JOHN WAIHEE
GOVERNOR

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
DAN T. KOCHI (PRIMARY)
RONALD N. HIRANO
JEANNE K. SCHULTZ
CALVIN M. TSUDA

IN REPLY REFER TO:
AIR-EP
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

November 15, 1990

TO: Dr. Bruce Anderson, Acting Interim Director
Office of Environmental Quality Control

FROM: Edward Y. Hirata
Director of Transportation

SUBJECT: ENVIRONMENTAL ASSESSMENT AND DETERMINATION OF NEGATIVE DECLARATION FOR THE AIRPORT CENTER HOTEL, HONOLULU, HAWAII

We have reviewed the attached Environmental Assessment (EA) for the subject project and have determined that a Negative Declaration is acceptable for this development. Therefore, we are submitting the OEQC publication form, four (4) copies of the EA and this memo as our determination of Negative Declaration for this project.

Attach: 4 EA
OEQC Publication Form

c: R. M. Towill Corporation - Ms. Colette Sakoda
HWY-C
AIR-EP

CONTACT:
Wally Nishigata
836-6407

836-B426

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1990-12-08-OA-FEA

FILE COPY

ENVIRONMENTAL ASSESSMENT for the

AIRPORT CENTER HOTEL

Honolulu, Hawaii

JUNE 1990

PREPARED FOR:

Airport Industrial Park Associates
Honolulu, Hawaii

RMTC

R. M. Towill Corporation

420 Waiakamilo Rd., Suite 411
Honolulu, Hawaii 96817-4941
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ENVIRONMENTAL ASSESSMENT

FOR THE

AIRPORT CENTER HOTEL
Honolulu, Hawaii

PREPARED FOR:

Airport Industrial Park Associates
Honolulu, Hawaii

PREPARED BY:

R. M. Towill Corporation
420 Waiakamilo Road., Suite 411
Honolulu, Hawaii 96817-4941

JUNE 1990

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A - Honolulu Airport Hotel, Traffic Study, Wilbur Smith Associates, March 1990.

B - Environmental Noise Assessment, Airport Center Hotel, Honolulu, Letter Report, Darby & Associates, December 11, 1989

C - Environmental Assessment at 3375 Koapaka Street, Airport Industrial Park, Honolulu, Hawaii, Preliminary Study, Unitek Environmental Consultants, Inc., August 31, 1989 and September 22, 1989.

D - Foundation Investigation, Proposed Airport Center, Phase II, III and IV, Dames & Moore, March 6, 1989

E - U.S. Department of Transportation, Federal Aviation Administration, Aeronautical Study No. 89-AWP, 829-0E, Determination of No Hazard To Air Navigation.

LIST OF FIGURES

GENERAL INFORMATION

APPLICANT:	Airport Industrial Park Associates (AIPA)
CONSULTANT:	R. M. Towill Corporation
ACCEPTING AUTHORITY:	Department of Transportation (DOT)
PROPOSED ACTION:	411 guest room hotel with attached parking garage.
PROJECT LOCATION:	Corner of Paiea Street and Aolele Street, mauka of Honolulu International Airport
TAX MAP KEY:	TMK 1-1-15, Parcel 14 (Portion)
LOT AREA:	71,032 square feet
STATE LAND USE:	Urban
DEVELOPMENT PLAN LAND USE:	Industrial
ZONING:	I-2, Intensive Industrial District, Hotel Development Permitted as Conditional Use, Type 1.
LANDOWNER:	Loyalty Development Corporation
DEVELOPER:	Airport Industrial Park Associates (AIPA)

SECTION 1

STATEMENT OF PURPOSE

Airport Industrial Park (AIPA) proposes to build a first class 411-guest room hotel and an attached parking garage.

This specific project is part of the ongoing improvement of the property owned by Loyalty Development Corporation. Other projects include the construction of a warehouse building containing approximately 396,000 square feet of floor area. Another warehouse building containing 270,679 square feet of floor area has been recently completed and tenants have started moving in.

The project site is ideally located mauka of the immediate vicinity of Honolulu International Airport. Market conditions support the development of a 400-unit, full service, commercial-oriented lodging facility with superior appointments and high quality amenities at the proposed site.

SECTION 2
DEVELOPMENT PROPOSAL

2.1 LOCATION

The subject property is located at 530 Paiea Street, Honolulu, Hawaii, on the north (mauka) side of Honolulu International Airport (see Figure 1).

It is part of a 546,210 square foot area designated as Tax Map Key 1-1-15, Parcels 13 and 14. The property is bounded to the north (mauka) by Koapaka Street, a private roadway, and a warehouse complex operated by ISI Airport Property Investors; to the east (Diamond Head) by Paiea Street; to the south (makai) by Aolele Street; to the west (Ewa) by Rodgers Boulevard.

The hotel site occupies 71,032 square feet of Parcel 14, at the southeast corner of the property fronting Paiea Street and Aolele Street (see Figure 2).

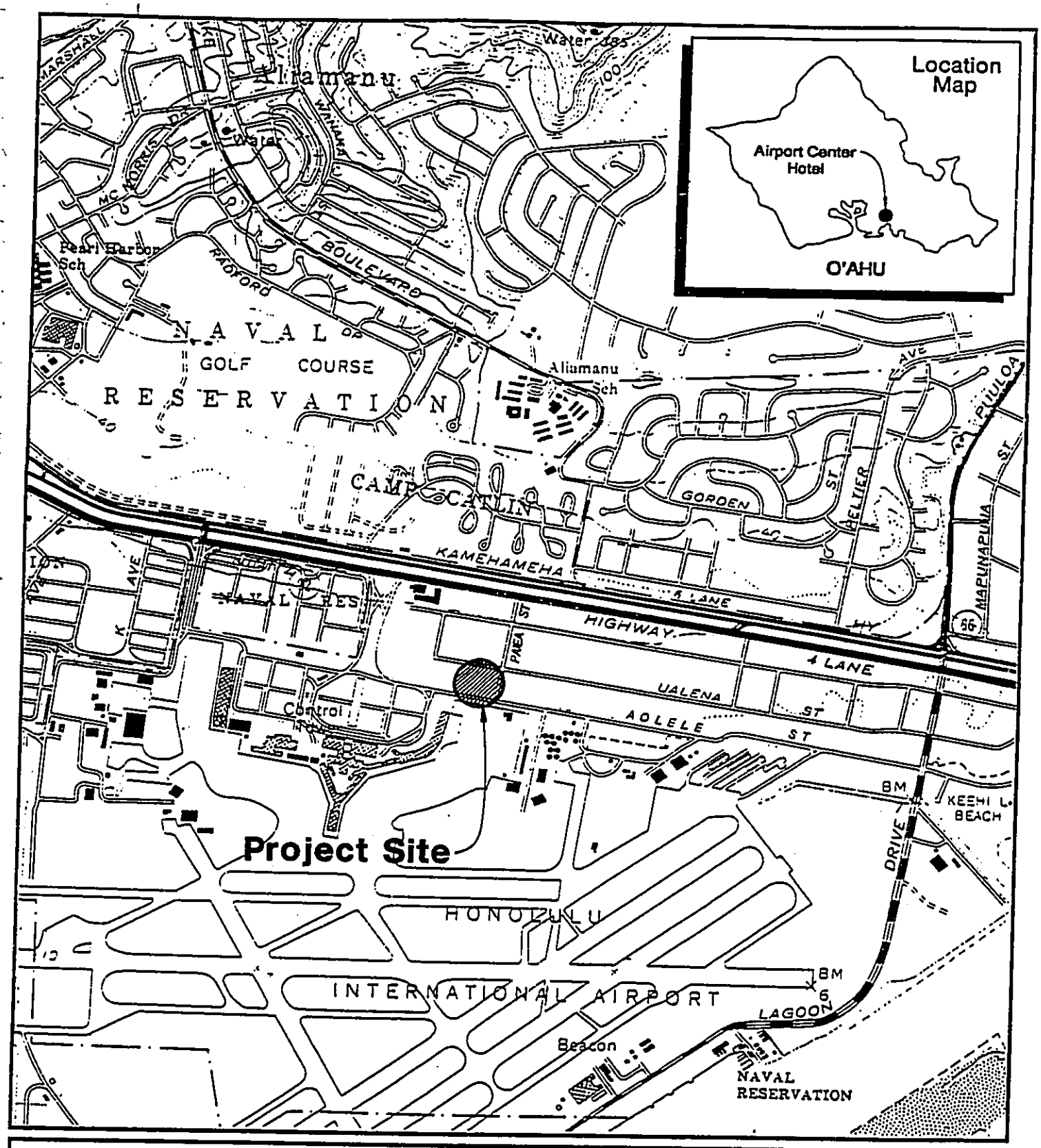
2.2 HISTORIC PERSPECTIVE

The project site is the former Damon Tract, a residential area which occupied the subject property until the late 1950's. The Lewers & Cooke Lumber Yard was then located here from 1965 to 1979. Multiple tenants occupied the subject property during the 1980's including United Parcel Service (UPS), Chrysler New Car Prep and Mid Pacific Airlines Parts Department. Most recently, the site was occupied by DHL Worldwide Express and Complete Car Prep.

2.3 PROJECT DESCRIPTION (See Figures 3 and 4)

The proposed project is a hotel development with a total of approximately 355,000 gross square feet of floor area.

The design consists of a 16-story hotel tower and a 3-story parking structure. The hotel tower is 82 feet wide, 234 feet long, and 156 feet high. The long side walls, which face north and south, uniformly consist of sliding glass doors opening onto scalloped projecting



Airport Center Hotel

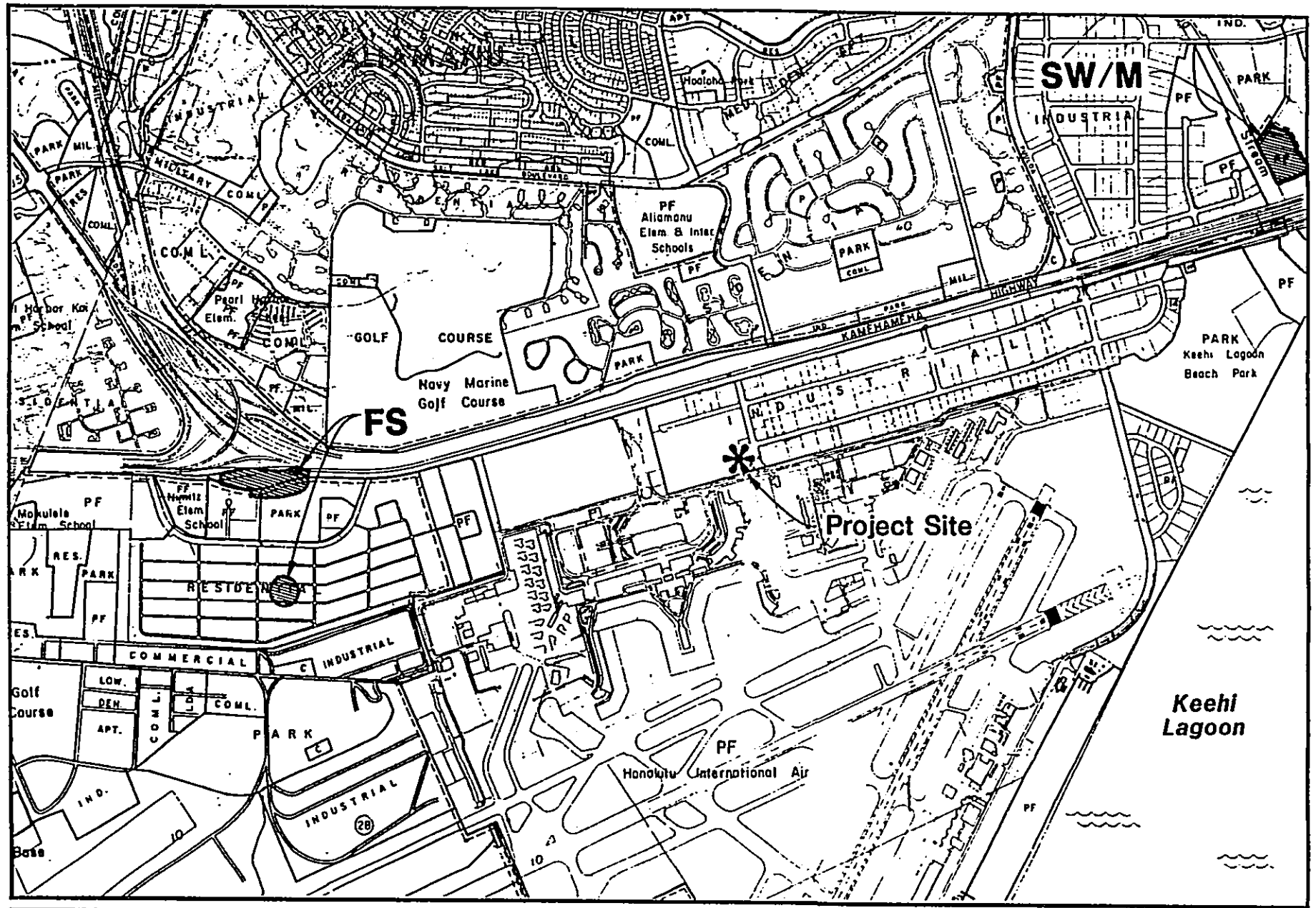
VICINITY MAP

Oahu, Hawaii

Figure 1

0 700 1400 FT.

January 1990



Airport Center Hotel

DEVELOPMENT PLAN LAND USE & PUBLIC FACILITIES MAP

Oahu, Hawaii

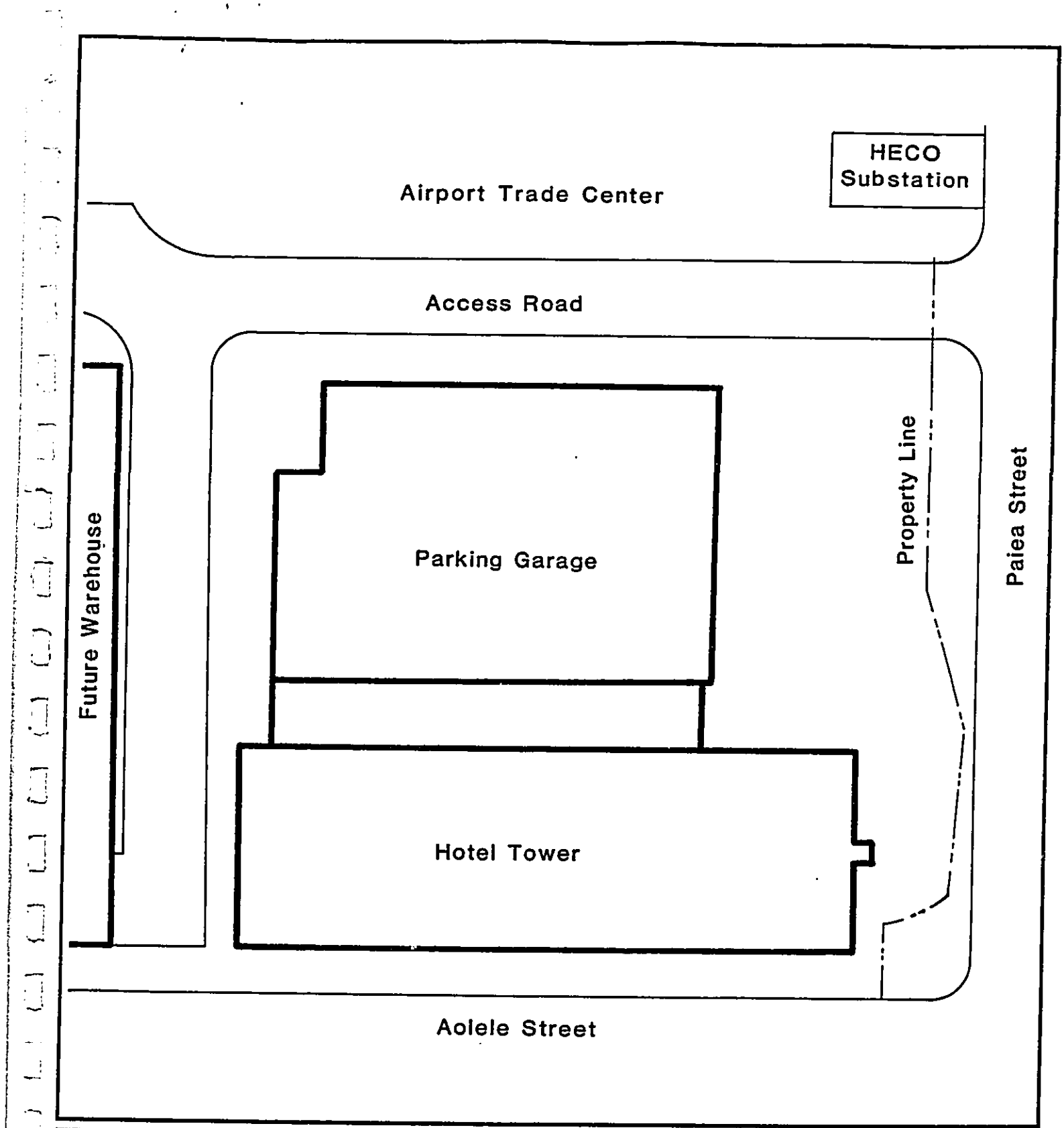
LEGEND:

FS Fire Station
SW/M Solid Waste/Modification

Figure 2

0 750 1500 FT.

January 1990



Airport Center Hotel

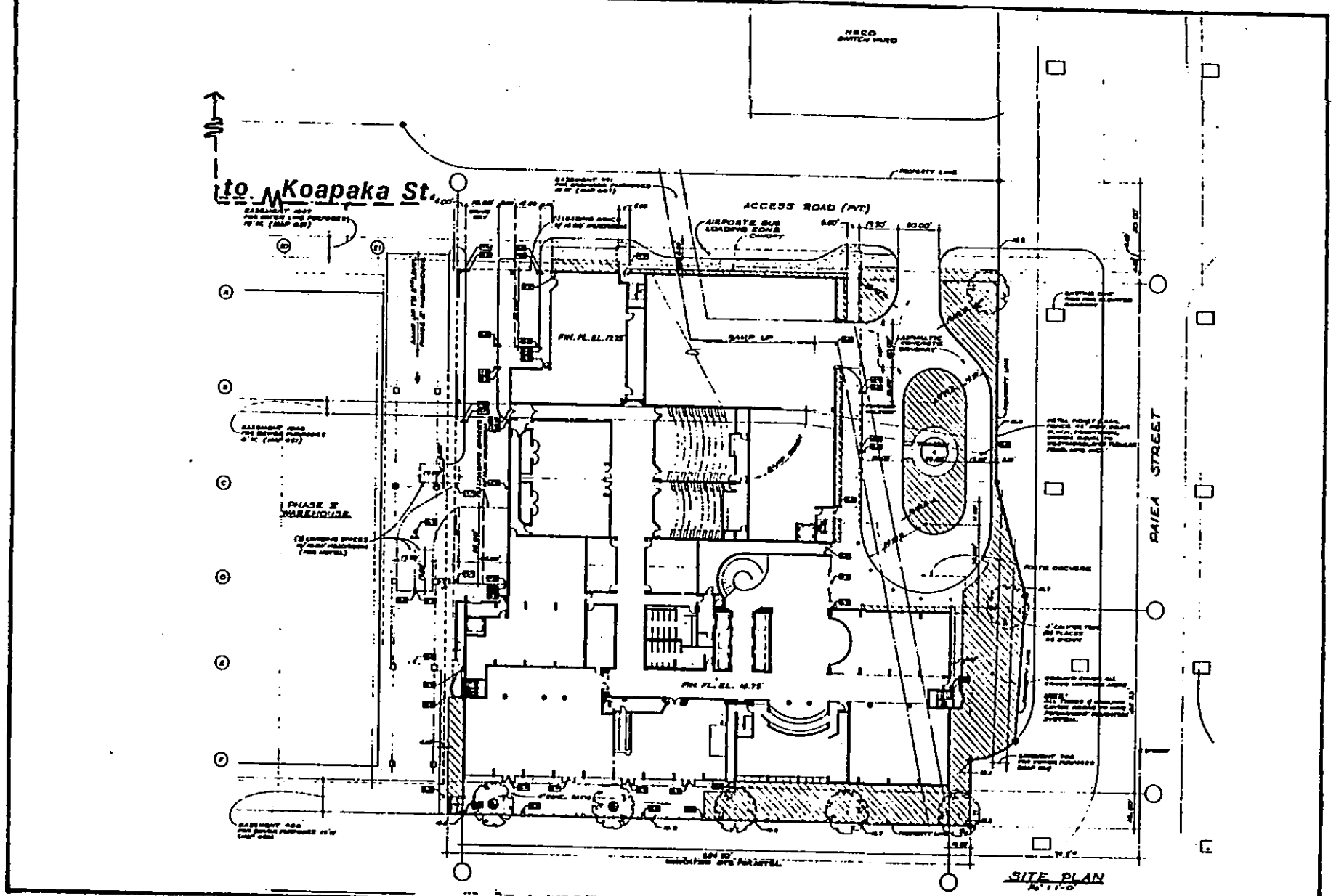
SCHEMATIC SITE PLAN

Oahu, Hawaii

Figure 3

0 25 50 FT.

January 1990



Airport Center Hotel

SITE PLAN

Oahu, Hawaii

Figure 4

0 1/16"

June 1990

balconies completed by metal picketed guardrails. The short side walls, which face east and west, are solid.

The garage structure has large openings for natural air circulation at each level on the east and west side.

Fronting a private access road which runs perpendicular to Paiea Street, a large open area provides space to accommodate a driveway, vehicular turnaround, and guest pickup and drop off. A porte cochere extends out from the hotel entry to the garage entrance. Available project information includes the following specifications:

2.3.1 Hotel Tower (281,768 Gross Square Feet of Floor Area)

A. Basement

The basement will contain the following:

- Hair Salon
- Hotel Administration
- Laundry
- Housekeeper
- Security Office
- Maintenance Shop
- Coach Office
- Golf and Other Recreational Amenities
- Staff Dining

B. First Floor

The first floor will contain the following:

- Retail (Gift Shops, Sundries)
- Hotel Administration
- Restaurant and Lounge
- One Meeting/Banquet Room (133 seats)
- Two Amphitheaters (117 and 72 seats, respectively)

- Three Meeting Rooms (89 seats total)
- Kitchen

C. Guest Floors (2 to 15)

Guest floors will contain 411 guest rooms.

D. Lanai Level (Roof)

The Lanai Level will contain the following:

- One Private Apartment (Penthouse)
- Snack Bar
- Restaurant and Lounge
- Kitchen
- Pool and Hot Tub with Open Deck

2.3.2 Parking

Article 4 (Section 4-20-20) of the land use ordinance requires that at least one space per 2 lodging units be provided. The 3-story, 4-level structure will provide parking accommodations for 274 vehicles, including 8 stalls for the physically disabled, (LUO 3-70-9).

2.3.3 Ventilation

With the exception of the parking structure, the proposed development will be centrally air conditioned with operable windows and/or sliding doors.

2.3.4 Height

The hotel tower will have a maximum height of 156 feet at the top of the penthouse roof (171 feet at the top of the elevator room), below the 160-foot height limit applicable in the area. AIPA has sought and received a Federal Aviation Administration (FAA) Determination of No Hazard To Air Navigation (Aeronautical Study No. 89-AWP-829-OE), in November 1989. The aeronautical study conducted by the Federal Aviation Administration found the proposal would have no adverse effect on visual flight operations nor would it adversely impact existing or planned minimum instrument flight altitudes. The FAA study also found that there would be no aderse effect to any FAA air navigation aids.

The proposed structure would be located in the general vicinity of other structures of similar heights. The proposed structure would have no greater impact on aeronautical operations than the existing structures, and was, therefore, not circularized to the public for comment (see Appendix F). FAA Form 7460-1, Notice of Proposed Construction or Alteration, will be filed prior to start of construction.

2.3.5 Floor Area Ratio (FAR)

In conformance with the LUO (Article 4, Section 4.40-20) relative to Hotel Development in I-2 Intensive Industrial Districts, the proposed project will have a FAR of 2.0.

2.3.6 Setbacks and Landscaping

In order to meet the LUO requirements, the hotel tower will be set back 92 feet from the Paiea Street centerline and at least 50 feet from the Aolele Street centerline.

There will be a minimum 180-foot setback for the parking garage allowing the area in front of it to accommodate a driveway, a vehicular turn-around, and space for guest pickup and dropoff. Additionally, along the north side of the parking garage, the building will be set back 16 feet from the private access road edge.

Landscaping will be provided in all open spaces not otherwise paved for walkway and driveway use and a large decorative fountain will be installed in the main open space fronting Paiea Street. In addition, planter boxes are provided continuously around the perimeter of the main roof of the hotel (Lanai Level) and at the openings in the front wall of the garage facing Paiea Street. Grade level landscaping will consist of ground covers and trees as designed and selected by a recognized, local professional consultant. All plantings will be served by a permanent irrigation system. A decorative metal picket and rail fence, 42 inches high, will parallel Aolele and Paiea Streets and extend along the access road to the corner of the garage.

2.3.7 Intended Market

Because of its location in the immediate vicinity of Honolulu International Airport and its closeness to Honolulu Central Business District and Capitol District, the proposed hotel

development, in addition to tour groups from overseas, is intended to appeal strongly to the commercial segment which includes the travelers visiting Hawaii on business or combining business with pleasure.

Based on statistics collected by the Hawaii Visitors Bureau, there were approximately 89,000 westbound Business Only Travelers with an average length of stay of 3 to 4 days in 1987. Westbound visitors combining business and pleasure accounted for approximately 379,000 with an average stay of 5 to 7 days.

Between 1986 and 1987 the number of Business With Pleasure Travelers decreased by 3 percent. In the same period Business Only Travelers increased by 7 percent. While the trend is unclear concerning travelers combining business and pleasure, the Hawaii Business Bureau as well as private market analysis expect a continued increase in Business Only Travelers in the years to come, due to the sustained vitality of the local economy and Hawaii's position at Midpoint between Asia, Australia, and the Pacific Rim and the Mainland United States.

2.3.8 Development Schedule

If all permits and approvals are obtained, construction is expected to begin during the second half of 1990, with completion by the end of 1991 or early 1992.

2.3.9 Estimated Cost

Anticipated project development costs, on and off-site infrastructure improvements included, can be estimated at $40 to $50 million. Possible public rights-of-way improvements cannot be quantified at this point.

SECTION 3

LAND USE REGULATIONS/PROJECT IMPACT

3.1 STATE LAND USE

The project site is included in a district designated for urban use, allowing urban developments such as the proposed hotel.

3.2 CITY AND COUNTY OF HONOLULU DEVELOPMENT PLAN LAND USE

The subject property is currently designated as "Industrial" on the Primary Urban Center Development Plan Land Use Map (see Figure 2). The area is to be principally reserved for industrial activities, unless otherwise specified by the existing zoning.

3.3 CITY AND COUNTY OF HONOLULU DEVELOPMENT PLAN PUBLIC FACILITIES

Several public facilities are located in the vicinity of the proposed hotel site:

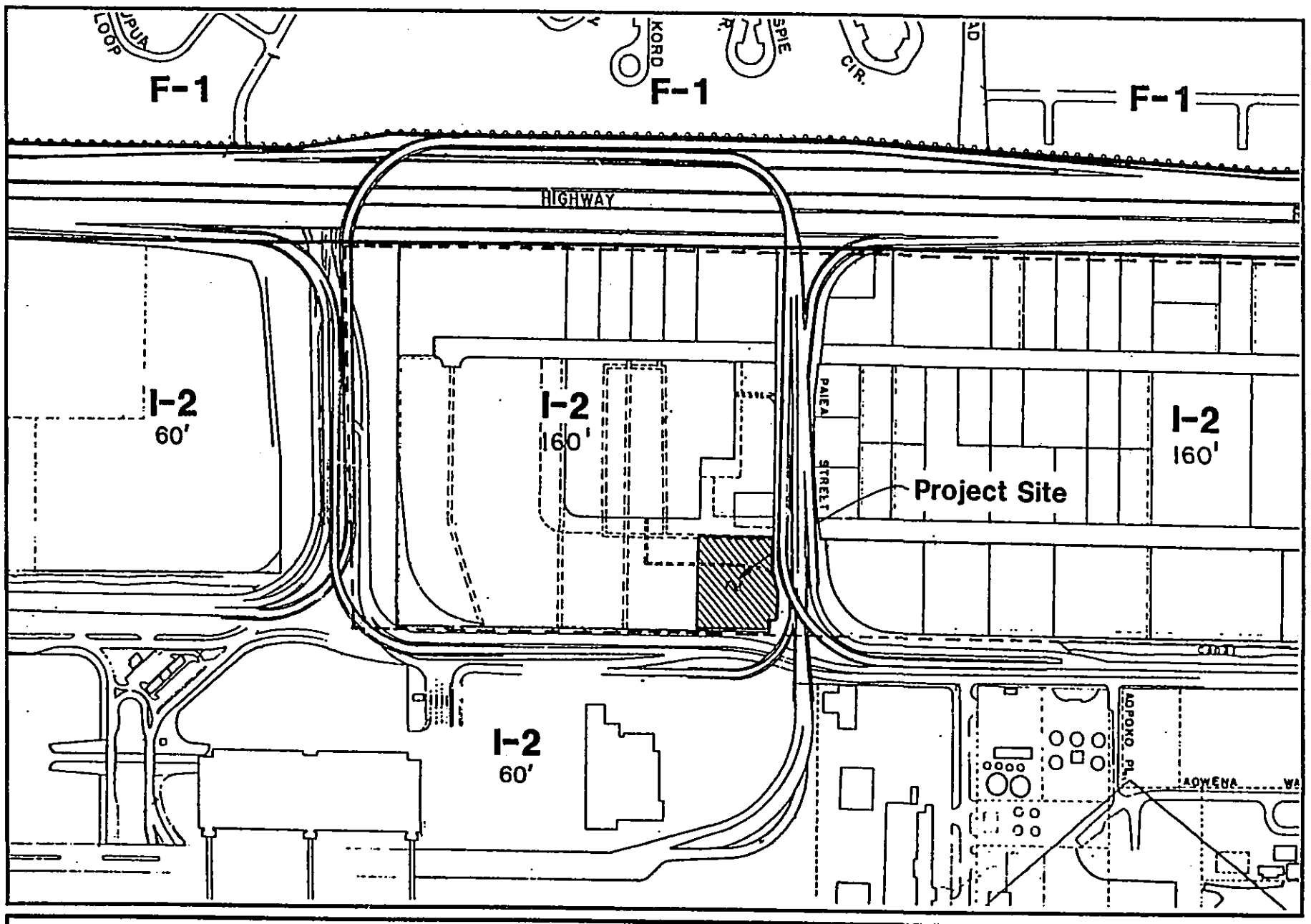
- Honolulu International Airport
- Honolulu Main Post office
- Keehi Lagoon Beach Park

3.4 ZONING (See Figure 5)

The subject site is presently included in an Intensive Industrial District (I-2). Since hotel developments are permitted as a conditional use under this designation, no zoning change is required. However, a Conditional Use Permit will be sought from the City and County of Honolulu upon acceptance of the Environmental Assessment by the State Department of Transportation.

3.5 HONOLULU INTERNATIONAL AIRPORT MASTER PLAN

Although located outside the airport boundaries, the Honolulu International Airport (HIA) Master Plan Update and Noise Compatibility Program identifies the property owned by Loyalty Development, which includes the area considered for the proposed hotel development, as a possible expansion site for the airport beyond the year 2005.



Airport Center Hotel

ZONING MAP

Oahu, Hawaii

LEGEND:

F-1 Military & Federal Reservation District
I-2 Intensive Industrial

Figure 5

0 200 400 FT.

January 1990

The Honolulu International Airport (HIA) Master Plan Update and Noise Compatibility Program (by KFC Airports, Inc., for the Department of Transportation, Airports Division, October 1988) accomplishes two things. It provides a physical development plan for HIA to 2005 and it implements recent Federal regulations pertaining to airport noise and the surrounding environment. The plan will guide the expansion of HIA to accommodate projected increases in passengers, cargo and aircraft. Some of the key features of the plan include the provision of more airfield capacity, the expansion of the overseas terminal, the provision of new interisland facilities, the provision of additional parking, and the acquisition of additional land for airport use. There is an interrelationship between the development plan and the noise compatibility program in that the expansion of HIA is planned in conformance with the noise standards apppropriate to the areas surrounding the airport. Because of recent plans for a new International Terminal Building, the HIA Master Plan Update Study will be further updated to include the HIA development plans to the year 2010. This 2010 study is presently anticipated to be completed in 1990.

In recent developments, it appears that the Department of Transportation, Airports Division, has excluded the subject property from its expansion plans for Honolulu International Airport. However, the long term plans include the closure of Aolele Street, on the Diamond Head side of the H-1 on-ramps.

3.6 KEEHI LAGOON RECREATION PLAN

Keehi Lagoon, as envisioned by the updated Keehi Lagoon Recreation Plan, is to become a major ocean recreation area for the Island of Oahu. The Traffic Impact Assessment (the text, in its entirety can be found as Appendix A in back) addresses potential traffic impacts of future developments. Future traffic generation estimates were derived from both known land use development projects, including the Keehi Lagoon Recreational Plan, and from the application of growth factors. The growth factor would account for increased airport activity through 1995. No significant impacts on this future recreation complex are expected from the proposed hotel development located outside the Keehi Lagoon planning area.

SECTION 4

ENVIRONMENTAL CONDITIONS/PROJECT IMPACT

4.1 EXISTING USES

As of November 1989, all tenants previously occupying the property, including DHL Worldwide Express and Complete Car Prep, have been relocated to the recently completed warehouse building (Phase I) developed by Airport Industrial Park Associates (AIPA).

Part of the site is currently used for concrete precasting operations relative to the construction of the adjacent warehouse structure (Phase II) also being developed by AIPA.

4.2 SURROUNDING USES (See Figure 6)

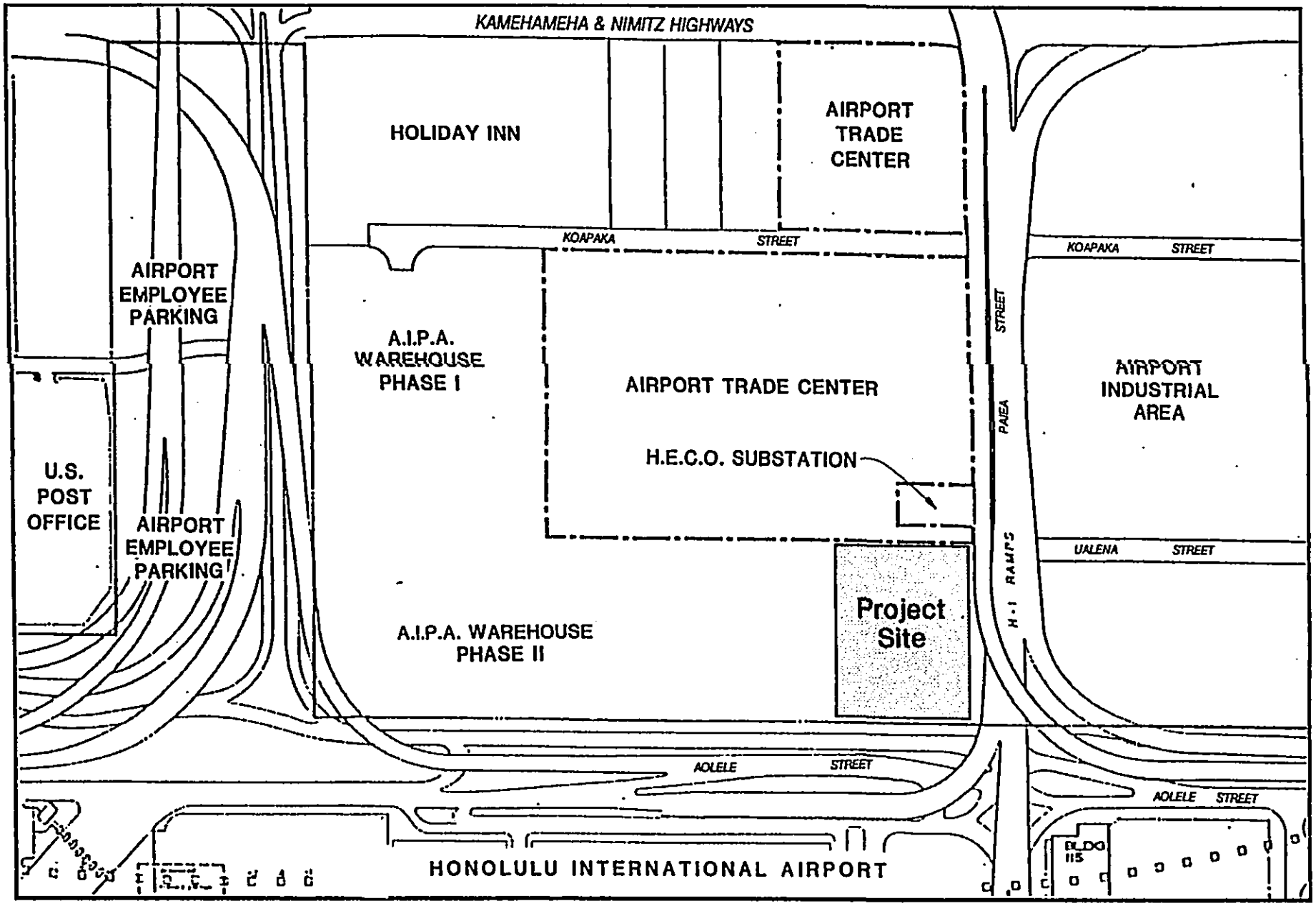
To the west (Ewa) of the proposed hotel site and immediately adjacent to it is the site of the future warehouse, Phase II. This 3-story, 4-level structure, extending all the way to the property limit fronting Rodgers Boulevard will have approximately 396,000 square feet of warehouse, office and parking space. Precast concrete operations are currently in progress in the area.

To the north (mauka) of the hotel site, right across the access road, is a Hawaiian Electric Company (HECO) substation.

The area surrounding the substation is part of the Airport Trade Center redevelopment project that will include a warehouse structure, two office towers and retail space.

A warehouse complex currently under remodeling occupies the site. Tropical Rent-a-Car is located in the east (Diamond Head) wing of the complex.

Further west (Ewa) is a large 3-story reinforced concrete structure that provides warehouse, retail and business space. The recently completed building constitutes the first phase of the redevelopment program initiated by Airport Industrial Park Associates (AIPA). The main tenant is Duty Free Shoppers Limited, which operates a central warehouse, a purchasing



Airport Center Hotel

SURROUNDING USES MAP

Oahu, Hawaii

Figure 6

0 150 300 FT.

January 1990

department and an operating warehouse in the premises. Other tenants include Greeters of Hawaii, Lynden Air Freight, Complete Car Prep Corp., The Framery, and DHL Worldwide Express.

North (mauka) of the AIPA warehouse and the Airport Trade Center site, across Koapaka Street, is a Holiday Inn Hotel and another smaller warehouse structure formerly occupied by BJ Furniture. This structure is to be demolished in the future and replaced by an office tower as part of the Airport Trade Center Redevelopment Project.

Directly north (mauka) of the Holiday Inn and the Airport Trade Center site are Nimitz Highway and the H-1 Freeway.

East (Diamond Head) of Paiea Street are the warehouses and light industry of the Airport Industrial Park subdivision and the Plaza Hotel. South (makai) of Aolele Street are the parkings and the terminals of Honolulu International Airport.

An airport employee parking and the Main Honolulu Post Office are located directly west (Ewa) of Rodgers Boulevard.

4.3 CLIMATE

Oahu has a mild, semi-tropical climate. Owing to the marine influence and the prevailing northeasterly trade winds, there is very little diurnal or seasonal variation in temperature. The mean annual temperature at sea level is approximately 75°F, with seasonal fluctuations rarely exceeding ±10°F. One of the outstanding features of Oahu's climate is the persistence of the northeast trade winds. Winds from the south and southwest are usually laden with moisture and bring heavy rainstorms, especially in the winter month.

Rainfall varies markedly over very short distances on Oahu. The Koolau Range on the windward side of the island is the wettest area, with an annual rainfall exceeding 250 inches. The Waianae Range in the leeward section is much drier, with the annual rainfall seldom exceeding 80 inches at the highest elevation.

Along the lee and southwest shores, where the hotel site is located, the mean annual rainfall is less than 20 inches. The winter season is the period of highest average rainfall throughout the year.

4.4 TOPOGRAPHY

The site is relatively level with slight variations of elevation from +15 to +16 feet mean sea level (msl). The area has been filled in and graded, and has been in urban use for over 20 years. It does not have any unique or unusual features.

4.5 SOILS

4.5.1 Surface

The areas not occupied by buildings are paved with asphaltic concrete.

4.5.2 Subsurface

A foundation investigation conducted by Dames & Moore indicates generally stable soil conditions. During borings performed up to a depth of 60 feet, the following layers wee encountered:

- Coralline sand and gravel.
- Volcanic stuff.
- Highly weathered tuff or possibly an old alluvium.
- Volcanic cinder tuff.

Groundwater was encountered at the existing approximately 15 to 17 feet below the surface.

Foundations appropriate to the existing subsurface conditions will be used to ensure structural soundness of the proposed construction.

4.6 FLOOD CONDITIONS

The entire project site is included in a Zone D, in the Flood Insurance Rate Map (FIRM). This designation indicates that the area is not subject to flood hazards. The proposed development will, however, comply with all flood control regulations applicable to the area.

4.7 PLANT AND WILDLIFE

The site is almost entirely paved and developed. With the exception of some shrubbery at the Paiea Street entrance there is no significant vegetation. The industrial uses of the subject property limit fauna to pests such as rats and mice, and common birds found throughout the urban areas of Honolulu.

4.8 TRAFFIC AND CIRCULATION

A Traffic Assessment Study was conducted by Wilbur Smith Associates to determine the proposed Hotel's impact on existing traffic conditions. For the purposes of this study, the ultimate project build out in 1995 assumed the worst case scenario, which include hotel, warehouse, and office uses on the project site. Future traffic generation estimates were derived from both known land use development projects, and from the applications of growth factors. The growth factor would account for increased airport activity through the year 1995. The following is a summary of the study's findings. The traffic impact assessment report can be found in its entirety as Appendix A of this document.

Roadway improvements recommended by the Traffic Impact Assessment Report (Pacific Planning & Engineering, Inc., July 1989) for the adjacent Airport Trade Center Redevelopment Project were assumed to be in place. These improvements include additional turn lanes on Paiea, Ualena and Aolele Streets, an additional turn lane on Kamehameha Highway and the signalization of three intersections on Paiea Street, between Nimitz Highway and Aolele Street.

Without the hotel and the future warehouse the level-of-service (LOS) at each of the five intersections located in the vicinity of the subject property is satisfactory. Traffic generated by the future hotel and the adjacent warehouse in the year 1995 would result in a significant lowering of the current LOS at the intersection of the Paiea/Koapaka and Paiea/Ualena intersections. Additional improvements would bring the LOS back to an acceptable level.

Access to the hotel site is primarily provided by driveways located near the intersection of Paiea Street and Ualena Street. Additional access is also being considered via a private, internal accessway through Koapaka Street. However, close coordination with the Airports

Division of the Department of Transportation would be needed to obtain the appropriate approvals and permits.

As a result of the Traffic Assessment Study, an alternative access is being studied. Ingress/egress would occur at the access road located north (mauka) of the project site. In order to avoid a queue of vehicles exiting at this point, tour buses and large vehicles leaving the hotel could be rerouted to Koapaka Street via the driveway located between the existing AIPA Warehouse (Phase I) and the Airport Trade Center Warehouse. This solution would considerably reduce the risk of congestion at the Paiea/Ualena intersection and still allow for an acceptable level-of-service at the Paiea/Koapaka intersection.

Deliveries to the loading berths at the northwest corner of the hotel will be made using a driveway along the west end of the garage from the access road which borders the north side of the site.

Existing pedestrian paths and sidewalk around the project site will be maintained. New pedestrian walkways will extend from the hotel entry eastward to Paiea Street and north, parallel to the garage front, to the access road where a sidewalk will parallel the road the entire length of the site. A porte cochere extends out from the hotel entry and the walkway north along the garage to the access road will be covered to provide shelter from heavy rains. All walks will be paved with concrete.

4.9 NOISE

A noise impact evaluation for the proposed development was prepared by Darby and Associates.

The study's findings can be summarized as follows:

- There are, at present, no noise-sensitive activities in the immediate vicinity of the project site. The closest noise-sensitive building is the Holiday Inn Hotel on the Nimitz Highway.

- Parts of the adjacent Airport Trade Center could possibly experience some noise impact from construction activities. However, because of the short-term nature of most of these activities, and the high existing ambient noise levels in the subject area, any construction noise impact should be relatively small.

- The additional traffic on Paiea Street generated by the proposed hotel will not cause any significant environmental noise impact.

- Provided the appropriate noise control measures are incorporated in the design, noise levels at the property lines due to the operation of mechanical and electrical equipment associated with the proposed development (air conditioning plant, exhaust fans, emergency generator, etc.) will be in compliance with the appropriate Department of Health and Land Use Ordinance regulations.

- The proposed development is potentially impacted by noise from aircraft operations associated with Honolulu International Airport and Hickam Air Force Base, and by noise from road traffic on Aolele Street, Paiea Street, and the adjacent freeway on-ramp and the H-1 Freeway. The estimated Day-Night Average Sound Level at the project site is approximately 71 dB to 72 dB, which is sufficiently high to warrant some special noise mitigation measures.

- The building envelope is designed to adequately attenuate noise from aircraft operations and road traffic noise, and the guest rooms and public areas will be air conditioned (to allow windows to be kept closed for noise reduction purposes, thus, the existing noise environment should not adversely affect the operation of the proposed hotel.

  It is estimated that an exterior-to-interior noise reduction of at least 35 dBA will be necessary, necessitating the use of acoustically double-glazed windows. A more thorough investigation into the most appropriate window construction, including additional site noise measurement, will be made during the detail design phase.

4.10 AIR QUALITY

With several major roadways, either at-grade or above-grade, surrounding the subject property, traffic is the main source of pollutants in the vicinity of the proposed hotel site, followed by emissions resulting from Honolulu International Airport and Hickam AFB aircraft movements. No heavy air polluting industries are located in the area.

The proposed project will generate impacts typical of site preparation and construction, including air quality. These impacts are temporary and can be mitigated through compliance with public regulations and standards set by the Department of Health regarding construction activities.

Future traffic generated by the hotel operations will be relatively light compared to traffic generated by AIPA and Airport Trade Center future developments. Guest transportation between the hotel and the airport will be provided mostly by shuttle vans.

Furthermore, according to the Environmental Protection Agency (EPA) forecast, vehicular emission rates will drop substantially over the next decades, as new cars are fitted with better catalytic converters and older cars disappear and leaded gas is totally phased out.

4.11 WATER QUALITY

There are no waterways near the project site. Thus, potential impact on existing water quality is minimal. Keehi Lagoon Beach Park is almost a mile away and should not be impacted by the project.

4.12 VISUAL CHARACTERISTICS

The proposed project site is bordered by elevated access ramps located immediately above Paiea Street on the east (Diamond Head) side, by Honolulu Airport installations on the south (makai) side, by the elevated Rodgers Boulevard on the west (Ewa) side and by large, mid-rise warehouse structures on the north (mauka) side.

Honolulu International Airport Control Tower, the Plaza Hotel on Nimitz Frontage Road and an office building (Sperry Building) located on Ualena Street are the only tall structures

presently encountered in the area. The ocean is not visible from the proposed hotel site and the mauka views of the Koolaus are partly obstructed by an existing warehouse and, further, by the elevated Kamehameha Highway and H-1 Freeway.

Present conditions in the immediate vicinity are unsightly with the HECO substation, the Airport Trade Center warehouse under remodeling, the Tropical Rent-A-Car parking lot and the temporary precasting yard site.

Completion of the AIPA warehouse and the Airport Trade Center will greatly improve the area's visual appearance. The carefully designed hotel structure and its surrounding landscaping will substantially upgrade the area's visual quality. No significant public views will be obstructed by the proposed development.

4.13 WIND

The prevailing winds at the subject property are northeast/east northeast (NE/ENE) normal trade winds. The average wind speed recorded at Honolulu International Airport was 11.5 miles per hour (mph) and the highest speed 46 mph. The project site may be partially exposed to direct trade winds, at least at the hotel tower upper levels and, to a lesser extent, to southerly Kona winds.

Turbulence is often observed in the vicinity of high rise buildings. Negative impacts associated with the new hotel tower will be minimized through careful design of the building. Generally, no significant wind impacts are expected by and to the proposed structure.

4.14 SHADOW

The 55-foot high access ramp above Paiea Street is the only source of shadow impacting the hotel site during the morning period. There is no structure susceptible of casting a shadow upon the site during the late afternoon/early evening period. The shadow projected by the proposed hotel tower for a short period of time during the morning hours will not impact any residential area or public facilities such as schools and parks as none of these uses are

located in the vicinity of the project.

4.15 SUNLIGHT REFLECTION

Reflective surfaces on and around the site cover less than 30 percent of each wall surface area and no adverse reflected sunlight impact has been observed.

The long side walls of the proposed hotel tower, which face north and south, consist of sliding glass doors, covering more than 30 percent of the wall surface thereby necessitating a Sunlight Reflection Permit as required by LUO Sections 3.110 and 8.30-5.

The developer has selected a glass with a reflectance value under 30 percent. Nearly all glazed areas will be protected by scalloped balconies, thereby minimizing negative reflection impacts on nearby public rights-of-way.

4.16 HAZARDOUS MATERIALS

Historically, the site has been in industrial use since the early 1960's. Hazardous substances have been stored and used for new car preparation. A 10,000-gallon capacity fuel tank was located at the northwest corner of the DHL Building, and a waste oil storage tank at the southwest corner of the same building.

Both of these tanks have been removed. A preliminary site survey conducted by Unitek Environmental Consultants found no evidence of significant contamination of the site. Further soil sampling is to be performed during the removal of the pipelines associated with the storage tanks.

Appropriate measures such as aerating and/or removing of eventually contaminated soil will be taken during the preliminary construction phase, in accordance with Federal and State requirements.

SECTION 5

PUBLIC FACILITIES AND SERVICES/PROJECT IMPACT

5.1 WATER

The Board of Water Supply (BWS) provides water distribution to the area. A 16-inch main runs along the project site on Paiea Street. The proposed development will require 430,000 gallons per day (gpd). Irrigation of the landscaped areas will require an additional 2,500 to 3,000 gpd.

Although the Board of Water Supply (BWS) has not responded yet to the applicant's request regarding the adequacy of the existing water system to answer the project needs, it does not appear that water supply will be a problem.

5.2 DRAINAGE

Stormwater currently drains off the subject property into a double 11'-6" x 4'-2" box culvert located along Aolele Street. A 24-inch drain line collects the stormwater on the eastern (Diamond Head) end of the site, on Paiea Street, into the double box culvert which drains off into Keehi Lagoon. The existing drainage system appears to be adequate to handle the future development needs.

5.3 WASTEWATER SYSTEM

Sewer service for the subject property is provided by the City and County of Honolulu, Department of Public Works. Wastewater is currently collected by an 8-inch line running along Paiea Street which connects to a 36-inch line located along Aolele Street. In order to meet the increase in sewerage generated by the project, the 8-inch line will be replaced by a 30-inch line.

5.4 SOLID WASTE

Solid waste collection for the project site is currently provided by the City and County of Honolulu, Department of Public Works. It does not appear that the project will have a significant impact on solid waste disposal services in the area.

5.5 ELECTRICITY AND TELEPHONE

A 1,000 KV underground line, serviced by the Hawaiian Electric Company (HECO), will provide electrical service to the proposed development site directly from the substation located in its immediate vicinity. Telephone lines, serviced by Hawaiian Telephone Company (HTCO) are located along Paiea Street. Both electricity and telephone services are expected to be adequate with regard to the proposed development.

5.6 GAS

Gas distribution, supplied by GASCO, will be adequately provided by an existing 6-inch line on Paiea Street.

5.7 FIRE PROTECTION

First response is provided by the Valkenburgh Fire Station and the second response by the Mokulele Fire Station. No significant impact on fire protection services is expected from the proposed development. Adequate fire protection systems, including fire hydrants, will be installed by the developer who will also comply with fire safety standards.

5.8 POLICE PROTECTION

The Kalihi Substation provides police service to the area. The project will have its own security force thereby minimizing its impact on existing police services.

SECTION 6

SOCIO-ECONOMIC CONDITIONS/PROJECT IMPACT

6.1 DISPLACEMENT

Tenants previously occupying the project site -- DHL Worldwide Express and Complete Car Prep -- have already been relocated to the warehouse building (Phase I) recently completed by AIPA.

6.2 ECONOMIC CONDITIONS

Much of the site is undeveloped and the existing structures are vacant. Thus, economic potential of the site will be realized with the proposed development.

Short-term economics impact resulting from the construction, will benefit the building industry and generate jobs in this sector, thereby contributing to the island's overall economic growth. Long-term economic impacts include the creation of new jobs, increased revenues for local governments, including collection of general excise and income taxes, real property taxes and transient accommodation taxes. At this time, however, it is difficult to quantitatively evaluate the anticipated returns generated by the project.

SECTION 7
ALTERNATIVES TO THE PROPOSED ACTION

7.1 NO ACTION ALTERNATIVE

Economically, since the site is currently unutilized, a "No Action" alternative would not be feasible.

7.2 WAREHOUSE DEVELOPMENT

A single warehouse building, extending from Rodgers Boulevard to Paiea Street, was at one time considered. Although economically viable, this alternative was rejected in view of the site's desirable location near the airport and of the future, adjacent developments, such as Class A office towers and retail space, planned at the Airport Trade Center site. The area's future characteristics call for further diversification of potential uses.

SECTION 8
CONSTRUCTION IMPACTS

The proposed project will generate impacts typical of site preparation and construction activities. These impacts include air quality, public safety, noise and traffic impacts. These are temporary conditions that can be mitigated through compliance with public regulations and standards.

8.1 NOISE

Adverse impacts from construction noise are expected to last for a period of time of less than 14 months, from site preparation to structural completion of the building. While there are no residential properties in the vicinity of the project site, the use of muffled construction equipment and, if soil conditions allow, the use of vibratory pile driving equipment is recommended to minimize noise impacts on nearby businesses.

The incorporation of State Department of Health construction noise limits during the construction phase is another potential mitigation measure.

8.2 AIR QUALITY

Fugitive dust from vehicle movement and soil excavation, along with emissions from construction equipment and trucks could result in short term air pollution. Dust emissions should be controlled accordingly to the State of Hawaii Air Pollution Control Regulations. Frequent watering of the construction site should substantially reduce fugitive dust emissions. Carbon monoxide emissions from construction equipment diesel engines are very low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

8.3 TRAFFIC

Slow moving construction vehicles could impede the normal flow of traffic on roadways leading to and from the construction site. Adverse traffic impacts can be mitigated by moving heavy construction equipment during periods of low traffic volume and adjusting the schedules of commuting construction workers to avoid peak hours.

8.4 PUBLIC SAFETY

Necessary measures to ensure public safety will be provided throughout all phases of construction. Signs, barricades and eventually police officers will be employed to adequately separate the public from potentially hazardous areas.

SECTION 9

NECESSARY APPROVALS

Prior to submitting a building permit application for the proposed development, several governmental approvals are required:

9.1 CONDITIONAL USE PERMIT, TYPE 1 (LUO, Section 4-40-20)

Hotel developments in Intensive Industrial Districts (I-2) require the issuance of a Conditional Use Permit. The application is to be submitted to the City and County of Honolulu, Department of Land Utilization (DLU). No public hearing is required for a Conditional Use, Type 1.

9.2 SUNLIGHT REFLECTION PERMIT (LUO, Section 3-110)

Since two of the proposed hotel tower walls contain a reflective surface for more than 30 percent of the wall surface area, a Sunlight Reflection Permit Application to be submitted to the City and County of Honolulu, Department of Land Utilization (DLU) is required.

APPENDIX

A - Honolulu Airport Hotel, Traffic Study, Wilbur Smith Associates, March 1990

B - Environmental Noise Assessment, Airport Center Hotel, Honolulu, Letter Report, Darby & Associates, December 11, 1989

C - Environmental Assessment at 3375 Koapaka Street, Airport Industrial Park, Honolulu, Hawaii, Preliminary Study, Unitek Environmental Consultants, Inc., August 31, 1989.

D - Foundation Investigation, Proposed Airport Center, Phase II, III and IV, Dames & Moore, March 6, 1989

E - U.S. Department of Transportation FAA Determination of No Hazard To Air Navigation, Aeronautical Study No. 89-AWP-829-0E, November 6, 1989

APPENDIX A

TRAFFIC STUDY

HONOLULU AIRPORT HOTEL

TRAFFIC STUDY

Prepared for

R.M. Towill Corporation

Prepared by

Wilbur Smith Associates

March 26, 1990

WILBUR
SMITH
ASSOCIATES
ENGINEERS • PLANNERS

282 SECOND STREET, 2nd FLOOR • SAN FRANCISCO, CA 94105 • (415) 896-0670 • TELEX 573439

March 26, 1990

Ms. Collette Sakoda
R.M. Towill
420 Waiakamilo Road
Suite 411
Honolulu, Hawaii 96817-4941

RE: Airport Hotel Traffic Study

Dear Collette:

We are pleased to submit the following traffic impact report for the proposed hotel, office, and warehouse development which is to be located near the Honolulu Airport. The issues raised by the State Department of Transportation in their letter of January 24, 1990, are addressed in this revised Draft Final Report.

Summary of Findings

It was found that the proposed hotel, warehouse, and office space would attract over 6,000 daily trips. It was concluded that traffic generated by the project, on top of other projected traffic growth near the hotel site, would be sufficient to suggest that certain roadway improvements would be needed. These improvements, which could be constructed within the existing rights-of-way, are described in the following report.

Please feel free to call me or Scott Ferguson if you have any questions or comments on this submittal. We are looking forward to your response.

Very truly yours,

WILBUR SMITH ASSOCIATES

Bryant T. Brothers
Senior Transportation Engineer

BTB:GSF/ld
261330/241

Attachments

ALBANY, NY • ALLIANCE, OH • CAIRO, EGYPT • CHARLESTON, SC • COLUMBIA, SC • COLUMBUS, OH • FALLS CHURCH, VA • HONG KONG
HOUSTON, TX • KNOXVILLE, TN • KUALA LUMPUR, MALAYSIA • LEXINGTON, KY • LONDON, ENGLAND • MIAMI, FL • MINNEAPOLIS, MN
NEW HAVEN, CT • ORLANDO, FL • PHOENIX, AZ • PITTSBURGH, PA • PORTSMOUTH, NH • PROVIDENCE, RI • RALEIGH, NC
RICHMOND, VA • ROSELLE, IL • SAN FRANCISCO, CA • SINGAPORE • TORONTO, CANADA • WASHINGTON, DC • WOODBRIDGE, NJ

EMPLOYEE-OWNED COMPANY

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Introduction

The following report addresses the traffic impacts of a proposed hotel, office, and warehouse project that would be located on a site adjacent to Aolele Street, between Rodgers Boulevard and Palea Street, in the vicinity of the Honolulu Airport. Existing and forecast Year 1995 traffic conditions are presented herein, along with a description of the roadway and circulation improvements that would be needed to accommodate future traffic demand. Pedestrian access routes, and potential modes and travel routes for hotel guests between the airport and the hotel are also discussed in the context of the transportation environment of the project. For an overview of suggested transportation improvements, see the final section of this report.

Project Definition

The proposed development would consist of a 411-room hotel, 72,000 square feet of office space, and 324,000 square feet of warehouse space. It was assumed that access to the hotel site and office space would be provided at the intersection of Palea Street and Ualena Street, and the warehouse uses would be accommodated at the driveway mauka (north) of the site, which connects to Koapaka Street.

It is important to note that additional egresses would require that adequate sight-line distances are available if a driveway is to be located near a column. It should also be located as far as possible from existing intersections (several hundred feet or more). Finally, close coordination with the Airports Division of the Department of Transportation would be needed to obtain the appropriate approvals and permits. (For these reasons it was assumed in this report that no direct access would be provided to Aolele Street.)

Existing Conditions

The project site is currently occupied by several construction trailers and serves as a staging area for a construction project. Land uses on the adjacent sites consist of warehousing, limited office space, and an automobile rental agency car storage area. It is anticipated that these uses, except for one warehouse building, would be displaced by the proposed hotel/office/warehouse project, and on the adjacent site, by the Airport Trade Center office project.

The Level of Service Concept - A level of service category describes the level of congestion at an intersection. There are six level of service categories, A through F, with Level of Service A being the least congested condition and Level of Service F representing severely congested conditions. The *1985 Highway Capacity Manual, Planning Method*, was used in the analysis for this letter-report. This method assumes that traffic signals are well timed and reports an overall level of service in terms of the total-critical-volume of an intersection. For the sake of being consistent with the level of service categories that were used before the *1985 Highway Capacity Manual* was published, an additional step is taken to convert the total-critical-volume into volume-capacity ratios and their corresponding level of service categories. For a brief overview of the level of service concept, see Figure 1.

Existing Levels of Service - Existing traffic flows at the site are low in comparison to projected traffic and existing traffic conditions near the site are relatively uncongested. Table 1 shows the existing levels of service at all five of the study intersections to the AM Peak period and the PM peak period. Since it is anticipated that all of these intersections would be signalized upon the construction of the Airport Trade Center project, all intersections were analyzed assuming that the traffic signals were in place. Each of the five intersections currently operates at Level of Service C or better, which is indicative of uncongested conditions.

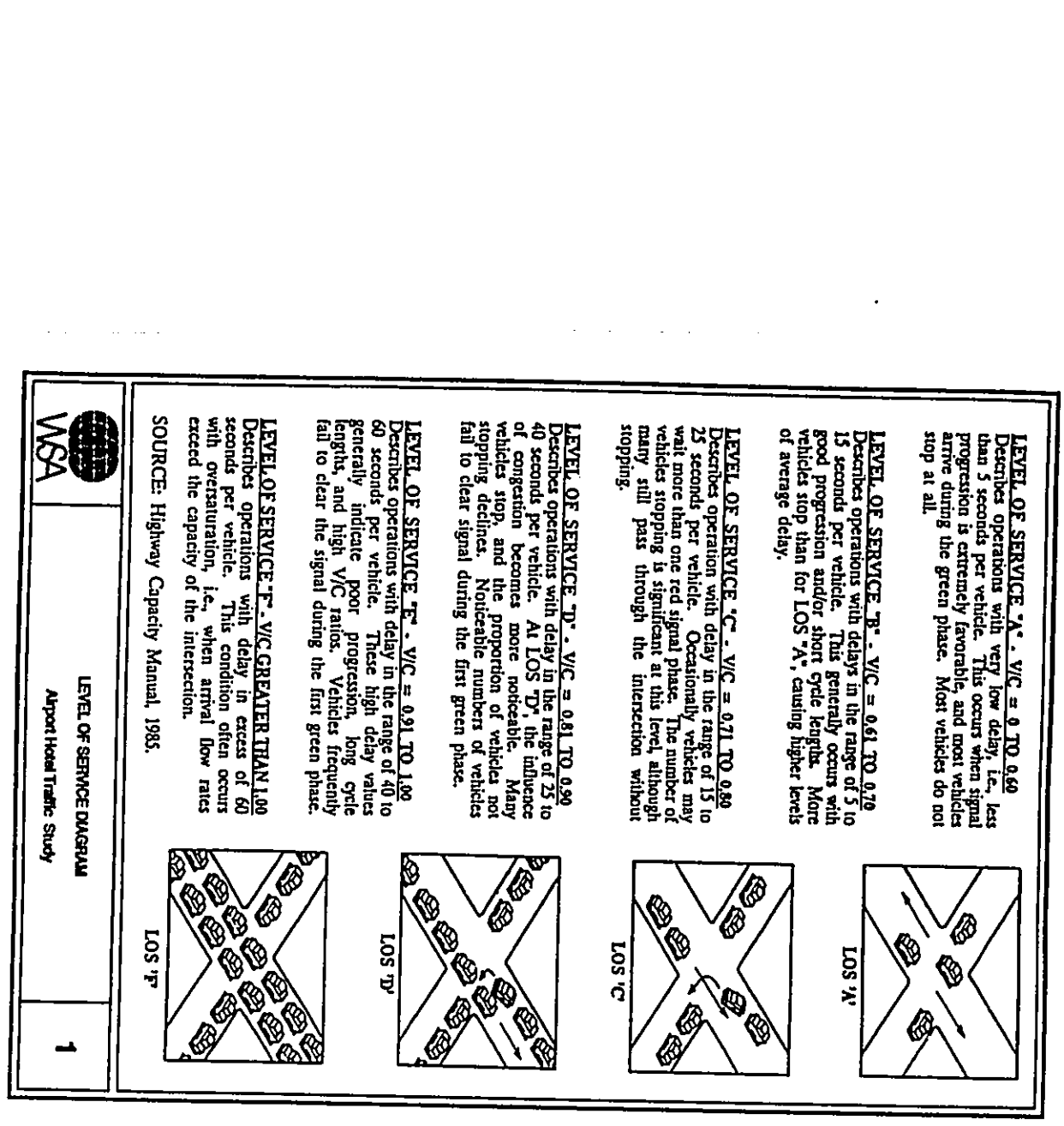

Table 1

EXISTING INTERSECTION LEVELS OF SERVICE
Honolulu Airport Hotel Traffic Study

INTERSECTION	EXISTING PEAK HOUR LEVEL OF SERVICE [1]					
	AM Peak Hour			PM Peak Hour		
	TCV	LOS	V/C	TCV	LOS	V/C
Paiea Street/ Nimitz Highway	762	A	0.54	726	A	0.52
Paiea Street/ Frontage Road	590	A	0.42	479	A	0.34
Paiea Street/ Koapaka Street	950	B	0.68	665	A	0.47
Paiea Street/ Ualena Street	817	A	0.58	722	A	0.52
Paiea Street/ Aolele Street	1,024	C	0.73	1,014	C	0.72

Notes:

[1] Analyzed as signalized intersections.

TCV = Total Critical Volume (vehicles per hour per lane).
LOS = Level of Service
V/C = Volume-Capacity Ratio

Wilbur Smith Associates; March, 1990.

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Site Access Improvements

The *Airport Trade Center Traffic Impact Assessment Report* (Pacific Planning and Engineering, Inc.; July, 1989) identified several roadway improvements which should be built in conjunction with the Airport Trade Center development. These are listed below:

1. On Palea Street between the Nimitz Highway and Koapaka Street, construct and restripe for two new lanes: a new southbound lane which would end as a right-turn only lane at Koapaka Street and a new northbound lane which would end as a right-turn only lane at the Nimitz Highway.

2. Restripe Kamehameha Highway in the westbound direction so that a second left-turn lane is available.

3. Signalize three intersections on Palea Street:
   - Ualena Street/Palea Street
   - Koapaka Street/Palea Street
   - Aolele Street/Palea Street

4. Restrict parking on both sides of Koapaka Street between Palea Street and the nearest proposed driveway of the Airport Trade Center project. Restripe the outbound lanes to provide two lanes: an exclusive left-turn lane and a shared right-through lane.

5. At Palea Street and Ualena Street, restripe the outbound lanes at Ualena Street to provide two outbound lanes. (While it is not shown in the Airport Trade Center study, it is our understanding that the ramp at this entry point would be removed. This would allow for two inbound lanes.)

6. At Palea Street and Aolele Street, restripe the diamond head (eastbound) approach to provide a second left-turn lane. It was also recommended as a desirable but not necessary improvement to add an exclusive right-turn lane on the makai bound approach to this intersection.

All of the above improvements were assumed to be in place for the analysis presented in this report. Traffic projections for Year 1995 were also drawn heavily from the *Airport Trade Center Traffic Impact Assessment Report*.

Traffic Impacts

The standard three-step process for traffic impact studies was used in this study. These steps, as discussed in more detail below are:

- Trip generation;
- Trip distribution; and
- Traffic assignment.

Trip Generation - As shown in Table 2, the proposed project would generate about 722 PM peak hour trips, 674 AM peak hour trips and 6,160 daily trips. This estimate is based on standard trip generation equations from Institute of Transportation Engineers (ITE) *Trip Generation* (Fourth Edition, 1987). These equations are also shown in Table 2.

Additional growth was also assumed through 1995. This growth was estimated by first assuming an ambient growth rate of 2 percent per year, except at locations where specific projects could be identified. Future traffic generation estimates were derived from both known land use development projects, and from the application of growth factors. The growth factor accounts for increased airport activity through 1995. The adjacent Airport Trade Center Report estimated that the incremental increase in trip generation, after subtracting trips generated by existing land uses, would amount to about 1,150 PM peak hour trips and 1,170 AM peak hour trips. This project includes about 600,000 sq. ft. of office space in three office towers.

The *Ke'ehi Lagoon Recreation Plan Traffic Impact Study* (Wilbur Smith Associates; May 1989) was used directly for the traffic volume projection on the Nimitz Highway. Projected trip generation associated with the project amounted to 1,930 PM peak hour trips, and 19,100 daily trips.

Table 2
PROJECT TRIP GENERATION
Honolulu Airport Hotel Traffic Study

LAND USE	PERIOD	TRIP RATE [1]	IN/OUT SPLIT	TRIP GENERATION IN	OUT	TOTAL
Hotel						
(411 Rooms)	Daily	T = 8.8(X)-59				3,560
	AM Peak Hour	Ln(T) = 1.61Ln(T)-3.90	66/34	216	111	327
	PM Peak Hour	Ln(T) = 1.30Ln(X)-2.15	54/46	157	134	291
Office						
(72,000 sq. ft.)	Daily	Ln(T) = 0.75Ln(X)+3.77				1,070
	AM Peak Hour	Ln(T) = 0.86Ln(X)+1.34	87/13	131	20	151
	PM Peak Hour	Ln(T) = 0.83Ln(X)+1.46	16/84	24	126	150
Warehouse						
(324,000 sq. ft.)	Daily	T = 3.68(X)+342				1,530
	AM Peak Hour	T = 0.36(X)+79	72/28	141	55	196
	PM Peak Hour	Ln(T) = 1.05Ln(X)-0.43	46/54	129	152	281
TOTAL	Daily			---	---	----- 6,160
	AM Peak Hour			488	186	674
	PM Peak Hour			310	412	722

[1] Source: Trip Generation, 4th Edition, ITE.

T = Trips
X = Thousands of gross leasable square feet or number of rooms.
Ln = Natural log.

Wilbur Smith Associates; December 6, 1989.

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A hotel within the airport complex would not have a significant impact on external trip generation since the vast majority of hotel users originate at the airport. A hotel located within the complex would capture a number of trips which would ordinarily travel to hotels outside the airport area, having a very small impact.

It is also important to note that plans at the Honolulu Airport include the closure of Aolele Street, on the diamondhead side of the H-1 on-ramps. Estimates of future traffic diversions from Aolele Street are considered subsequently in this report.

Trip Distribution - Project traffic was assumed to be distributed with 50 percent oriented towards the Nimitz Freeway, 15 percent in the Diamond Head direction down Koapaka Street, and 35 percent towards the airport. These distribution assumptions are patterned after projected year 1995 distribution patterns as presented in the *Airport Trade Center Report*.

Future Intersection Levels of Service - Year 1995 traffic projections from the Airport Trade Center study were used as a starting point to estimate traffic impacts of the project. The *Highway Capacity Manual* (TRB, 1985) "*Planning Method*" was used to calculate intersection levels of service. These calculations are contained in the appendix of this report and are summarized in Table 3 for the AM peak hour and Table 4 for the PM Peak hour with the hotel project, it was projected that two intersections (Palea Street/Koapaka Street and Palea Street/Ualena Street) would operate at Level of Service F during the AM and PM peak hour.

Hotel Access - The proposed plan indicates that the access to the parking garage at the hotel would be about 100 feet from the intersection of Palea Street and Ualena Street. This distance is short considering the queue of vehicles which would be expected at this exit point. The queue would average about 11 vehicles, or about 150 feet, during the PM peak hour period. This means that access to the parking structure would be blocked for a substantial period of time during the PM peak hour. It is likely that vehicles entering the site would backup onto Palea Street, resulting in lower levels of service than forecast.

It is anticipated that a hotel van would transport guests to and from the airport as well as to other attractions in Honolulu. It is likely that an airport-bound van would travel on a loop, stopping only at terminals where a pickup or drop-off is requested. A possible route follows for passenger pickups that covers all terminals: exit the site onto Palea Street; turn right onto Aolele and drive past the interisland terminal; drive past the taxi waiting area and to the Aloha Airlines terminal; continue through the main terminal on the lower level to pickup arriving passengers; exit the airport area at Palea Street and return to the Hotel. The route followed for passenger

Table 3

YEAR 1995 AM PEAK HOUR
INTERSECTION LEVELS OF SERVICE
Honolulu Airport Hotel Traffic Study

INTERSECTION	1995 AM PEAK HOUR LEVEL OF SERVICE [1]					
	AM Peak Hour			PM Peak Hour		
	TCV	LOS	V/C	TCV	LOS	V/C
Paiea Street/ Nimitz Highway	940	B	0.67	1,024	C	0.73
Paiea Street/ Frontage Road	1,051	C	0.75	1,247	D	0.89
Paiea Street/ Koapaka Street	1,601	F	1.14	1,835	F	1.31
Paiea Street/ Ualena Street	1,365	E	0.97	1,796	F	1.28
Paiea Street/ Aolele Street	1,055	C	0.75	1,168	D	0.83

Notes:

1 Assumes geometric improvements defined in the Airport Center Traffic Impact Assessment Report, July, 1989.

TCV = Total Critical Volume (vehicles per hour per lane).
LOS = Level of Service
V/C = Volume-Capacity Ratio

Wilbur Smith Associates; March, 1990.

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Table 4

YEAR 1995 PM PEAK HOUR
INTERSECTION LEVELS OF SERVICE
Honolulu Airport Hotel Traffic Study

INTERSECTION	1995 PM PEAK HOUR LEVEL OF SERVICE [1]					
	AM Peak Hour			PM Peak Hour		
	TCV	LOS	V/C	TCV	LOS	V/C
Paiea Street/ Nimitz Highway	919	B	0.66	1,000	C	0.71
Paiea Street/ Frontage Road	686	A	0.49	843	A	0.60
Paiea Street/ Koapaka Street	1,434	F	1.02	1,661	F	1.19
Paiea Street/ Ualena Street	1,259	D	0.90	1,681	F	1.20
Paiea Street/ Aolele Street	1,078	C	0.77	1,224	D	0.87

Notes:

1 Assumes geometric improvements defined in the Airport Center Traffic Impact Assessment Report, July, 1989.

TCV = Total Critical Volume (vehicles per hour per lane).
LOS = Level of Service
V/C = Volume-Capacity Ratio

Wilbur Smith Associates; March, 1990.

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drop-offs at the terminal could not make this complete route, since there is no direct access between the Aloha Airlines terminal and the main terminal. This would only be a problem when a driver is carrying passengers bound to both the main terminal and the Aloha Airlines terminal; however it is anticipated that this would not be a frequent occurrence, given the size of the hotel (411 rooms).

It is important to be aware that there are existing pedestrian paths and sidewalks which allow pedestrians to walk to the airport. While it is not anticipated that hotel guests would walk to the airport, it is important that planned improvements associated with the hotel project and the adjacent Airport Trade Center should not eliminate existing pedestrian routes. At the signalized intersections it would be appropriate to plan to accommodate light pedestrian flows. Existing pedestrian traffic would not warrant pedestrian buttons at the traffic signals; however, sufficient green time should be allotted for pedestrian crossings at all traffic signals and painted cross-walks should be added or maintained at the newly signalized intersections.

Additional Street Improvements

At two intersections, Palea Street/Koapaka Street and Palea Street/Ualena Street is was projected that year 1995 intersection levels of service would decline to Level of Service F. Several potential solutions to this impact were identified, including geometric improvements and at connection to Rodgers Boulevard and/or Aolele Street.

Koapaka Street/Palea Street - Projected AM and PM peak hour traffic flows with both the Hotel project and other cumulative growth through year 1995 result in Level of Service F operations at this intersection. These impacts could be mitigated by the addition of left-turn pockets in both the northbound and southbound directions plus the addition of a new approach lane on the ewa bound approach. The new lane on the diamondhead bound approach which was included as part of the improvements for the Airport Trade Center project should be restriped to allow for left-turn movements from both lanes. With these improvements, this intersection would operate at Level of Service E (V/C = 0.92) during the AM peak hour and Level of Service C (V/C = 0.78) during the PM peak hour. The improvements on Palea Street would require that Palea Street is widened to a least 50 feet (assuming 10 foot wide travel lanes) for about 200 to

300 feet on each side of the intersection. This would also require that parking would be removed on both approaches to Koapaka Street to allow for two lanes in each direction.

Ualena Street/Palea Street - This intersection was projected to operate at Level of Service F during both the AM and PM peak hours with year 1995 traffic flows. To mitigate these impacts, it would be necessary to restripe or widen Palea Street to allow four through lanes in both directions. The two southbound lanes should continue through to Aolele Street. In addition to this improvement, additional capacity would be needed at the intersection. This could be achieved by either widening Palea Street near the intersection to allow for northbound and southbound left turn lanes or by removing parking and adding a new lane to both approaches on Ualena Street. With the new left turn lanes and the new through lane on Palea Street, this intersection would operate at Level of Service C (V/C = 0.77) during the AM peak hour and Level of Service C (V/C = 0.79) during the PM peak hour. With the new lanes on Ualena Street and the new through lane on Palea Street, this intersection would operate at Level of Service D (V/C = 0.85) during the AM peak hour and Level of Service C (V/C = 0.77) during the PM peak hour. If the improvements were limited to the new southbound lane, the intersection would operate at Level of Service E (V/C = 0.93) during the AM peak hour and Level of Service D (V/C = 0.85) during the PM peak hour.

The projected intersection levels of service with these improvements are summaries in Table 5.

With respect to the internal circulation problems which would have an impact on site access, consideration should be given to relocating the parking garage access point for the hotel parking structure as well as the circulation system for hotel access.

Table 5

HOTEL PROJECT IMPACTS WITH MITIGATION
YEAR 1995 PM PEAK HOUR INTERSECTION LEVELS OF SERVICE
Honolulu Airport Hotel Traffic Study

INTERSECTION	1995 LEVELS OF SERVICE WITH MITIGATION					
	AM Peak Hour			PM Peak Hour		
	TCV	LOS	V/C	TCV	LOS	V/C
Paiea Street/ Koapaka Street	1,290	E	0.92	1,094	C	0.78
Paiea Street/ Ualena Street						
- With New SB Lane	1,296	E	0.93	1,194	D	0.85
- With New SB Lane and New Lane on Ualena Street	1,189	D	0.85	1,076	C	0.77
- With New SB Lane and Left-Turn Lanes on Paiea Street	1,080	C	0.77	1,104	C	0.79

Notes:

TCV = Total Critical Volume (vehicles per hour per lane).
LOS = Level of Service
V/C = Volume-Capacity Ratio

Wilbur Smith Associates; March, 1990.

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Traffic Impacts with the Closure of Aolele Street

The new Honolulu International Airport terminal, which is currently under construction, includes the acquisition and condemnation of additional properties and would involve closing Aolele Street between Lagoon Drive and Paiea Street. With this segment of Aolele Street closed, traffic would be forced to divert to Ualena Street, Koapaka Street and the Nimitz Highway. To understand the impacts of the project with the closure of Aolele Street, a traffic analysis was undertaken as presented below. This analysis focuses on two intersections:

- Paiea Street/Aolele Street; and
- Paiea Street/Ualena Street.

Analysis Assumptions - Projected traffic flows on Aolele Street were reassigned to several probable adjacent routes. It was assumed that about 50 percent of the traffic would divert to Aolele and that the remainder would be diverted to the Nimitz Highway. No reduction was made for existing trips that would be eliminated after land is reallocated for airport operations.

Traffic Impacts - Given the above assumptions, year 1995 traffic flows were reassigned and intersection levels of service were calculated. Summaries of these calculations are contained in the appendix to this report and the resulting intersection levels of service are shown in Table 6. Existing lane geometry was assumed.

As shown in Table 6, the closure of Aolele Street would result in an improved level of service at the intersection of Aolele Street and Paiea Street. The level of service would improve from level of service D (V/C = 0.87) to level of service A (V/C = 0.46) during the PM peak hour. At the intersection of Paiea Street and Ualena Street, projected intersection levels of service would decline from a projected volume capacity ratio of 1.20 to a volume capacity ratio of 1.29 during the PM peak hour with the closure of Aolele Street. Comparable declines would occur during the AM peak hour. Additional improvements would be needed to accommodate these flows at acceptable levels of service. Potential improvements are described below.

Additional Street Improvements - Table 6 also shows potential roadway improvements at the intersection of Aolele Street and Ualena Street and the projected level of service with these improvements.

Table 6
HOTEL PROJECT IMPACTS WITH AOLELE STREET CLOSURE
YEAR 1995 INTERSECTION LEVELS OF SERVICE
Honolulu Airport Hotel Traffic Study

INTERSECTION	YEAR 1995 PEAK HOUR LEVEL OF SERVICE					
	AM Peak Hour			PM Peak Hour		
	TCV	LOS	V/C	TCV	LOS	V/C
Paiea Street/ Ualena Street	791	A	0.56	648	A	0.46
Paiea Street/ Aolele Street	1,807	F	1.29	1,804	F	1.29
- with New SB Lane	1,498	F	1.07	1,443	F	1.03
- with New SB Lane, and New Lane on Ualena Street	1,360	E	0.97	1,188	D	0.85
- with New SB Lane, NB Left-Turn Lane and New Lane on Ualena Street	1,158	D	0.83	1,083	C	0.77

Notes:

TCV = Total Critical Volume (vehicles per hour per lane).
LOS = Level of Service
V/C = Volume-Capacity Ratio

Wilbur Smith Associates; March, 1990.

T-07/241

The added traffic to Ualena Street would be most critical during the AM peak hour. Level of Service E (AM peak hour) could be reached at this intersection without widening Paiea Street by adding a southbound lane on the Ualena Street approach, and by adding a new right turn lane by restriping and eliminating parking on the ewa bound approach on the Mauka side of the street. To reduce the level of service to Level of Service D or better during the AM peak hour, left-turn lanes would be needed at this intersection on Paiea Street.

Summary of Findings

The proposed hotel, warehouse, and office space would attract over 6,000 daily trips. This level of traffic generation, on top of other projected traffic growth near the hotel site, would be sufficient to suggest that certain roadway improvements would be needed. These improvements, which could be constructed within existing rights-of-way, were described in the above text. With the closure of Aolele Street, diverted traffic would be added to Ualena Street. This additional traffic could be accommodated by the potential improvements listed herein.

It is also important to note that the proposed circulation plan at the entrance to the hotel would result in additional congestion at the intersection of Paiea Street and Ualena Street due to turns to and from the proposed garage entrance. It is suggested that other circulation plans be considered which would locate the hotel circulation scheme farther from the intersection of Paiea Street/Ualena Street.

APPENDICES

INTERSECTION LEVEL OF SERVICE CALCULATIONS

EXISTING CONDITIONS

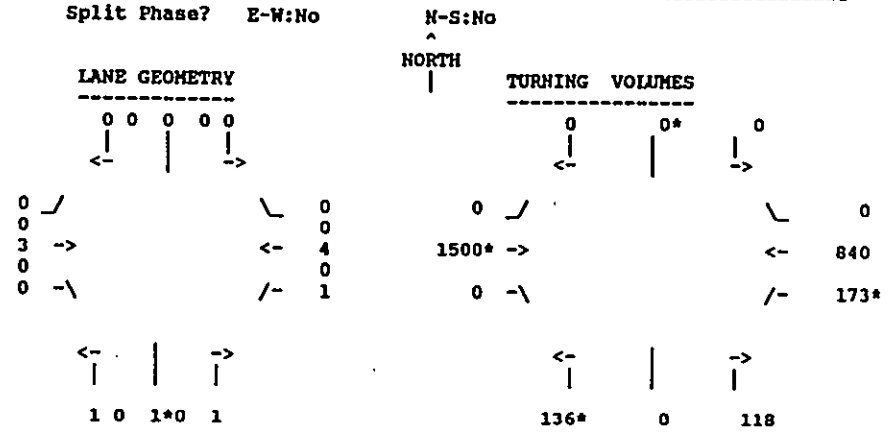
AM PEAK HOUR

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 1
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Nimitz Hwy/
Comments: Existing Conditions

Design Hour: AM Peak Hour
Signal Phasing: 3
Conditions:

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	500	0	0	210	173	0	0	0	0	89	89
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	173	500	0	0	89	0

Total Critical Volume = 762 LOS = A V/C = 0.54

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTAM.DAT
Time of run: 1:40:28 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

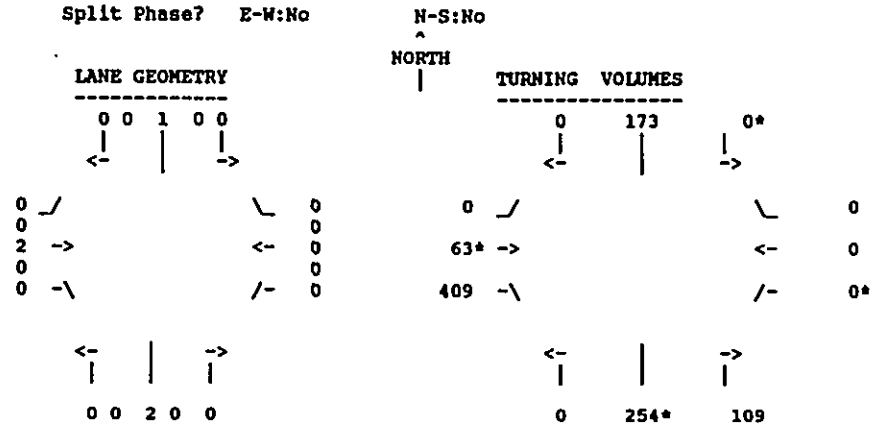
Warning and Error Messages

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 2
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Frontage Road/
Comments: Existing Conditions

Design Hour: AM Peak Hour
Signal Phasing: 2
Conditions:

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	409	0	0	0	0	0	173	0	0	181	0
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	0	409	0	0	0	181

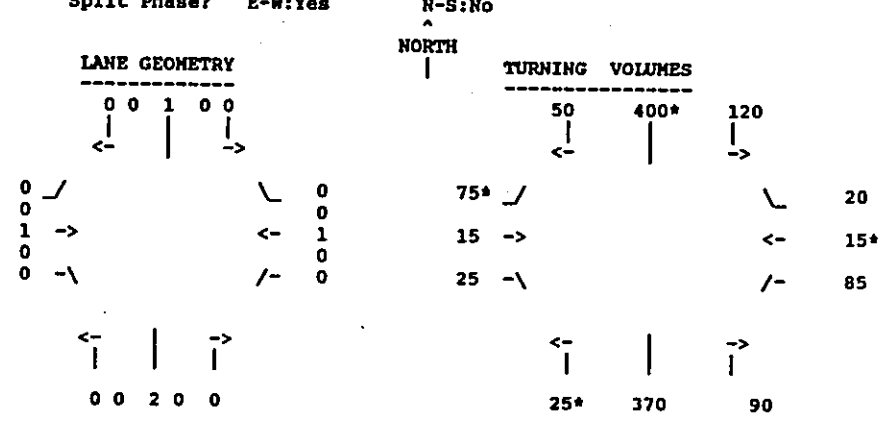
Total Critical Volume = 590 LOS = A V/C = 0.42

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTAM.DAT
Time of run: 9:03:57 AM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 3
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Koapaka Street/
Comments: Existing Conditions
Design Hour: AM Peak Hour
Signal Phasing: 4
Conditions:

Split Phase? E-W:Yes N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
0	115	0	0	120	0	0	690	0	0	255	25
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	115	120	0	0	0	25	690

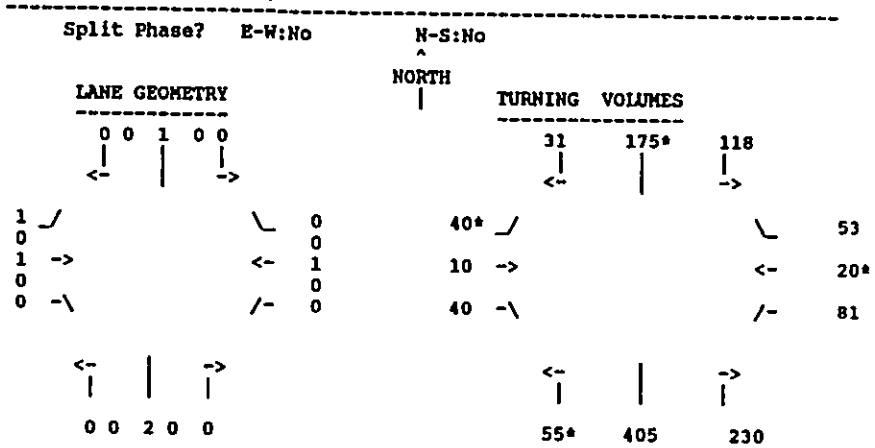
Total Critical Volume = 950 LOS = B V/C = 0.68

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTAM.DAT
Time of run: 9:04:02 AM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Ualena Street/
Comments: Existing Conditions
Design Hour: AM Peak Hour
Signal Phasing: 4
Conditions:

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
40	50	0	0	162	0	0	560	0	0	372	55
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	40	0	162	0	0	55	560

Total Critical Volume = 817 LOS = A V/C = 0.58

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTAM.DAT
Time of run: 9:04:06 AM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

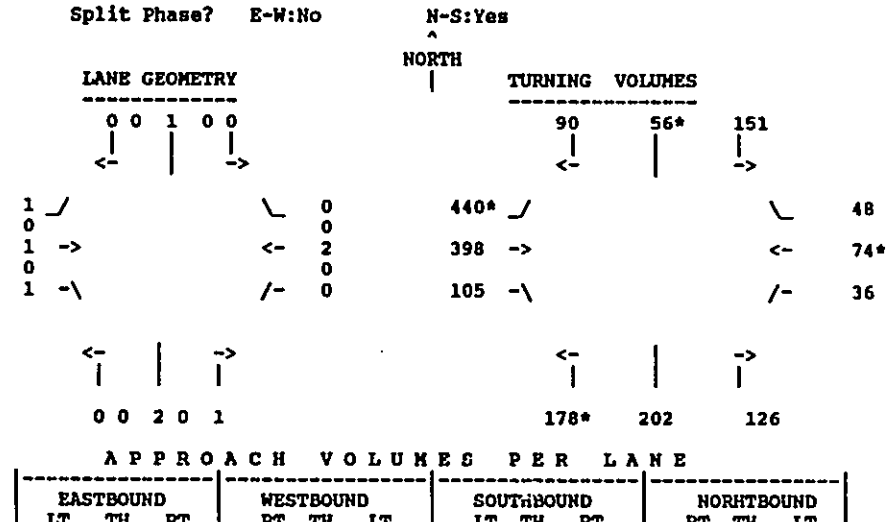
W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 5
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Aolele Street/
Comments: Existing Conditions

Design Hour: AM Peak Hour
Signal Phasing: 5
Conditions:

Split Phase? E-W:No N-S:Yes



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORTHBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
440	398	0	0	97	36	0	297	0	0	190	178
-------R---		0.80-	-0.80---		R--------	--------		R---	0.80-	-0.80---	R-------

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
36	404	0	97	0	190	297	0

Total Critical Volume = 1024 LOS = C V/C = 0.73

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTAM.DAT
Time of run: 9:04:10 AM
Date of run: 12/06/1989

INTERSECTION LEVEL OF SERVICE CALCULATIONS

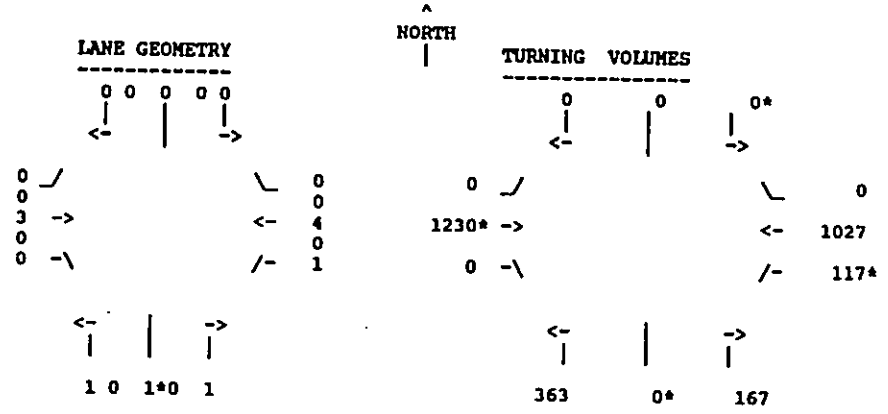
EXISTING CONDITIONS

PM PEAK HOUR

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 1
Project: Airport Hotel — Design Hour: PM Peak Hour
Approach 1/2: Paiea Street — Signal Phasing: 3
Approach 3/4: Nimitz Hwy/ — Conditions:
Comments: Existing Conditions without the Hotel Project

Split Phase? E-W:No N-S:No



APPROACH VOLUMES PER LANE

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	410	0	0	256	117	0	0	0	0	199	0
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	117	410	0	0	0	199

Total Critical Volume = 726 LOS = A V/C = 0.52

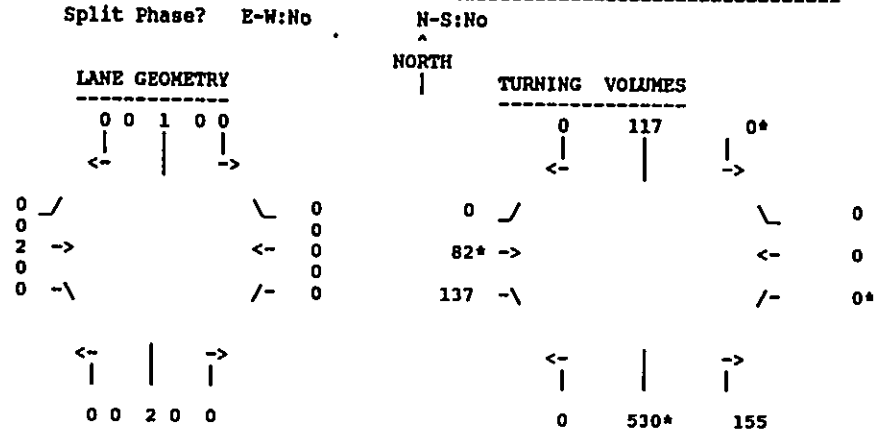
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTPM.DAT
Time of run: 9:09:02 AM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

Warning and Error Messages

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 2
Project: Airport Hotel — Design Hour: PM Peak Hour
Approach 1/2: Paiea Street — Signal Phasing: 2
Approach 3/4: Frontage Road/ — Conditions:
Comments: Existing Conditions without the Hotel Project

Split Phase? E-W:No N-S:No



APPROACH VOLUMES PER LANE

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	137	0	0	0	0	0	117	0	0	342	0
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	0	137	0	0	0	342

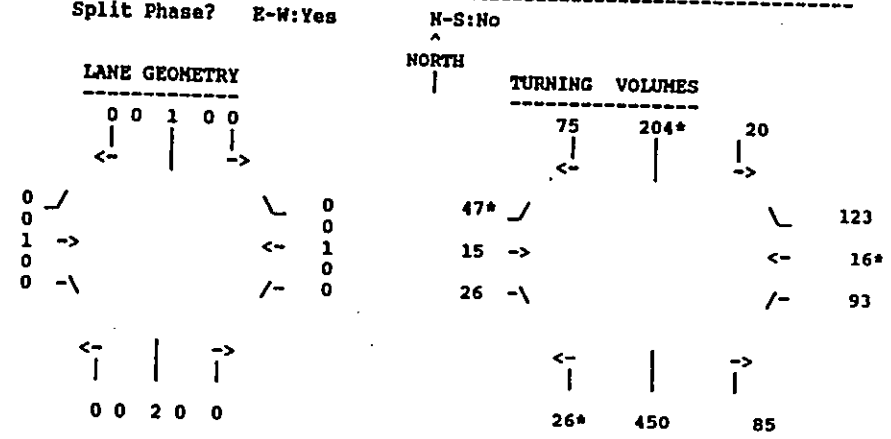
Total Critical Volume = 479 LOS = A V/C = 0.34

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTPM.DAT
Time of run: 9:09:06 AM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 3
Project: Airport Hotel — Design Hour: PM Peak Hour
Approach 1/2: Paiea Street — Signal Phasing: 4
Approach 3/4: Koapaka Street/ — Conditions:
Comments: Existing Conditions without the Hotel Project

Split Phase? E-W:Yes N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	88	0	0	232	0	0	319	0	0	293	26
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	88	232	0	0	0	26	319

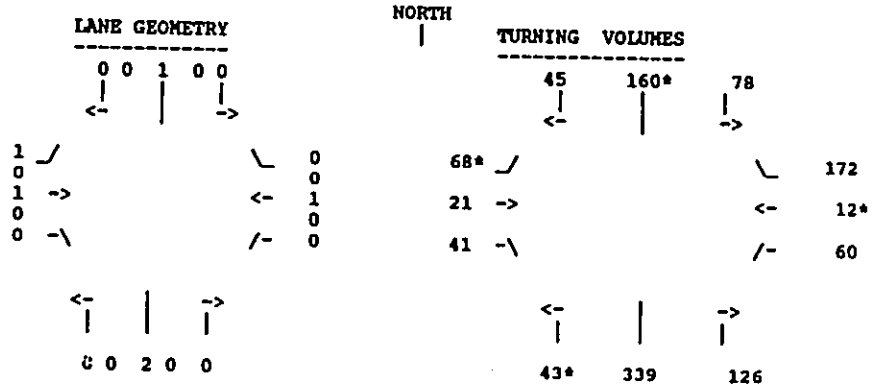
Total Critical Volume = 665 LOS = A V/C = 0.47

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTPM.DAT
Time of run: 9:09:10 AM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel — Design Hour: PM Peak Hour
Approach 1/2: Paiea Street — Signal Phasing: 4
Approach 3/4: Ualena Street/ — Conditions:
Comments: Existing Conditions without the Hotel Project

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
68	62	0	0	250	0	0	361	0	0	275	43
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	68	0	250	0	0	43	361

Total Critical Volume = 722 LOS = A V/C = 0.52

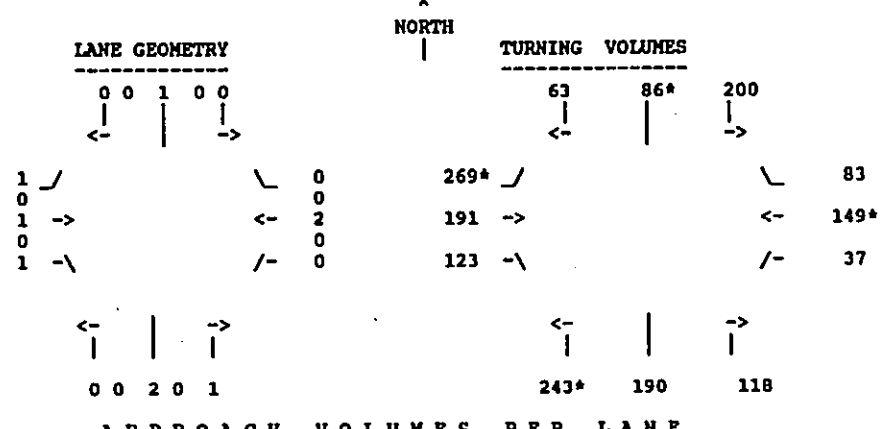
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTPM.DAT
Time of run: 9:09:15 AM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 5
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Aolele Street/
Comments: Existing Conditions without the Hotel Project
Design Hour: PM Peak Hour
Signal Phasing: 5
Conditions:

Split Phase? E-W:No N-S:Yes



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
--	--	--	--	--	--	--	--	--	--	--	--
269	191	0	0	153	37	0	349	0	0	216	243
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R--------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
37	232	0	153	0	243	349	0

Total Critical Volume = 1014 LOS = C V/C = 0.72

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: EXISTPM.DAT
Time of run: 9:09:19 AM
Date of run: 12/06/1989

INTERSECTION LEVEL OF SERVICE CALCULATIONS

YEAR 1995

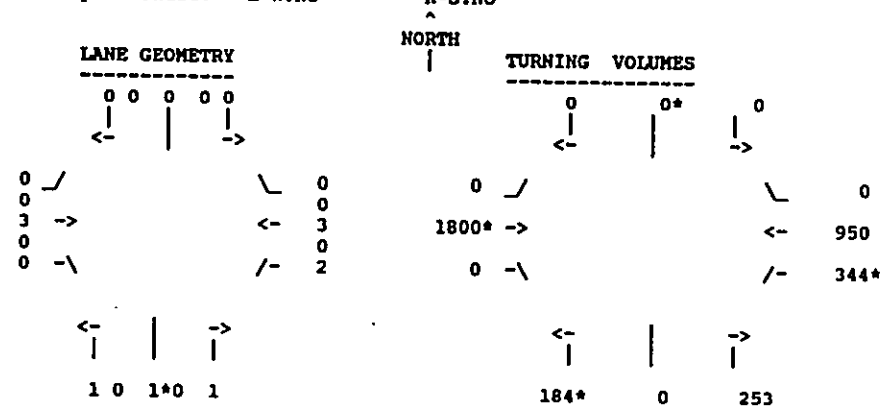
WITHOUT THE HOTEL PROJECT

AM PEAK HOUR

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 1
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Nimitz Hwy/
Comments: Year 1995 Conditions without the Hotel Project
Design Hour: AM Peak Hour
Signal Phasing: 3
Conditions:

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	600	0	0	316	189	0	0	0	0	151	151
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 --	--- 2 --	--- 3 --	--- 4 --	--- 5 --	--- 6 --	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	189	600	0	0	151	0

Total Critical Volume = 940 LOS = B V/C = 0.67

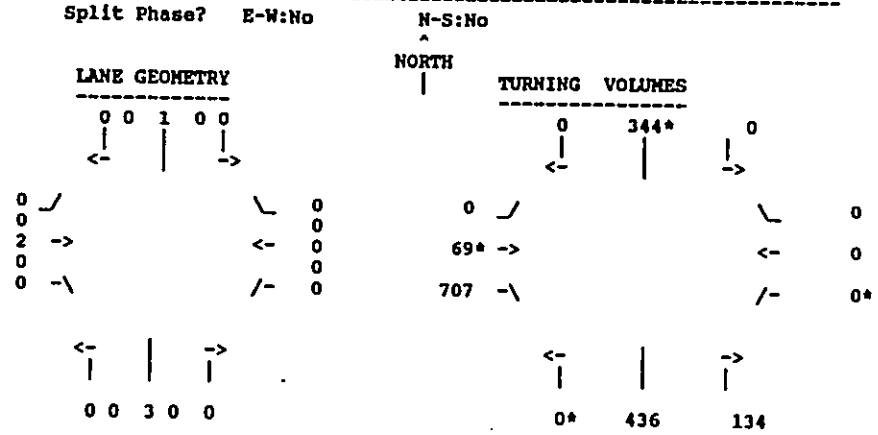
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWOUT.DAT
Time of run: 1:29:44 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

Warning and Error Messages

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 2
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Frontage Road/
Comments: Year 1995 Conditions without the Hotel Project
Design Hour: AM Peak Hour
Signal Phasing: 2
Conditions:

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	707	0	0	0	0	0	344	0	0	190	0
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 --	--- 2 --	--- 3 --	--- 4 --	--- 5 --	--- 6 --	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	0	707	0	0	0	344

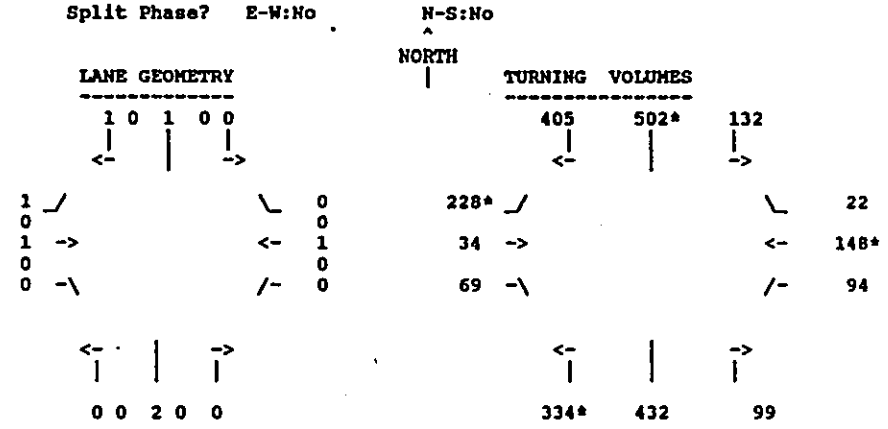
Total Critical Volume = 1051 LOS = C V/C = 0.75

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWOUT.DAT
Time of run: 1:29:48 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 3
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Koapaka Street/
Comments: Year 1995 Conditions without the Hotel Project
Design Hour: AM Peak Hour
Signal Phasing: 5
Conditions:

Split Phase? E-W:No N-S:No



APPROACH VOLUMES PER LANE

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
228	103	0	0	273	0	132	766	0	0	933	334
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	--- 7 ---	--- 8 ---
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	228	0	273	132	0	202	766

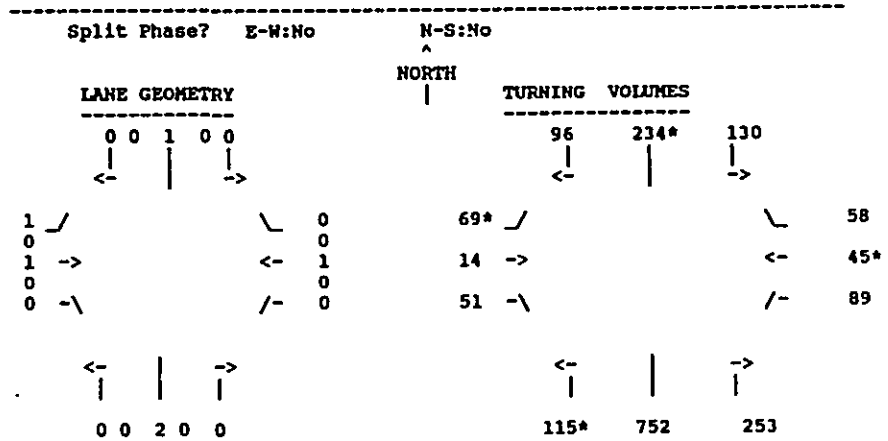
Total Critical Volume = 1601 LOS = F V/C = 1.14

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWOUT.DAT
Time of run: 1:29:53 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Ualena Street/
Comments: Year 1995 Conditions without the Hotel Project
Design Hour: AM Peak Hour
Signal Phasing: 4
Conditions:

Split Phase? E-W:No N-S:No



APPROACH VOLUMES PER LANE

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
69	65	0	0	201	0	0	980	0	0	617	115
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	--- 7 ---	--- 8 ---
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	69	0	201	0	0	115	980

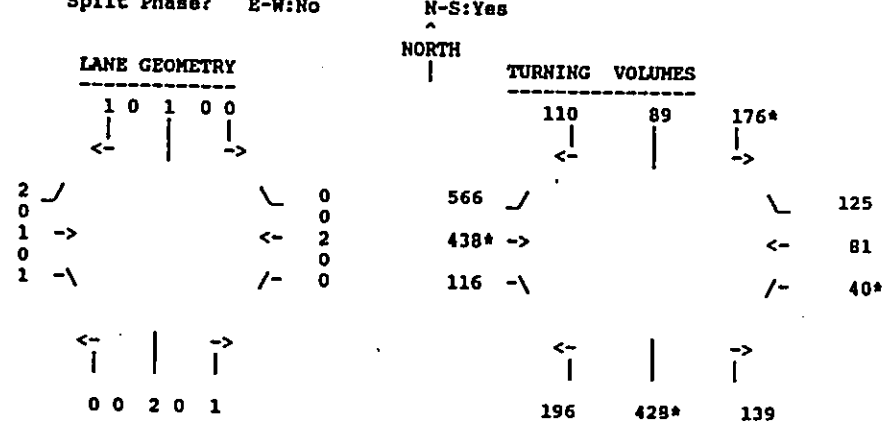
Total Critical Volume = 1365 LOS = E V/C = 0.97

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWOUT.DAT
Time of run: 1:29:57 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 5
Project: Airport Hotel — Design Hour: AM Peak Hour
Approach 1/2: Paiea Street — Signal Phasing: 5
Approach 3/4: Aolele Street/ — Conditions:
Comments: Year 1995 Conditions without the Hotel Project

Split Phase? E-W:No N-S:Yes



APPROACH VOLUMES PER LANE

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
311	438	0	0	143	40	176	265	0	0	312	196
-------R---0.80-			-0.80---R-------			--------R---0.80-			-0.80---R-------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
40	271	0	167	0	312	265	0

Total Critical Volume = 1055 LOS = C V/C = 0.75

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWOUT.DAT
Time of run: 1:30:01 PM
Date of run: 12/06/1989

INTERSECTION LEVEL OF SERVICE CALCULATIONS

YEAR 1995

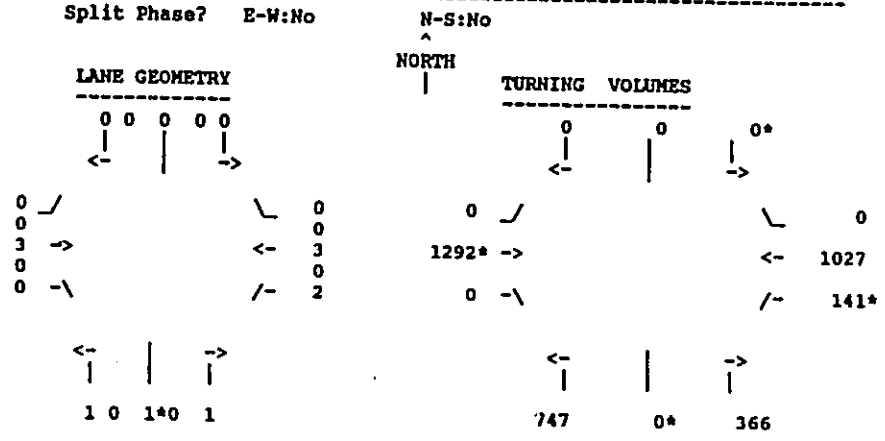
WITHOUT THE HOTEL PROJECT

PM PEAK HOUR

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 1
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Nimitz Hwy/
Comments: Year 1995 Conditions without the Hotel Project
Design Hour: PM Peak Hour
Signal Phasing: 3
Conditions:

Split Phase? E-W:No N-S:No



APPROACH VOLUMES PER LANE

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	430	0	0	342	78	0	0	0	0	411	0
-------R---0.80-			-0.80---R-------			--------R---0.80-			-0.80---R-------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	78	430	0	0	0	411

Total Critical Volume = 919 LOS = B V/C = 0.66

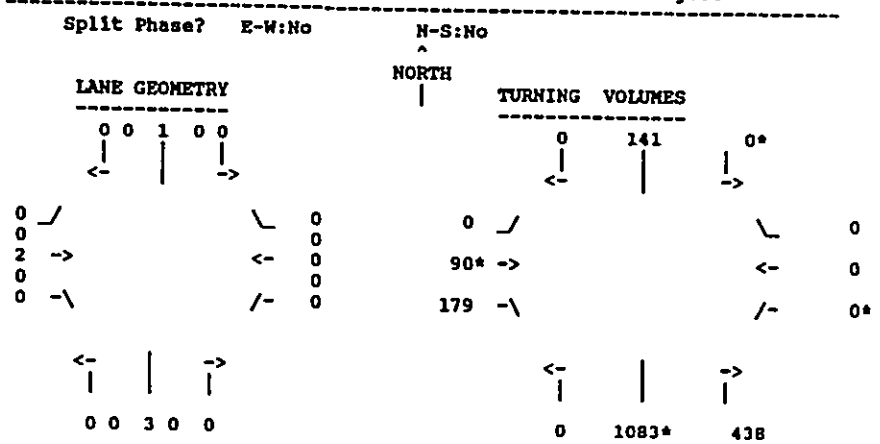
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWOUT.DAT
Time of run: 1:54:33 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

Warning and Error Messages

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 2
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Frontage Road/
Comments: Year 1995 Conditions without the Hotel Project
Design Hour: PM Peak Hour
Signal Phasing: 2
Conditions:

Split Phase? E-W:No N-S:No



APPROACH VOLUMES PER LANE

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	179	0	0	0	0	0	141	0	0	507	0
-------R---0.80-			-0.80---R-------			--------R---0.80-			-0.80---R-------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	0	179	0	0	0	507

Total Critical Volume = 686 LOS = A V/C = 0.49

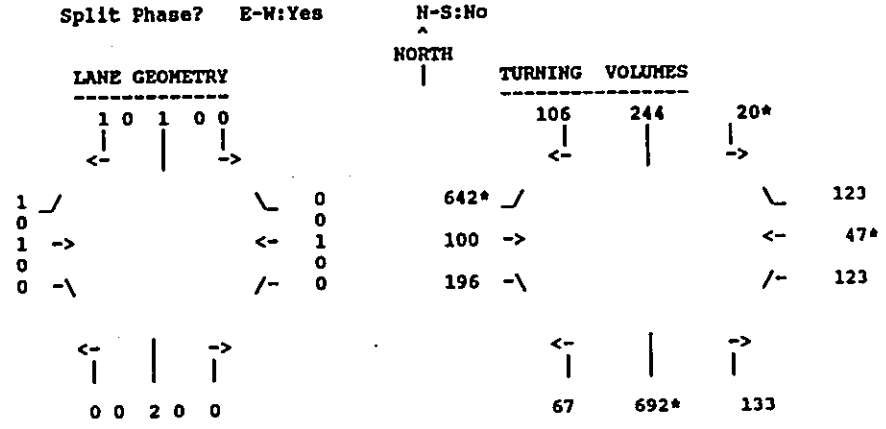
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWOUT.DAT
Time of run: 2:03:10 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 3
Project: Airport Hotel — Design Hour: PM Peak Hour
Approach 1/2: Paiea Street — Signal Phasing: 5
Approach 3/4: Koapaka Street/ — Conditions:
Comments: Year 1995 Conditions without the Hotel Project

Split Phase? E-W:Yes N-S:No



APPROACH VOLUMES PER LANE

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
--	--	--	--	--	--	--	--	--	--	--	--
642	296	0	0	293	0	20	324	0	0	479	67
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	642	293	0	20	0	47	432

Total Critical Volume = 1434 LOS = F V/C = 1.02

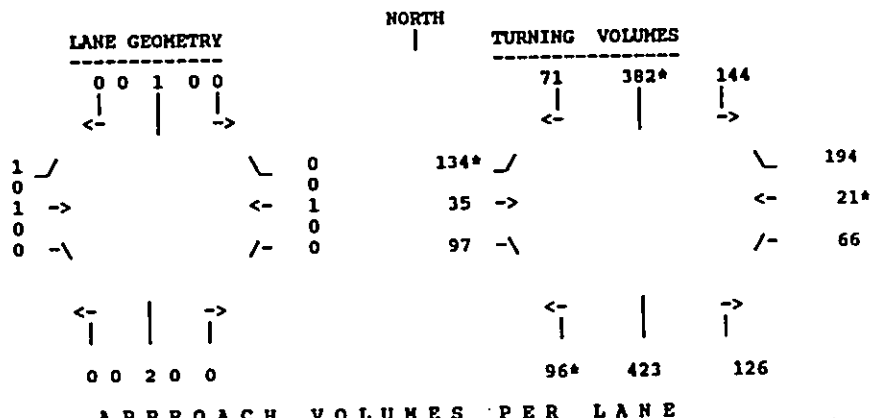
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWOUT.DAT
Time of run: 1:54:42 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel — Design Hour: PM Peak Hour
Approach 1/2: Paiea Street — Signal Phasing: 4
Approach 3/4: Ualena Street/ — Conditions:
Comments: Year 1995 Conditions without the Hotel Project

Split Phase? E-W:No N-S:No



APPROACH VOLUMES PER LANE

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
--	--	--	--	--	--	--	--	--	--	--	--
134	132	0	0	288	0	0	741	0	0	370	96
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	134	0	288	0	0	96	741

Total Critical Volume = 1259 LOS = D V/C = 0.90

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWOUT.DAT
Time of run: 1:54:46 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

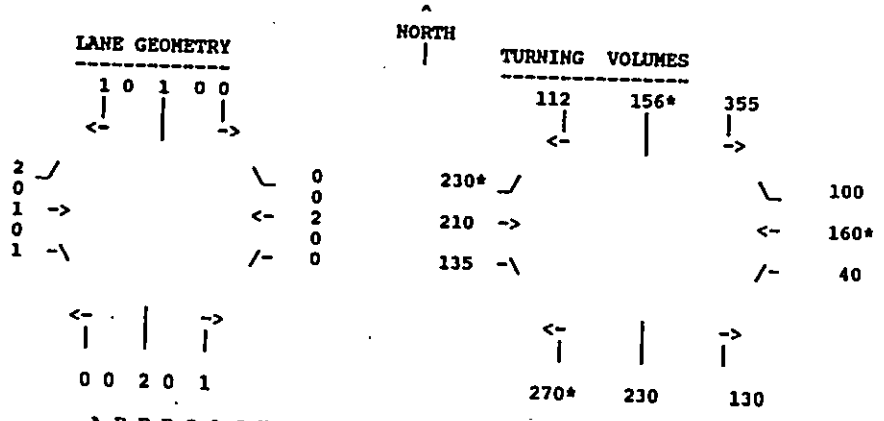
W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 5
Project: Airport Hotel
Approach 1/2: Paiea Street
Approach 3/4: Aolele Street/
Comments: Year 1995 Conditions without the Hotel Project

Design Hour: PM Peak Hour
Signal Phasing: 5
Conditions:

Split Phase? E-W:No N-S:Yes



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
127	210	0	0	170	40	355	511	0	0	250	270
-------R---	0.80-		-0.80---	R--------		--------R---	0.80-		-0.80---	R--------	

C R I T I C A L P H A S E S

1	2	3	4	5	6	7	8
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
40	87	0	170	0	270	511	0

Total Critical Volume = 1078 LOS = C V/C = 0.77

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWOUT.DAT
Time of run: 1:54:51 PM
Date of run: 12/06/1989

INTERSECTION LEVEL OF SERVICE CALCULATIONS

YEAR 1995

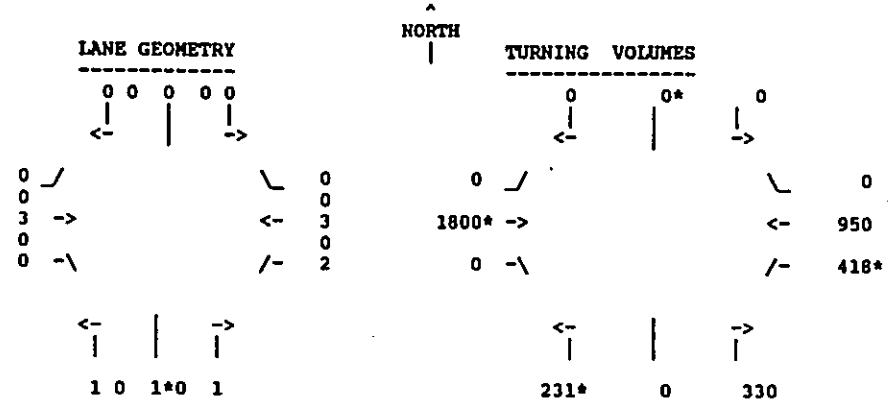
WITH THE HOTEL PROJECT

AM PEAK HOUR

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 1
Project: Airport Hotel Develo Design Hour: AM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 3
Approach 3/4: Nimitz Hwy/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	600	0	0	316	230	0	0	0	0	194	194
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	230	600	0	0	194	0

Total Critical Volume = 1024 LOS = C V/C = 0.73

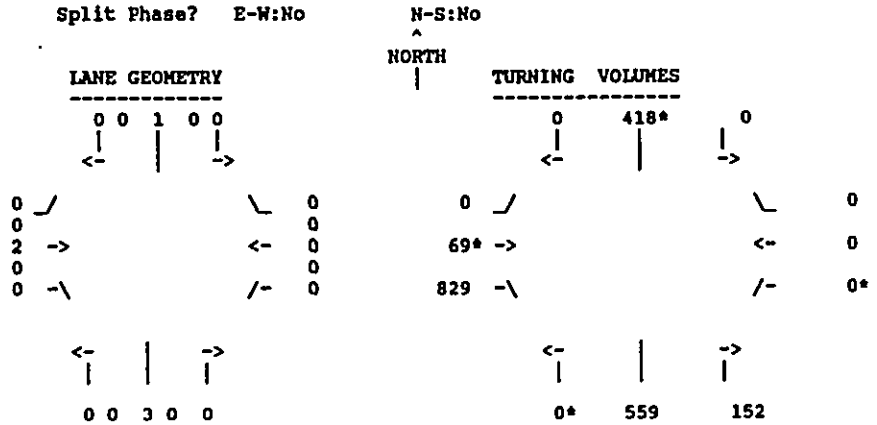
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWITH.DAT
Time of run: 1:28:08 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

Warning and Error Messages

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 2
Project: Airport Hotel Develo Design Hour: AM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 2
Approach 3/4: Frontage Road/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	829	0	0	0	0	0	418	0	0	237	0
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	0	829	0	0	0	418

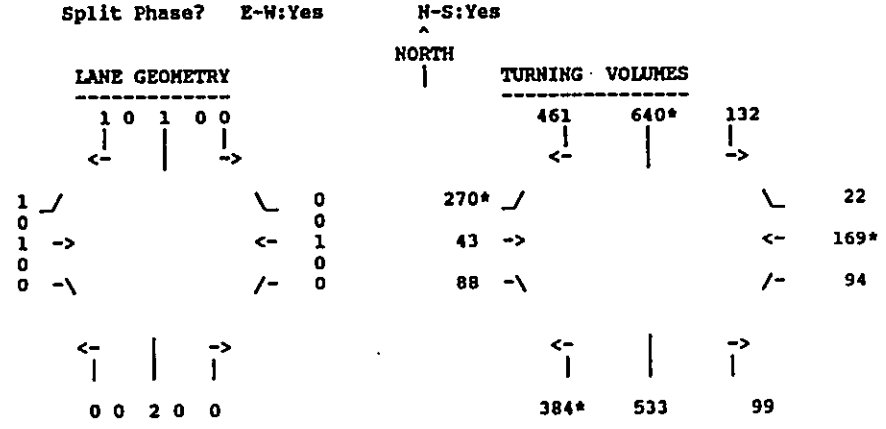
Total Critical Volume = 1247 LOS = D V/C = 0.89

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWITH.DAT
Time of run: 1:28:13 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 3
Project: Airport Hotel Develo Design Hour: AM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 4
Approach 3/4: Koapaka Street/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:Yes



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORTHBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
270	131	0	0	285	0	132	772	0	0	508	384
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	--- 7 ---	--- 8 ---
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	270	285	0	0	508	772	0

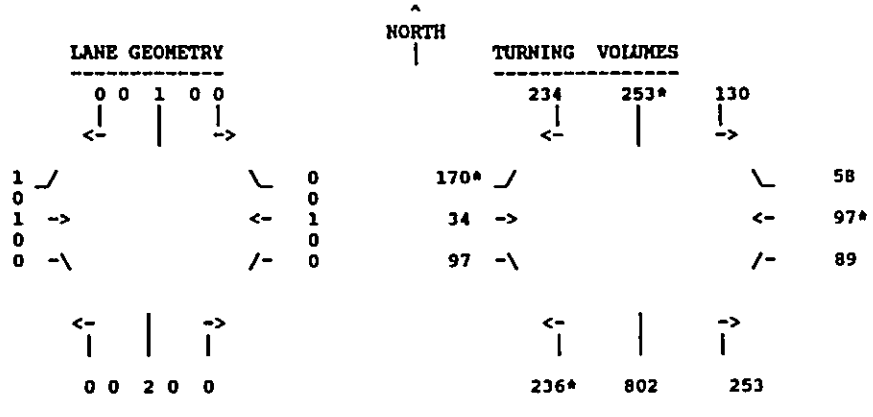
Total Critical Volume = 1835 LOS = F V/C = 1.31

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWITH.DAT
Time of run: 1:28:17 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel Develo Design Hour: AM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 4
Approach 3/4: Ualena Street/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
170	131	0	0	253	0	01137		0	0	763	236
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	--- 7 ---	--- 8 ---
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	170	0	253	0	0	236	1137

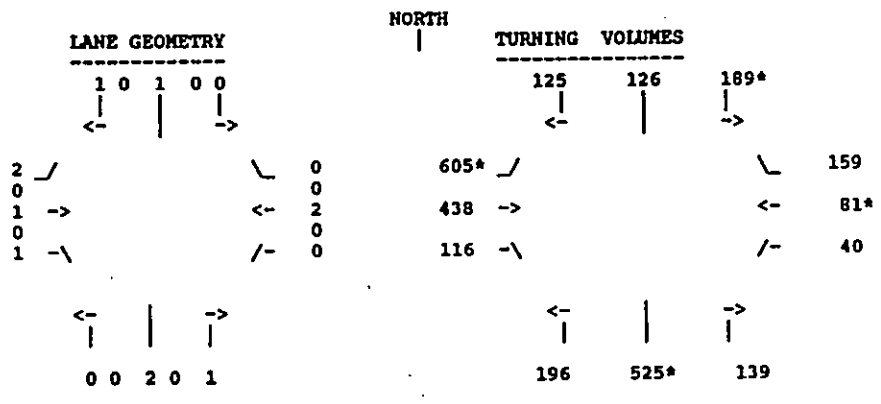
Total Critical Volume = 1796 LOS = F V/C = 1.28

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWITH.DAT
Time of run: 1:28:22 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 5
Project: Airport Hotel Develo Design Hour: AM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 5
Approach 3/4: Aolele Street/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:Yes



APPROACH VOLUMES PER LANE

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
333	438	0	0	160	40	189	315	0	0	360	196
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R--------		

CRITICAL PHASES

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
40	293	0	160	0	360	315	0

Total Critical Volume = 1168 LOS = D V/C = 0.83

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWITH.DAT
Time of run: 1:28:26 PM
Date of run: 12/06/1989

INTERSECTION LEVEL OF SERVICE CALCULATIONS

YEAR 1995

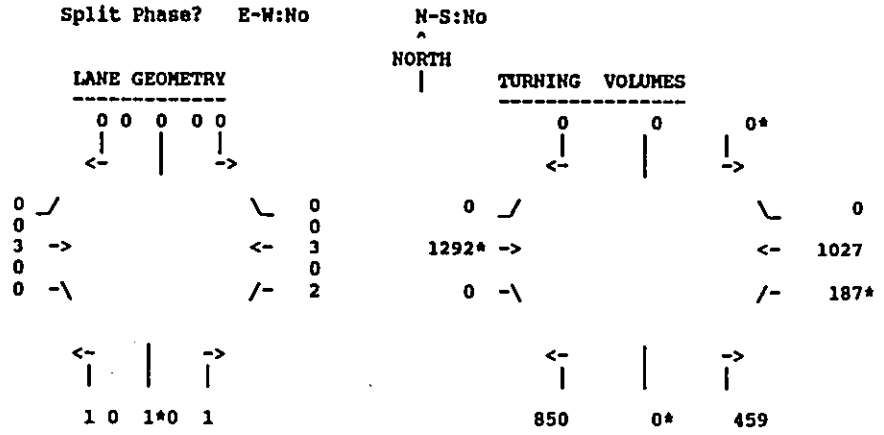
WITH THE HOTEL PROJECT

PM PEAK HOUR

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 1
Project: Airport Hotel Develo Design Hour: PM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 3
Approach 3/4: Nimitz Hwy/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	430	0	0	342	103	0	0	0	0	467	0
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	103	430	C	0	0	467

Total Critical Volume = 1000 LOS = C V/C = 0.71

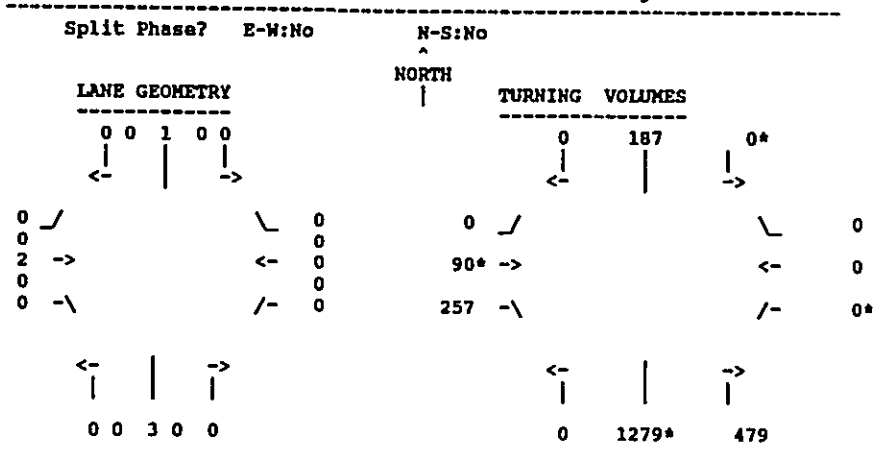
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWITH.DAT
Time of run: 1:26:36 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

Warning and Error Messages

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 2
Project: Airport Hotel Develo Design Hour: PM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 2
Approach 3/4: Frontage Road/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	257	0	0	0	0	0	187	0	0	586	0
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	0	257	0	0	0	586

Total Critical Volume = 843 LOS = A V/C = 0.60

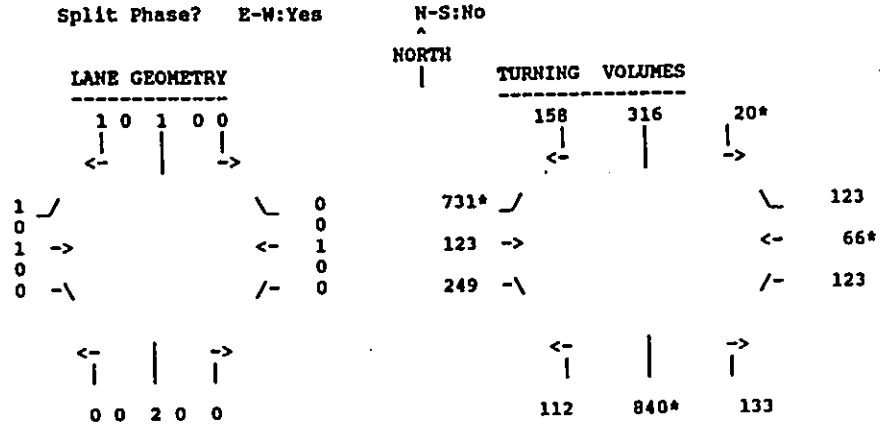
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWITH.DAT
Time of run: 2:02:48 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 3
Project: Airport Hotel Develo Design Hour: PM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 5
Approach 3/4: Koapaka Street/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
--	--	--	--	--	--	--	--	--	--	--	--
731	372	0	0	312	0	20	396	0	0	598	112
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	731	312	0	20	0	92	506

Total Critical Volume = 1661 LOS = F V/C = 1.19

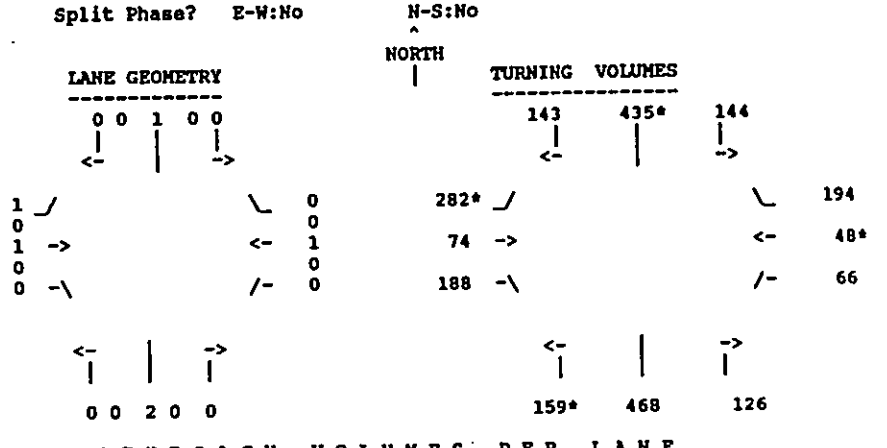
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWITH.DAT
Time of run: 1:26:44 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel Develo Design Hour: PM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 4
Approach 3/4: Ualena Street/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
--	--	--	--	--	--	--	--	--	--	--	--
282	262	0	0	374	0	0	866	0	0	456	159
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	282	0	374	0	0	159	866

Total Critical Volume = 1681 LOS = F V/C = 1.20

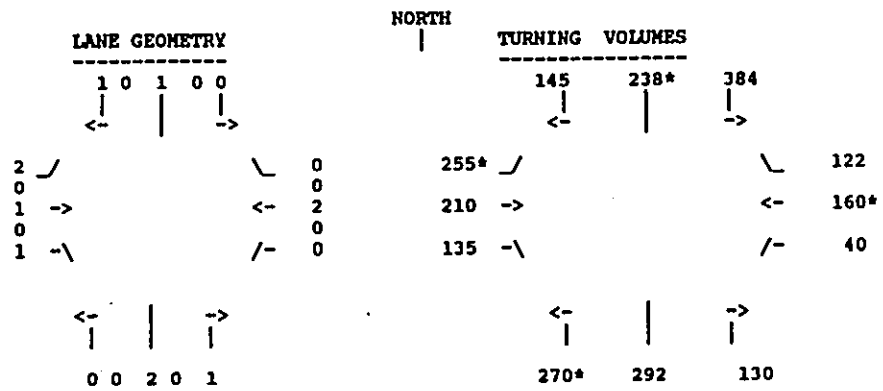
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWITH.DAT
Time of run: 1:26:49 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 5
Project: Airport Hotel Develo Design Hour: PM Peak Hour
Approach 1/2: Palea Street Signal Phasing: 5
Approach 3/4: Aolele Street/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:Yes



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORTHBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
--	--	--	--	--	--	--	--	--	--	--	--
140	210	0	0	181	40	384	622	0	0	281	270
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
40	100	0	181	0	281	622	0

Total Critical Volume = 1224 LOS = D V/C = 0.87

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWITH.DAT
Time of run: 1:26:53 PM
Date of run: 12/06/1989

INTERSECTION LEVEL OF SERVICE CALCULATIONS

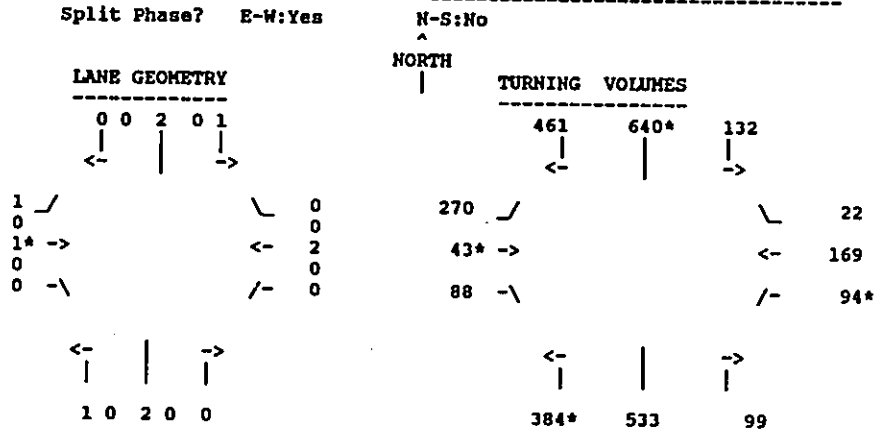
MITIGATION MEASURES

WITH THE HOTEL PROJECT

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 3
Project: Airport Hotel Develo Design Hour: AM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 5
Approach 3/4: Koapaka Street/ Conditions: MITIGATED GEOMETRY
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	214	0	0	142	94	132	550	0	0	316	384
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	214	142	0	132	0	252	550

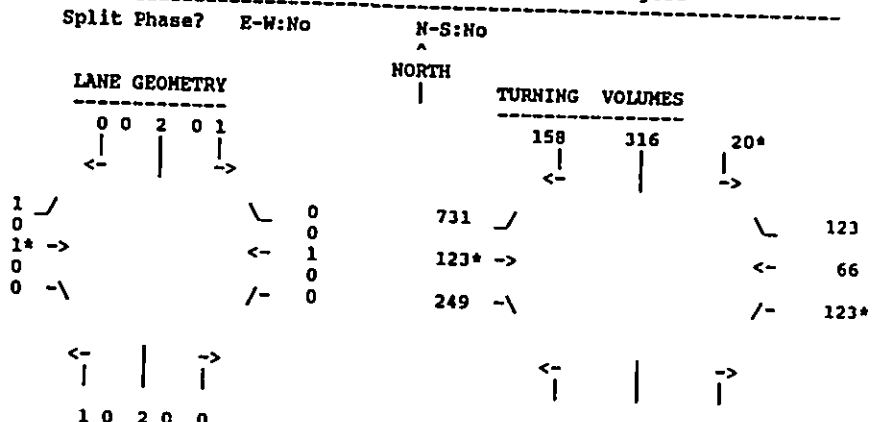
Total Critical Volume = 1290 LOS = E V/C = 0.92

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWITH.DAT
Time of run: 2:09:46 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 3
Project: Airport Hotel Develo Design Hour: PM Peak Hour
Approach 1/2: Paiea Street Signal Phasing: 4
Approach 3/4: Koapaka Street/ Conditions: MITIGATED GEOMETRY
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
0	588	0	0	435	0	20	237	0	0	486	112
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	0	0	588	20	0	92	394

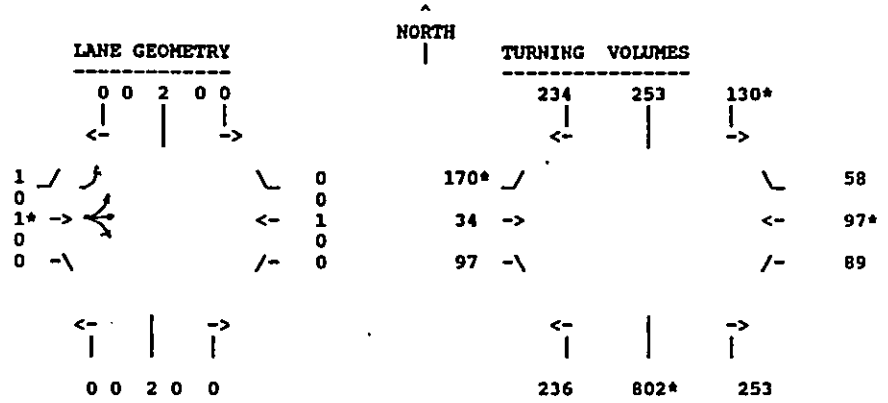
Total Critical Volume = 1094 LOS = C V/C = 0.78

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWITH.DAT
Time of run: 2:10:26 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel Develo Design Hour: AM Peak Hour
Approach 1/2: Palea Street Signal Phasing: 5
Approach 3/4: Ualena Street/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
0	159	0	0	244	0	130	568	0	0	763	236
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	159	244	0	130	0	106	657

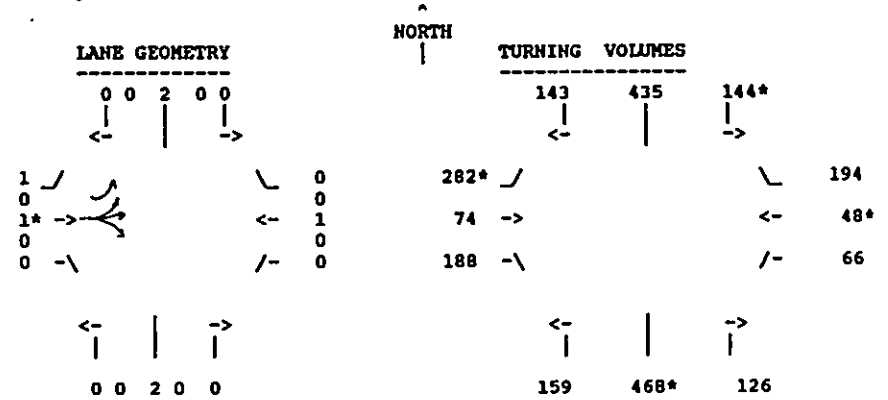
Total Critical Volume = 1296 LOS = E V/C = 0.93

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWITH.DAT
Time of run: 3:18:24 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel Develo Design Hour: PM Peak Hour
Approach 1/2: Palea Street Signal Phasing: 5
Approach 3/4: Ualena Street/ Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
0	286	0	0	308	0	144	433	0	0	456	159
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	286	308	0	144	0	15	441

Total Critical Volume = 1194 LOS = D V/C = 0.85

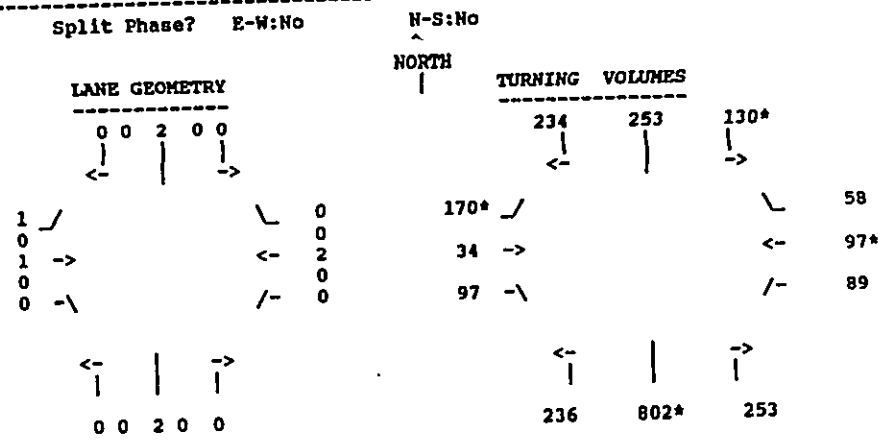
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWITH.DAT
Time of run: 2:30:54 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel Develo
Approach 1/2: Paiea Street
Approach 3/4: Ualena Street/
Comments: Year 1995 Conditions With the Hotel Project

Design Hour: AM Peak Hour
Signal Phasing: 6
Conditions:

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
170	131	0	0	126	89	130	568	0	0	763	236
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
89	81	0	126	130	0	106	657

Total Critical Volume = 1189 LOS = D V/C = 0.85

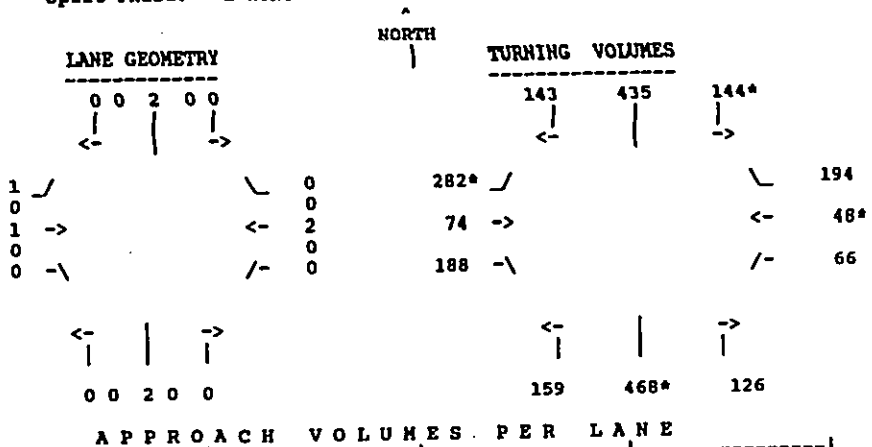
Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWITH.DAT
Time of run: 2:17:55 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel Develo
Approach 1/2: Paiea Street
Approach 3/4: Ualena Street/
Comments: Year 1995 Conditions With the Hotel Project

Design Hour: PM Peak Hour
Signal Phasing: 6
Conditions:

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORHTBOUND RT	NORHTBOUND TH	NORHTBOUND LT
282	262	0	0	194	66	144	433	0	0	456	159
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
66	216	0	194	144	0	15	441

Total Critical Volume = 1076 LOS = C V/C = 0.77

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWITH.DAT
Time of run: 2:17:30 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

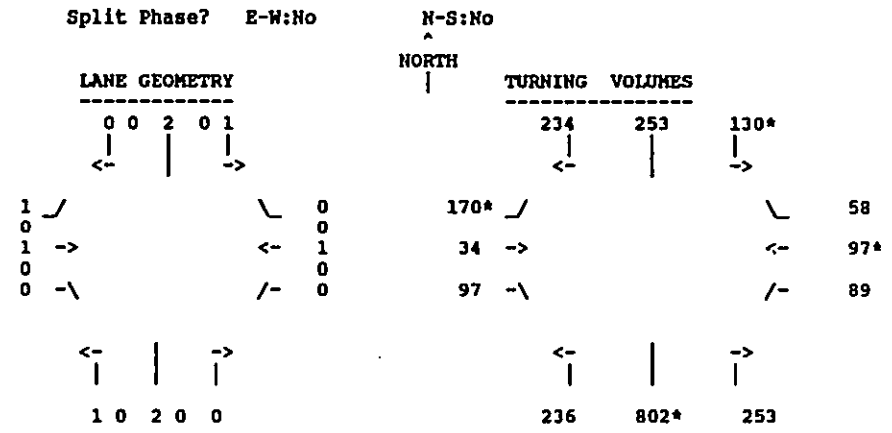
W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel Develo
Approach 1/2: Paiea Street
Approach 3/4: Ualena Street/
Comments: Year 1995 Conditions With the Hotel Project

Design Hour: AM Peak Hour
Signal Phasing: 5
Conditions: OPTION A MITIGATION

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
170	131	0	0	253	0	130	243	0	0	527	236
-------R---0.80-			-0.80---R--------			-------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	170	0	253	130	0	106	421

Total Critical Volume = 1080 LOS = C V/C = 0.77

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95AMWITH.DAT
Time of run: 2:12:35 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

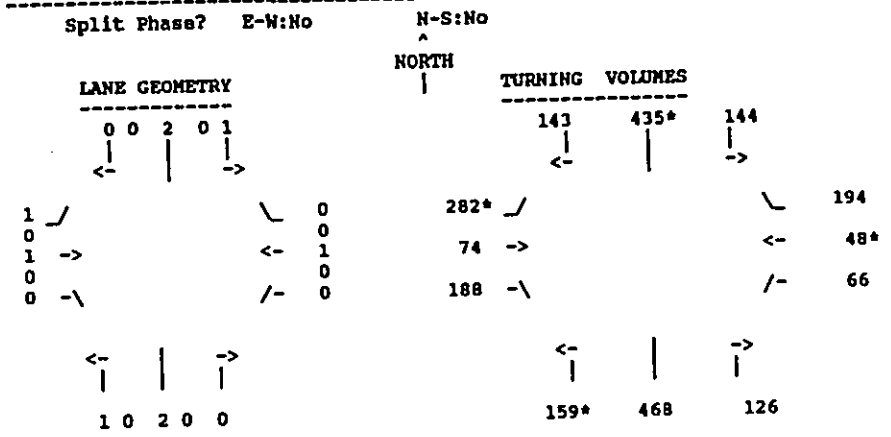
W I L B U R S M I T H A S S O C I A T E S

1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Intersection no.: 4
Project: Airport Hotel Develo
Approach 1/2: Paiea Street
Approach 3/4: Ualena Street/
Comments: Year 1995 Conditions With the Hotel Project

Design Hour: PM Peak Hour
Signal Phasing: 5
Conditions: OPTION A MITIGATION

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND			WESTBOUND			SOUTHBOUND			NORHTBOUND		
LT	TH	RT	RT	TH	LT	LT	TH	RT	RT	TH	LT
282	262	0	0	374	0	144	289	0	0	297	159
-------R---0.80-			-0.80---R--------			-------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

--- 1 ---	--- 2 ---	--- 3 ---	--- 4 ---	--- 5 ---	--- 6 ---	-- 7 --	-- 8 --
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	282	0	374	144	0	15	289

Total Critical Volume = 1104 LOS = C V/C = 0.79

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 95PMWITH.DAT
Time of run: 2:11:01 PM
Date of run: 12/06/1989
Wilbur Smith Associates, 1987,1988,1989. ver. 6.91

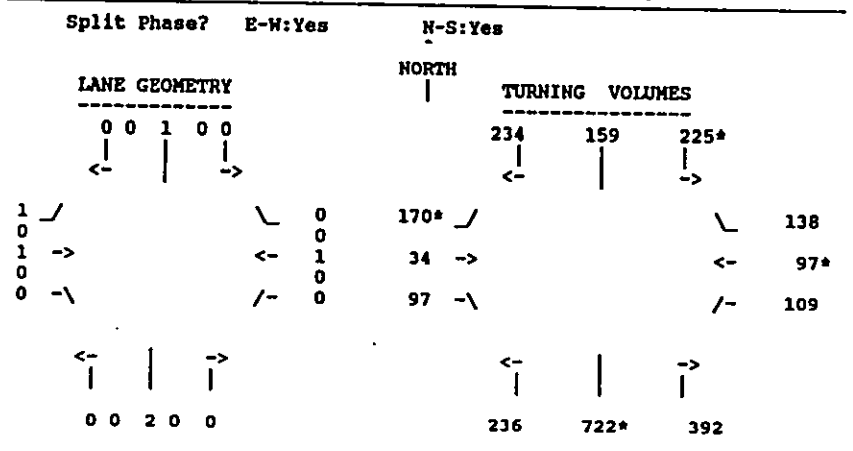
INTERSECTION LEVEL OF SERVICE CALCULATIONS

YEAR 1995 WITH PROJECT AND AOLELE STREET CLOSURE

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: AM Peak Hour
E-W Approach: Paiea Street
Conditions: No Aolele
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:Yes



APPROACH VOLUMES PER LANE

EASTBOUND LT TH RT	WESTBOUND RT TH LT	SOUTHBOUND LT TH RT	NORTHBOUND RT TH LT
170 131 0	0 344 109	225 618 0	0 675 236
-------R---0.80-	-0.80---R--------	--------R---0.80-	-0.80---R-------

CRITICAL PHASES

WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	170	344	0	0	675	618	0

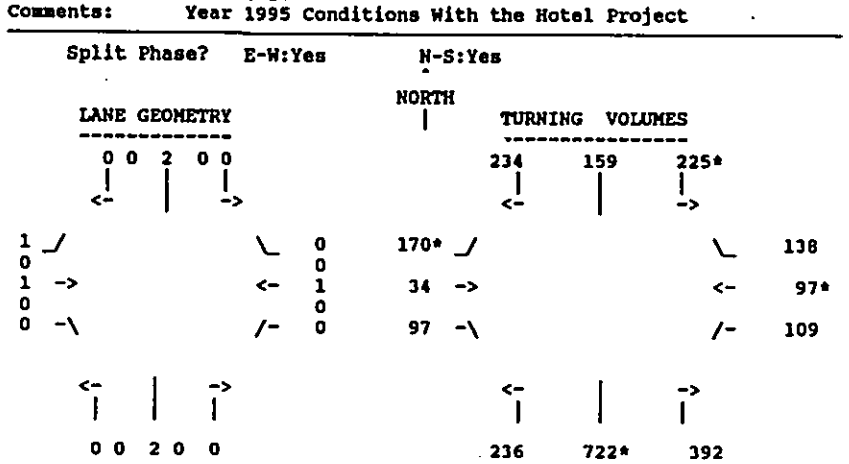
Total Critical Volume = 1807 LOS = F V/C = 1.29

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5AMW_NOA.DAT
Time of run: 10:08:01 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: AM Peak Hour
E-W Approach: Paiea Street
Conditions: No Aolele
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:Yes



APPROACH VOLUMES PER LANE

EASTBOUND LT TH RT	WESTBOUND RT TH LT	SOUTHBOUND LT TH RT	NORTHBOUND RT TH LT
170 131 0	0 344 109	225 309 0	0 675 236
-------R---0.80-	-0.80---R--------	--------R---0.80-	-0.80---R-------

CRITICAL PHASES

WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	170	344	0	0	675	309	0

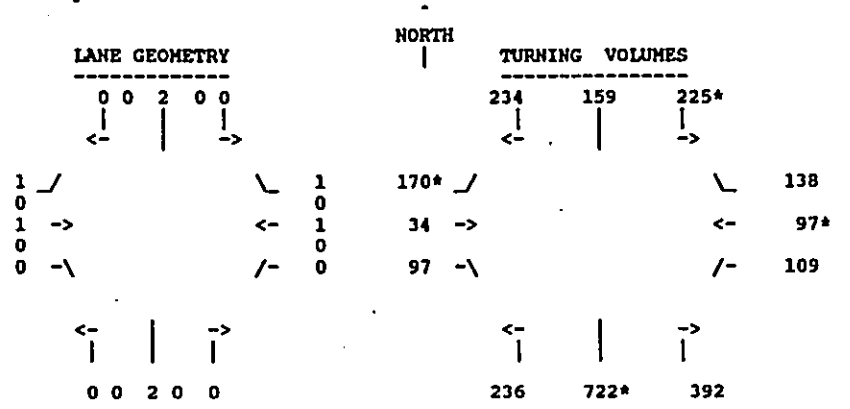
Total Critical Volume = 1498 LOS = F V/C = 1.07

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5AMW_NOA.DAT
Time of run: 10:08:13 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: AM Peak Hour
E-W Approach: Paiea Street
Conditions: No Aolele
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:Yes



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORTHBOUND RT	NORTHBOUND TH	NORTHBOUND LT
170	131	0	0	206	109	225	309	0	0	675	236
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	170	206	0	0	675	309	0

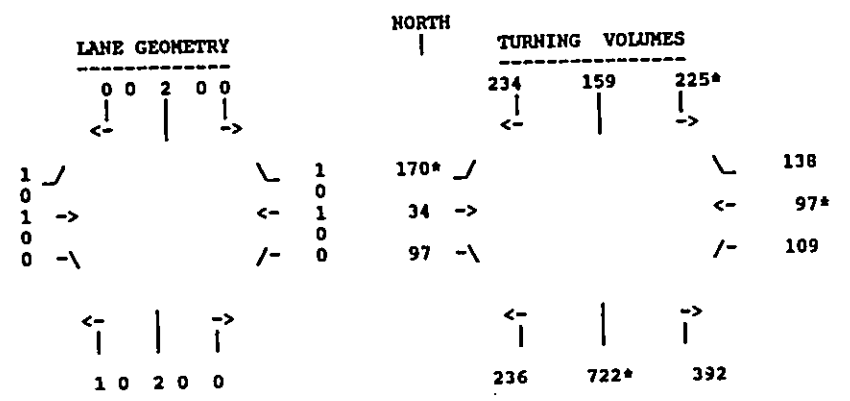
Total Critical Volume = 1360 LOS = E V/C = 0.97

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: SAMW_NOA.DAT
Time of run: 10:08:29 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: AM Peak Hour
E-W Approach: Paiea Street
Conditions: No Aolele
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	EASTBOUND TH	EASTBOUND RT	WESTBOUND RT	WESTBOUND TH	WESTBOUND LT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	NORTHBOUND RT	NORTHBOUND TH	NORTHBOUND LT
170	131	0	0	206	109	225	393	0	0	557	236
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	170	206	0	225	0	11	546

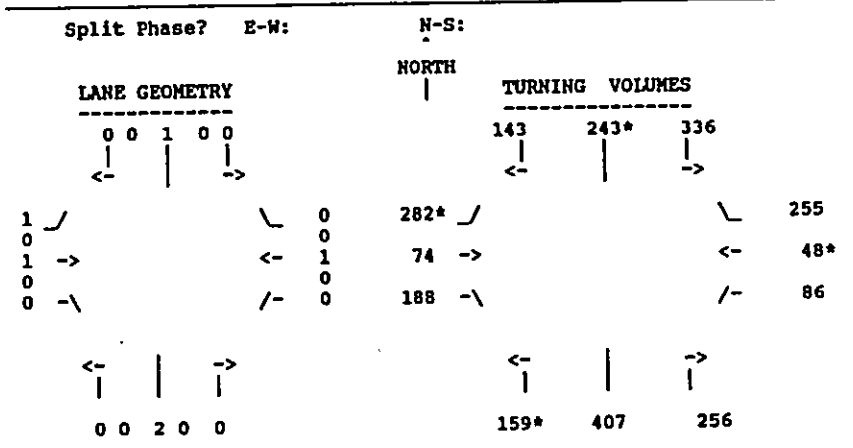
Total Critical Volume = 1158 LOS = D V/C = 0.83

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: SAMW_NOA.DAT
Time of run: 10:08:45 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: PM Peak Hour
E-W Approach: Paiea Street
Conditions: No Alolele St
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W: N-S:



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT TH RT	WESTBOUND RT TH LT	SOUTHBOUND LT TH RT	NORTHBOUND RT TH LT
282 262 0	0 389 86	336 722 0	0 411 159
-------R---0.80-	-0.80---R--------	--------R---0.80-	-0.80---R-------

C R I T I C A L P H A S E S

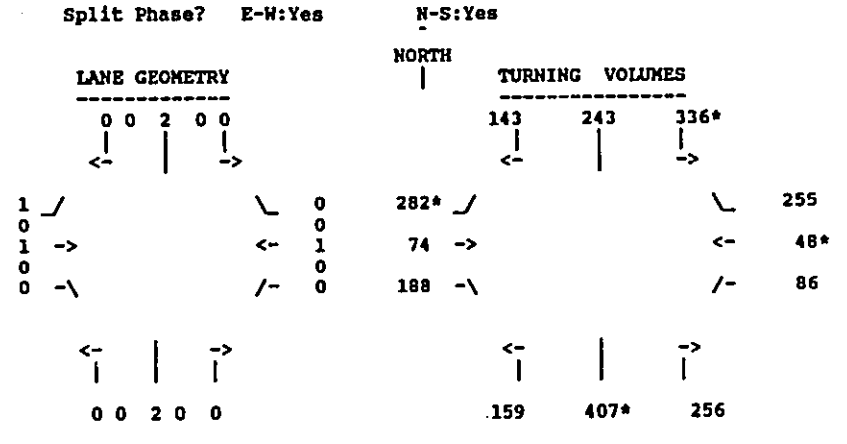
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	282	389	0	0	411	722	0
Total Critical Volume = 1804 LOS = F						V/C = 1.29	

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5PMW_NOA.DAT
Time of run: 9:58:33 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: PM Peak Hour
E-W Approach: Paiea Street
Conditions: No Alolele St
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:Yes



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT TH RT	WESTBOUND RT TH LT	SOUTHBOUND LT TH RT	NORTHBOUND RT TH LT
282 262 0	0 389 86	336 361 0	0 411 159
-------R---0.80-	-0.80---R--------	--------R---0.80-	-0.80---R-------

C R I T I C A L P H A S E S

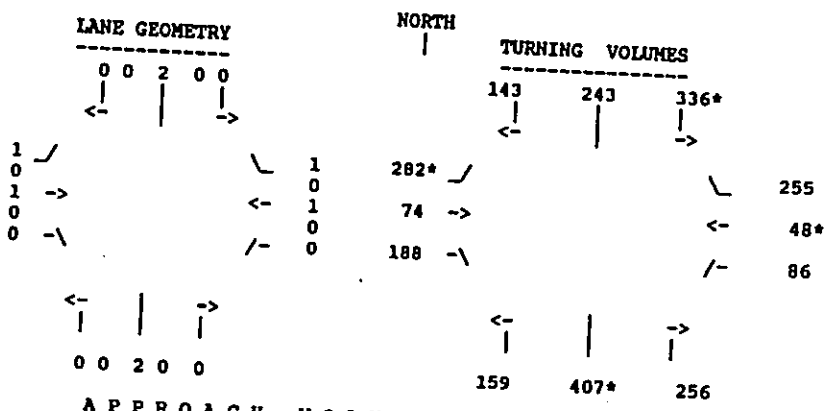
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	282	389	0	0	411	361	0
Total Critical Volume = 1443 LOS = F						V/C = 1.03	

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5PMW_NOA.DAT
Time of run: 9:58:40 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: PM Peak Hour
E-W Approach: Paiea Street
Conditions: No Alolele St
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:Yes



APPROACH VOLUMES PER LANE

EASTBOUND LT TH RT	WESTBOUND RT TH LT	SOUTHBOUND LT TH RT	NORTHBOUND RT TH LT
282 262 0	0 134 86	336 361 0	0 411 159
-------R---0.80-	-0.80---R--------	--------R---0.80-	-0.80---R-------

CRITICAL PHASES

WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	282	134	0	0	411	361	0

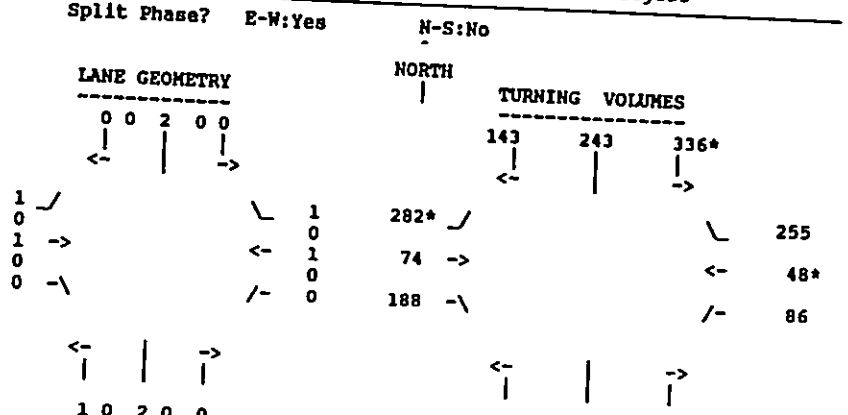
Total Critical Volume = 1188 LOS = D V/C = 0.85

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5PMW_NOA.DAT
Time of run: 9:59:02 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: PM Peak Hour
E-W Approach: Paiea Street
Conditions: No Alolele St
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:No



APPROACH VOLUMES PER LANE

EASTBOUND LT TH RT	WESTBOUND RT TH LT	SOUTHBOUND LT TH RT	NORTHBOUND RT TH LT
282 262 0	0 134 86	336 386 0	0 331 159
-------R---0.80-	-0.80---R--------	--------R---0.80-	-0.80---R-------

CRITICAL PHASES

WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	282	134	0	159	177	0	331

Total Critical Volume = 1083 LOS = C V/C = 0.77

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5PMW_NOA.DAT
Time of run: 9:59:28 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

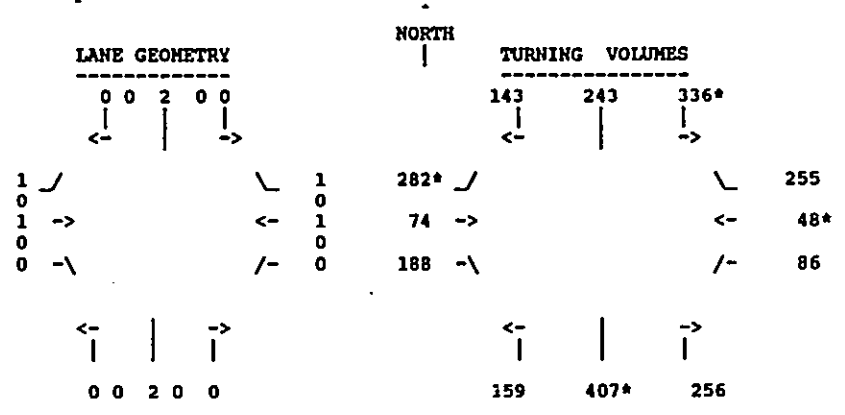
CORRECTION

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

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: PM Peak Hour
E-W Approach: Paiea Street
Conditions: No Alolele St
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:Yes



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT TH RT	WESTBOUND RT TH LT	SOUTHBOUND LT TH RT	NORTHBOUND RT TH LT
282 262 0	0 134 86	336 361 0	0 411 159
-------R---0.80-	-0.80---R--------	--------R---0.80-	-0.80---R-------

C R I T I C A L P H A S E S

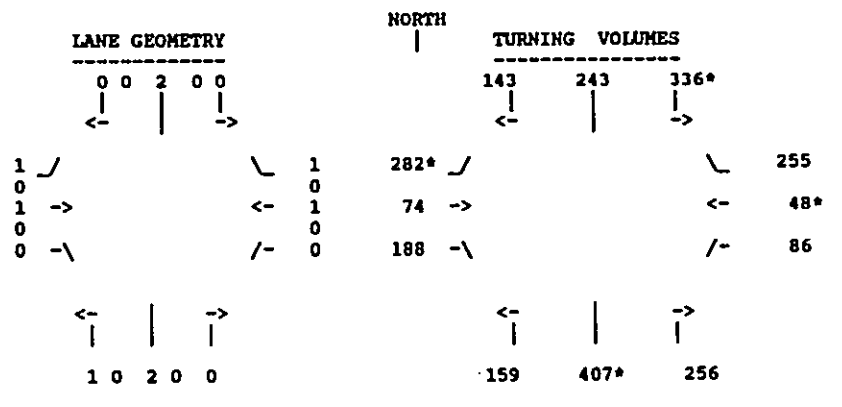
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	282	134	0	0	411	361	0
Total Critical Volume = 1188 LOS = D						V/C = 0.85	

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5PMW_NOA.DAT
Time of run: 9:59:02 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 4
N-S Approach: Ualena Street/ Design Hour: PM Peak Hour
E-W Approach: Paiea Street
Conditions: No Alolele St
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:Yes N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT TH RT	WESTBOUND RT TH LT	SOUTHBOUND LT TH RT	NORTHBOUND RT TH LT
282 262 0	0 134 86	336 386 0	0 331 159
-------R---0.80-	-0.80---R--------	--------R---0.80-	-0.80---R-------

C R I T I C A L P H A S E S

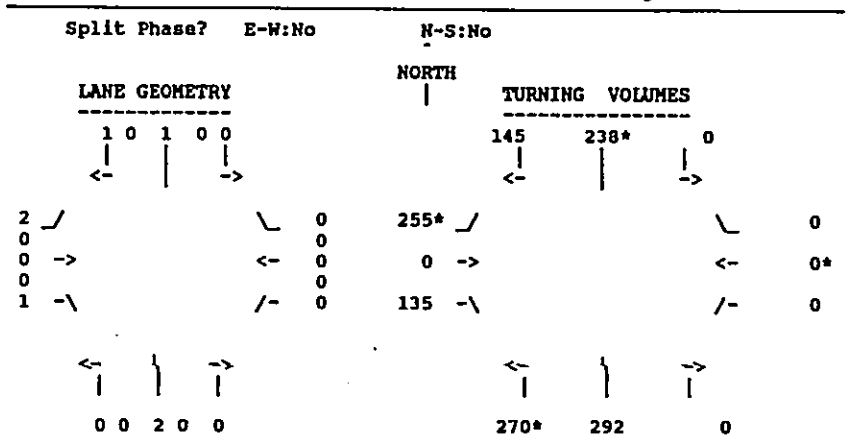
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	282	134	0	159	177	0	331
Total Critical Volume = 1083 LOS = C						V/C = 0.77	

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5PMW_NOA.DAT
Time of run: 9:59:28 AM
Date of run: 03/13/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 5
N-S Approach: Aolele Street/ Design Hour: PM Peak Hour
E-W Approach: Palea Street
Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W:No N-S:No



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	TH	RT	WESTBOUND RT	TH	LT	SOUTHBOUND LT	TH	RT	NORTHBOUND RT	TH	LT
140	0	0	0	0	0	0	238	0	0	292	270
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

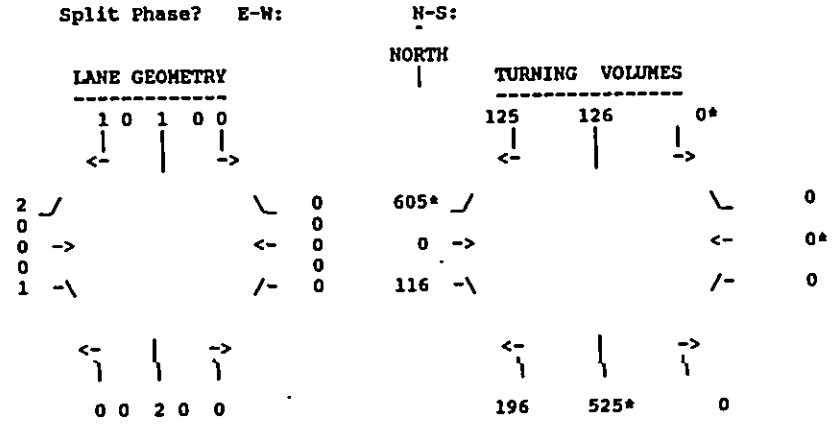
WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	140	0	0	0	0	270	238
Total Critical Volume = 648 LOS = A						V/C = 0.46	

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5PMW_NOA.DAT
Time of run: 10:07:26 AM
Date of run: 03/12/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

W I L B U R S M I T H A S S O C I A T E S
1985 HWCM/CIRC 212, SIGNALIZED, ISOLATED INTERSECTION CAPACITY ANALYSIS
PLANNING METHOD

Project: Airport Hotel Develo no. 5
N-S Approach: Aolele Street/ Design Hour: AM Peak Hour
E-W Approach: Palea Street
Conditions:
Comments: Year 1995 Conditions With the Hotel Project

Split Phase? E-W: N-S:



A P P R O A C H V O L U M E S P E R L A N E

EASTBOUND LT	TH	RT	WESTBOUND RT	TH	LT	SOUTHBOUND LT	TH	RT	NORTHBOUND RT	TH	LT
333	0	0	0	0	0	0	126	0	0	458	196
-------R---0.80-			-0.80---R--------			--------R---0.80-			-0.80---R-------		

C R I T I C A L P H A S E S

WB LT/ EB LT	EB TH/ EB LT	WB TH/ WB LT	WB TH/ EB TH	SB LT/ NB LT	SB TH/ SB LT	NB TH/ NB LT	SB TH/ NB TH
0	333	0	0	0	0	196	262
Total Critical Volume = 791 LOS = A						V/C = 0.56	

Intersection capacity = 1400
Double left-turn factor = 1.1
FILE: 5AMW_NOA.DAT
Time of run: 10:25:59 AM
Date of run: 03/12/1990
Wilbur Smith Associates, 1987,1988,1989. ver. 7.04

APPENDIX B

ENVIRONMENTAL NOISE ASSESSMENT

DARBY & ASSOCIATES
ACOUSTICAL CONSULTANTS

#89-35
December 11, 1989

R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, HI 96817-4941

Attention: Mrs. Colette Sakoda

RE: ENVIRONMENTAL NOISE ASSESSMENT
AIRPORT CENTER HOTEL, HONOLULU

Dear Mrs. Sakoda:

In this letter/report, we present our findings on the subject project.

1. SUMMARY OF FINDINGS

1.1 There are, at present, no noise-sensitive activities in the immediate vicinity of the project site. The closest noise-sensitive building is the Holiday Inn Hotel on the Nimitz Highway.

1.2 Parts of the adjacent Airport Trade Center could possibly experience some noise impact from construction activities. However, because of the short-term nature of most of these activities, and the high existing ambient noise levels in the subject area, any construction noise impact should be relatively small.

1.3 The additional traffic on Paiea Street generated by the proposed hotel will not cause any significant environmental noise impact.

1.4 Provided the appropriate noise control measures are incorporated in the design, noise levels at the property lines due to the operation of mechanical and electrical equipment associated with the proposed development (air conditioning plant, exhaust fans, emergency generator, etc.) will be in compliance with the appropriate Department of Health and Land Use Ordinance regulations.

1.5 The proposed development is potentially impacted by noise from aircraft operations associated with Honolulu International Airport and Hickam Air Force Base, and by noise from road traffic on Aolele Street, Paiea Street, the adjacent freeway on-ramp and the HI Freeway. The estimated Day-Night Average Sound Level at the project site is approximately 71 dB to 72 dB, which is sufficiently high to warrant some special noise mitigation measures.

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KAILUA, HAWAII 96734 • (808) 254-3318 • FAX (808) 254-4295

1.5 If the building envelope is correctly designed to adequately attenuate noise from aircraft operations and road traffic noise, and the guest rooms and public areas are air conditioned (to allow windows to be kept closed for noise reduction purposes), the existing noise environment should not adversely affect the operation of the proposed hotel.

It is estimated that an exterior-to-interior noise reduction of at least 35 dBA will be necessary, necessitating the use of either heavy, laminated glass windows or, preferably, acoustically double-glazed windows. A more thorough investigation into the most appropriate window construction, including additional site noise measurements, should be made during the detail design phase.

2. PROJECT DESCRIPTION

The proposed development, comprising a 16-story, 411-room hotel tower structure and a three-story parking garage, is located on the north-west corner of Aolele and Paiea Streets, adjacent to Honolulu International Airport (HIA). Vehicular access to the hotel and parking garage will be from Paiea Street.

The project site is zoned I-2 Intensive Industrial. There are, at present, no noise-sensitive activities in its immediate vicinity; the closest noise-sensitive building is the Holiday Inn Hotel on the Nimitz Highway. (Refer to Figure 1.)

3. THE EXISTING ACOUSTICAL ENVIRONMENT

The proposed development is potentially impacted by noise from aircraft operations associated with Honolulu International Airport and Hickham Air Force Base, and by noise from road traffic on Aolele Street, Paiea Street, the adjacent freeway on-ramp and the HI Freeway.

Ambient noise measurements were made at and near the project site on December 4, 1989. Noise levels were recorded over 20 to 30 minute sampling periods at Locations A, B, and C, shown in Figure 1, using two Larson Davis Laboratory Model 800B Precision Integrating Sound Level Meters, one fitted with an ACO 1/2" Condenser Microphone Type 7012 and the other fitted with an LDL 1" Condenser Microphone. The three measurement locations are described below:

A. At the Aolele Street facade of the proposed hotel, approximately 15 ft from the property line.

B. In the car parking lot next to the Kaman Bearing & Supply premises, approximately 15 ft from the Paiea Street curb.

C. At the north facade of the proposed hotel parking structure, approximately 200 ft from the Paiea Street curb.

Weather conditions during the measurements were fine and clear with a temperature of approximately 80° and tradewinds at 5 to 10 mph. Aircraft operations at HIA were typical of normal tradewind patterns, i.e., interisland jet landings and departures and wide-body jet landings on Runway 8L, and wide-body jet departures on Runway 8R (the reef runway).

The noise measurement results, in terms of the equivalent continuous noise level (Leq), the minimum noise level (Lmin), and the maximum noise level (Lmax), are presented below. Note that Leq is a commonly used community noise metric; it is defined as the level of a steady sound having the same acoustical energy as a given time-varying sound.

Location	Time	Measured Noise Levels - dBA Leq	Lmin	Lmax
A	10:37 am - 11:08 am	67	56	81
B	11:22 am - 11:35 am	72	64	83
C	11:48 am - 12:08 pm	68	57	84

Further noise data, summarized in Table 1, show that interisland aircraft takeoffs from Runway 8L were the dominant source of aircraft noise at the project site, generating typical Lmax levels of up to approximately 85 dBA. The estimated Lmax levels at the hotel's Paiea Street facade, due to bus movements on the freeway on-ramp, are also up to 85 dBA.

Based on the above noise data and the 1992 HIA Noise Exposure Map (see Figure 2), the estimated future Day-Night Average Sound level due to aircraft and road traffic noise at the project site is approximately 71 dB to 72 dB.

4. NOISE STANDARDS AND GUIDELINES

Land-use compatibility guidelines are commonly presented in terms of the Day-Night Average Sound Level (Ldn), a measure of noise exposure over a typical 24-hour period. For example, the U.S. Environmental Protection Agency and the Department of Housing and Urban Development (HUD) specify that residential and other noise-sensitive developments can normally be constructed in areas subjected to noise exposure levels of up to Ldn 65, with no special noise control measures required in buildings of conventional construction. Sites exposed to Ldn's in the range of 65 dB to 75 dB are considered normally unacceptable for residential development, with building approval subject to additional noise control measures.

Since the majority of homes in Hawaii is naturally ventilated, the State Department of Transportation stipulates an aircraft noise exposure limit of Ldn 60 for residential buildings.

Land use compatibility guidelines are typically less restrictive for transient lodging buildings such as hotels and motels, which are normally air conditioned and better acoustically insulated than conventional residential buildings. The California Department of Transportation's "Airport Land Use Planning Handbook" notes that, with proper sound insulation, hotels and motels may be constructed in areas subjected to noise exposures of up to Ldn 80.

Interior noise criteria are often presented in terms of Ldn and, for single-event noise sources such as buses and aircraft movements, criteria are also presented in terms of the maximum noise level (Lmax). For example, HUD has a design goal of Ldn 45 or less for the interior spaces of dwelling units. The above-referenced "Airport Land Use Planning Handbook" recommends an Lmax of 40 dBA or less due to aircraft noise in hotel and motel sleeping areas (although less restrictive Lmax criteria, of up to 55 dBA, have also been proposed for sleeping areas in residential buildings).

Turning to guidelines for noise generated by proposed developments, the Department of Health's (DOH)'s Community Noise Control for Oahu (Title 11, Chapter 43) specifies a maximum allowable noise level at property lines in an industrially-zoned area of 70 dBA (daytime or nighttime). The regulations state that this limit shall not be exceeded for more than 10% of the time in any 20-minute period. Section 3-100 of the City/County Building Department's Land Use Ordinance (LUO) sets forth the following property line limits for industrially-zoned areas (applicable daytime and nighttime).

Octave Band Center Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Maximum Octave Band Noise Level (dB)	79	74	66	59	53	47	41	39

These octave band limits are equivalent to an overall noise level of 63 dBA.

5. POTENTIAL IMPACTS AND DESCRIPTION OF CONTROLS

5.1 Construction Noise - As noted earlier, there are no existing noise-sensitive buildings or activities in the immediate vicinity of the project site. However, parts of the Airport Trade Center (e.g., office areas) could possibly experience some noise impact from construction activities such as demolition, excavation and pile driving. Because of the short-term nature of most of these activities, and the high existing ambient noise levels in the subject area, any construction noise impact should be relatively small.

5.2 Additional Traffic Generated by the Hotel - Vehicular access to the hotel and parking garage will be from Paiea Street, which carries an existing average daily traffic volume of approximately 12,000 vehicles. The Honolulu Airport Hotel Traffic Study includes an estimate that the hotel will generate a total of some 3,560 daily trips. It is estimated that noise exposure levels along Paiea Street will, as a result, increase by only about 1 dB. This is an insignificant increase in terms of subjective response.

Thus, the additional traffic on Paiea Street generated by the proposed hotel will not cause any significant environmental noise impact.

5.3 Mechanical and Electrical Equipment - The noise from mechanical and electrical equipment associated with the proposed development, including the air conditioning plant, exhaust fans, the transformer and the emergency generator, will be reduced to acceptable levels at the property lines (i.e., in compliance with the appropriate DOH and LUO limits) and within the development itself, provided the appropriate noise control measures are incorporated in the design. The required noise control measures may include the following:

1) Sound attenuators on building and garage exhaust fans.

2) Inlet and discharge silencers on cooling towers.

3) Acoustical louvers or silencers at mechanical and electrical equipment room air intake and discharge openings.

4) Appropriate selection of vibration isolation mounts, mechanical and electrical equipment room wall, floor and ceiling constructions, acoustical linings, etc.

5.4 Aircraft and Traffic Noise - The proposed development will be subjected to an estimated Day-Night Average Sound Level of approximately 71 dB to 72 dB and to maximum aircraft and road traffic noise levels of, typically, up to 85 dBA. Thus, assuming interior design criteria of Lmax 50 dBA or less and Ldn 45 or less, it will be necessary to design the hotel building envelope to provide an exterior-to-interior noise reduction of at least 35 dBA, and to air condition guest rooms and public areas (to allow windows to be kept closed for noise reduction purposes). This will necessitate the use of either heavy, laminated glass windows or, preferably, acoustically double-glazed windows.

A more thorough investigation into the most appropriate window construction, including additional site noise measurements, should be made during the detail design phase.

* * *

Please call if you have any questions on this report.

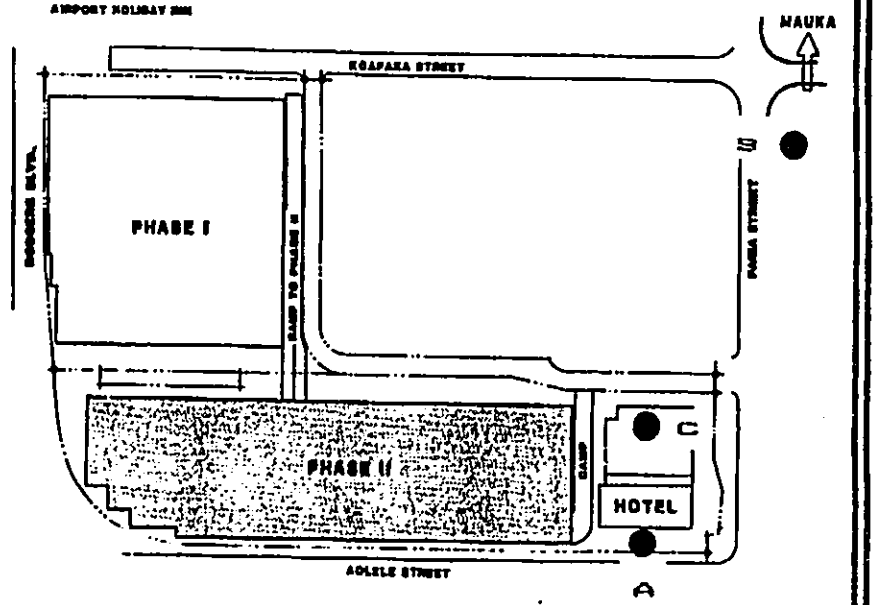
Sincerely,

John Shearer

John C. Shearer

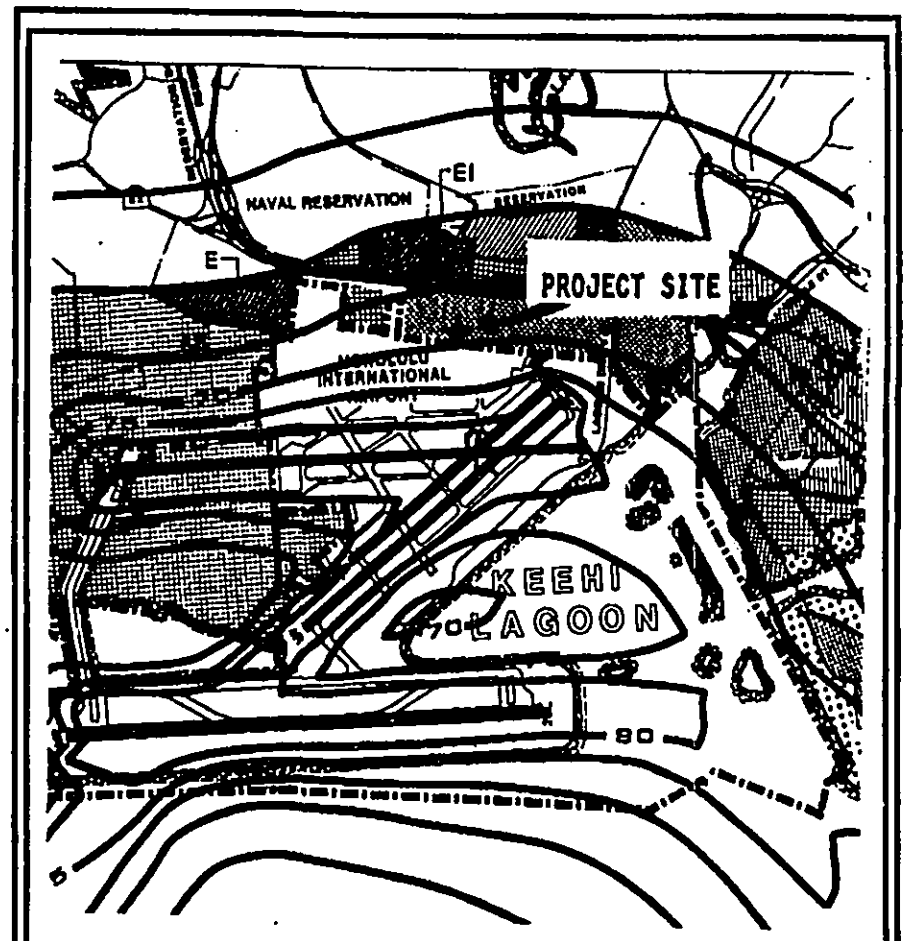
JCS/ld

Enclosures



DARBY & ASSOCIATES
ACOUSTICAL CONSULTANTS

Figure 1 Site Plan Showing Noise Measurement Locations



DARBY & ASSOCIATES
ACOUSTICAL CONSULTANTS

Figure 2 Extract from the 1992 Honolulu International Airport Noise Exposure Map, Showing Project Site in Relation to Ldn Contours

TABLE 1 SUMMARY OF SINGLE EVENT NOISE MEASUREMENTS WITHIN THE PROJECT SITE; DECEMBER 4, 1989

DESCRIPTION OF EVENTS	MEASURED VALUES Lmax, dBA	SEL, dBA	MEASUREMENT POSITION
B-737 TAKEOFF	80.8	87.5	A
B-737 TAKEOFF	83.0	90.9	A
B-737 TAKEOFF	84.8	92.1	A
DC-9 TAKEOFF	85.3	92.5	A
DC-9 TAKEOFF	85.8	93.1	A
TOUR BUS ON AOLELE ST.	77.2	83.3	A
TOUR BUS ON AOLELE ST.	78.0	84.1	A
TOUR BUS ON AOLELE ST.	78.0	84.1	A
MTL BUS ON AOLELE ST.	75.8	81.3	A
MTL BUS ON AOLELE ST.	77.8	82.5	A
TYPICAL TOUR VAN ON AOLELE ST.	65.8	72.1	A
TYPICAL PASSENGER AUTO. ON AOLELE ST.	63.8	70.0	A
TOUR BUS ON THE FREEWAY ON-RAMP	73.5	80.3	C
HELICOPTER OVERFLIGHT	76.5	84.9	C

NOTES:

1. ALL AIRCRAFT TAKEOFFS ARE TRADEWIND PATTERNS.
2. SEL IS THE SINGLE EVENT LEVEL, i.e. THE EQUIVALENT CONTINUOUS NOISE LEVEL NORMALIZED TO 1 SECOND. FOR AIRCRAFT NOISE, SEL IS TYPICALLY 5 dBA TO 7dBA HIGHER THAN Lmax.

APPENDIX C

PRELIMINARY SITE SURVEY

ENVIRONMENTAL ASSESSMENT

AT

3375 KOAPAKA STREET
AIRPORT INDUSTRIAL PARK
HONOLULU, HAWAII

PRELIMINARY SITE SURVEY

FOR

PCB ELECTRICAL EQUIPMENT
HAZARDOUS CHEMICAL MATERIALS
HAZARDOUS CHEMICAL WASTES
UNDERGROUND STORAGE TANK SYSTEMS
SURFACE/SUBSURFACE CONTAMINATION

AUGUST 31, 1989

prepared for

AIRPORT INDUSTRIAL PARK ASSOCIATES
3375 KOAPAKA STREET
HONOLULU, HAWAII 96819-1823
(808) 833-1304

prepared by

UNITEK ENVIRONMENTAL CONSULTANTS, INC.
2889 MOKUMOA STREET
HONOLULU, HAWAII 96819
(808) 836-0555

PROJECT 8390

TABLE OF CONTENTS

SCOPE OF THE ASSESSMENT

Unitek Environmental Consultants, Inc. was retained by Airport Industrial Park Associates (AIPA) to conduct a limited environmental assessment, preliminary site survey of the property and facility located at 3375 Koapaka Street, Airport Industrial Park, Honolulu, Hawaii. The survey was performed pursuant to the terms and conditions established in the "Agreement for Environmental Consulting Services" dated August 11, 1989, Addendum 1 to said Agreement dated August 16, 1989, and the Agreement to Expand the Scope of Work to Include Phase I, dated August 17, 1989.

The purpose of this preliminary survey was to identify the immediate and most recognizable environmental concerns relative to PCB (polychlorinated biphenyl) electrical equipment, hazardous chemical materials, hazardous chemical wastes, underground storage tank systems, and surface/subsurface contamination. Issues this survey did not address include, but are not limited to, asbestos containing building materials, fire/explosion hazards (which would be addressed by an insurance loss control survey), biological concerns (such as disease or infectious waste), public health/safety issues, community/worker right-to-know regulations, radiation hazards, or other environmental regulatory compliance requirements.

This preliminary site survey consisted of a cursory review of accessible documentation, interviews with people having knowledge of the property and a brief visual inspection of the property/facility. Although it provides a good screen for potential environmental liability, it should not be construed as a comprehensive evaluation of all possible environmental impairment associated with the site.

Given the often obscure and elusive nature of hazardous substances and the enormous liabilities they may represent, Unitek will not provide guarantees that negative findings during this preliminary site survey confirm the absence of all environmental contamination or liability. A far more in-depth investigation involving extensive sampling and laboratory analysis would need to be requested by the client for such assurance. Unitek Environmental Consultants, Inc. expressly disclaims any and all liability for representations, expressed or implied, contained in, or for omissions from this report, or any other written or oral communication transmitted to any party during the course of this survey which might be interpreted as establishing the total extent of all environmental liability present at the subject property/facility.

SOURCES OF INFORMATION

As a matter of necessity, Unitek relies largely on sources of information, such as client or public records and interviews, for recognizing potential environmental liabilities at a subject property/facility. Requests for information resources are made to collect relevant data on current and past practices conducted at the subject property/facility. Unitek may not receive all information requested or be able to confirm all information provided during the course of this preliminary site survey. Therefore, Unitek shall not be responsible for errors, omissions or misrepresentations resulting from missing documentation or from inaccurate information provided by such sources.

Documentation:

The following documents were examined during the course of this assessment. Copies were not retained nor included herein:

Real Property Ownership Records.

Tax Map Key.

Underground Storage Tank Registration list maintained by the State of Hawaii Department of Health, 1988.

Soil Survey, U.S. Department of Agriculture, Soil Conservation Service and University of Hawaii Agricultural Experimental Station, 1972.

Topographic Maps published by the United States Geological Survey, 1983.

EPA Region IX RCRA Database maintained by the U.S. Environmental Protection Agency, 1988.

Polk's Directory of City and County of Honolulu (Hawaii), 1960 through 1983 Editions.

Territory of Hawaii Maps, Vol. 6, published by Sandborn Map Company, New York, 1956.

The following documents were reviewed and copies are included in the Appendix:

Addendum 1 to the "Agreement for Environmental Consulting Services" dated August 11, 1989, herein also referred to as the questionnaire.

Material Safety Data Sheets for Burke Company products used in the precast operation.

The following persons were interviewed during the course of this assessment:

Mr. Catalino Balmilero, Duty Free Shoppers, Ltd.

Ms. Dorothy Ching, Loyalty Enterprises.

Ms. Nora Emilyon, Office Supervisor, DHL.

Mr. Dennis Freitas, Customer Engineer, Hawaiian Electric Company, Inc.

Mr. Robert Hadley, Vice President, Airport Industrial Park Associates.

Mr. John Hulton, Attorney (for Champion Properties).

Mr. Henry Muronaga, Warehouse Manager, Duty Free Shoppers, Ltd.

Mr. Herbert Nagata, Loyalty Enterprises.

Mr. Masa Nakai, M. Nakai Repair Service, Ltd.

Mr. Paul Oshiro, Loyalty Enterprises.

Mr. Larry Tamashiro, Mid-Pacific Airlines, Inc.

Mr. Harvey White, Ironworkers Superintendent, Airport Industrial Park Associates.

Mr. Virgil White, Foreman, Airport Industrial Park Associates.

Observations:

The following personnel conducted the site survey on August 11, 1989 and August 18, 1989:

Mr. Robert Weber, Senior Environmental Scientist, and Mr. Stephen Smith, Environmental Scientist, both of Unitek Environmental Consultants, Inc., performed a visual survey for PCB containing electrical equipment, hazardous chemical materials, hazardous chemical wastes, underground storage tanks and surface/subsurface contamination. They also reviewed available public records.

SITE DESCRIPTION AND HISTORY

Documentation:

Real Property Ownership Records.

Tax Map Key.

Polk's Directory of City and County of Honolulu (Hawaii), 1960 through 1983 Editions.

Territory of Hawaii Maps, Vol. 6, published by Sandborn Map Company, New York, 1956.

Interviews:

Mr. Catalino Balmilero, Duty Free Shoppers, Ltd.

Ms. Dorothy Ching, Loyalty Enterprises.

Ms. Nora Emilyon, Office Supervisor, DHL.

Mr. Robert Hadley, Vice President, Airport Industrial Park Associates.

Mr. John Hulton, Attorney (for Champion Properties).

Mr. Herbert Nagata, Loyalty Enterprises.

Mr. Masa Nakai, M. Nakai Repair Service, Ltd.

Mr. Paul Oshiro, Loyalty Enterprises.

Mr. Larry Tamashiro, Mid Pacific Airlines, Inc.

Mr. Harvey White, Ironworkers Superintendent, Airport Industrial Park Associates.

Mr. Virgil White, Foreman, Airport Industrial Park Associates.

Mr. David Shimokawa, Airport Division, Property Management Group.

Observations:

The subject property is located at 3375 Koapaka Street, Honolulu, Hawaii on the north side of the Honolulu International Airport. Designated as tax map key (TMK) 1-1-15:013, the "L" shaped property occupies 546,210 square feet of the Airport Industrial Park Subdivision and is currently owned by Loyalty Development Corporation. Airport Industrial Park Associates is constructing improvements on the site in three phases.

Phase I occupies 224,026 square feet of the north end of the property adjacent to the west end of Koapaka Street. A large (258,000 square feet) three-story reinforced concrete structure provides warehouse, retail, and business office space. Many tenants had begun occupancy on the date of the inspection. Phase II covers the majority of the site (formerly TMK 1-1-15:011 and portion of 014) and will support a structure similar to Phase I. The balance of the site will support a sixteen-story hotel with four levels of parking. Currently, precast operations are in progress in the Phase II area, and Complete Auto Prep Corporation continues servicing automobiles. The hotel site occupies the southeast corner of the site along Palea Street (formerly remainder of TMK 1-1-15:014).

North of Phase I across Koapaka Street is the Holiday Inn hotel. Beyond the hotel is Nimitz Highway, the H-1 Freeway and a U.S. Naval residential area. North of Phase II, and east of Phase I is Tropical Rent-A- Car. The 298,147 square foot site supports a reinforced concrete building used to park and service rental cars. Vehicle maintenance shops and underground fuel storage tanks are located on the site. North of the Tropical Rent-A- Car site on Koapaka Street are a variety of warehouses and retail businesses. North of the hotel site is a Hawaiian Electric Company, Inc. substation.

Palea Street borders the east side of the property along the hotel site. Beyond the street are the warehouses and light industry of the Airport Industrial Park Subdivision.

South of the subject site are parking and terminals for Honolulu International Airport. A gas station is located on the airport property south of the hotel site. Aviation fuel is stored in sixteen large above ground storage tanks approximately 500,000 to 1,000,000 gallons each, 300 meters southeast of the subject site.

The main Honolulu Post Office is located west of the project site across Rodgers Boulevard. Rodgers Boulevard provides the primary access to the Honolulu International Airport.

Damon Track, a residential area, occupied the site of the Airport Industrial Park Subdivision until the late 1950's. The Lewers & Cooke Lumber Yard was located on the subject site from 1965 to 1979. Multiple tenants occupied the subject site during the 1980s including United Parcel Post, Chrysler New Car Prep, and Mid Pacific Airlines' parts department. Airport Industrial Park Associates began leasing the property in 1981.

PCB ELECTRICAL EQUIPMENT

Documentation:

Addendum 1

Interviews:

Mr. Catalino Balmilero, Duty Free Shoppers, Ltd.

Mr. Dennis Frietas, Customer Engineer, Hawaiian Electric Company, Inc.

Mr. Robert Hadley, Vice President, Airport Industrial Park Associates.

Mr. Harvey White, Ironworkers Superintendent, Airport Industrial Park Associates.

Mr. Virgil White, Foreman, Airport Industrial Park Associates.

Observations:

Site owned electrical transformers were observed in use in the recently completed Phase I facility, and associated with the temporary power supply for the Phase II office and precast operations. Demolition of former Phase II improvements prevented inventory of any fluid filled, site owned transformers or capacitors at that location. However, no transformers or capacitors were reported by the demolition supervisor. No transformers were observed associated with the hotel site existing facility. All transformers observed during the visual inspection appeared to be dry-type according to the manufacturer's identification plate. Additionally, all transformers and capacitors for the Phase I facility were reported to be purchased new for the 1988 construction.

Utility company owned fluid filled transformers were observed on Phase I and adjacent to the Phase II property. Hawaiian Electric Company, Inc. (HECO) utility pole mounted transformers numbered 27127, 27137, and 27138 are located on the northwest corner of the subject site near the west end of Koapaka Street. Two HECO pad mounted transformers service the Phase I facility. HECO transformers numbered 52252 and 52872 are located in HECO vault number 6039 and an un-numbered vault, respectively, located at the northeast corner of the facility.

HECO's Airport Substation is located adjacent to the north boundary of the hotel site. Numerous transformer vaults are located in the substation.

Fluorescent lighting is used in portions of the Phase I and the hotel site existing facilities. Fluorescent lighting was used in demolished Phase II structures and the remaining Complete Auto Prep Corporation facility.

Recommendations:

Polychlorinated Biphenyls (PCBs) is the common name for a family of chemicals introduced in 1929. PCBs have been widely used and distributed because of their excellent chemical stability, superior electrical properties, heat transfer capabilities, and fire resistance. Major applications and uses of PCBs have been as insulating fluids in heat exchangers, transformers, and capacitors, and as high temperature hydraulic fluids. PCBs have also been used in carbonless copy paper, paint pigment, synthetic rubber, wire insulation, adhesives, and protective coatings. The U.S. Environmental Protection Agency aggressively enforces regulations concerning PCB manufacturing, use, distribution, release and disposal under the Toxic Substances Control Act (TSCA). This federal agency extensively regulates the use, servicing, and disposal of PCBs in electrical equipment by enforcing marking, notification, inspection, and recordkeeping requirements. Seemingly minor discrepancies in any of these regulations may result in significant liability to the owner.

The distribution in commerce of PCB items was banned in 1979 (40 CFR 761.20). However, before any new or additional electrical equipment, including transformers, capacitors, or fluorescent light ballasts are bought or installed at the subject property, certification from the manufacturer that the equipment does not contain PCBs should be obtained. Or the purchase specifications should state "NO PCBs."

All site owned electrical transformers observed during the inspection appeared to be recently manufactured dry-type. HECO pad mount transformers 52252 and 52872 were determined by HECO to be PCB free. HECO owned utility pole mounted transformers numbered 27127, 27137, and 27138 and the pad mounted vaults in the substation should be assumed to contain PCBs since installation predates regulatory restrictions.

Hawaiian Electric Company, Inc. estimates the probability of a suspect transformer actually containing PCBs to be 1 in 3,000 based on statistical analysis of service records. As indicated by HECO, of Oahu's 300,000 transformers, only 100 are believed to contain PCBs.

If existing transformers contain PCBs, current TSCA regulations allows these transformers to remain in service for the remainder of their useful life, but with strict inspection and recordkeeping requirements for the owner or operator.

Fluorescent light ballast may contain PCBs. As long as the ballast contains less than three (3) pounds of PCB oil, it is not regulated. Ballasts and transformers can overheat and rupture, thereby contaminating the immediate area. If this should happen and the ballast or transformer is not known to be PCB free, the area should be immediately vacated and barricaded. Cleanup should only be conducted by trained and experienced chemical incident response personnel.

HAZARDOUS CHEMICAL MATERIALS

Documentation:

Addendum 1

Material Safety Data Sheets for Burke Company products used in the precast operation.

Interviews:

Mr. Robert Hadley, Vice President, Airport Industrial Park Associates.

Mr. Virgil White, Foreman, Airport Industrial Park Associates.

Observations:

Hazardous chemical materials were observed stored in the Airport Industrial Park Associates (AIPA), Phase I Warehouse. A variety of potentially hazardous chemical materials include, but are not necessarily limited to cigarette lighter fluid, distilled alcoholic beverages, perfume and lead/acid batteries (used to power fork lifts). All products appear to be well managed and packaged. No indication of gross leakage or spillage was observed contributing to any site contamination.

Hazardous materials were found in the concrete girder casting and storage area in Phase II. Burke Res-X concrete curing compound and Burke Release Form Oil are both used to construct the girders. Both compounds are stored in 55 gallon steel drums. A description of the products is presented in the Appendix. Number 2 diesel fuel (in 55 gallon drums) is stored on site to fuel heavy equipment. Chevron Heavy Duty Grease is also present, stored in 120 pound cans. Elemental sulfur is kept in a vat at the concrete compression strength testing station. The sulfur is melted and poured over small concrete cylinders (about 2" x 6") to smooth the surface prior to testing. Sulfur pieces are collected for reuse after testing.

The Complete Auto Prep Corporation area, also in Phase II, contains a spray paint booth. Paint, thinner and a specialized car cleaner (Zep Formula 664), used to remove the protective vehicle coating from the new cars, are stored on site. In the past, Unitek Environmental Services, Inc. has been retained to package and remove waste paint thinners from the site.

Recommendations:

Hazardous chemical materials used on site should be substituted with non-hazardous materials whenever possible. For example, water based paints may replace flammable oil-based paints in some applications. Biodegradable cleaners may replace cleaning solvents. A detailed list of commonly used hazardous materials and corresponding non-hazardous alternatives is available upon request from the State of Hawaii, Office of Environmental Quality Control at telephone number 548-6915.

When no alternative non-hazardous product is suitable, hazardous materials should be used, stored, and disposed according to the manufacturer's directions. Material safety data sheets (MSDSs) should be obtained from the manufacturer and the information provided used to establish worker and community right-to-know, and emergency programs for employees and the public, as required by state and federal regulations (Chapter 203 of Title 12 of the Hawaii Administrative Rules and Parts 355 and 370 of Title 40 of the Code of Federal Regulations).

Stored products on site should be limited to quantities that can be readily used. Site use products and those stocked for wholesale or retail distribution should be stored in marked, compatible containers, preferably in the manufacturer's original container. Expired shelf life, excess, spilled, and adulterated products that are no longer suitable for their original intended use could require disposal as hazardous waste under the Resource Conservation and Recovery Act (RCRA) depending on ignitability, corrosivity, reactivity, and toxicity characteristics, chemical composition, and quantity (40 CFR § 261). Waste solvents should be considered RCRA regulated hazardous waste (see next report section).

Care should be taken to avoid storing chemically incompatible products in proximity of each other. Many non-hazardous materials could form hazardous compounds if incorrectly or accidentally combined. Compatibility information should be available on container labels or MSDSs. Drums of hazardous materials such as chlorinated solvents should be stored in a bermed containment area with capacity to confine any product leaks or spills and prevent release to the environment.

In addition to state and federal environmental and occupational health requirements, local regulations may also apply to hazardous chemical materials. Fire codes may require the proper storage of flammable and combustible compounds such as petroleum naphtha, paint, or paint thinner in metal cabinets.

HAZARDOUS CHEMICAL WASTES

Documentation:

Addendum 1.

EPA Region IX RCRA Database maintained by the U.S. Environmental Protection Agency, 1988.

Polk's Directory of City and County of Honolulu (Hawaii), 1960 through 1983 Editions.

Interviews:

Mr. Catalino Balmilero, Duty Free Shoppers, Ltd.

Mr. Robert Hadley, Vice President, Airport Industrial Park Associates.

Mr. Henry Muronaga, Warehouse Manager, Duty Free Shoppers, Ltd.

Mr. Herbert Nagata, Loyalty Enterprises.

Mr. Paul Oshiro, Loyalty Enterprises.

Mr. Harvey White, Ironworkers Superintendent, Airport Industrial Park Associates.

Mr. Virgil White, Foreman, Airport Industrial Park Associates.

Mr. David Shimokawa, Airport Division, Property Management Group.

Observations:

Business activities that inherently generate hazardous chemical wastes were observed on site. Automotive maintenance and painting firms have been listed by the U.S. Environmental Protection Agency (EPA) among businesses that are likely generators of hazardous chemical wastes (EPA form 530-SW-86-019). Complete Auto Prep Corporation does not appear to be registered with the EPA as a hazardous waste generator, but has shipped hazardous waste off site as a "conditionally exempt" generator (CFR § 261.5) under previous ownership. Waste paints and solvents are generated at the site. Mid Pacific Airlines was registered as a hazardous waste generator (EPA RCRA hazardous waste generator identification number HID981658457). Waste petroleum products contaminated with methylene chloride were shipped from the site for mainland hazardous waste disposal.

Interviews with property managers and advertising in the City Directory did not indicate the former Lewers & Cooke lumber yard performed any wood treating activity on the subject site.

Recommendations:

Hazardous chemical waste accumulation, transportation, storage, treatment, and disposal are highly regulated activities. Congress enacted the Resource Conservation and Recovery Act (RCRA) in 1976 and the Hazardous and Solid Waste Amendments (HSWA) in 1984, which provide specific guidelines for these activities and severe penalties for noncompliance. Regulations pertinent to hazardous waste management are promulgated by the U.S. Environmental Protection Agency (EPA) in Title 40 of the Code of Federal Regulations (CFR), by the U.S. Department of Transportation (DOT) in Title 49 CFR, and by the Occupational Safety and Health Administration (OSHA) in Title 29 CFR and Chapter 12-99, Hawaii Administrative Rules.

Any business that generates hazardous waste is regulated to some extent, with larger generators (those that produce more than 1,000 kg in any calendar month) regulated to a far greater degree. Hazardous waste is defined as any waste which is specifically listed in 40 CFR Part 261 Subpart D, meets the characteristics of ignitability, corrosivity, reactivity, or toxicity identified in 40 CFR Part 261 Subpart C or contains a mixture of hazardous and non-hazardous wastes. It is the generator's responsibility to determine which wastes are hazardous. This can be accomplished by analytical testing, review of MSDSs, or through a thorough knowledge of the product characteristics. A hazardous waste generators identification number must be obtained by application to the EPA Region IX headquarters in San Francisco. EPA form 8700-12 is used for application and can be acquired from the EPA Pacific Islands Contact Office in the Prince Kuhio Federal Building in downtown Honolulu.

Additionally, the generator may store hazardous waste on site only in limited quantity and only for a limited period of time. Hazardous waste must be properly labeled, packaged, and marked. Transportation may be performed only by an EPA-listed transporter and only to an EPA-permitted treatment, storage, and disposal facility (TSDF). A uniform hazardous waste manifest (UHWM) must accompany all off-site shipments and copies must be retained by the generator and transporter for a minimum of three years. The generator is responsible for his waste from "cradle to grave".

Waste paints, solvents, and paint thinners are regulated due to their exhibition of the ignitability characteristic (40 CFR § 261.21) and may be specifically listed depending on particular constituents. Generators of these RCRA hazardous wastes must comply with the above regulatory requirements. Complete Auto Prep Corporation should perform an environmental audit to assure they are in compliance with RCRA regulations.

Waste solvent may be recycled through a recycler such as Safety-Kleen. Safety-Kleen can remove spent solvent, provide clean solvent, and prepare all documentation required by the EPA.

Hazardous chemical materials that are no longer suitable for their original intended use due to spillage, leakage, expired shelf life or adulteration may be considered regulated hazardous wastes. Businesses displaced from the site due to construction activities should be encouraged to remove hazardous materials and hazardous waste prior to departure to prevent potential contamination of the site and to minimize AIPA adopting liability for proper disposal of those wastes.

UNDERGROUND STORAGE TANK SYSTEMS

Documentation:

Underground Storage Tank Registration List as maintained by the State of Hawaii Department of Health, 1988.

Interviews:

Ms. Dorothy Ching, Loyalty Enterprises.

Ms. Nora Emilyon, DHL, Office Supervisor.

Mr. Robert Hadley, Vice President, Airport Industrial Park Associates.

Mr. Herbert Nagata, Loyalty Enterprises.

Mr. Masa Nakai, M. Nakai Repair Service.

Mr. Paul Oshiro, Loyalty Enterprises.

Mr. Larry Tamashiro, Mid Pacific Airlines, Inc.

Mr. Harvey White, Ironworkers Superintendent, Airport Industrial Park Associates.

Mr. Virgil White, Foreman, Airport Industrial Park Associates.

Observations:

Indications of four underground storage tanks were observed on the property or, the date of the site reconnaissance. A tank, estimated to be 10,000 gallons in capacity was located at the northwest corner of the Complete Auto Prep Corporation service area. A second 10,000 gallon capacity tank was located at the northwest corner of the DHL building, formally UPS. At the southwest corner of the same building there was evidence of a waste oil storage tank. Electromagnetic toning and exploratory excavation indicates that this tank has already been removed. A new tank has been installed adjacent to the emergency generator near the northeast corner of the AIPA Phase I warehouse. This tank appears to meet all current regulations relative to underground storage tanks. The (former) Mid Pacific Airlines warehouse had two underground storage tanks used to store methanol. They were 6,000 and 4,000 gallons capacity respectively and were removed on December 23, 1988 by M. Nakai Repair Service. The two 10,000 gallon capacity tanks described above were removed subsequent to the site reconnaissance on August 25 and 26, 1989 by Unitek Environmental Consultants, Inc.

Large surface and subsurface fuel storage tanks were observed on properties to the north, east and south of the subject property. The possibility of subsurface contamination from these nearby tanks should be considered. It should be noted that the property immediately south of Aolele Street is owned by the State of Hawaii, Department of Transportation, Airports Division.

Recommendations:

Additional visual reconnaissance should be performed as stored materials on Phase II are moved to other locations to confirm the presence or absence of other underground storage tank systems on the subject property. Poor registration compliance and changes in site use and personnel may confound visual reconnaissance for tank systems. Typical visual indicators include fill pipes, vent pipes, dispenser pumps and asphalt or concrete caps.

All underground storage tanks are to be registered (40 CFR § 280.22) with the State of Hawaii Department of Health and the City and County of Honolulu, Fire Department. Section 342-62 of the Hawaii Revised Statutes requires that the owner of an existing underground storage tank system shall notify the Department of Health by December 31, 1986 of the existence of subsurface system and specify the age, size, type, location and uses. Notification of the tank system should be made to the Department of Health using EPA form 7530-1. The form is to be returned to Administration, Hazardous Waste Program, Hawaii Department of Health, 645 Halekauwila Street, 2nd Floor, Honolulu, Hawaii 96813. Notification to the Fire Prevention Bureau can be completed by sending a letter containing tank system information to the City and County of Honolulu Fire Department, 1455 South Beretania Street, Honolulu, Hawaii 96814.

Recently enacted underground fuel storage tank regulations promulgated by EPA (effective December 22, 1988) prescribe stringent requirements for owners and operators of underground storage tanks. Regulations govern leak detection, corrosion protection, and spill/overfill prevention for both tanks and associated piping. The Federal regulations also require tank owners to demonstrate financial responsibility.

Leak detection requirements provide three options for tank owners and operators:

- Monthly monitoring (automatic tank gauging, interstitial monitoring, groundwater monitoring, or other approved methods).
- Monthly inventory control and annual tightness testing (can be used until December 1998).
- Monthly inventory control and tightness testing every 5 years (can be used until the later of 10 years after installation of corrosion protection or spill/overfill prevention or until December 1998).

Leak detection for suction piping must conform to:

- Monthly monitoring (as above, except for automatic tank gauging).
- Line testing every 3 years.
- No requirements (under specific conditions).

Deadlines for leak detection implementation are staggered, with older or unknown age tanks requiring earliest compliance. Additional requirements exist for pressurized piping.

Corrosion protection for both tanks and piping must be in place by December 1998.

- Fiberglass construction.
- Cathodic protection.
- Interior lining (tanks only).
- Interior lining and cathodic protection (tanks only).

Spill/overfill prevention measures, required by December 1998 for all tanks, specify installation of a catchment system plus one of the following:

- Automatic shut-off device.
- Overfill alarms.
- Ball float valves.

New tanks must meet all these requirements at the time of installation.

Effective January 24, 1989, EPA also required all owners or operators of underground fuel storage tanks to demonstrate financial responsibility for corrective action and compensation of third parties for bodily injury and property damage caused by sudden and nonsudden accidental releases of their tanks. Owners or operators of no more than 100 underground fuel tanks must maintain coverage of $1 million annual aggregate. If the owner or operator has more than 100 underground fuel tanks, the annual aggregate increases to $2 million. Additionally, if monthly throughput of the stored material is 10,000 gallons or less, the owner or operator must maintain $500,000 of per occurrence coverage. If greater than 10,000 gallons, this required coverage increases to $1 million.

It is recommended that precaution be exercized during tank filling to prevent overfill and ground contamination.

Existing underground storage tank systems may be removed from service. Consideration should be given to precision leak test the system before removal. The high density population of underground storage tanks proximal to the subject site provides a strong likelihood of subsurface contamination. Evidence of tank tightness prior to removal presents a good basis that subsurface soil and water contamination that may be present are contributed by an off site source.

The preferred method for decommissioning an underground tank is to excavate, de-gas, and remove the tank and associated piping. Tanks should be removed carefully to prevent damage during removal. Soil and/or water from around the tank must be sampled and analyzed for any contamination by the tank product. Associated piping should be cut several feet back from the tank so that the bulkhead fittings can also be inspected after removal. The condition of the tank, fittings, and exposed piping should be noted and documented adequately to preserve for future reference any useful information regarding the integrity of the tank system. These procedures are obviously important where there is reason to believe a leak has occured or where there has been no previous verification of tank integrity. It may also be important to help eliminate the tank as a source of contamination if a problem is reported in the vicinity at a later date.

After removing residual product, the interior of the tank should be cleaned with an appropriate solvent. Residual sludge and any solvent rinsate should be contained in DOT specified drums and disposed as hazardous waste. The cleaned and empty tank should be cut up, crushed, or otherwise rendered unusable as a tank. A certificate of destruction should be obtained from the disposal site to insure the tank is not reused. Reuse could extend the liability of the original owner.

Federal regulations (40 CFR § 280.22) require assessment of the immediate environment around the tank for soil/water contamination upon removal. Results of the excavation zone assessment must be maintained on file for a minimum of three years after completion of permanent closure. Unitek recommends that a minimum of two soil samples be collected from beneath the tank, one from directly beneath the fill pipe, the other from a similar position at the opposite end of the tank. If obviously stained or contaminated areas exist in locations other than the two above locations, then additional soil samples should be collected from these areas. Initial laboratory analysis should focus on constituents of the product previously stored in the tank.

Total petroleum hydrocarbons would be appropriate for a diesel storage tank, while benzene, toluene, xylene, ethylbenzene and lead would be appropriate for a gasoline tank.

The State of Hawaii Department of Health and the City and County of Honolulu Fire Department must both be notified at least 30 days prior to tank system removal or closure.

The underground diesel storage tank associated with the electric generator at the Phase I, Duty Free Shoppers warehouse needs to be registered as described above and a leak detection program implemented according to the previously stated guidelines. This was the only underground storage tank observed in service on the subject site.

SURFACE/SUBSURFACE CONTAMINATION

Documentation:

Well drilling records maintained by the State of Hawaii Department of Land and Natural Recources.

Soil Survey, U.S. Department of Agriculture, Soil Conservation Service and University of Hawaii Agriculture Experiment Station, 1972.

Topographic Maps published by the United States Geological Survey, 1983.

Interviews:

Mr. Robert Hadley, Vice President, Airport Industrial Park Associates.

Mr. Harvey White, Ironworkers Superintendent, Airport Industrial Park Associates.

Mr. Virgil White, Foreman, Airport Industrial Park Associates.

Observations:

The U.S. Department of Agriculture has classified the naturally occurring near surface soils on the site as being predominately Makalapa clay with some Keaau stony clay along the southern border of the property. The Makalapa series are formed in volcanic tuff which occurs on Oahu near Salt Lake Crater, Diamond Head and on the Mokapu Peninsula. A representative profile of Makalapa clay would contain a very dark grayish-brown surface layer, about 8 inches thick. Next is an 18- to 36-inch thick layer of very dark grayish brown clay to silty loam with the latter having a subangular, blocky structure. Below this is light gray to dark grayish brown weathered tuff. These clays are very sticky and plastic. Permeability and run off are slow and erosion hazards are slight. Slopes are generally 2 to 6 percent. The shrink-swell potential is high.

The Keaau series consists of poorly drained soil on the coastal plains of Oahu. These soils appear to have developed in alluvium deposited over reef limestone or consolidated coral sand. Keaau stony clay generally has slopes of 2 to 6 percent. Like the Makalapa clay, the Keaau stony clay has slow run off and slight erosion hazards.

Groundwater in the immediate vicinity of the site is brackish basal water not currently developed as a drinking water source. The site is almost completely covered by structures or asphalt-paved parking areas. Soils for the small cultivated areas do not appear to be indigenous.

One underground fuel storage tank is located on the project site. There are large underground and/or subsurface storage tanks located to the north, east and south of the property.

Recommendations:

The objective of sampling is to identify areas of environmental concern and to document environmental quality for the site. It is therefore critical to consider all areas of potential environmental concern. These areas include all existing or former locations involved in generating, manufacturing, refining, transporting, storing, handling, treating, or disposing of hazardous materials or wastes. Sites of concern may additionally include areas outside of the immediate location involved in the management of hazardous materials and wastes. This includes areas where residual contaminants may be expected to migrate and accumulate (e.g., drainage system catch basin).

Determining appropriate sampling locations is often a matter of professional judgement based on site specific characteristics. This includes physical characteristics of the area (drainage patterns, subsurface characteristics and historical changes in site use) as well as characteristics of the potential contaminants (density, solubility, etc.). Sampling frequency is dependent on assuring that a sufficient number of samples are collected to adequately represent and characterize the environmental media under evaluation or define the extent of contamination.

Only an exhaustive subsurface and groundwater investigation can accurately assess all potential soil and water contamination on the subject property. Petroleum products, dry cleaning solvents, underground storage tanks, or hazardous materials formerly used or currently in use on the subject site or adjacent properties are possible sources of subsurface contamination. Such a subsurface investigation would consist of soil borings and, if warranted, the installation of monitoring wells to facilitate groundwater sampling.

APPENDIX

RECEIVED
AUG 11 1989

ADDENDUM 1

TO AGREEMENT FOR ENVIRONMENTAL CONSULTING SERVICES IPA

PROPERTY/FACILITY QUESTIONNAIRE

This Questionnaire is subject to all of the terms and conditions of the "Agreement for Environmental Consulting Services". All questions must be answered. Do not leave any blanks. Answer "none" or "not applicable" or "unknown" if suitable. Attach additional sheets or drawings if necessary so that each question is properly and thoroughly answered.

PROPERTY/FACILITY IDENTIFICATION

Property/Facility Name: Airport Industrial Park
Address: 3375 Koapaka St., Honolulu, HI 96819
Contact: Robert Hadhi Telephone: (808) 833-1304

Current Operator: Airport Industrial Park Associates
Address: Same as above
Contact: Same as above Telephone: (___) Same as above

Building Owner: Not yet constructed
Address: N/A
Contact: N/A Telephone: (___) N/A

Land Owner: ____________
Address: ____________
Contact: ____________ Telephone: (___) ____________

PROPERTY/FACILITY DESCRIPTION

Describe the Present Uses of the property/facility including all current operations and services performed on-site:

Phase I - West end: Precast concrete yard & precast storage
Central: [illegible] business, [illegible] [illegible], [illegible]
[illegible] air conditioner installation & precast storage
East end: Demolition of old dry [illegible] structure, precast
storage & [illegible] distribution center
Phase II - Multi-story warehouse

Describe the Past Uses of the property/facility including all operations and services which were previously performed on-site:

(Not necess. in order)
Rough lumber [illegible] & [illegible] operation with some storage
Rental [illegible] for trailers & [illegible] construction, etc.
Chrysler [illegible] operation & [illegible] prep bldg.
Mall Bldg. [illegible] & [illegible] center
U.P.S. - [illegible] maintenance center

3/88

STORAGE PRACTICES

Describe the type, quantity, age, capacity, contents, and location of all past and present Above Ground Storage Vessels including but not limited to containers (pails, drums, portable tanks) and active or inactive stationary tanks and pipelines (including underground pipelines), surface impoundments, and chemical/waste piles; and indicate which, if any, governmental activities have been notified of such above ground storage vessels:

- Various barrels of diesel oil, [illegible] oil, [illegible] [illegible] (Bruce Weber & Steve Smith [illegible])
- No known above ground storage tanks.
- No known waste piles or surface impoundments.
- [illegible] being checked with [illegible]. (R.M. [illegible])
- Unknown government [illegible]

Describe the type, quantity, age, capacity, contents, and location of all past and present Below Ground Storage Vessels including but not limited to active or inactive underground tanks and pipelines; and indicate which, if any, governmental activities have been notified of such below ground storage vessels:

- One active [illegible] [illegible] (Est. [illegible] gal)
- One [illegible] [illegible] 24' (Est. [illegible] gal)
- Possible other [illegible]
- Unknown [illegible]

Describe any spill or leak Contingency Measures which are in effect such as tank overfill alarms, corrosion protection systems, bermed storage areas (i.e., secondary containment), monitoring wells, and spill cleanup materials; and describe any emergency response plans including employee training which have been implemented:

- Responsibility of tenants [illegible]
- Contractor has safety plan for [illegible] operation. [illegible]

DISPOSAL PRACTICES

Describe all On-Site Treatment and Disposal Practices, past and present, including but not limited to land application, landfills, injection wells, ocean disposal, septic tanks, sewers, incinerators, or any discharges or emissions whatsoever onto or into soil, onto or into surface/groundwater, or into the atmosphere; and indicate which, if any, governmental activities have been notified of such treatment and disposal practices:

- Only known systems are storm & sanitary sewers which [illegible] into municipal systems. Details to be shown on plans ordered from engineer for [illegible].

Describe all Off-Site Treatment and Disposal Practices, past and present, and specify the names and addresses of all transporters and treatment/storage/disposal facilities (including landfills) which have been used for liquid and solid waste (including solvents and used oil); and indicate which, if any, governmental activities have been notified of such treatment and disposal practices:

- Unknown. Will have to follow up with contractor. [illegible]

HAZARDOUS MATERIALS

Describe the type, quantity, and location of any known or suspected Asbestos Containing Building Materials (or other asbestos products used on-site) including but not limited to pipe/duct insulation, ceiling/wall coverings, floor tiles, and transite piping; and indicate which, if any, governmental activities have been notified of such asbestos:

None known.

Describe the type, quantity, and location of any and all electrical transformers and capacitors (including florescent ballasts); and indicate whether they are known to contain Polychlorinated Biphenyls (and if so, please provide a copy of the laboratory report and indicate whether an inspection/management plan has been developed and is in operation); and which, if any, governmental activities have been notified of such PCB:

- Transformer [illegible] as shown on walk through with [illegible] Smith, Robert Weber - shown all [illegible] [illegible] in [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] - All appear to be dry type.

Describe any and all Chemicals including raw materials, products, byproducts, or waste (including solvents and used oil) not previously described that have been or are presently generated, manufactured, treated, stored, handled, or disposed at the property/facility; and indicate which, if any, governmental activities have been notified of their use:

- Soap [illegible] [illegible] is believed to be trapped, but is [illegible] to be biodegradable
- No others known.

ENVIRONMENTAL REGULATORY AFFAIRS

List all federal, state, and local Environmental Permits related to the property/facility which have been issued, which are pending, or which have been denied; and include the permit number, the name of the regulatory agency, the date of approval or denial, the date of expiration or reason for denial, and provide your EPA twelve digit Identification Number if one has been issued:

None known.

Describe any previous Environmental Assessments including but not limited to surveys, investigations, audits, or impact statements which have been performed for the property/facility and attach a copy of the report to this questionnaire:

None known.

Describe any Federal, State, or Local Laws, statutes, rules, or other regulations relating to the protection of the environment with which you have not in the past or cannot at present comply:

Unknown at present.

Identify all Environmental Violations including but not limited to administrative orders, temporary or permanent injunctions, civil penalties, or criminal actions concerning the environment issued at any time against the property/facility, its owners, its operators, or its managers; and for each action provide the date, the agency or regulatory body involved, the type of action, a description of the violation, and how the violation was resolved:

None known.

Describe any known or suspected Spills or Discharges of hazardous materials or hazardous wastes onto or into soil, onto or into surface/groundwater, or into the atmosphere which have occurred in the past or are presently occurring at the property/facility:

None known.

NEIGHBORING PROPERTIES/FACILITIES

Describe the Past and Present Uses of neighboring properties/facilities including any operations or services they perform:
Warehouse, hotel, packing, state highway.

Describe any Storage, Treatment, or Disposal Practices, past or present, by neighboring properties/facilities which may have caused any contamination of Client's property/facility:
None known.

Describe any known or suspected Spills or Discharges of hazardous materials or hazardous wastes onto or into soil, onto or into surface/groundwater, or into the atmosphere which have occurred in the past or are presently occurring at neighboring properties/facilities which may have caused any contamination of Client's property/facility:
None known.

CLIENT CERTIFICATION

Client hereby certifies that, to the best of its knowledge and belief and based upon reasonable investigation, the information furnished in this seven page Addendum is true. Client further warrants and represents that the information contained in this Addendum constitutes a full and accurate representation of Client's activities with respect to the use or presence of hazardous materials and hazardous wastes on the property or at the facility.

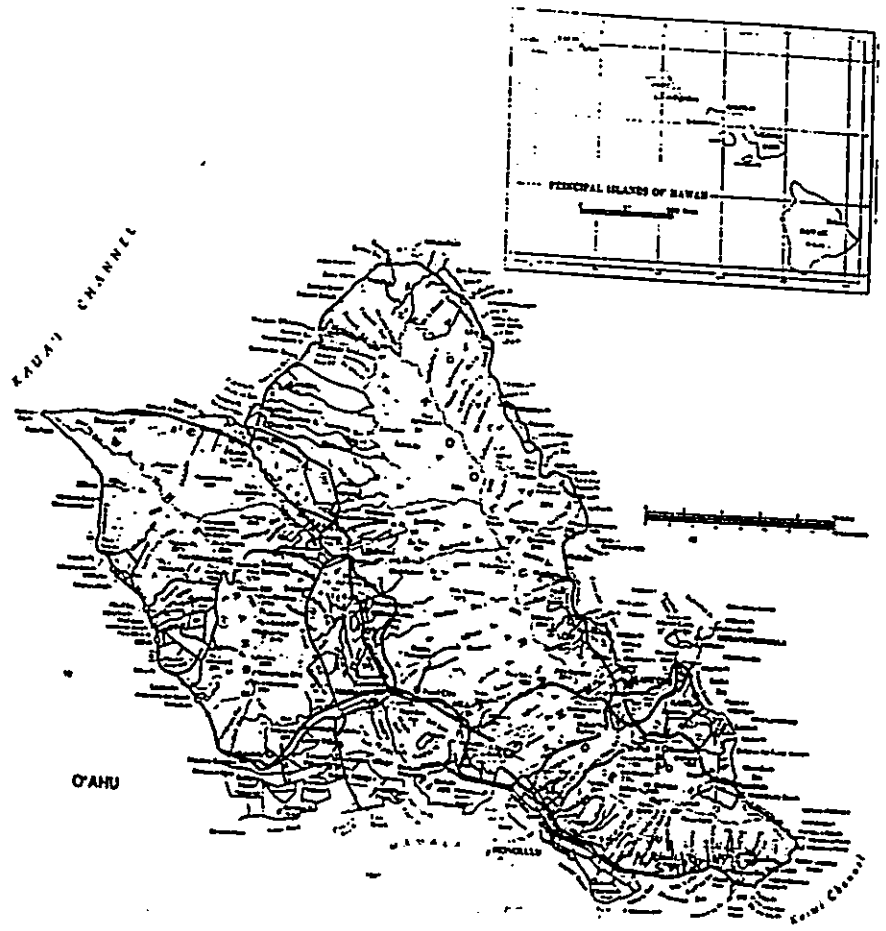
Airport Industrial Park Associates
(client name)

(signature)

Robert M Hadley
(typed or printed name)

Vice - President
(title)

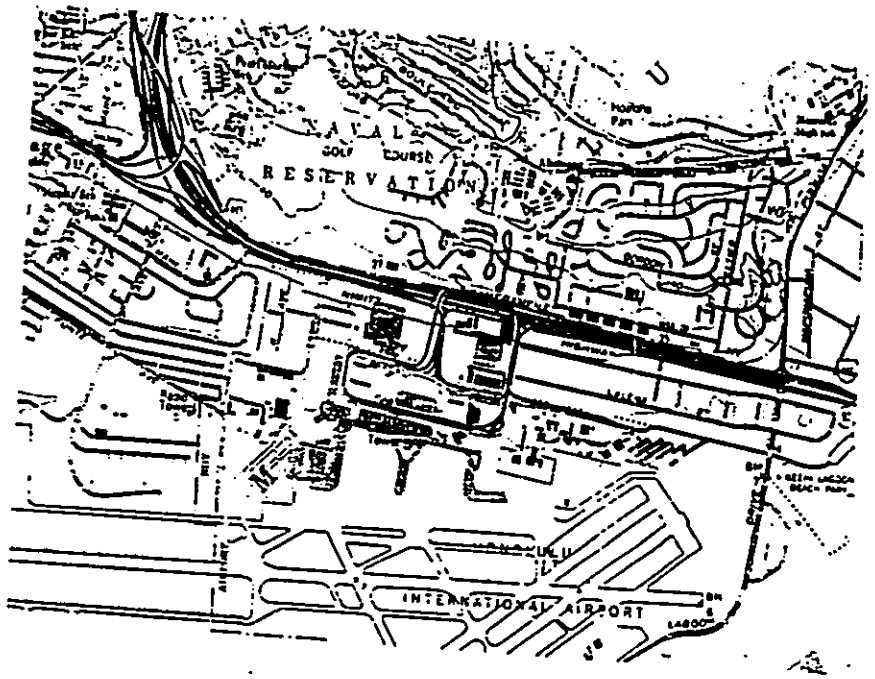
8/16/88
(date of signature)



UNITEK ENVIRONMENTAL CONSULTANTS, INC.

Environmental Assessment for
Airport Industrial Park Associates

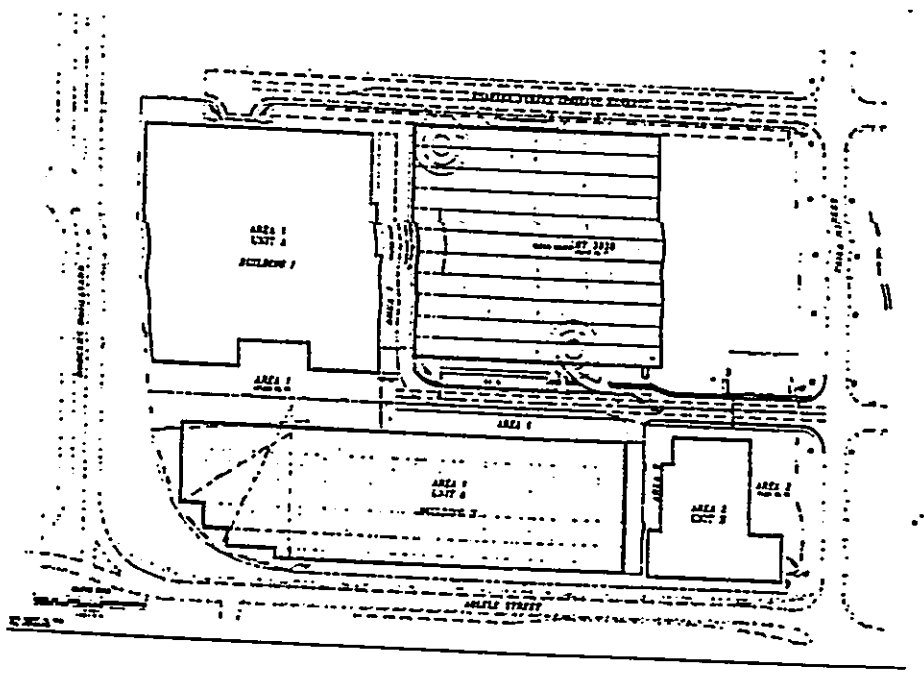
Site Location Map
Figure 1



UNITEK ENVIRONMENTAL CONSULTANTS, INC.

Environmental Assessment for
Airport Industrial Park Associates

Topographic Map
Figure 2



UNITEK ENVIRONMENTAL CONSULTANTS, INC.

Environmental Assessment for
Airport Industrial Park Associates

Site Plan
Figure 3

MATERIAL SAFETY DATA SHEET

Product Name: BURKE RELEASE NO 1

SECTION 1:

MANUFACTURER'S NAME: The Burke Company
ADDRESS: 2655 Campus Drive
CITY, STATE, ZIP: San Mateo, CA 94403
SIGNATURE OF PERSON RESPONSIBLE FOR OPERATION:

EMERGENCY PHONE NO: (213) 834-3401
OTHER INFORMATION: (415) 349-7600

Section 2: HAZARDOUS INGREDIENTS/IDENTITY

DATE PREPARED: August 8, 1986

HAZARDOUS COMPONENTS (chemical and common name)	OSHA PEL	ACGIH TLV	Other Exposure Limits	%	CAS NO.
Rosin Acid	Not established.	Not established.	N/A		8018817

SECTION 3: PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 480°F

SPECIFIC GRAVITY (H_2O=1): 0.867

VAPOR PRESSURE (mmHg): Nil

pH: N/A

VAPOR DENSITY (Air=1): Nil

SOLUBILITY IN WATER: None.

REACTIVITY IN WATER: None.

APPEARANCE AND COLOR: Brownish liquid with petroleum odor.

MELTING POINT: N/A

SECTION 4: FIRE AND EXPLOSION DATA

FLASH POINT: 176°F
METHOD USED: TCC

AUTO-IGNITION TEMPERATURE: 600°F

FLAMMABLE LIMITS IN AIR & BY VOLUME: LEL Lower 2.0 UEL Upper 6.5

EXTINGUISHER MEDIA: Dry chemical, CO_2

SPECIAL FIRE FIGHTING PROCEDURES: None.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

SECTION 5: PHYSICAL HAZARDS (REACTIVITY DATA)

STABILITY: Unstable ☐ Stable ☒ Conditions to Avoid: None.

INCOMPATABILITY (Materials to Avoid): Strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS: CO, CO_2

HAZARDOUS POLYMERIZATION: May Occur ☐ Will Not Occur ☒ Conditions to Avoid: None.

MATERIAL SAFETY DATA SHEET
Page -2-

Product: BURKE RELEASE NO. 1

SECTION 6: HEALTH HAZARDS

ACUTE: Headache.

CHRONIC: Not known.

SIGNS AND SYMPTOMS OF EXPOSURE: Overexposure may cause headache, dizziness.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Not known.

CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN:

National Toxicology Program	[ ] Yes [X] No	I.A.R.C. Monographs	[ ] Yes [X] No	OSHA	[ ] Yes [X] No

EMERGENCY AND FIRST AID PROCEDURES:
ROUTES OF ENTRY: Inhalation: Remove to fresh air area.
Eyes: Flush with plenty of water.
Skin: Flush with plenty of water.
Ingestion: Call a physician.

SECTION 7: SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Normal.

OTHER PRECAUTIONS: None.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Recover free liquid. Clean up with absorbant materials.

WASTE DISPOSAL METHODS (Consult Federal, State and Local Regulations): Dispose of accordance with regulations.

SECTION 8: SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

RESPIRATORY PROTECTION (Specify Type): Hydrocarbon vapor cannister.
Ventilation:
Local Exhaust: Recommend.
Mechanical: Recommend.
Special: None.
Other: None.

PROTECTIVE GLOVES: Recommend.

EYE PROTECTION: Safety goggles.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Long leg, long sleeve clothing.

WORK/HYGIENE PRACTICES: Wash hands before handling food.

BURKE

RES-X CURING COMPOUND

7655 Campus Drive · P.O. Box 5818 · San Mateo, California 94402 · TLX 332990 · (415) 349-7600

1. **PRODUCT NAME:** Res-X Curing Compound

2. **MANUFACTURED BY:** The Burke Company

3. **PRODUCT DESCRIPTION**

Basic Use

Res-X is a clear cure that dries quickly to a hard, vapor-proof membrane. Res-X forms a continuous film for the critical curing period, then starts an oxidation cycle. During a normal oxidation period of 45 to 60 days with exposure to the sun's ultraviolet light, this film will oxidize and disintegrate into a dry powder dust. Powder should be removed with a wire brush before applying paint, floor tile adhesives, or other coatings.

Res-X is especially desirable for interior or exterior concrete which will receive additional treatment such as paint, coatings or flooring material.

Composition

Res-X is a clear, all resin base liquid membrane-forming concrete curing compound. It is a solution of resinous solids and petroleum solvent. It contains no wax, paraffin or oil. A fugitive dye is added to provide a visual check of coverage during application.

Packaging

55 gallon (208 liter) drum. Order No. (302) 47-120
5 gallon (19 liter) container. Order No. (302) 47-125

4. **SPECIFICATIONS**

When applied at a specified rate, Res-X conforms to:

ASTM C-309, Type 1-D, Class A & B
AASHTO Des. M-148, Type 1-D, Class A & B

Air Pollution Control District #442
CGSB-90-GP-1a Type 1

* White pigment may be furnished on request.

5. APPLICATION INSTRUCTIONS

Apply as a curing compound on newly poured concrete surfaces immediately after final finishing when the water sheen has disappeared.

The most effective means of application is by hand or power sprayer. Care should be taken to insure an even film is obtained without over or under-applying. Application is not recommended at temperatures below 40° F.(4°C).

Excessive application or puddling will increase oxidation time and may necessitate manual removal of the membrane prior to coating or painting. Any residue remaining can easily be removed by wire brushing or by washing with a light solution of muriatic acid or trisodium phosphate (TSP).

Coverage Rates

Smooth Steel Trowel Surface — 300 sq. ft./gal. (7 sq. meters per liter)
Rough Bull Float Surface — 200 sq. ft./gal. (5m²/liter)
Rates may vary according to specification. Application equipment should be cleaned thoroughly with mineral spirits.

6. SUGGESTED SHORT FORM ARCHITECTURAL SPECIFICATION

All interior and exterior concrete surfaces, where so indicated, shall be cured with Res-X as manufactured by The Burke Company, San Mateo, California. It shall meet the moisture retention requirements of ASTM C 309-81, "Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete" (i.e. 0.55kg/m² at 72 hours), when tested in accordance with ASTM C 156-80 at the coverage rate recommended by the manufacturer.

7. WARRANTY

Burke products will perform according to specifications only if directions are followed. Burke is not responsible for improper use, application, or storage of its products or for use of its products in unsafe weather or with unsafe engineering or working conditions. Burke products are supplied subject to Burke's standard terms and conditions of sale or rental, which limit Burke's responsibility for the product. Any warranty of the product is limited to Burke's or the manufacturer's standard warranty unless otherwise specifically provided by Burke in writing.

BPS 300/4 6/84
Printed in U.S.A.

MATERIAL SAFETY DATA SHEET
Product Name: BURKE RES-X

SECTION 1:

MANUFACTURER'S NAME: The Burke Company
ADDRESS: 2655 Campus Drive
CITY, STATE, ZIP: San Mateo, CA 94403
SIGNATURE OF PERSON RESPONSIBLE FOR OPERATION:
EMERGENCY PHONE NO: (213) 834-3401
OTHER INFORMATION: (415) 349-7600

Section 2: HAZARDOUS INGREDIENTS/IDENTITY
DATE PREPARED: Oct. 12, 1988

HAZARDOUS COMPONENTS (chemical and common name)	OSHA PEL	ACGIH TLV	Other Exposure Limits	%	CAS NO.
Petroleum Naphtha	200 ppm	N/A	N/A	N/A	064742478

SECTION 3: PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT:
SPECIFIC GRAVITY (H_2O=1):
VAPOR PRESSURE (mmHg):
pH:
VAPOR DENSITY (Air=1): 4.9
SOLUBILITY IN WATER: Nil
REACTIVITY IN WATER: None
APPEARANCE AND COLOR: Red liquid, mild petroleum odor.
MELTING POINT: N/A

SECTION 4: FIRE AND EXPLOSION DATA

FLASH POINT:
METHOD USED:
AUTO-IGNITION TEMPERATURE: 448°F
FLAMMABLE LIMITS IN AIR & BY VOLUME: LEL Lower 1 UEL Upper 6
EXTINGUISHER MEDIA: CO2, water fog . . .
SPECIAL FIRE FIGHTING PROCEDURES: Straight water would spread fire, use air supplied rescue equipment for enclosed area.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION 5: PHYSICAL HAZARDS (REACTIVITY DATA)

STABILITY: Unstable ☐ Stable ☒
Conditions to Avoid: High temperature or heat.
INCOMPATABILITY (Materials to Avoid): Strong oxidants.

MATERIAL SAFETY DATA SHEET
Page -2-

Product: BURKE RES-X

HAZARDOUS DECOMPOSITION PRODUCTS: CO, CO2, HCL, etc.

HAZARDOUS POLYMERIZATION: May Occur [ ] Will Not Occur [X] Conditions to Avoid: High temperature or heat.

SECTION 6: HEALTH HAZARDS

ACUTE: Headache

CHRONIC: Not known.

SIGNS AND SYMPTOMS OF EXPOSURE: Over exposure may result ranging from mild depressi to convulsions and loss of consciousness.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Not known.

CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN:

National Toxicology Program		I.A.R.C. Monographs		OSHA	
[ ] Yes	[X] No	[ ] Yes	[X] No	[ ] Yes	[X] No

EMERGENCY AND FIRST AID PROCEDURES:

ROUTES OF ENTRY:
Inhalation: Remove to fresh air area. If breathing irregular, call a physician.
Eyes: Wash with plenty of water.
Skin: Wash with plenty of water.
Ingestion: Call a physician.

SECTION 7: SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat and flame.

OTHER PRECAUTIONS: None

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all ignition sources. Keep people away. Remove free liquid. Add absorbant to spilled area. Ventilate. Scoop up absorbant into container and seal.

WASTE DISPOSAL METHODS (Consult Federal, State and Local Regulations): Incinerate or dispose of in an approved facility.

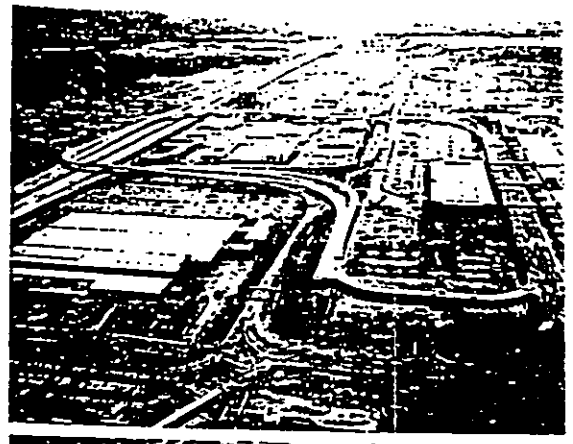
SECTION 8: SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

RESPIRATORY PROTECTION (Specify Type): Hydrocarbon vapor cannister.
Ventilation:
Local Exhaust: Recommend
Mechanical: Explosion proof ventilation equipment.
Special: None
Other: None

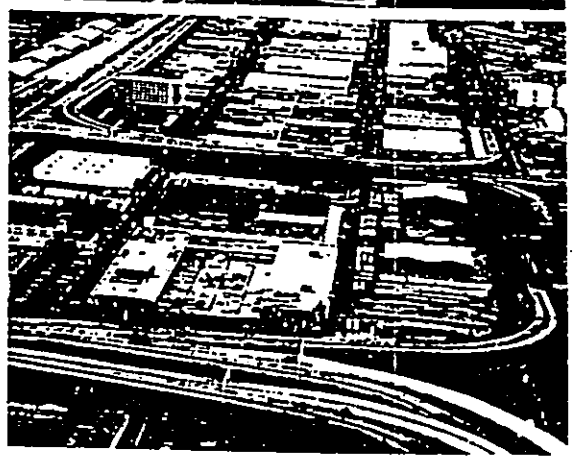
PROTECTIVE GLOVES: Recommend

EYE PROTECTION: Safety goggles.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Long leg, long sleeve clothing.

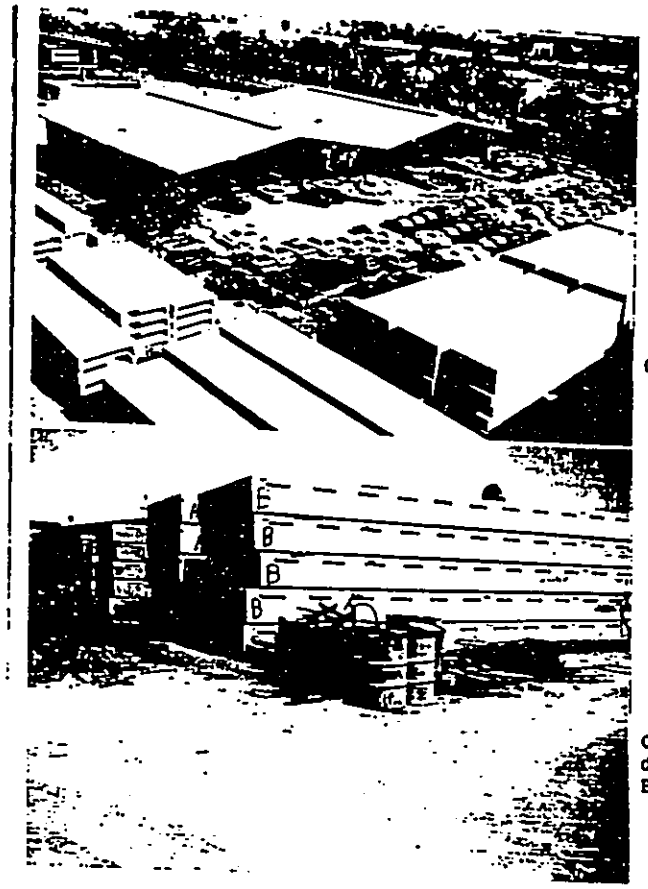


Aerial view of project site and surrounding area.



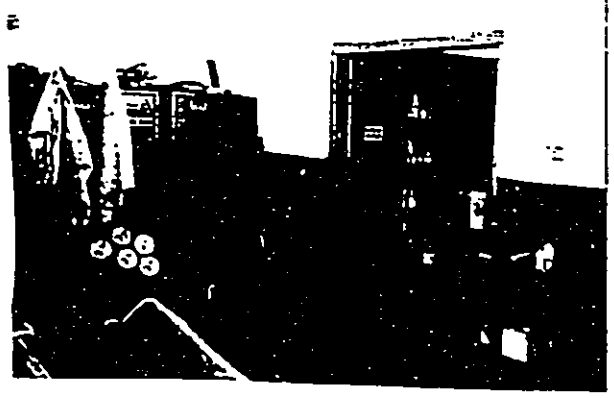
Aerial view of project site and surrounding area.

View from Phase I Warehouse, Level 3 showing precast concrete girder fabricating area and AIPA mobile office trailors.



Complete Auto Prep Corporation

Concrete fabricating yard. Note drums of diesel fuel (blue) and Burke Res X (yellow).



Complete Auto Prep Corporation hazardous materials storage.

Complete Auto Prep Corporation service area and painting booth.

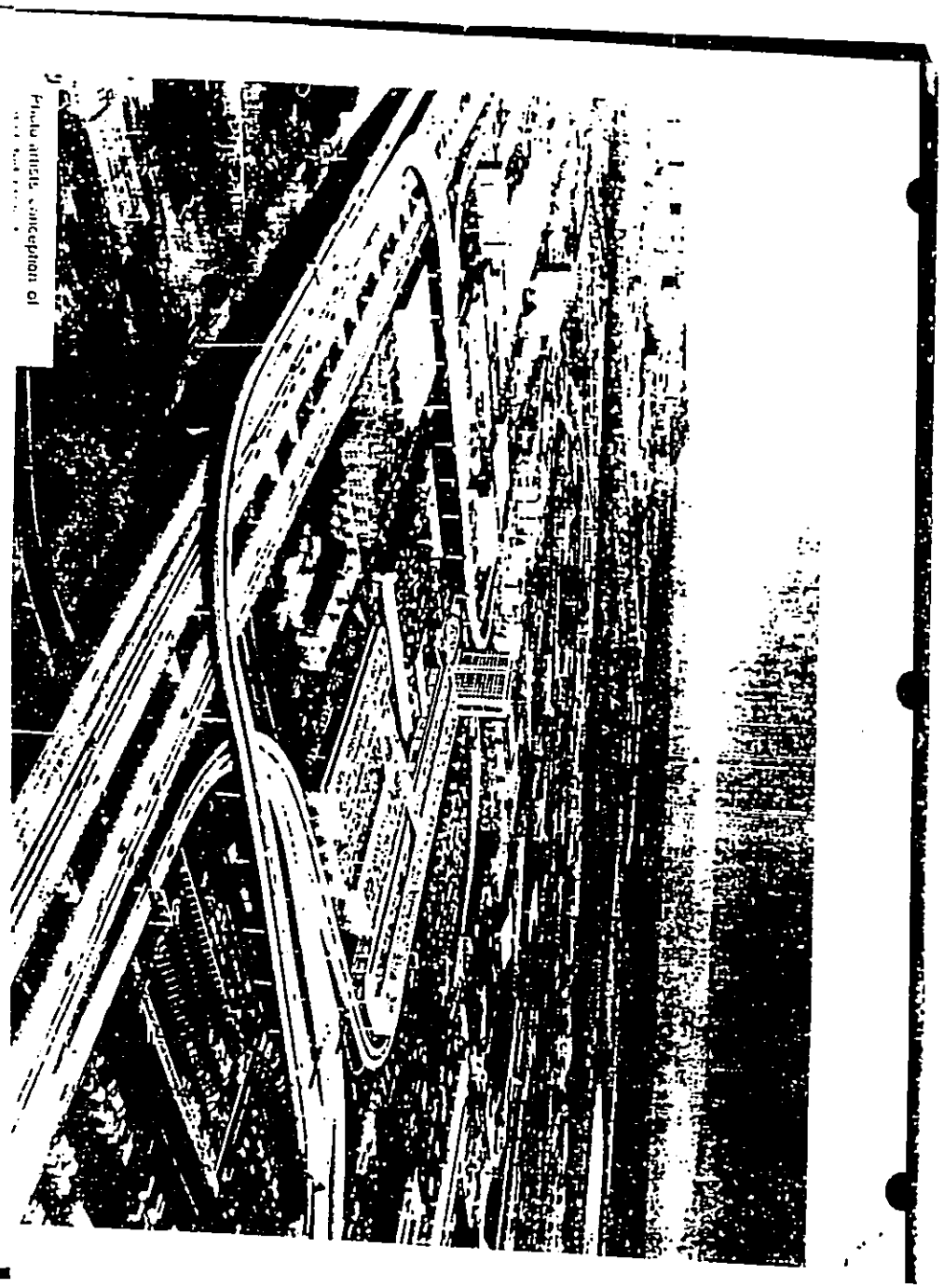
Complete Auto Prep Corporation cleaning area and cleaning products.

Underground fuel storage tank, transformers and generator at Phase I Warehouse.

Complete Auto Prep Corporation, location of underground fuel storage tank.

DHL, location of underground fuel storage tank.

HECO substation adjacent to property.



APPENDIX D

FOUNDATION INVESTIGATION

FOUNDATION INVESTIGATION
PROPOSED AIRPORT CENTER, PHASES II, III, AND IV
PAIEA AND AOLELE STREETS
HONOLULU, OAHU, HAWAII
TMK: 1-1-15: 11 AND 13

DAMES & MOORE JOB NO. 15712-004-11

DAMES & MOORE

DAMES & MOORE
1144 10TH AVENUE, SUITE 360, HONOLULU, HAWAII 96816 (808) 737-8998

March 6, 1989
15712-004-11

Airport Industrial Park Associates
3375 Koapaka Street
Honolulu, Hawaii 96819

Attention: Mr. Wallace Heap

Gentlemen:

Six copies of our report, "Foundation Investigation, Proposed Airport Center, Phases II, III, and IV, Paiea and Aolele Streets, Honolulu, Oahu, Hawaii, TMK: 1-1-15: 11 and 13," are submitted herewith.

The scope of our work was defined in our revised proposal dated November 15, 1988, and this Soil Investigation has generally conformed to the scope described in the proposal. One additional boring was drilled to verify the deep tuff bearing strata. Preliminary foundation recommendations were forwarded in a letter dated February 22, 1989.

Our findings and recommendations are presented in the body of the report. For convenient reference, a summary is given on the first page.

Selected soil samples were used in laboratory testing, and the remaining ones will be kept for a period of time for possible inspection and examination. Unless requested otherwise, they will be discarded 3 months from this date.

It has been a pleasure performing this assignment for you. If you have any questions regarding this report, please feel free to contact us for clarification.

Respectfully submitted,

DAMES & MOORE
A Professional Limited Partnership

S. K. Djou, P.E.
Partner (Ltd.)

SKD/MAY:ob(5620A/392A:15712-004-11)
(Six copies submitted)

cc: ABAM Engineers, Inc.
Attention: Mr. James Zusy

FOUNDATION INVESTIGATION

PROPOSED AIRPORT CENTER, PHASES II, III, AND IV

PAIEA AND AOLELE STREETS

HONOLULU, OAHU, HAWAII

TMK: 1-1-15: 11 AND 13

Summary

The soil condition is similar to the condition encountered on the southern end of the Phase I warehouse. The proposed warehouse and hotel should be supported on 16 1/2-inch octagonal concrete pile foundation design for a maximum vertical dead plus live load of 110 tons. The piles should bear on the tuff formation encountered 60 to 70 feet below the surface. Predrilling of the pile locations to a depth of 25 feet is required. The parking structure may be supported on spread foundations designed for an allowable bearing pressure of 6,000 psf when bearing on weathered tuff or coralline sand and gravel.

1.0 INTRODUCTION

This report presents the results of our foundation investigation for the proposed Airport Center Project, Phase II, III, and IV, in Honolulu, Oahu, Hawaii. The general location of the site is shown on the Map of Area, Plate 1.

2.0 PROJECT CONSIDERATION

It is our understanding that Phases II and III will consist of the construction of two warehouse buildings which will be connected to one another. The total length of the two warehouses will be approximately 875 feet long and the width of the warehouses will be 235 feet in the largest dimensions. The warehouse will be three (3) stories in height with roof parking. The height of the tallest portion of the warehouse will be on the order of 67 feet high. The proposed warehouse will be constructed of reinforced concrete similar to the Phase I warehouse building. The structural

engineer indicates that the maximum dead plus live load in the interior columns will be 1,260 kips. The minimum column load will be on the order of 246 kips. Uplift on the columns during a seismic event is estimated in the order of 90 kips. The ground floor of the building would be constructed of a concrete slab-on-grade design for heavy fork-lift wheel loads.

Phase IV will be a 15-story hotel building with a penthouse and a one-level basement to be located on the southeast corner of the site. The proposed hotel will have an approximate plan dimensions of 170 feet by 68 feet. The basement will extend approximately 10 feet below the existing surface. A two-story parking structure with a one-level basement will be constructed on the north of the proposed hotel. The structural engineer estimates that the maximum interior dead plus live hotel column load will be 1,100 kips. The maximum column load in the garage will be 350 kips. The location of the proposed warehouse and hotel are shown on the Plot Plan, Plate 2.

3.0 PURPOSE AND SCOPE

The purpose of our investigation was to explore the subsurface conditions at the site and to evaluate the engineering characteristics of the soil. Our scope of work consisted of the following:

1. Review of the boring data from Phase I.
2. The drilling of six (6) borings to a depth varying from 65.5 feet to 80 feet for a total linear footage of 442 feet.
3. A geophysical survey of approximately 1,860 linear feet in order to obtain information between the borings.
4. Engineering analysis of the soil conditions with relation to the proposed foundation.

5. The compilation of our field investigation, geophysical survey, laboratory testing and engineering analysis into the form of a bound report. Included in the report are foundation, and slab design recommendations.

4.0 SITE CONDITIONS

4.1 SURFACE CONDITION

The proposed project site is located south of the nearly completed Phase I warehouse and an older 2-story concrete building. The site is also bounded on the east by Paiea Street, on the south by Aolele Street, and on the west by Rogers Boulevard. Topographically, the site is relatively level with variations of elevations from +15 to +17 feet Mean Sea Level (MSL, all elevations in this report refer to this datum). Three (3) 1-story steel framed buildings are located on the east two-thirds of the site. The area around the buildings are paved with asphaltic concrete. The western third of the site, the area is clear of buildings and is paved with asphaltic concrete. A small portion of the area on the west end is used as a pre-cast yard. The location of the existing buildings are shown on the Plot Plan, Plate 2.

4.2 SUBSURFACE CONDITIONS

In general, the subsurface conditions encountered in Borings 2 through 6 were similar to the soil conditions encountered in the Phase I warehouse area. Approximately 5 to 5 1/2 feet of fill consisting mostly of brown clayey silt and possibly containing debris such as concrete, wood, metal, and boulders were encountered near the surface. An alluvial stiff brown and grayish brown silty clay and clayey silt was encountered below the fill material. This material appears to be potentially expansive. A gray brown

volcanic tuff was encountered below the stiff silty clay in Borings 2-04, 3-04, and 5-04 at depths varying from 11 to 17 feet. The tuff was weathered with zones and seams of very hard well-cemented tuff within this layer. In Borings 4-04 and 6-04, a coral sand and gravel layer was encountered between the alluvium and the weathered tuff.

Below the tuff was a partially consolidated backreef coralline formation. This formation consisted of a silty coralline sand which was medium dense to loose. Within this marine deposit there were also some layers of cemented coral sands and gravel.

A layer of hard grey brown volcanic cinder tuff was encountered at approximately 56 to 63 feet below the surface. The tuff was relatively weathered at the interface and graded less weathered with depth. The tuff was encountered to a depth of 80 feet in Boring 6 which was the deepest depth explored.

Ground water was encountered at approximately 15 to 17 feet below the surface.

The near surface soils encountered in Boring 1-04 were different from the other five (5) borings. A coralline sand and gravel layer was encountered at approximately 2 1/2 feet from the surface to a depth of 7 feet below the surface. Volcanic tuff was encountered below the coralline sand and gravel to depths of approximately 12 to 13 feet below the surface. Below the harder tuff, highly weathered tuff or possibly an old alluvium was encountered to a depth of 17 feet below the surface. Coralline backreef deposits similar to the other five (5) borings was encountered below the tuff. However, this coralline formation appears to be more dense than in the other five (5)

borings. Volcanic cinder tuff was encountered at approximately 60 feet below the surface.

4.3 GEOPHYSICAL SURVEY

A geophysical survey of the site was conducted to assist in evaluating subsurface conditions between the borings. The survey was conducted using the seismic refraction method. This method uses measurement of the travel time of shock waves through the ground to interpret vertical layering and to evaluate lateral continuity of layers. A total of approximately 1860 linear feet of profiling was performed along five lines, located as shown on Plate 3. A description of the seismic refraction method and the procedures used for this survey are presented in Appendix B.

The interpreted profiles obtained from the seismic refraction data are presented on Plates 4.1 and 4.2. The results are summarized as follows:

Subsurface layering is generally characterized by three layers:

- A shallow low velocity layer (800 to 3,060 feet per second) correlative with fill material and unsaturated alluvium.
- An intermediate layer with velocities ranging from 4,300 to 5,430 feet per second (fps) which corresponds to the upper tuff layer and, in places, a shallow coralline layer.
- A basal layer with a velocity of 7,750 to 8,810 fps which corresponds to the lower tuff unit.

The near surface layer velocity distribution appears to indicate that relatively loose fill material is present along the western 200 feet of Line 1. This layer appears to be more dense across the north-central and north-eastern portions of the site, particularly between stations 5+00 and 10+50 along Line 1. On the easternmost 150-foot segment of Lines 1 and 2, and

along Line 5, the shallow layer appears to correlate with a weakly cemented sand. Lines 1 and 2 suggest that this sand thins rapidly to the west.

The second layer indicates that the upper tuff layer may be continuous across the entire site. Eastward from Station 5+50 on Line 1 to approximately Line 10+00, also on Line 1, the tuff layer appears to occur at a greater depth. The southern ends of Lines 3 and 4 have a second layer which appears to correlate with the upper coralline sands and gravel encountered in Borings 4-04 and 6-04. This layer probably terminates about halfway along Lines 4 and 6.

The deep tuff layer, seen along the western portion of Line 1 and along Line 3, exhibits velocities considerably higher than the shallow tuff layer. This corresponds to the increased cementation found in the deeper layer.

Using velocities as an indicator of the level of cementation in the shallow tuff layer, it appears that the west-central portion of the site may contain tuff that is more well cemented than elsewhere on the site.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 EARTH WORK

The majority of the soil can be excavated with a moderate-size backhoe. Miscellaneous construction debris such as pile cutoffs, pipes, wood poles, and boulders were encountered in the Phase I excavations. We anticipate similar conditions will be encountered in the upper 5 feet of soil.

Excavation of the cemented coral sand and gravel, and tuff will require a large track-mounted backhoe. A hoeram attachment may be required in some locations.

It may be economical to excavate the large basement area in Phase IV using a D-9 bulldozer with a single ripper attachment.

5.2 WAREHOUSES AND HOTEL

We would recommend that the warehouses be supported on 16 1/2-inch octagonal prestressed piles designed for a maximum load of 110 tons. Several zones of hard tuff were encountered near the surface of the site and we would recommend predrilling to a depth of 25 feet prior to installation of the piles. The piles should be driven with a hammer having a manufacturer's energy of 50,000 foot-pounds or greater. These piles should be driven to the underlying tuff formation approximately 60 to 70 feet below the surface. The piles may be driven to a minimum criteria of 8 blows per inch for the last 3 inches of driving. The piles should be spaced at a minimum of 3 1/2 feet on center.

For occasional wind and seismic loadings, the pile vertical capacity may be increased by one-third and a uplift capacity of 10 tons may be assigned. The piles may be also assigned a lateral capacity of 5 kips per pile if the annular space made by predrilling is filled with sand after the pile installation. The sand should be compacted by water jetting.

Test Pile Program - We recommend that a minimum of 30 test piles be driven at the site to verify the driving characteristics of the piles and to confirm the penetration lengths. Two pile load tests should be performed during this program in accordance with the ASTM test procedure D-1143 to twice the allowable pile capacity which is 220 tons.

5.3 PARKING STRUCTURE

The plans indicate that a basement would be constructed in the parking structure approximately 10 feet below the surface. Boring 1 indicates that a tuff formation may be encountered within the excavation zone of the basement. The extent of this tuff has not been precisely defined. The geophysical survey indicates that the tuff may be continuous over the parking structure site. We would recommend that the parking structure be supported on spread foundations bearing on the tuff and designed for a bearing pressure of 6,000 pounds per square foot.

5.4 BASEMENT WALLS AND LATERAL FORCES

Basement walls which are restrained shall be designed for an equivalent hydrostatic at-rest earth pressure of 60 pounds per square foot per foot of depth. For lateral resistance computation of spread foundations, a passive earth pressure of 300 pounds per square foot per foot of depth and a coefficient of base friction of 0.55 may be used. The 300 pounds per square foot per foot of depth equivalent hydrostatic pressure may also be used for the lateral resistance computations of pile caps.

5.5 SEISMIC DESIGN CRITERIA FOR HOTEL

In general, the soil at the site are stable deposits of soils, gravel and stiff clayey silt, and can be classified as a Type S2 soil profile. Therefore, the numerical coefficient for site structure resonance S can be determined by Method B of Section 2312 of the 1985 Uniform Building Code, and can be assumed to be equal to 1.2.

6.0 LIMITATIONS

We have prepared this addendum report for the Airport Industrial Park Associates for design purposes in accordance with generally accepted soils and foundation engineering practices. No other warranty, expressed or implied, is made to the professional advice included in this report. This report has not been prepared for uses by parties other than the Airport Industrial Park Associates and ABAM Engineers, Inc. This report may or may not contain sufficient information for purposes of other parties or for other uses.

- oOo -

The following Plates and Appendices are attached and complete this report:

Plate 1 - Map of Area
Plate 2 - Plot Plan
Plate 3 - Seismic Refraction Survey Plan
Plate 4.1 - Seismic Refraction Survey Interpreted Cross Section, SRL-1
Plate 4.2 - Seismic Refraction Survey Interpreted Cross Section, SRL-2

Appendix A - Field Exploration and Laboratory Testing
Appendix B - Seismic Geophysical Investigation

SIH-KONG DJOU
REGISTERED PROFESSIONAL ENGINEER
No. 3587-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Respectfully submitted,

DAMES & MOORE
A Professional Limited Partnership

S. K. Djou, P.E.
Partner, (Ltd.)

Michael A. Yamasaki

Michael A. Yamasaki, P.E.
Associate

SKD/MAY:ob(5620A/392A:15712-004-11)
(Six copies submitted)

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BY ____
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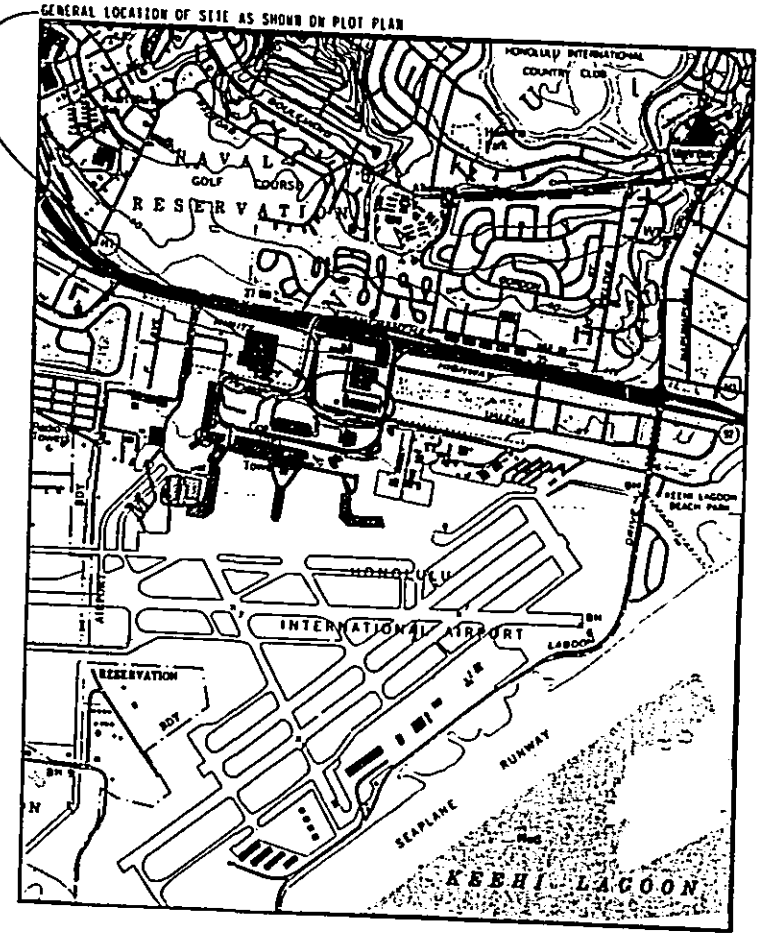

MAP OF AREA

SCALE 1:24000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

Reference:
U.S.G.S. Topographic Map
Pearl Harbor, Oahu, Hawaii (1983)

DAMES & MOORE

PLATE 1

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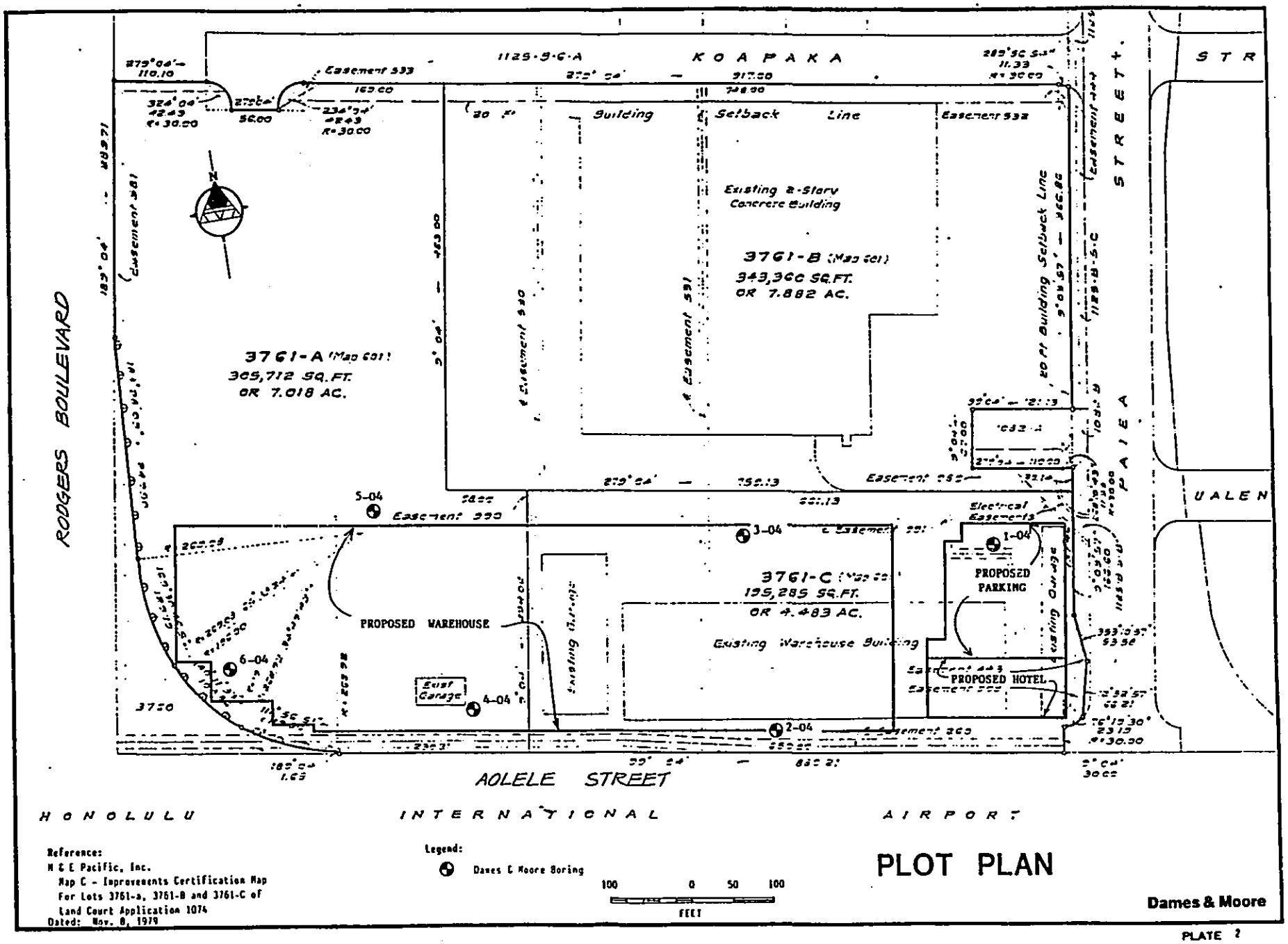

PLOT PLAN

Dames & Moore

PLATE 2

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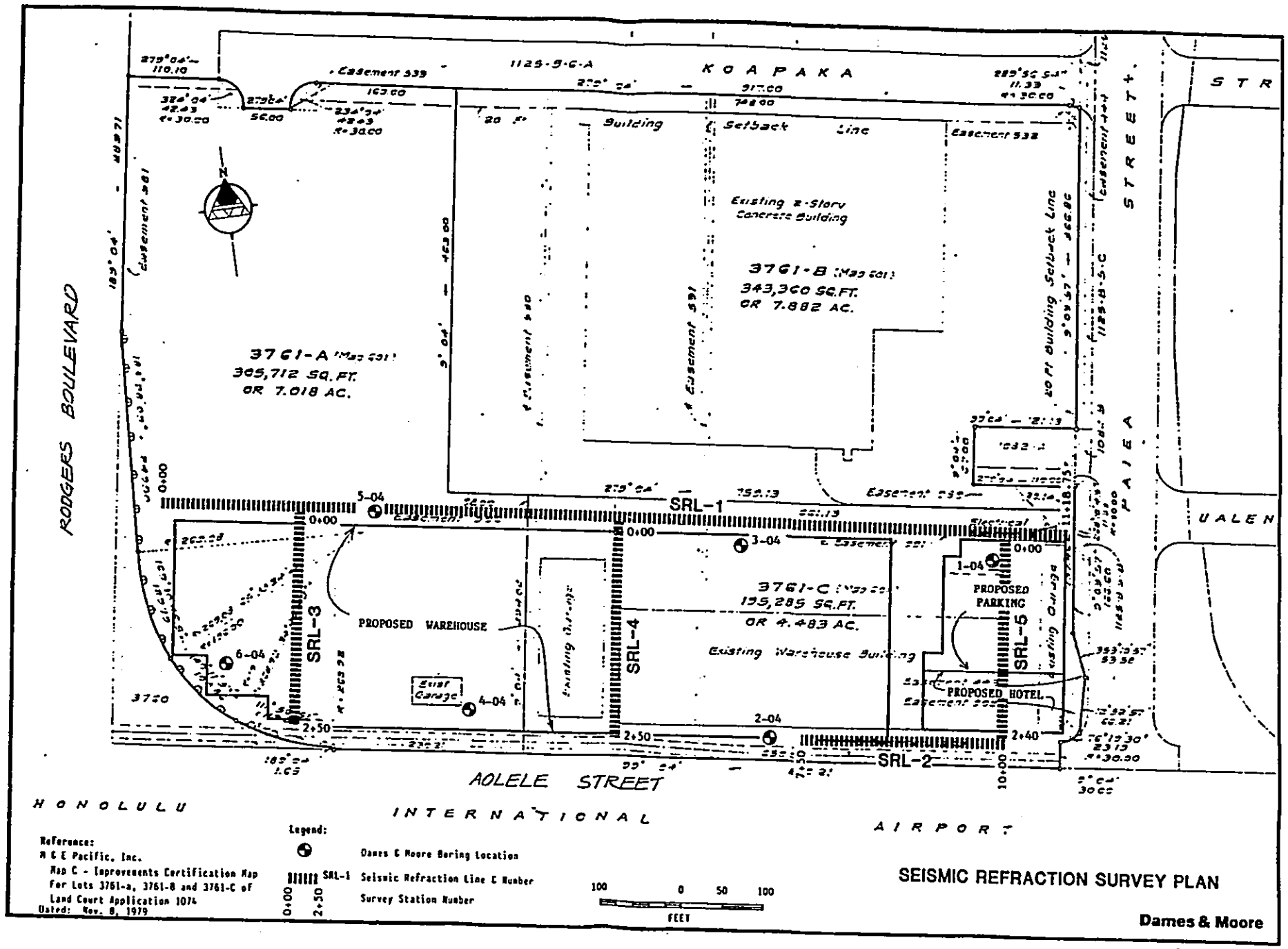

SEISMIC REFRACTION SURVEY PLAN

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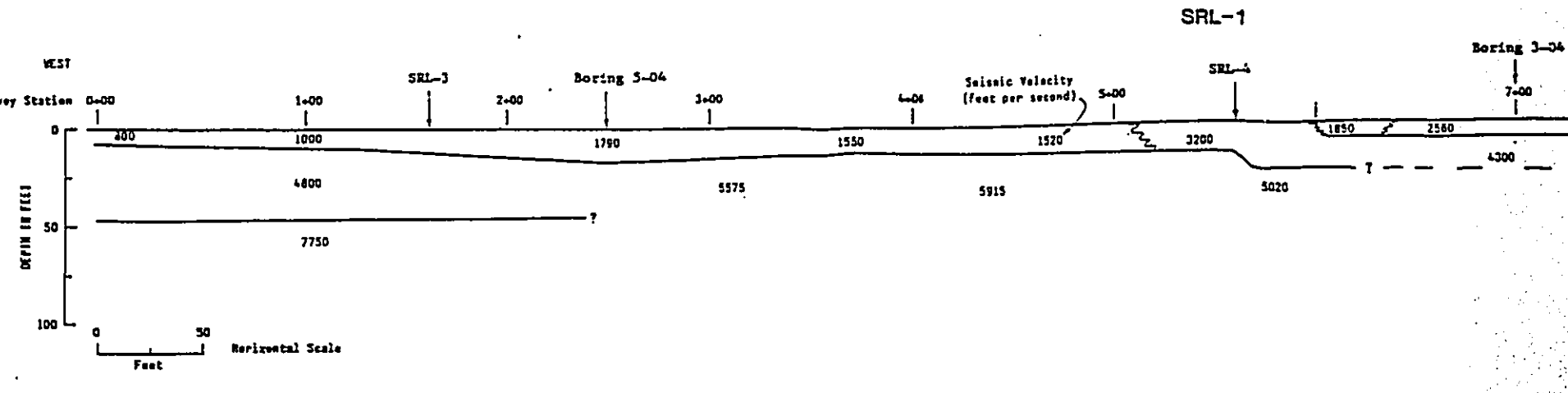
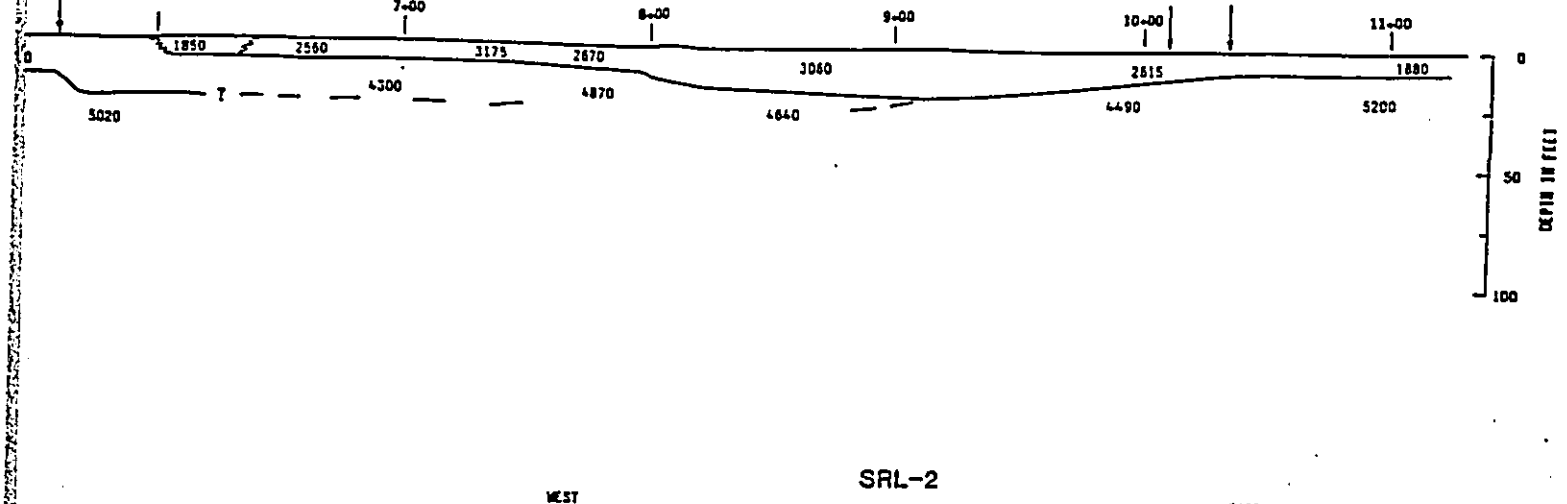
PLATE 3



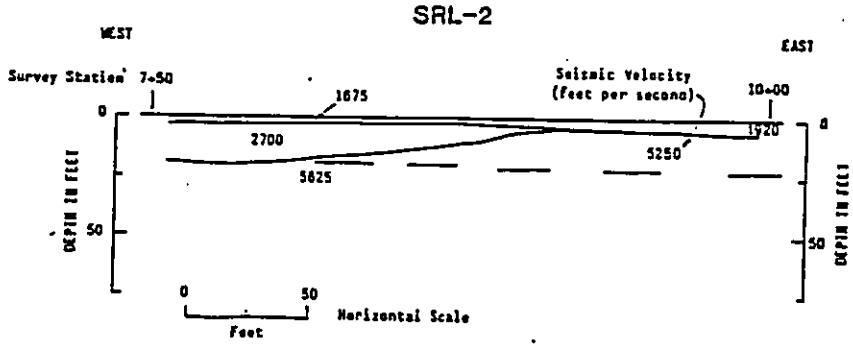
Note: Locations of seismic refraction lines are presented on Plate 3 - Seismic Refraction Survey Plan.

SEISMIC REFRACTION SURVEY INTERPRETED CROS

IL-1



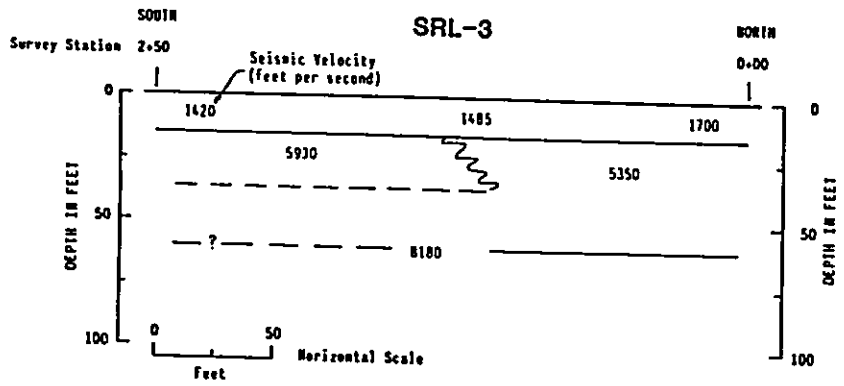
SRL-2

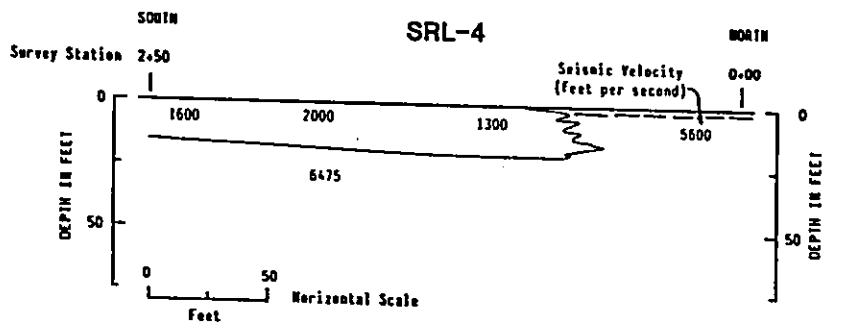


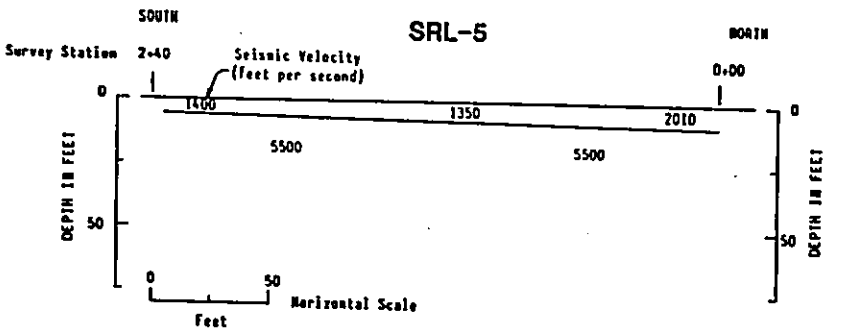
INTERPRETED CROSS SECTIONS

Dames & Moo

PLATE 4.1







Note: Locations of seismic refraction lines are presented on Plate 3 - Seismic Refraction Survey Plan.

SEISMIC REFRACTION SURVEY
INTERPRETED CROSS SECTIONS

Dames & Moore

PLATE 4.2

APPENDIX A

FIELD AND LABORATORY RESULTS

FIELD EXPLORATION

Borings 1-04 through 6-04 were performed during the period of January 23 to February 1, 1989. The borings were drilled with a truck-mounted wash-boring drilling rig from Drillco. The boring locations were located by our engineer and toned for underground utilities by the driller. The field investigation was performed under the technical observation of one of our engineering technicians who sampled and classified the various soils encountered using the Unified Soil Classification System, Plate A-2. Soil samples in the borings were taken using a Dames & Moore Underwater Sampler driven with a 300-pound hammer falling 30 inches. A description of the sampler is shown on Exhibit A-1.

The Logs of Borings are presented on Plates A-1.1 through A-1.6.

LABORATORY TESTING

General - Select samples of the subsurface soils obtained during the field exploration program were subjected to laboratory testing to evaluate their engineering properties. The testing consisted of identification, strength, and moisture and density determinations. The tests and their results are described in the following paragraphs.

Unconfined Compression Test - Six (6) unconfined compression tests were performed on tuff core samples from Borings 1-04 through 6-04 at depths of 58.5 to 73 feet. The results of the test are listed on the next page:

Boring Number	Depth (ft)	Peak Compressive Strength Per Square Inch (psi)
1-04	66.5	2,550
2-04	63.0	3,500
3-04	58.5	2,860
4-04	66.0	1,750
5-04	73.0	2,070
6-04	70.0	3,660

Atterberg Limits - Six (6) Atterberg Limits Tests were performed on selected samples to aid in classifying the soil. The tests were performed in accordance with ASTM Method D-4318-84. The results of these tests are listed below:

Boring Number	Depth (ft)	Field Moisture Content (percent)	Liquid Limit (%)	Plastic Index (%)	Soil Classif.
1-04	15.5	35.7	57.5	21.4	MH
2-04	5.5	24.4	72.3	39.3	CL
3-04	10.5	52.7	88.0	49.7	CH
4-04	3.0	26.7	62.8	31.0	MH
5-04	10.5	19.5	70.0	39.5	CH
5-04	5.5	41.8	65.2	28.3	MH

Moisture and Density Determinations - Various moisture and density determinations were performed on soil samples to correlate the vertical and horizontal soil properties. The results of these tests are presented on the Logs of Borings, Plates A-1.1 through A-1.6.

- oOo -

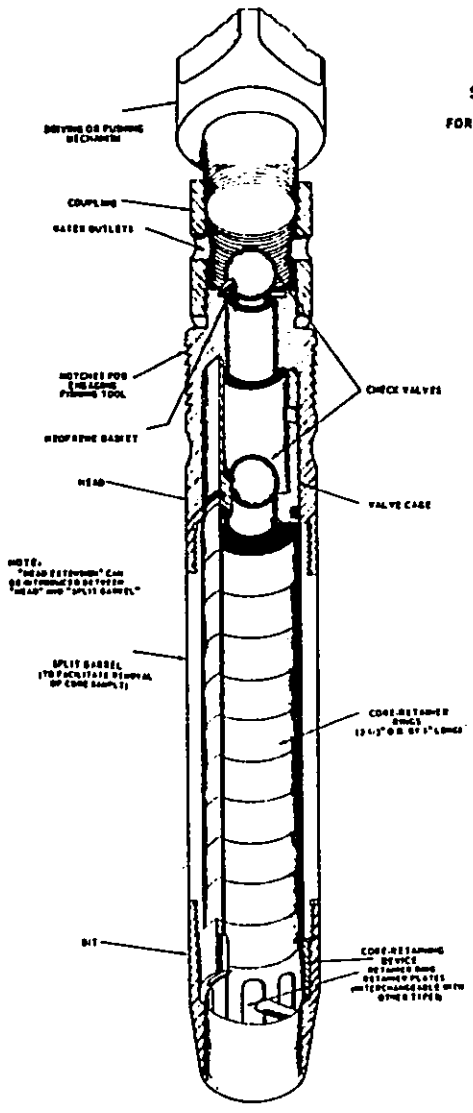
The following Exhibit and Plates are attached and complete this Appendix:

Exhibit A-1 - Dames & Moore Sampler, Type "U"

Plate A-1.1 - Logs of Borings, Boring 1-04
Plate A-1.2 - Logs of Borings, Boring 2-04
Plate A-1.3 - Logs of Borings, Boring 3-04
Plate A-1.4 - Logs of Borings, Boring 4-04
Plate A-1.5 - Logs of Borings, Boring 5-04
Plate A-1.6 - Logs of Borings, Boring 6-04
Plate A-2 - Unified Soil Classification System
Plate A-3 - Gradation Curve

SOIL SAMPLER TYPE U

FOR SOILS DIFFICULT TO RETAIN IN SAMPLER



ALTERNATE ATTACHMENTS

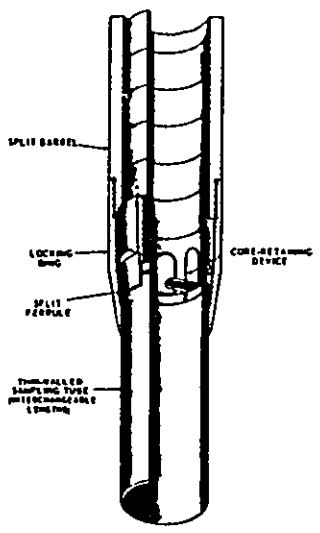


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EXHIBIT A-1

Boring 1-04

Surface Elevation 18.5 ± Feet MSL Datum

LABORATORY TEST DATA: Tests Reported Elsewhere	LABORATORY TEST DATA: Moisture Content in %	LABORATORY TEST DATA: Dry Density in PCF	Blows/Ft. on Sampler	Core and % Recovery	Samples and/or Cores	Depth in Feet	Graph Symbol	Letter Symbol	Description
									3-inch asphaltic concrete
									3-inch basaltic base course
	18.8	89	78/8"					MH	Dark brown clayey sandy silt, medium stiff (fill)
			44					SM	Tan weakly cemented coralline sand (possible backreef deposit)
									Brown fine- to medium-grained volcanic tuff, slightly weathered
			50/3"			10			
								CH/MH	Reddish brown silty clay, very stiff (old alluvium)
									Water level at 1300 hours on 01-25-89
	35.7	88	25					SM/GM	Tan fine to coarse coralline sand and gravel, loose to medium dense (backreef deposit)
			8			20			
	16.6	96	24						
			50/3"			30		SM	Cemented silty fine to medium coralline sand, very dense (cemented backreef deposit)
			52						
			18			40		GM/SM	Tan silty fine to coarse coralline sand and gravel, medium dense (backreef deposit)
	25.1	78	22						
			14			50			
			18						
			50/6"			60			Dark gray to black fractured volcanic tuff, slightly weathered
			RQD 20%	NX 100%					
			RQD 55%	NX 55%		70			
			RQD 40%	NX 40%					

Boring completed at 77.0 feet on 01-24-89

LOG OF BORINGS

NOTES:

- ■ – depth at which undisturbed sample was taken
- ■ – depth at which disturbed sample was taken
- □ – depth at which sample was lost during extraction
- I – depth and length of core run

Driving Energy – 300-lb. weight dropping 30 inches

Dames & Moore

PLATE A-1.1

Boring 2-04

Surface Elevation 16.7 ± Feet
MSL Datum

Tests Reported Elsewhere	Moisture Content in %	Dry Density in PCF	Blows/Ft. on Sampler	Core and % Recovery	Samples and/or Cores	Depth in Feet	Graph Symbol	Letter Symbol	Description
						0			3-inch asphaltic concrete pavement 3-inch basaltic base course
			grab					SM/GM	Brown clayey silty sand and gravel, medium dense (fill)
	24.4	97	14					CH/MH	Brown silty clay, stiff (potentially expansive soil)
			11			10			
									▽ Water level at 0950 hours on 01-30-89
	44.0	80	36						Dark brownish gray weathered tuff with zone of hard well cemented tuff
			20/6"			20			
								SM/GM	Tan silty coralline sand and gravel, loose (slightly consolidated lagoonal deposit)
			9						
	42.3	78	7			30			
			35						well cemented zone
			5			40			
	40.7	77	5						
								SM	Brown silty fine to medium coralline sand, weakly cemented, dense
			36			50			
								SM	Tan silty coralline sand, medium dense
			18						
			RQD 31%	NX 100%		60			Grayish brown fine to medium cinder sand, moderately cemented (tuff)
			RQD 88%	NX 100%					
						70			Boring completed at 70.0 feet on 01-30-89

LABORATORY TEST DATA

LOG OF BORINGS

NOTES:
- ■ – depth at which undisturbed sample was taken
- ▣ – depth at which disturbed sample was taken
- □ – depth at which sample was lost during extraction
- I – depth and length of core run

Driving Energy – 300 -lb. weight dropping 30 Inches

Dames & Moore

DATE 2 1 1

Boring 3-04

Surface Elevation 16.5 ± Feet
MSL Datum

Tests Reported Elsewhere	Moisture Content in %	Dry Density in PCF	Blows/Ft. on Sampler	Core and % Recovery	Samples and/or Cores	Depth in Feet	Graph Symbol	Letter Symbol	Description
						0			2- to 3-inch asphaltic concrete
			11					SM/GM	Grayish brown silty sand and gravel, loose (fill)
	40.7	80	11					CH/MH	Grayish brown silty clay and clayey silt, stiff (alluvium, potentially expansive)
	52.7	70	6			10			
			2						▽ Water level at 1310 hours on 02-01-89
	48.3	76	21					SM/GM	Dark gray fine- to medium-grained weathered tuff, hard, with seam of hard well cemented tuff
			52			20			
			30						
			13			30		CH	Reddish brown silty sandy clay, stiff (old alluvium)
	39.5	85	14						
			14			40		SM/GM	Brown to tan very silty coralline sand and gravel, loose to medium dense (partially consolidated lagoonal deposit)
			10						
	46.0	76	5			50			
			4						Brownish gray fine- to medium-grained moderately cemented tuff
			RQD 0	NX 95%		60			
			RQD 70%	NX 100%					grades well cemented
									Boring completed at 65.5 feet on 02-01-89

LABORATORY TEST DATA

LOG OF BORINGS

NOTES:
- ■ – depth at which undisturbed sample was taken
- ▨ – depth at which disturbed sample was taken
- □ – depth at which sample was lost during extraction
- ⊢⊣ – depth and length of core run

Driving Energy – 300 -lb. weight dropping 30 inches

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PLATE A-1.3

Boring 4-04

Surface Elevation 15.0 ± Feet
MSL Datum

Tests Reported Elsewhere	Moisture Content in %	Dry Density in PCF	Blows/Ft. on Sampler	Core and % Recovery	Samples and/or Cores	Depth in Feet	Graph Symbol	Letter Symbol	Description
									2-inch asphaltic concrete
									3-inch coral base course
	26.7	93	6					CH/MH	Brownish gray clayey sandy silt, soft to medium stiff, with occasional gravel (fill)
			10						
								CH/MH	Grayish brown clayey silt and silty clay, stiff (alluvium)
	19.5	86	3			10		SM/GM	Tan silty coralline gravel and sand with seams and lenses of well cemented algal coral
									Water level at 1330 hours on 01-25-89
			15						
			20			20		GM	Grayish brown silty cinder sand and olivine tuff gravel, dense (highly weathered tuff)
								MH	Reddish brown clayey sandy silt, medium stiff (old alluvium)
	34.3	77	7						
	48.2	76	9			30		ML	Mottled tan and brown silty fine to coarse coralline sand, loose, with pockets of brown clay (partially consolidated lagoonal deposit)
			7						
	28.4		6			40			
			2					SM/GM	Light brown moderately cemented silty coralline sand, medium dense (backreef deposit)
			4			50			
			35						
			63			60			Dark brown cemetned silty fine volcanic cinder sand (tuff)
			RQD 14%	NX 91%					
			RQD 85%	NX 100%					grades well cemented
			RQD 91%	NX 100%		70			

Boring completed at 75.0 feet on 01-25-89

LABORATORY TEST DATA

LOG OF BORINGS

NOTES:
- ■ – depth at which undisturbed sample was taken
- ▣ – depth at which disturbed sample was taken
- □ – depth at which sample was lost during extraction
- ⌶ – depth and length of core run

Driving Energy – 300 –lb. weight dropping 30 inches

Dames & Moore

PLATE A-1.4

Boring 5-04

Surface Elevation 17.5 ± Feet
MSL Datum

Tests Reported Elsewhere	Moisture Content in %	Dry Density in PCF	Blows/Ft. on Sampler	Core and % Recovery	Samples and/or Cores	Depth in Feet	Graph Symbol	Letter Symbol	Description
									3-inch asphaltic concrete
									9-inch clayey silty sandy basaltic gravel
	11.4	105	13		■			GM	Brown clayey silty basaltic sand and gravel, medium dense, with coral fragments (fill)
			11		■			CH/ MH	Gray and brown clayey sand and silty clay, stiff (alluvium)
			42		■	10			Gray fine-grained tuff, weathered to slightly weathered
			50		■				▽ Water level at 1000 hours on 01-31-89
	35.0	89	42		■	20		SM/ MH	Gray silty sand to sandy silt, very stiff to hard (old alluvium)
			7		■			GM/ SM	Tan silty coralline sand and gravel, loose to medium dense (lagoonal deposit)
	42.8	73	3		■	30			
			6		■				
			7		■	40			
	40.4	89	3		■				
			1		■	50			grades very loose, possible infilled void or cavity
			3		■				
			2		■	60			
			RQD 0	NX 70%	▬				Dark brownish gray silty fine to medium cinder sand, moderately cemented (tuff)
			RQD 0	NX 70%	▬				
			RQD 69%	NX 100%	▬	70			grades well cemented

Boring completed at 74.3 feet on 01-31-89

LOG OF BORINGS

NOTES:
■ - depth at which undisturbed sample was taken
■ - depth at which disturbed sample was taken
□ - depth at which sample was lost during extraction
⊢⊣ - depth and length of core run
Driving Energy - 300 -lb. weight dropping 30 inches

Dames & Moore

PLATE A-1.5

Boring 6-04

Surface Elevation 16.5 ± Feet
MSL Datum

Tests Reported Elsewhere	Moisture Content in %	Dry Density in PCF	Blows/Ft. on Sampler	Core and % Recovery	Depth in Feet	Graph Symbol	Letter Symbol	Description
					0			2-inch asphaltic concrete
							GP	Brown silty sandy basaltic gravel (base course)
			55				MH	Grayish brown clayey sandy silt, medium stiff, with occasional basalt gravel, concrete and coral fragments (fill)
	41.8	69	12				CH/MH	Grayish brown clayey silt-silty clay, stiff (alluvium)
			24		10		SM/GM	Tan silty coralline sand and gravel, medium dense, with pockets of medium stiff brown clay
			14					▽ Water level at 0705 hours on 01-27-89
	60.4	67	21		20		GM	seam of well cemented algal coral Grayish brown silty fine to medium cinder sand, dense (highly weathered tuff)
			13				CH/MH	Reddish brown silty clay-clayey silt, stiff (old alluvium)
			41		30		SM/SP	White to tan cemented fine to medium coralline sand and fragments, dense
	33.3	83	13					grades less cemented and medium dense (partially consolidated lagoonal deposit)
			10		40			
			8					
			8		50			
	44.3	75	9					
			8		60			
			74/8"					Dark grayish brown silty, fine-grained tuff, moderately cemented
			RQD 0	NX 78%	70			
			RQD 83%	NX 100%				grades well cemented
			RQD 95%	NX 100%				
					80			Boring completed at 80.0 feet on 01-27-89

LOG OF BORINGS

NOTES:
- ■ – depth at which undisturbed sample was taken
- ▣ – depth at which disturbed sample was taken
- □ – depth at which sample was lost during extraction
- I – depth and length of core run

Driving Energy – 300 –lb. weight dropping 30 inches

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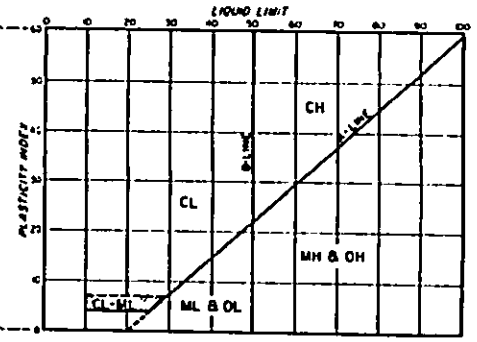
PLATE A-1.6

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL GRADED GRAVELS, GRAVEL SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY GRADED GRAVELS, GRAVEL SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL SAND SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL SAND CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND SILT MIXTURES
				SC	CLAYEY SANDS, SAND CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, MUCK, AND OTHER HIGHLY ORGANIC SOILS

FOR LABORATORY CLASSIFICATION OF FINE GRAINED SOILS

PLASTICITY CHART



GRADATION CHART

MATERIAL SIZE	PARTICLE SIZE			
	LOWER LIMIT		UPPER LIMIT	
	MILLIMETERS	SIEVE SIZE	MILLIMETERS	SIEVE SIZE
SAND				
FINE	0.06	NO.200	0.42	NO.40
MEDIUM	0.42	NO.40	2.00	NO.10
COARSE	2.00	NO.10	4.76	NO.4
GRAVEL				
FINE	4.76	NO.4	19.1	3/4"
COARSE	19.1	3/4"	76.2	3"
COBBLES	76.2	3"	304.8	12"
BOULDERS	304.8	12"	OVER 304.8	OVER 12"

U.S. STANDARD — SQUARE OPENINGS

NOTES:

1. DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE CLASSIFICATIONS.
2. WHEN SHOWN ON THE BORING LOGS, THE FOLLOWING TERMS ARE USED TO DESCRIBE THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE COMPACTNESS OF COHESIONLESS SOILS:

COHESIVE SOILS	(APPROXIMATE SHEARING STRENGTH - lb/sq.ft.)	COHESIONLESS SOILS	
VERY SOFT	LESS THAN 250	VERY LOOSE	THESE ARE USUALLY BASED ON AN EXAMINATION OF SOIL SAMPLES, PENETRATION RESISTANCE, AND SOIL DENSITY DATA
SOFT	250 TO 500	LOOSE	
MEDIUM STIFF	500 TO 1000	MEDIUM DENSE	
STIFF	1000 TO 2000	DENSE	
VERY STIFF	2000 TO 4000	VERY DENSE	
HARD	GREATER THAN 4000		

SAMPLES

- INDICATES UNDISTURBED SAMPLE
- INDICATES DISTURBED SAMPLE
- INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- INDICATES LENGTH OF CORING RUN

NOTE
DEFINITIONS OF ANY ADDITIONAL DATA REGARDING SAMPLES ARE ENTERED ON THE FIRST LOG ON WHICH THE DATA APPEAR

UNIFIED SOIL CLASSIFICATION SYSTEM

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PLATE A-2

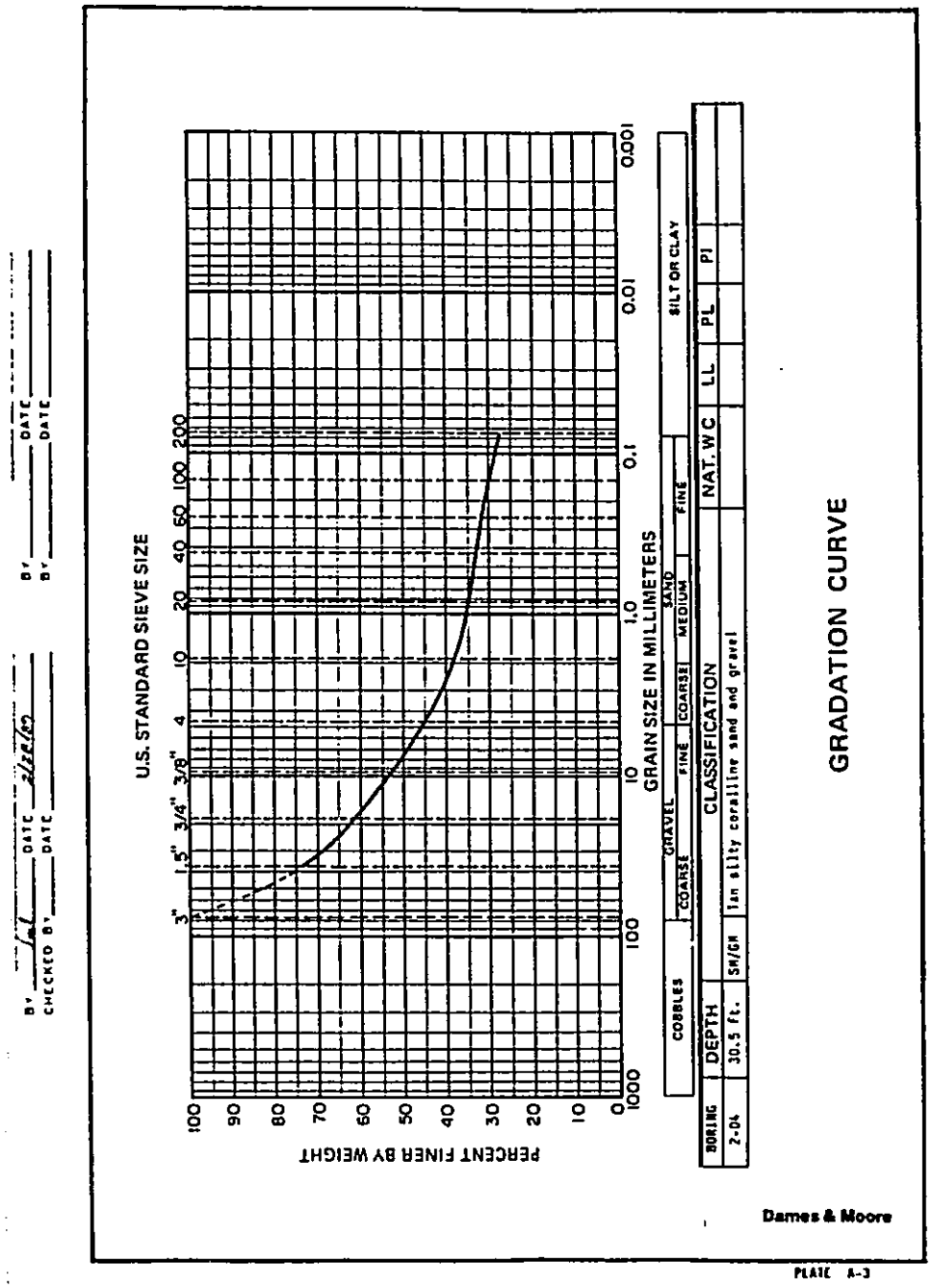


PLATE A-3

APPENDIX B

GEOPHYSICAL SURVEY METHODS

SEISMIC REFRACTION FIELD SURVEYS

Measurements of the time required for seismic waves to travel through the ground can be used to develop an interpretation of subsurface conditions. Although a number of different paths may occur for waves travelling outward from a source point, the refraction method relies on two types -- direct waves and refracted waves. The direct waves travel from one point to another solely through a given layer. In cases where multiple layers occur, some waves travel downward, following along layer interfaces and then travel back to the ground surface. Refracted waves are those that utilize these deeper paths. For refracted wave travel, however, the velocity of sequentially deeper layers must increase. When this condition is met, waves which travel along the deeper paths eventually overtake and pass the shallow direct travelling waves. Plate B-1 presents a schematic of the field survey set-up and illustrates the wave travel paths.

Geophones, placed in a line along the ground surface at increasing distances away from the source point, are used to detect seismic wave arrivals. The geophones are connected to a seismograph, which is used to make a record of geophone responses. Timing for wave travel is based on the instant that the seismic shock wave is produced. A mechanical or explosive energy source is used to produce the seismic shock wave. With current systems, the recording instrument is generally a signal enhancement seismograph. A signal enhancement system adds together individual impact or explosion records. In this operation, random background noise tends to cancel and true seismic signal tends to be enhanced in amplitude.

Field seismograms of geophone response are evaluated for the time of onset motion of the earliest arriving wave at each geophone. These arrival times are plotted at the respective location of each geophone in the array to produce time-distance plots. Straight line segments are drawn through the arrival time data and the inverse slope of each segment yields an apparent seismic wave velocity. A generalized time-distance plot is illustrated on Plate B-1. Depths to various velocity layer interfaces are calculated from the apparent velocities and their zero distance time intercepts. An alternate but equivalent method uses the distances away from the source at which the line slope breaks occur. These are termed critical distances.

Refraction profiles are recorded for reverse directions in order to determine if the subsurface layer interfaces are dipping. If interfaces are parallel with the ground surface, the apparent velocities from opposing directions will be equivalent. If the apparent velocities differ, dip is indicated. The rate of dip and true layer velocities can be calculated from the reverse profile data.

The depth of investigation by the refraction method is generally controlled by the spacings between geophones and, thus, the resulting length of the geophone array, and by the amount of energy put into the ground. For refraction depths of less than 20 to 40 feet, geophone spacings of 10 to 25 feet are frequently used. Similarly, for such shallow surveys, a sledgehammer source is generally adequate.

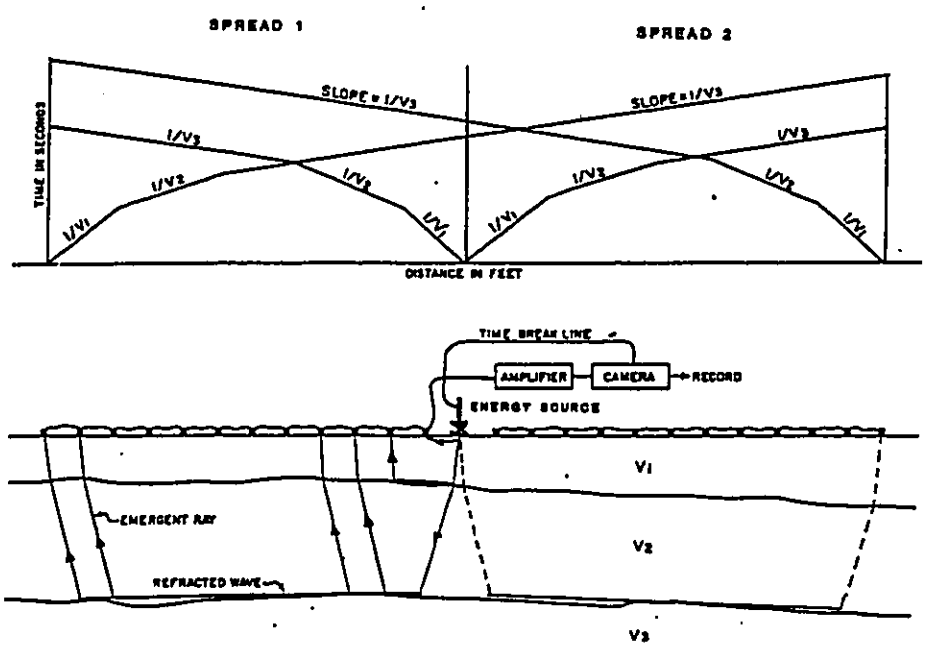
The survey conducted for this site used a Geometrics ES-1225 signal enhancement seismograph with a combination of a Betsy downhole shotgun energy source and a sledgehammer energy source. The shotgun source, which fires a blank shell in a shallow drilled hole, was selected to help overcome high

ambient background noise due to traffic and other sources. A twelve-geophone array was used with geophone spacings of either 10 or 25 feet, depending upon the refraction target for each array. Field work was performed between February 12 and 19, 1989. A total of five (5) seismic refraction lines were established. The field seismograms and time-distance plots for these lines are on file in our office and will be retained for future reference.

- oOo -

The following Plates are attached and complete this Appendix:

Plate B-1 - Schematic of Refraction Survey Set Up and Generalized Time-Distance Plot



SCHEMATIC OF REFRACTION SURVEY SETUP AND GENERALIZED TIME-DISTANCE PLOT

Dames & Moore
Plate B-1

APPENDIX E

AERONAUTICAL STUDY

US Department of Transportation
Federal Aviation Administration

RECEIVED
NOV 13 1989

IN REPLY REFER TO
AERONAUTICAL STUDY
NO. 89-AWP-829-OE

AIPA

DETERMINATION OF NO HAZARD TO AIR NAVIGATION

		CONSTRUCTION LOCATION	
SPONSOR	Airport Industrial Park Associates 33750 Koapaka Street Honolulu, HI 96819	PLACE NAME: Honolulu, HI	
		LATITUDE: 21°20'15"	LONGITUDE: 157°55'10"
CONSTRUCTION PROPOSED	DESCRIPTION: Hotel	HEIGHT (IN FEET) ABOVE GROUND: 171'	ABOVE MSL: 190'

An aeronautical study of the proposed construction described above has been completed under the provisions of Part 77 of the Federal Aviation Regulations. Based on the study it is found that the construction would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the construction would not be a hazard to air navigation provided the following conditions are met:

Conditions:

Building should be obstruction lighted in accordance with FAA Advisory Circular 70/7460-1G, Chapters 4, 5, and 9.

Supplemental notice of construction is required any time the project is abandoned (use the enclosed FAA form), or

☐ At least 48 hours before the start of construction (use the enclosed FAA form)
☒ Within five days after the construction reaches its greatest height (use the enclosed FAA form)

This determination expires on June 16, 1991 unless

(a) extended, revised or terminated by the issuing office;
(b) the construction is subject to the licensing authority of the Federal Communications Commission and an application for a construction permit is made to the FCC on or before the above expiration date. In such case the determination expires on the date prescribed by the FCC for completion of construction, or on the date the FCC denies the application.

NOTE: Request for extension of the effective period of this determination must be postmarked or delivered to the issuing office at least 15 days prior to the expiration date.

This determination is subject to review if an interested party files a petition on or before December 6, 1989. In the event a petition for review is filed, it should be submitted in triplicate to the Manager, Flight Information and Obstructions Branch, AAT-210, Federal Aviation Administration, Washington, D.C. 20591 and contain a full statement of the basis upon which it is made.

This determination becomes final on December 16, 1989 unless a petition for review is timely filed, in which case the determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review.

An account of the study findings, aeronautical objections, if any, registered with the FAA during the study, and the basis for the FAA's decision in this matter will be found on the following page(s).

If the structure is subject to the licensing authority of the FCC, a copy of this determination will be sent to that Agency.

This determination, issued in accordance with FAA Part 77, concerns the effect of this proposal on the safe and efficient use of the navigable airspace by aircraft and does not relieve the sponsor of any compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

- continued -

SIGNED Jeffrey H. Thorstenson TITLE Manager, System Management Branch

ISSUED IN Hawthorne, CA ON November 6, 1989

The proposed 171 foot above ground level (AGL)/190 foot above mean sea level (AMSL) building would be located 3,200 feet northwest of the approach end of Runway 22R of the Honolulu International Airport. The proposal is identified as an obstruction by exceeding the standards of Federal Aviation Regulations (FAR) Part 77, Subpart C, as follows:

> 77.23(a)(5) by 27 feet, a height exceeding a horizontal surface 150 feet above airport elevation (13') within a 10,000 foot radius of the Honolulu International Airport.

The aeronautical study conducted by the Federal Aviation Administration (FAA) found the proposal would have no adverse effect on visual flight operations nor would it adversely impact existing or planned minimum instrument flight altitudes. FAA study also found there would be no adverse effect to any FAA air navigation aids.

The proposed structure would be located in the general vicinity of other structures of similar heights. The proposed structure would have no greater impact on aeronautical operations than the existing structure and was, therefore, not circularized to the public for comment.

Although the structure has been identified as an obstruction, the study results conclude the proposal would not adversely affect the safe and efficient use of the navigable airspace and would not be a hazard to air navigation.

This determination does not include temporary construction equipment, such as cranes or derricks which meet the filing requirements of FAR Part 77. Such equipment requires notification to the FAA on Form 7460-1 for aeronautical study.