain by gravel and sand base course extending to approximately 1 foot bgs.
2. Clayey silt/fine sand (apparent low permeability) extending to approximately 9.5 to 11 feet bgs in points/wells MW-1 through MW-7, and basalt pea gravel (UST backfill) to approximately 9.5 feet bgs in point/well MW-8.
3. Well-graded, fine-coarse grained basalt sand (apparent moderate permeability) extending to approximately 12.5 to 15.5 feet bgs.
4. Hard coralline gravel/sand (apparent low to moderate permeability) extending to at least 21.5 feet bgs, the maximum depth explored.

6.2 GROUNDWATER HYDROLOGY

Regionally, the caprock contains groundwater which ranges in salinity from freshwater to seawater. The basaltic lavas that underlie the caprock contain basal groundwater, the upper portion of which is freshwater. The freshwater portion of the basal groundwater comprises a lens that floats on and partially displaces the underlying, denser sea water, in static equilibrium. The freshwater portion of the basal groundwater is recharged by infiltration of rainfall on the Koolau

Range. Discharge occurs from pumping of municipal and other water-supply wells, and naturally as springs and seeps in valleys and coastal areas, upward flow into the caprock, and probably as submarine seepage offshore.

Data from nearby offsite water wells indicate the elevation for the caprock water table is approximately 2.8 feet above MSL, and the elevations for the water levels in the basal aquifer are approximately 23.3 to 32 feet above MSL, which is approximately 6.3 to 11 feet *aboveground*, indicating that the basal aquifer is under artesian conditions. The water level elevations in the basal aquifer are higher than those for the caprock water table, indicating that if there is leakage between caprock and basal aquifers, the leakage will be upward from the basal aquifer into the caprock aquifer.

The caprock water table in the eight onsite points/wells ranged from approximately 11.40 to 12.63 feet bgs within the basalt sand, equivalent to elevations ranging from approximately 1.62 to 1.76 feet above MSL in MW-1 through MW-7 (water table elevations could not be calculated for MW-8 because its well-head elevation was not surveyed). These water table elevations indicate that the water table is nearly horizontal but is slightly irregular including a slight depression at MW-4 (Figure 7). There is however, no discernible hydraulic gradient onsite; the hydraulic gradient and flow direction for the local caprock aquifer are presumed to be south-southwesterly (makai or coastward). Because the Property is approximately 0.8 mile from the coast, water levels in the caprock aquifer fluctuate tidally. In the eight onsite wells, the observed tidal fluctuations range from 0.1 to 0.5 foot.

6.3 Underground Injection Control Line

The Underground Injection Control (UIC) line has been established by the DOH as the boundary between underground sources of drinking water and exempted (non-drinking water) portions of aquifers. The areas makai (coastward) of the UIC line is defined in *Underground Injection Control*, Hawaii Administrative Rules (HAR) 11-23, as the exempted (non-drinking water) portions of aquifers, and the areas mauka (inland) of the UIC line are drinking water portion. The Property is approximately 0.4 mile mauka of the UIC line which is along Kapiolani Boulevard (Figure 8), and is within a drinking water portion of the local aquifer (see below).

6.4 Aquifer Classification

The near-coastal part of the Nuuanu System of the Honolulu Sector, which includes the Property, contains a caprock aquifer and an underlying basal aquifer (Mink and Lau, February 1990).

The local caprock aquifer has an Aquifer Code of 30102116, and a Status Code of 13321 (Figure 4). The last three digits of the Aquifer Code and the five Status Code digits for the caprock aquifer indicate the following:

1. It is basal groundwater(freshwater in contact with seawater).
2. It is unconfined.
3. It occurs in sedimentary (nonvolcanic) strata.
4. It is currently used.
5. It does not have drinking water utility and it is not ecologically important.
6. Its salinity is moderate (1,000-5,000 mg/L Cl⁻).
7. It is replaceable.
8. It has a high vulnerability to contamination.

The local basal aquifer has an Aquifer Code of 30102121, and a Status Code of 11113. The last three digits of the Aquifer Code and the five Status Code digits for the basal aquifer indicate the following:

1. It is basal groundwater (freshwater in contact with seawater).
2. It is confined.
3. It occurs in flanks (horizontally-extensive lavas).
4. It is currently used.
5. It has drinking water utility.
6. It is freshwater (<250 mg/L Cl^-).
7. It is irreplaceable.
8. It has a low vulnerability to contamination.

6.5 Groundwater Utility

Although the Property is located mauka (inland) of the UIC line, it is nonetheless underlain by a moderately-saline caprock aquifer which has a utility code of 3, indicating that it does not have drinking water utility and is not ecologically important (Mink and Lau, February 1990). This regionally-based classification is consistent with field conductances measured during well development and purging which ranged from 980 to 1,540 μmhos. Furthermore, nearby well data indicate that water level elevations in the basal aquifer are higher than those for the caprock water table, therefore if there is leakage between caprock and basal aquifers, then the leakage will be upward from the basal aquifer into the caprock aquifer. These conditions mitigate adverse effects on the basal aquifer due to environmental conditions on the Property. Accordingly, the DOH Tier 1 SALs and GALs used in this report are based on the following: 1) annual rainfall on the Property of less than 80 cm (200 cm), and 2) drinking water source not threatened.

7.0 CONCLUSIONS

The following are concluded, based on: 1) field observations during the soil vapor survey, soil sampling, monitoring well installation, and caprock groundwater sampling; 2) laboratory analytical results of soil vapor samples, soil samples, and caprock groundwater samples; and 3) interpretations based on the above data and field observations.

1. The seven soil vapor samples having the highest TVH concentrations were capillary fringe samples from the seven probes which were nearest to the gasoline USTs.
2. To the east and south of the impacted area, the outermost probes satisfactorily evaluated the extent of the soil vapor impacts. To the west and north of the gasoline USTs, the deeper soil vapor samples from the probes near the western and northern property lines were significantly impacted by TVH which is, however, nearly all methane through pentane.
3. The elevated CO_2/O_2 ratios and CO_2 concentrations, together with the low O_2 concentrations, occur in ten soil vapor samples that have or that are adjacent to samples having the seven highest TVH concentrations. This relationship suggests that there is ongoing naturally-occurring biodegradation (intrinsic bioremediation) of the gasoline impacts present.
4. Chromatograms from laboratory analyses of the 19 soil vapor samples having detected TVH, indicate that the TVH in these samples is nearly all composed of methane through pentane (carbon chains C_1 through C_5). Together with the high CO_2/O_2 ratios in the samples having the higher TVH concentrations, this indicates that intrinsic bioremediation has broken down the longer chain components of the gasoline into short chain components which are nearly all shorter than gasoline-range hydrocarbons.
5. Together with the "not detected" or low soil and caprock groundwater sample analyses from the four groundwater monitoring wells near the gasoline USTs, the associated seven soil vapor sample analyses indicate that the impacts are primarily in vapor phase in the capillary fringe zone and that there are no significant sorbed- or dissolved-phase impacts.
6. In the 16 soil samples, all of the TPH-G, BTEX, and TPH-O concentrations, as well as laboratory reporting limits and PQLs, are less than corresponding DOH Tier 1 SALs, indicating that no further assessment and no remediation are necessary.
7. In the 15 caprock groundwater samples, all of the TPH-G, BTEX, and TPH-O concentrations, as well as laboratory reporting limits and PQLs, are less than corresponding DOH Tier 1 GALs, indicating that no further assessment and no remediation are necessary.

0000 0005 0867

8.0 CERTIFICATION

This Phase II Site Assessment Report has been prepared for Texaco Environment, Health & Safety by Walker Consultants, Ltd., in accordance with customary professional practice. This UST Closure Report generally complies with the following: 1) Title 40, CFR Part 280 *Technical Standards and Corrective Actions for Owners and Operators of Underground Storage Tanks*; 2) *Technical Guidance Manual for Underground Storage Tank Closure and Release Response* (DOH, August 1992) and DOH Policy Updates; and 3) *Risk-Based Corrective Action and Decision Making at Sites with Contaminated Soil and Groundwater* (DOH, December 1995, Revised June 1996).

No other warranty is either expressed or implied. Please contact us if you have questions or need additional information.

Duncan Walker, RG, CEG

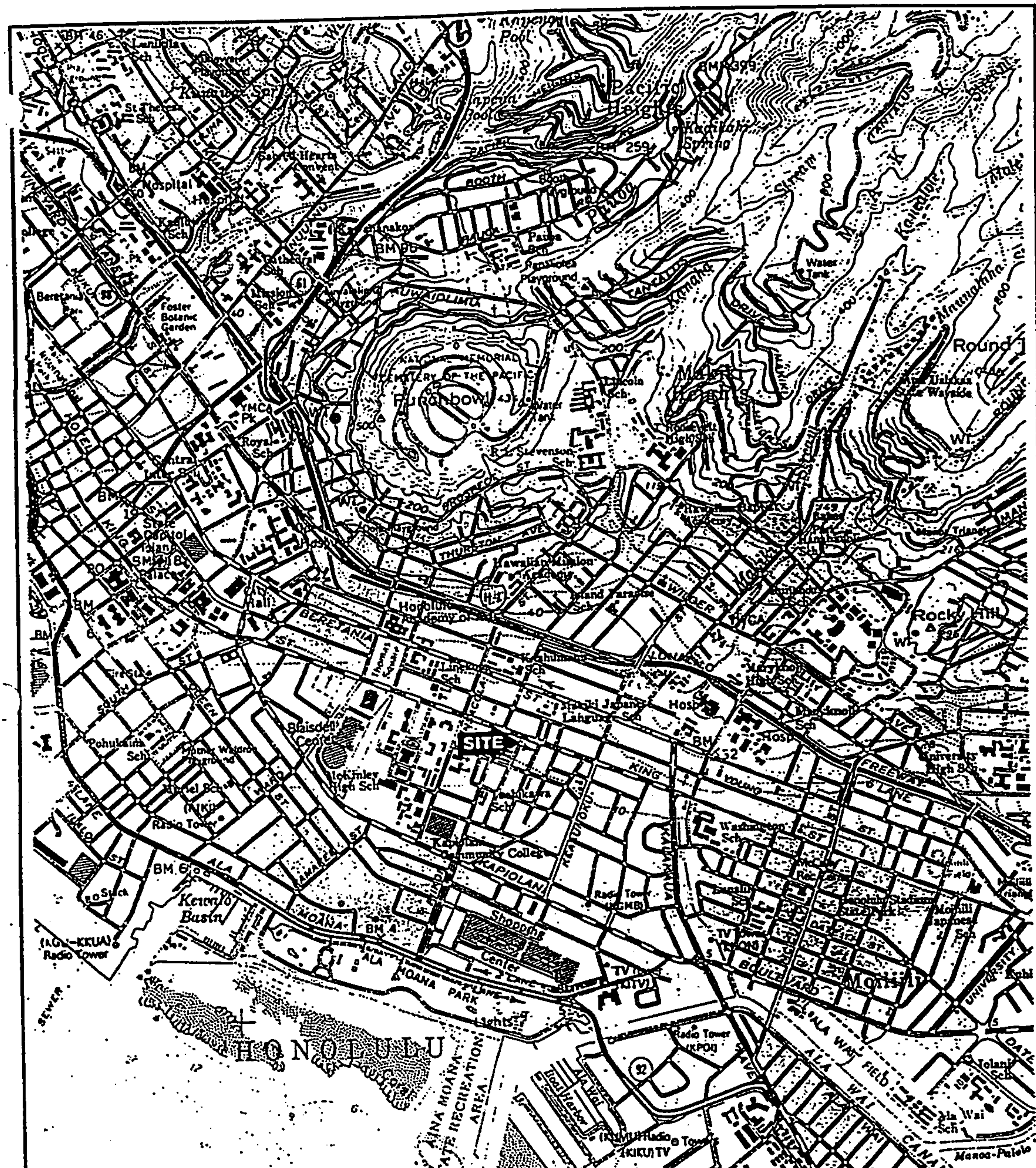
January 17, 1997
Date

REGISTERED GEOLOGIST
DUNCAN WALKER
EG1395
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

0000 0005 0868

FIGURES 1 THROUGH 8

0000 0005 0869



0 2,000'

SCALE

N

Note: Map reproduced from a portion of Honolulu 7.5' Quadrangle (USGS, 1981).

VICINITY MAP

for

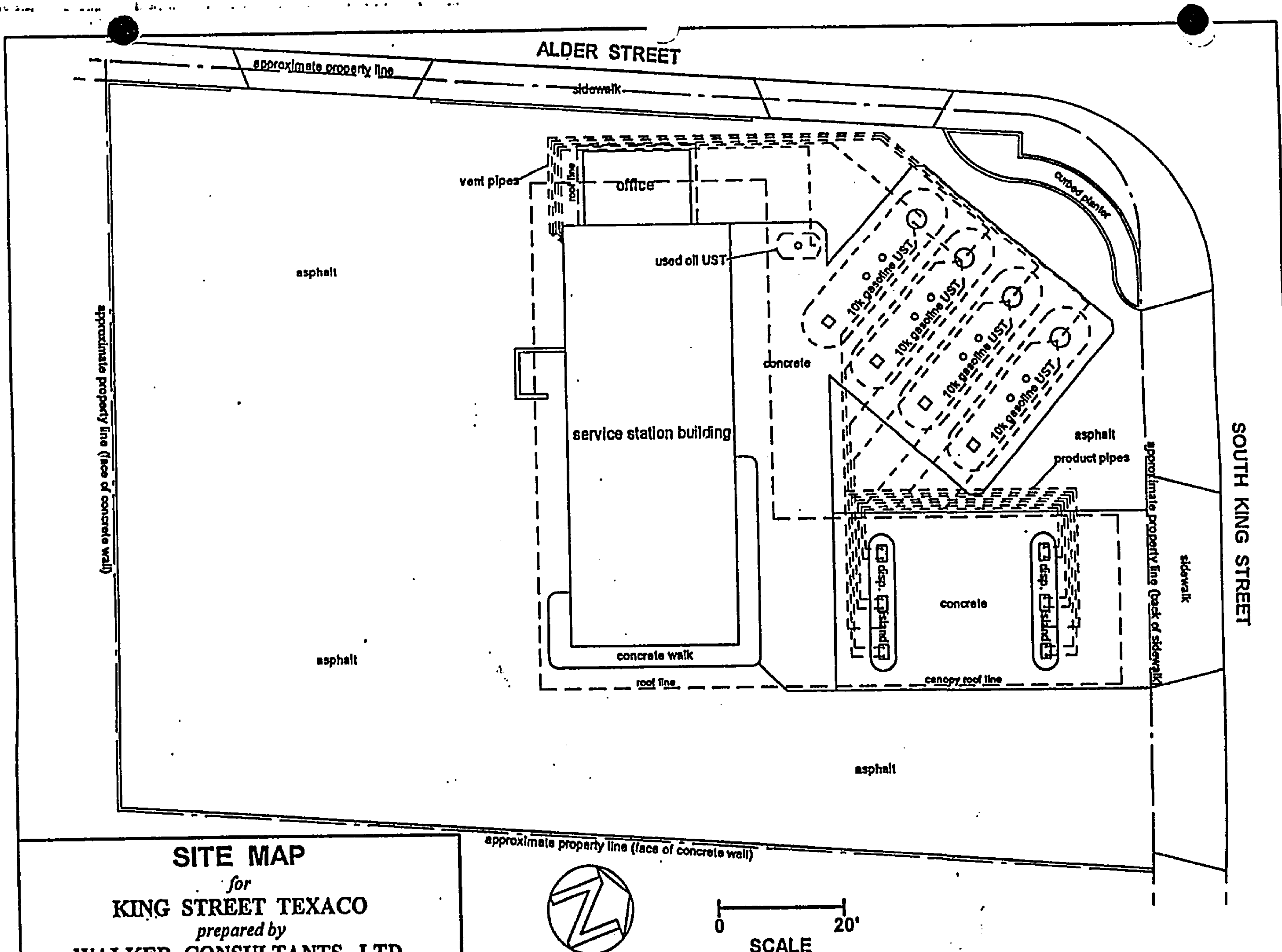
KING STREET TEXACO

prepared by

WALKER CONSULTANTS, LTD.

January 1997

FIGURE 1



Note: Map not a survey. Map data are based on field measurements and available plans, and are approximate.

SITE MAP

for

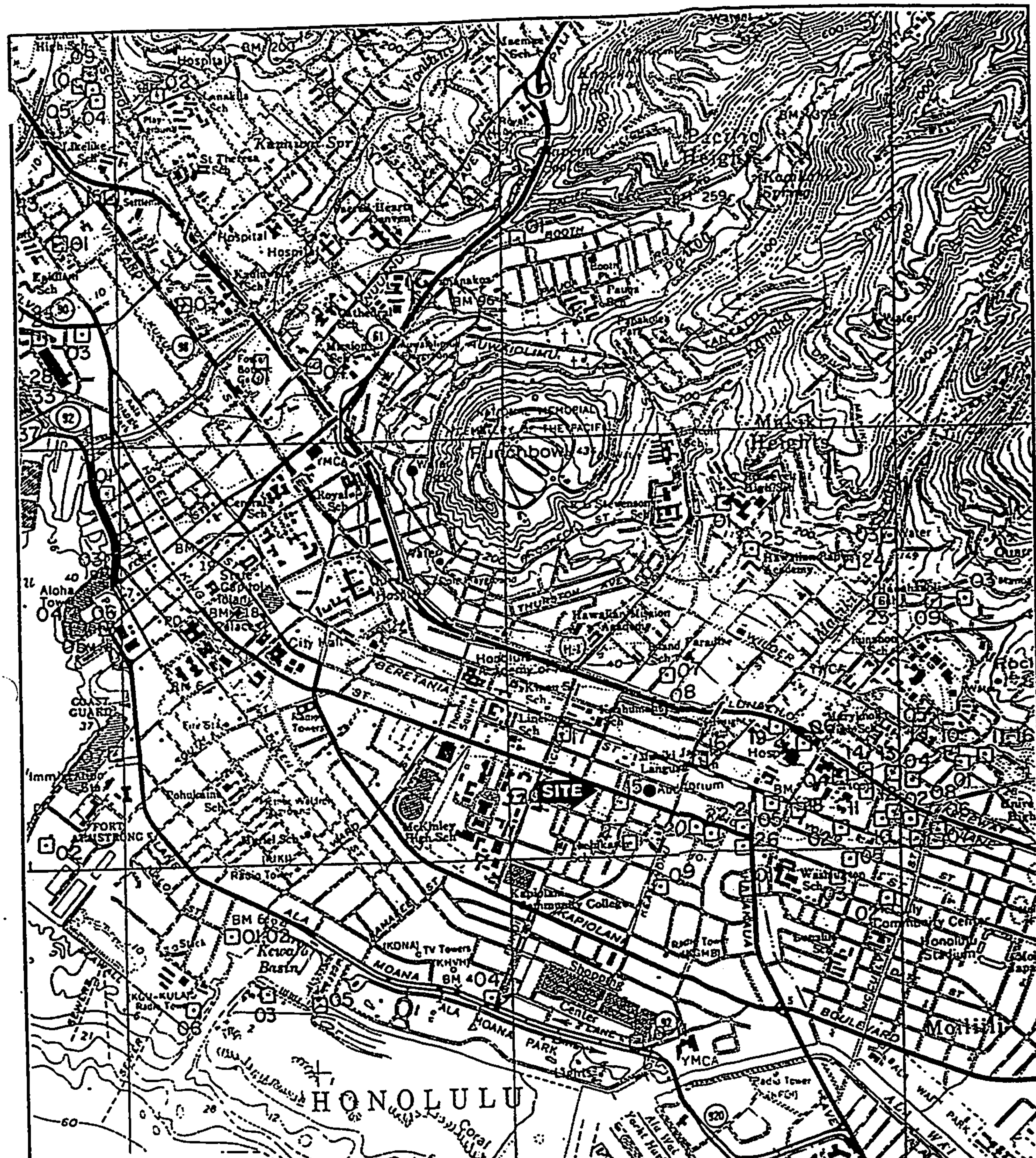
KING STREET TEXACO

prepared by

WALKER CONSULTANTS, LTD.

January 1997

FIGURE 2



EXPLANATION

⊡ Other well

0 2,000'

SCALE

Note: Map reproduced from a portion of well location map sheet O-13 (DLNR).

WELL LOCATION MAP

for

KING STREET TEXACO

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January 1997

FIGURE 3

0000 0005 0872

SUMMARY OF NEARBY WATER WELLS

State well I.D.	Owner or user	Approx. distance (mi.) and direction from Property	Presumed hydraulic gradient relationship	Year drilled	Dia. (in)	Total depth (ft.)	Surface elev. (ft.)	Top of screen elev. (ft.)	Bottom of hole elev. (ft.)	Static head elev. (ft.)	Chloride (mg/L)	Use/year
Water Wells within 0.5 mile of Property												
3-1850-15	Wilcox	0.05 SE	crossgradient	1884	6	656	17	-438	-639	19	48	sealed/1927
3-1850-27	Meadow Gold	0.15 SE	crossgradient	1914	10	552	8	-478	-544	27	85	sealed/1963
3-1850-17	Hawaiian Electric Co.	0.20 NW	crossgradient	1887	8	510	6	NR	-504	27.6	63	sealed/1924
3-1850-09	State of Hawaii	0.25 W	crossgradient	1882	6	620	6	NR	-614	29.6	62	sealed/1938
3-1850-08	Bank of Hawaii	0.25 NE	upgradient	1882	7	358	34	NR	-324	11.8	NR	sealed/1933
3-1850-16	Honolulu City	0.30 NE	crossgradient	1886	6	442	22	-378	-420	28.5	53	sealed/1940
3-1850-20	Plews & Wichman	0.30 SE	crossgradient	1891	8	437	14	-361	-423	31	62	sealed/1953
3-1750-09	Pagoda Hotel	0.30 SE	crossgradient	1964	16	53	7	-14	-46	2.8	490	industrial/1974
3-1850-22	Bishop Estate	0.30 SE	crossgradient	1894	8	521	16	-403	-505	27.6	62	sealed/1932
3-1850-07	Babcock	0.35 NE	crossgradient	1882	7	375	37	NR	-338	42	NR	sealed/1926
3-1850-21	Board of Water Supply	0.40 SE	upgradient	1894	8	409	20	-292	-389	29.8	62	sealed/1973
3-1850-26	II Estate	0.40 SE	crossgradient	1910	10	450	15	-341	-435	27.7	60	sealed/1940
3-1750-01	Honolulu City	0.45 SE	crossgradient	1890	8	475	14	NR	-461	29.9	67	sealed/1932
3-1850-05	Rowlins	0.45 SE	crossgradient	1882	5	310	28	-209	-282	29.7	61	sealed/1928
3-1850-19	Jodo Mission	0.50 NE	crossgradient	1890	10	277	41	-179	-236	30.6	NR	sealed/1928
Nearest Drinking Water Wells												
3-1851-12	Board of Water Supply	0.75 NW	crossgradient	1895	10	580	21	-478	-559	32	67	municipal/1974
3-1851-13	Board of Water Supply	0.75 NW	crossgradient	1895	10	616	22	-477	-594	NR	67	municipal/1974
3-1851-24	Board of Water Supply	0.75 NW	crossgradient	1910	12	616	20	-467	-596	26.9	67	municipal/1974
3-1851-31	Board of Water Supply	0.75 NW	crossgradient	1924	12	600	20	-469	-580	28	67	municipal/1974
3-1851-32	Board of Water Supply	0.75 NW	crossgradient	1924	12	600	20	-469	-580	27.8	67	municipal/1974
3-1851-33	Board of Water Supply	0.75 NW	crossgradient	1926	12	533	14	-465	-519	23.6	67	municipal/1974
3-1851-34	Board of Water Supply	0.75 NW	crossgradient	1926	12	636	14	-470	-622	23.6	67	municipal/1974
3-1851-35	Board of Water Supply	0.75 NW	crossgradient	1926	12	566	15	-473	-551	23.3	67	municipal/1974

NOTE
NR Not Reported.

STATE OF HAWAII / DEPARTMENT OF LAND AND NATURAL RESOURCES / COMMISSION ON WATER RESOURCE MANAGEMENT
GROUND WATER INDEX AND SUMMARY
JULY 14, 1992

ISLAND CODE 3: OAHU

WELL NUMBER	NAME OR LOCATION	QUAD MAP	OWNER OR USER	YEAR DRLD	DRILLER	COORDINATES LAT	COORDINATES LONG	PHYSICAL DATA TYPE CONS	CSG DIA IN	TOTAL DEPTH FT	ELEVATIONS IN FEET GRND SURF	BOTT SOLID CASE	BOTT PERF CASE	BOTT OF HOLE	INITIAL TEST STAT HEAD FT	CHLOR MG/L	PUMP TEST RESULTS PUMP RATE GPM	DRAW DOWN FT	SPEC CAP	CHLOR MG/L	WATR TEMP C	WATER SUPPLY PUMP CAPAC MGD	DRAFT MGD, YR	--CHLORIDES-- MG/L, YEAR MAX	MIN	MAJOR USE, YR	WELL NUMBER
3-1744-04	PIA EXPL	15	HONOLULU BWS	1990	ROSCOE MOSS	211750	1574441	PER	12	315	281	10	-30	-34	4.4	83	200	2.0	100	98	22.6						3-1744-04
3-1745-01	WAILUPE	15	HONOLULU BWS	1981	ROSCOE MOSS	211753	1574519	PER	14	435	379	12	-27	-56	3.7	63	350	14.9	23	76	19.5					UWU,83	3-1745-01
3-1746-01	AINAKOA WELL	13	HONOLULU BWS	1968	ROSCOE MOSS	211713	1574653	PER	12	305	156	-7	-37	-149	9.0	308	360			308	21.0	0.50	0.4,76		136.00	MUN,74	3-1746-01
3-1746-02	WAIALAE IKI WELL	15	HONOLULU BWS	1973	ROSCOE MOSS	211707	1574617	PER	12	440	385	2	-28	-55	2.0	130	350			130	21.0	0.50	0.2,76			MUN,74	3-1746-02
3-1747-01	WAIALAE	13	HONOLULU BWS	1935	KEIZER	211717	1574739		1	171	152	-6	-16	-19	10.3								0.4,76			OBS,74	3-1747-01
3-1747-02	WAIALAE SHAFT	13	HONOLULU BWS	1937		211719	1574736	TUN	96	157	160			3	10.2	73	694	0.8	848	364		0.60	0.4,	173.	138.	MUN,74	3-1747-02
3-1747-03	WAIALAE NUI	13	HONOLULU BWS	1983	ROSCOE MOSS	211753	1574704	PER	14	410	310	-17	-57	-100	11.4	48	1000	7.8	128	48	20.8					UWU,83	3-1747-03
3-1748-01	PALOLO	13	BISHOP ESTATE	1895	MCCANDLESS	211749	1574854		8		40	-38			24.2											OBS,74	3-1748-01
3-1748-02	PALOLO	13	BOOTH E K	1896	MCCANDLESS	211735	1574850		10	159	29	-71		-130												SLD,28	3-1748-02
3-1748-03	KAIMUKI PUMP STA	13	HONOLULU BWS	1898		211727	1574850		12	260	25			-235	25.2						22.5		3.5,76	67.	39.	MUN,74	3-1748-03
3-1748-04	KAIMUKI PUMP STA	13	HONOLULU BWS	1898		211727	1574850		12	260	26			-234							22.5					MUN,74	3-1748-04
3-1748-05	KAIMUKI PUMP STA	13	HONOLULU BWS	1912	MCCANDLESS	211727	1574850		12	250	37	-63		-213	22.3						22.5					MUN,74	3-1748-05
3-1748-06	KAIMUKI PUMP STA	13	HONOLULU BWS	1912	MCCANDLESS	211727	1574850		12	250	27	-73		-223	24.0						22.5					MUN,74	3-1748-06
3-1748-07	KAIMUKI PUMP STA	13	HONOLULU BWS	1925	MCCANDLESS	211727	1574850		12	301	29	-66		-272	24.9	41					22.5			48.	39.	MUN,74	3-1748-07
3-1748-08	KAIMUKI PUMP STA	13	HONOLULU BWS	1925	MCCANDLESS	211727	1574850		12	304	28	-73		-276	23.9	46					22.5			53.	44.	MUN,74	3-1748-08
3-1748-09	KAIMUKI PUMP STA	13	HONOLULU BWS	1925	MCCANDLESS	211727	1574850		12	302	28	-73		-274	24.0						22.5					MUN,74	3-1748-09
3-1748-10	KAIMUKI PUMP STA	13	HONOLULU BWS	1928	MCCANDLESS	211727	1574850		12	308	32	-69		-276	25.0						22.5					MUN,74	3-1748-10
3-1748-11	KAIMUKI	13	HONOLULU BWS	1960	PACIFIC DRLG	211727	1574850		6	1404	29	-85		-1375		16800				17500						OBS,74	3-1748-11
3-1748-12	KAAU	13	HONOLULU BWS	1975	ROSCOE MOSS	211719	1574809	PER	12	368	121	-9	-166	-247	7.9	3000										MUN,74	3-1748-12
3-1748-13	MANOA I	13	HONOLULU BWS	1984	ROSCOE MOSS	211754	1574659	PER	12	100	40	-8	-60	-60	25.0	33	700	42.5	16	30	21.1					UWU,84	3-1748-13
3-1748-14	KAIMUKI MONITR 2	13	HONOLULU BWS	1986	NAT RES INTL	211727	1574858	ROT	9	1203	26	-97		-1177												OBS,86	3-1748-14
3-1749-01	KAPAHULU	13	SPENCER C K	1881		211725	1574922		6	407	15			-392	22.7	28										SLD,72	3-1749-01
3-1749-02	KAPAHULU	13	SHEE Y C	1881		211720	1574924		6	428	13			-415												SLD,38	3-1749-02
3-1749-03	KAPAHULU	13	MACOON TRUST	1882	COOKE-PEDDLER	211734	1574936			730	10			-720												LOS,74	3-1749-03
3-1749-04	KAPAHULU	13	STATE OF HAW	1883		211738	1574906		8	266	28	-162		-258										30.		SLD,26	3-1749-04
3-1749-05	KAPAHULU	13	UNG T Y	1883		211730	1574929		6	507	8	-556		-579	24.8	37								218.	37.	SLD,45	3-1749-05
3-1749-06	KAPAHULU	13	BISHOP ESTATE	1884		211735	1574905		10	162	22	-103		-140	23.3	34								34.	27.	SLD,30	3-1749-06
3-1749-07	KAPAHULU	13	STATE OF HAW	1885		211718	1574910		8	625	18	-291		-607	25.0	56							0.6,	2250.	51.	OBS,74	3-1749-07
3-1749-08	KAPAHULU	13	CHANG KIM	1888		211712	1574912		4	411	11	-185		-400	20.1	51							0.0,76	335.	51.		3-1749-08
3-1749-09	KAPAHULU	13	HONOLULU CTY	1889		211700	1574901		6	510	12	-458		-498	21.0	74								120.	74.	SLD,28	3-1749-09
3-1749-10	KAPAHULU	13	TSUMOTO F T	1889		211722	1574923		12	463	13	-411		-450	23.2	47								47.	25.	SLD,40	3-1749-10
3-1749-11	KAPAHULU	13	DUNAE S S	1889		211723	1574923		10	475	14	-406		-461	24.0	47								63.	30.	SLD,45	3-1749-11
3-1749-12	KAPAHULU	13	CHAR Y T	1889		211720	1574927		6	521	12	-406		-509	19.9	240								810.	240.	SLD,49	3-1749-12
3-1749-13	KAPAHULU	13	WEEE L Y	1889		211721	1574926		8	500	14	-416		-486	23.0	216								270.	56.	SLD,28	3-1749-13
3-1749-14	KAPAHULU	13	HONOLULU BWS	1891		211721	1574914		8	417	13	-269		-404	24.8	57							0.1,	162.	53.	OBS,74	3-1749-14
3-1749-15	KAPAHULU	13	NAKANO D S	1892	MCCANDLESS	211727	1574901		6	165	19	-103		-146	17.3	44								44.	34.	SLD,40	3-1749-15
3-1749-16	KAPAHULU	13	U S ARMY	1911	WRIGHT	211709	1574902		10	420	8	-336		-412	22.0	53								65.	42.	SLD,67	3-1749-16
3-1749-17	KAPAHULU	13	HAWN HOTELS	1917	MCCANDLESS	211718	1574925		10	468	11	-391		-457	18.5	83								700.	83.	SLD,71	3-1749-17
3-1749-18	KAPAHULU	13	LOVES BAKERY	1921	SAMSON-SHOCK	211715	1574901		4	269	16	-239		-253	22.6	32							0.1,76	98.	32.	IND,74	3-1749-18
3-1749-19	KAPAHULU	13	HAWN HOTELS	1927	MCCANDLESS	211732	1574908		12	276	21	-154		-255	24.7	28							0.4,	36.	22.	DOM,74	3-1749-19
3-1749-20	MOILIILI	13	STAR MARKET	1954	NAT WRITON	211746	1574936		12	28							200	2.4	83			0.03	0.0,			SLD,82	3-1749-20
3-1749-21	MOILIILI	13	STAR MARKET	1954	NAT WRITON	211746	1574936		12	28							100	1.0	100							SLD,82	3-1749-21
3-1749-22	KAIMUKI OBS	13	HONOLULU BWS	1970	LAYNE INT	211718	1574908	ROT	8	911	14	-291		-897	23.4	145					24.0				105.00	OBS,74	3-1749-22
3-1750-01	MCCULLY	13	HONOLULU CTY	1881		211754	1575023		8	475	14			-461	29.9	42								67.	42.	SLD,32	3-1750-01
3-1750-02	MCCULLY	13	YOU HAN	1890		211783	1575002		6	416	9	-354		-407	29.6	75							0.1,	142.	55.	SLD,76	3-1750-02

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3-1750-03	MCCULLY	13	DIAMOND BKRY	1890		211756	1575010		8	374	10	-330		-364	28.2	58							0.1,	91.	58.	BLD,29	3-1750-03
3-1750-04	WAIKIKI	13	NIUMALU HOTEL	1950	SAMSON-SHOCK	211706	1575024		10	62							230	1.0	230							UNU,74	3-1750-04
3-1750-05	MCCULLY	13	TIMES MARKET	1953	MAT WEITON	211758	1575009		8	154							50	8.0	6							UNU,81	3-1750-05
3-1750-06	WAIKIKI	13	HILTON HOTEL	1955	SAMSON-SHOCK	211709	1575020		8	122																UNU,74	3-1750-06
3-1750-07	WAIKIKI	13	HILTON HOTEL	1955	SAMSON-SHOCK	211713	1575022		8	120																UNU,74	3-1750-07
3-1750-08	WAIKIKI	13	HILTON HOTEL	1955	SAMSON-SHOCK	211713	1575022		8	90																UNU,74	3-1750-08
3-1750-09	ALA MOANA	13	PAGODA HOTEL	1964	MAT WEITON	211757	1575036		16	53	7	-14		-46			550	2.9	190					490.		IND,74	3-1750-09
3-1750-10	ALA MOANA	13	ALA MOANA CTR	1967	MAT WEITON	211733	1575041		18	88	4	-38		-84	2.8	13954	600	0.8	750							DIS,74	3-1750-10
3-1750-11	ALA MOANA	13	ALA MOANA CTR	1967	MAT WEITON	211734	1575042		18	55	5	-32		-50	2.9	13451	550	0.5	1100	17680						DIS,74	3-1750-11
3-1751-01	ALA MOANA	13	CASTLE & COOKE	1939	MAT WEITON	211751	1575142		12	142						16100						1.01				IND,74	3-1751-01
3-1751-02	ALA MOANA	13	CASTLE & COOKE	1949	MULLIN	211751	1575142		12	150						15700						2.02				IND,74	3-1751-02
3-1751-03	ALA MOANA	13	STATE OF HAW	1959	SAMSON-SHOCK	211742	1575138		6	92						18000										OTR,74	3-1751-03
3-1751-04	ALA MOANA	13	1350ALA MOANA	1967	MAT WEITON	211740	1575103				5															DIS,74	3-1751-04
3-1751-05	ALA MOANA	13	U OF HAWAII	1968	MAT WEITON	211740	1575138										600			17070						OTR,74	3-1751-05
3-1751-06	ALA MOANA	13	U OF HAWAII	1970	ROSCOE MOSS	211740	1575149	PER	16	151	5	-41		-146			179	0.0	22							OTR,74	3-1751-06
3-1800-01	EWA BEACH	10	N O A A	1972	CONTINENTAL	211858	1580020		4	106																OBS,74	3-1800-01
3-1805-01	BARBERS POINT	06	CAMPBELL EST	1957	SAMSON-SHOCK	211859	1580527		7	50	22	20		-28	1.1	932	375	1.0	375	930						UNU,74	3-1805-01
3-1805-02	BARBERS POINT	06	OCEAN MINERALS	1978	ROSCOE MOSS	211837	1580526	PER	20	100	18	-2	-22	-82			3000	2.0	1500							UNU,83	3-1805-02
3-1805-03	HIAI FIREWELL	06	HAWN IND REFIN	1985	FOUND INTL	211019	1580525	ROT	20	50	10	-9		-40		2700	2800	3.0	933			0.00				OTR,85	3-1805-03
3-1806-01	BARBERS POINT	06	CAMPBELL EST	1957	SAMSON-SHOCK	211009	1580617		7	50	9	6		-41	0.8	4630										UNU,74	3-1806-01
3-1806-02	BARBERS POINT	06	CHEVRON USA	1957	SAMSON-SHOCK	211058	1580656		7	50	7	5		-43	0.8	7160										UNU,74	3-1806-02
3-1806-03	BARBERS POINT	06	HAW WESTRN ST	1959	SAMSON-SHOCK	211020	1580628		16	100	12	-12	-36	-88	0.5	9050	1100	2.5	440			1.58				UNU,81	3-1806-03
3-1806-04	BARBERS POINT	06	HAW WESTRN ST	1959	SAMSON-SHOCK	211020	1580628		16	50	12	9		-38		3020	1000	1.7	588			1.44				UNU,81	3-1806-04
3-1806-05	BARBERS POINT	06	SO PIPE&CASG	1959	SAMSON-SHOCK	211036	1580624		8	40	12	-4	-28	-28												IND,74	3-1806-05
3-1806-06	BARBERS POINT	06	CHEVRON USA	1959	MAT WEITON	211033	1580650		18	50	7			-43	1.0	13600	1500	4.0	375	14300		2.74				IND,74	3-1806-06
3-1806-07	BARBERS POINT	06	DILL-CONOCO	1972	CONTINENTAL	211020	1580642		6	300	9	-207		-291			385	2.0	193							DIS,74	3-1806-07
3-1806-08	BARBERS POINT	06	DIL-CONOCO	1972	CONTINENTAL	211020	1580642			215																OBS,74	3-1806-08
3-1806-09	BARBERS POINT	06	C&C R-POWER	1986	ROSCOE MOSS	211030	1580629	PER	18	103	12	-38	-88	-91	0.3		3000	1.0	1667			0.00				OTR,86	3-1806-09
3-1806-10	BARBERS POINT	06	C&C R-POWER	1986	ROSCOE MOSS	211030	1580629	PER	18	105	12	-38	-88	-93	0.2		3000	5.0	600			0.00				OTR,86	3-1806-10
3-1806-11	AES PROD #1	06	AES INC	1989	ROSCOE MOSS	211024	1580630	PER	20	115	12	-48	-103	-103			4300	19.0	237								3-1806-11
3-1806-12	AES 1B	06	AES INC	1990	ROSCOE MOSS	211022	1580632	PER	20	124	13	-24	-109	-111	0.6		3000	2.4	1250							IND,00	3-1806-12
3-1806-13	AES 1C	06	AES INC	1990	ROSCOE MOSS	211022	1580629	PER	20	124	11	-26	-111	-113	0.8		2000	2.9	690	28000						IND,00	3-1806-13
3-1806-14	AES 1D	06	AES INC	1990	ROSCOE MOSS	211021	1580631	PER	20	125	13	-24	-107	-112	1.0		1000	5.1	196		25.0					IND,00	3-1806-14
3-1840-01	KALAMA VALLEY	15	COOKE	1945	MULLIN	211008	1574040		6	116	96	27		-22	1.3	667								1040.	667.	OTR,74	3-1840-01
3-1840-02	KALAMA VALLEY	15	KUBA Y	1945	MULLIN	211000	1574045		6	116	106	31	11	-10	2.6	785										UNU,74	3-1840-02
3-1840-03	KALAMA VALLEY	15	TAJIRI T	1946	MULLIN	211017	1574038		6	99	78	-21		-21	3.0	922										UNU,74	3-1840-03
3-1840-04	KALAMA VALLEY	15	LEONG K	1947	MULLIN	211030	1574036		7	110	88	4	-20	-22	2.2	1080								1080.	834.	UNU,74	3-1840-04
3-1840-05	KALAMA VALLEY	15	MARSHIRO T	1949	MAT WEITON	211008	1574034		6	83	67	-16		-16	0.6	1190	59	1.9	31					1300.	1100.	OTR,74	3-1840-05
3-1840-06	KALAMA VALLEY	15	KACOR REALTY	1949	MAT WEITON	211005	1574036		8	101	78	-11		-23	0.6	1370	33	1.3	25					1390.		LOS,74	3-1840-06
3-1840-07	KALAMA VALLEY	15	ING P	1950	MAT WEITON	211011	1574034		6	89	75	-13		-14	0.8	1740	82	0.1	820							OTR,74	3-1840-07
3-1841-01	KAMILONUI VALLEY	15	KANESHIRO M	1956	SAMSON-SHOCK	211033	1574152		8	275	37			-238												UNU,74	3-1841-01
3-1842-01	KAMILONUI VALLEY	15	SHINDO T	1945	MULLIN	211015	1574200		6	200	35			-165	0.8	750										UNU,74	3-1842-01
3-1843-01	KULIOUOU	15	HONOLULU BWS	1983	ROSCOE MOSS	211027	1574340	PER	12	246	218	10	-30	-50	3.7		350	2.6	135	100	21.1					UNU,83	3-1843-01
3-1845-01	WAILUPE II	15	HONOLULU BWS	1986	ROSCOE MOSS	211815	1574535	PER	12	490	380	-15		-110	7.5		300	17.0	18	25	20.3					UNU,87	3-1845-01
3-1847-01	PALOLO WELL	13	HONOLULU BWS	1974	WAT RES INTL	211037	1574729	ROT	12	570	387	-33		-103	21.9	22	1100	11.0	100	24		1.50	1.4,76			MUN,75	3-1847-01

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3-1849-01	MANOA VALLEY	13	MARQUES E M	1880	PIERCE	211812	1574950		3	295	37	-236		-258	43.5	49								49.	48.	SLD,30	3-1849-01
3-1849-02	MANOA VALLEY	13	HOWARD M	1881	FESSLER	211804	1574959		8	358	25	-281		-333	30.0	51								67.	51.	SLD,43	3-1849-02
3-1849-03	MANOA VALLEY	13	PIETSCH D & L	1882		211834	1574949			980	200			-780												SLD,53	3-1849-03
3-1849-04	MANOA VALLEY	13	SOON T Y	1885		211809	1574958		6	260	30	-151		-230	42.0	52								52.		SLD,29	3-1849-04
3-1849-05	MANOA VALLEY	13	PUNAHOU SCH	1889		211816	1574950		6	213	48	-124		-165	35.8	55										SLD,29	3-1849-05
3-1849-06	MANOA VALLEY	13	CHING S S	1891	MCCANDLESS	211800	1574954		8	160	17			-143	30.6	54							0.1,	62.	51.	UNU,00	3-1849-06
3-1849-07	MANOA VALLEY	13	LAND PROC SERV	1891	MCCANDLESS	211800	1574955		8		18				30.0	55							0.1,	58.	55.	IRR,65	3-1849-07
3-1849-08	MANOA VALLEY	13	CHINN J T	1894		211801	1574957		8	397	20	-317		-377	30.8	56								49.	55.	SLD,51	3-1849-08
3-1849-09	MANOA VALLEY	13	MORGAN R S	1901		211835	1574956		10	194	154	51		-40	37.0	55								55.	15.	SLD,47	3-1849-09
3-1849-10	MANOA VALLEY	13	PUNAHOU SCH	1909	MCCANDLESS	211813	1574952		8	315	36	-159		-279	29.1	48							0.2,76	62.	18.	DOM,74	3-1849-10
3-1849-11	WILDER AVE WELLS	13	HONOLULU BWS	1912	MCCANDLESS	211813	1574947		12	304	43	-229		-261	27.7	52							7.2,76	106.	45.	OBS,74	3-1849-11
3-1849-12	WILDER AVE WELLS	13	HONOLULU BWS	1912	MCCANDLESS	211813	1574947		12	430	43	-257		-387												OBS,74	3-1849-12
3-1849-13	WILDER AVE WELLS	13	HONOLULU BWS	1961	PACIFIC DRLG	211813	1574947		16	400	50	-202		-350								2.50				MUN,74	3-1849-13
3-1849-14	WILDER AVE WELLS	13	HONOLULU BWS	1961	PACIFIC DRLG	211813	1574947		16	406	56	-202		-350								2.50				MUN,74	3-1849-14
3-1849-15	WILDER AVE WELLS	13	HONOLULU BWS	1962	PACIFIC DRLG	211813	1574947		16	394	44	-202		-350								2.50				MUN,74	3-1849-15
3-1849-16	WILDER AVE WELLS	13	HONOLULU BWS	1962	PACIFIC DRLG	211813	1574947		16	376	56	-230		-320			1935	8.8	220			2.50				MUN,74	3-1849-16
3-1850-01	ROOSEVELT SCH	13	STATE OF HAW			211849	1575026		7		144															SLD,32	3-1850-01
3-1850-02	MAKIKI	13	BISHOP TRUST	1880	PIERCE	211803	1575008		5	475	25	-322		-450	29.8	51								51.		SLD,53	3-1850-02
3-1850-03	MAKIKI	13	HONOLULU BWS	1881		211844	1575001		12	900	160			-740		36								44.	36.	UNU,74	3-1850-03
3-1850-04	MAKIKI	13	DILLINGHAM B	1882	PIERCE	211810	1575010		6	300	36			-264	30.0											SLD,32	3-1850-04
3-1850-05	MAKIKI	13	RAWLINS M F	1882	FESSLER	211807	1575020		5	310	28	-209		-282	29.7	61								61.		SLD,28	3-1850-05
3-1850-06	MAKIKI	13	DOWSETT J M	1882		211815	1575014		4	419	47	-130		-372	27.5									50.		SLD,54	3-1850-06
3-1850-07	MAKIKI	13	BABCOCK	1882	FESSLER	211826	1575035		7	375	37			-338	42.0											SLD,26	3-1850-07
3-1850-08	MAKIKI	13	BANK OF HAW	1882	MCCANDLESS	211821	1575035		7	358	34			-324	11.8											SLD,33	3-1850-08
3-1850-09	MAKIKI	13	STATE OF HAW	1882	COOKE-FROOLER	211808	1575058		6	620	6			-614	29.6	62								62.	41.	SLD,38	3-1850-09
3-1850-10	MAKIKI	13	YAP LIN	1883,		211804	1575003		6	281	28	-206		-253	30.3											SLD,28	3-1850-10
3-1850-11	MAKIKI	13	DILLINGHAM W	1882		211808	1575005		6	310	36	-231		-274	24.1											SLD,53	3-1850-11
3-1850-12	MAKIKI	13	HOWARD M	1884		211804	1575000		6	311	25	-280		-286	30.7	60								76.	60.	SLD,43	3-1850-12
3-1850-13	MAKIKI	13	VILLADA J M	1884		211810	1575000		6	357	37	-217		-320	42.9	54								54.		SLD,52	3-1850-13
3-1850-14	MAKIKI	13	KING R	1884		211810	1575004		6	271	40	-200		-231	30.8											SLD,46	3-1850-14
3-1850-15	MAKIKI	13	WILCOX G N	1884	MCCANDLESS	211808	1575043		6	656	17	-438		-639	19.0									48.		SLD,27	3-1850-15
3-1850-16	MAKIKI	13	HONOLULU CTY	1886		211813	1575031		6	442	22	-378		-420	25.8	53								53.	44.	SLD,40	3-1850-16
3-1850-17	MAKIKI	13	HAWN ELEC CO	1887		211817	1575053		8	510	16			-494	27.6	63								63.	62.	SLD,24	3-1850-17
3-1850-18	MAKIKI	13	TANNER J	1890		211805	1575015		8	383	29			-354	26.4											SLD,28	3-1850-18
3-1850-19	MAKIKI	13	JODO MISSION	1890		211817	1575019		10	277	41	-179		-236	30.6											SLD,28	3-1850-19
3-1850-20	MAKIKI	13	PLEWS&WICKMAN	1891	MCCANDLESS	211803	1575032		8	437	16	-361		-421	31.0	56								62.	56.	SLD,53	3-1850-20
3-1850-21	MAKIKI	13	HONOLULU BWS	1894	MCCANDLESS	211803	1575023		8	409	20	-292		-389	29.8	62										SLD,73	3-1850-21
3-1850-22	MAKIKI	13	BISHOP ESTATE	1894	AKANA	211802	1575028		8	521	16	-403		-505	27.6	61								62.	60.	SLD,32	3-1850-22
3-1850-23	MAKIKI	13	CONDON M I	1899	MCCANDLESS	211834	1575003		10	194	104	18		-90	33.0	47								47.		SLD,28	3-1850-23
3-1850-24	MAKIKI	13	LOWREY A M	1906		211841	1575007		10	302	137	-119		-165	16.0	32								50.	32.	SLD,24	3-1850-24
3-1850-25	MAKIKI	13	KIM C L	1907		211842	1575023		12	123	150	64		27		65										SLD,46	3-1850-25
3-1850-26	MAKIKI	13	II ESTATE	1910	MCCANDLESS	211801	1575024		10	450	15	-341		-435	27.7	57								60.	57.	SLD,40	3-1850-26
3-1850-27	MAKIKI	13	MEADOW GOLD	1914		211802	1575042		10	552	8	-478		-544	27.0	75								85.	52.	SLD,63	3-1850-27
3-1851-01	K I C	13	WARD C P	1881		211817	1575108		6	540	16			-524	30.8	65								65.	44.	SLD,62	3-1851-01
3-1851-02	THOMAS SQUARE	13	HONOLULU BWS	1882		211824	1575107		2	470	27	-431		-443	27.2											OBS,74	3-1851-02

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WELL NUMBER	NAME OR LOCATION	QUAD MAP	OWNER OR USER	YEAR DRLD	DRILLER	COORDINATES LAT	LONG	PHYSICAL DATA TYPE CONS	CSG DIA IN	TOTAL DEPTH FT	ELEVATIONS IN FEET GRND SURF	BOTT SOLID CASE	BOTT PERF CASE	BOTT OF HOLE	INITIAL TEST STAT HEAD FT	CHLOR MG/L	PUMP TEST RESULTS PUMP RATE GPM	DRAW DOWN FT	SPEC CAP	CHLOR MG/L	WATR TEMP C	WATER SUPPLY PUMP CAPAC MGD	DRAFT MGD,YR	--CHLORIDES-- MG/L, YEAR MAX	MIN	MAJOR USE, YR	WELL NUMBER
3-1851-03	KING ST	13	STATE OF HAW	1882		211030	1575141		5	769	14	-701		-755	30.8	55							0.1,	55,	44,	SLD,77	3-1851-03
3-1851-04	IOLANI PALACE	13	STATE OF HAW	1882		211038	1575140		14	752	18	-730		-734	25.2	43								54,	43,	UNU,74	3-1851-04
3-1851-05	ALAKEA ST	13	COOPER R M	1882		211045	1575141		6	636	20			-616	26.0	48								48,	43,	SLD,25	3-1851-05
3-1851-06	YOUNG ST	13	VIDA VILLA	1883		211018	1575101		6	503	17	-217		-486	19.2											SLD,27	3-1851-06
3-1851-07	PACIFIC CLUB	13	PACIFIC CLUB	1884	ASHLEY	211049	1575127		3	560	28	-470		-532	23.2	35						0.03	0.0,76	53,	30,	DOM,74	3-1851-07
3-1851-08	HOTEL ST	13	R A T	1889	MCCANDLESS	211025	1575120		8	648	19	-565		-629	27.2	56								56,	50,	SLD,50	3-1851-08
3-1851-09	KAWAIAHAO CH	13	KAWAIAHAO CH	1893	PINKHAM	211029	1575139		4	765	14	-701		-751	26.1	52						0.10	0.0,76	80,	43,	SLD,87	3-1851-09
3-1851-10	ACAD OF ARTS	13	COOKE C M	1894	MCCANDLESS	211027	1575104		8	486	30	-392		-456	31.0											SLD,28	3-1851-10
3-1851-11	QUEENS HOSP	13	QUEENS HOSP	1894	MCCANDLESS	211039	1575122		8	521	24	-395		-497	27.1	49									48.00	SLD,60	3-1851-11
3-1851-12	BERETANIA P STA	13	HONOLULU BWS	1895	MCCANDLESS	211031	1575120		19	580	21	-478		-559	32.0								7.6,76	67,	36,	MUN,74	3-1851-12
3-1851-13	BERETANIA P STA	13	HONOLULU BWS	1895	MCCANDLESS	211031	1575120		10	616	22	-477		-594										67,	35,	MUN,74	3-1851-13
3-1851-14	KAPIOLANI BLVD	13	HONOLULU CTY	1897	MCCANDLESS	211020	1575128		6	691	9	-641		-682	24.9	80								80,	73,	SLD,40	3-1851-14
3-1851-15	WARD AVE	13	HAWN ELEC CO	1898	MCCANDLESS	211015	1575122		8	734	5	-597		-729	28.3	70								70,	50,	UNU,74	3-1851-15
3-1851-16	CENTRAL SCHOOL	13	HONOLULU CTY	1889	MCCANDLESS	211055	1575135		6	1007	28			-979										90,		SLD,39	3-1851-16
3-1851-17	POHUKAINA	13	HON IRON WORKS	1900	MCCANDLESS	211017	1575154		8	1007	5	-798		-1002	27.8	98								190,	98,	SLD,40	3-1851-17
3-1851-18	QUEEN S	13	C Q YEE HOP	1900	MCCANDLESS	211022	1575144		8	806	8	-766		-798	27.7	89								89,	60,	UNU,74	3-1851-18
3-1851-19	HALEKAUWILA ST	13	HAWN ELEC CO	1900	MCCANDLESS	211032	1575155		1	1053	6	-1037		-1047	27.2	67								6120,	210,	OBS,74	3-1851-19
3-1851-20	BERETANIA ST	13	MTL INC	1901	MCCANDLESS	211028	1575120		8	576	19	-513		-557	31.2	75							0.1,76	75,	35,	SLD,90	3-1851-20
3-1851-21	KAWAIAHAO ST	13	MACOON ESTATE	1901	MCCANDLESS	211018	1575136		8	791	4	-610		-787	29.1	90								350,89	40,	SLD,90	3-1851-21
3-1851-22	ALA MOANA BLVD	13	U.S.G.S.	1901	MCCANDLESS	211028	1575150		8	1152	4	-1121		-1148	22.5	194							0.6,	7650,	113,	OBS,82	3-1851-22
3-1851-23	BISHOP ST	13	A YOUNG HOTEL	1901	MCCANDLESS	211043	1575148		10	960	15	-835		-945	26.5	67							0.3,	580,	16,	SLD,71	3-1851-23
3-1851-24	BERETANIA P STA	13	HONOLULU BWS	1910	MCCANDLESS	211031	1575120		12	616	20	-467		-596	26.9									67,	36,	MUN,74	3-1851-24
3-1851-25	BERETANIA P STA	13	HONOLULU BWS	1910	MCCANDLESS	211031	1575120		12	617	17	-478		-600	27.7									67,	36,	SLD,63	3-1851-25
3-1851-26	KAPIOLANI BLVD	13	BUS INVEST LTD	1910	MCCANDLESS	211015	1575128		8	725	6	-653		-719	27.8	95	800	6.0	133				0.1,76	116,	40,	SLD,90	3-1851-26
3-1851-27	QUEEN ST	13	HAWN ELEC CO	1910	MCCANDLESS	211034	1575153		12	1145	2	-803		-1143	27.2	55								141,	55,	SLD,63	3-1851-27
3-1851-28	YOUNG ST	13	MED ARTS BLDG	1913	MCCANDLESS	211018	1575103		8	505	18	-458		-487	30.3	41							0.1,	63,	24,	UNU,78	3-1851-28
3-1851-29	ALA MOANA BLVD	13	INTERISLND NV	1913	MCCANDLESS	211017	1575159		12	1009	7	-904		-1002	30.2	103							0.0,76	216,	103,	SLD,38	3-1851-29
3-1851-30	ALAKEA ST	13	HON HOSE MART	1915	MCCANDLESS	[illegible]	[illegible]		14	[illegible]	14	-444		-792	28.4	44							0.1,	63,	34,	SLD,90	3-1851-30
3-1851-31	BERETANIA P STA	13	HONOLULU BWS	1924	MCCANDLESS	211031	1575120		12	600	20	-469		-580	28.0									65,	36,	MUN,74	3-1851-31
3-1851-32	BERETANIA P STA	13	HONOLULU BWS	1924	MCCANDLESS	211031	1575120		12	600	20	-469		-580	27.8									67,	38,	MUN,74	3-1851-32
3-1851-33	BERETANIA P STA	13	HONOLULU BWS	1926	PRINGER	211031	1575120		12	533	14	-465		-519	23.6									67,	38,	MUN,78	3-1851-33
3-1851-34	BERETANIA P STA	13	HONOLULU BWS	1926	PRINGER	211031	1575120		12	636	14	-470		-622	23.6	55								67,	36,	MUN,74	3-1851-34
3-1851-35	BERETANIA P STA	13	HONOLULU BWS	1926	PRINGER	211031	1575120		12	566	15	-473		-551	23.3	47								67,	36,	MUN,74	3-1851-35
3-1851-36	HOTEL ST	13	HAW JUICE IND	1936	MULLIN	211024	1575117		6	700	15	-588		-685	29.0	38								38,	30,	SLD,69	3-1851-36
3-1851-37	NUUANU AVE	13	CONS AMUS CO	1936	HOBART	211056	1575147		8	52	24	-16		-28	0.4		3									OTR,74	3-1851-37
3-1851-38	FT ST MALL	13	BREWER C & CO	1937	MULLIN	211043	1575156		6	100							130									OTR,74	3-1851-38
3-1851-39	HOTEL ST	13	CONS AMUS CO	1937	MULLIN	211051	1575152		6	60							50	0.8	63	181						OTR,74	3-1851-39
3-1851-40	FT ST MALL	13	EASY APPLIANC	1938	HOBART	211045	1575154		6	42																OTR,74	3-1851-40
3-1851-41	FT ST MALL	13	FRONK & WYNN	1938	NAT WHITON	211050	1575146		6	46	21	-1	-21	-25	1.5	139	40	2.3	17	150						OTR,74	3-1851-41
3-1851-42	MERCHANT ST	13	WILCOX DEV	1939	NAT WHITON	211037	1575150		8	50	10	-12	-30	-40		2100	125	2.3	54							OTR,74	3-1851-42
3-1851-43	MERCHANT ST	13	WILCOX DEV	1939	NAT WHITON	211037	1575150		8	40	10	-7	-27	-30			125	3.1	40							DIS,74	3-1851-43
3-1851-44	PUNCHBOWL ST	13	MEDICAL GROUP	1939	MULLIN	211033	1575133		6	62																SLD,57	3-1851-44
3-1851-45	MERCHANT&RICHARD	13		1939	MULLIN	211036	1575150		6	80						1040										OTR,74	3-1851-45
3-1851-46	MERCHANT&RICHARD	13		1939	MULLIN	211036	1575150		6	75																UNU,74	3-1851-46
3-1851-47	KING ST	13	WALSTON & CO	1939	NAT WHITON	211041	1575152		6	41					3.7	3290	75	0.3	250						1190,00	UNU,74	3-1851-47

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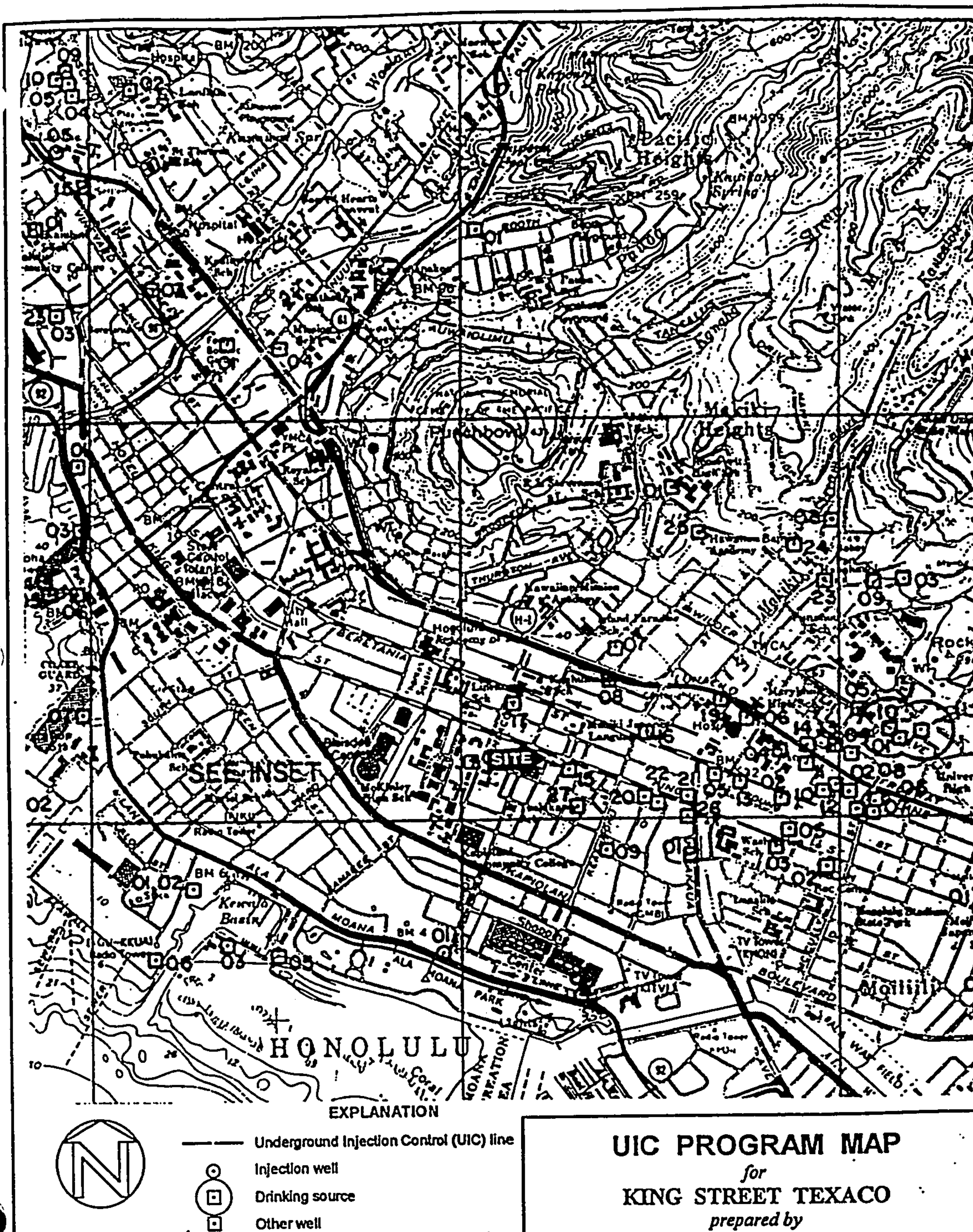
WELL NUMBER	NAME OR LOCATION	QUAD MAP	OWNER OR USER	YEAR DRLD	DRILLER	COORDINATES LAT	LONG	PHYSICAL DATA: TYPE CONS	CSG DIA IN	TOTAL DEPTH FT	ELEVATIONS IN FEET: GRND SURF	BOTT SOLID CASE	BOTT PERF CASE	BOTT OF HOLE	INITIAL TEST: STAT HEAD FT	CHLOR MG/L	PUMP TEST RESULTS: PUMP RATE GPM	DRAW DOWN FT	SPEC CAP	CHLOR MG/L	WATR TEMP C	WATER SUPPLY: PUMP CAPAC MGD	DRAFT MGD, YR	--CHLORIDES-- MG/L, YEAR MAX	MIN	MAJOR USE, YR	WELL NUMBER
3-1851-48	KING ST	13	WALSTON & CO	1939	MAT WEITON	211041	1575152		8	40					3.6	1360	75	0.3	250							UNU,74	3-1851-48
3-1851-49	KING ST	13	ROYAL AMUSEMT	1940	MULLIN	211046	1575155			60																OTR,74	3-1851-49
3-1851-50	FT ST MALL	13	RAMSEY W A	1940	MAT WEITON	211032	1575145		3	35																OTR,74	3-1851-50
3-1851-51	IOLANI PALACE	13	STATE OF HAW	1952	MAT WEITON	211035	1575138		8	71	18	-6		-53	3.6	964	300	1.6	188							OTR,74	3-1851-51
3-1851-52	KING ST	13	BANK OF HAW	1952	SAMSON-SHOCK	211043	1575152		8	100							148	0.6	247							LOG,74	3-1851-52
3-1851-53	QUEEN ST	13	ALEX&BALDWIN	1956	SAMSON-SHOCK	211040	1575156		12	122	8	-14	-22	-114	0.4		400	13.1	31	19						OTR,74	3-1851-53
3-1851-54	QUEENS HOSP	13	QUEENS HOSP	1958	PACIFIC DRLG	211042	1575122		10	460	34	-322		-426	28.5	41						1.08	0.7,76	65.	41.	DOM,74	3-1851-54
3-1851-55	ALAKEA ST	13	AM MUTUAL INS	1958	MAT WEITON	211046	1575140		24	40	16	13		-24	1.0	967	250	4.0	63							OTR,74	3-1851-55
3-1851-56	ALAKEA ST	13	AM MUTUAL INS	1958	MAT WEITON	211046	1575140		24	30	16	13		-14	1.0		75	1.0	75							OTR,74	3-1851-56
3-1851-57	BWS MONITOR WELL	13	HONOLULU BWS	1960	PACIFIC DRLG	211033	1575122		6	1509	23	-427		-1486	26.9											OBS,74	3-1851-57
3-1851-58	KAPIOLANI BLVD	13	SHELLY MOTORS	1960	PACIFIC DRLG	211012	1575120		6	710	6	-636		-704								0.58				UNU,84	3-1851-58
3-1851-59	KING ST	13	SPUDS LOFT	1960	PACIFIC DRLG	211019	1575121		4	678	8	-599		-670	25.9	48							0.1,	52,		SLD,76	3-1851-59
3-1851-60	WARD AVE	13	STRAUB CLINIC	1962	SAMSON-SERBR	211019	1575112		6	180	16	-144	-144	-164	6.0	470	115	4.0	29							OTR,74	3-1851-60
3-1851-61	STATE CAPITOL	13	STATE DAGS	1963	SAMSON-SERBR	211041	1575139		16	77	20	-5	-51	-57	30.0	4030	1655	27.0	61	7500	24.4					OTR,74	3-1851-61
3-1851-62	MBC	13	ECH AUDITORIUM	1967	MAT WEITON	211013	1575111			65	5			-60		376	600	1.9	316							OTR,74	3-1851-62
3-1851-63	MBC	13	ECH AUDITORIUM	1967	MAT WEITON	211012	1575116				5															OTR,74	3-1851-63
3-1851-64	KING ST	13	BERTS SERVICE	1967	ROSCOE MOSS	211021	1575122	PER	8	91	7	-20	-28	-84			200	0.3	667							DIS,74	3-1851-64
3-1851-65	QUEEN ST	13	KAY SERVICE	1967	ROSCOE MOSS	211021	1575141	PER	8	80	7	-5		-73	1.5		275	0.7	393	2100						DIS,74	3-1851-65
3-1851-66	BERETANIA	13	STATE OF HAW	1967	LAYNE INT	211042	1575137	ROT		100	20			-80			1500	40.0	38							OTR,74	3-1851-66
3-1851-67	BERETANIA	13	HONOLULU BWS	1968	LAYNE INT	211031	1575120	ROT	20	619	18	-466		-601	3.0											OBS,74	3-1851-67
3-1851-68	FT ST MALL	13	AMFAC	1968	MAT WEITON	211037	1575150		24	36	7	-1		-29			440	4.5	98	16750	26.1					OTR,74	3-1851-68
3-1851-69	FT ST MALL	13	AMFAC	1968	MAT WEITON	211037	1575150		24	40	7	-2		-33	0.3		425	11.2	38	17300	25.6					OTR,74	3-1851-69
3-1851-70	FT ST MALL	13	AMFAC	1968	MAT WEITON	211037	1575150		24	30	7			-23	0.3		550	1.9	289	17800	25.6					DIS,74	3-1851-70
3-1851-71	FT ST MALL	13	CENTER PROP	1973	ROSCOE MOSS	211041	1575159	PER	16	45	7	-3		-38.			850	8.2	104							OTR,74	3-1851-71
3-1851-72	FT ST MLL	13	CENTER PROP	1973	ROSCOE MOSS	211041	1575159	PER	16	45	7	-3		-38			950	8.5	112							OTR,74	3-1851-72
3-1851-73	KAWAIAHAO CHURCH	13	KAWAIAHAO CH	1986	WAT RES INTL	211020	1575139	ROT	9	777	13	-696		-764	19.2		102	6.0	17							IRR,87	3-1851-73
3-1851-74	BERETANIA STA	13	HONOLULU BWS	1988	WAT RES INTL	211033	1575123	ROT	14	598	19	-479		-579	21.0		1400	1.9	737	66	21.5					MUN,00	3-1851-74
3-1851-75	BERETANIA STA	13	HONOLULU BWS	1989	WAT RES INTL	211031	1575121	ROT	14	625	18	-505		-607	22.9		1400	2.2	636	102	20.4					MUN,00	3-1851-75
3-1852-01	ALA MOANA BLVD	13	CHUN HOON MKT	1937	MULLIN	211054	1575202		6	60																OTR,74	3-1852-01
3-1852-02	FT ARMSTRONG	13	STATE OF HAW	1939	MULLIN	211005	1575212		8	102						14500										UNU,74	3-1852-02
3-1852-03	ALA MOANA BLVD	13	CASTLE&COOKE	1947	MAT WEITON	211044	1575200		6	52							150	2.3	65							OTR,74	3-1852-03
3-1852-04	ALOHA TOWERS	13	CASTLE&COOKE	1947	MAT WEITON	211037	1575207		6	64							150	1.5	100							OTR,74	3-1852-04
3-1852-05	ALOHA TOWER	13	POOMORE J W	1951	MAT WEITON	211036	1575207		8	40							90	3.4	26							UNU,74	3-1852-05
3-1852-06	ALA MOANA BLVD	13	HAWN ELEC CO	1953	SAMSON-SHOCK	211033	1575200		24	94																OTR,74	3-1852-06
3-1852-07	IMMIGRATION STA	13	STATE OF HAW	1955	MAT WEITON	211016	1575203		10	95	8	-20		-87			600	3.1	194								3-1852-07
3-1852-08	COAST GUARD RES	13	STATE AQUATICS	1971	MAT WEITON	211020	1575229	1	12		8	-92					900	2.3	391	19000						OTR,74	3-1852-08
3-1853-01	SAND ISLE WHARF	13	STATE OF HAW	1973	CONTL DRLG CO	211059	1575304			120																	3-1853-01
3-1900-01	EWA PLANTN SP 20	10	OAHU SUGAR	1930		211958	1580058	DUG	12	30	25			-5								2.90		600.	480.	OBS,74	3-1900-01
3-1900-02	EWA PLANTN SP 22	10	OAHU SUGAR	1930		211952	1580040	DUG.	12	29	23			-6									1.8,76	660.	520.	OBS,74	3-1900-02
3-1900-03	BARBERS PT	10	U S NAVY	1939	MULLIN	211959	1580010		6	37	15	-5		-22		1000										UNU,74	3-1900-03
3-1900-04	BARBERS POINT	10	U S NAVY	1939	MULLIN	211934	1580002		6	37	15	-5		-22		905										UNU,74	3-1900-04
3-1900-05	BARBERS POINT	10	U S NAVY	1941	MAT WEITON	211952	1580002		6	35						1050										UNU,74	3-1900-05
3-1900-06	BARBERS POINT	10	U S NAVY	1941	MAT WEITON	211952	1580080		6	37						1100										UNU,74	3-1900-06
3-1900-07	BARBERS POINT	10	U S NAVY	1941	MAT WEITON	211937	1580013		6	31								30.0								UNU,74	3-1900-07
3-1900-08	BARBERS POINT	10	U S NAVY	1941	MAT WEITON	211942	1580000		6	28						1080										UNU,00	3-1900-08



EXPLANATION

Underground Injection Control (UIC) line

Injection well

Drinking source

Other well

0 2,000'

SCALE

Note: Map reproduced from a portion of well location map sheet O-13 (DLNR).

UIC PROGRAM MAP

for

KING STREET TEXACO

prepared by

WALKER CONSULTANTS, LTD.

January 1997

FIGURE 4

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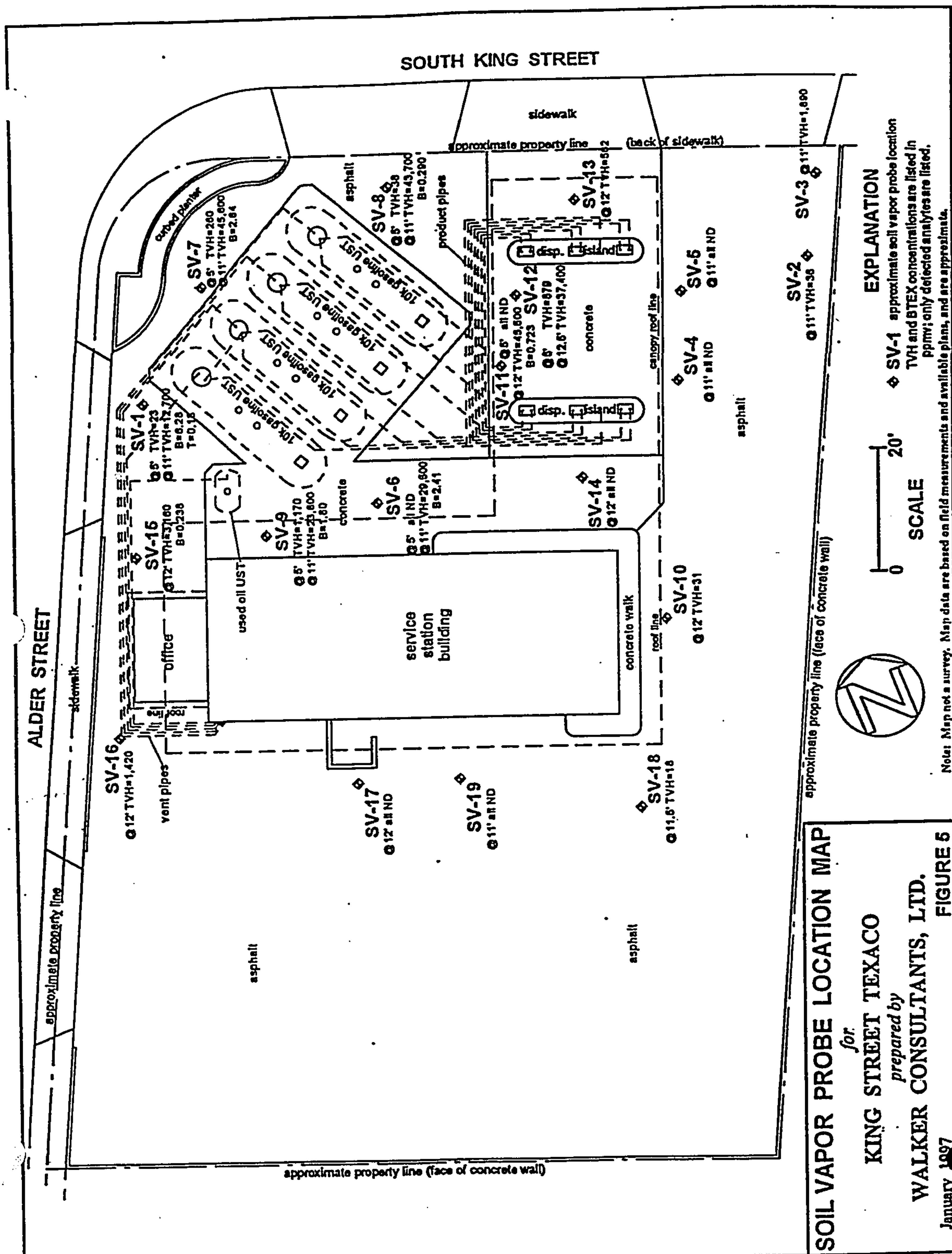
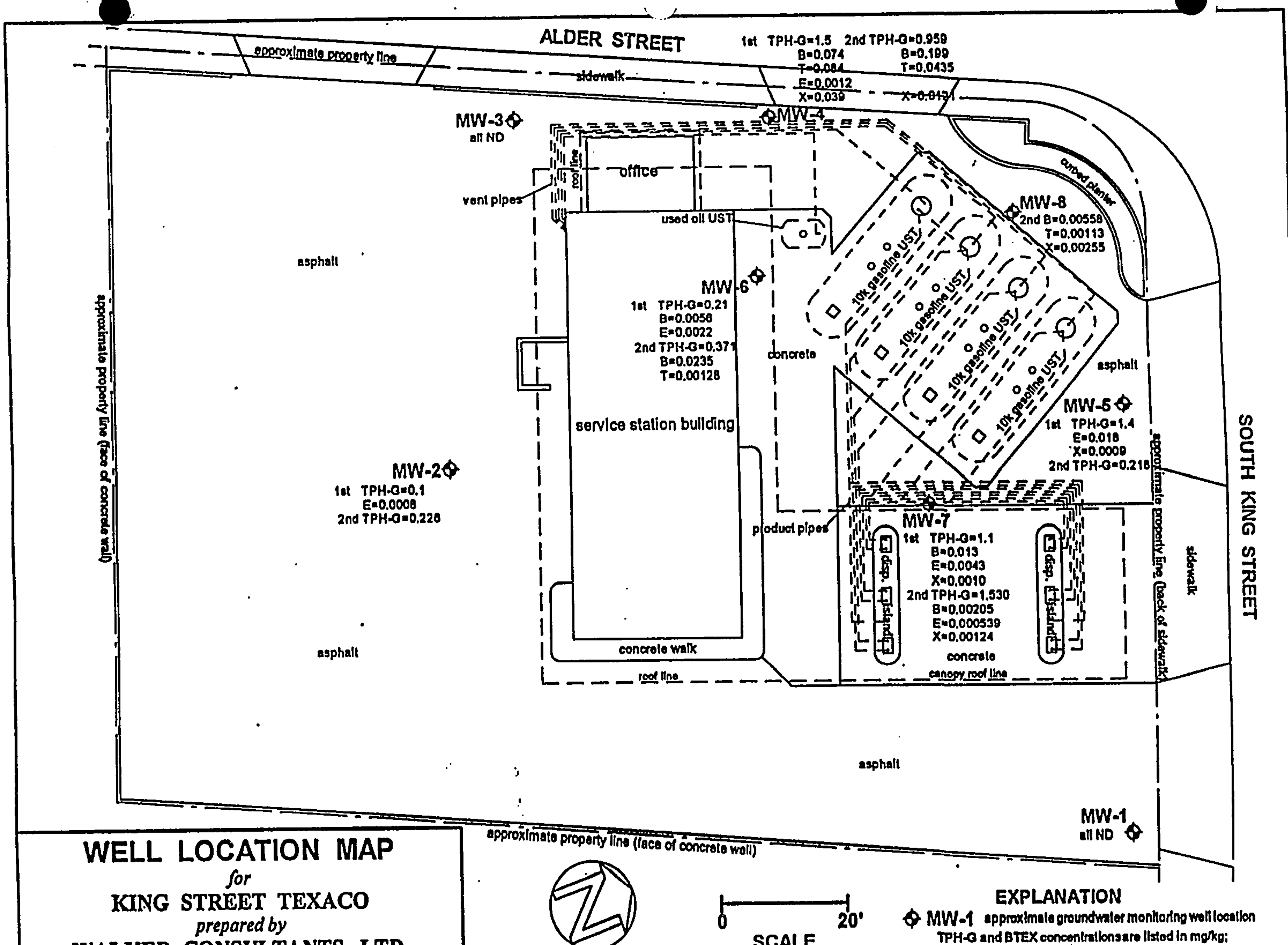




WELL LOCATION MAP

for

KING STREET TEXACO

prepared by

WALKER CONSULTANTS, LTD.

January 1997

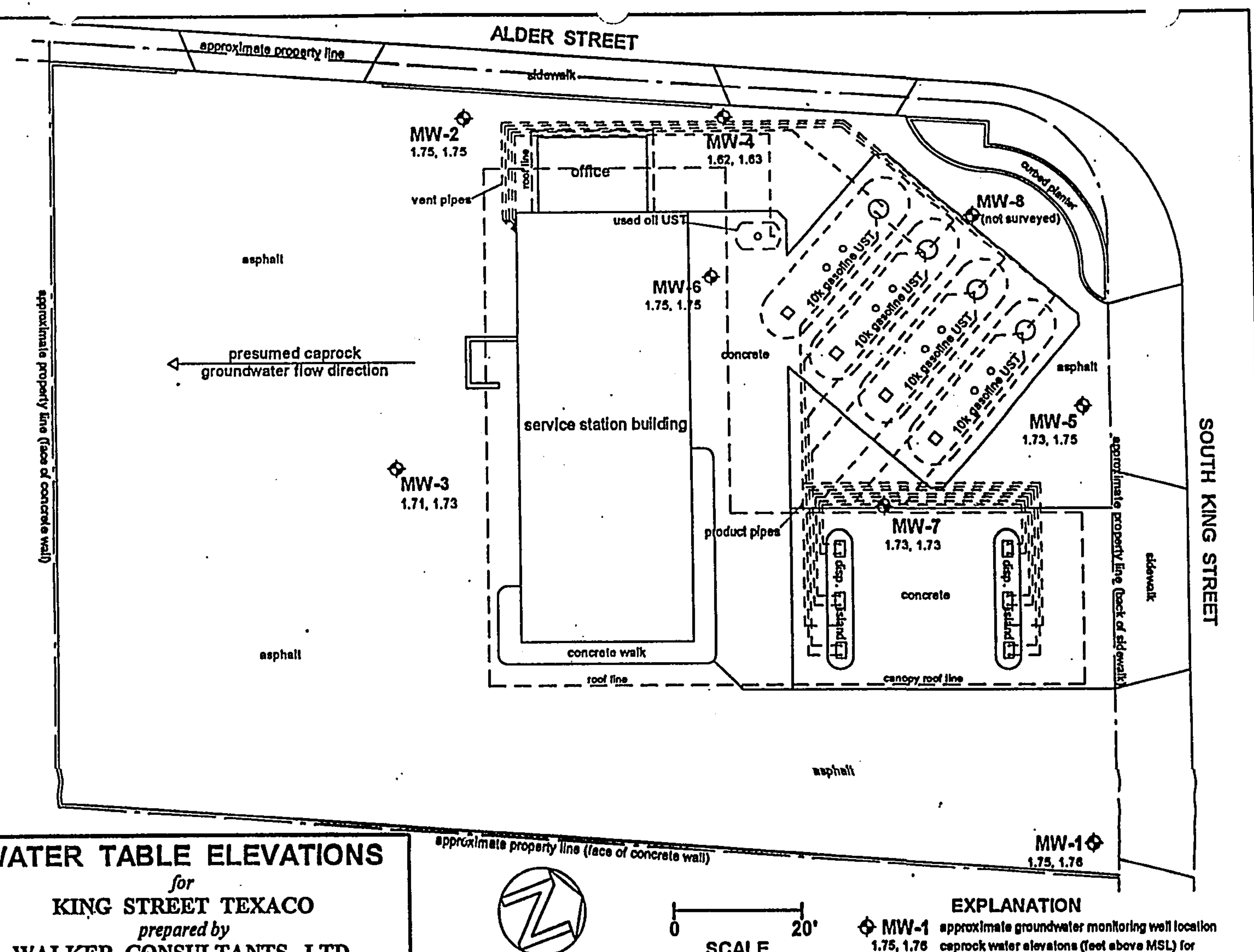
FIGURE 6

EXPLANATION

MW-1 approximate groundwater monitoring well location

TPH-G and BTEX concentrations are listed in mg/kg; only detected analytes are listed.

Note: Map not a survey. Map data are based on field measurements and available plans, and are approximate.



WATER TABLE ELEVATIONS

for

KING STREET TEXACO

prepared by

WALKER CONSULTANTS, LTD.

January 1997

FIGURE 7

EXPLANATION

MW-1 — approximate groundwater monitoring well location

1.75, 1.76 — caprock water elevations (feet above MSL) for first and second monitoring events.

Note: Map not a survey. Map data are based on field measurements and available plans, and are approximate.

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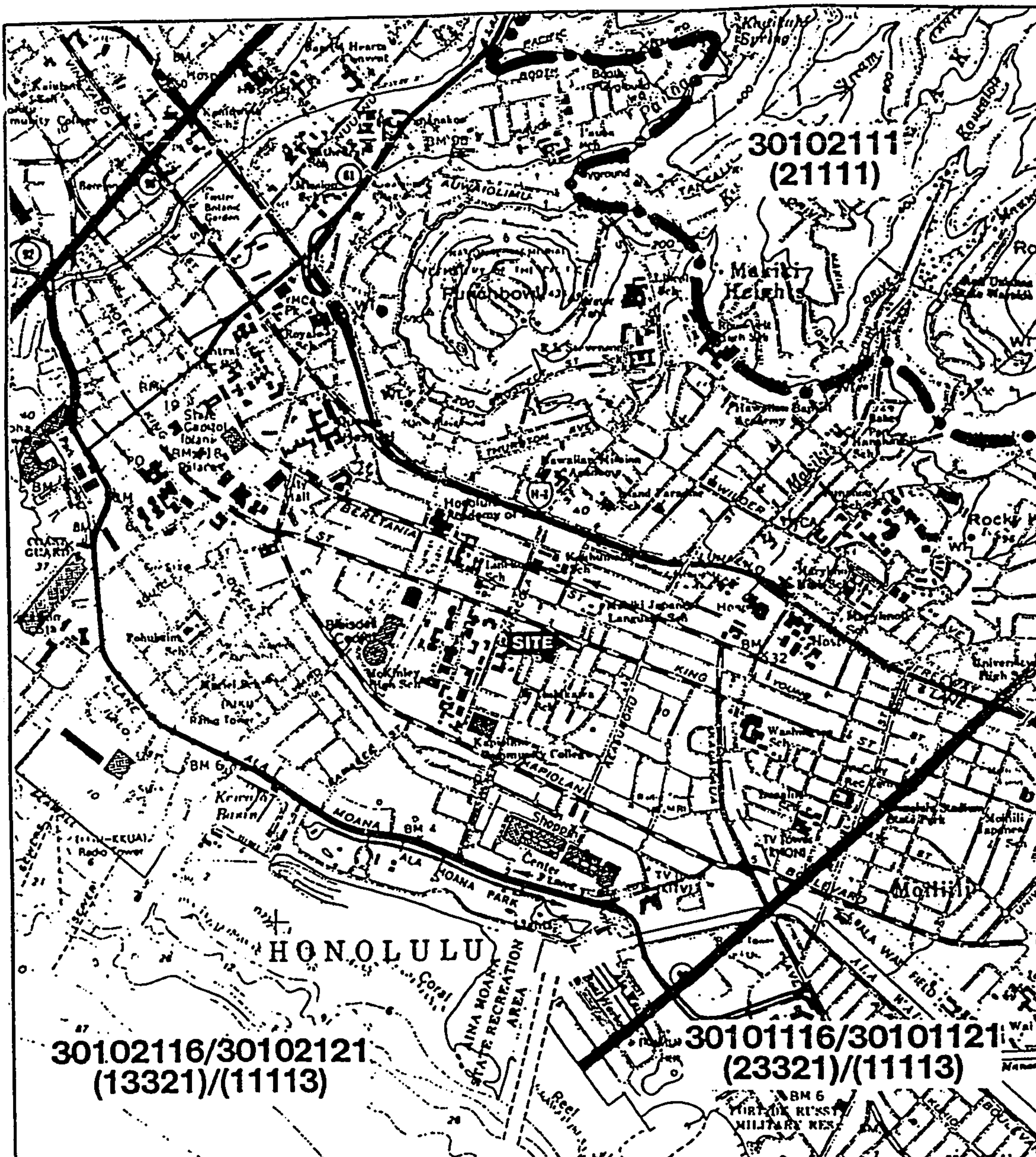

EXPLANATION

- Aquifer Sector
- Aquifer System
- Aquifer Type
- 30101116 Aquifer Code*
- 23321 Status Code*

* where two Aquifer and Status Codes are listed, numerators and denominators refer to upper and lower aquifers, respectively.

0 2,000'

SCALE

Note: Map reproduced from a portion of Aquifer Classification Map O-13 (Mink and Lau, February 1990 Revised).

AQUIFER CLASSIFICATION MAP

for

KING STREET TEXACO

prepared by

WALKER CONSULTANTS, LTD.

January 1997

FIGURE 8

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Walker Consultants, Ltd.
Phase II Site Assessment Report
King Street Texaco (Location #61-100-90)
1239 South King Street, Honolulu, Hawaii
Texaco Environment, Health & Safety
January 1997

TABLES 1 THROUGH 4

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TABLE 1
SOIL VAPOR SAMPLE ANALYTICAL RESULTS

Sample Number	Sample Date	Sample Depth	TVH (ppmv)	methane[a] (ppmv)	benzene (ppmv)	toluene (ppmv)	ethylbenzene (ppmv)	xylenes (ppmv)	CO_2 (%)	O_2 (%)	CO_2/O_2
SV1-5	09/25/95	~5' bgs	23	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	8.30	7.47	1.11
SV1-11	09/25/95	~11' bgs	12,700	3,050	6.28	0.18	ND <0.100	ND <0.100	10.90	5.15	2.12
SV2-11	09/25/95	~11' bgs	36	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	7.75	9.11	0.85
SV3-11	09/25/95	~11' bgs	1,890	1,890	ND <0.100	ND <0.100	ND <0.100	ND <0.100	6.90	10.4	0.66
SV4-11	09/25/95	~11' bgs	ND <10	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	7.41	9.60	0.77
SV5-11	09/25/95	~11' bgs	ND <10	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	7.77	9.70	0.80
SV6-5	09/25/95	~5' bgs	ND <10	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	2.60	10.2	0.26
SV6-11	09/25/95	~11' bgs	29,500	10,000	2.41	ND <0.100	ND <0.100	ND <0.100	10.3	1.82	5.66
SV7-5	09/25/95	~5' bgs	260	56	ND <0.100	ND <0.100	ND <0.100	ND <0.100	7.70	4.60	1.67
SV7-11	09/25/95	~11' bgs	45,600	14,100	2.84	ND <0.100	ND <0.100	ND <0.100	11.2	1.68	6.67
SV8-5	09/25/95	~5' bgs	38	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	6.48	5.55	1.17
SV8-11	09/25/95	~11' bgs	43,700	17,100	0.290	ND <0.100	ND <0.100	ND <0.100	9.36	3.12	3.00
SV9-5	09/25/95	~5' bgs	1,170	832	ND <0.100	ND <0.100	ND <0.100	ND <0.100	2.32	13.5	0.17
SV9-11	09/25/95	~11' bgs	23,800	7,730	1.80	ND <0.100	ND <0.100	ND <0.100	7.22	6.87	1.05

NOTES:
ND Not Detected at the listed laboratory detection limits.
ppmv Parts Per Million Volumetric.
TVH Total Volatile Hydrocarbons.
a Methane concentration for each soil vapor sample is included in the corresponding TVH concentration.

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TABLE 1 (Continued)
SOIL VAPOR SAMPLE ANALYTICAL RESULTS

Sample Number	Sample Date	Sample Depth	TVH (ppmv)	methane[a] (ppmv)	benzene (ppmv)	toluene (ppmv)	ethylbenzene (ppmv)	xylenes (ppmv)	CO_2 (%)	O_2 (%)	CO_2/O_2
SV10-12	09/25/95	~12' bgs	31	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	5.65	11.8	0.48
SV11-5	09/25/95	~5' bgs	ND <10	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	2.12	15.0	0.14
SV11-12	09/25/95	~12' bgs	45,500	17,200	0.723	ND <0.100	ND <0.100	ND <0.100	9.88	2.95	3.35
SV12-5	09/25/95	~5' bgs	879	323	ND <0.100	ND <0.100	ND <0.100	ND <0.100	4.22	12.7	0.33
SV12-12.5	09/25/95	~12.5' bgs	37,400	15,300	ND <0.100	ND <0.100	ND <0.100	ND <0.100	9.87	2.97	3.32
SV13-12	09/25/95	~12' bgs	562	211	ND <0.100	ND <0.100	ND <0.100	ND <0.100	9.35	2.89	3.24
SV14-12	09/25/95	~12' bgs	ND <10	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	5.71	9.21	0.62
SV15-12	09/25/95	~12' bgs	3,160	683	0.238	ND <0.100	ND <0.100	ND <0.100	4.92	8.79	0.56
SV16-12	09/25/95	~12' bgs	1,420	272	ND <0.100	ND <0.100	ND <0.100	ND <0.100	4.04	9.98	0.40
SV17-12	09/25/95	~12' bgs	ND <10	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	8.43	11.7	0.72
SV18-11.5	09/25/95	~11.5' bgs	18	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	4.61	17.0	0.27
SV19-11	09/25/95	~11' bgs	ND <10	ND <10	ND <0.100	ND <0.100	ND <0.100	ND <0.100	5.93	14.5	0.41

NOTES:
ND Not Detected at the listed laboratory detection limits.
ppmv Parts Per Million Volumetric.
TVH Total Volatile Hydrocarbons.
a Methane concentration for each soil vapor sample is included in the corresponding TVH concentration.

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TABLE 3
CAPROCK GROUNDWATER SAMPLE ANALYTICAL RESULTS

Sample Number	Sample Date	Water Table Depth	TPH-O (mg/L)	TPH-G (mg/L)	benzene[a] (mg/L)	toluene[a] (mg/L)	ethylbenzene[a] (mg/L)	xylenes[a] (mg/L)
MW1-1W	10/02/95	~12.57' bgs	ND <0.5	ND <0.05	ND <0.0005	ND <0.0005	ND <0.0005	ND <0.0005
MW1-2W	07/18/96	~12.56' bgs	NA	ND <0.0500[a]	ND <0.000500	ND <0.000500	ND <0.000500	ND <0.00100
MW2-1W	10/02/95	~11.40' bgs	NA	ND <0.05	ND <0.0005	ND <0.0005	ND <0.0005	ND <0.0005
MW2-2W	07/18/96	~11.40' bgs	NA	0.226[a]	ND <0.000500	ND <0.000500	ND <0.000500	ND <0.00100
MW3-1W	10/02/95	~12.15' bgs	ND <0.5	0.10	ND <0.0005	ND <0.0005	0.0008	ND <0.0005
MW3-2W	07/18/96	~12.13' bgs	NA	ND <0.0500[a]	ND <0.000500	ND <0.000500	ND <0.000500	ND <0.00100
MW4-1W	10/02/95	~11.42' bgs	ND <0.5	1.5	0.074	0.084	0.0012	0.039
MW4-2W	07/18/96	~11.41' bgs	ND <1.00	0.969[a]	0.199	0.0435	ND <0.000500	0.0121
MW5-1W	10/02/95	~12.28' bgs	NA	1.4	ND <0.0005	ND <0.0005	0.018	0.0009
MW5-2W	07/18/96	~12.26' bgs	NA	0.218[a]	ND <0.000500	ND <0.000500	ND <0.000500	ND <0.00100
MW6-1W	10/02/95	~12.47' bgs	ND <0.5	0.21	0.0056	ND <0.0005	0.0022	ND <0.0005
MW6-2W	07/18/96	~12.47' bgs	ND <1.00	0.371[a]	0.0235	0.00128	ND <0.000500	ND <0.00100
MW7-1W	10/02/95	~12.63' bgs	NA	1.1	0.013	ND <0.0005	0.0043	0.0010
MW7-2W	07/18/96	~12.63' bgs	NA	1.530[a]	0.00205	ND <0.000500	0.000539	0.00124
MW8-1W	07/18/96	~12.21' bgs	NA	ND <0.0500[a]	0.00558	0.00113	ND <0.000500	0.00255
DOH Tier 1 Groundwater Action Levels			NGAL	NGAL	1.7	2.1	0.14	10

NOTES:
DOH Tier I Groundwater Action Levels are based on onsite rainfall ≤200 cm/year and drinking water source not threatened.
NA Not Analyzed.
NGAL No DOH Tier I Groundwater Action Level.
ND Not Detected at the listed laboratory practical quantitation limits or reporting limits.
a Laboratory reported analyses in µg/L (0.001 mg/L).

TABLE 4
CAPROCK WATER TABLE ELEVATIONS

Well Numbers	Well Surface Elevations[a] (feet, MSL)	10/02/95 Caprock Water Table Depths (feet, bgs)	10/02/95 Caprock Water Table Elevations (feet, MSL)	07/18/96 Caprock Water Table Depths (feet, bgs)	07/18/96 Caprock Water Table Elevations (feet, MSL)
MW-1	14.32	12.57	1.75	12.56	1.76
MW-2	13.15	11.40	1.75	11.40	1.75
MW-3	13.86	12.15	1.71	12.13	1.73
MW-4	13.04	11.42	1.62	11.41	1.63
MW-5	14.01	12.28	1.73	12.26	1.75
MW-6	14.22	12.47	1.75	12.47	1.75
MW-7	14.36	12.63	1.73	12.63	1.73
MW-8	not surveyed[b]	not measured[c]	not applicable[d]	12.21	not applicable[d]

NOTES:
bgs below ground surface.
MSL Mean Sea Level.
a Surface elevations are top of north side of well cover rim.
b MW-8 was installed after the wellhead survey.
c MW-8 was installed after the initial groundwater monitoring event.
d Caprock water table elevations for MW-8 cannot be calculated, because its surface elevation was not surveyed.

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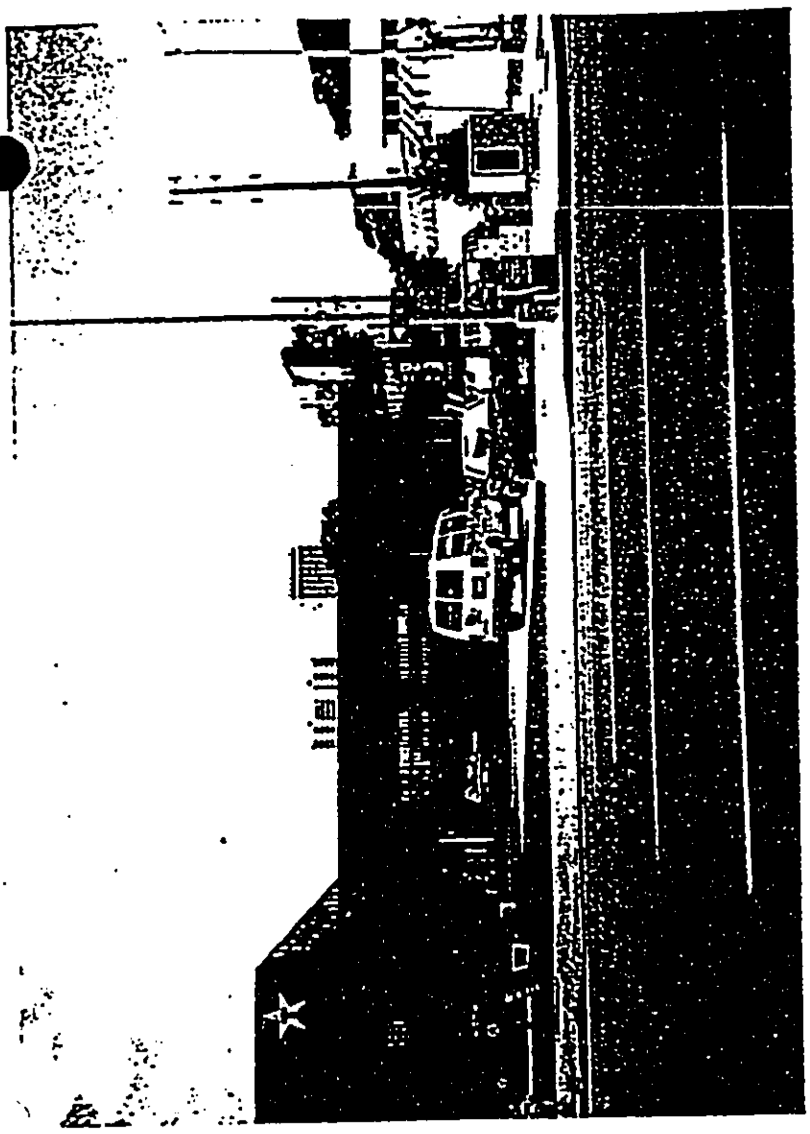
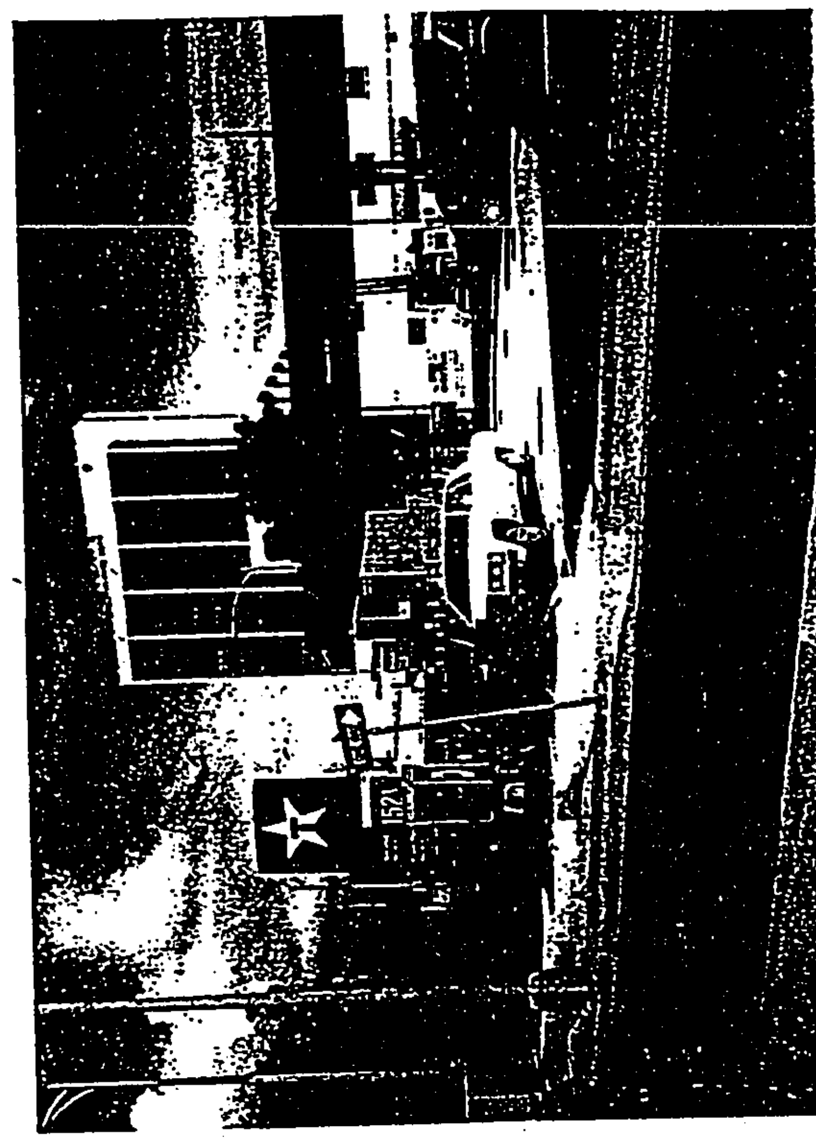
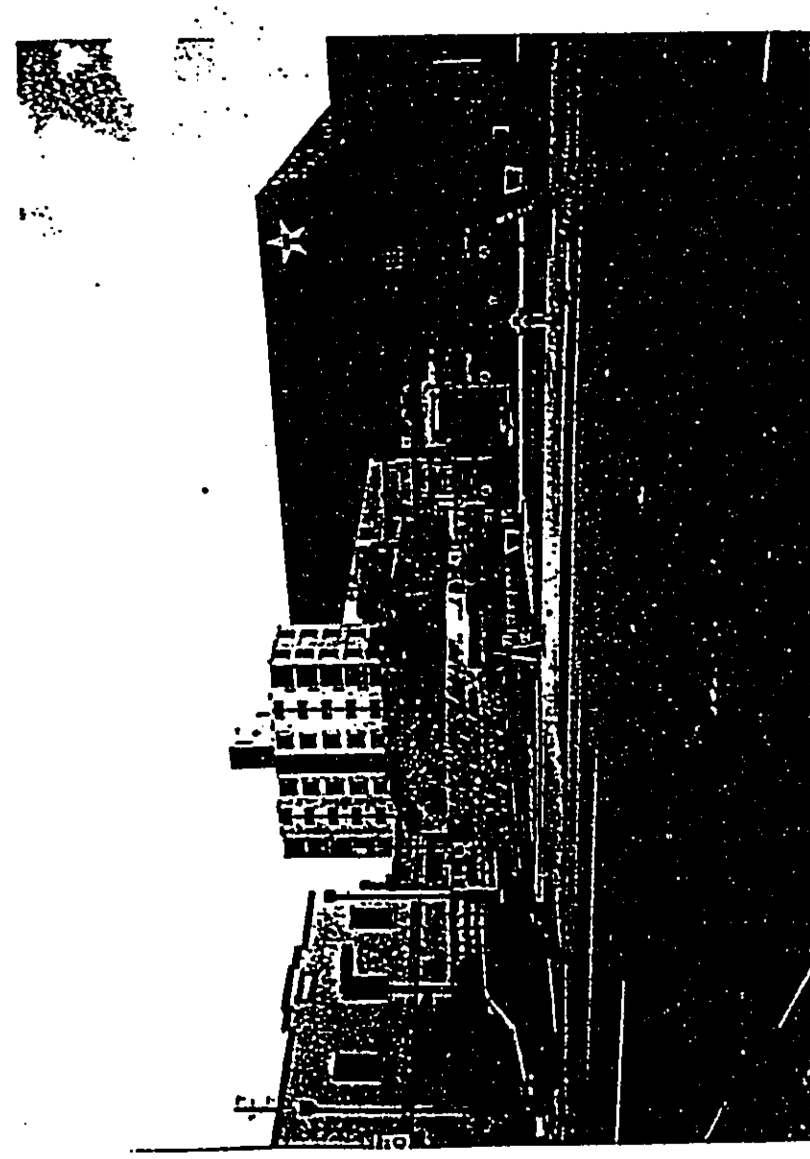
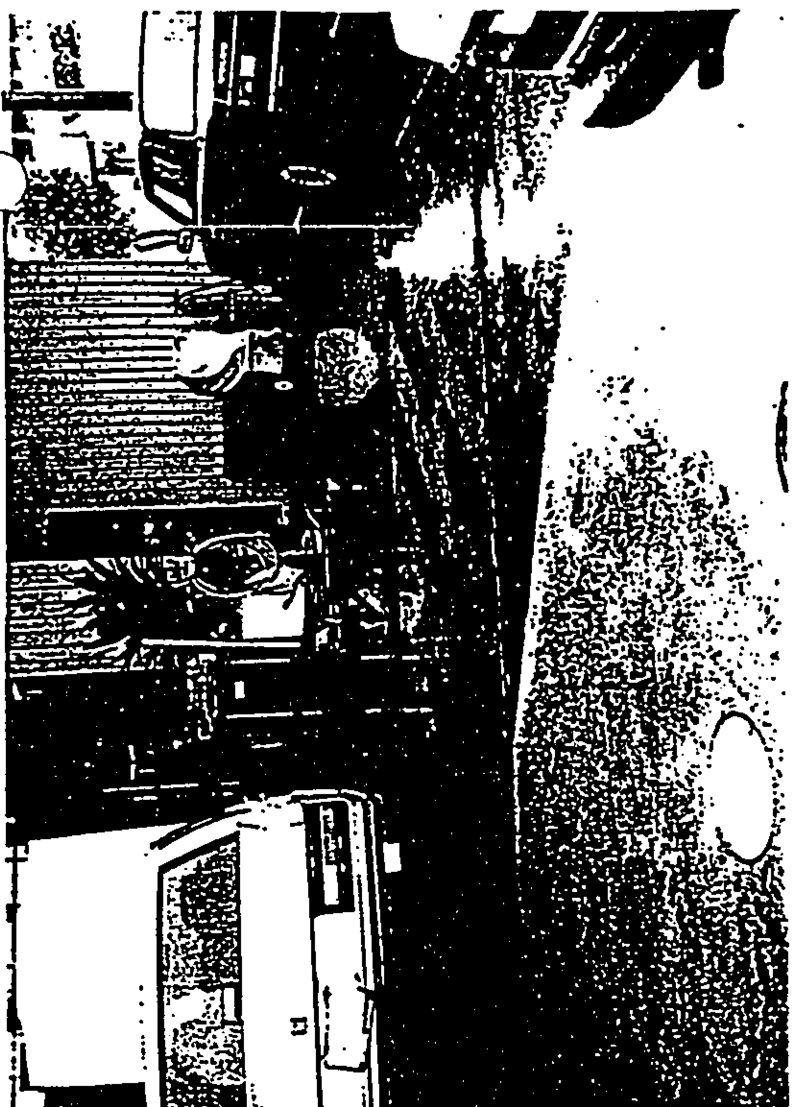
APPENDIX A

PHOTOGRAPHS







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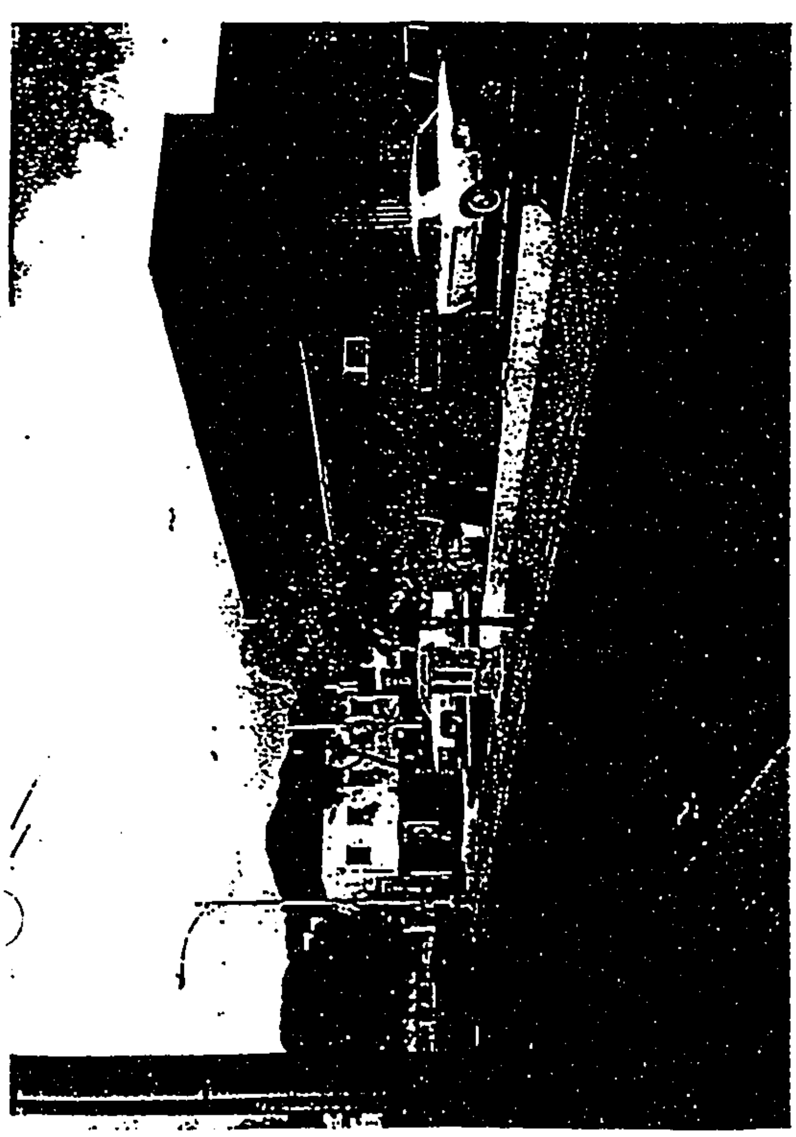

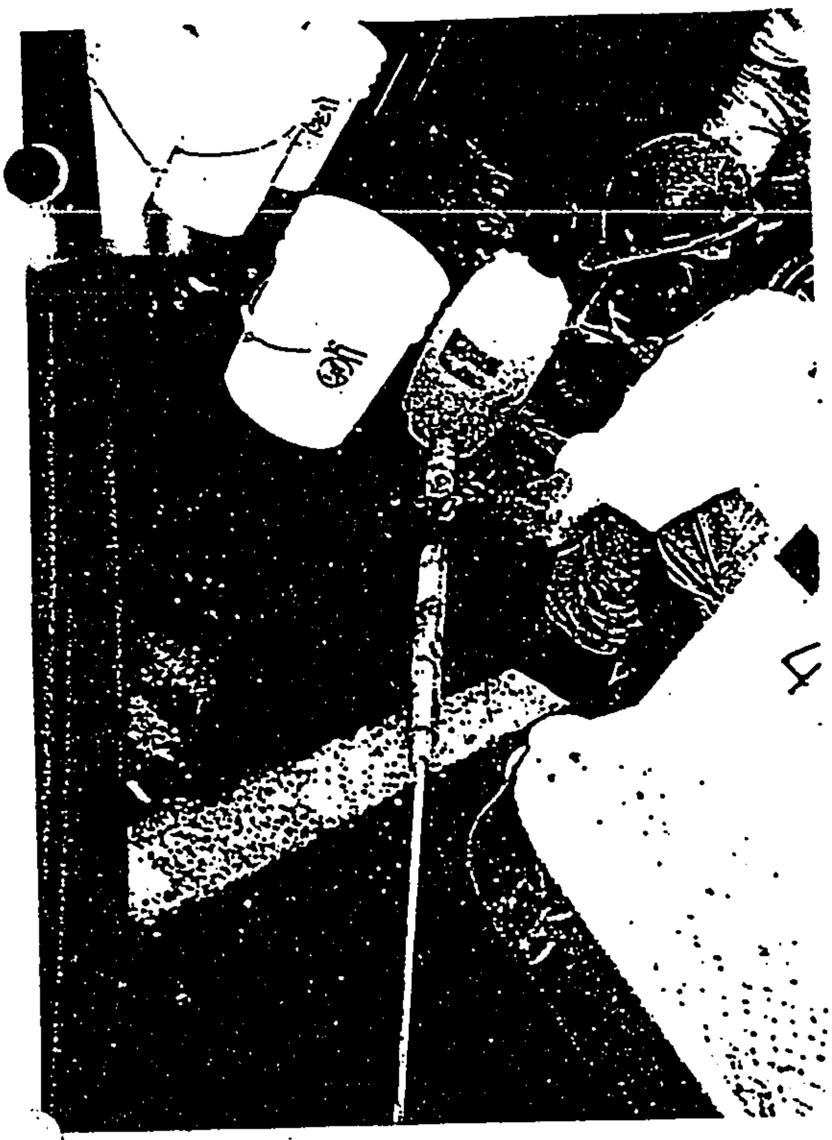

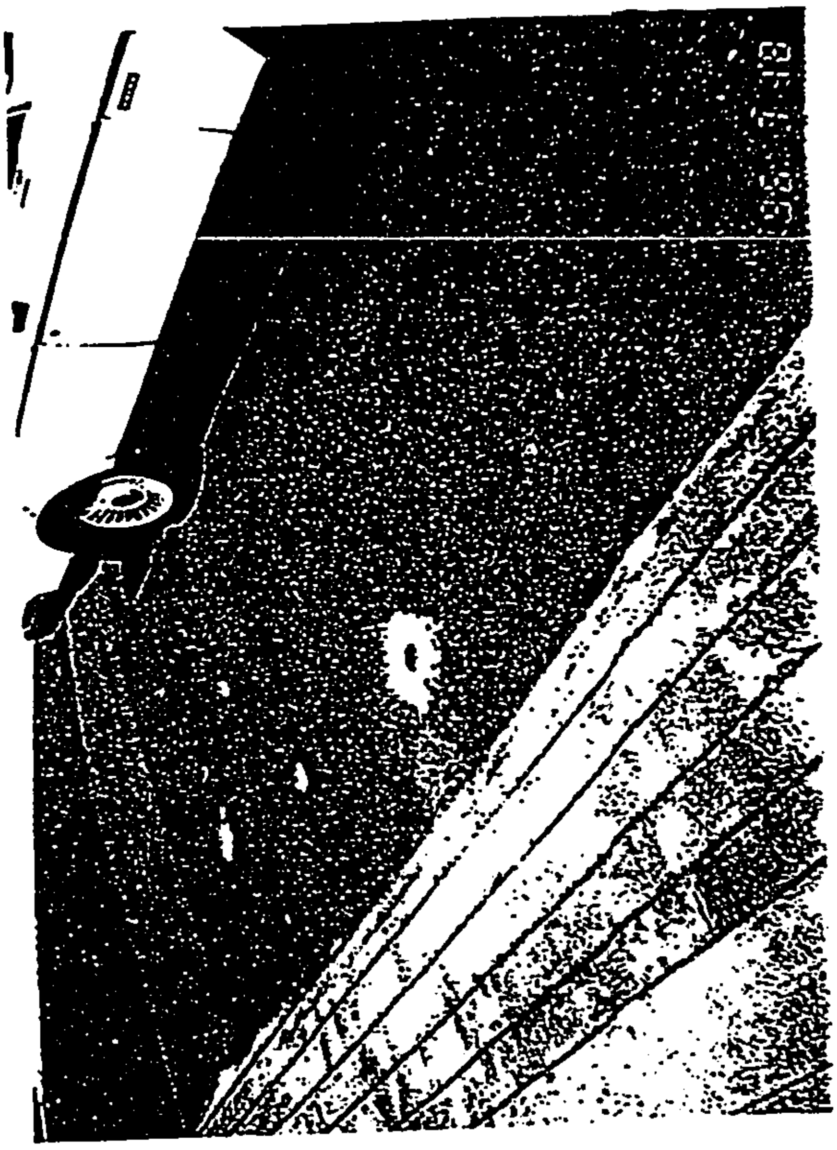

APPENDIX B

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

For

TEXACO ENVIRONMENTAL SERVICES

At

KING STREET TEXACO
1239 SOUTH KING STREET
HONOLULU, HAWAII
TMK No. 2-3-12:44

Prepared by

WALKER CONSULTANTS, LTD.
7192 Kalanianaole Highway
Suite G-220
Honolulu, Hawaii 96825
808-395-0392

	Name	Date
WCL Project Manager:	[signature]	7/16/96
WCL Health and Safety Representative:	David W. Nart	7/16/96

EMERGENCY CONTACTS

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations, contact should first be made with the field team leader (or designee), who will notify emergency personnel, who will then contact the appropriate response teams. The emergency contacts list must be kept in an easily accessible location at the site.

Contingency Contacts	**Telephone Number**
Nearest telephone located onsite	284-4591
Fire Department	911
Police	911
Ambulance Service	911
County Sheriff	911
Chemtrec	1-800-424-9300
Texaco Refining & Marketing Inc..	533-1886
Medical Emergency	
Hospital Name	Kapiolani Medical Center
Hospital Address	1319 Punahou Honolulu, Hawaii
Hospital Telephone Number	973-8511
Ambulance Service Telephone Number	911
Travel Time from Site	15 minutes
Map to Hospital	See next page
Route to Hospital	Right onto King Street approx. 1/2 mile, left onto Punahou approx. 1/4 mile, right on Bingham, 2nd entrance, follow signs to emergency room.
Walker Consultants, Ltd. Contacts	
Project Manager & Health and Safety Officer	Duncan Walker Office: 395-0392 Cellular: 284-4591
Field Team Leader	Duncan Walker Office: 395-0392 Cellular: 284-4591

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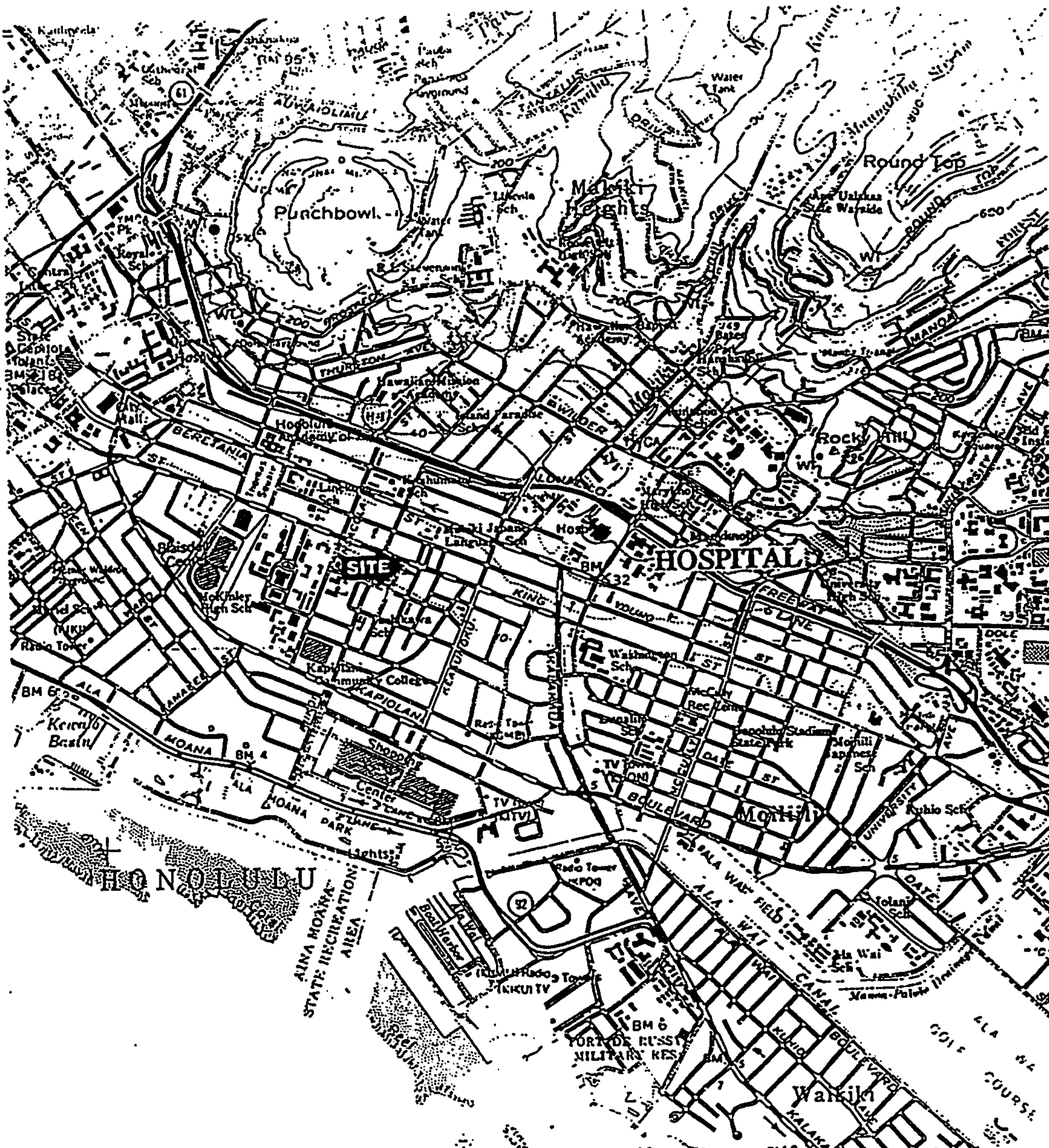
DOCUMENT CAPTURED AS RECEIVED



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0 2,000'
SCALE

NOTE: Map reproduced from a portion of Honolulu Quadrangle 7.5 USGS, 1981.

HOSPITAL ROUTE MAP
for
KING STREET TEXACO
prepared by
WALKER CONSULTANTS, LTD.

July 1996

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

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SECTION 1

INTRODUCTION

1.1 PURPOSE AND POLICY

The purpose of this Health and Safety Plan is to establish personnel protection standards and mandatory safety practices and procedures for all onsite work conducted by Walker Consultants, Ltd. (WCL). This Health and Safety Plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted at the site described below.

The provisions of this Health and Safety Plan are mandatory for all field personnel onsite. All WCL field personnel and all other field personnel onsite will abide by this Health and Safety Plan, at a minimum. Any supplemental health and safety plans used by others shall at least conform to this Health and Safety Plan. All personnel who engage in field activities onsite must be familiar with this Health and Safety Plan and comply with its requirements.

1.2 SITE LOCATION AND USAGE

The site is located at 1239 South King Street, Honolulu, Hawaii 96814 (the Property). The Property is occupied by the King Street Texaco Service Station.

1.3 SCOPE OF WORK

The field tasks to be performed at the Property are expected to include:

1. Conducting a Subsurface Soil Investigation, including collecting soil samples.
2. Drilling and installing groundwater monitoring wells, including collecting soil and groundwater samples.
3. Conducting a Soil Vapor Survey, including collecting soil vapor samples for onsite laboratory analyses.

1.4 PROJECT TEAM ORGANIZATION

Table 1.1 describes the responsibilities of all onsite personnel associated with this project. The names of principal onsite personnel associated with this project are listed below (the Field Team Leader may also be the Site Safety Officer):

Project Manager:	Duncan Walker
Field Team Leader:	Duncan Walker
Site Safety Officer:	Duncan Walker

TABLE 1.1 ONSITE PERSONNEL		
Title	**General Description**	**Responsibilities**
Project Manager	Reports to upper-level management. Has authority to direct response operations. Assumes total control over site activities.	Prepares and organizes Work Plan, Site Safety Plan, and the field team.
		Obtains permission for site access and coordinates activities with appropriate officials.
		Ensures that the Work Plan is completed and on schedule.
		Briefs the field teams on their specific assignments.
		Uses the site safety and health officer to ensure that safety and health requirements are met.
		Prepares the final report and support files on the response activities.
		Serves as the liaison with public officials.
Site Safety Officer	Advises the Project Manager on all aspects of health and safety onsite. Stops work if any operation threatens worker or public health or the Access Points.	Periodically inspects protective clothing and equipment.
		Ensures that protective clothing and equipment are properly stored and maintained.
		Controls site entry and exit.
		Coordinates safety and health program activities with the Project Safety Officer.
		Confirms each team member's suitability for work based on a physician's recommendation.
		Monitors the work parties for signs of stress, and fatigue.
		Implements the Site Safety Plan.
		Conducts periodic inspections to determine if the Site Safety Plan is being followed.
		Knows emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, and fire and police departments.
		Notifies, when necessary, local public emergency officials.
		Coordinates emergency medical care.
		Sets up decontamination solutions appropriate for the type of chemical contamination onsite.
		Stops work if any operation threatens worker or public health or the Access Points. Controls the decontamination of all equipment, personnel, and samples from the contaminated areas.

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TABLE 1.1 (Continued) ONSITE PERSONNEL		
Title	**General Description**	**Responsibilities**
Site Safety Officer (Continued)	Advises the Project Manager on all aspects of health and safety onsite. Stops work if any operation threatens worker or public health or the Access Points.	Controls the decontamination of all equipment, personnel, and samples from the contaminated areas
		Assures proper disposal of contaminated clothing and materials.
		Ensures that all required equipment is available.
		Advises medical personnel of potential exposures and consequences.
		Notifies emergency response personnel by telephone or radio in the event of an emergency.
Field Team Leader	Responsible for field team operations and safety.	Manages field operations.
		Executes the Work Plan and Schedule.
		Enforces safety procedures.
		Coordinates with the Site Safety Officer in determining protection level.
		Enforces site control.
		Documents field activities and sample collection.
		Serves as a liaison with public officials.
Work Team	Performs the field tasks described in the Work Plan.	Safely completes the onsite tasks required to fulfill the Work Plan.
		Complies with Site Health and Safety Plan.
		Notifies Site Safety Officer or supervisor of suspected unsafe conditions.

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SECTION 2

RISK ANALYSIS

2.1 CHEMICAL HAZARDS

A number of products containing hazardous chemicals may be encountered onsite. The chemicals of primary concern will be those originating from gasoline. Chemical constituents of gasoline include benzene, ethylbenzene, toluene, and xylenes (BTEX).

The toxicological properties of these compounds are summarized in Table 2.1. The Material Safety Data Sheets (MSDS) for gasoline are contained in Appendix A. These compounds can be taken into the body by oral ingestion, by absorption through the skin, and by inhalation. Benzene is a known human carcinogen.

TABLE 2.1
TOXICOLOGICAL PROPERTIES OF COMPOUNDS

Compound	LEL (%)	PEL-TWA (ppm)	PEL-STEL (ppm)	IDLH (ppm)	Odor Characteristics	Acute Toxic Effects of Compound
Benzene	1.3	1	5	3,000	Aromatic	Headache, dizziness, lassitude, (inhalation); inflammation, blistering (dermal).
Ethylbenzene	1.0	100	125	2,000	Aromatic	Irritation of skin, eyes, nose, and upper respiratory tract
Gasoline	1.3	300	none	none	Aromatic	See those for BTEX.
Toluene	1.2	100	150	2,000	Aromatic, Sour	Nausea, headache, confusion, lack of coordination.
Xylenes	1.1	100	150	1,000	Aromatic	Upper respiratory tract irritation; eye irritation; blistering and cracking skin.

NOTES
LEL Lower Explosive Limit.
PEL-TWA Permissible Exposure Level-8-Hour Time Weighted Average, OSHA 1987, as adopted by the State of Hawaii.
PEL-STEL Permissible Exposure Level-Short Term (15 minute average) Exposure Level.
IDLH Level which is Immediately Dangerous to Life and Health.
NA Not Applicable.

2.2 PHYSICAL HAZARDS

2.2.1 Explosion and Fire

BTEX and gasoline, which have flash points that range from 12° to 84°F, are highly flammable and can be explosive.

2.2.2 Heat Stress

The use of personal protective equipment (PPE) may create heat stress. Monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70°F or above, using the frequencies listed below in Table 2.2.

TABLE 2.2
SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING FOR FIT AND ACCLIMATED WORKERS[a]

Adjusted Temperature[b]	Normal Work Ensemble[c]	Impermeable Ensemble
90°F or above (32.3°C or above)	After each 45 minutes of work	After each 15 minutes of work
87.5-90°F (30.8-32.3°C)	After each 60 minutes of work	After each 30 minutes of work
82.5-87.5°F (28.1-30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5-82.5°F (25.3-28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5-77.5°F (22.5-25.3°C)	After each 150 minutes of work	After each 120 minutes of work

NOTES
a For work levels of 250 kilocalories/hour.
b Calculate the adjusted air temperature (TA ADJ) by using this equation:

TA ADJ °F = TA °F + (13 x % Sunshine).

Measure air temperature (TA) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (for example, 100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)
c A normal work ensemble consists of cotton coveralls or other cotton clothing with long pants.

Monitoring frequency should increase as the ambient temperature increases or as slow recovery rates are observed. Heat-stress monitoring should be performed by a person with a current first aid certification who is trained to recognize heat stress symptoms. For monitoring the body's recuperative abilities to excess heat, one or more of the following techniques will be used.

To monitor the worker, measure the heart rate and oral temperature as follows:

1. Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period.
   a. If the heart rate exceeds 100 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
   b. If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following work cycle by one-third.

2. Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).
   a. If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period.

b. If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third.

c. Do not permit a worker to wear a semipermeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C).

Prevention of Heat Stress

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress the following steps should be taken:

1. Adjust work schedules.
   a. Modify work/rest schedules according to monitoring requirements.
   b. Mandate work slowdowns as needed.
   c. Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.

2. Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.

3. Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluids intake must approximately equal the amount of water lost in sweat, i.e., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:
   a. Maintain water temperature at 50°-60°F (10°-16.6°C).
   b. Provide small disposable cups that hold about four ounces (0.1 liter).
   c. Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.
   d. Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

4. Train workers to recognize the symptoms of heat related illness.

2.2.3 Sunburn

Worker sunburn will be primarily mitigated by the coverage afforded by work clothes and PPE. Exposed portions of faces, necks, hands, and arms should be monitored from time to time for soreness and(or) redness, and sun-block will be available onsite to provide protection for these exposed areas.

2.2.4 Other Hazards

Other physical hazards at the site include:

- overhead power lines.
- underground utilities and pipelines.
- vehicular traffic.

SECTION 3

PERSONNEL PROTECTION AND MONITORING

3.1 MEDICAL SURVEILLANCE

WCL will utilize the services of a licensed occupational health physician with knowledge and/or experience in the hazards associated with the project to provide the medical examinations and surveillance specified herein.

Personnel undergo medical surveillance prior to employment at WCL, and thereafter at 12-month intervals. The 12-month medical examination includes a complete medical and work history and a standard occupational physical, examination of all major organ systems, complete blood count with differential (CBC), and a SMAC/23 blood chemistry screen which includes calcium, phosphorous, glucose, uric acid, BUN, creatinine, albumin, SGPT, SGOT, LDH, globulin, A/G ratio, alkaline phosphatase, total protein, total bilirubin, triglyceride, cholesterol, and a creatinine/BUN ratio. Additionally, a pulmonary function test will be performed by trained personnel to record Forced Vital Capacity (FVC) and Forced Expiratory Volume (FEV 1.0). An audiogram and visual acuity measurement, including color perception, is provided. The medical exam is performed under the direction of a licensed Occupational Health Physician. A medical certification as to the fitness or unfitness for employment on hazardous waste projects, or any restrictions on his/her utilization that may be indicated, is provided by the physician. This evaluation will be repeated as indicated by substandard performance or evidence of particular stress that is evident by injury or time loss illness on the part of any worker.

3.2 SITE-SPECIFIC TRAINING

The Site Safety Officer will be responsible for developing a site-specific occupational hazard training program and providing training to all WCL personnel that are to work onsite. This training will be conducted prior to starting field work and will consist of the following topics:

- Names of personnel responsible for site safety and health.
- Safety, health, and other hazards at the site.
- Proper use of personal protective equipment.
- Work practices by which the employee can minimize risk from hazards.
- Safe use of engineering controls and equipment onsite.
- Acute effects of chemicals that may be present at the site.
- Decontamination procedures.

3.3 PERSONAL PROTECTIVE EQUIPMENT

Level D PPE will be used for initial entry onsite and initially for all work activities. The level of personal PPE will be upgraded to Level C if any of the action levels discussed in Section 3.5 are exceeded:

Level D PPE will consist of the following:

- Standard work clothes.

- o Safety boots.
- o Hard hat, only during appropriate activities.

Level C PPE will consist of the following:

- o Standard work clothes and tyvek coveralls.
- o Half-face air-purifying respirator (APR) fitted with combination dust and organic vapor/acid gas cartridges.
- o PVC inner and nitrile outer gloves.
- o Butyl rubber boots with steel toe and shank.
- o Hard hat, only during appropriate activities.

All personal protective equipment used during the course of this field investigation must meet the following OSHA standards:

Type of Protection	Regulation	Source
Eye and face	29 CFR 1910.133	ANSI Z87.1-1968
Respiratory	29 CFR 1910.134	ANSI Z88.1-1980
Head	29 CFR 1910.135	ANSI Z89.1-1969
Foot	29 CFR 1910.136	ANSI Z41.1-1967

NOTES:
ANSI American National Standards Institute
CFR Code of Federal Regulations

In accordance with OSHA regulations (29 CFR 1910.1025; 29 CFR 1910.134), the half-face APR (fitted with the cartridges specified for use in Level C PPE) must be fit-tested by each worker prior to use.

Half-face APRs cannot be worn under the following conditions:

- o Oxygen-deficient atmosphere (an oxygen concentration less than 19.5 percent).
- o IDLH concentrations listed in Table 2.1.
- o High relative humidity.
- o Contaminant levels which exceed designated use concentrations (50 times the PEL-TWAs listed in Table 2.1).

3.4 MONITORING REQUIREMENTS

If noticeable hydrocarbon odors are present in the breathing zone, then monitoring for organic vapors in the breathing zone will be conducted with a Photovac Microtip or other photo ionization detector (PID). PID readings will be taken under the following circumstances:

- o Upon initial entry onto the site.
- o When weather conditions change.
- o When work begins and periodically during sampling and soil excavation and handling.
- o When work begins at another portion of the site.

3.5 ACTION LEVELS

Dust (potentially hazardous due to possible contamination by BTEX) may be generated onsite during excavation, soil handling, and backfilling. Water spraying will be used for dust suppression, if necessary.

Level D PPE will be used for initial entry onsite and initially for all work activities. The level of personal PPE will be upgraded to Level C PPE if any of the following conditions occur:

- The total volatile organic compounds (VOCs) concentration in the breathing zone exceeds 300 ppmv (parts per million volumetric).
- The benzene concentration in the breathing zone equals or exceeds 1 ppmv.
- The Field Team Leader decides that dust conditions warrant it.

All work in the affected area will cease and workers will vacate the area until additional monitoring indicates that these conditions are temporary and(or) engineering controls are implemented, if one or more of the following occurs:

- The total VOCs concentration exceeds 1,000 ppmv.
- The benzene concentration exceeds 10 ppmv.
- The available oxygen concentration is less than 19.5 percent.

If further monitoring indicates that these conditions are permanent and(or) implementation of engineering controls do not mitigate these conditions, then work in the affected area will cease and workers will vacate the area, and the Project Health and Safety Officer will be notified. If the only condition requiring long-term work stoppage is a total VOCs concentration exceeding 1,000 ppmv, then additional chemical-specific monitoring for TEX (toluene, ethylbenzene, and xylenes) using Drager tubes will be implemented to evaluate whether IDLH conditions have been exceeded. Work may resume if the chemical-specific monitoring for TEX indicates that IDLH conditions have not been exceeded, but additional TEX monitoring may be necessary if a total VOCs concentration exceeding 1,000 ppmv is encountered in the future

SECTION 4

WORK ZONES AND DECONTAMINATION

4.1 ONSITE WORK ZONES

If Level C PPE is necessary, then work zones will be delineated onsite to reduce the spread of hazardous materials by workers from the contaminated areas to the clean areas. The flow of personnel between the zones will be controlled and unauthorized persons will be prohibited. The establishment of the work zones will help ensure that (1) personnel are properly protected against the hazards present where they are working, (2) work activities and contamination are confined to the appropriate areas, and (3) personnel can be located and evacuated in an emergency.

4.1.1 Exclusion Zone

An Exclusion Zone will be established at the job site if Level C PPE is necessary. In general, the Exclusion Zone will consist of the excavation and stockpiled soil areas, and the Exclusion Zone will be delineated by barricades, warning tape, and traffic cones/delineator posts. All personnel within the Exclusion Zone must don Level C PPE as discussed in Section 3.3, and unprotected workers and visitors will not be allowed within/downwind of the Exclusion Zone. No eating, drinking, or smoking will be allowed in the Exclusion Zone.

4.1.2 Decontamination Zone

A Decontamination Zone will be utilized if Level C PPE is necessary. The Decontamination Zone will be established between the Exclusion Zone and the Support Zone, and will include the personnel and equipment necessary for decontamination of equipment and personnel (discussed below). The Decontamination Zone will be delineated by barricades, warning tape, and traffic cones/delineator posts. Personnel and equipment in the Exclusion Zone must pass through this zone before entering the Support Zone. The Decontamination Zone should always be located upwind of the Exclusion Zone, and unprotected workers and visitors will not be allowed within the Decontamination Zone. No eating, drinking, or smoking will be allowed in the Decontamination Zone.

4.1.3 Support Zone

The Support Zone will include the remaining areas of the job site if Level C PPE is necessary. Break areas, operational direction and support facilities (to include supplies, equipment storage and maintenance areas) will be located in this area. No equipment or personnel will be permitted to enter the Support Zone from the Exclusion Zone without passing through the personnel or equipment decontamination station. Eating and drinking, but no smoking, will be allowed only in this area.

4.2 DECONTAMINATION

4.2.1 Personnel Decontamination

Full decontamination procedures which are described herein will be necessary when Level C PPE is used. The following OSHA-specified procedures include steps necessary for complete decontamination prior to entry into the Support Zone, and steps necessary if a worker only needs to change a respirator or respirator canister. Modification can be made to the eight-station decontamination process depending upon the extent of worker contamination. For example, outer gloves and safety boots may be carefully removed and may be subsequently reused without washing/rinsing if they are not significantly contaminated.

APR, APR Cartridge, and(or) Outer Glove Replacement

If a worker leaves the exclusion zone to change an APR, APR cartridge, and(or) outer gloves the worker should leave the tools and equipment in the Exclusion Zone and this is the only step in the decontamination procedure. The worker removes the outer gloves (and discards them if they are to be replaced, exchanges the APR and(or) APR cartridge (if these are to be replaced), dons the outer gloves, and returns to duty.

Station 1: Segregated Equipment Drop

Deposit equipment used onsite (tools, monitoring instruments, clipboards, hard hats, safety vests, etc.) on plastic drop cloths or in different containers with plastic liners. Each type of equipment will probably be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Station 2: Safety Boot and Outer-Glove Wash

Thoroughly wash safety boots and outer-gloves. Scrub with long-handle, soft-bristle scrub brush and copious amounts of alconox/water solution. Necessary equipment includes:

1. Wash tub (large enough for person to stand in)
2. Alconox/water solution
3. Long-handle soft-bristle scrub brushes

Station 3: Safety Boot and Outer-Glove Rinse

Rinse off alconox/water solution using copious amounts of water. Repeat as many times as necessary. Necessary equipment includes:

1. Wash tub (large enough for person to stand in)
2. Spray unit with water
3. Long-handle, soft-bristle scrub brushes

Station 4: Outer Gloves Removal

Carefully remove the outer gloves and deposit in plastic bag.

Station 5: Removal and Disposal of Tyvek Suit

Carefully remove tyvek suit inside-out, and deposit it in a plastic bag.

Station 6: Inner-Glove Removal

Carefully remove inner gloves and deposit in a plastic bag.

Station 7: Field Wash

Wash hands and face. Necessary equipment includes:

1. Water
2. Soap

3. Table
4. Wash and rinse buckets
5. Clean towels

<u>Station 8: Redress</u>

Personnel re-entering Exclusion Zone, must don PPE (e.g., tyvek suits, gloves, etc.); PPE may be reused if not significantly contaminated. Necessary equipment includes:

1. Table
2. PPE, including APR

4.2.2 Equipment Decontamination

Gross contamination will be removed from the excavating machines, equipment, tools and test meters prior to leaving the site. Excavating machines will be steam cleaned, and smaller tools and equipment will be washed with Alconox, and rinsed with water.

SECTION 5

ACCIDENT PREVENTION AND CONTINGENCY PLAN

5.1 ACCIDENT PREVENTION

All field personnel will receive health and safety training prior to the start of onsite work. On a day-to-day basis, individual workers should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. Before daily work assignments, the Field Team Leader should hold organizational meetings. Discussion should include:

- Tasks to be performed.
- Time constraints (e.g., rest breaks, APR cartridge changes, etc.).
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals.
- Emergency procedures.

Prior to any excavation, efforts should be made to determine whether underground installations will be encountered and, if so, where these installations are located. Level D PPE (Section 3.3), including safety boots, must be worn during all onsite work. The Field Team Leader or Site Safety Officer will provide constant onsite supervision of the workers and visitors to ensure that they are meeting the health and safety requirements. If deficiencies are noted, work will be stopped and corrective action will be taken (e.g., retrain, provide additional safety equipment). Reports of health and safety deficiencies and the corrective action taken will be forwarded to the Project Manager. Periodic air monitoring will be performed by the Site Safety Officer to ensure that proper personal protection is being utilized.

5.2 CONTINGENCY PLAN

General emergency procedures, and specific procedures for chemical exposure and personal injury, are described below.

5.2.1 Emergency Procedures

In the event that an emergency develops onsite, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any worker is involved in an accident or experiences any adverse effects or symptoms of exposure while onsite.
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

5.2.2 Chemical Exposure

If a worker demonstrates symptoms of chemical exposure the procedures outlined below should be followed:

- Another worker (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the Field Team Leader (via voice or hand signals) of the chemical exposure. The Field Team Leader should contact the appropriate emergency response agency.
- Precautions should be taken to avoid exposure of other workers to the chemical.
- If the chemical is on the worker's clothing, then the chemical should be neutralized or removed if it is safe to do so.
- If the chemical has contacted the worker's skin, then the skin should be washed with copious amounts of water.
- In case of eye contact, an emergency eye wash should be used. Eyes should be washed for at least 15 minutes.
- All chemical exposure incidents must be reported in writing to the Health and Safety Representative. The Site Safety Officer or Field Team Leader is responsible for completing the attached Accident Report.

5.2.3 Personal Injury

In case of personal injury at the site, the following procedures should be followed:

- Another worker (buddy) should signal the Field Team Leader (via voice or hand signals) that an injury has occurred.
- A worker trained in first aid can administer treatment to an injured worker.
- The injured worker should then be transported to the nearest hospital or medical center (Page i and ii). If necessary, an ambulance should be called to transport the injured worker.
- For minor injuries, the injured worker can be treated onsite.
- The Field Team Leader or Site Safety Officer is responsible for making certain that the Accident Report is completed. The Accident Report is to be submitted to the Health and Safety Representative. Follow-up action should be taken to correct the situation that caused the accident.

5.2.4 Evacuation Procedures

If monitoring results or other conditions indicate the need to cease work and evacuate the work area, then the following procedures should be followed:

- The Field Team Leader will initiate the evacuation procedure by signaling (via voice or hand signal) to leave the site.
- All personnel in the work area should evacuate the area and meet in the common designated area.
- All personnel suspected to be in or near the contract work area should be accounted for and the whereabouts of missing persons determined immediately.
- Further instructions will then be given by the Field Team Leader.

5.2.5 Procedures To Be Implemented in the Event of a Major Fire, Explosion or Onsite Health Emergency Crisis

In the event of a major fire, explosion or onsite health emergency crisis, the following procedures should be followed:

- Notify the paramedics and/or fire department, as necessary (Page i).
- Signal the evacuation procedure outlined above and implement the entire procedure.
- Isolate the problem source area.
- Stay upwind of any fire or the problem source area.
- Keep area surrounding the problem source area clear after the incident occurs.
- Complete Accident Report and distribute it to appropriate personnel.

SECTION 6

STANDARD SAFE WORK PRACTICES

STANDARD SAFE WORK PRACTICES

The following are considered standard safe work practices:

1. Eating, drinking, chewing tobacco, smoking and carrying matches or lighters is prohibited in a contaminated or potentially contaminated area or where the possibility for the transfer of contamination exists.

2. All workers should avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid, whenever possible, kneeling on the ground, leaning or sitting on equipment or ground. Do not place monitoring equipment on potentially contaminated surfaces (i.e., ground, etc.).

3. All workers should make use of their senses (all senses) to alert them to potentially dangerous situations in which they should not become involved, (i.e., presence of strong and irritating or nauseating odors).

4. All workers should prevent, to the extent possible, spillages. In the event that a spillage occurs, contain liquid if possible.

5. All workers shall be familiar with the physical characteristics of investigations, including:

   a. Wind direction in relation to excavations, stockpiles, and nearby buildings.
   b. Accessibility to associates, equipment, vehicles and communication devices.
   c. Hot zones (areas of known or suspected contamination).
   d. Site access.
   e. Nearest water sources.

6. All wastes generated during activities onsite should be disposed of as directed by the project manager or onsite representative.

7. Personal protective equipment specified in Section 3 will be utilized by workers onsite.

APPENDIX A

MATERIAL SAFETY DATA SHEETS

Date Issued: 05-12-94
Supersedes: 02-24-94

TEXACO
MATERIAL SAFETY DATA SHEET

NOTE: Read and understand Material Safety Data Sheet before handling or disposing of product.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY
Product Code and Name:
00365 TEXACO UNLEADED GASOLINE
Chemical Name and/or Family or Description:
Automotive Lead-Free Gasoline

Manufacturer's Name and Address:
TEXACO REFINING AND MARKETING, INC
P.O. Box 7812
Universal City, CA 91608

Telephone Numbers:

Transportation Emergency	-Company	: (914) 831-3400
	CHEMTREC	: (800) 424-9300
Health Emergency	-Company	: (914) 831-3400
General MSDS Assistance		: (914) 838-7204
Technical Information	-Fuels	: (914) 838-7336
	-Chemical	: (512) 459-6543
	-Lubricant/: Antifreezes	(800) 782-7852
	-Additives	: (713) 235-6278
	-Solvents	: (800) 876-3738

2. COMPOSITION/INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION IS AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE A COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA	IARC	NTP	OTHER	NONE
X	X	X	X	-

Composition: (Sequence Number and Chemical Name)

Gasoline consists mainly of straight chain and branched paraffinic hydrocarbons, olefins, cycloparaffins, and aromatics. The MTBE content may vary based on seasonal requirements from 0-15%. Typical constituents (not intended as manufacturing specifications) include:

Seq.	Chemical Name	CAS Number	Range in %
01	* Gasoline		95.00-99.99
02	* Propane, 2-methoxy-2-methyl-	1634-04-4	3.00-9.99
03	* Xylenes	1330-20-7	3.00-9.99
04	* Toluene	108-88-3	3.00-9.99
05	* Benzene	71-43-2	1.00-2.99
06	* 1,2,4-trimethylbenzene	95-63-6	1.00-2.99
07	* Ethylbenzene	100-41-4	1.00-2.99
08	* N-hexane	110-54-3	1.00-2.99

PRODUCT IS HAZARDOUS ACCORDING TO OSHA (1910.1200).
* COMPONENT IS HAZARDOUS ACCORDING TO OSHA.

Exposure Limits referenced by Sequence Number in the Composition Section

Seq.	Limit
01	300 ppm TWA-OSHA
01	500 ppm STEL-OSHA
01	300 ppm TWA-ACGIH
01	100 ppm TWA-TEXACO
03	100 ppm TWA-OSHA
03	150 ppm STEL-OSHA
03	100 ppm TWA-ACGIH
03	150 ppm STEL-ACGIH
04	100 ppm TWA-OSHA
04	150 ppm STEL-OSHA
04	50 ppm TWA-ACGIH (SKIN)

N.D. - NOT DETERMINED   N.A. - NOT APPLICABLE   N.T. - NOT TESTED
< - LESS THAN   > - GREATER THAN

3. HAZARD IDENTIFICATION (CONT)

Sensitization Properties:
Unknown.

Chronic:
No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:
Because of its irritating properties, repeated skin contact may aggravate an existing dermatitis (skin condition).

Other Remarks:
This product contains benzene. Prolonged and repeated exposure to benzene may cause headaches, loss of appetite, rapid pulse, fatigue, liver and kidney damage, decreased bone-marrow activity with increased bleeding tendencies, and possible irreversible injury to blood forming organs. Prolonged and repeated overexposure to benzene has been associated with aplastic anemia and acute myelogenous leukemia in humans.

4. FIRST AID MEASURES

Eyes:
Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:
Wash skin with plenty of soap and water until all traces of material are removed. Remove and clean contaminated clothing (See Other Instructions). Destroy non-resistant footwear. Get medical attention if skin irritation persists or contact has been prolonged.

Ingestion:
If person is conscious and can swallow, give two glasses of water (16 oz.) but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:
If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:
Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

5. FIRE-FIGHTING MEASURES

Ignition Temperature (degrees F):
850
Flash Point (degrees F):
-40 (PMCC)
Flammable Limits (%):
Lower: 1.4
Upper: 7.6

8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONT)

Ventilation:
Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for Total Product:
Gasoline: OSHA PEL-TWA 300 ppm; STEL 500 ppm.
ACGIH TLV-TWA 300 ppm; STEL 500 ppm.
TEXACO TLV-TWA 100 ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:
Light red to light straw liquid
Odor:
Petroleum odor

Boiling Point (degrees F):
> 90

Melting/Freezing point (degrees F):
Not applicable.

Specific Gravity (water=1):
.7 - .77

pH of undiluted product:
Not applicable.

Vapor Pressure:
465 - 775 mmHg at 100.0

Viscosity:
< 1.4 cSt at 37.7 C

VOC Content:
Not determined.

Vapor Density (air=1):
3 - 4

Solubility in Water (%):
.1 - 1

Other: None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:
(If Others is checked below, see comments for details)

Air	Water	Heat	Strong Oxidizers	Others	None of These
_	_	X	X	_	_

Comments:
None

Products Evolved When Subjected to Heat or Combustion:
Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations: DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION(ANIMAL TOXICITY DATA)
Median Lethal Dose
Oral:
LD50 Believed to be > 5.00 g/kg (rat) practically non-toxic
Inhalation:
Not determined.

N.D. - NOT DETERMINED   N.A. - NOT APPLICABLE   N.T. - NOT TESTED
< - LESS THAN   > - GREATER THAN

13. TRANSPORT INFORMATION

Transportation
DOT:
Proper Shipping Name:
Gasoline
Hazard Class:
3
Identification Number: UN1203
Packing Group: II
Label Required:
Flammable liquid

Marine pollutant:
Not applicable

This product contains a DOT Hazardous Substance or substances, listed in Section 14 of the MSDS. DOT information must be accompanied with RQ notation, or, an otherwise 'Not Regulated' product will be classified as Environmentally Hazardous (solid/liquid) N.O.S., Class 9, if the product's shipping container holds at least (lbs) 714.

IMDG:
Proper Shipping Name:
Not evaluated

ICAO:
Proper Shipping Name:
Not evaluated

TDG:
Proper Shipping Name:
Not evaluated

14. REGULATORY INFORMATION

Federal Regulations:
SARA Title III:
Section 302/304 Extremely Hazardous Substances

Seq.	Chemical Name	CAS Number	Range in %
None			

Section 302/304 Extremely Hazardous Substances (CONT)

Seq.	TPQ	RQ
None		

Section 311 Hazardous Categorization:

Acute	Chronic	Fire	Pressure	Reactive	N/A
X	X	X	–	–	–

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Propane, 2-methoxy-2-methyl-	1634-04-4	3.00-9.99
Xylenes	1330-20-7	3.00-9.99
Toluene	108-88-3	3.00-9.99
Benzene	71-43-2	1.00-2.99
1,2,4-trimethylbenzene	95-63-6	1.00-2.99
Ethylbenzene	100-41-4	1.00-2.99

CERCLA 102(a)/DOT Hazardous Substances: (+ indicates DOT Hazardous Substance)

Seq.	Chemical Name	CAS Number	Range in %
01	Propane, 2-methoxy-2-methyl-	1634-04-4	3.00-9.99
02+	Xylenes	1330-20-7	3.00-9.99
03+	Toluene	108-88-3	3.00-9.99
04+	Benzene	71-43-2	1.00-2.99
05	N-hexane	110-54-3	1.00-2.99
06+	Ethylbenzene	100-41-4	1.00-2.99
07+	Benzene, (1-methylethyl) -	98-82-8	0.01-0.09

15. ENVIRONMENTAL INFORMATION (CONT)

Mobility:
Not determined.

Persistence and Biodegradability:
Not determined.

Potential to Bioaccumulate:
Not determined.

Remarks:
None

16. OTHER INFORMATION

THIS PRODUCT IS INTENDED FOR USE AS A MOTOR FUEL ONLY.

Texaco recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Texaco has notified EPA of a TSCA 8(e) Notice of Substantial Risk to Health on the basis of results from a range finding developmental toxicity study for this product or a component of this product.
A definitive developmental toxicity study is underway.

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT FOR PURPOSE OF HAZARD COMMUNICATION AS PART OF TEXACO'S PRODUCT SAFETY PROGRAM. IT IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT OR THE INFORMATION CONTAINED HEREIN. DATA SHEETS ARE AVAILABLE FOR ALL TEXACO PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL TEXACO PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE AND YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, USER SHOULD CONSULT HIS LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. TEXACO DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

Date: 05-12-94   _ New   X Revised, Supersedes: 02-24-94
Date printed: 08-09-94

Inquiries regarding MSDS should be directed to:
Texaco Inc.
Manager, Product Safety
P.O. Box 509
Beacon, N.Y. 12508

PLEASE SEE NEXT PAGE FOR PRODUCT LABEL

N.D. - NOT DETERMINED   N.A. - NOT APPLICABLE   N.T. - NOT TESTED
< - LESS THAN   > - GREATER THAN

0000 0005 0920

PRODUCT CODE: 00365
NAME: TEXACO UNLEADED GASOLINE

Date Issued: 05-12-94
Supersedes: 02-24-94

17. PRODUCT LABEL (CONT)

*	Gasoline		95.00-99.99
*	Propane, 2-methoxy-2-methyl-	1634-04-4	3.00-9.99
*	Xylenes	1330-20-7	3.00-9.99
*	Toluene	108-88-3	3.00-9.99
*	Benzene	71-43-2	1.00-2.99
*	1,2,4-trimethylbenzene	95-63-6	1.00-2.99
*	Ethylbenzene	100-41-4	1.00-2.99
*	N-hexane	110-54-3	1.00-2.99

PRODUCT IS HAZARDOUS ACCORDING TO OSHA (1910.1200).
* COMPONENT IS HAZARDOUS ACCORDING TO OSHA.

Pennsylvania Special Hazardous Substance(s)	CAS Number	Range in %
Benzene	71-43-2	1.00-2.99

HMIS				NFPA			
Health:	1	Reactivity:	0	Health:	1	Reactivity:	0
Flammability:	3	Special	: -	Flammability:	3	Special	: -

Transportation
DOT:
Proper Shipping Name:
Gasoline
Hazard Class:
3
Identification Number: UN1203
Packing Group: II
Label Required:
Flammable liquid

Marine pollutant:
Not applicable

This product contains a DOT Hazardous Substance or substances, listed in Section 14 of the MSDS. DOT information must be accompanied with RQ notation, or, an otherwise 'Not Regulated' product will be classified as Environmentally Hazardous (solid/liquid) N.O.S., Class 9, IF the product's shipping container holds at least (lbs) 714.

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flame or heat. Keep container closed and drum bungs in place.

Manufacturer's Name and Address:
TEXACO REFINING AND MARKETING, INC
P.O. Box 7812
Universal City, CA 91608

TRANSPORTATION EMERGENCY Company: (914) 831-3400
CHEMTREC: (800) 424-9300

HEALTH EMERGENCY Company: (914) 831-3400

ATTACHMENTS

FORMS

NOTE: THE OSHA JOB SAFETY AND HEALTH POSTER MUST BE DISPLAYED PROMINENTLY AT THE SITE

ACCEPTANCE FORM
PROJECT HEALTH AND SAFETY PLAN

I have read and agree to abide by the contents of the Health and Safety Plan for the following project: ______________________________

Name (print): ______________________

Signature: ______________________

Date: ______________________

Return to Health and Safety Officer before starting to work on subject project work site.

0000 0005 0923

WALKER CONSULTANTS, LTD.

7192 Kalanianaole Highway, Suite G-220
Honolulu, HI 96825
(808) 395-0392
FAX (808) 395-1969

ACCIDENT REPORT FORM

PROJECT

1. Project: ____________________

EMPLOYER

2. Name: ____________________
3. Address: ____________________
4. Mailing Address: ____________________

INJURED OR ILL EMPLOYEE

5. Name: ____________ 6. SSAN: ____________
7. Home Address: ____________________
8. Age: ______ 9. Sex: Male _____ Female _____
10. Occupation: ____________________
11. Department: ____________________

ACCIDENT OR EXPOSURE

12. Location:
13. Was accident or exposure on employer's premises? _____ (Yes/No)
14. Specific activity when injured or exposed: ____________________

____
15. How did the accident or exposure occur? ____________________ (Describe fully the events which caused the injury or

____
illness. Tell what happened and how. Name the objects and substances involved. Give details of all

____
factors which led to the accident or exposure. Use separate sheets for additional space.)
16. Date and time of accident or exposure: ____________________

ACCIDENT REPORT FORM
(Continued)

WITNESSES

17. __________ (Name) __________ (Affiliation) __________ (Phone No.)

__________ (Name) __________ (Affiliation) __________ (Phone No.)

__________ (Name) __________ (Affiliation) __________ (Phone No.)

OCCUPATIONAL INJURY OR ILLNESS

18. Fully describe the injury or illness and indicate the body part affected: __________

19. Name the object or substance which directly caused the injury or illness. (For example, the object which struck the employee; the vapor or poison inhaled or swallowed; the chemical or radiation which irritated the skin; or in the cases of strains, hernias, etc., the object being lifted or pulled, etc.)

20. Date of the initial illness diagnosis if different from exposure date: __________

21. Did the injury or illness result in a fatality? _____ (Yes/No)

PHYSICIAN AND HOSPITAL INFORMATION

22. Physician's name, address, and phone number: __________

23. Hospital's name, address, and phone number: __________

REPORT PREPARATION INFORMATION

24. Report date: __________
25. Preparer's name: __________
26. Preparer's signature: __________
27. Preparer's employer: __________
28. Preparer's position: __________

0000 0005 0925

JOB SAFETY & HEALTH PROTECTION

The Occupational Safety and Health Act of 1970 provides job safety and health protection for workers by promoting safe and healthful working conditions throughout the Nation. Provisions of the Act include the following:

Employers

All employers must furnish to employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to employees. Employers must comply with occupational safety and health standards issued under the Act.

Employees

Employees must comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to their own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct jobsite inspections to help ensure compliance with the Act.

Inspection

The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Where there is no authorized employee representative, the OSHA Compliance Officer must consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaint

Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or unhealthful conditions exist in their workplace. OSHA will withhold, on request, names of employees complaining.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or for otherwise exercising their rights under the Act.

Employees who believe they have been discriminated against may file a complaint with their nearest OSHA office within 30 days of the alleged discriminatory action.

Citation

If upon inspection OSHA believes an employer has violated the Act, a citation alleging such violations will be issued to the employer. Each citation will specify a time period within which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

Proposed Penalty

The Act provides for mandatory civil penalties against employers of up to $7,000 for each serious violation and for optional penalties of up to $7,000 for each nonserious violation. Penalties of up to $7,000 per day may be proposed for failure to correct violations within the proposed time period and for each day the violation continues beyond the prescribed abatement date. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to $70,000 for each such violation. A minimum penalty of $5,000 may be imposed for each willful violation. A violation of posting requirements can bring a penalty of up to $7,000.

There are also provisions for criminal penalties. Any willful violation resulting in the death of any employee, upon conviction, is punishable by a fine of up to $250,000 (or $500,000 if the employer is a corporation), or by imprisonment for up to six months, or both. A second conviction of an employer doubles the possible term of imprisonment. Falsifying records, reports, or applications is punishable by a fine of $10,000 or up to six months in jail or both.

Voluntary Activity

While providing penalties for violations, the Act also encourages efforts by labor and management, before an OSHA inspection, to reduce workplace hazards voluntarily and to develop and improve safety and health programs in all workplaces and industries. OSHA's Voluntary Protection Programs recognize outstanding efforts of this nature.

OSHA has published Safety and Health Program Management Guidelines to assist employers in establishing or perfecting programs to prevent or control employee exposure to workplace hazards. There are many public and private organizations that can provide information and assistance in this effort, if requested. Also, your local OSHA office can provide considerable help and advice on solving safety and health problems or can refer you to other sources for help such as training.

Consultation

Free assistance in identifying and correcting hazards and in improving safety and health management is available to employers, without citation or penalty, through OSHA-supported programs in each State. These programs are usually administered by the State Labor or Health department or a State university.

Posting Instructions

Employers in States operating OSHA approved State Plans should obtain and post the State's equivalent poster.

Under provisions of Title 29, Code of Federal Regulations, Part 1903.2(a)(1) employers must post this notice (or facsimile) in a conspicuous place where notices to employees are customarily posted.

More Information

Additional information and copies of the Act, specific OSHA safety and health standards, and other applicable regulations may be obtained from your employer or from the nearest OSHA Regional Office in the following locations:

Atlanta, GA	(404) 347-3573
Boston, MA	(617) 565-7164
Chicago, IL	(312) 353-2220
Dallas, TX	(214) 767-4731
Denver, CO	(303) 844-3061
Kansas City, MO	(816) 426-5861
New York, NY	(212) 337-2378
Philadelphia, PA	(215) 596-1201
San Francisco, CA	(415) 744-6670
Seattle, WA	(206) 553-5930

Washington, DC
1992 (Reprinted)
OSHA 2203

Robert B. Reich, Secretary of Labor

U.S. Department of Labor

Occupational Safety and Health Administration

To report suspected fire hazards, imminent danger safety and health hazards in the workplace, or other job safety and health emergencies, such as toxic waste in the workplace, call OSHA's 24-hour hotline: 1-800-321-OSHA.

This information will be made available to sensory impaired individuals upon request. Voice phone: (202) 219-8615; TDD message referral phone: 1-800-326-2577

GPO : 1993 0 – 355-763 QL 3

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APPENDIX C

UST TIGHTNESS TESTING CERTIFICATES

0000 0005 0927

CERTIFICATE OF UNDERGROUND STORAGE TANK SYSTEM TESTING

NDE ENVIRONMENTAL CORPORATION
8906 WALL STREET, SUITE 306
AUSTIN, TEXAS 78754
(512) 719-4633
FAX (512) 719-7986

TEST RESULT SITE SUMMARY REPORT

TEST TYPE: Sure Test

WORK ORDER NUMBER: 670446

TEST DATE: 08/29/95

CLIENT: TEXACO REFINING AND MARKETING INC.
1800 SW FIRST AVE, SUITE 180
PORTLAND, OR 97201

SITE: KING STREET TEXACO 61-100-090
1239 SOUTH KING STREET
HONOLULU, HI 96814

ATTN: Kerstin Anderson

The following test were conducted at the site above in accordance with all applicable portions of Federal, NFPA and local regulations

Tank Tests

1	REGULAR	9,816	92.00	PASS	0.021	PASS
	REGULAR	9,816	92.00	PASS	0.038	PASS
	PREMIUM	9,816	92.00	PASS	-0.001	PASS
4	PLUS	9,816	92.00	PASS	-0.012	PASS
5	WASTE OIL	,548	48.00	PASS	0.007	FAIL

Line and Leak Detector Tests

1	REGULAR	0.004	P	YES	PASS
2	REGULAR				
3	PREMIUM	0.006	P	YES	PASS
4	PLUS	0.003	P	YES	PASS
5	WASTE OIL				

NDE appreciates the opportunity to serve you, and looks foward to working with you in the future. Please call any time, day or night, when you need us.

NDE Customer Service Representative:
THOMAS CORNO

Test conduted by:
AL QUEIROS

Reviewed:

Technician Certification Number:

0000 0005 0928

INDIVIDUAL TANK/LINE/LEAK DETECTOR TEST REPORT

NDE ENVIRONMENTAL CORPORATION

WORK ORDER NUMBER: 670446

EST DATE: August 29,

SITE: KING STREET TEXACO

LIENT: TEXACO REFINING AND

Tank ID:	1	Bottom to top fill in inches:	
Product:	REGULAR	Bottom to grade fill in inches:	
Capacity in gallons:	9,816	Fill pipe length in inches:	
Diameter in inches:	92.00	Fill pipe diameter in inches:	4.0
Length in inches:	345	Stage I vapor recovery:	NONE
Material:	FIBERGLASS	Stage II vapor recovery:	NONE
Tank:	YES		
Manifolded Vent:	NO		
V/R:	NO		

LINE & LD TEST ONLY.

Test Method:	Sure Test
Psi at tank bottom:	0.63
Fluid level in inches:	25.00
UFT/OFT:	UFT
Fluid volume in gallons:	2,142
Water Level in inches:	0.00
Test time:	06:45-10:45
Number of thermistors:	
Specific gravity:	0.705
Water table depth in inches:	150.00
Determined by: (method):	MONTR WELL
Leak rate in gph:	0.021
RESULT:	PASS

	New/passed detector	Failed/Replaced detector
Test method:	FTA	
Make:	RED JACKET	
Model:	X.L.D.	
Serial Number:	30194-6110	
Open time in sec.:	3.00	
Holding psi:	17	
Resiliancy cc:	105	
Test leak rate ml/min:	252.0	
Metering psi:	11	
Calib. leak in gph:	4.00	
RESULT:	PASS	

Test method:	U2
Test time:	12:20-12:50
Ullage volume:	7,674
Ullage pressure:	1.00
RESULT:	PASS

DATA FOR UTS-4T ONLY:

Time of test 1:	12:20-12:42
Temperature:	65.00
Flow rate (cfh):	
Time of test 2:	
Temperature:	
Flow rate (cfh):	
Time of test 3:	
Temperature:	
Flow rate (cfh):	

Material:	FIBERGLASS
Diameter (in):	2.0
Length (ft):	60.0
Test psi:	50
Bleedback cc:	140
Test time (min):	30
Test 1 Start time:	11:17
finish psi:	48
Vol change cc:	6
Test 2 Start time:	11:27
finish psi:	49
Vol change cc:	2
Test 3 Start time:	11:37
finish psi:	50
Vol change cc:	8
Final gph:	0.004
RESULT:	PASS

Test type: Proline Test Series III

Pump type: PRESSURE Pump make: RED JACKET

0000 0005 0929

INDIVIDUAL TANK/LINE/LEAK DETECTOR TEST REPORT

NDE ENVIRONMENTAL CORPORATION

TEST DATE: August 29,

CLIENT: TEXACO REFINING AND

WORK ORDER NUMBER: 670446

SITE: KING STREET TEXACO

Tank ID:	2	Bottom to top fill in inches:	
Product:	REGULAR	Bottom to grade fill in inches:	
Capacity in gallons:	9,816	Fill pipe length in inches:	
Diameter in inches:	92.00	Fill pipe diameter in inches:	4.0
Length in inches:	345	Stage I vapor recovery:	NONE
Material:	FIBERGLASS	Stage II vapor recovery:	NONE
Tank:	YES		
Manifolded Vent:	NO		
V/R:	NO		

LINE 6 ID TEST ONLY.

Test Method:	Sure Test
Psi at tank bottom:	0.62
Fluid level in inches:	24.50
UFT/OFT:	UFT
Fluid volume in gallons:	2,080
Water Level in inches:	0.00
Test time:	08:15-12:15
Number of thermistors:	3
Specific gravity:	0.705
Water table depth in inches:	300.00
Determined by: (method):	MONTR WELL
Leak rate in gph:	0.038
RESULT:	PASS

	New/passed detector	Failed/Replaced detector
Test method:		
Make:		
Model:		
Serial Number:		
Open time in sec.:		
Holding psi:		
Resiliency cc:		
Test leak rate ml/min:		
Metering psi:		
Calib. leak in gph:		
RESULT:		

Test method:	U2
Test time:	16:10-17:35
Ullage volume:	7,736
Ullage pressure:	1.00
RESULT:	PASS

DATA FOR UTS-4T ONLY:

Time of test 1:	16:10-16:20
Temperature:	66.00
Flow rate (cfh):	
Time of test 2:	17:05-17:27
Temperature:	65.00
Flow rate (cfh):	
Time of test 3:	
Temperature:	
Flow rate (cfh):	

TEST RAN TWICE DUE ULLAGE
LEAK FOUND AT 4" RISER.

Material:	FIBERGLASS
Diameter (in):	2.0
Length (ft):	60.0
Test psi:	
Bleedback cc:	
Test time (min):	
Test 1:Start time:	
finish psi:	
Vol change cc:	
Test 2:Start time:	
finish psi:	
Vol change cc:	
Test 3:Start time:	
finish psi:	
Vol change cc:	
Final gph:	
RESULT:	
Test type:	

Pump type: PRESSURE Pump make: RED JACKET

0000 0005 0930

INDIVIDUAL TANK/LINE/LEAK DETECTOR TEST REPORT

NDE ENVIRONMENTAL CORPORATION

WORK ORDER NUMBER: 670446

TEST DATE: August 29,

SITE: KING STREET TEXACO

CLIENT: TEXACO REFINING AND

Tank ID: 3
Product: PREMIUM
Capacity in gallons: 9,816
Diameter in inches: 92.00
Length in inches: 345
Material: FIBERGLASS

Bottom to top fill in inches:
Bottom to grade fill in inches:
Fill pipe length in inches:
Fill pipe diameter in inches: 4.0
Stage I vapor recovery: NONE
Stage II vapor recovery: NONE

Tank: NO
Manifolded Vent: NO
V/R: NO

LINE & LD TEST ONLY.

Test Method: Sure Test
Psi at tank bottom: 0.80
Fluid level in inches: 33.00
UFT/OFT: UFT
Fluid volume in gallons: 3,181
Water Level in inches: 0.00
Test time: 07:15-11:15
Number of thermistors: 4
Specific gravity: 0.680
Water table depth in inches: 300.00
Determined by: (method): MONTR WELL
Leak rate in gph: -0.001
RESULT: PASS

	New/passed detector	Failed/Replaced detector
Test method:	PTA	
Make:	RED JACKET	
Model:	X.L.D.	
Serial Number:	40693-9585	
Open time in sec.:	3.00	
Holding psi:	16	
Resiliency cc:	85	
Test leak rate ml/min:	252.0	
Metering psi:	11	
Calib. leak in gph:	4.00	
RESULT:	PASS	

Test method: U2
Test time: 13:30-14:00
Ullage volume: 6,635
Ullage pressure: 1.00
RESULT: PASS

DATA FOR UTS-4T ONLY:
Time of test 1: 13:30-14:00
Temperature: 61.00
Flow rate (cfh):
Time of test 2:
Temperature:
Flow rate (cfh):
Time of test 3:
Temperature:
Flow rate (cfh):

Material: FIBERGLASS
Diameter (in): 2.0
Length (ft): 60.0
Test psi: 50
Bleedback cc: 114
Test time (min): 30
Test 1 Start time: 13:29
finish psi: 46
Vol change cc: 8
Test 2 Start time: 13:39
finish psi: 49
Vol change cc: 4
Test 3 Start time: 13:49
finish psi: 50
Vol change cc: 0
Final gph: 0.006
RESULT: PASS

Test type: Proline Test Series III

Pump type: PRESSURE
Pump make: RED JACKET

0000 0005 0931

INDIVIDUAL TANK/LINE/LEAK DETECTOR TEST REPORT

NDE ENVIRONMENTAL CORPORATION

WORK ORDER NUMBER: 670446

TEST DATE: August 29,

SITE: KING STREET TEXACO

CLIENT: TEXACO REFINING AND

TANK INFORMATION

Tank ID:	4	Bottom to top fill in inches:	
Product:	PLUS	Bottom to grade fill in inches:	
Capacity in gallons:	9,816	Fill pipe length in inches:	
Diameter in inches:	92.00	Fill pipe diameter in inches:	4.0
Length in inches:	345	Stage I vapor recovery:	NONE
Material:	FIBERGLASS	Stage II vapor recovery:	NONE

Tank: NO
Manifolded Vent: NO
V/R: NO

COMMENTS

LINE & LD TEST ONLY.

TANK TEST RESULTS

Test Method:	Sure Test
Psi at tank bottom:	0.97
Fluid level in inches:	38.50
UFT/OFT:	UFT
Fluid volume in gallons:	3,936
Water Level in inches:	0.00
Test time:	07:30-11:30
Number of thermisters:	4
Specific gravity:	0.700
Water table depth in inches:	300.00
Determined by: (method):	MONTR WELL
Leak rate in gph:	-0.012
RESULT:	PASS

COMMENTS

LEAK DETECTOR RESULTS

	New/passed detector	Failed/Replaced detector
Test method:	FTA	
Make:	RED JACKET	
Model:	X.L.D.	
Serial Number:	10394-0157	
Open time in sec.:	3.00	
Holding psi:	16	
Resiliency cc:	90	
Test leak rate ml/min:	252.0	
Metering psi:	10	
Calib. leak in gph:	4.00	
RESULT:	PASS	

COMMENTS

ULLAGE TEST RESULTS

Test method:	U2
Test time:	15:05-15:35
Ullage volume:	5,880
Ullage pressure:	1.00
RESULT:	PASS

DATA FOR UTS-4T ONLY:

Time of test 1:	15:05-15:27
Temperature:	72.00
Flow rate (cfh):	
Time of test 2:	
Temperature:	
Flow rate (cfh):	
Time of test 3:	
Temperature:	
Flow rate (cfh):	

COMMENTS

LINE TEST RESULTS

Material:	FIBERGLASS
Diameter (in):	2.0
Length (ft):	60.0
Test psi:	50
Bleedback cc:	140
Test time (min):	30
Test 1:Start time:	14:44
finish psi	49
Vol change cc:	6
Test 2:Start time:	14:54
finish psi:	50
Vol change cc:	0
Test 3:Start time:	15:04
finish psi:	50
Vol change cc:	0
Final gph:	0.003
RESULT:	PASS

Test type: Proline Test Series III

Pump type: PRESSURE Pump make: RED JACKET

COMMENTS

0000 0005 0932

INDIVIDUAL TANK/LINE/LEAK DETECTOR TEST REPORT

NDE ENVIRONMENTAL CORPORATION

WORK ORDER NUMBER: 670446

TEST DATE: August 29,

SITE: KING STREET TEXACO

CLIENT: TEXACO REFINING AND

Tank ID:	5	Bottom to top fill in inches:	84.5
Product:	WASTE OIL	Bottom to grade fill in inches:	89.5
Capacity in gallons:	548	Fill pipe length in inches:	35.0
Diameter in inches:	48.00	Fill pipe diameter in inches:	2.0
Length in inches:	60	Stage I vapor recovery:	NONE
Material:	FIBERGLASS	Stage II vapor recovery:	NONE

Manifolded Tank: NO
Vent: NO
V/R: NO

Test Method:	Sure Test
Psi at tank bottom:	0.74
Fluid level in inches:	23.50
UT/OFT:	UFT
Fluid volume in gallons:	240
Water Level in inches:	0.00
Test time:	13:20-16:20
Number of thermistors:	3
Specific gravity:	0.880
Water table depth in inches:	300.00
Determined by: (method):	MONTR WELL
Leak rate in gph:	0.007
RESULT:	PASS

	New/passed detector	Failed/Replaced detector
Test method:		
Make:		
Model:		
Serial Number:		
Open time in sec.:		
Holding psi:		
Resiliency cc:		
Test leak rate ml/min:		
Metering psi:		
Calib. leak in gph:		
RESULT:		

COMMENTS

Test method:	U2
Test time:	17:00-17:30
Ullage volume:	308
Ullage pressure:	1.00
RESULT:	FAIL

DATA FOR UTS-4T ONLY:

Time of test 1:	17:00-17:12
Temperature:	78.00
Flow rate (cfh):	
Time of test 2:	
Temperature:	
Flow rate (cfh):	
Time of test 3:	
Temperature:	
Flow rate (cfh):	

TANK FAILS NO VISUAL LEAKS.

Material:	NONE
Diameter (in):	
Length (ft):	
Test psi:	
Bleedback cc:	
Test time (min):	
Test 1:Start time:	
finish psi:	
Vol change cc:	
Test 2:Start time:	
finish psi:	
Vol change cc:	
Test 3:Start time:	
finish psi:	
Vol change cc:	
Final gph:	
RESULT:	

Test type:

Pump type: GRAVITY   Pump make: NONE

COMMENTS

0000 0005 0933

APPENDIX D

PID, FIELD AND SAMPLE COLLECTION METHODS

APPENDIX D

PID FIELD SCREENING AND SAMPLE COLLECTION METHODS

Equipment Decontamination

The soil sample sleeves, and all portions of the Strataprobe™ soil gas probe system and soil sampler system that were driven into the ground were decontaminated by TEG Hawaii prior to each use using Liquinox™ detergent, followed by successive potable and distilled water rinses.

Soil Gas Sample Collection

TEG Hawaii used its truck-mounted, Strataprobe™ direct-push rig to drive the soil gas probes and collect the soil gas samples. TEG Hawaii's soil gas probe system consists of the following:

1. An internally-threaded probe tip fitted with a conical drop-off steel drive-tip.
2. 48-inch long sections of nominal 1-inch outside diameter (OD), flush-threaded steel drive-tube which are added to the probe tip as it is advanced.
3. Mylar sample tubing with an externally-threaded metal tip.
4. A plastic sampling syringe with two valved ports.

First, the pavement and upper foot of the underlying soil were pre-drilled, and the drive-tube was then driven to the desired sample depth, at which time the drive-tube was retracted slightly, partially ejecting the conical drive-tip from the drive-tube to admit the soil gas. The mylar sample tubing was then inserted into the drive-tube and the threaded metal tip was screwed into the upper end of the probe tip; the tubing was sufficiently long that it extended beyond the top of the drive-tube. A plastic syringe was connected to the upper end of the mylar tubing and the probe. The syringe and mylar tubing system was purged sufficiently to remove several times their combined volume prior to collecting the soil gas sample. While purging a probe, the valve of the inlet port (connected to the mylar tubing) was open and the valve of the exhaust port (open to the air) was closed; to empty the syringe, the positions of the valves were reversed. After purging, the soil gas sample was collected using the syringe. After sampling, the probe was then either driven to the next sampling depth (at which time the above procedure is repeated) or it was withdrawn. After collecting the deepest soil gas sample, the probe tube was withdrawn, leaving the drop-off drive tip behind, and each probe hole was filled with bentonite chips. After backfilling, the ground surface at each probe location was patched using asphalt cold patch or sand-cement mixture to match the surrounding paving materials.

Each soil gas sample syringe was labeled, and was hand-carried to TEG Hawaii's onsite mobile laboratory. The soil gas samples were analyzed onsite by TEG Hawaii within two hours of collection. Chain-of-Custody records were completed in the field.

Soil Sample Collection

TEG Hawaii used its truck-mounted direct-push rig to drive the soil sampler and collect the soil samples. TEG Hawaii's Strataprobe™ soil sampler system consists of the following:

1. A nominal 1-inch inside diameter (ID), 24-inch long, split-barrel steel sampler with removable (threaded) steel drive-tip and top assembly.

2. A conical-tipped end-plug (having an outside diameter (OD) slightly-smaller than 1 inch) with a rod attached to its top; the end-plug fits inside the sampler drive-tip.
3. Nominal 1-inch OD, 6-inch long, thin-walled stainless steel sample sleeves which fit inside the sampler barrel.
4. 48-inch long sections of nominal 1-inch OD, flush-threaded steel drive-tube which are added to the sampler as it is advanced.
5. 48-inch long sections of nominal ¼-inch OD threaded steel rod and threaded couplers.

First, the pavement and upper foot of the underlying soil were pre-drilled, and the soil sampler was then driven to the desired sample depth. Prior to reaching the sampling depth, the end-plug blocks the drive-tip and prevents soil from entering the sampler; the end-plug is fixed inside the drive-tip by a coupling that is reverse (left-hand) threaded into the top of the sampler and acts against the rod attached to the end-plug. When the sampling depth is reached, the threaded rod is inserted into the drive-tube and threaded into the reverse-threaded coupling to remove it from the sampler and free the end plug. The rod and coupling are then withdrawn from the tube. The sampler is then driven an additional 24-inches (or to refusal, if less than 24-inches), and soil enters and fills the sampler tube by pushing the end-plug upward inside the sampler tube.

After driving each soil sample, TEG Hawaii immediately withdrew the sampler and disassembled it. WCL then removed sample sleeves from the sampler and selected one of the sleeves for laboratory analysis. Both ends of the sample sleeve for laboratory analysis were covered with Teflon sheets and fitted with plastic end-caps. An additional sleeve from each sample was retained for field screening and geologic logging.

Photo Ionization Detector Calibration and Field Screening

The Photovac Microtip photo ionization detector (PID) was calibrated prior to the start of each field day using a 100-ppmv (parts per million; volumetric) hexane (isobutylene) gas standard; "zero air" calibration was accomplished at an up-wind location which had no olfactory evidence that volatiles were present, and which was remote from the USTs, motor vehicles and other volatile organic compound (VOC) sources.

For the splits of the soil samples, the field PID screening was accomplished by extruding the sample split from the sample sleeve into a plastic bag which was then sealed and set aside for approximately one-half hour to allow for any VOCs in the sample to migrate into the bag's headspace. The bag was then opened slightly, and the PID tube was inserted into the bag and the VOC concentration was measured. This headspace measurement method is considered better than the glass-jar method recommended in the DOH Technical Guidance Manual, because removal of the glass jar lid for PID measurement may result in substantial losses of VOCs. Soil sample headspace PID measurements were recorded.

Groundwater Monitoring Well Installation

After collecting the deepest sample, TEG Hawaii used its truck-mounted direct-push rig and soil sampling system to deepen each of the eight soil sampling points and permit installation of a groundwater monitoring well. After first pre-punching the hole to total depth using the Strataprobe™ soil sampling system, a 2-inch nominal OD, flush-threaded, thin-walled steel drive-tube was driven to refusal to allow well installation, due to caving soil conditions in the lower part of each well. The down-hole end of the drive-tube was fitted with a conical drop-off drive-tip which was ejected by retracting the drive-tube slightly when the total depth was reached.

The 1-inch nominal ID, flush-threaded, schedule 80 polyvinyl chloride (PVC) well casing and machine-slotted well screen (0.010 inch slots) were assembled and were inserted into the conductor casing. In the first seven wells, a 10-foot length of well screen was used, and in the eighth well (MW-8), a 5-foot length of well screen was used. After installing the well casing screen, the drive-tube was withdrawn and the annular materials (Monterey sand filter pack and bentonite chips) were successively placed in the well annulus. The Monterey sand filter pack extends from total depth to approximately 3 to 7 feet bgs. The bentonite chips extend from the top of the filter pack to approximately 1 to 2 feet bgs (approximately 5 feet bgs in MW-8).

The top of the casing was cut-off approximately 0.3 foot bgs, and was fitted with a PVC slip cap. The pavement surrounding each well-head was enlarged to accommodate the well-cover coupling, and the remaining well annulus was then filled with a sand-cement mixture, as part of the well-head cover installation. The well-head cover rim consists of a 3-inch ID, internally-threaded PVC coupling, and the well-head cover rim consists a 3-inch OD, externally-threaded brass plug. The rim/coupling was set in the sand-cement mixture so as to extend slightly above the surrounding ground surface, and the surface of the cement was tapered downward to match the surrounding ground surface.

Groundwater Monitoring Well Development

After installation, each of the wells was developed by pumping approximately 8 to 15 gallons of water from it using an air-operated diaphragm pump. A new section of Nalgene® suction tubing was used in each well to avoid cross-contaminating the wells. Each well pumped dry at approximately 1 to 3 gallons and pumping was then intermittent. The temperature, pH, and conductivity were monitored in the field during development. Development was continued until these three parameters had stabilized to within EH&S' criteria between the second and third measurements, and the discharge water was clear or there was no visual improvement in turbidity with continued development. The turbidity was also monitored and recorded. The development water from the eight wells was contained in two properly-labeled, USDOT-approved, 55-gallon drums which were temporarily stored onsite.

Caprock Groundwater Sample Collection

Prior to purging for each of the two groundwater sampling events, the caprock water table depths in the wells were measured. Each of the wells was then purged of approximately 1.5 gallons using a peristaltic pump. New sections of Nyloflow® suction and discharge tubing and Tygon® pump tubing were used in each well to avoid cross-contaminating the wells. The temperature, pH, and conductivity were monitored in the field during development. Purging was continued until these three parameters had stabilized to within EH&S' criteria between the second and third measurements, and the discharge water was clear or there was no visual improvement in turbidity with continued purging. The turbidity was also monitored and recorded. The purge water from the seven or eight wells was contained in a properly-labeled, USDOT-approved, 55-gallon drum which was temporarily stored onsite.

After purging, the water level was allowed to stabilize in each well, and a caprock groundwater sample was collected from each well. For TPH-G and BTEX analyses of the first-event samples, a stainless-steel bailer was used. The stainless-steel bailer was properly decontaminated prior to each use using Liquinox™ detergent, followed by successive potable and distilled water rinses; a bailer blank was collected after decontaminating the bailer to evaluate its effectiveness. For TPH-G and BTEX analyses of the second-event samples, precleaned, single-use polyethylene bailers were used, fitted with single-use, slow-discharge polyethylene bottom-emptying devices for sampling volatiles; the bailer and bottom-emptying device were disposed of after each well. For the TPH-O analyses of selected samples from each event, the peristaltic pump was used for sample collection.

For TPH-G and BTEX analyses, the caprock groundwater samples were each contained in two 40-mL VOA vials having Teflon septa. For the TPH-O analyses of selected samples from each event, the caprock groundwater samples were also each contained in one 1-liter amber glass bottle having a Teflon seal. The sample containers, which were appropriately preserved, were supplied by the analytical laboratory. Trip and field blanks of distilled water accompanied the samples from the time of collection until received by the analytical laboratory.

Soil and Caprock Groundwater Sample Labeling, Storage, and Chain-of-Custody Records

Each of the soil sample sleeves and caprock groundwater sample containers was properly labeled. The soil sample sleeves and caprock groundwater sample containers were immediately placed in chilled ice chests and were maintained in a chilled condition until analyzed. Chain-of-Custody records were completed in the field and accompanied the samples to the analytical laboratory.

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APPENDIX E

SOIL VAPOR SAMPLE ANALYTICAL RESULTS, LABORATORY QA/QC DATA, CHAIN-OF-CUSTODY RECORDS AND SELECTED CHROMATOGRAMS

teg hawaii

TRANSGLOBAL
ENVIRONMENTAL
GEOCHEMISTRY

October 27, 1995

Duncan Walker
Walker Consultants, Ltd.
7192 Kalanianaole Hwy, Suite G-220
Honolulu, HI 96825

SUBJECT: DATA REPORT - 1239 S. King St.

TEG Project #F50925

Mr. Walker:

Please find enclosed a data report for the samples analyzed from the above referenced project for Walker Consultants, Ltd.. The samples were collected by TEG personnel using the STRATAPROBE system and soil vapor samples were analyzed on-site in TEG's CA DOHS certified mobile laboratory (cert #1887).

The results of the analyses are summarized in the enclosed table. Also included are color 2D (contour) plots of the most prevalent species encountered. Also included is a plot of sampling locations for the survey.

Also enclosed is a brief description of TEG's soil vapor procedure for the analyses performed on the samples.

TEG appreciates the opportunity to have provided analytical services to Walker Consultants, Ltd. on this project. If you have any further questions relating to the data or report, please do not hesitate to contact us.

Sincerely,

Tim Fitzpatrick
Vice President
TEG Hawaii

WALKER CONSULTANTS, LTD
1239 S. KING STREET, HONOLULU, HI

TEG PROJECT #F50925

SOIL VAPOR DATA IN PPM BY VOLUME IN THE GAS

SAMPLE DESCRIPTION	BLANK	SV1-11	SV1-5	SV2-11	SV3-11	SV4-11	SV5-11	SV6-5	SV6-11	SV7-5	SV7-11
DATE ANALYZED	9/25/95	9/25/95	9/25/95	9/25/95	9/25/95	9/25/95	9/25/95	9/26/95	9/25/95	9/26/95	9/25/95
SAMPLING DEPTH (ft)	•	11	5	11	11	11	11	5	11	5	11
VOLUME WITHDRAWN (cc)	240	240	240	240	240	240	240	240	240	240	240
BENZENE	nd	6.28	nd	nd	nd	nd	nd	nd	2.41	nd	2.84
TOLUENE	nd	0.18	nd	nd	nd	nd	nd	nd	nd	nd	nd
ETHYLBENZENE	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TOTAL XYLENES	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TPH	nd	12700	23	36	1890	nd	nd	nd	29500	260	45600
METHANE	nd	3050	nd	nd	1890	nd	nd	nd	10000	56	14100
CO2 (%)	nd	10.80	8.30	7.75	6.90	7.41	7.77	2.6	10.3	7.7	11.2
O2 (%)	21.00	5.15	7.47	9.11	10.4	9.80	9.70	10.2	1.82	4.60	1.68
CO2/O2 RATIO	nd	2.12	1.11	0.85	0.66	0.77	0.80	0.26	5.66	1.67	6.67

ND MEANS NOT DETECTED AT 0.100 PPMV FOR EACH COMPONENT - 10 PPMV FOR TPH

SAMPLES ANALYZED IN TEG'S CA-DOHS CERTIFIED MOBILE LAB (CERT #1887)

ANALYSES PERFORMED BY: PHILIP HABECKER

DATA REVIEWED BY: TIM FITZPATRICK

teg

TRANSGLOBAL ENVIRONMENTAL GEOCHEMISTRY

WALKER CONSULTANTS, LTD
1239 S. KING STREET, HONOLULU, HI

TEG PROJECT #F50925

SOIL VAPOR DATA IN PPM BY VOLUME IN THE GAS

SAMPLE DESCRIPTION	SV8-11	SV8-5	SV9-11	SV9-5	SV10-12	SV11-5	SV11-12	SV12-5	SV12-12.5	SV13-12	SV14-12
DATE ANALYZED	9/25/95	9/26/95	9/25/95	9/26/95	9/25/95	9/26/95	9/25/95	9/26/95	9/25/95	9/25/95	9/26/95
SAMPLING DEPTH (ft)	11	5	11	5	12	5	12	5	12.5	12	12
VOLUME WITHDRAWN (cc)	240	240	240	240	240	240	240	240	240	240	240
BENZENE	0.290	nd	1.80	nd	nd	nd	0.723	nd	nd	nd	nd
TOLUENE	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
ETHYLBENZENE	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TOTAL XYLENES	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TPH	43700	38	23800	1170	31	nd	45500	879	37400	562	nd
METHANE	17100	nd	7730	832	nd	nd	17200	323	15300	211	nd
CO2 (%)	9.36	6.48	7.22	2.32	5.65	2.12	9.88	4.22	9.87	9.35	5.71
O2 (%)	3.12	5.55	6.87	13.5	11.8	15.0	2.95	12.7	2.97	2.89	9.21
CO2/O2 RATIO	3.00	1.17	1.05	0.17	0.48	0.14	3.35	0.33	3.32	3.24	0.62

ND MEANS NOT DETECTED AT 0.100 PPMV FOR EACH COMPONENT - 10 PPMV FOR TPH

SAMPLES ANALYZED IN TEG'S CA-DOHS CERTIFIED MOBILE LAB (CERT #1887)
ANALYSES PERFORMED BY: PHILIP HABECKER
DATA REVIEWED BY: TIM FITZPATRICK

teg

TRANSGLOBAL ENVIRONMENTAL GEOCHEMISTRY

WALKER CONSULTANTS, LTD
1239 S. KING STREET, HONOLULU, HI

TEG PROJECT #F50925

SOIL VAPOR DATA IN PPM BY VOLUME IN THE GAS

SAMPLE DESCRIPTION	SV15-12	SV16-12	SV17-12	SV18-11.5	SV18-11.5 DUP	SV19-11	SV19-11 DUP
DATE ANALYZED	9/25/95	9/25/95	9/25/95	9/26/95	9/26/95	9/26/95	9/26/95
SAMPLING DEPTH (ft)	12	12	12	11.5	11.5	11	11
VOLUME WITHDRAWN (cc)	240	240	240	240	240	240	240
BENZENE	0.238	nd	nd	nd	nd	nd	nd
TOLUENE	nd	nd	nd	nd	nd	nd	nd
ETHYLBENZENE	nd	nd	nd	nd	nd	nd	nd
TOTAL XYLENES	nd	nd	nd	nd	nd	nd	nd
TPH	3160	1420	nd	18	nd	nd	nd
METHANE	683	272	nd	nd	nd	nd	nd
CO_2 (%)	4.92	4.04	8.43	4.81	3.58	5.93	6.33
O_2 (%)	8.79	9.98	11.7	17.0	14.7	14.5	14.2
CO_2/O_2 RATIO	0.56	0.40	0.72	0.27	0.24	0.41	0.45

ND MEANS NOT DETECTED AT 0.100 PPMV FOR EACH COMPONENT - 10 PPMV FOR TPH

SAMPLES ANALYZED IN TEG'S CA-DOHS CERTIFIED MOBILE LAB (CERT #1887)
ANALYSES PERFORMED BY: PHILIP HABECKER
DATA REVIEWED BY: TIM FITZPATRICK

TRANSGLOBAL ENVIRONMENTAL GEOCHEMISTRY, INC.

CHAIN-OF-CUSTODY RECORD

CLIENT: WALKER CONSULTANTS
ADDRESS:
PHONE: 395-0392 FAX:
CLIENT PROJECT #: 95-119X7 (GH) PROJECT MANAGER: DUNCAN

DATE: SEPT 25 1995 PAGE 1 OF 3
TEG PROJECT #: F5 0925
LOCATION: 1239 SKING ST
COLLECTOR: TEG SPROBE DATE OF COLLECTION: 9-25

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 gasoline	TPH 8015 diesel	TPH 8015 (g & d)	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TOTAL LEAD	pH	ASBESTOS	CO2/O2 TVH			FIELD NOTES	Total Number Of Containers	Laboratory Note Number
SV1-5	5'	0930	SOIL VAPOR	30cc Syringe	X														X	X				2	
SV1-11	11'	0935	"	60cc Syringe	X														X	X				1	
SV2-5	5'	1000	"	"	X														X	X			HOLD	2	
SV2-11	11'	1005	"	"	X														X	X				1	
SV3-5	5'	1020	"	"	X														X	X			HOLD	2	
SV3-11	11'	1030	"	"	X														X	X					
SV4-5	5'	1100	"	"																			HOLD		
SV4-11	11'	~~1105~~	"	"	X														X	X			1005		
SV5-5'	5'	~~1120~~	"	"																			HOLD 1020		
SV5-11'	11	~~1128~~	"	"	X														X	X			1100		
SV6-5'	5'	~~1138~~	"	"	X														X	X			HOLD 1135 RUN		
SV6-11	11'	~~1148~~	"	"	X														X	X			1140=TIME		
SV7-5	5'	1204	"	"	X														X	X			HOLD RUN		
SV7-11	11'	1210	"	"	X														X	X					
SV8-5	5	1225	"	"	X														X	X			HOLD RUN		
SV8-11	11	1231	"		X														X	X					
SV9-5	5	1252	"		X														X	X			HOLD RUN		
SV 9-11	11	1310			X														X	X					

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
D—	9/25/95/1525	Phil Habel	9/25/95 1525
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	

LABORATORY NOTES:
HELD SAMPLES STORED IN VAPOR VIAL 1 EACH

SAMPLE DISPOSAL INSTRUCTIONS

TRANSGLOBAL ENVIRONMENTAL GEOCHEMISTRY, INC.

CHAIN-OF-CUSTODY RECORD

CLIENT: WALKER
ADDRESS:
PHONE: FAX:
CLIENT PROJECT #: 95-1197 PROJECT MANAGER: DUNCAN

DATE: SEPT 25 - 1995 PAGE 2 OF 3
TEG PROJECT #: F50925
LOCATION: 1299 S. KING ST
COLLECTOR: TEG STROBE DATE OF COLLECTION: 9-25

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (g & d)	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TOTAL LEAD	pH	ASBESTOS	CO2/O2	TVH			FIELD NOTES	Total Number Of Containers	Laboratory Note Number
SV10-5	5'	1410	VAPOR	SYRINGE	X																			HOLD	2	
SV10-12	12'	1415	"	"	X														X	X						
SV11-5	5'	1430	"	"	X														X	X				HOLD RUN —		
SV11-12	12'	1441	"	"	X														X	X						
SV12-5	5'	1500	"	"	X														X	X				HOLD RUN —		
SV12-12.5	12.5	1510	"	"	X														X	X				H2O @ 12.5		
SV13-5	5'	1530	"	"																				HOLD		
SV13-13'2	13'2	1545	"	"	X														X	X						
SV14-5	5'	1550	"	"																				HOLD		
SV14-12	12	1605	"	"	X														X	X						
SV15-5	5'	1620	"	"																				HOLD		
SV15-12	12'	1650	"	"	X														X	X						
SV16-5'	5'	1645	"	"	X NO(PH)																	HOLD		H2O @ 13		
SV16-12'	12'	1700	"	"	X														X	X						
SV17-12	12'	1730	"	"	X														X	X						
SV18-11.5	11.5	1800	"	"																				HOLD		
SV18-11.5DA	11.5	1801	"	"	X														X	X						
SV19-11	11	1807	"	"	X														X	X						

RELINQUISHED BY: (Signature) [signature] DATE/TIME 9/25/95/1822 RECEIVED BY: (Signature) Phil Hated DATE/TIME 9/25/95 1835

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature) DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT
TOTAL NUMBER OF CONTAINERS
CHAIN OF CUSTODY SEALS Y/N/NA
SEALS INTACT? Y/N/NA
RECEIVED GOOD COND./COLD
NOTES:

LABORATORY NOTES:

teg ENVIRONMENTAL GEOCHEMISTRY, INC.

CHAIN-OF-CUSTODY RECORD

CLIENT: WALKER
ADDRESS:
PHONE: FAX:
CLIENT PROJECT #: 95-1197 PROJECT MANAGER: DUNCAN

DATE: SEPT 25 1995 PAGE 3 OF 3
TEG PROJECT #: F50925
LOCATION: 1234 KING ST
COLLECTOR: TEG DATE OF COLLECTION: 9-25

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (g & d)	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TOTAL LEAD	pH	ASBESTOS	Co2/O2	TVH			FIELD NOTES	Total Number Of Containers	Laboratory Note Number
9-11DUP	11'	1819	Vapor	SYRINGE	X														X	X						

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
Dw	9/25/95/1825	Phil Holand	9/25/95 1825
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

TEG DISPOSAL @ $2.00 each [ ] Return [ ] Pickup

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS
CHAIN OF CUSTODY SEALS Y/N/NA
SEALS INTACT? Y/N/NA
RECEIVED GOOD COND./COLD
NOTES:

LABORATORY NOTES:
PLEASE RUN
6, 7, 8, 9, 11, 12
SHALLOW SAMPLES

0000 0005 0945

teg

STRATAPROBE™

Soil Vapor Sampling Procedures

Probe Construction

TEG's soil vapor probes are constructed of one inch diameter, steel, equipped with a hardened, steel tip. Nominal lengths are 5 feet although additional lengths may be added. An inert 1/8 inch polypropylene nylaflow tube runs down the center of the probe to sampling port.

Probe Insertion

The probe is driven into the ground by an electric rotary hammer or with TEG's *STRATAPROBE*™ system. Once inserted to the desired depth, the probe is retracted which opens the tip and exposes the vapor sampling port. This design prevents clogging of the sampling ports and cross-contamination from soils during insertion.

Soil Gas Sampling

Soil vapor is withdrawn from the nylaflow tubing using a 20 cc syringe connected via an on-off valve. The first 5 dead volumes of gas are discarded to flush the probe and fill it with in-situ soil vapor. The next 20 cc of gas are withdrawn in the syringe, plugged, and immediately transferred to the mobile lab for analysis within minutes of collection. Additional soil vapor samples may be collected and stored in gas-tight containers as desired.

Flushing & Decontamination Procedures

To minimize the potential for cross-contamination between sites, all external probe parts are cleaned of excess dirt and moisture prior to insertion. The internal nylaflow tubing and sampling ports are flushed with hundreds of cc's of ambient air between samples. If water, dirt, or any material is observed in the tubing, the tubing is replaced with fresh tubing. If concentrations greater than 100 ppmv are detected for any compound (except methane), the tubing is replaced.

Sampling syringes are opened and exposed to outside air on a clean surface to allow any volatiles to escape after each use. If concentrations greater than 100 ppmv are detected for any compound (except methane), the syringe is discarded.

Field Collection Log

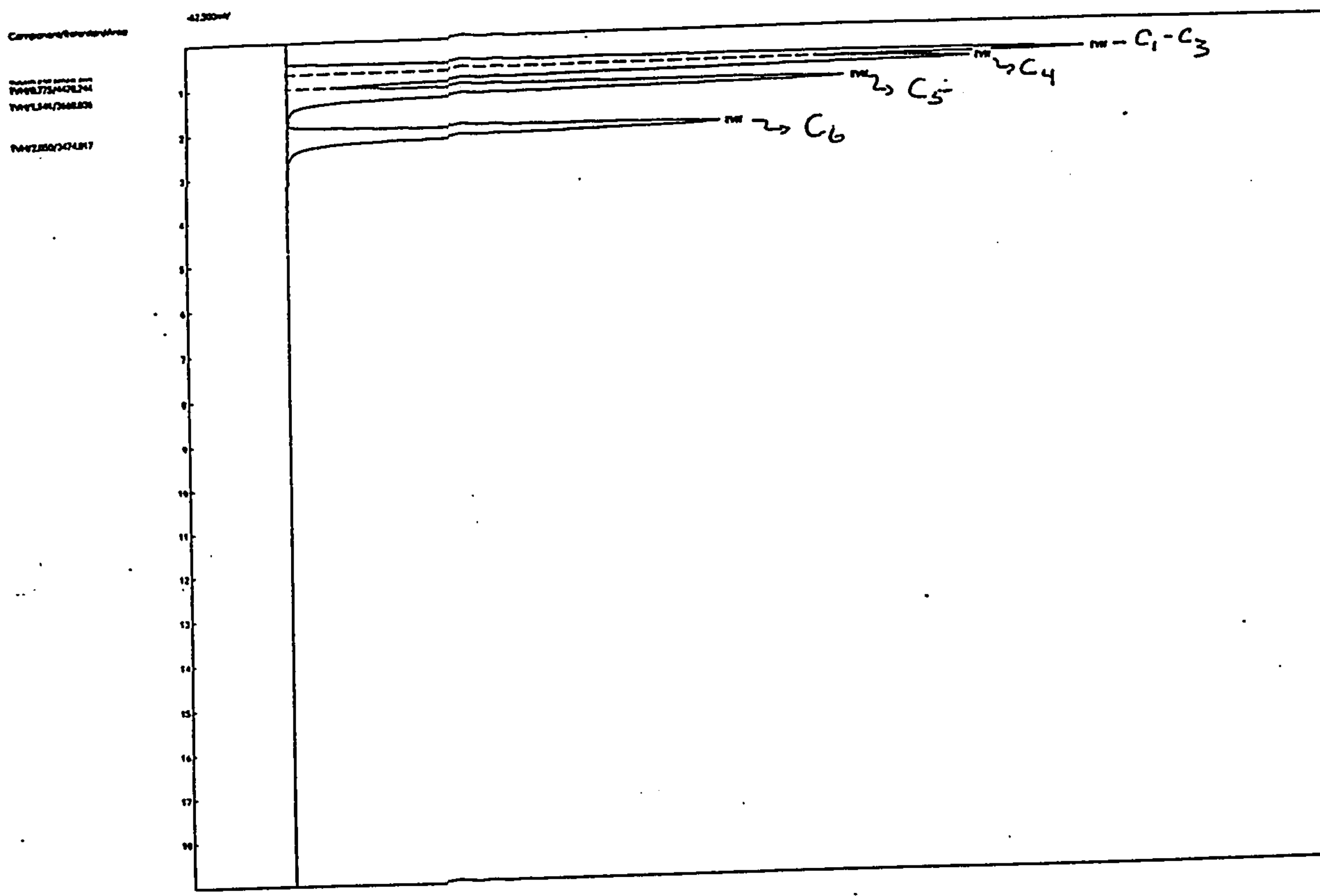
The field technician completes a logsheet summarizing depth of penetration, refusal, which probe is used on each sampling location, when tubing is replaced, any visual contamination on the probe, OVM readings as applicable, and any other unusual occurrences at a particular sampling location.

Transfer of Samples to the Laboratory

The sample syringe is immediately transferred in to the mobile laboratory for immediate analysis following the protocols discussed in the Analytical Methodology Section.

0000 0005 0947

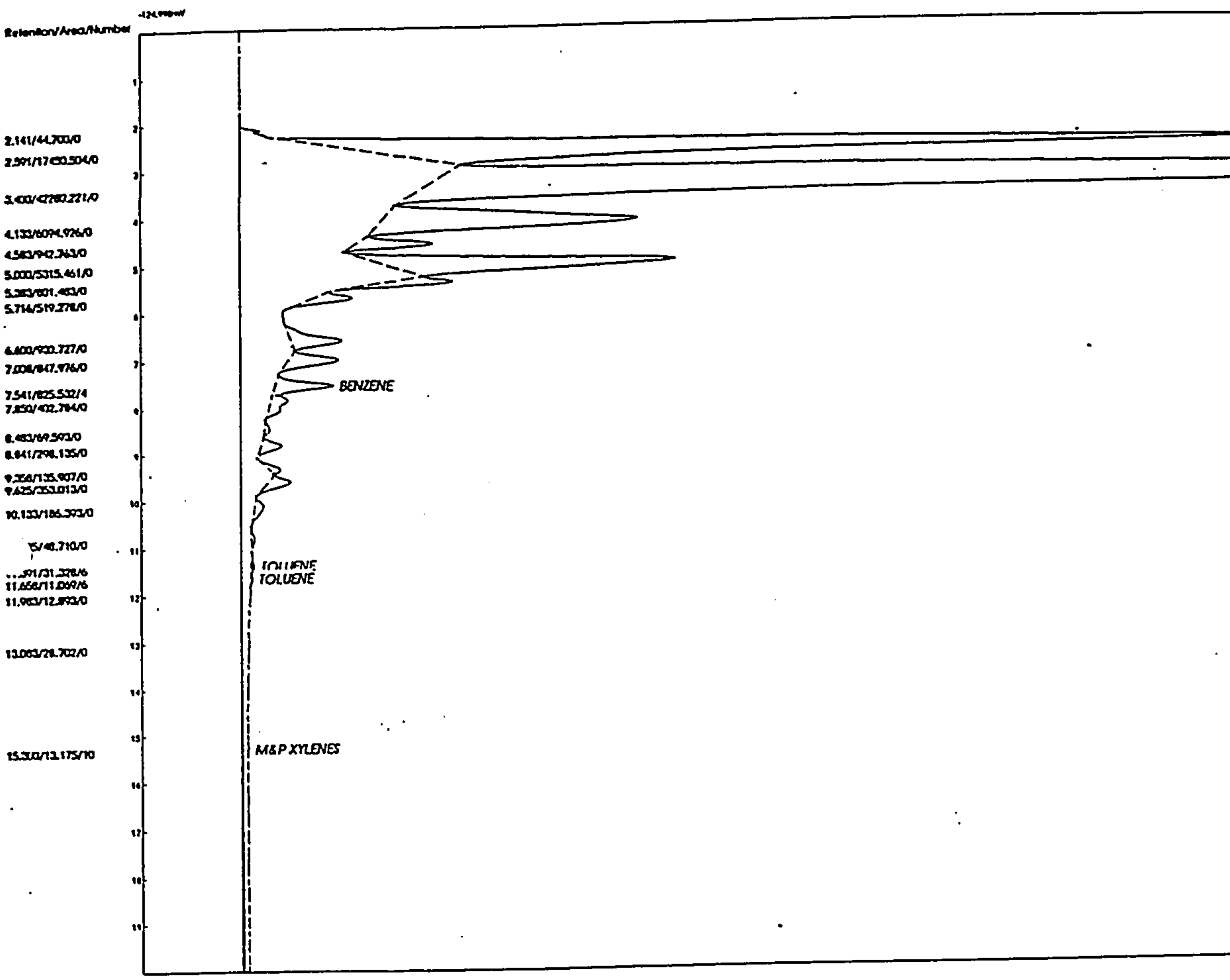
Lab name: IEG HAWAII
Client: WCL
Analysis date: 09/26/1995 16:24:51
Description: SRI #1 FID
Column: OLD RESTEK MXT-VOL
Carrier: N2 @150
ntegration: Peak sens=80.0 Base sens=60.0 Min area= 35.00 Dilution= 1.000 Tangents=off
Data file: C:\PEAK\0926A15.CHR 0
Sample: 600pppmV
Operator: PH



Component	Number	Retention	Area	Internal
TVH	1	0.625	4068.402	186.3248
TVH	1	0.775	4478.244	205.0948
TVH	1	1.141	3668.036	167.9888
TVH	1	2.050	3474.017	159.1031
	4		15689	719

0000 0005 0948

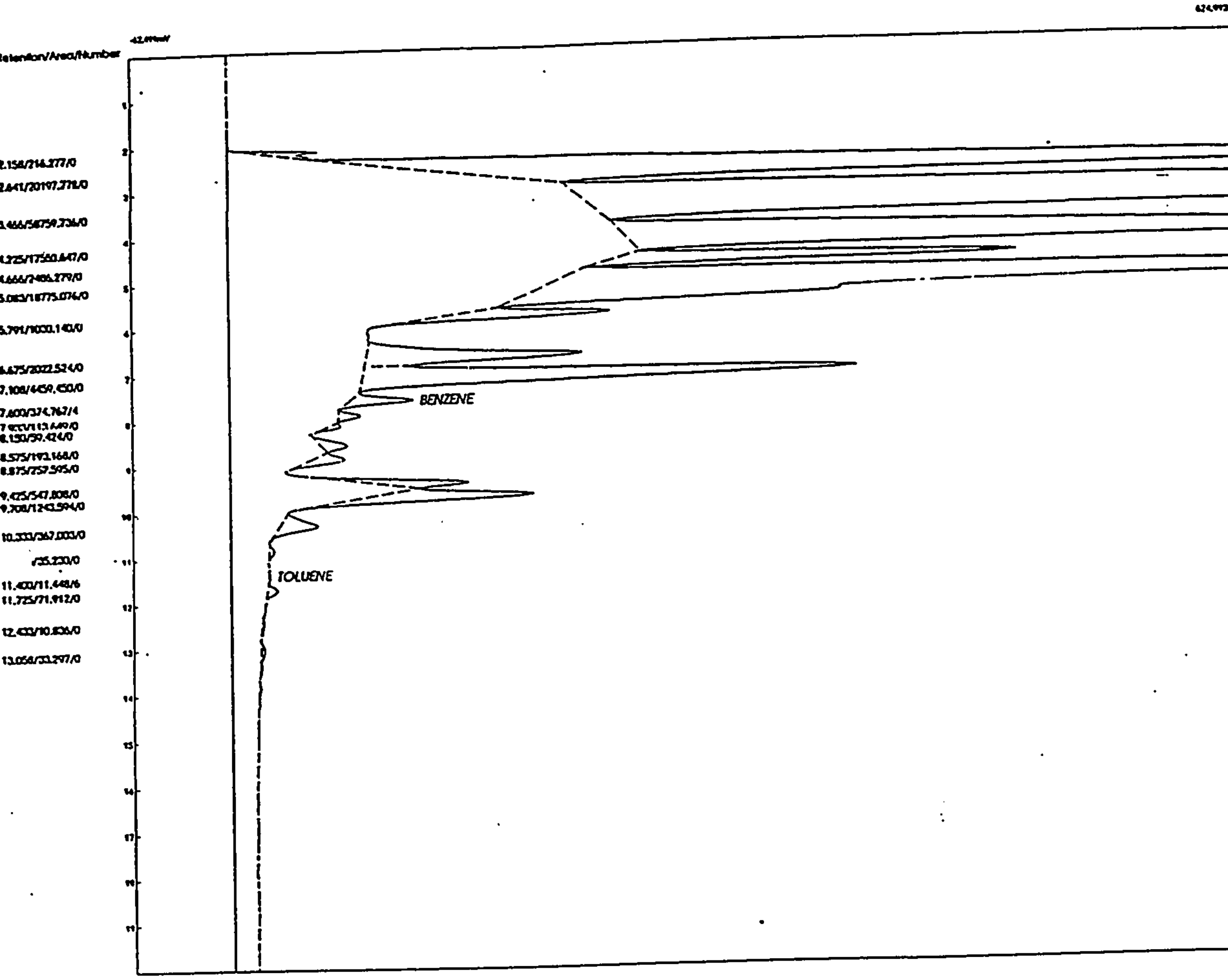
Lab name: TEG HAWAII
Client: WCL
Analysis date: 09/25/1995 09:38:02
Description: outboard pid
Integration: Peak sens=85.0 Base sens=40.0 Min area= 10.00 Dilution= 1.000 Tangents=on
Data file: C:\PEAK\09025C6.CHR 0
Sample: SV1-11
Operator: PH



Component	Retention	Area	Internal w/o
BENZENE	7.541	825.532	20.4430
TOLUENE	11.391	31.328	0.6903
TOLUENE	11.658	11.069	0.2439
M&P XYLENES	15.300	13.175	0.3191
		881	22

0000 0005 0949

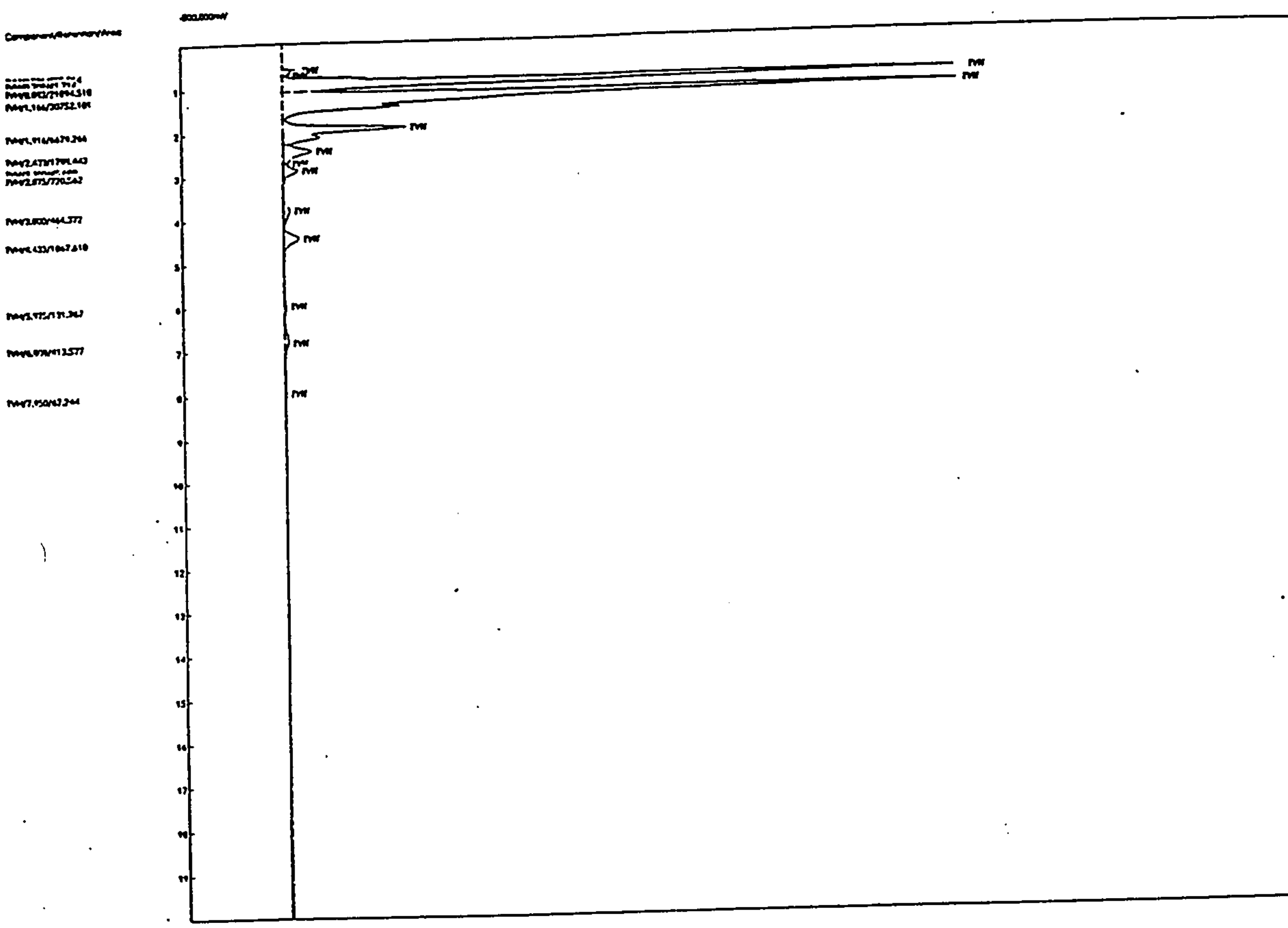
Lab name: TEG HAWAII
Client: WCL
Analysis date: 09/25/1995 12:36:52
Description: outboard pid
Integration: Peak sens=85.0 Base sens=40.0 Min area= 10.00 Dilution= 1.000 Tangents=on
Data file: C:\PEAK\09025C12.CHR 0
Sample: SV6-11
Operator: PH



Component	Retention	Area	Internal w/o
BENZENE	7.600	374.767	7.8187
TOLUENE	11.400	11.448	0.2522
		386	8

0000 0005 0950

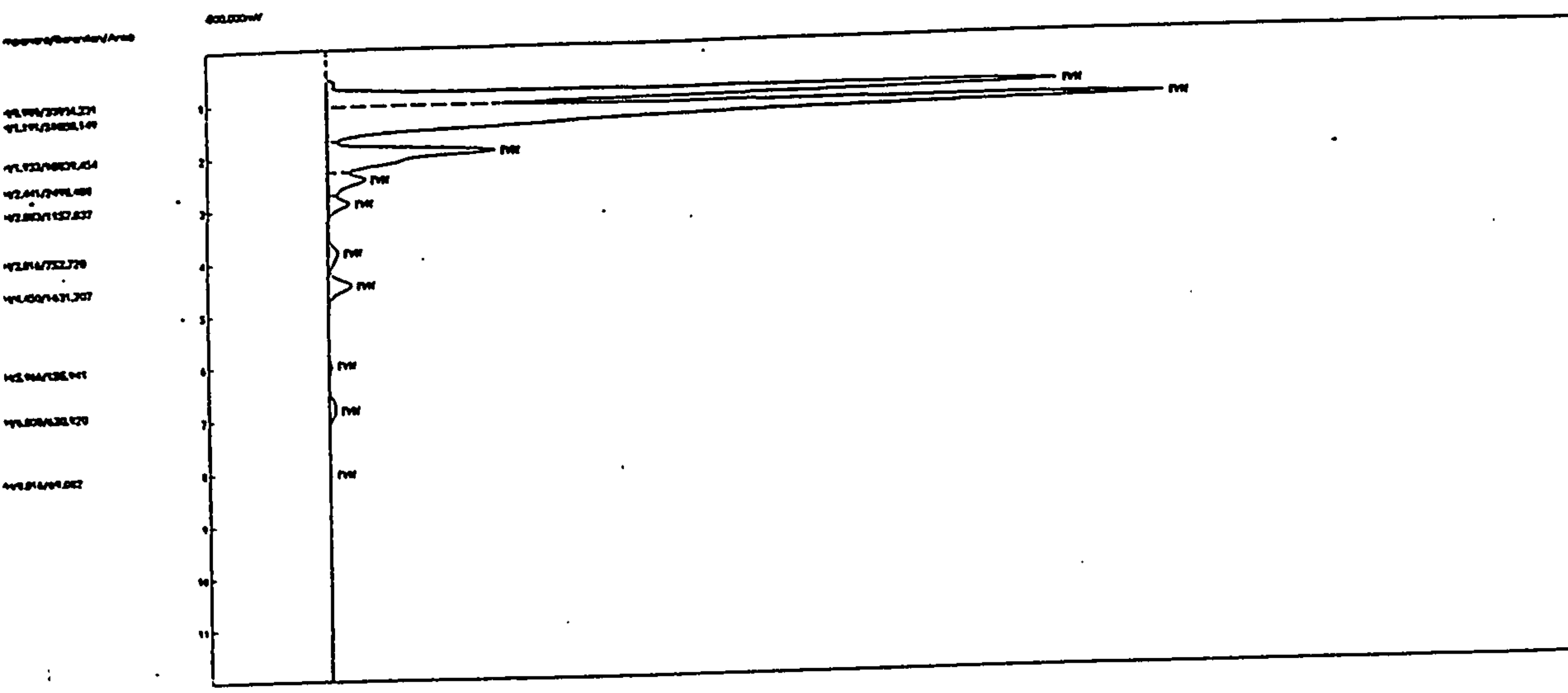
Lab name: IEG HAWAII
Client: WCL
Analysis date: 09/25/1995 12:36:52
Description: SRI #1 FID
Column: OLD RESTEK MXT-VOL
Carrier: N2 @150
Integration: Peak sens=80.0 Base sens=60.0 Min area= 35.00 Dilution= 1.000 Tangents=off
Data file: C:\PEAK\0925A12.CHR 0
Sample: SV6-11 1:10
Operator: PH



Component	Number	Retention	Area	Internal	
TVH	1	0.591	355.014	16.2590	
TVH	1	0.708	41.714	1.9104	
TVH	1	0.883	21894.518	1002.7258	METHANE x10 = 10,000
TVH	1	1.166	30752.101	1408.3857	
TVH	1	1.916	6679.266	305.8972	
TVH	1	2.433	1788.443	81.9072	
TVH	1	2.700	45.688	2.0924	
TVH	1	2.875	720.562	33.0003	
TVH	1	3.800	464.372	21.2673	
TVH	1	4.433	1067.610	48.8944	
	1	5.975	131.767	6.0346	
TVH	1	6.808	413.577	18.9410	
TVH	1	7.950	62.244	2.8507	
	13		64417	2950 x10 = 29,500	

0000 0005 0951

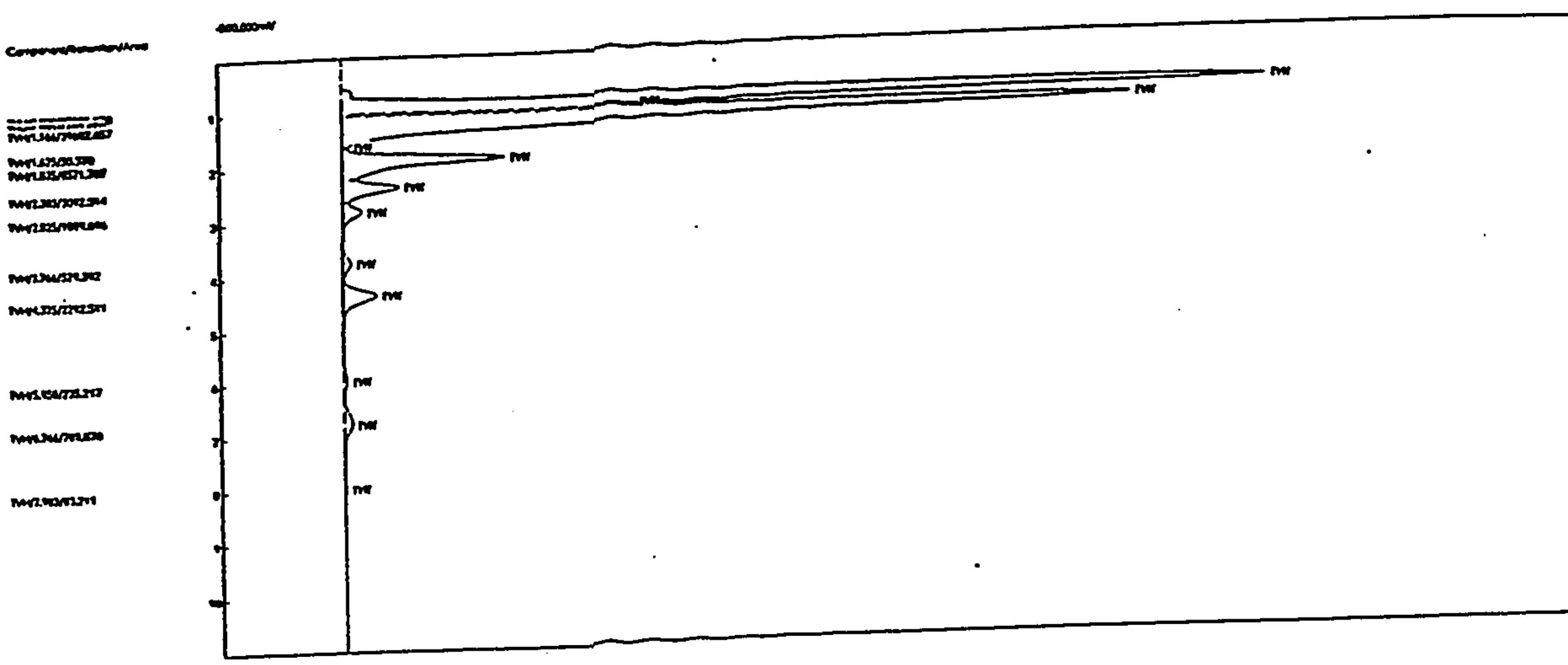
Lab name: TEG HAWAII
Client: WCL
Analysis date: 09/25/1995 13:37:39
Description: SRI #1 FID
Column: OLD RESTEK MXT-VOL
Carrier: N2 @150
Integration: Peak sens=80.0 Base sens=60.0 Min area= 35.00 Dilution= 1.000 Tangents=off
Data file: C:\PEAK\0925A14.CHR 0
Sample: SV7-11 1:10
Operator: PH



Component	Number	Retention	Area	Internal	
VH	1	0.908	30804.231	1410.7731	Y~14,100
VH	1	1.191	51058.149	2338.3627	
VH	1	1.933	10839.454	496.4256	
VH	1	2.441	2498.488	114.4258	
VH	1	2.883	1157.837	53.0267	
VH	1	3.816	752.720	34.4731	
VH	1	4.450	1631.707	74.7290	
VH	1	5.966	155.941	7.1418	
VH	1	6.808	620.920	28.4369	
VH	1	8.016	69.082	3.1638	
	10		99589	4561	45,610

0000 0005 0952

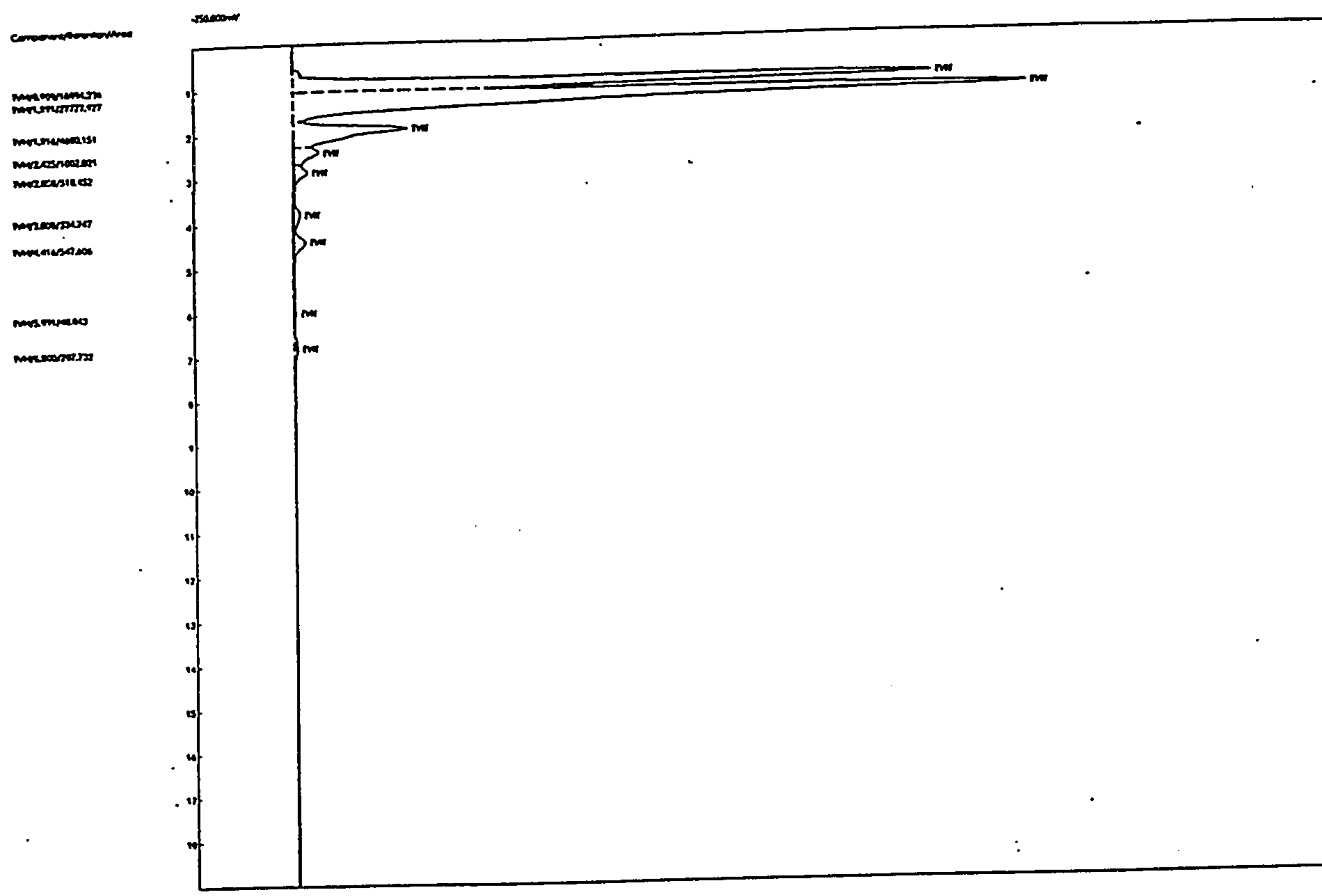
Lab name: TEG HAWAII
Client: WCL
Analysis date: 09/25/1995 14:26:55
Description: SRI #1 FID
Column: OLD RESTEK MXT-VOL
Carrier: N2 @150
Integration: Peak sens=80.0 Base sens=60.0 Min area= 35.00 Dilution= 1.000 Tangents=off
Data file: C:\PEAK\0925A16.CHR 0
Sample: SV8-11 1:10
Operator: PH



Component	Number	Retention	Area	Internal	
TVH	1	0.908	37391.130	1712.4401	X10 17100 METHANE
TVH	1	1.033	1603.659	73.4444	
TVH	1	1.166	39602.657	1813.7237	
TVH	1	1.625	50.370	2.3068	
TVH	1	1.875	8571.707	392.5673	
TVH	1	2.383	3092.514	141.6310	
TVH	1	2.825	1089.696	49.9059	
TVH	1	3.766	529.392	24.2451	
TVH	1	4.375	2292.511	104.9925	
TVH	1	5.958	235.217	10.7725	
TVH	1	6.766	789.870	36.1745	
TVH	1	7.983	83.211	3.8109	
	12		95332	4366	

0000 0005 0953

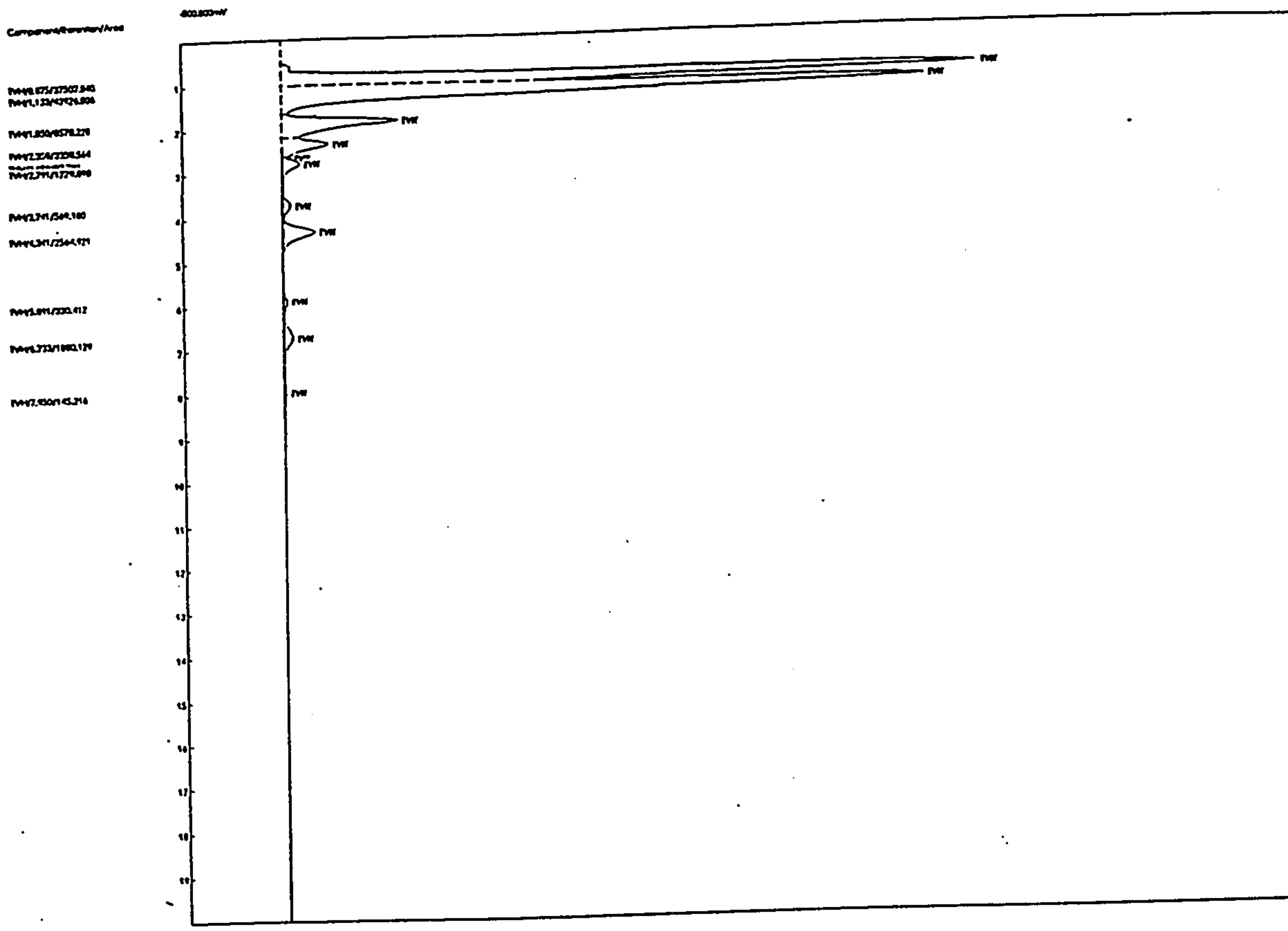
Lab name: TEG HAWAII
Client: WCL
Analysis date: 09/25/1995 15:11:27
Description: SRI #1 FID
Column: OLD RESTEK MXT-VOL
Carrier: N2 @150
Integration: Peak sens=80.0 Base sens=60.0 Min area= 35.00 Dilution= 1.000 Tangents=off
Data file: C:\PEAK\0925A18.CHR 0
Sample: SV9-11 1:10
Operator: PH



Component	Number	Retention	Area	Internal	
TVH	1	0.908	16884.336	773.2693	x 7730
TVH	1	1.191	27727.927	1269.8844	
TVH	1	1.916	4680.151	214.3417	
TVH	1	2.425	1002.021	45.8906	
TVH	1	2.858	518.452	23.7441	
TVH	1	3.808	334.747	15.3307	
TVH	1	4.416	547.606	25.0793	
TVH	1	5.991	48.843	2.2369	
TVH	1	6.800	207.732	9.5137	
	9		51952	2379	x 23,80.0

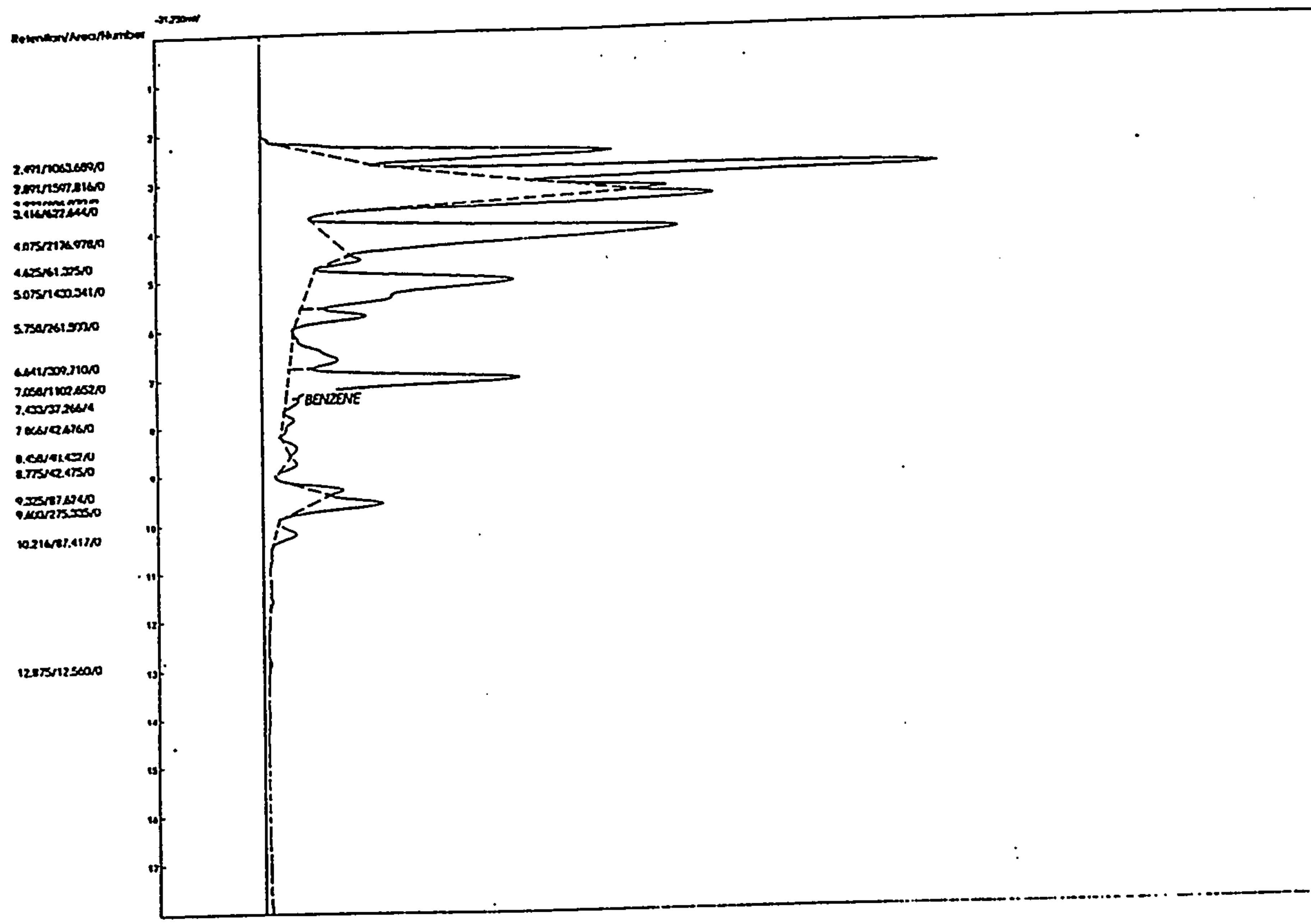
0000 0005 0954

Lab name: TEG HAWAII
Client: WCL
Analysis date: 09/25/1995 16:20:32
Description: SRI #1 FID
Column: OLD RESTEK MXT-VOL
Carrier: N2 @150
egration: Peak sens=80.0 Base sens=60.0 Min area= 35.00 Dilution= 1.000 Tangents=off
Data file: C:\PEAK\0925A21.CHR 0
Sample: SSV11-12 1:10
Operator: PH



Component	Number	Retention	Area	Internal
TVH	1	0.875	37507.840	1717.7852 X 10 17200 METHANE
TVH	1	1.133	43926.806	2011.7612
TVH	1	1.850	8578.228	392.8659
TVH	1	2.358	3358.564	153.8156
TVH	1	2.650	87.781	4.0202
TVH	1	2.791	1229.090	56.2899
TVH	1	3.741	569.100	26.0637
TVH	1	4.341	2564.921	117.4684
TVH	1	5.891	330.412	15.1322
TVH	1	6.733	1080.129	49.4678
	1	7.950	145.216	6.6506
	11		99378	4551 X 10 = 45500

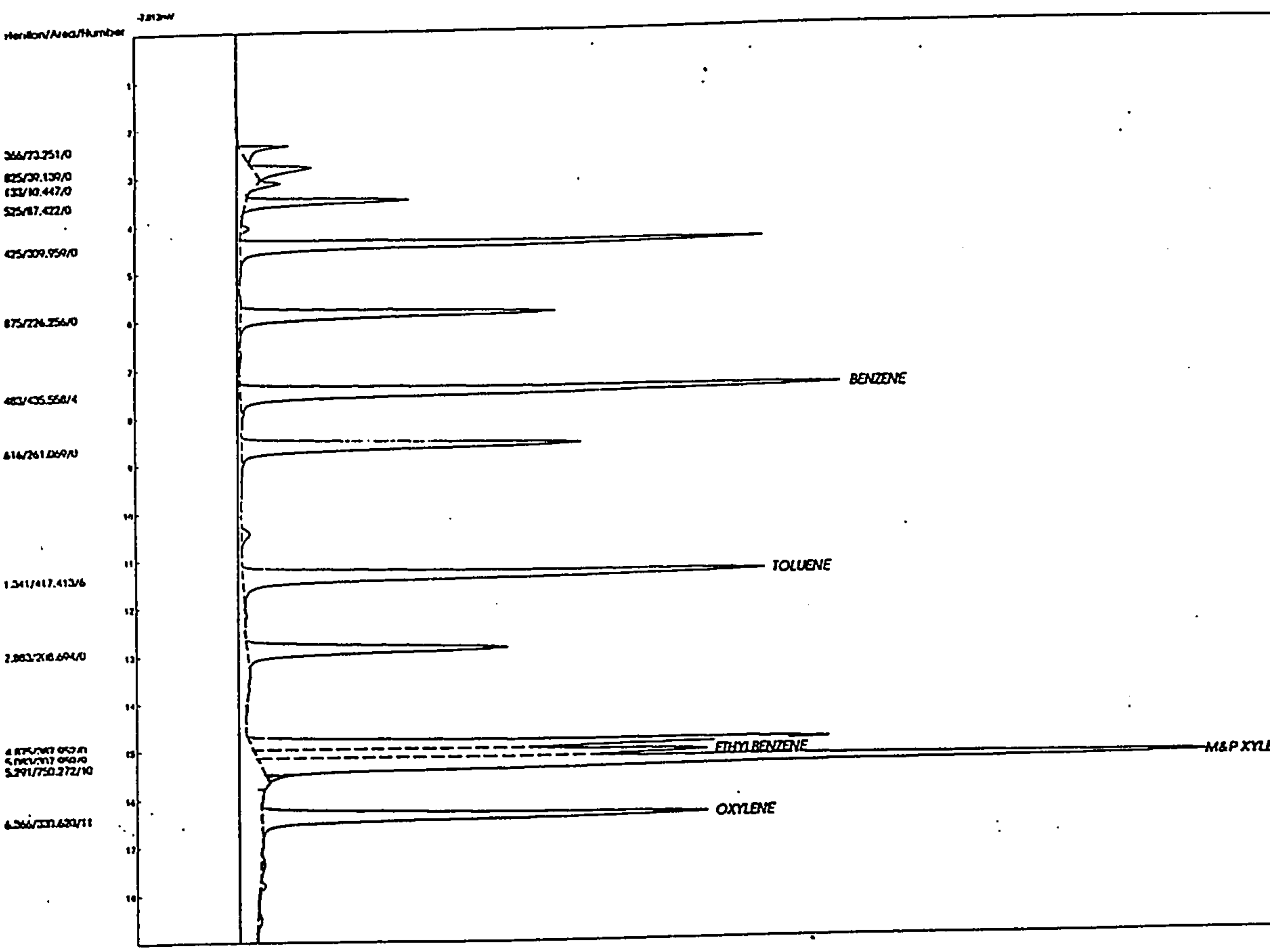
Lab name: TEG HAWAII
Client: WCL
Analysis date: 09/25/1995 18:42:57
Description: outboard pid
Integration: Peak sens=85.0 Base sens=40.0 Min area= 10.00 Dilution= 1.000 Tangents=on
Data file: C:\PEAK\09025C27.CHR 0
Sample: SV15-12
Operator: PH



Component	Retention	Area	Internal w/o
BENZENE	7.433	37.266	0.7775
		37	1

0000 0005 0956

Lab name: TEG HAWAII
Client: WCL
Analysis date: 09/26/1995 15:58:15
Description: outboard pid
Integration: Peak sens=85.0 Base sens=40.0 Min area= 10.00 Dilution= 1.000 Tangents=on
Data file: C:\PEAK\09026C14.CHR 0
Sample: 10NG 8021
Operator: PH



Component	Retention	Area	Internal w/o
BENZENE	7.483	435.558	·9.0870
TOLUENE	11.341	417.413	9.1972
ETHYLBENZENE	15.083	307.959	9.6582
M&P XYLENES	15.291	750.272	18.1720
OXYLENE	16.366	330.620	9.4878
		2242	56

0000 0005 0957

APPENDIX F

LOGS AND SCHEMATICS OF WELLS

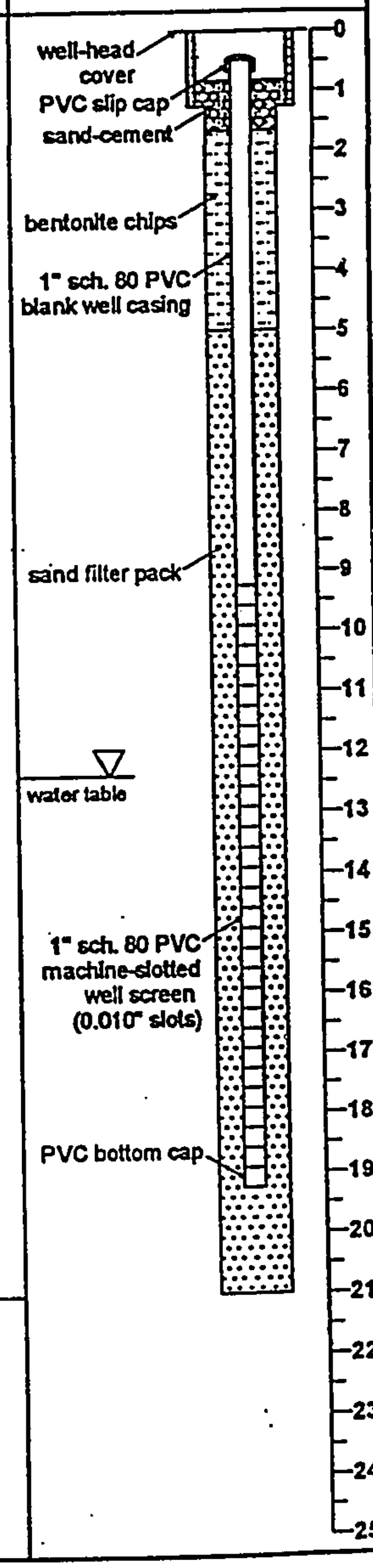
0000 0005 0958

LOG AND SCHEMATIC OF WELL MW-1

Project Name: King Street Texaco	
Project Location: 1239 South King Street, Honolulu, Hawaii	**Drilling Date:** September 26, 1995
Well Location: Near Northeastern Property Corner	**Drilling Method:** Strataprobe Direct-Push Rig
Driller: TEG Hawaii (Eric/Greg)	**Sampling Method:** 1.5" Split Barrel Sampler (Strataprobe driven)
Geologist: Duncan Walker	**Static Water Level:** ~12.4' below ground surface

Depth (feet, bgs)	Sample Identifier	PID (ppmv)	Lithologic Symbol	USCS Symbol	Description
0					Asphalt pavement.
				gp	Gray sand/gravel base course, sl.damp.
6	MW1-6	1.5		ml	Dk. brown clayey silt/fn. sand, mod. plastic, damp (no odor).
12	MW1-12	9.1		sw	Dk. gray f-c basaltic sand, moist-wet (no odor).
16				sp/gp	Buff-tan coralline gravel/sand, wet (no odor).
21					T.D. = 21'

Well Schematic



WALKER CONSULTANTS, LTD.

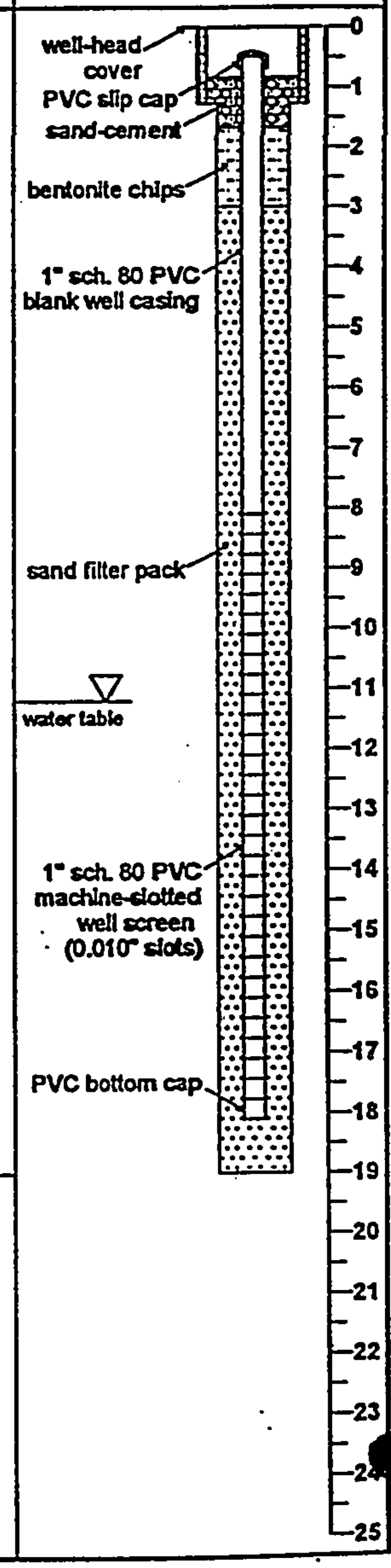
0000 0005 0959

LOG AND SCHEMATIC OF WELL MW-2

Project Name: King Street Texaco	
Project Location: 1239 South King Street, Honolulu, Hawaii	**Drilling Date:** September 26, 1995
Well Location: Southwest of Service Station Building	**Drilling Method:** Strataprobe Direct-Push Rig
Driller: TEG Hawaii (Eric/Greg)	**Sampling Method:** 1.5" Split Barrel Sampler (Stratoprobe driven)
Geologist: Duncan Walker	**Static Water Level:** ~11.2' below ground surface

Depth (feet, bgs)	Sample Identifier	PID (ppmv)	Lithologic Symbol	USCS Symbol	Description
0					Asphalt pavement.
				gp	Gray sand/gravel base course, sl.damp.
6	MW2-6	0.5		ml	Dk. brown clayey silt/fn. sand, mod. plastic, moist (no odor).
9	MW2-9	2.4		sm	Dk. gray silty f-c basaltic sand w/fn. gravel, moist (no odor).
11	MW2-11	ND		sw	Dk. gray f-c basaltic sand, wet (no odor).
13	MW2-13	0.6		sp/gp	Buff-tan coralline gravel/sand, wet (no odor).
19					T.D. = 19'

Well Schematic



WALKER CONSULTANTS, LTD.

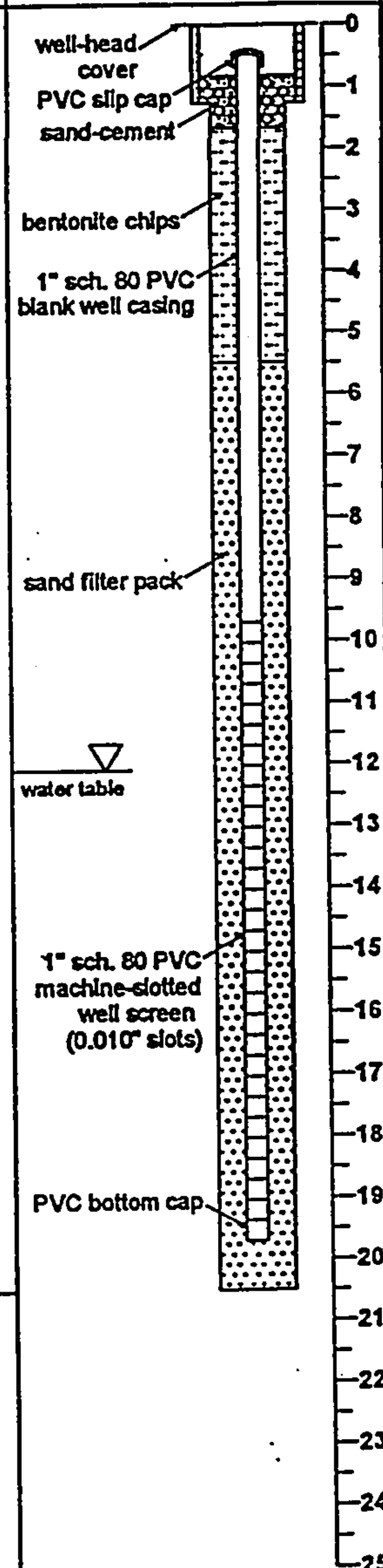
0000 0005 0960

LOG AND SCHEMATIC OF WELL MW-3

Project Name: King Street Texaco	
Project Location: 1239 South King Street, Honolulu, Hawaii	**Drilling Date:** September 26, 1995
Well Location: South-Center of Service Station Building	**Drilling Method:** Strataprobe Direct-Push Rig
Driller: TEG Hawaii (Eric/Greg)	**Sampling Method:** 1.5" Split Barrel Sampler (Stratoprobe driven)
Geologist: Duncan Walker	**Static Water Level:** ~12.1' below ground surface

Depth (feet, bgs)	Sample Identifier	PID (ppmv)	Lithologic Symbol	USCS Symbol	Description
0					Asphalt pavement.
0.5				gp	Gray sand/gravel base course, sl.damp.
6	MW3-6	9.8		ml	Dk. brown clayey silt/fn. sand, mod. plastic, damp (no odor).
11	MW3-11	6.4		sw	Dk. gray f-c basaltic sand, moist-wet (no odor).
16				sp/gp	Buff-tan coralline gravel/sand, wet (no odor).
20.5					T.D. = 20.5'

Well Schematic



WALKER CONSULTANTS, LTD.

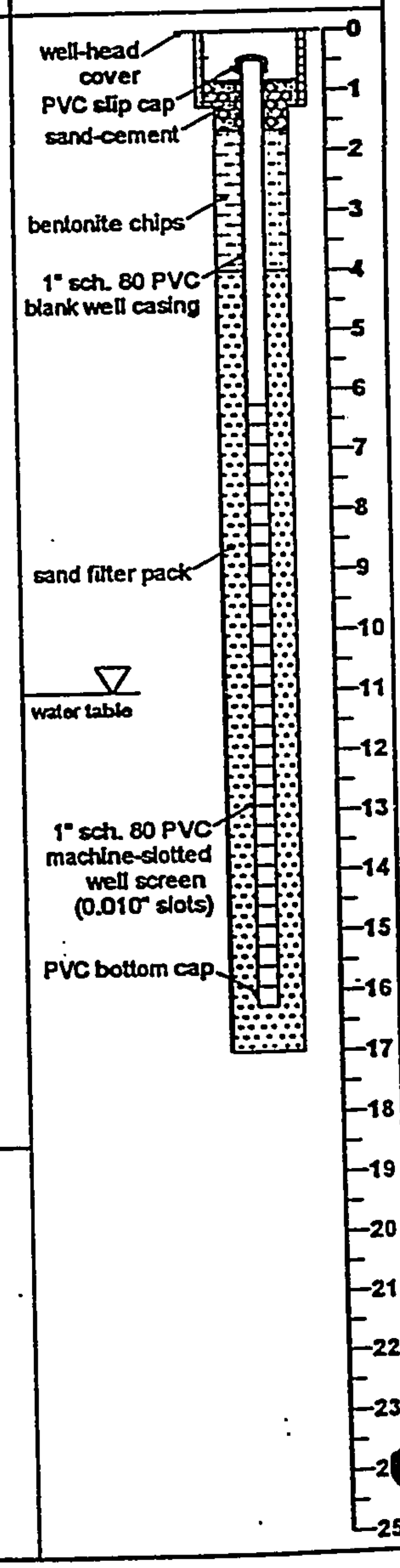
0000 0005 0961

LOG AND SCHEMATIC OF WELL MW-4

Project Name: King Street Texaco	
Project Location: 1239 South King Street, Honolulu, Hawaii	**Drilling Date:** September 26, 1995
Well Location: Northwest of Service Station Building	**Drilling Method:** Strataprobe Direct-Push Rig
Driller: TEG Hawaii (Eric/Greg)	**Sampling Method:** 1.5" Split Barrel Sampler (Stratoprobe driven)
Geologist: Duncan Walker	**Static Water Level:** ~11.0' below ground surface

Depth (feet, bgs)	Sample Identifier	PID (ppmv)	Lithologic Symbol	USCS Symbol	Description
0					Asphalt pavement.
0–1				gp	Gray sand/gravel base course, sl.damp.
6	MW4-6	4.6		ml	Dk. brown clayey silt/fn. sand, mod. plastic, damp (no odor).
11	MW4-11	10.4		sw	Dk. gray f-c basaltic sand, moist-wet (no odor).
16				sp/gp	Buff-tan coralline gravel/sand, wet (no odor).
18.5					Pilot Hole T.D. = 18.5' (refusal of drive tube at 17')

Well Schematic



WALKER CONSULTANTS, LTD.

0000 0005 0962

LOG AND SCHEMATIC OF WELL MW-5

Project Name: King Street Texaco

Project Location: 1239 South King Street, Honolulu, Hawaii

Well Location: Northeast of Gasoline USTs

Driller: TEG Hawaii (Eric/Greg)

Geologist: Duncan Walker

Drilling Date: September 28, 1995

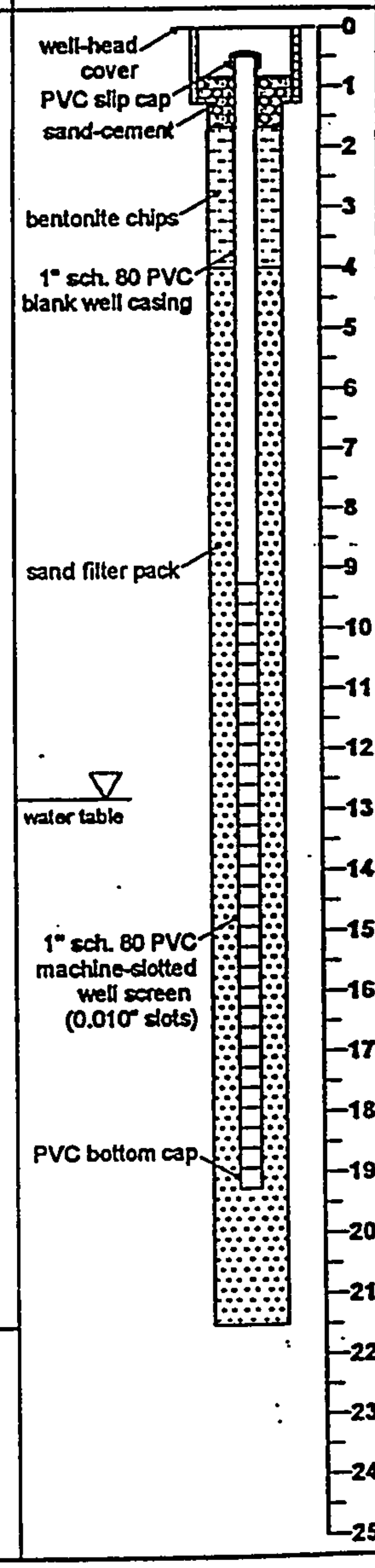
Drilling Method: Strataprobe Direct-Push Rig

Sampling Method: 1.5" Split Barrel Sampler (Strataprobe driven)

Static Water Level: ~12.8' below ground surface

Depth (feet, bgs)	Sample Identifier	PID (ppmv)	Lithologic Symbol	USCS Symbol	Description
0					Asphalt pavement.
0–1				gp	Gray sand/gravel base course, sl.damp.
6	MW5-6	16.2		ml	Dk. brown clayey silt/fn. sand, mod. plastic, damp (no odor).
11	MW5-11	19.1		sw	Dk. gray f-c basaltic sand, moist-wet (faint gasoline odor).
16				sp/gp	Buff-tan coralline gravel/sand, wet (gasoline odor).
21.5					T.D. = 21.5'

Well Schematic



WALKER CONSULTANTS, LTD.

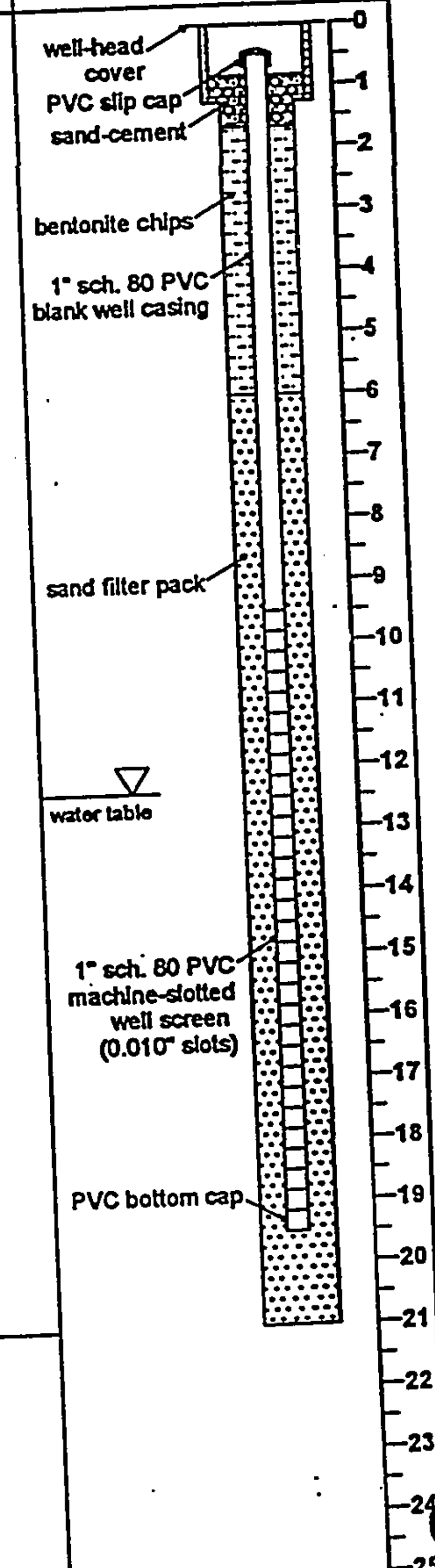
0000 0005 0963

LOG AND SCHEMATIC OF WELL MW-6

Project Name: King Street Texaco	Drilling Date: September 28, 1995
Project Location: 1239 South King Street, Honolulu, Hawaii	Drilling Method: Strataprobe Direct-Push Rig
Well Location: Service Bay Apron, Southeast of Used Oil UST	Sampling Method: 1.5" Split Barrel Sampler (Stratoprobe driven)
Driller: TEG Hawaii (Eric/Greg)	Static Water Level: ~12.4' below ground surface
Geologist: Duncan Walker	

Depth (feet, bgs)	Sample Identifier	PID (ppmv)	Lithologic Symbol	USCS Symbol	Description
0					Concrete slab.
0.5				gp	Gray sand/gravel base course, sl.damp.
6	MW6-6	35.3		ml	Dk. brown clayey silt/fn. sand, mod. plastic, damp (no odor).
13	MW6-13	86.8		sw	Dk. gray f-c basaltic sand, wet (gasoline odor).
17				sp/gp	Buff coralline gravel/sand, wet (no odor).
21					T.D. = 21'

Well Schematic



WALKER CONSULTANTS, LTD.

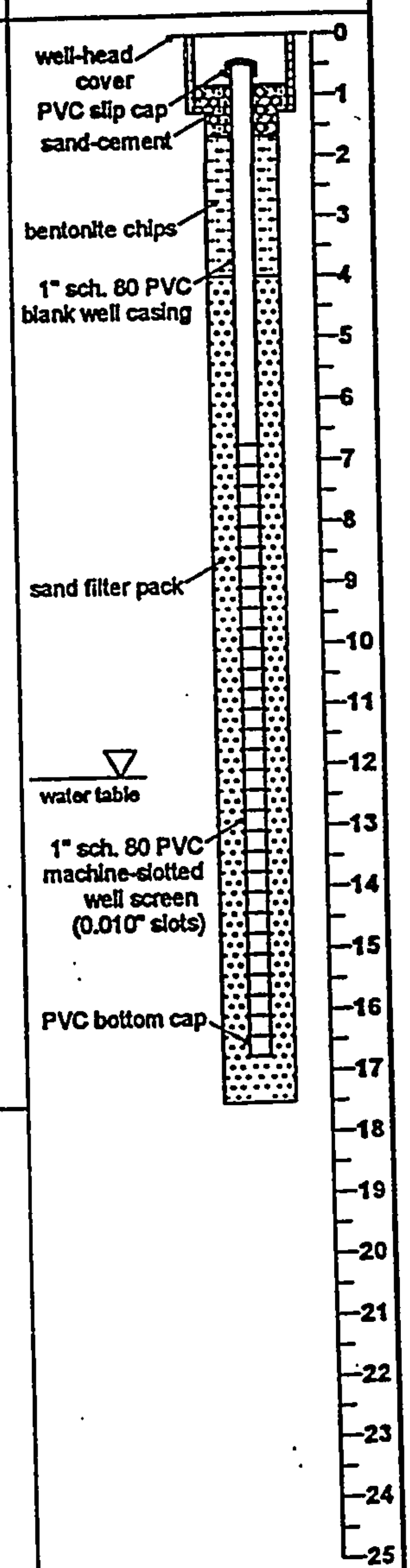
0000 0005 0964

LOG AND SCHEMATIC OF WELL MW-7

Project Name: King Street Texaco	Drilling Date: September 26, 1995
Project Location: 1239 South King Street, Honolulu, Hawaii	Drilling Method: Strataprobe Direct-Push Rig
Well Location: East of Gasoline USTs	Sampling Method: 1.5" Split Barrel Sampler (Stratoprobe driven)
Driller: TEG Hawaii (Eric/Greg)	Static Water Level: ~12.15' below ground surface
Geologist: Duncan Walker	

Depth (feet, bgs)	Sample Identifier	PID (ppmv)	Lithologic Symbol	USCS Symbol	Description
0					Concrete slab.
0–1				gp	Gray sand/gravel base course, sl.damp.
6	MW7-6	6.7		ml	Dk. brown clayey silt/fn. sand, mod. plastic, moist (no odor).
11	MW7-11	3.6		sw	Dk. gray f-c basaltic sand, moist-wet (gasoline odor).
16				sp/gp	Buff-tan coralline gravel/sand, wet (gasoline odor/sheen on water on downhole tools).
17.5					T.D. = 17.5' (refusal)

Well Schematic



WALKER CONSULTANTS, LTD.

0000 0005 0965

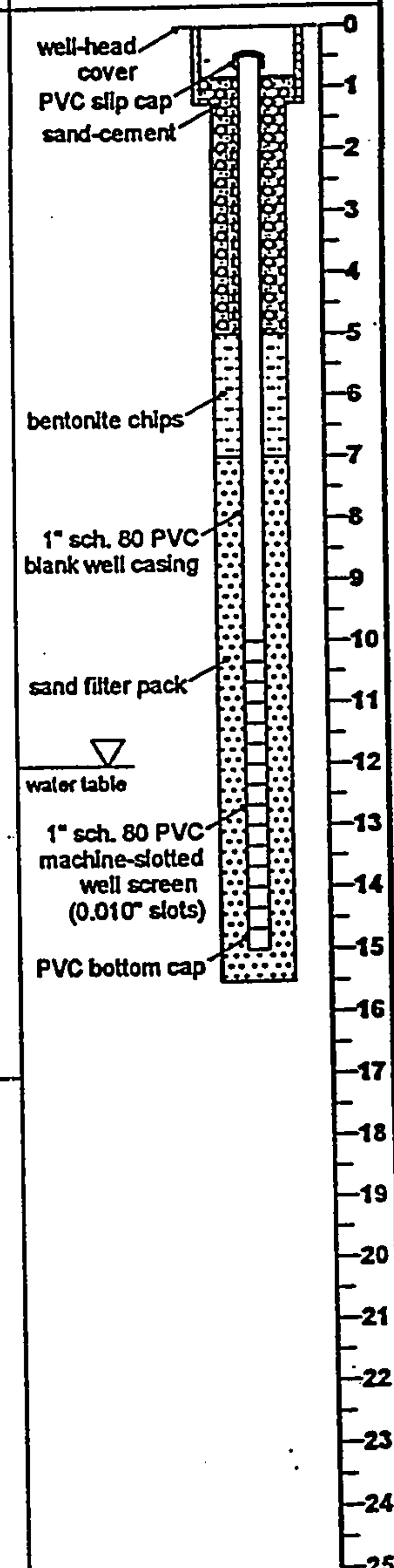
LOG AND SCHEMATIC OF WELL MW-8

Project Name: King Street Texaco	
Project Location: 1239 South King Street, Honolulu, Hawaii	**Drilling Date:** February 2, 1996
Well Location: West of Gasoline USTs	**Drilling Method:** Strataprobe Direct-Push Rig
Driller: TEG Hawaii (Eric/Greg)	**Sampling Method:** 1.5" Split Barrel Sampler (Stratoprobe driven)
Geologist: Duncan Walker	**Static Water Level:** ~12.0' below ground surface

Depth (feet, bgs)	Sample Identifier	PID (ppmv)	Lithologic Symbol	USCS Symbol	Description
					Asphalt pavement.
				gp	Gray sand/gravel base course, sl.damp.
	MW8-6.5	6.7		gp	Gray basaltic pea gravel (UST backfill), sl.damp (no odor).
				sw	Dk. gray f-c basaltic sand, moist-wet (faint gasoline odor).
	MW8-12	3.6		ml	Dk. brown clayey silt/fn. sand, mod. plastic, moist (no odor).
				sp/gp	Buff-tan coralline gravel/sand, wet (no odor).
					Pilot Hole T.D. = 17' (refusal—drive tube refusal at 15.5')

Depth (feet, bgs): 0–25

Well Schematic



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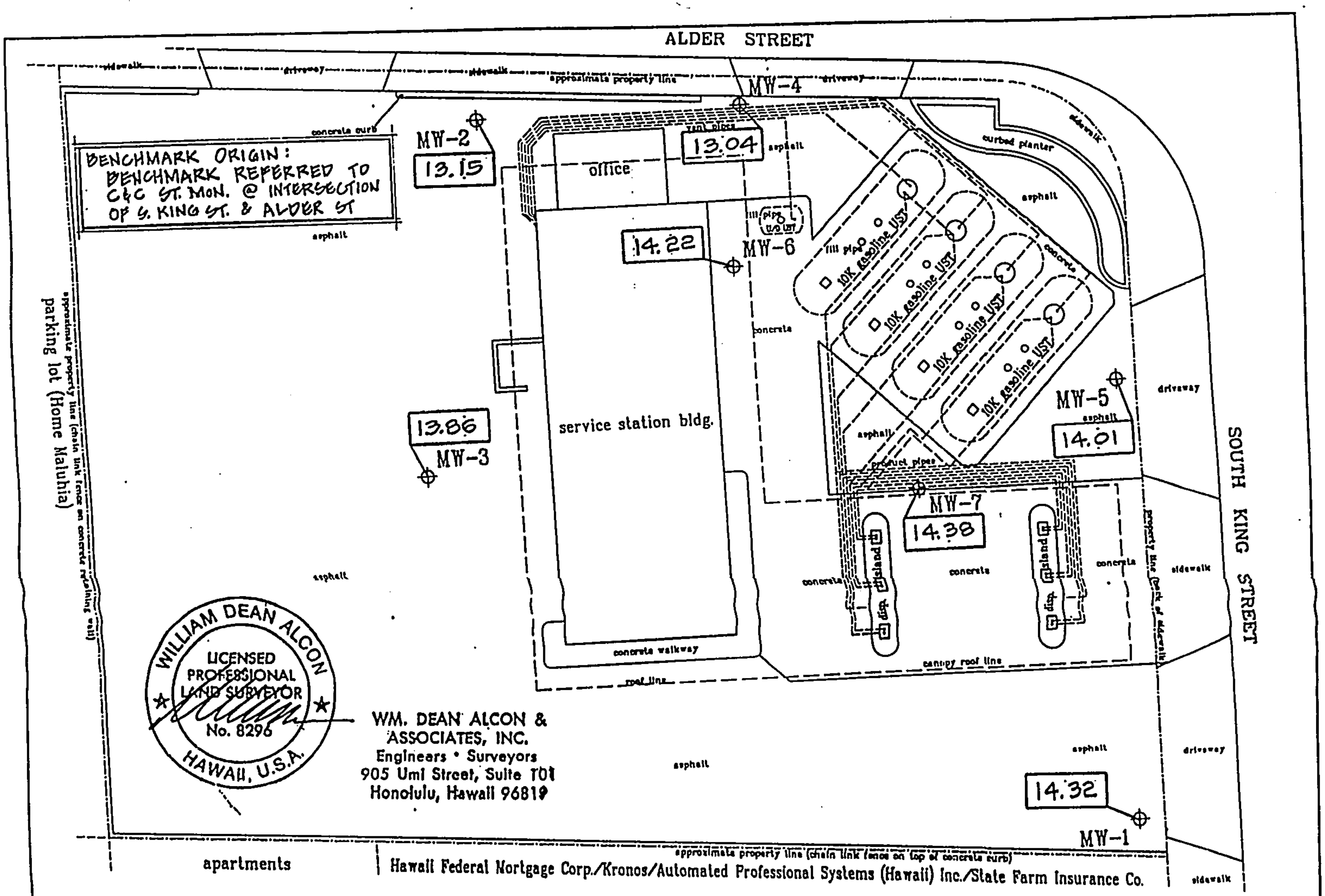
0000 0005 0966

APPENDIX G

WELL HEAD SURVEY DATA



WELL MAP *for* KING STREET TEXACO

prepared by WALKER CONSULTANTS, LTD.

FIGURE 5

EXPLANATION

⊕ MW-1 approximate groundwater monitoring well location

NOTE: Map not a survey. Map data are based on field measurements and TRMI General Arrangement Plan, and are approximate.

0000 0005 0968

APPENDIX H

GROUNDWATER SAMPLING FIELD DATA AND DISPOSAL RECEIPTS FOR PURGED WATER

0000 0005 0969

WALKER CONSULTANTS, LTD.
GROUNDWATER SAMPLING FIELD DATA

Job No.: 95-1197 Site: King Street Texaco Date: 9/28/95

Field Conditions: Warm (80s), Partly Cloudy, Showers, Mod Trades Sampling Team: Duncan Walker

Sampling Method: NA Development Method: Diaphragm Pump

Well No.: MW-1

Well Depth: 19.25' Water Depth: 12.4'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1010	8 gal.	7.1	1020	82	(UNDIL) 3.57	Clear, No Odor, No Sheen, No Seds
1015	10 gal.	7.0	1000	82	3.00	As Above
1020	12 gal.	7.0	1000	82	3.12	As Above

COMMENTS: Water very turbid for ~ first 3 gallons, then clear for ~ last 5 gallons - Good yield.

Well No.: MW-3

Well Depth: 19.7' Water Depth: 12.1'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1052	11 gal.	7.0	1250	86	(undil.) 12.1	V/Sl. Cloudy, No odor, No Sheen, No Seds.
1100	13 gal.	7.0	1240	86	13.4	As Above
1108	15 gal.	6.9	1200	86	8.71	As Above

COMMENTS: Water very turbid, ~ first 3 gallons, then clear for ~ last 4 gallons - Slow yield.

Well No.: MW-2

Well Depth: 18.1' Water Depth: 11.2'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1200	4 gal.	7.1	1120	85	(undil) 31.6	Sl. Cloudy, Sl. Gas odor, No Sheen, No SEDS
1216	6 gal.	7.1	1100	85	20.5	As Above
1230	8 gal.	7.1	1100	85	22.6	As Above

COMMENTS: Water very turbid ~ first 1 gallon, then clear ~ last 5 gallons - very slow yield.

0000 0005 0970

WALKER CONSULTANTS, LTD.
GROUNDWATER SAMPLING FIELD DATA

Job: 95-1197 Site: King Street Texaco Date: 9/28/95

Field Conditions: Warm (80s), Partly Cloudy, Showers, Mod Trades Sampling Team: Duncan Walker

Sampling Method: NA Development Method: Diaphragm Pump

Well No.: MW-4

Well Depth: 16.25' Water Depth: 11.0'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1310	11 gal.	6.9	1070	84	(undil.) 5.81	VSL. Cloudy, Faint Oil Odor, No Sheen, No SEDs
1316	13 gal.	6.9	1090	84	6.27	As Above
1322	15 gal.	6.9	1040	84	7.97	As Above

COMMENTS: Water very turbid ~ first 3 gallons, then clear ~ last 8 gallons, moderately good yield.

Well No.: MW5

Well Depth: 19.8' Water Depth: 12.8'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1405	11 gal.	7.1	1390	85	(undil.) 12.8	SL. Cloudy, Faint Gas Odor, No Sheen, No SEDs
1411	13 gal.	7.0	1300	85	11.5	As Above
1418	15 gal.	7.0	1300	85	14.1	As Above

COMMENTS: Water very turbid ~ first 4 gallons, then clear ~ last 6 gallons, moderately good yield.

Well No.: MW6

Well Depth: 19.5' Water Depth: 12.4'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1502	8 gal.	6.9	1090	82	(undil.) 6.0	Nearly Clear, No Odor, No Sheen, No SEDs
1508	10 gal.	6.9	1040	82	7.29	As Above
1514	12 gal.	7.0	1110	82	3.17	As Above

COMMENTS: Water very turbid ~ first 3 gallons, then clear ~ last 5 gallons, moderately good yield.

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WALKER CONSULTANTS, LTD.
GROUNDWATER SAMPLING FIELD DATA

b No: 95-1197 Site: King Street Texaco Date: 9/28/95

Field Conditions: Warm (80s), Partly Cloudy, Showers, Mod. Trades Sampling Team:

Sampling Method: NA Development Method: Diaphragm Pump

Well No.: MW-7

Well Depth: 16.75' Water Depth: 12.1'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
0930	8 gals.	6.7	1480	83	(UDIL) 9.67	V/SL. Cloudy, Mod. Gas Odor, Faint Sheen, No SEDs
0934	10 gals.	6.6	1400	83	7.15	As Above
0938	12 gals	6.7	1410	83	6.29	As Above

COMMENTS: Water very turbid ~ first 2 gallons, then clear ~ last 5 gallons, good yield.

Well No.:

Well Depth: Water Depth:

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition

COMMENTS:

Well No.:

Well Depth: Water Depth:

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition

COMMENTS:

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WALKER CONSULTANTS, LTD.
GROUNDWATER SAMPLING FIELD DATA

[illegible]o: 95-1197 Site: King Street Texaco Date: 10/2/95

Field Conditions: Warm (80's), Partly Cloudy, Mod. Trades Sampling Team: Duncan Walker & Eric Anders

Sampling Method: Stainless Steel Bailer Purging Method: Peristaltic Pump

Well No.: MW-1

Well Depth: 19.25' Water Depth: 12.57'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1134	0.4 Gal.	7.1	1010	82	1.37 (UND)	Clear, No Sheen, No Odor, No Sed
1137	0.8 Gal.	7.1	1000	82	1.28 "	As Above
1140	1.2 Gal.	6.9	980	82	1.18 "	As Above

COMMENTS:

Well No.: MW-3

Well Depth: 19.7' Water Depth: 12.15'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1225	0.4 Gal.	7.1	1290	86	20:1 Dil. 40.8	Tan, Opaque - No Odor, No Sheen, <<1% Sed
1228	0.8 Gal.	7.1	1250	86	No Dil. 13.45	V/SL. Cloudy, No Odor, No Sheen, No Sed
1231	1.2 Gal.	7.0	1260	86	Undil. 8.18	Clear, No Odor, No Sheen, No Sed

COMMENTS:

Well No.: MW-2

Well Depth: 18.1' Water Depth: 11.40'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1409	0.4 Gal.	7.1	1140	85	20:1 Dil. 30.8	Tan, Opaque - Sl. Gas Odor, No Sheen, <<1% Sed
1416	1.2 Gal.	7.1	1100	84	Undil. 38.7	Sl. Cloudy, Sl. Gas Odor, No Sheen, No Sed
1419	1.6 Gal.	7.0	1090	83	Undil. 21.4	As Above

COMMENTS:

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2 of 3

WALKER CONSULTANTS, LTD.
GROUNDWATER SAMPLING FIELD DATA

o: 95-1197 Site: King Street Texaco Date: 10/2/95

Field Conditions: Warm (80's), Partly Cloudy, Mod. Trades Sampling Team: Duncan Walker & ERIC ANDERS

Sampling Method: Stainless Steel Bailer Purging Method: Peristaltic Pump

Well No.: MW-4

Well Depth: 16.25' Water Depth: 11.42'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1443	0.4 Gal.	7.0	1040	85	UNDIL 1520	V/SL Cloudy, Faint GAS (Oil(?) ODOR, No Sheen, No SE
1446	0.8 Gal.	6.9	1090	84	UNDIL 5.66	V/SL Cloudy, Faint oil ODOR, No Sheen, No SED
1449	1.2 Gal.	6.9	1100	83	UNDIL 5.48	As ABOVE

COMMENTS:

Well No.: MW-5

Well Depth: 19.8' Water Depth: 12.28'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1519	0.4 Gal.	7.0	1360	84	UNDIL. 35.1	V/SL Cloudy, Faint Gas ODOR?, No Sheen, No SE
1522	0.8 Gal.	6.9	1400	84	UNDIL 11.7	V/SL Cloudy, Sl. Gas ODO No Sheen, No SED
1525	1.2 Gal.	6.9	1440	84	5.6	Nearly Clear, SL./NO (Fa Gas ODOR, No Sheen, No SE

COMMENTS:

Well No.: MW-6

Well Depth: 19.5' Water Depth: 12.47'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1551	0.4 Gal.	7.0	1070	82	UNDIL. 3.21	Nearly clear, NO ODOR No Sheen, NO SED
1555	0.8 Gal.	7.0	1080	81	2.03	AS ABOVE
1558	1.2 Gal.	6.9	1060	82	1.47	AS ABOVE

COMMENTS:

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WALKER CONSULTANTS, LTD.
GROUNDWATER SAMPLING FIELD DATA

Job No: 95 - 1197 Site: King Street Texaco Date: 10/2/95

Field Conditions: WARM (80's), Partly Cloudy, Mod. Trades Sampling Team: Duncan Walker & ERIC ANDERS

Sampling Method: Stainless Steel Bailer Purging Method: Peristaltic Pump

Well No.: MW-7

Well Depth: 19.75' Water Depth: 12.63'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1622	0.4 Gal.	6.6	1460	83	UNDIL 10.47	V/SL. Cloudy, Faint Gas ODOR, No Sheen, No SED
1625	0.8 Gal.	6.6	1440	83	4.69	Nearly Clear, SL/NO (Faint) Gas ODOR, No Sheen. No SED
1628	1.2 Gal.	6.6	1420	83	3.68	AS ABOVE

COMMENTS:

Well No.:

Well Depth: Water Depth:

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition

COMMENTS:

Well No.:

Well Depth: Water Depth:

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition

COMMENTS:

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WALKER CONSULTANTS, LTD.
GROUNDWATER SAMPLING FIELD DATA

. 96-1246 Site: So. King Street Texaco Date: 7/18/96

ield Conditions: Lt. Trades - 80° Sampling Team: Dave Martin / [illegible]

ampling Method: Disposable Vinly Bailers Purging Method: Peristaltic Pump

Vell No.: MW-1

Vell Depth: 19.25' Water Depth: 12.56

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1008	Initial	7.8	1120	82°	>200 OFF Scale	Cloudy
1014	1/2 gallon	7.6	1050	80°	4.9	Clear
1022	1 gallon	7.6	1040	81°	26.4	Clear

COMMENTS:

Well No.: MW-3

Depth: 19.7 Water Depth: 12.13

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1038	Initial	7.6	1220	85°	166.8	Cloudy
1045	1/2 gallon	7.6	1220	82°	15.6	Clear
1052	1 gallon	7.6	1220	82°	2.43	Clear

COMMENTS:

Well No.: MW-2

Well Depth: 18.1' Water Depth: 11.40'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1100	Initial	7.6	1300	82°	177.5	Cloudy
1103	1 gallon	7.6	1120	82°	10.39	Clear
1109	1 1/2 gallon	7.6	1120	82°	4.20	Clear

COMMENTS:

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WALKER CONSULTANTS, LTD.
GROUNDWATER SAMPLING FIELD DATA

: 96-1246 Site: 1239 So. King St. Date: 7/18/96

ld Conditions: Lt. Trades - 80° Sampling Team: Dave Hoshino / Dennis [illegible]

mpling Method: Disposable Poly Bailers Purging Method: Peristaltic Pump

ell No.: MW-4

ell Depth: 16.25' Water Depth: 11.41'

Time	Volume Purged	pH	Conductivity	T°F	Turbidity	Water Condition
1150	Initial	7.6	1160	83°	54.9	Slightly Cloudy Product Odor
1157	1/2 gallon	7.4	1170	83°	7.7	Clear
1203	1 gallon	7.4	1160	83°	6.0	Clear

OMMENTS:

Vell No.: MW-5

Depth: 17.8' Water Depth: 12.26

Time	Volume Purged	pH	Conductivity	T°F	Turbidity	Water Condition
1255	Initial	7.4	1300	82°	>200	Cloudy
1300		7.4	1310	83°	17.2	Clear
1305		7.4	1310	83°	3.5	Clear

COMMENTS:

Well No.: MW-6

Well Depth: 19.5' Water Depth: 12.47

Time	Volume Purged	pH	Conductivity	T°F	Turbidity	Water Condition
1345	Initial	7.5	1020	82°	13.0	Clear - product odor
1352	1/2 gallon	7.5	1020	82°	34.9	Clear
1356	1 gallon	7.5	1020	82°	5.5	Clear

COMMENTS:

0000 0005 0977

WALKER CONSULTANTS, LTD.
GROUNDWATER SAMPLING FIELD DATA

96-1246 Site: 1234 So [illegible] Date: 7/18/96

ield Conditions: [illegible] Sampling Team: Dave [illegible] / [illegible]

ampling Method: Disposable Poly Bailers Purging Method: Peristaltic Pump

Well No.: MW-7
Well Depth: 16.75' Water Depth: 12.63'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1425	Initial	7.4	1410	84°	>200 off scale	Cloudy
1432	1/2 gallon	7.2	1360	83°	71.8	Slightly cloudy
1437	1 gallon	7.1	1360	83°	5.0	

COMMENTS:

Well No.: MW-8
Well Depth: 17.0' Water Depth: 12.21'

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition
1455	Initial	7.4	1540	84°	1849	Very cloudy w/ clay intersp. & silt

COMMENTS: Bailed dry at 1500 hours after removing 0.25 gallon. Start at 0.09 [illegible]

Well No.:
Well Depth: Water Depth:

Time	Volume Purged	pH	Conductivity	T °F	Turbidity	Water Condition

COMMENTS:

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DUSTRIAL TECHNOLOGY
NK CLEANING & WASTE MANAGEMENT
). BOX 27066 • HONOLULU, HAWAII 96827
3 - 682 - 5858 • FAX 808 - 682 - 4377

INVOICE NO: 42245

CUSTOMER NO: TEXACO

RECEIVED TEXACO ENVIRONMENTAL SERVICES NOV

SOLD TO
TEXACO REFINING & MARKETING
1602 NUUANU AVE. SUITE 201
HONOLULU, HI
96817

SHIP TO
TEXACO REFINING & MARKETING
C/O KING ST. TEXACO STATION
1239 S. KING ST.
96817

DATE	CONTACT	PHONE NO.	TERMS
November 02, 95		(808) 533-1886	Net 30 Days

PURCHASE ORDER NUMBER	ORDER DATE	SALESPERSON	OUR ORDER NUMBER
CONTRACT#		JM	42245

QUANTITY ORDERED	SHIPPED	B.O.	ITEM NUMBER	DESCRIPTION	UNIT PRICE	EXTENSION
Ordered 2.000	Shipped 2.000		DISWWN	Disposal NON HAZ WELL WATER/SEE LABS	63.500	127.00

Date Received Nov 22
Location Address
T[illegible] 12-5 From EPC
Location # 01-100-0090
Incident # 9594509 PAC 7015.30
Job No.
Approved
Approved
The [illegible] reasonable and in accordance [illegible] solely for labor performed [illegible] in this agreement [illegible] covered by this invoice has been [illegible]
Certified

DATE RECEIVED
LOC. CODE/STA. ID
PO #/EST. #
PAC CODE
DE CODES
APPROVED
APPROVED

Taxable Subtotal	:	127.00
Tax	:	5.29
Total	:	$132.29

Page 1

ease pay from invoice. No statement rendered. late charge of 1½% per month charged on past [du]e balance.

CUSTOMER
(See reverse for terms and conditions)

INVOICE TOTA[L]

0000 0005 0979

TEXACO ENVIRONMENTAL SERVICES

WASTE DISPOSAL FORM

SITE ADDRESS: 1239 South King Street

Honolulu, Hawaii 96814

61-100-90

DISPOSAL AUTHORIZATION

DRUM #	ACCUM. DATES	CONTENTS	DESTINATION	COMMENTS
1	9/26-28/95	Develop. Water MW1-MW4	Industrial Technology	
2	9/28-10/2/95	Develop. /Purge Water	Industrial Technology	

EMPTY DRUM DISPOSITION

# OF DRUM	FACILITY NAME	STATUS (Check One)		
		STORAGE	RECYCLE	DISPOSAL
2	Walker Consultants	X		

STOCKPILES

CONTENTS	SIZE (YDS^3)	DESTINATION	TRANSPORTER	SHIP DOCS.

TES PM SIGNATURE: ______________________ DATE: __________

DISPOSAL VERIFICATION SECTION

The above listed wastes were transported and disposed at the above listed facilities with the following exceptions/modifications:

CONSULTANT SIGNATURE: ______________________ DATE: 10/2/95

WDF.DOC

0000 0005 0980

TEXACO ENVIRONMENTAL SERVICES

WASTE MANAGEMENT/TRACKING SHEET

SITE LOCATION: 1239 South King Street
Honolulu, Hawaii 96814

LOCATION #: 61-100-90

TES PROJECT MANAGER: Ray Fields

DATE, TIME AND PURPOSE OF SITE VISIT: 10/2/95 - Groundwater Monitoring

PERSON & COMPANY MAKING REPORT: Duncan Walker, Walker Consultants, Ltd.

DRUMS

DRUM #	ACCUMULATION DATES	CONTENTS	COMMENTS
1	9/26-28/95	Develop. Water MW1-MW4	50 gallons
2	9/28-10/2/95	Develop. Water - MW5-MW-7 Purge Water - MW1 - MW7	50 gallons

STOCKPILES

I.D.	SIZE (YDS^3)	COMMENTS/MAINTENANCE

GENERAL SITE COMMENTS:

SIGNATURE:

0000 0005 0981

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No.

2. Page 1 of 1

HW9608151

SHC: Texaco service station at South King St.

3. Generator's Name and Mailing Address King ST. Texaco
c/o Walker Consultant, Ltd
7192 Kalanianaole Hwy
Honolulu, Hi 96825

4. Generator's Phone ( )

5. Transporter 1 Company Name Allwaste

6. US EPA ID Number HID980880884

7. Transporter 2 Company Name

8. US EPA ID Number

A. Transporter's Phone 682-3033

B. Transporter's Phone

9. Designated Facility Name and Site Address
Allwaste
91-416 Komohana St
Kapolei, Hi 96707

10. US EPA ID Number HIR000000927

C. Facility's Phone 682-3600

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. Non-DOT Regulated Wastewater	001	DM	15	G
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
24 Hr. Emergency Response # 808-682-3600

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name Tuki

Signature

Month Day Year 08 15 9[illegible]

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name MC MAKINNEY

Signature [signature]

Month Day Year 08 15 9[illegible]

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name JINGBO CHANG

Signature [signature]

Month Day Year 08 15 9[illegible]

GENERATOR / TRANSPORTER / FACILITY

ORIGINAL – RETURN TO GENERATOR

0000 0005 0982

TEXACO ENVIRONMENTAL SERVICES

WASTE DISPOSAL FORM

SITE ADDRESS: King Street Texaco
1239 So. King Street., Honolulu, Hawaii
Location #: 61-100-090

DISPOSAL AUTHORIZATION

DRUM #	ACCUM. DATES	CONTENTS	DESTINATION	COMMENTS
1	7/18/96	Purge Water MW-1 thru MW-8	AllWaste of Hawaii	~15 gallons

EMPTY DRUM DISPOSITION

# OF DRUM	FACILITY NAME	STATUS (Check One)		
		STORAGE	RECYCLE	DISPOSAL

STOCKPILES

CONTENTS	SIZE (YDS^3)	DESTINATION	TRANSPORTER	SHIP DOCS.

TES PM SIGNATURE: [signature] DATE: 7/30/96

DISPOSAL VERIFICATION SECTION

The above listed wastes were transported and disposed at the above listed facilities with the following exceptions/modifications:

CONSULTANT SIGNATURE:____________ DATE: ______

0000 0005 0983

TEXACO ENVIRONMENTAL SERVICES

WASTE MANAGEMENT/TRACKING SHEET

SITE LOCATION: 1239 South King Street
Honolulu, Hawaii

LOCATION #: 61-100-090

TES PROJECT MANAGER: Mike Condon

DATE, TIME AND PURPOSE OF SITE VISIT: 7/18/96 Groundwater Monitoring

PERSON & COMPANY MAKING REPORT: Dave Martin, Walker Consultants, Ltd.

DRUMS

DRUM #	ACCUMULATION DATES	CONTENTS	COMMENTS
1	7/18/96	Purge Water MW-1 thru MW-8	~ 15 gallons

STOCKPILES

I.D.	SIZE (YDS^3)	COMMENTS/MAINTENANCE

GENERAL SITE COMMENTS:

SIGNATURE: David W. Martin

0000 0005 0984

APPENDIX I

SOIL SAMPLE ANALYTICAL RESULTS, LABORATORY QA/QC DATA, AND CHAIN-OF-CUSTODY RECORDS

0000 0005 0985

Applied P & Ch Laborat
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:
Walker Consultants, Ltd.
Attention: Duncan Walker
7192 Kalanianaole Hwy., Ste. G-220
Honolulu, HI 96825
Tel: (808)395-0392 Fax: (808)395-1969

Service ID #: 801-953841
Collected by: Duncan Walker
Collected on: 09/26/95
Sample description:
Soil from 1239 S. King St. in Honolulu
Project: King St. Texaco; Job#: 95-1197

Received : 09/29/95
Tested : 10/3-5/95
Reported : 10/06/95

Analysis of Soil

Component Analyzed	Method	Unit	PQL	Concentration MW1-6 95-3841-1	MW1-11 95-3841-2	MW2-6 95-3841-3	MW2-11 95-3841-4	MW5-6 95-3841-9
TPH: Gasoline + BTXE Distinction								
TPH (Gasoline)	M8015	mg/kg	1	N.D.	N.D.	N.D.	N.D.	N.D.
Benzene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
Ethylbenzene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
o-Xylene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
m-Xylene/p-xylene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
BTXE, Total	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.

Component Analyzed	Method	Unit	PQL	MW5-11 95-3841-10	MW7-6 95-3841-13	MW7-11 95-3841-14	MW3-6 95-3841-5	MW3-11 95-3841-6
TPH: Gasoline + BTXE Distinction								
TPH (Gasoline)	M8015	mg/kg	1	N.D.	N.D.	N.D.	N.D.	N.D.
Benzene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
Ethylbenzene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
o-Xylene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
m-Xylene/p-xylene	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
BTXE, Total	8020	μg/kg	5	N.D.	N.D.	N.D.	N.D.	N.D.
TPH: Motor Oil	LUFT/M8015	mg/kg	10	—	—	—	N.D.	N.D.

Applied P & Ch Laboratc
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Analysis of Soil

Component Analyzed	Method	Unit	PQL	Concentration MW4-6 95-3841-7	MW4-11 95-3841-8	MW6-6 95-3841-11	MW6-13 95-3841-12
TPH: Gasoline + BTXE Distinction							
TPH (Gasoline)	M8015	mg/kg	1	N.D.	N.D.	N.D.	8
Benzene	8020	µg/kg	5	N.D.	N.D.	N.D.	N.D.
Ethylbenzene	8020	µg/kg	5	N.D.	N.D.	N.D.	N.D.
Toluene	8020	µg/kg	5	N.D.	N.D.	N.D.	N.D.
o-Xylene	8020	µg/kg	5	N.D.	N.D.	N.D.	N.D.
m-Xylene/p-xylene	8020	µg/kg	5	N.D.	N.D.	N.D.	N.D.
BTXE, Total	8020	µg/kg	5	N.D.	N.D.	N.D.	N.D.*
TPH: Motor Oil	LUFT/M8015	mg/kg	10	N.D.	N.D.	N.D.	

PQL : Practical Quantitation Limit
– : Analysis not requested.
N.D. : Not Detected or less than the quantitation limit.
* Sample contains 132 mg/kg of unknown hydrocarbons in Kerosene range.

Respectfully submitted,

Dominic Lau
Laboratory Manager
Applied P & Ch Laboratory

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
(909) 590-1828 Fax: (909) 590-1498

APCL QA/QC Report

Submitted to:
Walker Consultants, Ltd.
Attention: Duncan Walker
7192 Kalanianaole Hwy, Ste G-220
Honolulu, HI 96825
Tel: (808)395-0392 Fax: (808)395-1969

Service ID #: 801-953841
Collected by: Duncan Walker
Collected on: 09/26/95
Sample description:
.Soil from 1239 S. King St. in Honolulu
Project: King St. Texaco; Job# 95-1197

Received: 09/29/95
Tested: 10/3-5/95
Reported: 10/11/95

801-953841QC

Analysis of Soil

Component Name	Analysis Batch #	CCV mg/L	CCV %Rec	M-Blank mg/kg	SP Level mg/kg	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	Control Limit %Diff
TPH in Soil by GC/FID (M8015)											
Motor Oil	95G1963	1000	99	N.D.	500	104	96	109	13	65-135	35
Gasoline	95G1967	1	100	N.D.	10	97	101	107	6	70-130	30
Benzene	95G1967	0.100	107	N.D.	0.24	82	87	89	2	65-135	25
Toluene	95G1967	0.100	111	N.D.	0.66	107	110	113	3	65-135	25
Ethylbenzene	95G1967	0.100	108	N.D.	0.15	98	102	103	1	65-135	25
p/m-Xylene	95G1967	0.200	111	N.D.	0.54	105	107	110	3	65-135	25
o-Xylene	95G1967	0.100	108	N.D.	0.20	103	107	110	3	65-135	25

Samples were received intact and in chilled condition.

Notation:
ICV – Initial Calibration Verification
CCV – Continuation Calibration Verification
LCS – Lab Control Spike
MS – Matrix Spike
MSD – Matrix Spike Duplicate
ICS – Interference Check Standard
MD – Matrix Duplicate
N.D. – Not detected or less than PQL
CCB – Continuation Calibration Blank
M-blank – Method Blank
SP Level – Spike Level
%Rec – Recovery Percent
%RPD – Relative Percent Differences
%Diff – Control Limit for %RPD
ICP-SD – ICP Serial Dilution
N.A. – Not Applicable

Respectfully submitted,

Kevin Xie
QA/QC Coordinator
Applied P & Ch Laboratory

Applied P & Ch Laboratory

APCL

13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

Chain of Custody

Please Print in pen

Contact: DUNCAN WALKER Tel #: 808-395-0391 Fax #: 808-395-1569

Client: WCL State: HI Zip code: 96825

Address: 7192 Kalanianaole Hwy, #G220 City: Honolulu

Bill to: TES (RAY FIELDS, UNIVERSAL CITY, CA, 808-505-2066

Project Name/Code King St. Texaco Job # 95-1197 P.O. #

Project Address 1239 So. King St., Honolulu APCL Quotation #

Due Date: ☒ regular ☐ rush: 7 days ___ hours Sampled by: DUNCAN WALKER

White – With report
Yellow – Lab copy
Pink – Originator

Field Sample ID No.	Sample Description	Date Collected	Time Collected	Sample Matrix	Preservation	# of Containers	Analysis Items: TPH-C/BTEX	TPH-O		Remarks
MW1-6	Soil, MW1 @ 6' BGS	9/26/95	0835	Soil	—	1	X			
MW1-11	Soil, MW1 @ 11' BGS	9/26/95	0855	Soil	—	1	X			
MW2-6	Soil, MW2 @ 6' BGS	9/26/95	1130	Soil	—	1	X			
MW2-11	Soil, MW2 @ 11' BGS	9/26/95	1200	Soil	—	1	X			
MW3-6	Soil, MW3 @ 6' BGS	9/26/95	1420	Soil	—	1	X	X		
MW3-11	Soil, MW3 @ 11' BGS	9/26/95	1505	Soil	—	1	X	X		
MW4-6	Soil, MW4 @ 6' BGS	9/26/95	1630	Soil	—	1	X	X	X	
MW4-11	Soil, MW4 @ 11' BGS	9/26/95	1645	Soil	—	1	X	X		
MW5-6	Soil, MW5 @ 6' BGS	9/28/95	0855	Soil	—	1	X			
MW5-11	Soil, MW5 @ 11' BGS	9/28/95	0905	Soil	—	1	X			
MW6-13	Soil, MW6 @ 13' BGS	9/28/95	1230	Soil	—	1	X	X		
MW6-6	Soil, MW6 @ 6' BGS	9/28/95	1455	Soil	—	1	X	X		
MW7-6	Soil, MW7 @ 6' BGS	9/28/95	1620	Soil	—	1	X			
MW7-11	Soil, MW7 @ 11' BGS	9/28/95	1635	Soil	—	1	X			

QC Requirement: ☐ Regular; ☒ QA/QC Report; ☐ WIP; ☐ Raw Data; ☐ Extended Raw Data ☐ CLP; ☐ ACE ☐ AFCEE ☐ NEESA ___ (E, C or D); ☐ Other ______ (Please specify)

If not specified, samples will be discarded 45 days after samples are received.

Sample Disposal: ☐ Return ☒ Disposal by APCL ☐ Hold for ______ days after receiving date.

Temperature: ☐ Room ☒ Cold (3.7 °C).

Sample Conditions: ☒ Intact; ☐ Broken. Cooler Seal: ☒ Intact; ☐ Broken; ☐ None. Tag # ______

Relinquished by [signature] Date/Time 9/28/95 / 1955 Received by Amy [signature] Date/Time 9/29/95 11:35

Relinquished by Date/Time / Received by Date/Time /

3821

Note:

APCL USE ONLY Service #

Clients understand that all terms described in the proposals, quotations for this project, and/or the general terms provided in the current APCL price schedules will be followed. APCL reserves the right to terminate its service or withhold delivery of any reports, if in APCL's sole discretion the terms of the project have been broken.

Root:file:[CUST.DATA.LAB]CHAIN.ROOT.TEX File:[CUST.DATA.LAB]CHAIN1.TEX

0000 0005 0988

0000 0005 0989

Applied P & Ch Laboratory
15760 Magnolia Ave., Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

Sample Receiving Checklist

APCL ServiceID: 3841 Client Name/Project: walker / King St. Texaco

1. Sample Arrival

Date/Time Received 9/29/95 Date/Time Opened 11:35. By (name): AS
Shipping: Air Bill#: 772 8669701 Company:
Custody Transfer: ☐ Client ☐ Courier/Fast ☐ UPS ☐ US Mail ☒ ~~FedEx~~ DHL ☐ APCL Empl:

2. Chain-of-Custody (CoC)

☑ With Samples? ☐ Faxed? ☑ Client has Copy? ☑ Signed, dated? By: DW
☑ Project ID? ☑ Analyses Clear? ☐ Hold Samples? #on Hold # Received 14
☑ CoC/Docs Zip-Locked under lid? ☐ Compos.#: ☑ #Samples OK? 14
☐ Discrepancies? ☐ Client notified? ☐ Response (attach docs):

3. Shipping Container/Cooler

☑ Cooler Used? # of Cooled by: ☑ Ice ☐ Blue Ice ☐ Dry Ice ☐ None
Temp? 3.7 °C °F Measured: ☐ Blank? ☑ Cooler? ☐ Other?
Cooler Custody Seal? ☐ Absent ☐ Intact ☐ Tampered? Custody Seal#:

4. Sample Preservation

☐ pH on label? ☐ Correctly? ☐ pH <2 ☐ pH >12 ☐ Third Party
If Not, pH = Preserved by: ☐ Client ☐ APCL ☐ Anomaly?
Initialed: Use pH login checklist for multiple samples.

5. Holding-time Requirements

☐ pH 24hr ☐ BACT 6/24hr ☐ Cr^{VI} 24hr ☐ NO_3^- 48hr ☐ BOD 48hr ☐ SVOCs 7day-Extr
☑ VOCs 14day ☐ Cl_2 24hr ☐ Turbidity
☐ HT Expired? ☐ Client notified?* Response?

6. Sample Container Condition

☑ Intact? ☐ Broken? ☐ Documented? Number: ☑ from Client ☐ from APCL
Type: ☐ plastic ☐ glass ☑ Tube: brass/SS ☐ Tedlar Bag ☐ Septum Reqd?
☑ Quantity OK? ☐ Leaking? ☐ Anomaly? ☐ Action:
☑ Caps tight? ☐ Air Bubbles? ☐ Anomaly? ☐ Action:
Labels: ☑ Unique ID? ☑ Date/Time ☐ Preserved? ☐ Action:

7. Turn Around Time

☑ RUSH TAT: 5 days ☐ Std (6 days) ☐ Not Marked ☐ Problem? ☐ Action:

8. Sample Matrix

☐ Drinking H_2O ☐ Other Liq ☑ Soil ☐ Wipe ☐ Polymer ☐ Air ☐ Other:
☐ Ground H_2O ☐ Sludge ☐ Filter ☐ Oil/Petrol ☐ Paint ☐ Waste ☐ Extract ☐ Unknown

9. Pre-Login Check List Completed & OK?

☑ ALL OK? (if not, attach docs) ☐ Client Contact? (Name:)Date/Time:
Received/Checked by: AS Date: 29 Sep 1995 Time: 11:28 a.m.

NOTE: Samples must be analyzed for results to reflect total concentrations. Results generated outside required of holding times are considered minimal values and may be used to define waste as hazardous but not as non-hazardous.

DocumentFile: [acal.texfiles]smprcl.tex.

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NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bc_ WA 98011-9508 (206) 481-9200 • FAX 485-2992
East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290
9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

Walker Consultants, Ltd.
9192 Kalanianaole Hwy., #G-220
Honolulu, HI 96825
Attention: Duncan Walker

Project Name: Texaco Honolulu, #61-100-90
Client Project : #95-1197
NCA Project #: B602087

Received: Feb 6, 1996
Reported: Feb 16, 1996

PROJECT SUMMARY PAGE

Laboratory Sample Number	Sample Description	Sample Matrix	Date Sampled
B602087-01	MW8-6.5	Soil	2/2/96
B602087-02	MW8-12	Soil	2/2/96

The results in this report apply to the samples analyzed in accordance with the chain of custody document.
This analytical report must be reproduced in its entirety.

NORTH CREEK ANALYTICAL Inc.

Jack Cooper
for Matthew T. Essig
Project Manager

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NORTH CREEK ANALYTICAL

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Walker Consultants, Ltd.
9192 Kalanianaole Hwy., #G-220
Honolulu, HI 96825
Attention: Duncan Walker

Client Project ID: Texaco Honolulu, #61-100-90
Sample Matrix: Soil
First Sample #: B602087-01

Received: Feb 6, 1996
Reported: Feb 16, 1996

TOTAL SOLIDS & MOISTURE CONTENT REPORT

Sample Number	Sample Description	Total Solids %	Moisture Content %
B602087-01	MW8-6.5	95	5.0
B602087-02	MW8-12	70	30

The enclosed analytical results for soils, sediments and sludges have been converted to a DRY WEIGHT reporting basis. To attain the wet weight "as received" equivalent, multiply the dry weight result by the decimal fraction of percent Total Solids.

NORTH CREEK ANALYTICAL Inc.

Jack Cooper
for Matthew T. Essig
Project Manager

602087.WWW <2>

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NORTH CREEK ANALYTICAL

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9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

Walker Consultants, Ltd.	Client Project ID: Texaco Honolulu, #61-100-90	Sampled: Feb 2, 1996
9192 Kalanianaole Hwy., #G-220	Sample Matrix: Soil	Received: Feb 6, 1996
Honolulu, HI 96825	Analysis Method: TPH-G	Analyzed: Feb 13, 1996
Attention: Duncan Walker	First Sample #: B602087-01	Reported: Feb 16, 1996

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result mg/kg (ppm)	Surrogate Recovery %
B602087-01	MW8-6.5	N.D.	101
B602087-02	MW8-12	N.D.	88
BLK021396	Method Blank	N.D.	102
Reporting Limits		1.0	

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

Jack Cooper
for Matthew T. Essig
Project Manager

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Walker Consultants, Ltd. 9192 Kalanianaole Hwy., #G-220 Honolulu, HI 96825 Attention: Duncan Walker	Client Project ID: Texaco Honolulu, #61-100-90 Sample Matrix: Soil Analysis Method: TPH-G Units: mg/kg (ppm)	Analyzed: Feb 13, 1996 Reported: Feb 16, 1996

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline	
Spike Conc. Added:	5.0
Spike Result:	4.6
% Recovery:	92
Upper Control Limit %:	115
Lower Control Limit %:	33

PRECISION ASSESSMENT
Sample Duplicate

Gasoline Range Hydrocarbons	
Sample Number:	B602173-06
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	67

NORTH CREEK ANALYTICAL In

Jack Boper

for Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{\text{(Original Result + Duplicate Result) / 2}} \times 100$

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9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

Walker Consultants, Ltd.	Client Project ID:	Texaco Honolulu, #61-100-90	Sampled:	Feb 2, 1996
9192 Kalanianaole Hwy., #G-220	Sample Matrix:	Soil	Received:	Feb 6, 1996
Honolulu, HI 96825	Analysis Method:	EPA 8020	Analyzed:	Feb 13, 1996
Attention: Duncan Walker	First Sample #:	B602087-01	Reported:	Feb 16, 1996

BTEX DISTINCTION

Sample Number	Sample Description	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
B602087-01	MW8-6.5	N.D.	N.D.	N.D.	N.D.	111
B602087-02	MW8-12	N.D.	N.D.	N.D.	N.D.	93
BLK021396	Method Blank	N.D.	N.D.	N.D.	N.D.	103
Reporting Limits:		0.050	0.050	0.050	0.10	

4-Bromofluorobenzene surrogate recovery control limits are 34 - 166 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.
The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

Jack Cooper
for Matthew T. Essig
Project Manager

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NORTH CREEK ANALYTICAL

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9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

Walker Consultants, Ltd.
9192 Kalanianaole Hwy., #G-220
Honolulu, HI 96825
Attention: Duncan Walker

Client Project ID: Texaco Honolulu, #61-100-90
Sample Matrix: Soil
Analysis Method: EPA 8020
Units: mg/kg (ppm)
QC Sample #: B602176-05

Analyzed: Feb 13-14, 1996
Reported: Feb 16, 1996

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Result:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.54	0.54	0.54	1.62
Spike Result:	0.44	0.46	0.45	1.51
Spike % Recovery:	81%	85%	83%	93%
Spike Dup. Result:	0.41	0.43	0.42	1.41
Spike Duplicate % Recovery:	76%	80%	78%	87%
Upper Control Limit %:	111	118	120	128
Lower Control Limit %:	59	55	61	55
Relative % Difference:	7.1%	6.7%	6.9%	6.8%
Maximum RPD:	17	16	17	17

NORTH CREEK ANALYTICAL In

Jack Cooper
for Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result - Sample Result}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Spike Result - Spike Dup. Result}}{\text{(Spike Result + Spike Dup. Result) / 2}} \times 100$

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East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

TEXACO CHAIN OF CUSTODY REPORT

Work Order #:

CONSULTANT: Walker Consultants, LTD.
PROJECT MANAGER: Duncan Walker
ADDRESS: 7192 Kalanianaole Hwy, # G220
Honolulu, HI 96825
PHONE: 808-395-0392 FAX: 808-395-1969
PROJECT NAME: King Street Texaco
PROJECT NUMBER: 95-1197(WCL)
SAMPLED BY: Duncan Walker

TEXACO INFORMATION

TEXACO PROJECT MANAGER: Mike Gandon
TEXACO FACILITY NUMBER: 61-100-90
SITE ADDRESS: 1239 South King St.
Honolulu, HI 96814
State Hydrocarbon Methods (please circle): WA OR AK ID

TURNAROUND REQUEST in Business Days

Organic & Inorganic Analyses *: [X] 10, [ ] 5, [ ] 3, [ ] 1
Air Analyses *: [ ] 3, [ ] 1
OTHER Specify:
* Standard Turnaround for Organic & Inorganic Analyses is 10 Days
* Standard Turnaround for Air Analyses is 3 Days

Analysis Request:

NCA SAMPLE NUMBER	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE / TIME	TPH-G/BTEX	TPH-D	TPH-D Extended	TPH-418.1	TPH-HCID	Tot/Diss Lead				MATRIX (W, S, O)	# OF CONTAINERS	COMMENTS & PRESERVATIVES USED
B602087-01	1. MWB-6.5	2/2/95 / 1435	X									S	1	—
B602087-02	2. MWB-12	2/2/95 / 1450	X									S	1	—
	3.													
	4.													
	5.													
	6.													
	7.													
	8.													
	9.													
	10.													

RELINQUISHED BY: Dwalker DATE: 2/5/96
PRINT NAME: Duncan Walker FIRM: WCL TIME: 1200

RECEIVED BY: M. Girard DATE: 2/6/96
PRINT NAME: Girard FIRM: NCA TIME: 10:40

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

PAGE OF

APPENDIX J

GROUNDWATER SAMPLE ANALYTICAL RESULTS, LABORATORY QA/QC DATA, AND CHAIN-OF-CUSTODY RECORDS

Applied P & Ch Laborat

13760 Magnolia Ave. Chino CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:
Walker Consultants, Ltd.
Attention: Duncan Walker
7192 Kalanianaole Hwy., Ste. G-220
Honolulu, HI 96825
Tel: (808)395-0392 Fax: (808)395-1969

Service ID #: 801-953861
Collected by:
Collected on: 10/02/95
Sample description:
Water from 1239 So. King St. in Honolulu
Project: King St. Texaco; Job#: 95-1197

Received : 10/03/95
Tested : 10/06-09/95
Reported : 10/09/95

Analysis of Water

801-953861 Page 1 of 1

Component Analyzed	Method	Unit	PQL	Concentration MW1-1W 95-3861-2	MW3-1W 95-3861-4	MW4-1W 95-3861-5	MW6-1W 95-3861-7	MW2-1W 95-3861-3
TPH: Motor Oil	MOD-LUFT/M	mg/L	0.5	N.D.	N.D.	N.D.	N.D.	—
TPH: Gasoline + BTXE Distinction								
TPH (Gasoline)	M8015	mg/L	0.05	N.D.	0.10	1.5	0.21	N.D.
Benzene	8020	μg/L	0.5	N.D.	N.D.	74	5.6	N.D.
Ethylbenzene	8020	μg/L	0.5	N.D.	0.8	1.2	2.2	N.D.
Toluene	8020	μg/L	0.5	N.D.	N.D.	84	N.D.	N.D.
o-Xylene	8020	μg/L	0.5	N.D.	N.D.	12	N.D.	N.D.
m-Xylene/p-xylene	8020	μg/L	0.5	N.D.	N.D.	27	N.D.	N.D.
BTXE, Total	8020	μg/L	0.5	N.D.	N.D.	198	7.8	N.D.

Component Analyzed	Method	Unit	PQL	MW5-1W 95-3861-6	MW7-1W 95-3861-8	FIELD BLANK 95-3861-1	TRIP BLANK 95-3861-9
TPH: Gasoline + BTXE Distinction							
TPH (Gasoline)	M8015	mg/L	0.05	1.4	1.1	N.D.	N.D.
Benzene	8020	μg/L	0.5	N.D.	13	N.D.	N.D.
Ethylbenzene	8020	μg/L	0.5	18	4.3	N.D.	N.D.
Toluene	8020	μg/L	0.5	N.D.	N.D.	N.D.	N.D.
o-Xylene	8020	μg/L	0.5	N.D.	N.D.	N.D.	N.D.
m-Xylene/p-xylene	8020	μg/L	0.5	0.9	1.0	N.D.	N.D.
BTXE, Total	8020	μg/L	0.5	19	18	N.D.	N.D.

PQL : Practical Quantitation Limit
— : Analysis not requested.
N.D. : Not Detected or less than the quantitation limit.

Respectfully submitted,

Dominic Lau
Laboratory Manager
Applied P & Ch Laboratory

0000 0005 0999

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

APCL QA/QC Report

Submitted to:
Walker Consultants, Ltd.
Attention: Duncan Walker
7192 Kalanianaole Hwy,Ste G220
Honolulu, HI 96825
Tel: (808)395-0392 Fax: (808)395-1969

Service ID #: 801-953861
Collected by:
Collected on: 10/02/95
Sample description:
Water from 1239 So. King St. in Honolulu
Project: King St. Texaco; Job# 95-1197

Received: 10/03/95
Tested: 10/06-09/95
Reported: 10/11/95

Analysis of Water

801-953861QC

Component Name	Analysis Batch #	CCV mg/L	CCV %Rec	M-Blank mg/L	SP Level mg/L	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	Control Limit %Diff
TPH in Water by GC/FID (M8015)											
Motor Oil	95G1991	1000	106	N.D.	50	105	105	102	3	65-135	35
Gasoline	95G1989	1	99	N.D.	1	94	91	96	5	70-130	30
Benzene	95G1989	0.100	101	N.D.	0.024	80	82	83	1	65-135	25
Toluene	95G1989	0.100	105	N.D.	0.066	105	104	106	2	65-135	25
Ethylbenzene	95G1989	0.100	106	N.D.	0.015	97	98	98	0	65-135	25
p/m-Xylene	95G1989	0.200	106	N.D.	0.054	104	103	105	2	65-135	25
o-Xylene	95G1989	0.100	107	N.D.	0.020	95	97	98	1	65-135	25

Samples were received intact and in chilled condition.

Notation:
ICV – Initial Calibration Verification
CCV – Continuation Calibration Verification
LCS – Lab Control Spike
MS – Matrix Spike
MSD – Matrix Spike Duplicate
ICS – Interference Check Standard
MD – Matrix Duplicate
N.D. – Not detected or less than PQL
CCB – Continuation Calibration Blank
M-blank – Method Blank
SP Level – Spike Level
%Rec – Recovery Percent
%RPD – Relative Percent Differences
%Diff – Control Limit for %RPD
ICP-SD – ICP Serial Dilution
N.A. – Not Applicable

Respectfully submitted,

Kevin Xie
QA/QC Coordinator
Applied P & Ch Laboratory

0000 0005 1000

Applied P & Ch Laboratory

APCL

13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

Chain of Custody

Please Print in pen — Page 1 of 1

Client: WCL — Contact: DUNCAN WALKER — Tel #: 808-395-0392 — Fax #: 808-395-1969

Address: 7192 KALANIANAOLE HWY, #G-220 — City: HONOLULU — State: HI — Zip code: 96825

Bill to: TET (RAY FIELDS, USP, AR-505-2066

Project Name/Code KING ST. TEXACO — Job # 95-1197 — P.O. #

Project Address 1239 So. KING ST., HONOLULU — APCL Quotation #

Due Date: ☒ regular ☐ rush: 7 days ___ hours — Sampled by:

White - With report
Yellow - Lab copy
Pink - Originator

Field Sample ID No.	Sample Description	Date Collected	Time Collected	Sample Matrix	Preservation	# of Containers	TPH-G/BTEX	TPH-D (BOSR)	Remarks
MW1-1W	GROUNDWATER, MW1	10/2/95	1200	WATER	HCL	3	X	X	
MW2-1W	GROUNDWATER, MW2	10/2/95	1245	WATER	HCL	2	X		
MW3-1W	GROUNDWATER, MW3	10/2/95	1420	WATER	HCL	3	X	X	
MW4-1W	GROUNDWATER, MW4	10/2/95	1451	WATER	HCL	3	X	X	
MW5-1W	GROUNDWATER, MW5	10/2/95	1535	WATER	HCL	2	X		
MW6-1W	GROUNDWATER, MW6	10/2/95	1600	WATER	HCL	3	X	X	
MW7-1W	GROUNDWATER, MW7	10/2/95	1640	WATER	HCL	2	X		* RUN ONLY IF DETECTED IN SAMPLE
FIELD BLANK	FIELD BLANK	10/2/95	—	WATER	HCL	2	X*		
TRIP BLANK	TRIP BLANK	—	—	WATER	HCL	2	X*		

3861

QC Requirement: ☐ Regular; ☒ QA/QC Report; ☐ WIP; ☐ Raw Data; ☐ Extended Raw Data ☐ CLP; ☐ ACE ☐ AFCEE ☐ NEESA __ (E, C or D); ☐ Other ______ (Please specify)

Sample Disposal: ☐ Return ☒ Disposal by APCL ☐ Hold for ____ days after receiving date. If not specified, samples will be discarded 45 days after samples are received.

Sample Conditions: ☑ Intact; ☐ Broken. Cooler Seal: ☑ Intact; ☐ Broken; ☐ None. Tag # ______ Temperature: ☐ Room ☑ Cold (8.6 °C).

Relinquished by Dw — Date/Time 10/2/95 / 1900 — Received by V Bottomley — Date/Time 10/3/95 / 9:45 AM

Relinquished by — Date/Time / — Received by — Date/Time /

APCL USE ONLY Service # — Note:

Clients understand that all terms described in the proposals, quotations for this project, and/or the general terms provided in the current APCL price schedules will be followed. APCL reserves the right to terminate service or withhold delivery of any reports, if in APCL's sole discretion the terms of the project have been broken.

Root-file:|CUST.DATA.LAB|CHAIN.ROOT.TEX File:|CUST.DATA.LAB|CHAIN4.TEX

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Applied P & Ch Laboratory

13760 Magnolia Ave., Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

Sample Receiving Checklist

APCL ServiceID: 3861 Client Name/Project: WCL | King St. Texaco

1. Sample Arrival

Date/Time Received 10/3/95 9:45 Date/Time Opened 10/3/95 10:00 AM By (name): VB
Shipping: ______ Air Bill#: 7653704612 Company: ______
Custody Transfer: ☐ Client ☑ ~~Courier/Fast~~ DHL ☐ UPS ☐ US Mail ☐ FedEx ☐ APCL Empl: ______

2. Chain-of-Custody (CoC)

☑ With Samples? ☐ Faxed? ☑ Client has Copy? ☑ Signed, dated? By: VB
☑ Project ID? ☑ Analyses Clear? ☐ Hold Samples? #on Hold ______ # Received 1
☐ CoC/Docs Zip-Locked under lid? ☐ Compos.#: __ ☑ #Samples OK? ______
☐ Discrepancies? ☐ Client notified? ☐ Response (attach docs): ______

3. Shipping Container/Cooler

☑ Cooler Used? # of ~~5~~ 1 (VB 10/3/95) Cooled by: ☑ Ice ~~☑~~ Blue Ice (VB 10/3/95) ☐ Dry Ice ☐ None
Temp? 8.6 °C °F Measured: ☐ Blank? ☑ Cooler? ☐ Other? ______
Cooler Custody Seal? ☐ Absent ☑ Intact ☐ Tampered? Custody Seal#: ______

4. Sample Preservation

☐ pH on label? ☐ Correctly? ☐ pH <2 ☐ pH >12
If Not, pH = ______ Preserved by: ☐ Client ☐ APCL ☐ Third Party ______
Initialed: ______ Use pH login checklist for multiple samples. ☐ Anomaly? ______

5. Holding-time Requirements

☐ pH 24hr ☐ BACT 6/24hr ☐ Cr^{VI} 24hr ☐ NO_3^- 48hr ☐ BOD 48hr ☐ SVOCs 7day-Extr
☑ VOCs 14day ☐ Cl_2 24hr ☐ Turbidity
☐ HT Expired? ☐ Client notified?* Response? ______

6. Sample Container Condition

☑ Intact? ☐ Broken? ☑ Documented? Number: 22 ☐ from Client ☐ from APCL
Type: ☐ plastic ☑ glass ☐ Tube: brass/SS ☐ Tedlar Bag ☐ Septum Reqd?
☑ Quantity OK? ☐ Leaking? ☐ Anomaly? ☐ Action: ______
☑ Caps tight? ☐ Air Bubbles? ☐ Anomaly? ☐ Action: ______
Labels: ☑ Unique ID? ☑ Date/Time ☑ Preserved? ☐ Action: ______

7. Turn Around Time

☑ RUSH TAT: 5 days ☐ Std (6 days) ☐ Not Marked ☐ Problem? ☐ Action: ~~Normal~~ VB 10/3/95

8. Sample Matrix

☐ Drinking H_2O ☐ Other Liq ☐ Soil ☐ Wipe ☐ Polymer ☐ Air ☑ Other: H_2O
☐ Ground H_2O ☐ Sludge ☐ Filter ☐ Oil/Petro ☐ Paint ☐ Waste ☐ Extract ☐ Unknown

9. Pre-Login Check List Completed & OK?

☑ ALL OK? (if not, attach docs) ☐ Client Contact? (Name:______)Date/Time:______
Received/Checked by: VB Date: 3 Oct 1995 Time: 9:55 a.m.

Samples must be analyzed for results to reflect total concentrations. Results generated outside required of holding times are considered minimal values and may be used to define waste as hazardous but not as non-hazardous.

DocumentFile: [aeal.texfiles]smprcl.tex.

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PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

Walker Consultants, LTD 9192 Kalanianaole HWY, G220 Honolulu, HI 96825	Project: South King Street Texaco Project Number: 96-1246 Project Manager: Duncan Walker	Sampled: 7/18/96 Received: 7/22/96 Reported: 8/9/96

Project Summary

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW1-2W	B607339-01	Water	7/18/96
MW3-2W	B607339-02	Water	7/18/96
MW2-2W	B607339-03	Water	7/18/96
MW4-2W	B607339-04	Water	7/18/96
MW5-2W	B607339-05	Water	7/18/96
MW6-2W	B607339-06	Water	7/18/96
MW7-2W	B607339-07	Water	7/18/96
)W8-1W	B607339-08	Water	7/18/96
FIELD BLANK	B607339-09	Water	7/18/96
TRIP BLANK	B607339-10	Water	7/18/96

North Creek Analytical, Inc.

Jack R. Boyer for
Matthew Essig, Project Manager

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Walker Consultants, LTD 9192 Kalanianaole HWY, G220 Honolulu, HI 96825	Project: South King Street Texaco Project Number: 96-1246 Project Manager: Duncan Walker	Sampled: 7/18/96 Received: 7/22/96 Reported: 8/9/96

Gasoline Hydrocarbons (C6-C12) and BTEX by EPA 8015M and 8020A

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes
MW1-2W			B607339-01				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	ND	ug/l (ppb)	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*108*	%	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-136*		*83.7*	"	
MW3-2W			B607339-02				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	ND	ug/l (ppb)	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*110*	%	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-136*		*85.0*	"	
MW2-2W			B607339-03				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	226	ug/l (ppb)	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*142*	%	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-136*		*90.0*	"	
MW4-2W			B607339-04				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	969	ug/l (ppb)	
Benzene	"	"	"		0.500	199	"	
Toluene	"	"	"		0.500	43.5	"	
Ethylbenzene	"	"	"		2.50	ND	"	
Xylenes (total)	"	"	"		1.00	12.1	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*110*	%	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-136*		*88.1*	"	
MW5-2W			B607339-05				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	218	ug/l (ppb)	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	

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Jack R. Cooper for
Matthew Essig, Project Manager

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Walker Consultants, LTD 9192 Kalanianaole HWY, G220 Honolulu, HI 96825	Project: South King Street Texaco Project Number: 96-1246 Project Manager: Duncan Walker	Sampled: 7/18/96 Received: 7/22/96 Reported: 8/9/96

Gasoline Hydrocarbons (C6-C12) and BTEX by EPA 8015M and 8020A

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW5-2W (continued)			B607339-05				Water	
Ethylbenzene	6070684	7/25/96	7/25/96		0.500	ND	ug/l (ppb)	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*120*	%	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-136*		*88.1*	"	
MW6-2W			B607339-06				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	371	ug/l (ppb)	
Benzene	"	"	"		0.500	23.5	"	
Toluene	"	"	"		0.500	1.28	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*128*	%	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-136*		*91.3*	"	
MW7-2W			B607339-07				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	1530	ug/l (ppb)	
Benzene	"	"	"		0.500	2.05	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	0.539	"	
Xylenes (total)	"	"	"		1.00	1.24	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*138*	%	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-136*		*98.1*	"	
MW8-1W			B607339-08				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	ND	ug/l (ppb)	
Benzene	"	"	"		0.500	5.58	"	
Toluene	"	"	"		0.500	1.13	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	2.55	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*103*	%	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-136*		*86.3*	"	
FIELD BLANK			B607339-09				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	ND	ug/l (ppb)	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	0.714	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*105*	%	

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Jack R. Cooper for
Matthew Essig, Project Manager

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Walker Consultants, LTD 9192 Kalanianaole HWY, G220 Honolulu, HI 96825	Project: South King Street Texaco Project Number: 96-1246 Project Manager: Duncan Walker	Sampled: 7/18/96 Received: 7/22/96 Reported: 8/9/96

Gasoline Hydrocarbons (C6-C12) and BTEX by EPA 8015M and 8020A

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
FIELD BLANK (continued)			B607339-09				Water	
Surrogate: 4-BFB (PID)	*6070684*	*7/25/96*	*7/25/96*	*53.0-136*		*86.9*	*%*	
TRIP BLANK			B607339-10				Water	
Gasoline Range Hydrocarbons	6070684	7/25/96	7/25/96		50.0	ND	ug/l (ppb)	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*104*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-136*		*86.9*	"	

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Jack R. Cooper for
Matthew Essig, Project Manager

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Walker Consultants, LTD
9192 Kalanianaole HWY, G220
Honolulu, HI 96825

Project: South King Street Texaco
Project Number: 96-1246
Project Manager: Duncan Walker

Sampled: 7/18/96
Received: 7/22/96
Reported: 8/9/96

Gasoline Hydrocarbons (C6-C12) and BTEX by EPA 8015M and 8020A
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 6070684	**Date Prepared: 7/25/96**									
					Water					
Blank	**6070684-BLK1**									
Gasoline Range Hydrocarbons	7/25/96			ND	ug/l (ppb)	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	1.00				
Surrogate: 4-BFB (FID)	"	*16.0*		*16.6*	"	*50.0-150*	*104*			
Surrogate: 4-BFB (PID)	"	*16.0*		*13.0*	"	*53.0-136*	*81.3*			
					Water					
Blank Spike	**6070684-BS1**									
Gasoline Range Hydrocarbons	7/25/96	501		532	ug/l (ppb)	63.0-127	106			
Surrogate: 4-BFB (FID)	"	*16.0*		*21.1*	"	*50.0-150*	*132*			
					Water					
Duplicate	**6070684-DUP1**		**B607339-03**							
Gasoline Range Hydrocarbons	7/25/96		226	202	ug/l (ppb)			45.0	11.2	
Surrogate: 4-BFB (FID)	"	*16.0*		*18.6*	"	*50.0-150*	*116*			
					Water					
Matrix Spike	**6070684-MS1**		**B607339-01**							
Benzene	7/25/96	10.0	ND	8.75	ug/l (ppb)	62.0-126	87.5			
Toluene	"	10.0	ND	9.23	"	72.0-120	92.3			
Ethylbenzene	"	10.0	ND	9.22	"	69.0-129	92.2			
Xylenes (total)	"	30.0	ND	28.0	"	73.0-126	93.3			
Surrogate: 4-BFB (PID)	"	*16.0*		*14.4*	"	*53.0-136*	*90.0*			
					Water					
Matrix Spike Dup	**6070684-MSD1**		**B607339-01**							
Benzene	7/25/96	10.0	ND	8.94	ug/l (ppb)	62.0-126	89.4	13.5	2.15	
Toluene	"	10.0	ND	9.46	"	72.0-120	94.6	8.70	2.46	
Ethylbenzene	"	10.0	ND	9.48	"	69.0-129	94.8	13.6	2.78	
Xylenes (total)	"	30.0	ND	28.8	"	73.0-126	96.0	16.3	2.85	
Surrogate: 4-BFB (PID)	"	*16.0*		*14.7*	"	*53.0-136*	*91.9*			

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Jack R. Cooper for
Matthew Essig, Project Manager

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Correspondence to: 18939 - 120th Ave. NE, #101, Bothell, WA 98011

Walker Consultants, LTD
9192 Kalanianaole HWY, G220
Honolulu, HI 96825

Project: South King Street Texaco
Project Number: 96-1246
Project Manager: Duncan Walker

Sampled: 7/18/96
Received: 7/22/96
Reported: 8/1/96

Project Summary

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW4-2W	B607339-04	Water	7/18/96
MW6-2W	B607339-06	Water	7/18/96

North Creek Analytical, Inc.

Jack R. Cooper for

Matthew Essig, Project Manager

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Honolulu, HI 96825

Project: South King Street Texaco
Project Number: 96-1246
Project Manager: Duncan Walker

Sampled: 7/18/96
Received: 7/22/96
Reported: 8/1/96

Heavy Oil Range Hydrocarbons by WTPH-418.1

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
MW4-2W			B607339-04					
Petroleum Oil Hydrocarbons	6070071	7/30/96	7/30/96	EPA 418.1	1.00	ND	mg/L (ppm)	
MW6-2W			B607339-06					
Petroleum Oil Hydrocarbons	6070071	7/30/96	7/30/96	EPA 418.1	1.00	ND	mg/L (ppm)	

North Creek Analytical, Inc.

Jack R. Cooper for
Matthew Essig, Project Manager

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ATTACHMENT "F"

MARKET STUDY OF ELDERLY HOUSING

SMS Research & Marketing Services, Inc.
1042 Fort Street Mall, Suite 200
Honolulu, Hawaii 96813
Telephone: (808) 537-3356
Fax: (808) 537-2686

To: Name: Gary S. Furuta
Fax: 395-1520

From: John Kirkpatrick
Date: March 10, 1998
Number of pages including this one: 1

Thanks for your fax. In reply:

Our exhibit list projects recently completed or planned for the near future. The analysis builds on the 1997 Hawai'i Housing Policy Study Update, so it lists projects that are not in the inventory (as of 1/1/97) listed in that study. Accordingly, the Na Lei Hulu Kupuna project in Kaka'ako .and Hale Mohalu in Pearl City are not included, since these opened their doors before 1997.

The bankers asked, "What is the rent for comparable market units?" What units? One-bedroom rentals in multi-family buildings? As of mid-1997, there were a total of 467 units advertised on Oahu, and the average rent asked was $722. The median rent was $700 (as compared to $500 in the proposed King Street Apartments!)

If they're asking with regard to one-bedroom *elderly* units, our answer has to be that the available inventory is small. New projects such as Kulana Hale have included a very few one-bedroom units at affordable rates – and they're gone. There simply isn't a "market rate" here, i.e., both demand and a supply of units for which the market sets a price. Since there is demand but no units to meet it, we can be confident the King Street Apartments is well designed to respond to demand.

I hope this clears up the questions. Thanks!

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Socio-Economic Studies

MARKET STUDY OF ELDERLY HOUSING, CITY AND COUNTY OF HONOLULU, FOR THE PROPOSED KING STREET APARTMENTS

February 1998

Prepared for:

Hawai'i Housing Development Corporation

SMS affiliations:
Alan Barker Associates
Customer Insight Company
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INTRODUCTION

The proposed King Street Apartments will provide 91 one-bedroom units for elderly persons for rent for about $500 per month. (Including utilities, gross housing costs should come to about $550 per month.) This rate is affordable for households with 50% of the HUD median annual income. This market has been targeted on the expectation that demand is strong for such housing in the area.

In this report, SMS Research & Marketing Services, Inc. compiles and analyzes information bearing on the question of demand for elderly housing at this income level in Urban Honolulu. Major sources for the report are the *1997 Hawaii Housing Policy Study Update* and calls to developers. Major findings include:

- There is clear evidence of pent-up demand for elderly housing;
- Evidence of demand at the income level selected for the project is strong in wait-lists for existing projects;
- Little new competing supply is planned to be built; and
- Demographic projections strongly suggest that demand will grow in the next few decades.

We conclude that the project will respond to a strong existing demand. Demand from Honolulu's senior citizens will make vacancy levels in the project extremely low for the foreseeable future.

Key indicators of supply and demand are shown in Exhibit A. Calculations used to estimate demand are discussed later in the text.

AFFORDABLE HOUSING SUPPLY

O'ahu has long stood out as an urban area with low rates of homeownership, and extremely high housing prices. Rents, along with other components of the cost of living, have also been high. In recent years, rental vacancy rates have usually been less than 5% (as shown in Exhibit B), and are consistently lower than vacancy rates for the State as a whole.

Exhibit A: INDICATORS OF SUPPLY AND DEMAND FOR THE PROJECT

	O'ahu	Urban Honolulu
Supply		
New elderly units potentially competing with King/Alder Project	343	223
King/Alder Project units	91	91
Demand		
Households with persons age 62 or older	76,674	38,956
Households with seniors -- respondent will move	21,168	8,918
Share expects to rent	41.4%	50.4%
Seniors expected to move (1)	14,108	7,168
Potential movers to project (2)	1,294	910
Demand as % of Supply	298%	290%

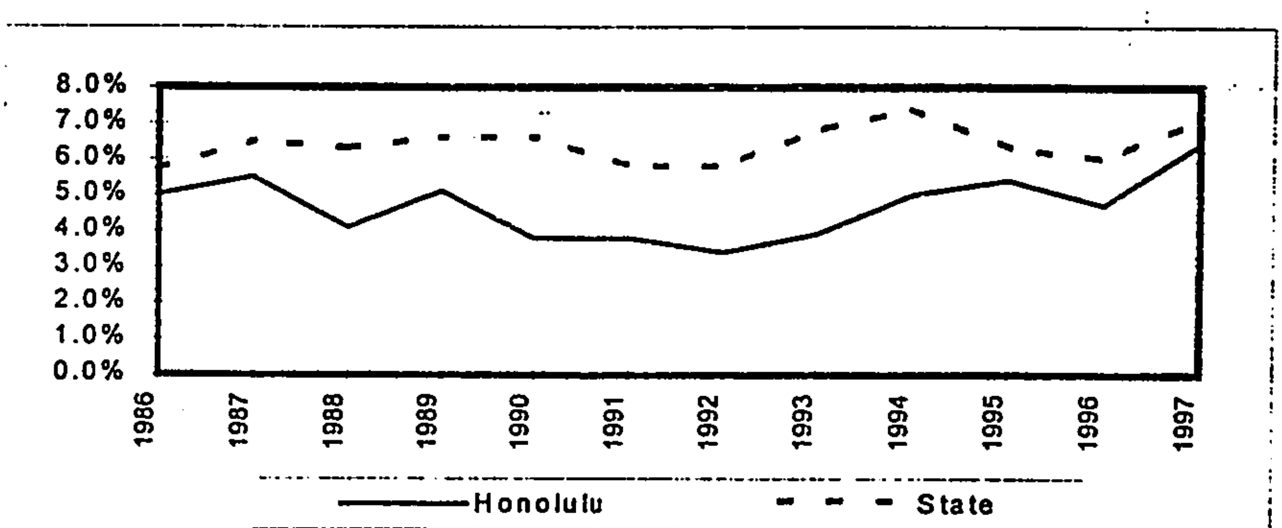
NOTES: Counts may not sum to total units due to weighting. Percentages may not sum to 100% due to rounding. Totals vary from table to table depending on whether "undecided" or "no data" responses are included.

(1) "Seniors" may be persons or couples moving as a separate household..

(2) Estimate based on affordability and locational preference.

SOURCE: SMS Research & Marketing Services, Inc. and The Prudential Locations, Inc., 1997.

Exhibit B: US CENSUS ESTIMATES OF RENTAL VACANCY RATES



SOURCE: US Bureau of the Census, 1997.

An analysis of annual changes in islandwide rents suggests that rents are stable with vacancy rates at about 4% and can decrease when the rate exceeds 5% (The Prudential Locations, 1997). This suggests that average rents will fall in the near term. However, as will be discussed below, additions to the island rental supply are small in comparison to demand, and vacancy rates will likely fall to the 4% to 5% range, or even lower. As a result, the supply of rental units available for households with incomes at about 50% to 60% of the HUD median will remain tight or even diminish.

In the year from August 1996 through July 1997, 5,953 newspaper advertisements – 37.3% of the annual total – on O'ahu were for studio and one-bedroom apartments. The studio units were all located in Honolulu and nearby Salt Lake. One-bedroom units were found in most parts of the island, but most were in the Honolulu area. Listed rents averaged $631/month for studios, an amount about half-way between the affordable rents for households earning 50% and 60% of the HUD median household income for O'ahu (for one- and two-person households). For one-bedroom apartments, the mean rent was $732/month, or about 60% of the HUD median.

At the end of the period (July 1997) the average rents listed had fallen slightly, to about $620 for studios and $722 for one-bedroom apartments. In comparison, rents at the King Street project are expected to be about – well below the average rate for studios, and about 70% the average cost of such units.

Recent Additions to the Elderly Housing Supply

SMS identified several existing and proposed elderly housing projects for additional research because of their potential to compete with the proposed King Street Apartments project. They are considered additions to the housing stock (taking the housing stock as of the end of 1996 as a baseline). These projects are shown in Exhibit C.

Of the existing projects identified, only three are located within the general vicinity of the proposed project — Arcadia Retirement Residence, Kulana Hale Phase I, and One Kalākaua Senior Living. Of these, only Kulana Hale Phase I competes directly with the King Street Apartments project.

Exhibit C: RECENTLY BUILT AND PROPOSED ELDERLY HOUSING

	Total Units	Elderly Units	Afford-able Units	Afforda-bility Criteria	Competes with King St. Apts	Maximum Number of Units Competing	Wait List/Duration
Existing							
Arcadia Retirment Residence (Makiki) (Purchase lifetime lease)	216	216	None	N/A	No	0	Yes/4-5 yrs
Kauolu Phase I (Kamalu) (Waipahu)	109	109	109	<50%	Yes	0	Yes/1-2 yrs
Kauolu Phase II (Hoolulu) (Waipahu)	112	112	112	<50%	Yes	0	Yes/1-2 yrs
Kulana Hale - Phase I (Makiki)	176	176	176	35 @ 50% 141 @ 60%	Yes	88	Had full sign-up/Opened 12/97 (approx 50% rented)
Maluhia Elderly Housing (Kalihi)	40	39	39	50%	Yes	0	Yes/1-2 yrs
Olaloa Retirement Community (Purchase) (Mililani)	360	360	180	80% - 160%	No	0	N/A (All affordable units sold)
One Kalakaua Senior Living (Purchase) (Makiki)	166	166	None	None	No	0	N/A - 80% Sold
Ponds at Punaluu (Punaluu)	138	138	None	N/A	No	0	N/A (25% Cater/Assisted Living rented; 50% Alzh. rented)
Proposed/Under Construction							
H & M Apartment Project (Waikiki)	132	0	66	up to 140%	Possibly	13	10% for 80% or less of med. inc.
Hawaii Kai (Assisted Living) (Hawaii Kai)	197	197	None	None	No	0	Yes
Isenberg Affordable Housing Project (Makiki)	217	54-72	217	Unknown	Possibly	36 (1)	N/A
Kapiolani Renaissance (Kakaako)	186	186	37	50%-140%	Possibly	18 (1)	N/A
Kauolu Phase III & IV (Waipahu)	240	240	Unknown	Unknown	Possibly	120 (2)	N/A
Kulana Hale Phase II (Assisted Living) (Makiki)	162	162	65	60%	No	0 (3)	N/A
One Archer Lane (purchase) (Kakaako)	331		None	None	No	0	N/A
Pawaa Annex Condos (purchase) (Makiki)	246	None	245	140%	No	0	N/A
Pawaa Annex Rentals (Makiki)	200	20	20	60%	Possibly	20	N/A
Queen Emma Fdn Waipahu Project (Assisted Living) (Waipahu)	277 beds	277 beds	None	None	No	0	
Royal Kinau	84	84	84	60%	Yes	46	Sign up list was full.
Symphony Park (purchase) (Kakaako) (Independent/Assisted Living)	490	490	None	None	No	0	N/A
TOTAL APPROXIMATE UNITS COMPETING WITH KING ST. PROJECT						343	

NOTES: Based on calls to developers by SMS Research, January 1998.

(1) Many or most "affordable" units could be priced much higher than the King St. Apartments. Hence the 50% estimate used here is maximal.

(2) 120 units of this project are being proposed for an assisted living facility. It is presently unclear what affordability criteria will be applied for the remaining units.

(3) The project's income limits are close to those of the King Street Apartments, but these assisted living units will be held for renters who need services.

Kulana Hale Phase I was recently completed and opened for occupancy in December 1997. It is presently approximately 50% occupied. Of the 176 total units in the project, 35 are reserved for seniors making 50% or less of the median household income. The remainder (141) are being marketed to those earning 60% or less of the median household income. It should be noted that of the 176 apartments, 11 are 2-bedroom units and will not compete with the proposed project. The large majority of units are studios and one-bedroom apartments. All the one-bedroom units are now rented

The King Street Apartments project will not compete with the other two existing facilities — Arcadia Retirement Residence and One Kalākaua Senior Living. Units in these two facilities are available only for sale and both contain assisted living and skilled nursing facilities.

The remaining existing seniors project are located outside of the general vicinity of the King Street Apartments project. Only the Kauolu projects (Kamalu and Hoolulu) and the Maluhia Elderly Housing compete for tenants at the same income level as the proposed project. However, vacancies at these projects are nearly non-existent and those signed up on the waiting lists typically wait 1 to 2 years for a unit to become available.

Proposed Housing

There are a number of proposed senior living projects proposed within the general vicinity of the proposed King Street Apartments project. However, only four — Kulana Hale Phase II, Royal Kinau, the Pawa'a Annex Rental project, and the Isenberg Affordable Housing Project — could compete with the proposed project for prospective tenants. Kulana Hale Phase II will be an assisted living facility. Of the 162 units, 65 will be reserved for seniors making 60% or less of the median household income, and those presently living in Phase I of the project will have first priority for these 65 units. It is anticipated that groundbreaking for this project could occur as early as May, 1998. Units should be available for occupancy approximately one year later.

The Royal Kinau building is to include some 48 units affordable to seniors earning 60% of the HUD median. It is scheduled to open in mid-1998. Currently, the developer is considering renting the entire project at rates affordable to households with 60% of the median income (personal communication to G. Furuta. February 1998), but is not committed to that strategy for the long term.

The Pawa'a Annex Rental project is actually the second phase of the development of the Pawa'a Annex property. The first phase consists of a 240-

condominium high-rise. It is currently under construction. These units are being marketed to those making 140% of the median household income. None of the units have been set aside for rental or for seniors.

Phase II of the Pawa'a Annex property consists of a 200-rental unit high-rise tower. The developer has applied for low-income tax credits. If these are granted, approximately 10% of the units, 20 units, will be reserved for seniors making 60% of the median income. It is these units that would compete with the King Street Apartments project. However, if the developer should not receive the low-income tax credit, all units will be marketed to those making 80%-140% of the median household income. Construction on this project could begin as early as next month, March, 1998, and units available for occupancy approximately one year later.

The proposed 217-unit Isenberg Affordable Housing project will include from 54 to 72 units available for seniors. At this time, though, it is unclear what the affordability criteria will be for these units. These units would not be available until mid-1999 at the earliest.

The remaining proposed projects are designed chiefly as more moderately-priced condominiums for sale, or as assisted living facilities. While several are intended to serve the seniors market, none has units reserved for seniors who might also compete for the units at the King Street Apartments project.

Total New Supply

The new O'ahu supply (since the cut-off point for the *1997 Update*) for senior singles and couples in the 50% to 60% income range amounts to 343 units listed in Exhibit B and another 91 units in the proposed King Street project, for a total of 434 units. Counting only units in urban Honolulu, the total comes to 314 units. It should be stressed that **most of these units will cost more** than King Street units, and **most will be studios, not one-bedroom apartments.** The King Street project stands out as new, very competitively priced, and cosnsisting entirely of one-bedroom units..

DEMAND

The Island Housing Market. O'ahu's high housing costs have long testified to pent-up demand. As of 1997, overall pent-up demand (or the "resident housing unit deficit") is estimated as 19,000 units. Pent-up demand remains, even though much new housing has been developed, and crowding has appreciably diminished. (In 1992, 23.2% of households surveyed on O'ahu had more than one person per room; by 1997, only 10.8% did.)

Pent-up demand is theoretical – it is demand that could be realized if both incomes and the housing stock permitted. Current demand, as measured by residents' expectation that they will be moving in the near future, is lower now than in 1992. Moreover, the share of survey respondents who prefer to move to a location outside Hawaii has increased to 32.2% of current demand of the O'ahu respondents expecting to move sooner or later.

Renters form a smaller share of the O'ahu population as of 1997 (46.2%, compared to 52.4% surveyed in 1992). Growth in homeownership has been achieved at some cost. The share of homeowners paying 30% or more of their income for housing has grown to 39.2%. Among renters, the share with such high shelter-to-income ratios has declined slightly, from 44.6% to 41.4%.

The key indicator of current demand in surveys is respondents' expectation that they will move. The number of O'ahu households expecting to move has increased slightly, while the share of households expecting to move went down from 57.4% in 1992 to 55.2% in 1997.

Households now renting form the large majority (65.6%) of the 129,000 households expecting to move sooner or later. Most of those (56.0%) expect and prefer to rent their next home. Of potential renters, Statewide, a quarter (25.4%) thought that housing costs of about $500 to $799 would be affordable, and another quarter (27.8%) thought that costs in the $800 to $1,099 range would be affordable.

Senior Housing Demand – Analytic Issues. The *Hawaii Housing Policy Study* provides evidence of demand for housing among senior citizens. However, the data do not establish the extent of demand for elderly housing, for three reasons:

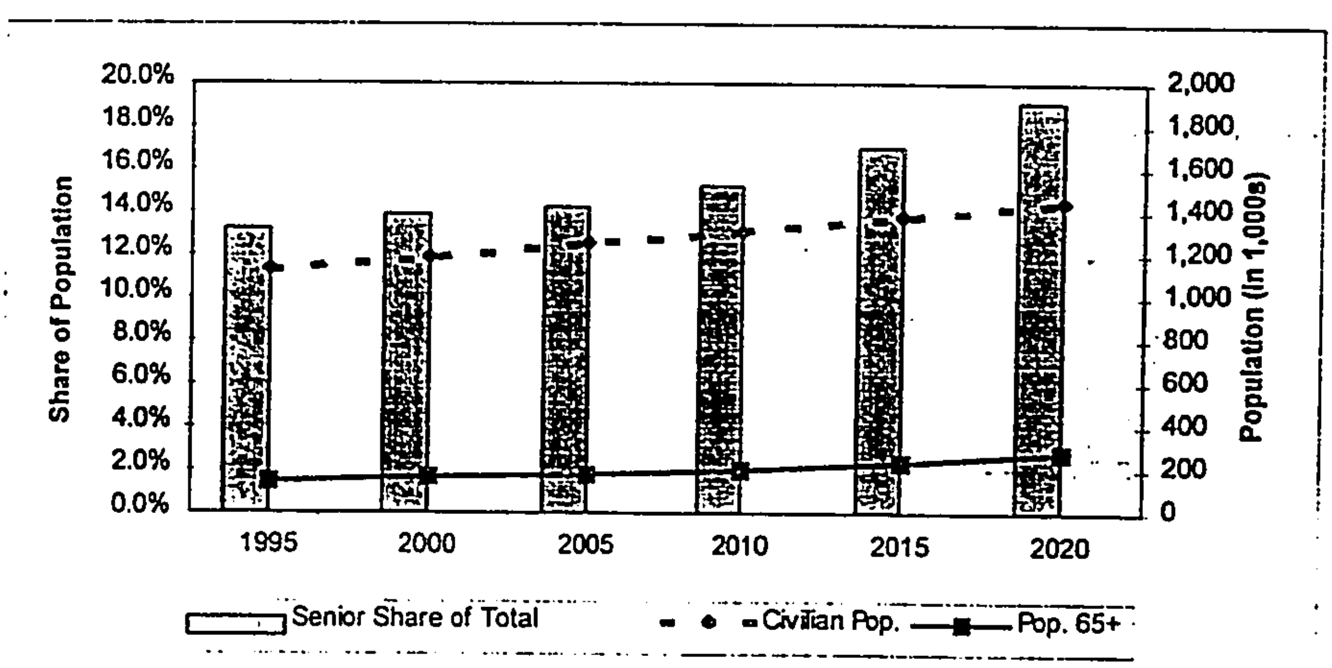
- Respondents are asked whether they expect to move, but not whether they might move into elderly housing.
- Some seniors leave multi-generational families to enter elderly housing. In their cases, data on household income is misleading, since it refers to a larger household than the senior(s) moving to new quarters.
- Seniors' moves to elderly housing, especially housing with assisted living, is often experienced as a matter of necessity, not preference or expectation.

Data from the *1997 Update* of the *Hawaii Housing Policy Study* must then be assessed to estimate (a) the share of households with seniors in which the older members of the household are expecting to move; and (b) the share of households in which reported household income is much greater than the income of the moving person(s). The share of households in which seniors will move can be estimated from information on relationships among household members. The income issue is harder to tackle, so a very conservative approach is used in this report.

The likelihood that seniors are forced to move cannot be estimated from the study. By omitting cases in which seniors can no longer maintain independent households, the study provides a conservative estimate of demand for housing among seniors. Moreover, most Hawaii seniors have little experience of the range of options for elderly housing that are or may soon be available. The few options they have in mind may seem unacceptable. However, as housing of different types (assisted, congregate-living communities, and others) becomes available, seniors' interest in elderly housing is likely to increase.

Senior Housing Demand – Current and Future Demand. In the coming decades, seniors will constitute a growing share of Hawaii's population: some 275,000 persons 65 or older, over 19% of the resident population as of the year 2020.

Exhibit C: GROWTH IN SENIOR POPULATION, STATE OF HAWAII, TO 2020



NOTE: The State projections single out persons age 65 and older (State Department of Business, Economic Development and Tourism, 1997b). The share of the population meeting age criteria for elderly housing (in most cases, age 62 and above) would be greater than shown in the table.

On O'ahu, 55.2% of survey respondents say they expect to move eventually. For households with seniors, only 27.6% expect to move. SMS Research

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estimates that the share of senior persons or couples likely to move is about 18.4% of all households with seniors present. (The number of senior movers – persons or couples – expecting to move can be estimated by using data on relationships in these households. About 50% of these households are one-generation units. All of the persons or couples moving from these units will be seniors. The remainder are multi-generation units. If seniors (not younger members) are assumed to move a third of the time, then the overall ratio of seniors moving from households with seniors in which a respondent expects to move is 50% + (50% * 33.3%) = 66.7%.) This estimate does not include cases in which another member of the household – not the respondent – may move.

The estimated number of senior movers (persons or couples) on the island is estimated as 14,108, given O'ahu's estimated 76,674 households with persons age 62 or older. (See Appendix, Exhibit A-1 for key State and County demographics of senior households.) In the urban Honolulu area (defined here by zip codes beginning with "968"), the estimated number of senior movers comes to 7,168.

Households with seniors in which respondents expect to move differ slightly from non-movers. (See Appendix Exhibits A-1 and A-2 for the comparison.) Most households with seniors have only one persons 62 or older in the home. In urban Honolulu, however, the majority of senior households where respondents expect to move include two or more seniors. Again, while about half the households with seniors on O'ahu make 100% of the HUD median or less, the share in this income range is closer to 60% for households with potential movers.

Demand for the affordable units in urban Honolulu – the King Street Apartments and competing projects – can be estimated when affordability, location, and the likelihood that seniors, not others in the household, intend to move, are taken into consideration. The results, shown in Exhibit D, indicate that demand as of the year 1997 is for about 2,000 units for elderly persons or couples.

The number of singles or couples who might move into affordable elderly housing must be inferred, not simply computed from their current reported income, for at least three reasons. First, the current income may be due to younger earners, who would not move with them. Next, earning streams may diminish sharply as older people end or cut back on paid work. On the other hand, some elders can look to their children for financial support, and may be able to afford rents of about $500 per month even if their personal income is very modest.

Exhibit D: ESTIMATION OF DEMAND FOR URBAN HONOLULU AFFORDABLE ELDERLY RENTALS

	SOURCE	SHARE	DEMAND	
Urban Honolulu				
prefer to rent				
can afford --				
$0 to $499	720	50%	360	
$500 to $799	538	75%	404	
$800 to $1,099	538	25%	135	
$1,100 +	1,440	10%	144	
Don't know, refused (1)	720	28%	200	
Subtotal: affordability			1,242	
Adjust for household type		66.7%		828
Prefer urban location		94.7%		784
Rest of O`ahu				
prefer to rent				
can afford --				
$0 to $499	729	50%	365	
$500 to $799	668	75%	501	
$800 to $1,099	589	25%	147	
$1,100 +	487	10%	49	
Don't know, refused (1)	782	41%	320	
Subtotal: affordability			1,382	
Adjust for household type		66.7%		922
Prefer urban location		13.7%		126
Urban Honolulu				
prefer to own				
can afford --				
$0 to $499	-	50%	-	
$500 to $799	-	50%	-	
$800 to $1,099	1,110	25%	278	
$1,100 +	728	10%	73	
Don't know, refused (1)	1,682	15%	254	
Subtotal: affordability			604	
Adjust for household type		66.7%		403
Prefer urban location		71.2%		287
Rest of O`ahu				
prefer to own				
can afford --				
$0 to $499	-	50%	-	
$500 to $799	640	50%	320	
$800 to $1,099	864	25%	216	
$1,100 +	1,250	10%	125	
Don't know, refused (1)	1,759	19%	342	
Subtotal: affordability			1,003	
Adjust for household type		66.7%		669
Prefer urban location		14.5%		97
TOTAL				1,294

The best indicator of "affordability" in the survey data respondents' estimates of what they could pay for housing, not their reported income, (Also, fewer persons refused to answer the housing question than ones about incomes.) As shown in Exhibit D, SMS Research estimates that some households in which respondents say they would not be able to pay $500 for housing would actually be able to afford the rent at the King Street project ($498 plus utilities), while a share of households reporting that they could pay much more would still be candidates for this project, when senior-only income is separated from the total current income of the household.

On the grounds of affordability, some 4,231 households with persons age 62 or older are potential sources of demand for the project.

Next, the factor discussed earlier, that seniors will move sooner or later from two-thirds of households with seniors where respondents intend to move, was applied. Finally, locational preferences were counted, by treating only the share of potential movers expressing interest in an urban Honolulu location as potential candidates for the project. The share interested in urban Honolulu was calculated separately for potential renters and potential owners in urban Honolulu and the rest of the island, so four separate locational preference percentages are shown in Exhibit D.

The result is about three times the existing and expected supply (including the project along with competition).

Likelihood of Continuing Demand.

To estimate the extent of current vs. future demand, two separate issues deserve note: when those identified as potential movers are likely to move, and the recruitment of new potential movers in the future.

Among the O'ahu senior households with respondents expecting to move, some 33.9% expect to move in two years, and the rest are less certain about their timetables. In the current situation, of limited housing stock available for seniors, and limited housing at affordable rental rates, these judgments of when people will move likely often reflect a sense that there is little to move to, rather than plans not to move for the near future. As a result, it is likely that all the demand expressed in 1997 will be realized – i.e., people will take steps to move – within five years or less.

Furthermore, housing vacancies are currently relatively high, in comparison to historical data for O'ahu. Rental vacancy rates could fall gradually as the population grows and new housing production remains sluggish. They could fall sharply if there are major additions to the military family population (as is proposed in the event that a nuclear carrier is homeported at Pearl Harbor). With lower vacancy rates, the supply of housing affordable to households making 60% or less of the median income will shrink due both to fewer vacancies and to rent increases in buildings not subject to affordability rules.

Exhibit E: INCREASES IN O'AHU SENIOR POPULATION, TO 2020

	Five-Year Increase, Residents Age 65	O'ahu Share of State Pop.	Five-Year Increase, O'ahu Residents
2000	15,300	73.0%	11,168
2005	13,700	72.4%	9,918
2010	21,700	71.7%	15,560
2015	33,700	71.0%	23,935
2020	41,000	70.3%	28,813

Specific Housing Preferences. Of those who express a preference, most respondents from senior households expecting to move expect to own their next home. However, a large share of potential renters insisted not just that they expected to rent, but that they sought not to own their homes in the coming years.

Respondents from senior households often preferred two-bedroom housing or two-bathroom units. However, they were overwhelmingly willing to accept smaller units if necessary. Similarly, many of those intending to move would like to live in units larger than 1,000 square feet – but the single most common response to questions about acceptable size of units was "don't know." This suggests that these potential movers are flexible on the point.

In light of these results, the design of the King Street Apartments as a one-bedroom building, when studios predominate in the elderly housing stock, should guarantee its continuing appeal.

CONCLUSION

The estimated demand for affordable rentals in urban Honolulu among O'ahu's senior citizens is some three times greater than the existing and proposed supply (including the King Street Apartments). This demand is more than sufficient to justify the project.

In the coming decades, growth in the elderly population will result in continuing demand for projects like the King Street Apartments. As aging residents leave the project and comparable buildings, the number of potential renters for similar projects will be increasing. Continuing demand is certain.

A further point deserves note, since it underscore the fact that this report is conservative, and may underestimate demand. Seniors' housing choices are life choices. They involve decisions about resources, needs for shelter, health, convenient services, and sociability, not just income. A housing survey can provide indicators of demand, but cannot sort out with due care the forces motivating seniors to seek new housing. Nor can it fully estimate demand, since demand may be due to many different considerations, not just housing preferences.

The State Housing Finance and Development Corporation has expressed interest in a new study to estimate demand among seniors for multifamily rentals, independent elderly rentals, and assisted living situations. That study could provide more specific estimates of demand than are used here if it brings together information about the various factors motivating the search for new housing among Hawai'i's senior citizens. We expect that it could show that demand is appreciably higher than indicated here.

APPENDIX:

SUPPLEMENTARY TABLES

Exhibit A-1: KEY DEMOGRAPHICS, HOUSEHOLDS WITH SENIORS

	State	O`ahu
Households with persons age 62 or older	110,764	76,674
Households with seniors --		
Number of seniors		
One	60,788	42,360
Two	46,240	31,419
Three or more	3,736	2,895
Senior units likely to move		
Income as % of HUD median		
30% or less	10,335	8,634
over 30% to 50%	17,448	11,304
over 50% to 80%	24,350	16,006
over 80% to 100%	14,600	9,971
over 100%	35,858	26,192
no data	8,172	4,567
Household type		
one person	22,459	15,144
related, 1 gen.	37,729	24,631
related, 2 gen.	28,158	20,717
related, 3+ gen.	15,434	11,356
others	6,441	4,286
no data	545	538

NOTES: Counts may not sum to total units due to weighting. Percentages may not sum to 100% due to rounding. Totals vary from table to table depending on whether "undecided" or "no data" responses are included.

SOURCE: SMS Research & Marketing Services, Inc. and The Prudential Locations, Inc., 1997.

Exhibit A-2: KEY DEMOGRAPHICS, HOUSEHOLDS WITH SENIORS, IN WHICH RESPONDENT EXPECTS TO MOVE

	O'ahu	Honolulu
Households with member(s) 62 or older - EXPECT TO MOVE		
Total	21,168	10,373
Number of seniors		
One	11,296	4,162
Two	9,095	5,822
Three or more	777	390
Income as % of HUD median		
30% or less	2,392	2,153
over 30% to 50%	2,197	546
over 50% to 80%	3,782	1,474
over 80% to 100%	2,604	1,084
over 100%	8,700	4,935
no data	1,493	182
Household type		
one person	2,914	902
related, 1 gen.	6,609	4,348
related, 2 gen.	6,843	3,286
related, 3+ gen.	3,888	1,118
others	913	719

NOTES: Total includes both households in which respondent expects to move and ones in which another member of the household (19.5% of the O'ahu sample, 14.0% of the urban sample) will move. "O'ahu" is the City and County of Honolulu; "Honolulu" covers the areas with zip codes beginning in 968--, i.e, Honolulu and East Honolulu. Counts may not sum to total units due to weighting. Percentages may not sum to 100% due to rounding. Totals vary from table to table depending on whether "undecided" or "no data" responses are included.

SOURCE: SMS Research & Marketing Services, Inc. and The Prudential Locations, Inc., 1997.

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Exhibit A-3: ACCEPTABLE HOUSING OPTIONS, O`AHU SENIOR HOUSEHOLDS WITH RESPONDENT EXPECTING TO MOVE

	O`ahu – Respondent Expects to Move	
	All Household with Seniors	**Prefers to Rent**
Housing Preference		
single-family	3,747	1,152
multi-family	11,581	4,427
undecided	1,706	1,315
Bedrooms		
studio, one	4,464	1,808
two	7,666	3,290
three or more	3,213	720
undecided	1,691	1,077
Willing to reduce?		
yes	10,026	4,378
no	5,078	1,440
undecided, no data	1,930	1,077
Acceptable bathrooms		
one	8,105	4,666
two or more	7,568	1,691
undecided	1,361	538
Willing to reduce?		
yes	10,300	5,098
no	5,374	1,258
undecided, no data	1,360	538
Smallest area acceptable		
800 sq. ft. or less	1,865	1,224
800 to 1,000	1,562	842
1,000 to 1,200	1,103	-
1,200 to 1,500	3,300	1,478
more than 1,500	2,183	640
don't know	7,022	2,710
TOTAL	17,034	6,894

NOTES: Based on responses from Oahu, in which household includes a senior and survey respondent expects to move eventually.
Counts may not sum to total units due to weighting. Percentages may not sum to 100% due to rounding. Totals vary from table to table depending on whether "undecided" or "no data" responses are included.

SOURCE: SMS Research & Marketing Services, Inc. and The Prudential Locations, Inc., 1997.

Exhibit A-4: ACCEPTABLE HOUSING OPTIONS, URBAN HONOLULU SENIOR HOUSEHOLDS WITH RESPONDENT EXPECTING TO MOVE

	Honolulu -- Respondent Expects to Move	
	All Household with Seniors	**Prefers to Rent**
Acceptable Housing		
single-family	1,292	720
multi-family	6,160	2,699
undecided	1,467	1,077
Bedrooms		
studio, one	1,979	720
two	3,972	1,979
three or more	1,708	720
undecided	1,258	1,077
Willing to reduce?		
yes	4,563	1,979
no	3,096	1,440
undecided, no data	1,259	1,077
Acceptable bathrooms		
one	4,147	2,699
two or more	4,051	1,258
undecided	720	538
Willing to reduce?		
yes	5,283	2,699
no	2,915	1,258
undecided, no data	720	538
Smallest area acceptable		
800 sq. ft. or less	538	538
800 to 1,000	1,084	364
1,000 to 1,200	910	
1,200 to 1,500	1,649	1,077
more than 1,500	1,111	
don't know	3,627	2,517
TOTAL	8,918	4,496

NOTE: Based on responses from Honolulu and East Honolulu (zip codes beginning in 968–), in which household includes a senior and survey respondent expects to move eventually.
Counts may not sum to total units due to weighting. Percentages may not sum to 100% due to rounding. Totals vary from table to table depending on whether "undecided" or "no data" responses are included.

SOURCE: SMS Research & Marketing Services, Inc. and The Prudential Locations, Inc., 1997.

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ATTACHMENT "G"

TRAFFIC IMPACT ASSESSMENT REPORT

TRAFFIC IMPACT ASSESSMENT REPORT

FOR

KING STREET APARTMENTS

April 15, 1998

Honolulu, Oahu, Hawaii

Prepared for:

Hawaii Housing Development Corporation

Prepared By:

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FOREWORD

The traffic forecasts shown within this report's figures and tables are the direct result of Pacific Planning & Engineering, Inc.'s proprietary analytical tools. For report editing and review purposes, some or all of the forecast values have been rounded to the nearest five vehicles from our mathematical results, although we do not imply this level of accuracy can exist in any forecast method. The rounded values, however, reasonably quantify the forecasted traffic volumes for the purposes of this study.

The findings and conclusions contained herein are based solely in terms of roadway capacity. No inference should be made from the conclusions regarding traffic safety.

EXECUTIVE SUMMARY

Pacific Planning & Engineering, Inc. (PPE) was engaged to identify and assess future traffic impacts that would be caused by the proposed King Street Apartments project in Honolulu, Oahu, Hawaii.

Project Description

Hawaii Housing Development Corporation is proposing to develop an elderly residential project in Honolulu, Oahu, Hawaii. The project site is located along King Street and is identified by Tax Map Key: 2-3-12:44.

The proposed King Street Apartments project is intended to be an elderly (age 62+) rental project consisting of 91 one-bedroom units and 27 at grade parking stalls. Access to the project will be via driveways on King Street and Alder Street. The project is expected to be completed by the year 2000.

Methodology

Analysis was conducted for the unsignalized intersections of Alder Street with Elm Street and Alder Street with the proposed main project driveway to determine the relative impact of the proposed King Street Apartments Project on the local roadway system.

Future traffic was forecasted for the study intersections by adding the following:

- Existing traffic volumes at the study intersections,
- Traffic generated by other nearby developments in the area that would impact the study intersections, and
- Traffic generated by the project.

This study assesses the impact on each intersection by determining and comparing the level-of-service (LOS) for existing traffic, 2000 forecast without the project, and 2000 forecast with the project traffic conditions.

The time periods analyzed include the two weekday commuter peak hours (morning and afternoon). These periods were studied since traffic volumes on the surrounding roadways would be highest at these times.

Conclusions and Recommendations

The King Street Apartments Project, when completed in the year 2000, would not affect the Level-of-Service at the existing study intersection of Alder Street with Elm Street during the weekday commuter hours. In addition, the intersection of Alder Street with the Project Driveway is anticipated to operate at Level-of-Service A condition. No capacity mitigating actions are required due to the proposed project.

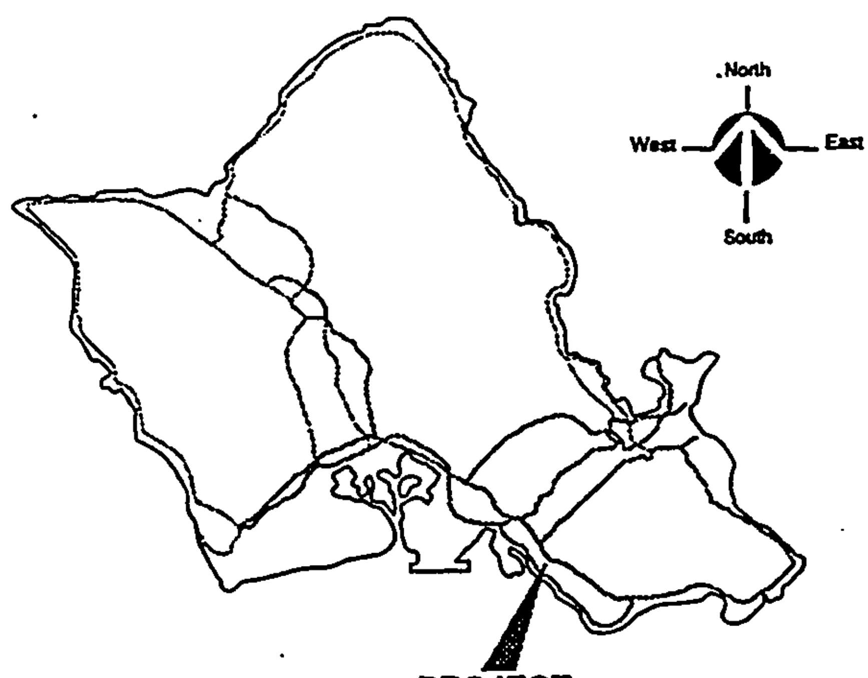
The trips generated by the King Street Apartments Project is estimated to be less than the number of trips generated by the existing Texaco Gas Station.

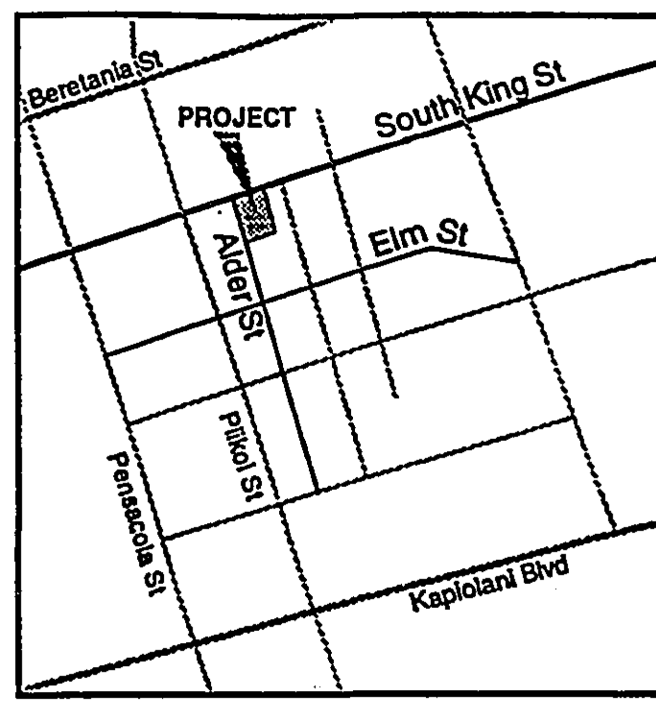
The 27 parking spaces provided as part of the King Street Apartments should be adequate for the intended use as an elderly rental facility.

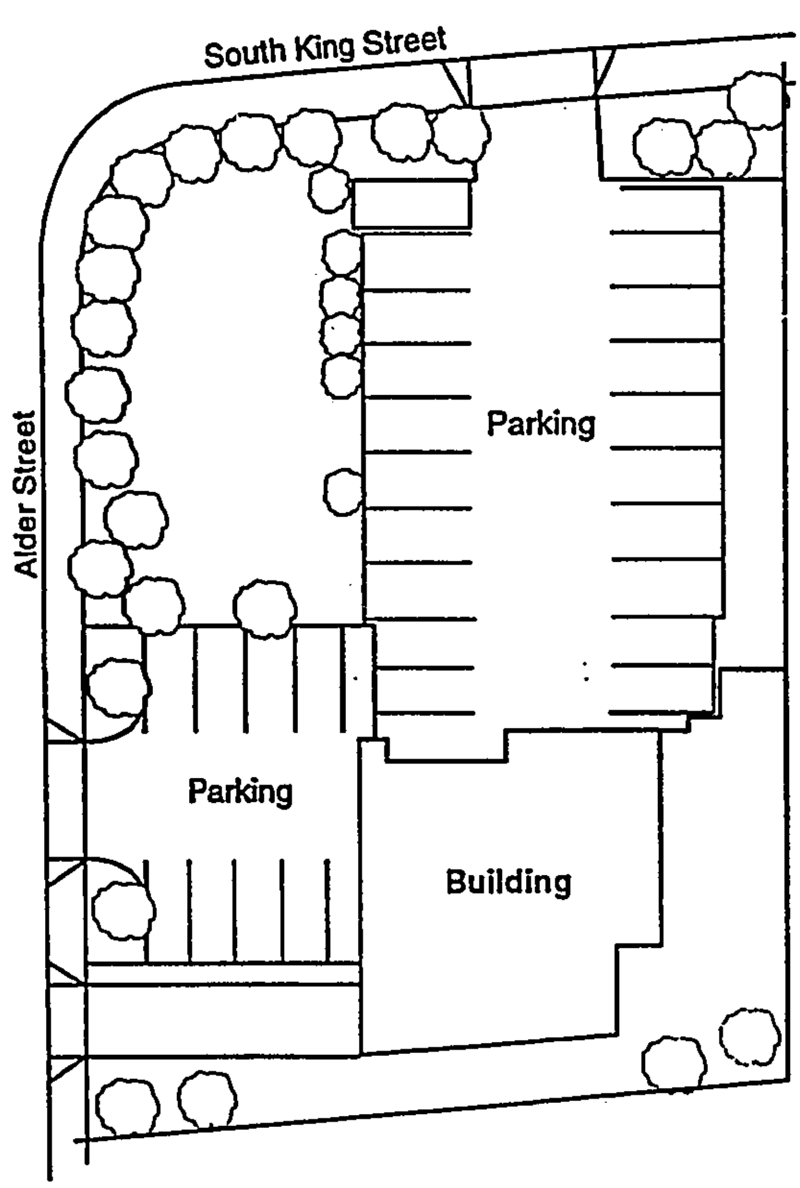
PROJECT DESCRIPTION

Hawaii Housing Development Corporation is proposing to develop a residential project in Honolulu, Oahu, Hawaii. The project site is located at the corner of King Street and Alder Street and is identified by Tax Map Key: 2-3-12:44. Figure 1 shows the project location, roadway network in the vicinity and site plan.

The King Street Apartments project consists of 91 one-bedroom units for elderly (age 62+) rental with 27 on-site parking stalls. The project is expected to be completed by the year 1998. Currently, the project site is occupied by a Texaco Gas Station. Access to the project will be via driveways on King Street and Alder Street.







King Street Apartments

- 91 One Bedroom Units

- 27 Parking Stalls

PACIFIC PLANNING & ENGINEERING, INC | Project Location Map & Site Plan | Figure 1

EXISTING CONDITIONS

An inventory of existing conditions was conducted to ascertain the current traffic conditions in the area and to provide a basis for estimating the potential traffic impact of the proposed project. The review included the land uses in the area, roadway facilities, and existing traffic conditions.

Land Uses

The land uses in the vicinity of the project consists primarily of residential uses and commercial uses. Residential uses are generally located makai of King Street. Commercial uses are predominately located along South King Street.

Land use surrounding the project include Hale Ho'omalu, a youth detention facility and Sheridan Park. Hale Ho'omalu is located south of the project along Alder Street. Sheridan Park is also located along Alder Street makai of Elm Street.

Roadway Facilities

South King Street is a major one-way urban arterial road running through Honolulu. Near the T-intersection with Alder Street, South King Street has four through lanes with provisions for parking on both sides. During the afternoon commuter peak times (3:30 - 5:30 p.m.), parking is banned along South King Street. The result is six through lanes. On-street parking consists of metered parallel stalls. The posted speed limit in the vicinity of the intersection with Alder Street is 30 miles per hour (mph).

Alder Street is a single-lane one-way road paralleling Piikoi Street. Parking is allowed on the west side of the street. The intersection is unsignalized with pedestrian crosswalks. The posted speed limit on Alder Street is 20 mph.

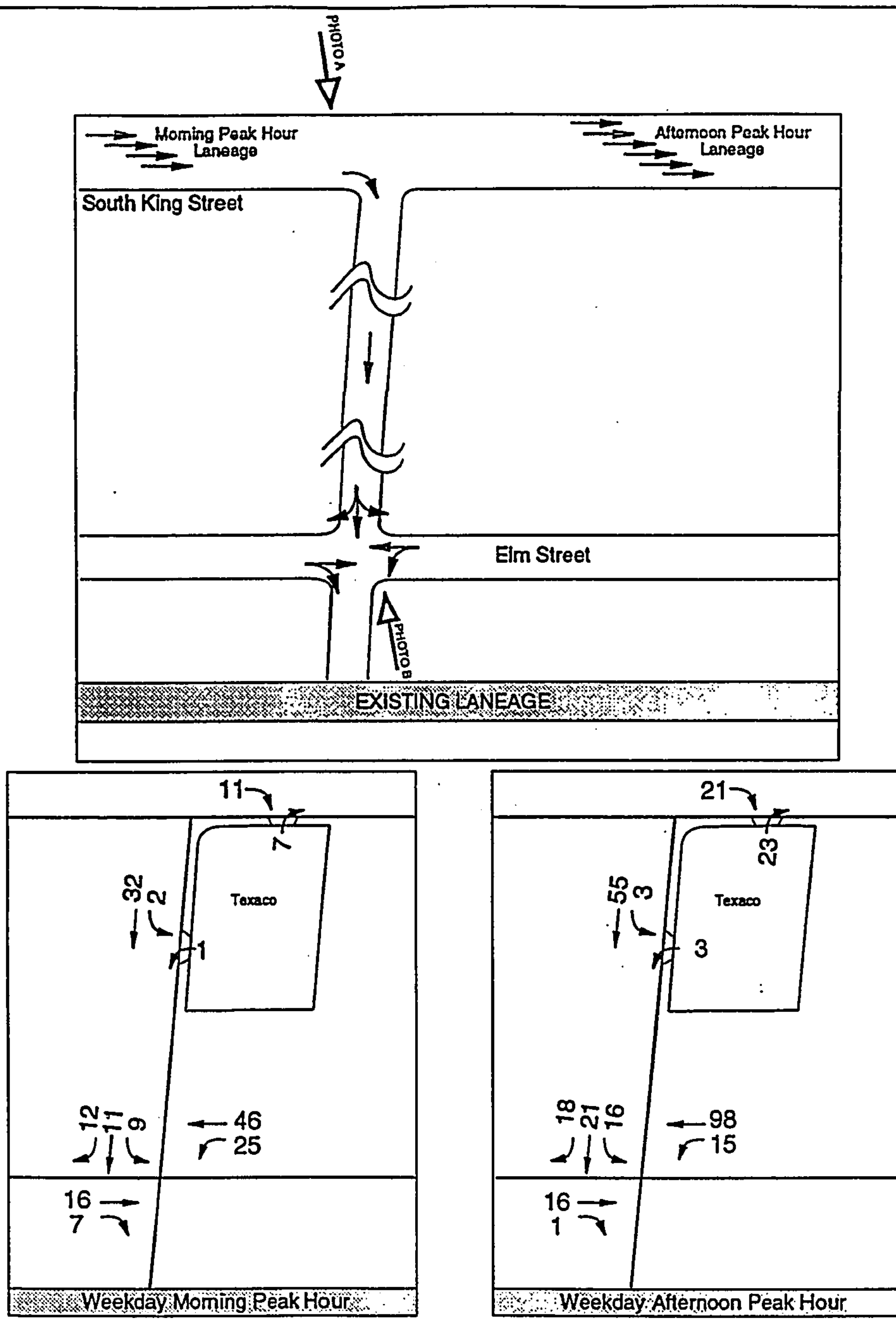
Elm Street is a two-way two-lane road paralleling South King Street with parking allowed on the north side of the street. The posted speed limit on Elm Street is 25 mph.

Figure 2 shows the existing laneage at the study intersections. Photos of the study intersections are shown in Figure 3.

Traffic Conditions

A review of 1995 Hawaii Department of Transportation (HDOT) traffic count data for Station SL-72C on South King Street East of Ward Avenue indicate that the commuter peak periods generally occurs on weekdays between 7:00 to 8:30 in the morning and 4:15 to 5:45 in the afternoon. These peak hours were used to determine traffic impacts, since the project traffic would impact the surrounding roads the most during these time periods.

Manual traffic counts were taken at the intersection of Alder Street with Elm Street and the existing Texaco driveways located on King Street and Alder Street. The counts were taken on Wednesday, February 11, 1998 during the afternoon peak period and on Thursday, February 12, 1998 during the morning peak period. These counts were used as the baseline condition upon which future estimated traffic volumes were added.



PACIFIC PLANNING & ENGINEERING, INC	Existing Laneages and Weekday Morning & Afternoon Peak Hour Traffic Volumes	Figure 2

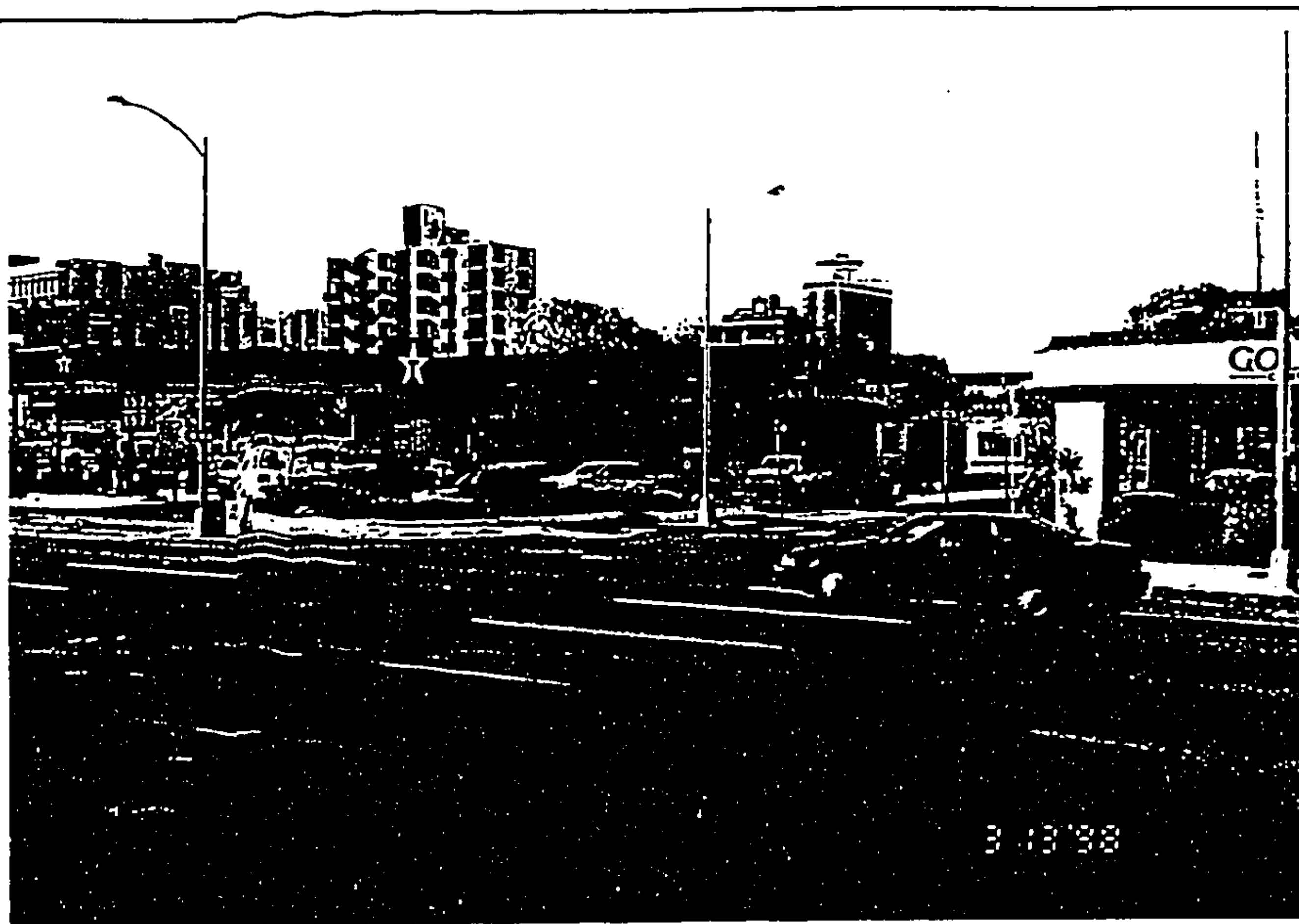


Photo A - Intersection of King Street with Alder Street

Photo B - Intersection of Alder Street with Elm Street

PACIFIC PLANNING & ENGINEERING, INC	Study Intersections	Figure 3

Manual counts were taken of passenger cars, trucks and buses by turning movements and approaches. During the field counts, the weather was clear and the roadway pavement was dry. Figure 2 shows the present volume of traffic at the study intersections for the observed peak hours. Manual traffic count data is summarized in Appendix A.

Observed Traffic Conditions

The following observations were made during the field survey:

- Traffic along South King Street and Alder Street flowed smoothly during the study periods. Traffic flow along South King Street was heavily platooned.

FUTURE CONDITIONS

A survey was conducted of planned developments in the immediate area to estimate future traffic conditions at the study intersections.

Future Land Uses

The Birch Street Apartments, a 53 unit apartment, is currently under construction with an anticipated competion by the end of year 1998. Birch Street Apartments is located south of the project between Alder Street and Birch Street. Access to Birch Street Apartments will be via new driveways on Alder Street and Birch Street.

Future Roadway Facilities

Within the study time frame, there are no known roadway improvements planned in the vicinity of the project. The roadway patterns and study intersection laneages are expected to remain the same as existing.

PROJECTED TRAFFIC CONDITIONS

Future traffic was forecasted for traffic conditions without and with the King Street Apartments Project. Traffic forecasts were estimated for the year 1998 when the project is expected to be completed.

Future Traffic Without Project

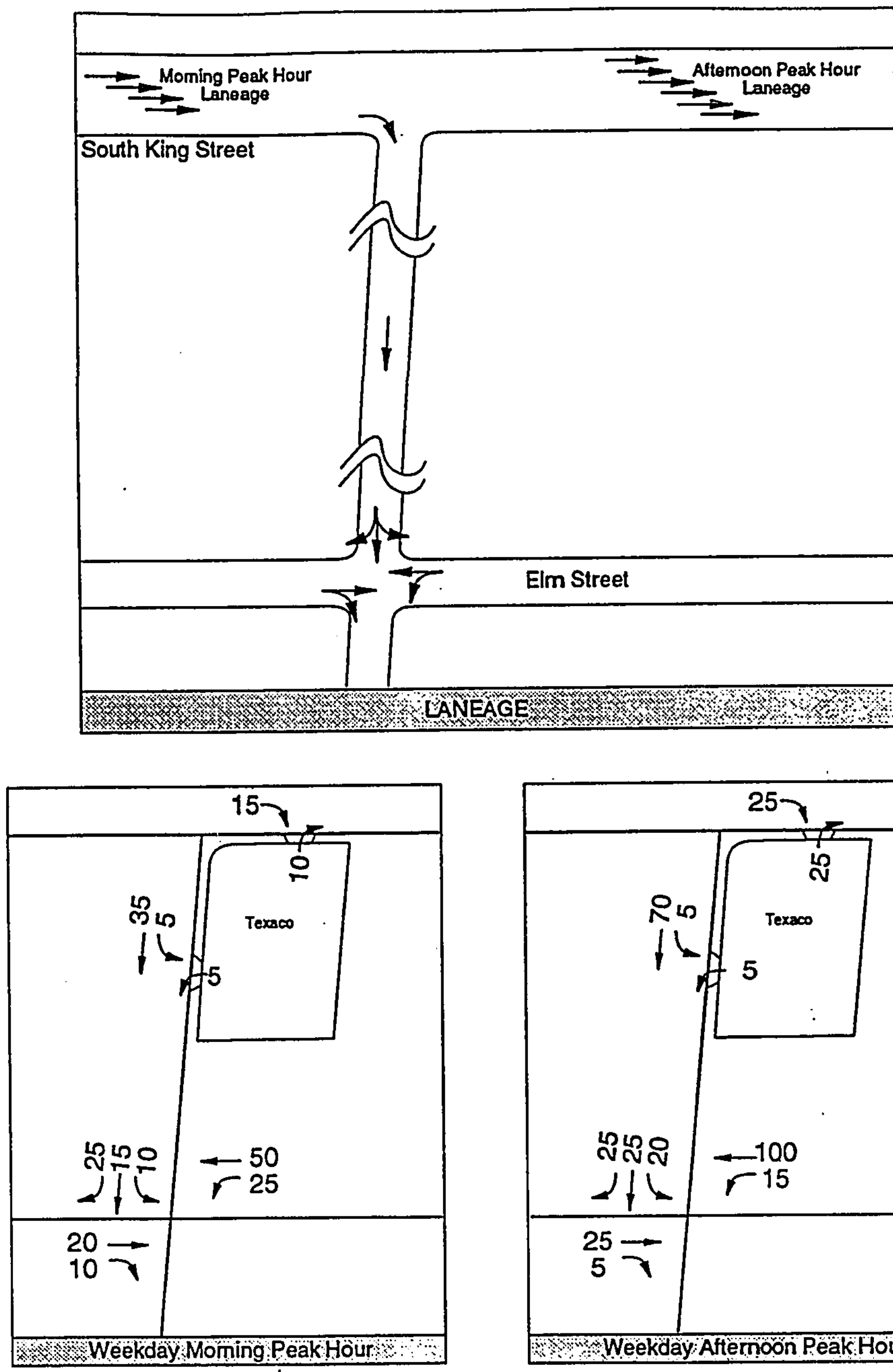
Future traffic without the project was forecasted by adding the following; 1) existing traffic volumes, 2) adding traffic from other proposed developments in the area. The resulting traffic volume forecasts at the study intersections for the traffic peak hours without the project in year 1998 are shown in Figure 4.

Traffic From Other Developments

The three-step procedure of trip generation, trip distribution, and traffic assignment was used to forecast traffic from other developments.

The trip generation step estimates the number of trips that would be generated by the other developments in the area during the weekday morning and afternoon peak hours. Trip generation was based on rates from the ITE Trip Generation Report[1]. Table 1 shows the estimated trips generated by other developments.

1 Trip Generation Report, by the Institute of Transportation Engineers, Sixth Edition, 1997.



PACIFIC PLANNING & ENGINEERING, INC	Year 2000 Without Project Weekday Morning & Afternoon Peak Hour Traffic Volumes	Figure 4

Table 1. Trip Generation For Other Developments				
	Morning		Afternoon	
Land Use	Enter	Exit	Enter	Exit
Birch Street Apartments (53 units)	5	17	16	9

The trip distribution step estimates the distribution of vehicle trips to their predicted destinations and origins. It is not expected that the trip distribution will be significantly different from existing conditions, so trips were distributed based on existing data.

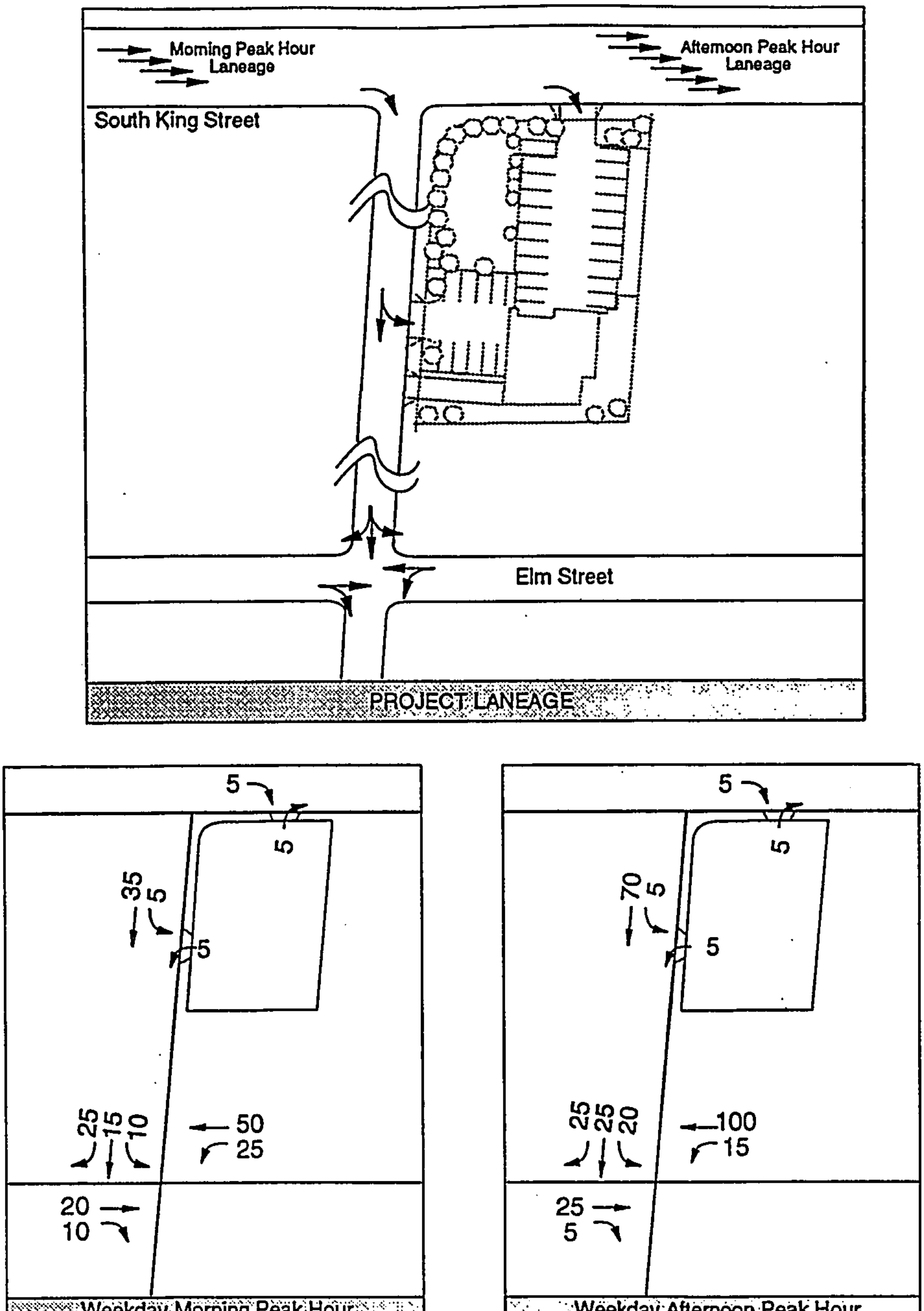
Future traffic from these developments were assigned to a specific route for each origin and destination based on the estimated shortest distance or travel time.

Future Traffic With Project

Future traffic with the project was forecasted by adding traffic generated by the King Street Apartments Project to the forecasted traffic without the project. The resulting peak hour traffic volume forecasts with the project are shown in Figure 5.

The standard three-step procedure of trip generation, trip distribution, and traffic assignment was used to estimate peak hour traffic from the proposed project.

Trip generation for the proposed project was determined based on the project land uses and data from the ITE Trip Generation Report. Trips were also obtained for the existing Texaco Gas Station from manual traffic counts.



PACIFIC PLANNING & ENGINEERING, INC	Year 2000 With Project Weekday Morning & Afternoon Peak Hour Traffic Volumes	Figure 5

Table 2 shows the number of trips generated due to the project and the number of trips generated by the existing Texaco Gas Station.

Table 2. Project Site Trip Generation				
	Morning		Afternoon	
Land Use	**Enter**	**Exit**	**Enter**	**Exit**
Elderly Apartments (91 units)	4	2	5	4
Existing Texaco Gas Station	13	8	24	26

The trip distribution step estimates the distribution of vehicle trips to their predicted destinations and origins. It is not expected that the trip distribution will be significantly different from existing conditions, so trips were distributed based on existing data.

The traffic assignment step assigns vehicle trips to specific routes on the roadway network that drivers would take from their trip origin to their destination.

TRAFFIC IMPACT ANALYSIS

Analyses were conducted for the intersections of Alder Street with Elm Street and Alder Street with the project driveway to determine the relative impact of the project. Analyses were conducted for the existing, 1998 forecasts without project, and 1998 forecast with project traffic conditions.

Analysis Methods

The study intersections were analyzed using the methods for unsignalized intersections outlined in the 1994 Highway Capacity Manual. Appendix B provides detailed definitions of the "level-of-service" (LOS) used in this study.

"Level-of-service" for unsignalized intersections is determined by total delay which is defined as the total elapsed time from when a vehicle stops at the end of a queue until the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the last-in-queue position. LOS for unsignalized intersections is classified into six categories ranging from less than 5 seconds of average total delay per vehicle (LOS A) to over 45 seconds of average total delay per vehicle (LOS F).

Analysis Results

The results of the analysis for the weekday morning and afternoon peak hours generally are shown in Tables 3 and 4. The results of the analysis show that there would be no change in LOS due to the project.

Table 3 - Unsignalized Intersection Analysis - Morning Peak Hour			
Movement	LOS (delay-seconds/vehicle)		
	Existing	2000 Without Project	2000 With Project
Birch Street with Elm Street			
Southbound LT/TH/RT on Alder St	A	A	A
Westbound LT from Elm St	A	A	A
Alder Street with Project Driveway			
Westbound LT from Project	n/a	n/a	A
Southbound LT from Alder St	n/a	n/a	A

Table 4 - Unsignalized Intersection Analysis - Afternoon Peak Hour			
Movement	LOS (delay-seconds/vehicle)		
	Existing	2000 Without Project	2000 With Project
Birch Street with Elm Street			
Southbound LT/TH/RT on Alder St	A	A	A
Westbound LT from Elm St	A	A	A
Alder Street with Project Driveway			
Westbound LT from Project	n/a	n/a	A
Southbound LT from Alder St	n/a	n/a	A

Note: TH - Through, RT - Right turn, LT- Left turn

PARKING GENERATION

The proposed King Street Apartments project includes 27 at grade parking stalls. A review was conducted to determine the adequacy of the parking provided by the project.

Parking generation was determined based on the project land uses and data from the ITE Parking Generation Report[2]. The parking generation rate is the number of occupied parking spaces per one unit of independent variable. The average parking generation rate on a weekday for a retirement community is 0.27 occupied stalls per dwelling unit. This rate is expected to include parking generated by residents, visitors and service personel. Therefore, based on the data provided by ITE, the estimated peak parking spaces occupied on a weekday for the project is 25 parking stalls.

A survey was also conducted of the number of parking stalls provided by other elderly housing projects and is shown in Table 5.

Table 5 - Provided Parking at Urban Elderly Housing Projects

Project Name	Location	Total Units	Stalls Provided
Kalunihuia	Aala Park	151	42
Makamae	Nuuanu	124	27
Punchbowl Homes	Kalihi	144	69
Makua Au	Kalakaua	210	49
Paokalani	Kalakaua	150	28
Midrise	Kalakaua	123	40
Kapunai	Liliha	162	57
Hale Poai (Kapuna II)	Liliha	206	82
Manoa Gardens	Manoa	80	40
Pauahi Elderly	Chinatown	48	12

2 Parking Generation Report, by the Institute of Transportation Engineers, Second Edition, 1987.

Based on the results of the analysis and the survey of other elderly housing projects, the 27 parking spaces provided for the King Street Apartments should be adequate for a 91 one-bedroom elderly rental project

CONCLUSIONS AND RECOMMENDATIONS

The King Street Apartments Project, when completed in the year 2000, would not affect the Level-of-Service at the existing study intersection of Alder Street with Elm Street during the weekday commuter hours. In addition, the intersection of Alder Street with the Project Driveway is anticipated to operate at Level-of-Service A condition. No capacity mitigating actions are required due to the proposed project.

The trips generated by the King Street Apartments Project is estimated to be less than the number of trips generated by the existing Texaco Gas Station.

The 27 parking spaces provided as part of the King Street Apartments should be adequate for the intended use as an elderly rental facility.

APPENDIX A

TRAFFIC COUNT DATA

0000 0005 1057

Project : 82.0 King St. Apartments
Date: 2/12/98

	Direction NORTHBOUND				North-South Road Alder Street	Direction SOUTHBOUND Makai Bound				
Start Time	NB-LT	NB-TH	NB-RT	T/B		SB-LT	SB-TH	SB-RT	T/B	
6:30 AM										
6:45 AM						2	4	2		
7:00 AM						3	3	5		
7:15 AM						1	2	0		
7:30 AM						0	4	3		
7:45 AM						3	2	2		
8:00 AM						0	4	5		
8:15 AM						6	1	2		
8:30 AM										
8:45 AM										

PEAK HOUR	NB-LT	NB-TH	NB-RT			SB-LT	SB-TH	SB-RT		
7:30 AM	0	0	0	0	0	9	11	12	0	0
8:45 AM	TOTAL	0		#DIV/0!		TOTAL	32		0.00%	

	Direction EASTBOUND DH Bound				East-West Road Elm Street	Direction WESTBOUND Ewa Bound				
Start Time	EB-LT	EB-TH	EB-RT	T/B		WB-LT	WB-TH	WB-RT	T/B	
6:30 AM										
6:45 AM		4	2			1	12			
7:00 AM		1	1			1	9			
7:15 AM		3	1			6	22			
7:30 AM		4	1			6	12			
7:45 AM		4	0			7	12			
8:00 AM		4	1			8	9			
8:15 AM		4	5			4	13			
8:30 AM										
8:45 AM										

PEAK HOUR	EB-LT	EB-TH	EB-RT			WB-LT	WB-TH	WB-RT		
7:30 AM	0	16	7	0	0	25	46	0	0	0
8:45 AM	TOTAL	23		0.00%		TOTAL	71		0.00%	

Project : 82.0 King St. Apartments
Date: 2/12/98

Direction NORTHBOUND

North-South Road
Alder Street

Direction SOUTHBOUND
Makai Bound

Start Time	NB-LT	NB-TH	NB-RT	T/B		SB-LT	SB-TH	SB-RT	T/B	
3:45 PM										
4:00 PM						4	4	0		
4:15 PM						5	2	2		
4:30 PM						6	5	4		
4:45 PM						2	6	6		
5:00 PM						7	4	8		
5:15 PM						1	6			
5:30 PM										
5:45 PM										
6:00 PM										

PEAK HOUR	NB-LT	NB-TH	NB-RT			SB-LT	SB-TH	SB-RT		
4:30 PM	0	0	0	0	0	16	21	18	0	0
6:00 PM	TOTAL	0		#DIV/0!		TOTAL	55		0.00%	

Direction EASTBOUND
DH Bound

East-West Road
Elm Street

Direction WESTBOUND
Ewa Bound

Start Time	EB-LT	EB-TH	EB-RT	T/B		WB-LT	WB-TH	WB-RT	T/B	
3:45 PM										
4:00 PM		1	4			2	22			
4:15 PM		5	0			6	18			
4:30 PM		4	0			5	32			
4:45 PM		3	0			6	20			
5:00 PM		3	0			2	19			
5:15 PM		6	1			2	27			
5:30 PM										
5:45 PM										
6:00 PM										

PEAK HOUR	EB-LT	EB-TH	EB-RT			WB-LT	WB-TH	WB-RT		
4:30 PM	0	16	1	0	0	15	98	0	0	0
6:00 PM	TOTAL	17		0.00%		TOTAL	113		0.00%	

Project : 82.0 King St. Apartments
Date: 2/12/98

Direction NORTHBOUND — North-South Road Alder Street — Direction SOUTHBOUND

Start Time	NB-LT	NB-TH	NB-RT	T/B		SB-LT (in)	SB-TH	SB-RT (out)	T/B	
6:30 AM										
6:45 AM						0		1		
7:00 AM						0		0		
7:15 AM						0		0		
7:30 AM						0		0		
7:45 AM						0		0		
8:00 AM						1		0		
8:15 AM						1		1		
8:30 AM										
8:45 AM										

PEAK HOUR	NB-LT	NB-TH	NB-RT			SB-LT	SB-TH	SB-RT		
7:30 AM	0	0	0	0	0	2	0	1	0	0
8:45 AM	TOTAL	0		#DIV/0!		TOTAL	3		0.00%	

Direction EASTBOUND DH Bound — East-West Road King Street — Direction WESTBOUND

Start Time	EB-LT	EB-TH	EB-RT	T/B		WB-RT (in)	WB-TH	WB-RT (out)	T/B	
6:30 AM										
6:45 AM						3		1		
7:00 AM						3		3		
7:15 AM						4		3		
7:30 AM						3		2		
7:45 AM						4		2		
8:00 AM						2		1		
8:15 AM						2		2		
8:30 AM						2		4		
8:45 AM										

PEAK HOUR	EB-LT	EB-TH	EB-RT			WB-RT	WB-TH	WB-RT		
7:30 AM	0	0	0	0	0	11	0	7	0	0
8:45 AM	TOTAL	0		#DIV/0!		TOTAL	18		0.00%	

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Project : 82.0 King St. Apartments
Date: 2/12/98

	Direction NORTHBOUND					North-South Road Alder Street in	Direction SOUTHBOUND out			
Start Time	NB-LT	NB-TH	NB-RT	T/B		SB-LT	SB-TH	SB-RT	T/B	
3:45 PM										
4:00 PM						0		0		
7:00 AM						1		0		
7:15 AM						0		0		
7:30 AM						0		1		
7:45 AM						1		0		
8:00 AM						2		1		
8:15 AM						0		1		
8:30 AM						1		0		
8:45 AM										

PEAK HOUR	NB-LT	NB-TH	NB-RT			SB-LT	SB-TH	SB-RT		
7:30 AM	0	0	0	0	0	3	0	3	0	0
8:45 AM	TOTAL	0		#DIV/0!		TOTAL	6		0.00%	

	Direction EASTBOUND DH Bound					East-West Road King Street in	Direction WESTBOUND out			
Start Time	EB-LT	EB-TH	EB-RT	T/B		WB-RT	WB-TH	WB-RT	T/B	
3:45 PM										
4:00 PM						4		3		
7:00 AM						3		5		
7:15 AM						5		4		
7:30 AM						5		3		
7:45 AM						4		6		
8:00 AM						7		5		
8:15 AM						5		9		
8:30 AM						3		2		
8:45 AM										

PEAK HOUR	EB-LT	EB-TH	EB-RT			WB-RT	WB-TH	WB-RT		
7:30 AM	0	0	0	0	0	21	0	23	0	0
8:45 AM	TOTAL	0		#DIV/0!		TOTAL	44		0.00%	

APPENDIX B

LEVEL-OF-SERVICE DEFINITIONS

FOR

UNSIGNALIZED INTERSECTIONS

REFERENCE: Highway Capacity Manual (Special Report 209, 1994)

LEVEL-OF-SERVICE FOR UNSIGNALIZED INTERSECTIONS

The level of service criteria are given in the table to the right. As used here , total delay is defined as the total elapsed time from when a vehicle stops at the end of a queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position.

Level of Service	Average Total Delay (sec/veh)
A	≤ 5
B	> 5 and ≤ 10
C	> 10 and ≤ 20
D	> 20 and ≤ 30
E	<30 and ≤ 45
F	>45

The proposed level of service criteria are somewhat different from the criteria for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, whereas drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersections than for a signalized intersection.

0000 0005 1063

ATTACHMENT "H"

LETTERS FROM AGENCIES CONSULTED

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4414 • FAX: (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

98-01198(ST)
'98 EA Comments Zone 2

April 6, 1998

Mr. Randolph G. Moore
Hawaii Housing Development Corporation
c\o Gary S. Furuta
725 Kapiolani Boulevard, Suite C-103
Honolulu, Hawaii 96813

Dear Mr. Moore:

Draft Environmental Assessment (EA): King Street Apartments
An Elderly Low Income Rental Housing Project
Honolulu, Oahu
Tax Map Key: 2-3-12: 44

We have reviewed the Draft EA for the above-referenced project received on February 17, 1998, and offer the following comments:

Section II. **GENERAL INFORMATION** - This section should be revised to identify the accepting authority for the Final EA pursuant to the Environmental Impact Statement (EIS) regulations, Section 11-200-10(1), Hawaii Administrative Rules (HAR). The Final EA should also discuss the type of "action" which triggered its preparation pursuant to Section 11-200-6, HAR. This section should also include a list of all permits and approvals which are required for the project.

We also suggest that the property history on page 3 be moved to Section III, under its own heading and that the soil mitigation/contamination discussion be moved to the next section with the discussion of construction characteristics.

Section III. **DESCRIPTION OF PROPOSED ACTION** - This section should be expanded to provide additional information on the surrounding community and the physical characteristics of the existing site. The construction characteristics of the proposed project should also be described, including any demolition, grading, filling and soil remediation required.

This section should also discuss the intended market for this project. Although reference is made to the project as a low income elderly rental apartment, details on the restrictions and criteria for occupancy have not been provided.

Based on our staff's earlier consultations on this project, it is our understanding that the Hawaii Housing Development Corporation (HHDC) had intended to seek the approval of a Conditional Use Permit, Type 2 (CUP2) for this project as a group living facility.

In order to determine if this project could be considered as such, information on the operations of the project, including whether or not assistance with daily living services (e.g., meals, house cleaning, etc.) or specialized services (e.g., group counseling, medical care, etc.) must be provided.

SECTION IV. **IMPACTS** - This section is confusing and the labeling of impacts *appear* to be more appropriately labeled as project characteristics. Furthermore, this section should elaborate on access and parking requirements, as well as disclose the estimated water and wastewater demands of the proposed ninety-one (91) unit structure. In addition, an anticipated development timetable (i.e., construction phasing) and cost estimates of the proposed project should be provided.

We have no further comment to offer at this time. If you have any questions, please contact Steve Tagawa of our staff at 523-4817.

Very truly yours,

JAN NAOE SULLIVAN
Director of Land Utilization

JNS:am

cc: State Office of Environmental Quality Control

g:ppd\DEAking.sht

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
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JEREMY HARRIS
MAYOR

JONATHAN K. SHIMADA, PHD
DIRECTOR AND CHIEF ENGINEER
ROLAND D. LIBBY, JR.
DEPUTY DIRECTOR

ENV 98-060

March 2, 1998

Mr. Randolph G. Moore
Chairman of the Board
Hawaii Housing Development Corp.
c/o Gary S. Furuta
Imperial Plaza, Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Moore:

Subject: Draft Environmental Assessment (DEA)
King Street Apartments
TMK: 2-3-12: 44

We have reviewed the subject DEA and have the following comments:

1. The DEA should address City Ordinance 96-34 for controlling peak runoff.

2. The condition of the existing street frontage improvements may require repair and/or reconstruction in accordance with City standards and the Americans with Disabilities Act Accessibility Guidelines. Construct new or reconstruct existing curb ramps to current standards and guidelines.

3. The DEA should describe best management practices (BMPs) during construction to minimize erosion and sediment runoff. List any other storm water pollution prevention measures proposed during construction to mitigate pollutants from entering the City's drainage system, specifically if runoff from the existing Texaco Station contains any oily substances.

4. Direct storm water runoff from paved areas to planted area or use water quality inlets to minimize discharge of pollutants to the City's drainage system after completion of construction.

0000 0005 1067

Mr. Randolph G. Moore
Page 2
March 2, 1998

Should you have any questions, please contact Alex Ho, Environmental Engineer, at 523-4150.

Very truly yours,

For JONATHAN K. SHIMADA, PhD
Director and Chief Engineer

0000 0005 1068

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 527-6663 • FAX: (808) 527-6675

JEREMY HARRIS
MAYOR

KENNETH E. SPRAGUE, P.E., Ph.D.
DIRECTOR

CHERYL K. OKUMA-SEPE, ESQ.
DEPUTY DIRECTOR

In reply refer to:
WCC 98-30

February 20, 1998

Mr. Randolph G. Moore, Chairman of the Board
Hawaii Housing Development Corporation
Imperial Plaza, Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Moore:

Subject: **Draft Environmental Assessment**
King Street Apartments
1329 South King Street
TMK: 2-3-12: 44

A Sewer Connection Application form was approved for the subject project on December 11, 1997, provided connection is made to the existing Alder Street sewer line. The subject project is for construction of 91 low income elderly rental units. The applicant is liable for payment of a wastewater system facility charge.

If you have any questions, please contact Ms. Tessa Ching of the Service Control Branch at 523-4956.

Sincerely,

Cheryl K. Okuma-Sepe

KENNETH E. SPRAGUE
Director

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

JEREMY HARRIS
MAYOR

ANTHONY J. LOPEZ, JR.
FIRE CHIEF

ATTILIO K. LEONARDI
FIRE DEPUTY CHIEF

February 25, 1998

Mr. Randolph G. Moore, Chairman of the Board
Hawaii Housing Development Corporation
Imperial Plaza, Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Moore:

Subject: Draft Environmental Assessment
King Street Apartments
HFD OL 98-077

We have reviewed the submitted information relating to the proposed property and foresee no adverse impact if the amendment were approved.

The Fire Code of the City and County of Honolulu requires the removal of the five underground storage tanks. Once they have been removed, we will require that a letter be submitted to us certifying that these tanks were removed per the UST Guidelines of the State of Hawaii.

If you need additional information, please contact Battalion Chief Charles Wassman of our Fire Prevention Bureau at 831-7778.

Sincerely,

ANTHONY J. LOPEZ, JR.
Fire Chief

AJL/CW:bh

0000 0005 1070

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

March 27, 1998

TSP2/98-00981R

Mr. Randolph G. Moore, Chairman of the Board
Hawaii Housing Development Corporation
c/o Gary S. Furuta
Imperial Plaza, Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Moore:

Subject: King Street Apartments

In response to your February 12, 1998 letter, we reviewed the draft environmental assessment for the subject project and have the following comments:

1. On-site parking should be provided to support the demand for the entire development. Problems have occurred when the parking demand for a housing project exceeds the amount being provided on-site. Residents must then depend on street parking. As the area develops and densities increase, there will be a need to remove on-street parking to facilitate traffic movement.

2. Adequate vehicular sight distance to pedestrians and other vehicles must be provided and maintained at all driveways. Landscaping and walls should be placed in locations which will afford the greatest vehicular sight.

3. Driveway grades should not exceed five percent for a minimum distance of 35 feet from the curb prolongation. Existing driveways, which will not be used by this project, should be adjusted to match the existing curb grade.

4. Vehicular access at all public streets should be constructed as standard City dropped driveways.

5. On-site loading and parking areas should be designed such that no maneuvering occurs on any public street. This will affect the design of the loading area on Alder Street.

6. Parking entry controls, if provided, should be recessed as far into the project as practical to avoid vehicular queuing onto any public street.

7. The property line radius at the intersection of King Street and Alder Street should be adjusted from 20 feet to 30 feet to provide a wider sidewalk area. This will be requested at the time of the submittal of the building permit.

8. Construction plans and a traffic control/detour plan for all work within the City's street right-of-way should be submitted to this department for review and approval. Existing and new traffic signs and pavement markings on both sides of each affected street should be included in the plans.

Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation System Planning Division at 527-6976.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

0000 0005 1072

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714

March 25, 1998

Mr. Randolph G. Moore, Chairman of the Board
Hawaii Housing Development Corporation
c/o Gary S. Furuta
Imperial Plaza, Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Moore:

Subject: Your Transmittal of February 12, 1998 Regarding the Draft Environmental Assessment for the Proposed King Street Apartment, TMK: 2-3-012: 044

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the proposed King Street Apartments.

We have the following comments:

1. The existing water system is presently adequate to accommodate the proposed apartment building.

2. There is an existing 3/4-inch domestic water meter currently serving the project site.

3. The availability of water will be confirmed when the building permit application is submitted for our review and approval. When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

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

5. Board of Water Supply approved reduced pressure principle backflow prevention assemblies will be required to be installed after all domestic water meters serving the project site.

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

Very truly yours,

FOR RAYMOND H. SATO
Manager and Chief Engineer

0000 0005 1073

BUILDING DEPARTMENT

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI
DIRECTOR AND BUILDING SUPERINTENDENT

ISIDRO M. BAQUILAR
DEPUTY DIRECTOR AND BUILDING SUPERINTENDENT

PB 98-113

February 26, 1998

Mr. Randolph G. Moore, Chairman of the Board
Hawaii Housing Development Corporation
c/o Gary S. Furuta
Imperial Plaza, Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Moore:

Subject: King Street Apartments
Draft Environmental Assessment (DEA)

This is in response to your request of February 12, 1998 to review and comment on the subject DEA.

We have no comments to offer but appreciate the opportunity to review the document.

Should there be any questions, please contact Douglas Collinson at 527-6375.

Very truly yours,

RANDALL K. FUJIKI
Director and Building Superintendent

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 10TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4182 • FAX: (808) 523-4054

JEREMY HARRIS
MAYOR

WILLIAM D. BALFOUR, JR.
DIRECTOR

MICHAEL T. AMII
DEPUTY DIRECTOR

March 5, 1998

Mr. Randolph G. Moore
Chairman of the Board
Hawaii Housing Development Corporation
Imperial Plaza, Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Moore:

Subject: Draft Environmental Assessment (EA) for
King Street Apartments, 1329 South King Street
Makiki, Oahu, Hawaii
Tax Map Key No. 2-3-012: 044

We have reviewed the draft EA for the above-described project and offer the following comments.

Your project will have a significant impact on our recreational facilities and services in the Makiki/McCully area and should have been identified and addressed in Section IV of the draft EA.

For your information, the proposed residential development project will need to comply with the City and County of Honolulu's Park Dedication Ordinance No. 4621 and street tree requirements.

We recommend that you consult our Advance Planning Branch staff for park dedication requirements. During your plan development stage, please submit a detailed street tree planting plan to our Landscape Section for review and approval.

Please contact Mr. Lester Lai, planner, at 523-4696 for consultation on park dedication and Mr. David Kumasaka, landscape architect, at 523-4884 for information on street tree requirements.

Sincerely,

WILLIAM D. BALFOUR, JR.
Director

WDB:ei

0000 0005 1076

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 5TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4427 • FAX: (808) 527-5498

JEREMY HARRIS
MAYOR

CITY AND COUNTY OF HONOLULU
STATE OF HAWAII

ROBERT AGRES JR.
DIRECTOR

DARWIN J. HAMAMOTO
DEPUTY DIRECTOR

March 9, 1998

Mr. Randolph G. Moore, Chairman of the Board
Hawaii Housing Development Corporation
c/o Gary Furuta
Imperial Plaza, Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Moore:

SUBJECT: King Street Apartments - Draft Environmental Assessment

We have received and reviewed the Hawaii Housing Community Development Corporation's (HHDC) Draft Environmental Assessment for the King Street Apartments, an elderly low income rental housing development project to be located at 1329 South King Street, Honolulu, Hawaii.

We understand that the proposed project will occupy approximately 18,963 square feet in urban Honolulu and include the development of 91 rental apartments and 27 parking stalls. We further understand that the units will be rented at rates affordable to elderly households earning less than 50 percent of Honolulu's median income and that the Director of Land Utilization will determine the adequacy of the parking stalls proposed.

The proposed project is consistent with the Department of Housing and Community Development's goal of providing affordable rental housing for low income households in the urban core. In addition, we find that this project does not interfere with any DHCD projects or programs. As such, we are supportive of your plans to provide much needed low income rental housing to our elderly population and recommend your continued consultation with appropriate City agencies as your project progresses.

Questions regarding this matter may be directed to Kim Evans at 527-5085.

Sincerely,

ROBERT AGRES, JR.

0000 0005 1077

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

JEREMY HARRIS
MAYOR

LEE D. DONOHUE
ACTING CHIEF

WILLIAM B. CLARK
DEPUTY CHIEF

OUR REFERENCE BS-DL

February 19, 1998

Mr. Randolph G. Moore
Chairman of the Board
Hawaii Housing Development
Corporation
c/o Gary S. Furuta
Imperial Plaza, Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Moore:

This is in response to your letter of February 12, 1998, regarding the Draft Environmental Assessment for the King Street Apartments.

This project should have no significant impact on the operations of the Honolulu Police Department.

Thank you for the opportunity to review this document.

Sincerely,

LEE D. DONOHUE
Acting Chief of Police

By [signature]
JAMES FEMIA, Assistant Chief
Administrative Bureau

ALA MOANA/KAKAAKO NEIGHBORHOOD BOARD NO. 11

c/o NEIGHBORHOOD COMMISSION • CITY HALL, ROOM 400 • HONOLULU, HAWAII 96813

March 30, 1998

Gary Furuta
Hawaii Housing Development Corporation
Suite C-103
725 Kapiolani Blvd.
Honolulu, HI 96813

Dear Mr. Furuta:

We appreciate your taking the time to give a presentation to the Ala Moana-Kakaako Neighborhood Board at our meeting on March 24, 1998 on your proposed senior housing project on King Street. Judging by the number of people attending the Board meeting who are interested in this project we assume there is a need in our area for affordable senior housing. Questions were raised regarding the very difficult on street parking in that area and the need for adequate on site parking for any new buildings in our neighborhood. We strongly recommend that sufficient parking for residents, staff, and visitors be incorporated into the plans for this project and that this project have no negative impact on street parking.

The Board did not take a position on this project at this time and reserves the right to comment in the future as the plans develop. Thank you for keeping the Board informed and we look forward to hearing from you as these plans continue to be developed.

Sincerely,

John A. Breinich

John A. Breinich
Chair

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

GILBERT COLOMA-AGARAN

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

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

March 5, 1998

Randolph G. Moore, Chairman
Hawaii Housing Development Corporation
Imperial Plaza, Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

LOG NO: 21122 ✓
DOC NO: 9802EJ15

Dear Mr. Moore:

SUBJECT: **Chapter 6E-8 Historic Preservation Review -- Hawaii Housing Development: Draft Environmental Assessment for the King Street Apartments, A Elderly Low Income Rental Housing Development Project at 1329 South King Street, Honolulu, Hawaii Honolulu, Kona, O'ahu**
TMK: 2-3-12:44

Thank you for the opportunity to review the DEA for this project which proposes the construction of a 91 unit elderly, low income, rental project. We commented in September, 1996 that we believed that another proposed low income rental housing project on the adjacent parcel (TMK: 2-3-12:4) "The Birch Street Apartments, would have "no effect" on historic sites (Doc No. 9609TD14). Our comments consisted of the following:

> A review of our records shows that there are no known historic sites at this parcel. The parcel has been developed and the portion fronting Alder Street is now used for parking. It is unlikely that subsurface historic sites are located here. 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 State Historic Preservation Division must be contacted at 587-0047.

The current project is also located on land which has been extensively developed and altered making it unlikely that subsurface historic sites would be found. Therefore, we believe that this project will have "no effect" on historic sites. As with the previous comments, 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 State Historic Preservation Division must be contacted at 587-0047.

If you have any questions please call Elaine Jourdane at 587-0014.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

EJ:jk

c: Gary Furuta

0000 0005 1080

CITY COUNCIL

CITY AND COUNTY OF HONOLULU

HONOLULU, HAWAII 96813-3065 / TELEPHONE 547-7000

May 19, 1998

ANDY MIRIKITANI
COUNCILMEMBER
(808) 547-7005

Gary Furuta, Project Manager
Hawaii Housing Development Corporation
725 Kapiolani Boulevard Ste C-103
Honolulu, Hawaii 96813

RE: Parking Concerns Relating to the King Street Apartments Project

Dear Mr. Furuta:

Residents have voiced concerns regarding parking for the King Street Apartments project and potential impacts on the Sheridan-Kamaile-Piikoi-King Street quadrant. Residents have expressed concerns regarding this housing project and the adverse parking impact it may generate in the surrounding residential community. Residents have reported that this low income, elderly housing project does not contain an adequate amount of on-site parking stalls to support the parking demand of tenants and their guests.

Residents have stated that the density in the area will increase as a result of this housing project and the Birch Street Apartments Project and result in exacerbating the existing on-street parking shortage. Residents have stated that this housing project will lead to a decreased amount of available on-street parking which would be at the expense of current residents, lessen motorist visibility on the roadways due to the increased on-street parking demand and cause more congestion that would impede vehicular movement on the adjacent roadways.

This is to initiate a request for your organization to conduct an investigation and respond to these residential concerns. If you have any questions, please feel free to call my aide Rudy Bilan at 527-5598.

Very truly yours,

Andy Mirikitani

ANDY MIRIKITANI
Councilmember, District V

AKM:rtb

cc: Members of the Ala Moana/Kakaako Neighborhood Board No. 11
Roy Oshiro, Executive Director - State Housing Finance and Development Corporation
Gary Gill, Director - State Office of Environmental Quality Control

ATTACHMENT “I”

RESPONSE LETTERS TO AGENCIES CONSULTED

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o GARY S. FURUTA
Imperial Plaza · Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813
Telephone: 596-2120 · Fax: 395-1520

April 17, 1998

Ms. Jan Noe Sullivan, Director
Department of Land Utilization
City & County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low-Income Rental Housing Development Project

Subject: Environmental Assessment – Final

Dear Ms. Sullivan:

We appreciate your Department's review and comments of April 6, 1998 regarding our Draft Environmental Assessment for the project.

With regard to the comments we provide the following responses:

1. Section II. GENERAL INFORMATION: We have included information designating the accepting authority as Housing Finance and Development Corporation, as well as references to corresponding Hawaii Revised Statutes that have initiated this Environmental Assessment.

   We have also reviewed your comments regarding the format of the document, as well as discussed them with Steve Tagawa of your staff. We have made the appropriate revisions.

2. Section III. DESCRIPTION OF THE PROPOSED ACTION: We have expanded this section to include information regarding the surrounding community and its characteristics. We also have included information regarding the demolition of the existing service station, and the anticipated construction process of the new building.

   We have added information regarding criteria for occupancy as a low-income elderly rental apartment. We also included the operational aspect of Catholic Charities Elderly Services for the occupants in the proposed project.

   The project is anticipating application for a Conditional Use Permit – Type 2, for a Group Living Facility. We have added information supporting that application, regarding the anticipated services that will be provided to the elderly tenants.

3. Section IV. IMPACTS: We have reviewed this section with regard to your comments and have revised our labeling of the subsections.
   We have also provided additional information regarding the access to and from the site, based on the Traffic Impact Assessment Report For King Street Apartments prepared by Pacific Planning & Engineering, Inc.

We hope the above is a satisfactory response to your comments. Please feel free to contact Mr. Gary Furuta, at 596-2120 or the address indicated above, if you require any questions.

We are preparing our Final Environmental Assessment and will include a copy of your comments in our submittal.

Very truly yours,

Randolph G Moore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

cc: Gary Furuta, HHDC Project Manager

0000 0005 1084

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

March 30, 1998

Mr. Jonathan K. Shimada, Phd.
Director and Chief Engineer
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Environmental Assessment - Final

Dear Sir,

We appreciate your Department's review and comments of March 2, 1998 regarding our Draft Environmental Assessment for the Project.

With regard to your comments, we provide the following response:

1. We will instruct our engineering consultants to address City Ordinance 96-34 with regard to controlling peak runoff from the site during our design development and preparation of the construction documents for the project.

2. The project will include any necessary reconstruction of the street frontage to conform to the provisions of the Americans with Disabilities Act (ADA), as well as the detail standards of the Department of Public Works regarding driveways, curbs and gutters.

3. The existing Texaco Station site will be cleared of all contaminants before the construction of the project as part of the lease requirements between the tenant, Texaco, and the landowner. The engineering planning will include provisions for Best Management Practices (BMPs) to control erosion and sediment runoff, as well as other measures to control storm water pollution from the site during the course of construction.

4. The site grading plan will be engineered to direct paved areas runoff into planing areas to minimize discharge into the City's storm drainage system.

In addition to the above, we will direct our engineering consultants to contact Mr. Alex Ho, Environmental Engineer of your staff, as we develop the plans for the project.

We hope the above is a satisfactory response to your comments. Please feel free to contact Mr. Gary Furuta, at Phone # 596-2120 or the address indicated above, if you require any further discussion.

We are preparing our Final Environmental Assessment and will include a copy of your comments and this response in our submittal

Very truly yours,

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

0000 0005 1086

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

March 30, 1998

Mr. Kenneth E Sprague, Director
Department of Wastewater Management
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income rental Housing Development Project

Subject: Environmental Assessment - Final

Dear Sir,

We appreciate your Department's review and comments of February 20, 1998 regarding our Draft Environmental Assessment for the Project.

With regard to your comments we recognize that we will pay the corresponding wastewater system facility charge for the project coincidental with the building permit application.

In addition to the above, we will direct our engineering consultants to keep in touch with Ms. Tessa Ching of your Service Control Branch, as we develop the plans for the project.

We hope the above is a satisfactory response to your comments. Please feel free to contact Mr. Gary Furuta, at Phone # 596-2120 or the address indicated above, if you require any further discussion.

We are preparing our Final Environmental Assessment and will include a copy of your comments and this response in our submittal

Very truly yours,

Randolph G. Moore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

0000 0005 1087

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

March 30, 1998

Fire Chief Anthony J. Lopez
Fire Department
City & County of Honolulu
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Environmental Assessment - Final

Dear Chief,

We appreciate your Department's review and comments of February 25, 1998 regarding our Draft Environmental Assessment for the Project.

In response to your comments, we submit that the existing five underground storage tanks will be removed as per requirements of the lease agreement between the tenant, Texaco, and the landowner. The removal will be according to the UST Guidelines of the State of Hawaii, and proper certification will be submitted to your Department during the processing of the project building permit application.

In addition to the above, we will direct our design and engineering consultants to keep in contact with Battalion Chief Charles Wassman, of your Fire Prevention Bureau, as we develop the plans for the project.

We hope the above is a satisfactory response to your comments. Please feel free to contact Mr. Gary Furuta, at Phone # 596-2120 or the address indicated above, if you require any further discussion.

We are preparing our Final Environmental Assessment and will include a copy of your comments and this response in our submittal

Very truly yours,

Randolph G Moore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

0000 0005 1089

APR-20-98 11:41 FROM:KANEOHE RANCH ID:

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o GARY S. FURUTA
Imperial Plaza - Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813
Telephone: 596-2120 · Fax: 395-1520

April 19, 1998

Ms. Cheryl Soon, Director
Department of Transportation Services
City & County of Honolulu
Pacific Park Plaza, Suite 1200
711 Kapiolani Boulevard
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low-Income Rental Housing Development Project

Subject: Environmental Assessment – Final

Dear Ms. Soon:

We appreciate your Department's review and comments of March 27, 1998, regarding our Draft Environmental Assessment for the project.

With regard to your comments we provide the following responses:

1. Pacific Planning & Engineering, Inc. has completed a Traffic Impact Assessment Report for the proposed project. The report indicates, among other things, that the average parking generation rate for a retirement community is 0.27 parking stalls per dwelling unit. This ratio is for total parking, including parking for visitors, staff, service vehicles, etc., as well as the residents. Using the above ratio and the proposed 91 elderly units in the project, 25 parking stalls would be required. The proposed on-site parking of thirty (30) stalls is expected to be more than adequate for the development. The final number of parking stalls will be determined by the Department of Land Utilization.

   The Report also concluded that the traffic for the proposed elderly project will have less of an impact than the existing service station use. Also, no existing street parking will have to be removed to facilitate traffic or ingress/egress requirements for the project.

2. The site improvements, including landscaping and fence walls, will be designed to assure adequate and clear sight lines for vehicles and pedestrians at all driveways.

3. The design of new driveway grades will not exceed five percent (5%). Abandoned driveways will be reconstructed for sidewalks, curbs and gutters to match the adjacent existing conditions.

4. All new driveways and reconstructed sidewalks, curbs and gutters will be built according to the standard details of the Department of Public Works.

5. The site will be planned to allow on-site maneuvering for loading spaces and parking stalls.

6. Parking entry controls, if planned, will be positioned to allow queuing of vehicles entering the site to clear the public street.

7. The engineering studies of the site improvements will include increasing the property line radius at the intersection of King and Alder Streets, from 20 to 30 feet, in anticipation of the DOTS request during the building permit application processing.

8. We will direct our engineering consultant to submit to your department a traffic control/detour plan for the project. It will include both new and existing traffic signs and pavement markings on both sides of each affected street.

In addition to the above, we will direct our engineering consultants to keep contact with Ms. Faith Miyamoto of your Transportation System Planning Division, as we develop the plans for the project.

We hope the above is a satisfactory response to your comments. Please feel free to contact Mr. Gary Furuta at 596-2120 or the address above if you require any further discussion.

We are preparing our final Environmental Assessment and will include a copy of your comments in our submittal.

Very truly yours,

Randolph Amoore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

0000 0005 1091

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

March 30, 1998

Mr. Raymond H. Sato, Manager and Chief Engineer
Board of Water Supply
City & County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Environmental Assessment - Final

Dear Sir,

We appreciate your review and comments of March 25, regarding our Draft Environmental Assessment for the Project.

With regard to your comments, we submit that we will accept responsibility for payment of the corresponding Water System Facilities Charges for the project.

We will direct our engineering consultants to coordinate the determination and sizing of appropriate water meter and backflow preventer for the project with the Board of Water Supply.

In addition the above, we also will direct our engineering consultant to keep in contact with Mr. Barry Usagawa, of your staff, as we develop the plans for the project.

We hope the above is a satisfactory response to your comments. Please feel free to contact Mr. Gary Furuta, at Phone # 596-2120 or the address indicated above, if your require any further discussion.

We are preparing our Final Environmental Assessment and will include a copy of your comments in our submittal

Very truly yours,

Randolph G Moore

Randolph G. Moore, Chair

0000 0005 1092

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

March 30, 1998

Mr. Randall K. Fujiki,
Director and Building Superintendent
Building Department
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Environmental Assessment - Final

Dear Sir,

We appreciate your Department's review and comments of February 26, regarding our Draft Environmental Assessment for the Project.

We are preparing our Final Environmental Assessment and will include a copy of your letter as well as this response in our submittal

Very truly yours,

Randolph G Moore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

0000 0005 1093

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

March 30, 1998

Mr. William D. Balfour, Jr., Director
Department of Parks and Recreation
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Environmental Assessment - Final

Dear Sir,

We appreciate your Department's review and comments of March 5, 1998 regarding our Draft Environmental Assessment for the Project.

With regard to your comments, we provide the following response:

1. We have expanded Section IV to identify the impact the proposed project will have on the recreational facilities in the Makiki/McCully area, in particular the Sheridan Neighborhood park.

2. We will comply with the Park Dedication Ordinance, and instruct our design, landscape and engineering consultants to develop their design to comply with street tree requirements.

As also requested in your letter, we will direct our design, landscape and engineering consultants to contact your planner, Mr. Lester Lai and landscape architect, Mr. David Kumasaka, as we develop the plans for the project.

We hope the above is a satisfactory response to your comments. Please feel free to contact Mr. Gary Furuta, at Phone # 596-2120 or the address indicated above, if you require any further discussion.

We are preparing our Final Environmental Assessment and will include a copy of your comments and this response in our submittal

Very truly yours,

Randolph G Moore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

March 30, 1998

Mr. Robert Agres, Jr., Director
Department of Housing and Community Development
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Environmental Assessment - Final

Dear Sir,

We appreciate your Department's review and comments of March 9, 1998 regarding our Draft Environmental Assessment for the Project.

We are preparing our Final Environmental Assessment and will include a copy of your comments and this response in our submittal

Very truly yours,

Randolph G Moore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

0000 0005 1096

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

March 30, 1998

Acting Chief Lee D. Donohue
Police Department
City & County of Honolulu
801 South Beretania Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Environmental Assessment - Final

Dear Sir,

We appreciate your Department's review and comments of February 19, 1998 regarding our Draft Environmental Assessment for the Project.

We are preparing our Final Environmental Assessment and will include a copy of your comments and this response in our submittal

Very truly yours,

Randolph G. Moore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

0000 0005 1097

APR-17-98 12:47 FROM:KANEOHE RANCH ID:

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o GARY S. FURUTA
Imperial Plaza · Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813
Telephone: 596-2120 · Fax: 395-1520

April 17, 1998

Mr. John A. Breinich, Chair
Ala Moana/Kakaako Neighborhood Board
c/o Neighborhood Board Commission
City & County of Honolulu
City Hall, Room 400
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low-Income Rental Housing Development Project

Subject: Environmental Assessment – Final

Dear Mr. Breinich:

We appreciated the opportunity to present the proposed project to your board and the public on March 24, 1998. We noted many people at the meeting had the flyers we sent out regarding our presentation. Councilmember Mirikitani had suggested that we send flyers to residents in the immediate neighborhood. Like you, we were pleasantly surprised at the considerable turnout of residents in the area for the presentation.

Thank you for your letter regarding our presentation. As you suggested, we will keep your board informed of the progress we make on the project. Regarding the concerns about parking that one individual brought up, we wish to assure you that we will do everything reasonably possible, as we did in our adjacent Birch Street Apartments project, to provide sufficient on-site parking. As an elderly apartment project, a parking ratio of one stall per four units (1:4) is a recognized acceptable standard, both locally and nationally. In the case of the King Street Apartments project with 91 units, this ratio equates to 23 parking stalls which would be sufficient to accommodate guests, employees, service personnel, etc., as well as the residents in the project. For the proposed project, 30 on-site parking stalls (1:3 ratio) are being provided. We believe that this number of stalls will accommodate the parking needs of the residents, staff and visitors.

As we explained in the presentation, the Pacific Planning & Engineering, Inc. traffic study indicates that the proposed project will have less of an impact to traffic in the area than even the existing service station. The project also will have little or no impact on the area, compared to either a condominium (for sale) or retail/office building project, both of which are logical alternative development scenarios for the site.

0000 0005 1098

APR-17-98 12:48 FROM:KANEOHE RANCH ID:

We hope the above is a satisfactory response to your comments. Please feel free to contact Mr. Gary Furuta, at 596-2120 or the address indicated above, if you have any questions.

We are preparing our Final Environmental Assessment and will include a copy of your comments in our submittal.

Again, thank you for your cooperation. Mahalo!

Very truly yours,

Randolph G Moore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

cc: Gary S. Furuta, HHDC Project Manager

0000 0005 1099

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

March 30, 1998

Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Environmental Assessment - Final

Dear Sir,

We appreciate your Office's review and comments of March 5, 1998 regarding our Draft Environmental Assessment for the Project.

In response to your comments, we submit that we will incorporate into the construction documents provisions directing the contractor to stop work and notify the State Historic Preservation Division should any historical sites, including human burial, be uncovered during routine construction activities.

We are preparing our Final Environmental Assessment and will include a copy of your comments and this response in our submittal

Very truly yours,

Randolph G. Moore

Randolph G. Moore, Chair
Hawaii Housing Development Corporation

0000 0005 1 100

KING STREET APARTMENTS L.P.
GARY S. FURUTA
Imperial Plaza · Suite C-103
725 Kapiolani Boulevard
Honolulu, Hawaii 96813
Telephone: 596-2120 · Fax: 395-1520

May 22, 1998

Councilmember Andy Mirikitani
City Council
City and County of Honolulu
Honolulu, Hawaii 96813-3065

Subject: Parking Concerns Relating to the King Street Apartments Project

Reference: Your letter of May 19, 1998, same subject.

Dear Councilmember Mirikitani:

This is a follow up to the above referenced letter as well as my telephone conversation with Mr. Rudy Bilan of your office.

It was comforting to hear that concerns regarding parking for the King Street Apartments project have not been prevalent. When we made a public presentation at a neighborhood board meeting a few months earlier in March, we were pleasantly surprised at the large turnout. You may recall that there was only one person that brought up issues regarding parking during the question and answer period after our presentation.

As with the adjacent Birch Street Apartments project, Hawaii Housing Development Corporation ("HHDC") is committed to being a good neighbor, and working and coordinating with the neighborhood board in its development of the King Street Apartments project. You may recall during the Chapter 201E, HRS approval process for the Birch Street Apartments family rental project, HHDC solicited the support of the neighborhood board. Together we were successful in maintaining the planned number of parking stalls, in spite of outside pressure to reduce parking in the project.

Since our presentation to the neighborhood board, we have completed a traffic report, prepared by Pacific Planning & Engineering, Inc., for the proposed project. The report included an investigation on the generation and adequacy of parking for the project. It concluded the following:

- The level-of-service at the intersections in the area would not be affected by the proposed project;
- The traffic generated by the project is estimated to be less than that presently being generated by the existing Texaco service station;
- The 27 parking stalls are adequate for the proposed elderly rental King Street Apartments project. *(Note: the most recent site plan for the project increases the number of parking stalls to 30)*

The project is being designed within the BMX-3 zoning density allowed by the city. In fact, the project is considerably below the allowable density for the property. The project will have a building area of approximately 47,000 sq. ft., which is approximately 70% of the maximum allowable density of 66,000 sq. ft. A considerably larger building could be built on the property.

As part of the project, adequate on-site parking, using national and local standards, will be provided. Based on these standards, and experience with existing projects in the urban core, an elderly rental project generates approximately 0.25 parking stalls per dwelling unit, or 23 parking stalls for the King Street Apartments project. This would include parking for residents, as well as visitors and service personnel. The proposed project will be providing 30 parking stalls (0.33 parking stalls per dwelling unit), considerably more than that normally required. Other allowable uses for the property, e.g., "for sale" condominium, office building, etc., would generate considerably more parking.

The proposed project will not reduce the number of existing parking stalls, or impede vehicular movement on adjacent roadways in the area. Presently, curbside parking is not allowed on the street frontages of the property and therefore, no existing parking will be eliminated. The level-of-service at the intersections in the area will not be affected by the project. Road visibility will not be hampered; overall traffic in the area should be improved. Traffic related to the project should be less than that presently being generated by the existing Texaco service station.

We trust that the above further clarifies the parking and traffic situation for the proposed project. HHDC will continue to have in mind the interest and concerns of the neighborhood when proposing developments in the area. We believe we have investigated and researched these matters, and incorporated reasonable and proper considerations in the design of the King Street Apartments project.

Please call if you have any questions. As discussed with Mr. Bilan, attached is another copy of the traffic report for your use or dissemination as necessary.

Very truly yours,

Gary S. Furuta, Project Manager

cc: Members of the Ala Moana/Kakaako Neighborhood Board No. 11
Roy Oshiro, Executive Director – State Housing Finance and Development Corporation
Gary Gill, Director - State Office of Environmental Quality Control

Attachment

0000 0005 1102

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

July 28,1998

Mr. Jonathan K. Shimada, Phd., Director
Department of Facilities Maintenance
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

COPY

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Sir,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

for:

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

COPY

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

July 28, 1998

Chief Lee D. Donohue
Police Department
City & County of Honolulu
801 South Beretania Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Chief,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

for

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

COPY

July 28, 1998

Mr. Brooks Yuen, Acting Manager and Chief Engineer
Board of Water Supply
City & County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Sir,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

0000 0005 1105

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

COPY

July 28, 1998

Mr. Randall K. Fujiki, Director
Department of Design and Construction
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Sir,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

0000 0005 1106

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

COPY

July 28, 1998

Ms. Jan Noe Sullivan, Director
Department of Planning and Permitting
City & County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Madame Director,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

COPY

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

July 28, 1998

Mr. William D. Balfour, Jr., Director
Department of Parks and Recreation
City & County of Honolulu
650 South King Street, 10th Floor
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Sir,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

0000 0005 1 108

COPY

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

July 28, 1998

Fire Chief Attilio Leonardi
Fire Department
City & County of Honolulu
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Chief,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

COPY

July 28, 1998

Ms. Cheryl Soon, Director
Department of Transportation Services
City & County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Ms Director,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

0000 0005 1110

COPY

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

July 28, 1998

Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Sir,

This is to inform you that the correct address of the property is <u>1239</u> South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as <u>1329</u> South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

[signature] for

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

COPY

July 28, 1998

Mr. John A Breinich, Chair
Ala Moana / Kakaako Neighborhood Board
c/o Neighborhood Board Commission
City & County of Honolulu
530 South King Street, Room 400
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Mr. Brienich,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

COPY

July 28, 1998

Mr. Robert Agres, Jr., Director
Department of Community Services
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income Rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Sir,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

for:

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation

0000 0005 1113

HAWAII HOUSING DEVELOPMENT CORPORATION
c/o Gary S. Furuta
Imperial Plaza - Suite C-103
725 Kapiolani Blvd.
Honolulu, Hawaii 96813

COPY

July 28, 1998

Mr. Kenneth E. Sprague, Director
Department of Environmental Assessment
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Project: King Street Apartments
An Elderly Low Income rental Housing Development Project

Subject: Final Environmental Assessment - Address Correction

Dear Sir,

This is to inform you that the correct address of the property is 1239 South King Street. In the Draft Environmental Assessment, the address was incorrectly stated as 1329 South King Street.

The address correction has been incorporated into the Final Environmental Assessment.

Please call if you have any questions.

Very truly yours,

for

Gary S. Furuta, Project Manager
Hawaii Housing Development Corporation