

Planning Department

25 Aupuni Street, Rm. 109 • Hilo, Hawaii 96720 • (808) 961-8288

Larry S. Tanimoto
Mayor

Duane Kanuha
Director

William L. Moore
Deputy Director

RECEIVED

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OFC. OF ENVIRONMENTAL
QUALITY CONTROL

Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, HI 96813

Gentlemen:

Environmental Assessment - Negative Declaration
Applicant: Mauna Lani Resort, Inc.
TMK: 6-8-01:portion of 52

Enclosed please find four copies of an Environmental Assessment - Negative Declaration for the construction of a helicopter facility and related improvements within the Mauna Lani Resort. This report is filed for publication in your bulletin.

Should you have any questions, please contact this office.

Sincerely,


DUANE KANUHA
Planning Director

CRK:syw

Enclosures

cc/enc: Mr. Gerald Park
Mauna Lani Resort

1990-11-08-HA-FA

Mauna Lani Resort Helicopter Facility

FILE COPY

ENVIRONMENTAL ASSESSMENT - NEGATIVE DECLARATION

APPLICANT: Mauna Lani Resort, Inc.
P.O. Box 4959
Kohala Coast, Hawaii 96743-4959

APPROVING AGENCY: Hawaii County Planning Commission
through the Planning Department

CONSULTED AGENCIES: State Department of Land and Natural
Resources
State Department of Transportation
Airports Division
State Department of Health
Federal Aviation Administration

REQUEST

The applicant is proposing the construction of three helipads, a terminal building, parking lot and related improvements on two acres of land on the mauka side (northeast) of Kaniku Drive approximately 1,300 feet northeast of the existing resort services building within Mauna Lani Resort, Lalamilo, South Kohala, Hawaii, Tax Map Key No. 6-8-01: Portion of 52.

CLASS OF ACTION

The proposed development involves the construction of a new helicopter facility and related improvements.

PROJECT DESCRIPTION

The purpose of the project is to relocate the existing Mauna Lani Resort helipad outside of the resort core so as not to disturb the resort ambience at Mauna Lani Resort. The existing helipad is located adjacent to the Mauna Lani Golf Course and Mauna Lani Drive. Two circular grass landing areas approximately 15,000 and 8,000 square feet separated by a 3-4 foot high hedge make up the landing area. A wooden bench has been placed under a grove of coconut palms for waiting passengers. This helipad is sited about 1/2 mile from the nearest residential development (Mauna Lani Terrace) and the Mauna Lani Bay Hotel.

Three new helipads will be constructed of load bearing 18-foot diameter concrete pads sited a minimum of 70 feet from a hovering

point placed in the center of the takeoff/landing surface. A 70-foot center-to-center separation between parked helicopters is proposed for operational and safety reasons. The ground level takeoff and landing surface (approximately 20,000 square feet) will be grassed to minimize dust. The helipad may be marked to aid in identifying boundaries of the takeoff/landing area, hover point, parking areas, weight limitations, and heliport owner. These markings will be visible primarily from the air.

In lieu of fencing, the perimeter of the helipad will be bermed and landscaped for safety and aesthetic purposes. Earthen berms and plant materials will be kept low so as not to pose a hazard to flight operations, and in conjunction with posted signs should prevent inadvertent or unauthorized entry.

The applicant proposes the following operational procedures:

"1. Operations: The heliport will be open during daylight hours, 365 days a year for the convenience of hotel guests. Passengers (hotel guests) will be picked up at the hotel, driven to the helipad, and returned to the hotel when the tour is completed. Flights generally take between 1-1/2 to 2 hours depending on the tour.

Two approach and departure routes--one from the east and one from the south--are planned. Both direct aircraft over undeveloped lava fields between the helipad and the Queen Kaahumanu Highway about 2/3 of a mile away. All aircraft now cross the Queen Kaahumanu Highway at an altitude of

between 500-1,000 feet above ground level (AGL) and this practice will continue. Beyond the boundaries of the Mauna Lani Resort, pilots will adhere to the flight paths prescribed in the Helicopter Sound Abatement Procedure Program for the Island of Hawaii.

Helicopters will be parked (and secured) overnight for washing and light routine maintenance. No fuel tanks will be placed on site as refueling will continue at the existing Waikoloa Helipad."

No night flights are planned and, except for building lights, the helipad will not be illuminated or equipped for night operations.

A maximum of four passengers per helicopter would board the parked aircraft. According to the applicant's submittal, "when ready, the helicopter will lift off the parking pad and proceed to the hovering point; pause, then ascend into the appropriate takeoff approach. When airborne, the pilot will adhere to flight paths prescribed in the Helicopter Sound Abatement Procedure Island of Hawaii. Returning flights will follow the takeoff procedure in reverse."

A 252 square foot terminal building will be constructed to accommodate an office, storage and restrooms. A 1,200 square foot lanai will adjoin the terminal building for use as a waiting area. Food will not be served on the premises but non-alcoholic beverages will be provided.

Paved off-street parking for 10 vehicles and turnaround are planned approximately 100 feet away from the helipads. Two driveways would service the project site. Landscaping is shown on the plot plan around the perimeter of the parking area and terminal building.

Two construction phases are proposed. The helipad and off-street parking area will be built during the first phase which should take 4-6 months to complete. A timetable for the second phase, construction of the terminal building, has not been determined. Upon completion, the helipad and ancillary building may be leased to a helicopter operator. The cost of the project, which is estimated at \$115,000 (\$1988), will be borne by the applicant.

DESCRIPTION OF THE AFFECTED ENVIRONMENT

Climate, Topography and Soils

The subject area is presently vacant except for scattered kiawe and fountain grass.

The site is at an elevation of 75 to 80 feet above mean sea level.

Rainfall averages less than 10 inches annually.

Wind patterns are generally offshore from mid-morning until just before sunset and onshore from early evening until the following morning. This diurnal pattern contrasts with the relatively constant northeast tradewind condition prevalent in most other areas of the state. The average wind velocity is also less, averaging 7 to 8 miles per hour for the land-sea breeze compared to 12 to 14 mph

for the tradewinds. Gusty winds blowing through the saddle between Mauna Kea and Mauna Loa reach the project area under certain atmospheric conditions.

Relative humidity is generally low, commonly under 40 percent during the late morning and afternoon hours of warm, cloudless days.

The topography of the project site is relatively flat with a slight slope seaward in a mauka to makai direction.

The U.S.D.A. Soil Conservation Service's Soil Survey Report classifies the soils as A'a Lava Rock (rLV). The A'a Lava Rock soil type is described as a mass of clinkery, hard, sharp pieces piled in tumbled heaps.

Drainage and Flooding

There are no defined drainageways or streams affecting the project site.

The Flood Insurance Rate Map (FIRM), prepared by the U.S. Army Corps of Engineers, depicts the area to be in Zone X--an area outside of the 500-year flood plain.

Water Quality

The selected site is approximately 1.60 miles east (mauka) of the shoreline, which offshore waters are classified Class AA by the State Department of Health.

Floral and Fauna Resources

As mentioned previously, kiawe trees and fountain grasses are common vegetation to this area.

The most common mammal found around the proposed project area is the Small Indian Mongoose (Herpestes auropunctatus). The endangered Hawaiian hoary bat (Lasiurus cinereus semotus) may frequent the area, but none were sighted during bird or mammal surveys conducted of the area for the Mauna Lani Cove (marina) project and none have been reported since a dead specimen was found on the grounds of the Royal Waikoloa Hotel, approximately two miles south of the project site.

Archaeological and Cultural Resources

An archaeological survey conducted of the area by William Barrera found no significant archaeological features or sites on the project site. However, if any unanticipated sites or remains should be unearthed, work shall cease and the Planning Department notified immediately. Subsequent work shall proceed upon an archaeological clearance from the Planning Department when it finds that sufficient mitigative measures have been taken.

The Puako Petroglyph Archaeological Park, which is approximately 2,500 feet to the north of the subject site, has been placed on the National and State Register of Historic Places (Site 10-11-4713). As a condition of approval for a Conservation District Use Permit and a Special Management Area Use Permit, Mauna Lani Resort was required to develop a plan for the management of the Puako Petroglyph Archaeological Park. While a Management and Interpretive Plan has been approved, the Park is undergoing final management preparations prior to public opening by Mauna Lani Resort.

After review of the subject development and the Noise Impact Assessment, the Department of Land and Natural Resources had no objections to the proposed development.

Noise Quality

A "Noise Impact Assessment-Helicopter Flight Operations at the Proposed Mauna Lani Helipad, Mauna Lani Resort, Hawaii" dated April 2, 1990, was prepared by Darby & Associates [see attached study]. The study utilized a 3,000-foot radius (suggested by the Planning Department) to identify noise-sensitive zones at the site and along the approach/departure corridor centerline. In summary, the Puako Petroglyphs Archaeological Park, the resort services building, and the pre-school were identified noise sensitive areas within the 3,000-foot zone. Noise measurements obtained at existing noise sensitive locations within the Mauna Lani Resort area, indicate that the existing acoustical environment is generally excellent with the natural sounds being dominant. The average levels ranged from about 35-51 dBA and the Day-Night Average Sound Levels (Ldn's) are estimated to be about 6-7 dB above these measured levels. The helicopter-generated Ldn levels were calculated for four different scenarios of daily takeoff/landing operations (12, 16, 24 and 30). Using all scenarios, Ldn levels will be less than 55 dB at the three identified noise sensitive locations in

Mauna Lani Resort. The estimated noise level at the southern boundaries of the Puako Petroglyph Archaeological Park range from 35-44.5 dBA. If the noise levels are a threat to the health and welfare of the staff and children of the pre-school, the applicant has stated that the flight operations will be curtailed by Mauna Lani Resort.

Air Quality

Although there is no air monitoring station in the project area, the principal source of air pollution in West Hawaii has been Kilauea Volcano more recently. During eruptive periods and when the predominant northeasterly tradewinds are blowing, volcanic air pollution builds up causing continuous haze over the Kona area. As part of the impact analysis for the Mauna Lani Cove project, carbon monoxide (CO) sampling was conducted during am and pm peak traffic hours at the Mauna Lani Drive/Queen Kaahumanu Highway intersection. The results of that monitoring indicated CO levels in the 1.0 to 4.0 milligrams/cubic meter (mg/c^3) level, which is below the state standard of $10.0 \text{ mg}/\text{m}^3$.

Surrounding Land Uses

The surrounding area is vacant and similar in character to the project site. The nearest land uses are the Mauna Lani Golf Course (hole #6) approximately 900 feet away. The Mauna Lani sewage treatment plant (STP) is situated approximately 1,600 feet to the northeast.

Potential noise sensitive uses include the resort service buildings and Mauna Lani Resort preschool approximately 1,300 and 2,800 feet to the southwest, respectively. Additionally, the Puako Petroglyph Archaeological Park is located approximately 2,500 feet to the north.

SOCIAL AND INSTITUTIONAL CONSIDERATIONS

The General Plan Land Use Pattern Allocation Guide (LUPAG) Map designates the area as an Urban Expansion area. This designation may allow for a mix of high density, medium density, low density, industrial and/or open designations in areas where new settlements may be desirable, but where the specific settlement pattern and mix of uses have not yet been determined. The General Plan document recognizes Mauna Lani Resort as a major resort destination area.

The subject site was a portion of a larger area classified from an Agricultural into an Urban District by the State Land Use Commission on March 3, 1986. It should be mentioned that the closest State Land Use Conservation District boundary is the Puako Petroglyph Archaeological Park lands approximately 2,500 feet away to the north.

The West Hawaii Regional Plan (November 1989), prepared by the Office of State Planning, identifies the Mauna Lani/Waikoloa areas as one of the resort destination nodes.

The site is currently zoned Unplanned by the County of Hawaii Zoning Code. A Use Permit application has been submitted to the Planning Department, which would allow the proposed use if approved by the Planning Commission.

The project site is within the Special Management Area (SMA) of the County of Hawaii. An SMA Major Use Permit has been submitted to the Planning Department for processing to the Planning Commission.

FACILITIES AND SERVICES

Access to the project site is via Kaniku Drive, which has a 20-foot wide pavement. Kaniku Drive intersects with Mauna Lani Drive, the main access road to Mauna Lani Resort from Queen Kaahumanu Highway.

Water is available to the project site.

Sewage will be treated at the Mauna Lani STP.

All other essential utilities will be available to the affected area.

At present, fire and emergency services are provided out of stations at the South Kohala Resort station, Waimea and Kapaau. Police protection is available from Waimea with a substation out of the South Kohala Resort facility.

ENVIRONMENTAL IMPACT

The proposed construction of three helipads, a terminal building and related improvements are not anticipated to have a significant environmental impact on the resources of the area. Specifically identified by Chapter 343-5, Hawaii Revised Statutes, the proposed development will not affect (1) lands classified Conservation by the State Land Use Commission, which are approximately 2,500 feet away; (2) the shoreline area, which is approximately 1.06 miles away; and (3) the Puako Petroglyph Archaeological Park also 2,500 feet away. The approach and departure flight paths would occur in a diametrically opposite direction from the above-stated criterion. According to the Noise Impact Assessment report prepared by Darby and Associates and reviewed by the FAA, Department of Transportation-Airports Division, the Department of Health and the Department of Land and Natural Resources, the noise generated from 12-30 flights would be less than 50-55 dB at these locations; thereby not affecting the identified lands. The Puako Petroglyph Archaeological Park was measured as having an average sound pressure range from 35.0 to 44.5 dBA. When applying the 55 dB along the approach/departure/site corridor, the Park's exposure to helicopter generated noise would be minimally affected. The Department of Land and Natural Resources has stated that visitors in the Park should not be affected by the proposed use. While the preschool, a noise sensitive use, is within the 3,000 foot radius, the school and the helipad facility are both under the Mauna Lani Resort's management umbrella. Should there be a conflict, Mauna Lani Resort will be required to mitigate or mediate any problems that may arise as

conditioned in further permits, if approved by the Planning Commission. The closest noise-sensitive use, the resort service and office, are planned to be moved to Mauna Lani Drive. The imposition of a termination date to any permits granted by the Planning Commission is also recommended for this facility. This requirement (life of a permit) is not unusual for a private helicopter landing pad request in the County of Hawaii. If a request to renew the permits is received, new factors and changing conditions in the area can be reassessed.

The combination of aridity and the erosive soil-types will generate fugitive dust and particulates during the construction phase and following its completion. This will be controlled by the application of accepted construction practices and the utilization of groundcover landscaping on exposed areas in the vicinity of the landing area and terminal building.

The project is not in a coastal hazard area nor will it aggravate any flood plains. The administration of the Hawaii County Code, Chapter 27 relating to Flood Control, by the Department of Public Works, will oversee on-site drainage concerns.

Since the project is located over one mile from the shoreline, coastal water quality and public access to the shoreline will not be affected. Moreover, no recreational areas in the vicinity should be affected other than the Mauna Lani Golf Course.

No endangered species of plants or animals or their habitat have been identified in or around the development or its activities.

Finally, the action should not involve an irrevocable commitment of any important lands or ecological resources of the region. It does not contain any historic sites of significance. In the event that archaeological features are discovered during the construction phase, it is recommended that subsequent permits include a standard condition which informs the applicant to stop work until clearance can be given by the Planning Department.

The proposed development is a resort amenity that presently exists but at a more obtrusive site. The new project site and terminal building will be landscaped and paved to be visually buffered. It is recognized that the landscaping cannot hinder line of sight or landing patterns of the helicopters.

Traffic to the site will increase over present levels. Since this traffic is expected to be internally generated from the resort visitors, impacts to the roadway system, including Kaniku Drive having a 20-foot wide pavement, should be minimal.

DETERMINATION

Based upon the above considerations and the best available information of the area, it is determined that the proposed development and related improvements will not have significant impacts on the environment. Therefore, a notice of negative declaration is being filed with this environmental assessment.

DARBY ACOUSTICAL CONSULTANTS, LTD.
dba



J90-04
April 2, 1990

GERALD PARK, URBAN PLANNER
1245 Young Street
Suite 201
Honolulu, Hawaii 96814

Attention: Mr. Gerald Park

Subject: Noise Impact Assessment, Helicopter Flight Operations at the
Proposed Mauna Lani Helipad, Mauna Lani Resort, Hawaii

Dear Mr. Park:

Noise measurements and analyses have been performed to assess the noise
impact due to helicopter operations associated with the subject helipad.

The following provides the result of our study:

I. SUMMARY

- A. The Puako Petroglyphs Archaeological Park and the office spaces
within the resort services building on Kaniku Drive are the
existing noise sensitive areas located within the 3,000-foot
zone (3,000-foot radius or \pm 3,000 feet of the approach/
departure corridor centerline) within the Mauna Lani Resort
area. In addition, a proposed preschool is to be located adjacent
to the resort services building.
- B. Noise measurements obtained at various existing noise sensitive
locations within the Mauna Lani Resort area, including those
within the 3,000-foot zone, indicate that the existing acoustical
environment is generally excellent with the natural sounds

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KAILUA, HAWAII 96734 • (808) 254-3318 • FAX (808) 254-5295

(e.g., wind in foliage, birds, and surf) being dominant. At such locations, the measured average levels ranged from about 35 to 51 dBA, and the Day-Night Average Sound Levels (Ldn)'s are estimated to be about 6 to 7 dB above these measured levels.

- C. The helicopter-generated Ldn levels were calculated, using the methodology outlined in the helicopter noise modelling methodology section of the State Helicopter System Plan, for four different scenarios, of 12, 16, 24 and 30 daily takeoff and daily landing operations. The results of these calculations are presented in Figures 5 through 9. For the above four operational scenarios, the 55 dB Ldn contour lines lie entirely within a 3,000-foot radius from the proposed helipad location. The calculation results indicate that all noise sensitive locations within the 3,000-foot zone will be exposed to a helicopter-generated Ldn level of less than 55 dB. The Ldn levels will also be less than 55 dB at all other existing noise sensitive locations within the Mauna Lani Resort area.
- D. According to the above Ldn calculation results, the helicopter activities associated with the proposed helipad will comply with the noise standards and guidelines set forth by the U.S. Environmental Protection Agency (EPA); the Hawaii Helicopter Operations Association Sound Abatement Program; the Hawaii State

Helicopter System Plan; and other federal and local agencies and standards organizations (FAA, State DOT, etc.).

- II. PROJECT DESCRIPTION -- The proposed project involves the development of a new helipad within the Mauna Lani Resort area. There is an existing helipad within the resort area, and the proposed location is about one mile to the northeast of this existing site. Refer to Figure 1 for the location of the proposed and the existing sites.
- III. NOISE STANDARDS -- The U.S. Environmental Protection Agency (EPA)'s aircraft noise regulations specify 65 dB Day-Night Average Sound Level (Ldn) as a maximum allowable level for residential and other noise sensitive areas (Appendix I provides an explanation of the Ldn noise descriptor). An Ldn of 55 dB is considered as a long-term goal set forth by the EPA to "ensure protection of the public health and welfare from all adverse effects of noise based on present knowledge" [Reference 1]. Other federal and local agencies and standards organizations (FAA, State DOT, etc.) also specify compatible Ldn zones for various land uses. They normally allow noise sensitive uses such as residences, parks, and schools at areas exposed to an Ldn of 55 to 65 dB, or less.

The Sound Abatement Program initiated by the Hawaii Helicopter Operators Association (HHOA) [Reference 2] proposes that flight activities conducted by HHOA members should not cause an Ldn of 55 dB to be exceeded at noise sensitive areas (residences, churches, schools,

etc.) The HHOA also proposes that new helicopter related facilities (heliports, helipads and helistops) should comply with its 55 dB Ldn guideline.

The recommended criteria outlined in the Hawaii State Helicopter System Plan (Reference 3) state that, at residential areas, helicopter flight activities should not generate an Ldn of more than 5 dB below the existing ambient level. Furthermore, the plan also specifies that no more than eight flights per day should be allowed over residences.

IV. EXISTING ACOUSTICAL ENVIRONMENT -- In accordance with the County Planning Department's comments (Reference 4), a 3,000-foot zone within the Mauna Lani resort area has been considered as the area of primary concern regarding potential noise impact from helicopter activities associated with the proposed helipad. This 3,000-foot zone is defined as a 3,000 foot radius from the proposed helipad, or within $\pm 3,000$ feet of the approach/ departure corridor centerline.

The existing noise sensitive areas located within a 3,000 foot radius of the proposed helipad are: a portion of the Puako Petroglyphs Archaeological Park; and the office spaces within the resort services building on Kaniku Drive. In addition, a proposed preschool is to be located adjacent to the resort services building, and is expected to be in operation sometime this year. Figure 2 provides the location of these areas. There are no other existing noise sensitive locations within $\pm 3,000$ feet of the approach/departure corridor centerline

within the Mauna Lani Resort area. The Mauna Lani Bay Hotel, Mauna Lani Terrace condominiums, and the various recreational areas (i.e., racquet club, public park, etc.) are the other existing noise sensitive areas located within the resort area but outside the 3,000-foot zone.

Noise measurements have been obtained at locations within the vicinity of the proposed helipad, including the above noise sensitive locations, to assess the existing acoustical environment. Table 1 provides a summary of the measurements. The existing acoustical conditions at most of the measurement positions were excellent with the natural sounds (e.g., wind in foliage, birds, and surf) being dominant. At locations with little or no foliage, the measured ambient levels were as low as 35 dBA, whereas ambient levels ranging from about 46 to 51 dBA were measured at locations near a beach and/or where large amount of foliage were present. An ambient level as high as 65 dBA was measured at locations where traffic noise was dominant. Day-Night Average Sound Levels (Ldn)'s at the locations where the acoustical environment is dominated by natural conditions are estimated to be about ~~6 to 7~~ dB above the measured ambient levels, assuming there are no other significant noise sources.

IV. HELICOPTER GENERATED NOISE LEVELS AND ASSESSMENT OF POTENTIAL IMPACT

- A. Day-Night Average Sound Level (Ldn) Calculation -- As prescribed in the helicopter noise modelling methodology section of the State Helicopter System Plan (Section 6.2, Chapter 6, Appendix L

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Attn: Mr. Gerald Park

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[Reference 5]), the Federal Aviation Administration (FAA) Helicopter Noise Model (HNM) [Reference 6] is used to determine the location of the Ldn contour lines at areas within a 1/2 mile radius (about 3,000-foot radius) from the proposed helipad. The computation involved the following assumptions:

- o 12 to 30 takeoff and 12 to 30 landing operations per day (on an annual daily average basis.)
- o "Straight-in" and "Straight-out" flight tracks (see Figure 4.)
- o AGL (above ground level) altitude of 1000' at or near Queen Kaahumanu Highway.
- o Use of an Aerospatiale Gazelle SA341G helicopter.

Note that the Aerospatiale Gazelle SA341G helicopter has a similar noise profile to the Bell 206 helicopter, and therefore, the location of the Ldn contour lines would be similar for both helicopters (Reference 7).

The numbers of daily helicopter operations used in the HNM calculations are annual daily averages, as specified in Appendix L of the State Helicopter System Plan. Such numbers are obtained by dividing the total number of annual operations by 365. Therefore, the actual number of daily operations may vary from day to day, depending on the flight demand, weather conditions, etc.

The results of the HNM calculations showing the 55, 60, and 65 dB Ldn contour lines for four scenarios (12, 16, 24 and 30 daily takeoff and daily landing operations), are presented in Figures 5

through 8. Figure 9 provides comparative locations of the 55 dB Ldn line for the above four cases. As can be seen from these figures, the 55 dB Ldn contour lines, for 30 takeoff and 30 landing operations per day or less, lie entirely within a 3,000-foot radius from the proposed helipad.

- B. Comparison With the Ldn 55 dB Criterion -- Based on the above HNM calculation results, none of the previously discussed noise sensitive areas would experience an Ldn greater than 55 dB. Therefore, the helicopter noise exposure would be in compliance with the EPA's current aircraft noise standards and its long-term goal; other federal and local land-use compatibility guidelines; and the HHOA's Sound Abatement Program.
- C. Comparison With the State Helicopter System Plan -- As stated earlier, the States's "5 dB less than ambient" criterion applies to residential areas. Therefore, none of the noise sensitive areas located within the 3,000-foot zone within the Mauna Lani Resort area are required to comply with this criterion.

At resort and residential occupied locations outside the 3,000-foot zone (i.e., Mauna Lani Bay Hotel, and the Mauna Lani Terrace condominium area), the helicopter generated Ldn will be about 20 dB below the ambient Ldn level, due to the distances involved (more than one mile) and the high ambient noise levels (primarily due to traffic and other activities associated with the

hotel and condominium, and surf). Therefore, the helicopter generated Ldn levels are expected to comply with the State's "5 dB less than ambient" criterion at the existing residential areas within the resort areas.

The State plan's criterion of a maximum of 8 overflights per day does not apply to the subject project, since, according to the proposed flight tracks, there are no existing residences within the Mauna Lani Resort area which would experience helicopter overflights.

- D. Single Event Noise Indices, SEL and Lmax -- The Sound Exposure Level (SEL) and the maximum noise level (Lmax) are widely used noise indices for the assessment of the sleep and speech interference caused by a single noise event. There are currently no generally recognized noise criteria using these noise indices, however, several federal agencies are proposing to include the SEL and Lmax in their aircraft noise related guidelines.

Field noise measurements have been performed to estimate the ~~SEL~~ and the Lmax levels for a typical helicopter flyover. The measurements were performed for two flyover events of a Bell 206B helicopter at an altitude of 500 feet above ground level. The measured SEL ranged from about 82 to 84 dBA and the Lmax ranged from about 72 to 76 dBA. The measured SEL levels are compared to the published data and the results are provided in Figure 10. As

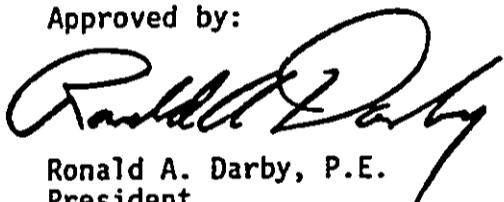
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stated earlier, there are currently no generally recognized noise criteria using the SEL or Lmax noise descriptors for helicopter operations, however, it is possible that occupants of the future preschool, office spaces (within the existing resort service building), or persons engaging in golf activities, may be momentarily disturbed by the noise generated by individual helicopter operations. It should be noted, however, that the helicopter-generated noise exposure levels at all existing noise sensitive locations within the Mauna Lani Resort area will be in compliance with the applicable criteria.

Sincerely,

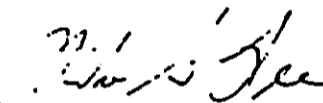
Approved by:



Ronald A. Darby, P.E.
President

MSL;RAD:msl

Prepared by:



Mike S. Lee
Senior Consultant

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Attn: Mr. Gerald Park

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REFERENCES:

1. "Toward a National Strategy for Noise Control," U.S. Environmental Protection Agency, April 1977
2. "Draft Action Proposal: Sound Abatement; Tour Operator Permit System; Heliport Siting," Hawaii Helicopter Operators Association, April 5, 1989
3. "Hawaii State Helicopter System Plan, Preliminary Findings and Recommendations," Department of Transportation, Airport Division, January 1989
4. Letter from the Planning Department, Hawaii County, "Environmental Assessment, Construction of a Helipad, Mauna Lani Resort, TMK 6-8-11: por. of 52," dated October 23, 1989.
5. Appendix L, "Acoustic Study of the Possible Causes of Noise Impacts and Concerns Associated the Helicopter Operations in Hawaii (State Helicopter System Plan), Prepared by Y. Ebisu & Associates, December 1988
6. "HNM Heliport Noise Model, Version 1, User's Guide," Federal Aviation Administration, February, 1988
7. "Helicopter Noise Exposure Curves for Use in Environmental Impact Assessment," Federal Aviation Administration, November, 1982

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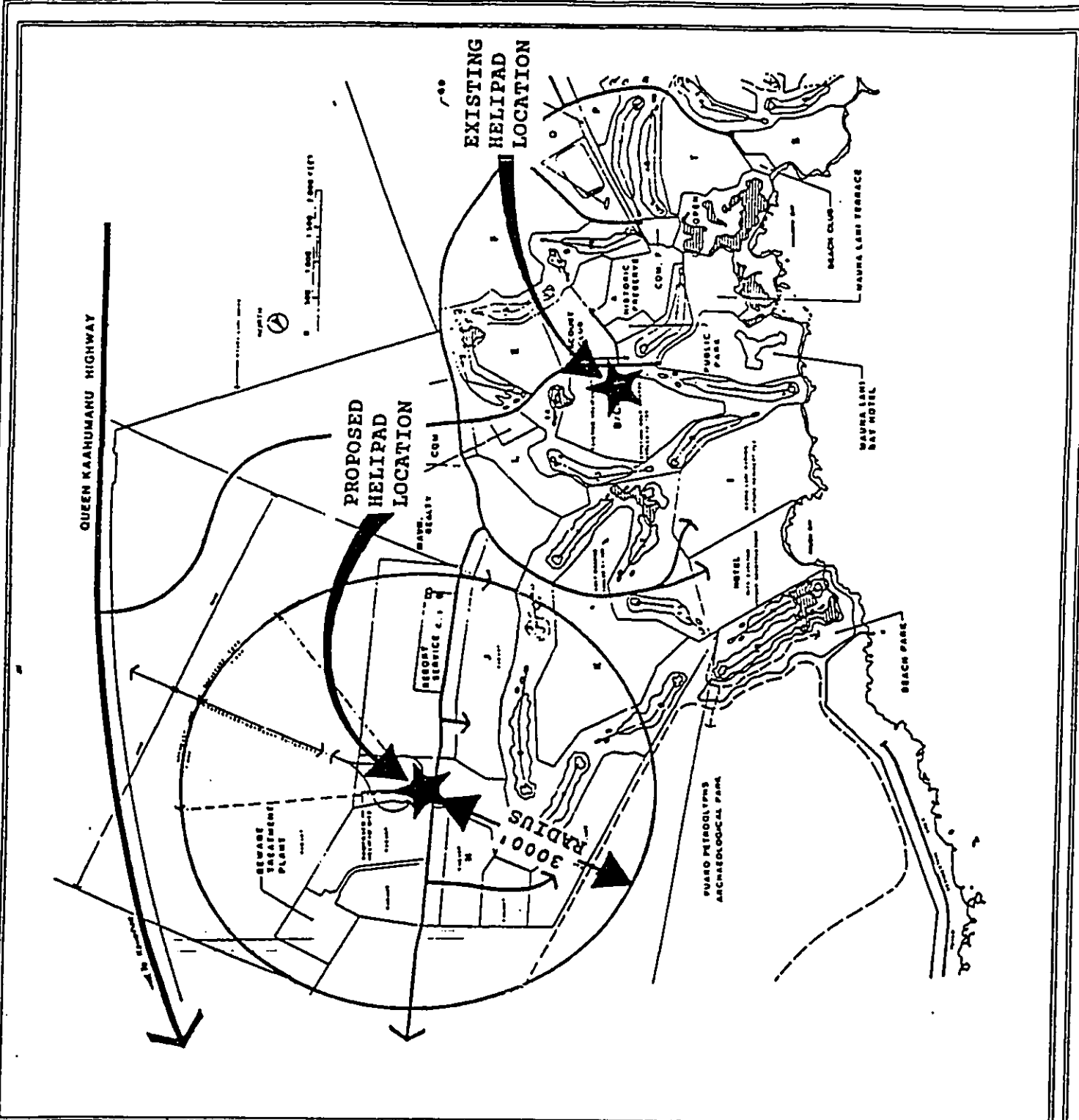
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NOISE CRITERIA AND GUIDELINES FROM FEDERAL AGENCIES AND STANDARDS ORGANIZATIONS

1. "Guidelines for Considering Noise in Land Use Planning and Control," Federal Interagency Committee on Urban Noise, June 1980.
2. "Noise Control and Compatibility Planning for Airports," Federal Aviation Administration, August 5, 1983.
3. American National Standard for Sound Level Descriptors for Determination of Compatible Land Use, American National Standards, ANSI S3.23-1980, May 30, 1980
4. "Airport Noise Level Recommended for Land Use Planning (Preliminary)," State Department of Transportation - Airport Division, Received on May 19, 1987.

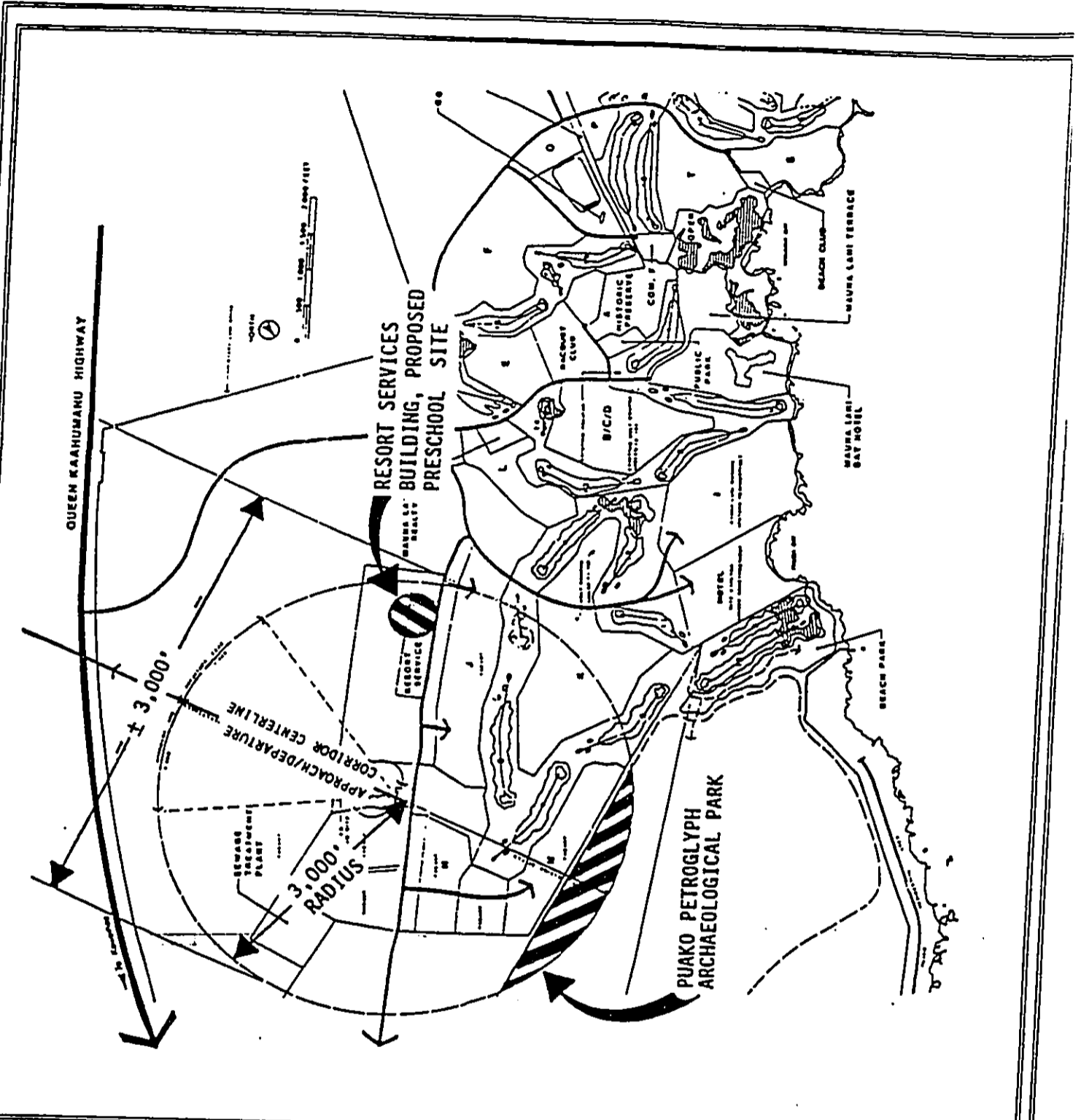
Table 1. Summary of Ambient Noise Measurements Obtained at the Mauna Lani Resort Area, February 23, 1990

Measurement Location (see Figure 3)	Average Sound Pressure Level, Leq, (dBA)	Overall Sound Pressure Level Range, (dBA)	Dominant Sound Source
Position A -- Puako Archaeological Park, portion of the park within a 3,000 foot radius from the proposed heliport	37.6	35.0 to 44.5	birds
Position B -- the proposed heliport site, about 30 to 40 feet mauka of Kaniku Dr.	37.4	35.0 to 44.5	birds, traffic
Position C -- resort service building, area adjacent to the southwest elevation of the building	51.5	49.0 to 65.0	traffic, air conditioners
Position D -- Mauna Lani Golf Course, 14th tee	42.3	40.0 to 47.0	birds, traffic
Position E -- Racquet Club, grass area between the parking lot and the tennis courts	46.0	41.5 to 51.5	wind in foliage, birds
Position F -- Public Park, between the parking lot and a visitor display	46.8	40.0 to 55.0	wind in foliage, birds, traffic
Position G -- Mauna Lani Terrace, landscape area between the entrance gate and the residential units	50.2	40.5 to 63.0	wind in foliage, birds, traffic
Position H -- Mauna Lani Bay Hotel, walkway between the hotel and to the bungalows, near the swimming pool area	50.9	48.5 to 55.5	surf, birds
Position I -- Mauna Lani Marina, near the beach and the second hole green of the golf course	46.0	44.5 to 50.0	surf, birds



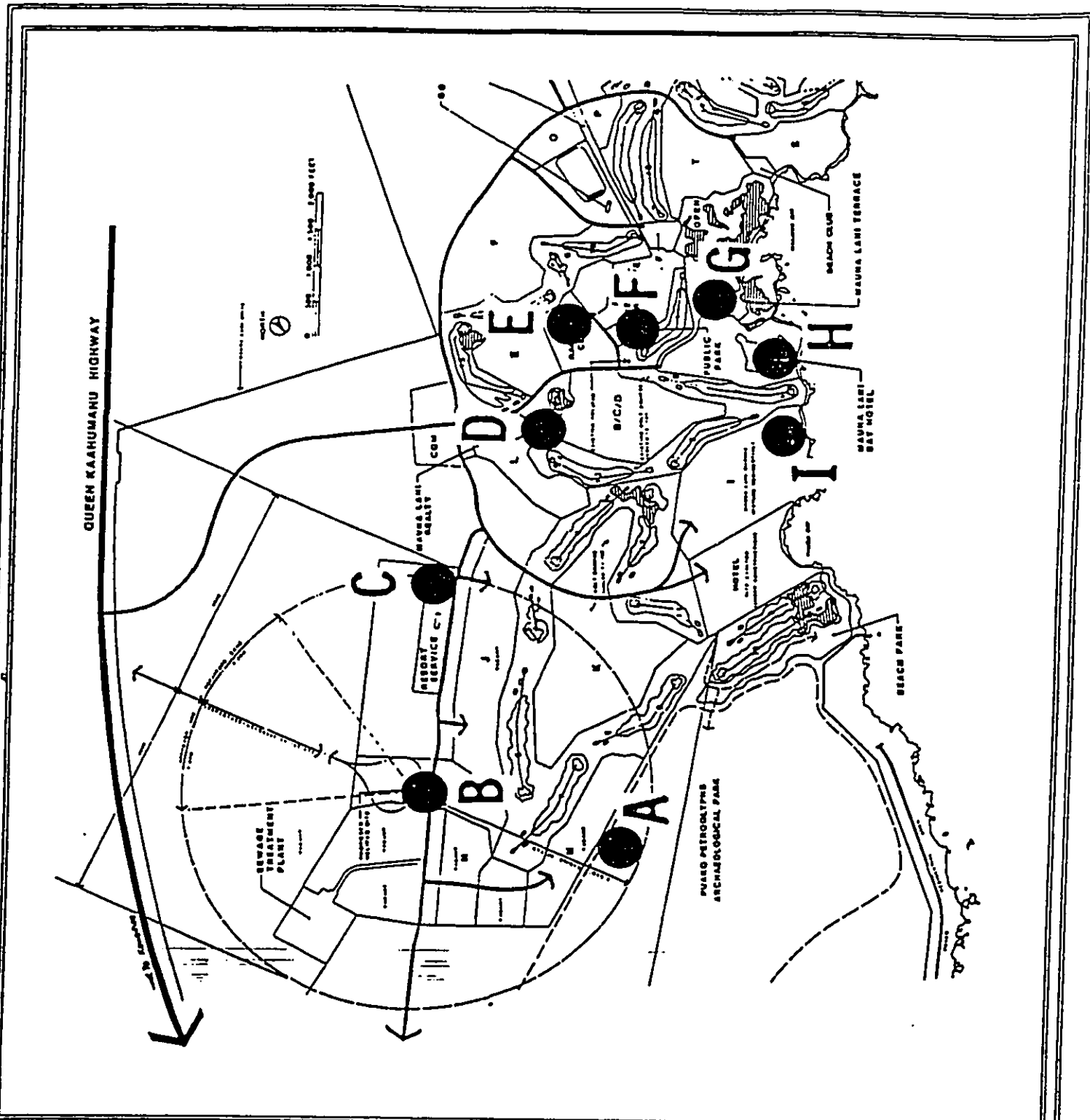
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FIGURE 1. LOCATION OF THE EXISTING AND THE PROPOSED HELIPAD



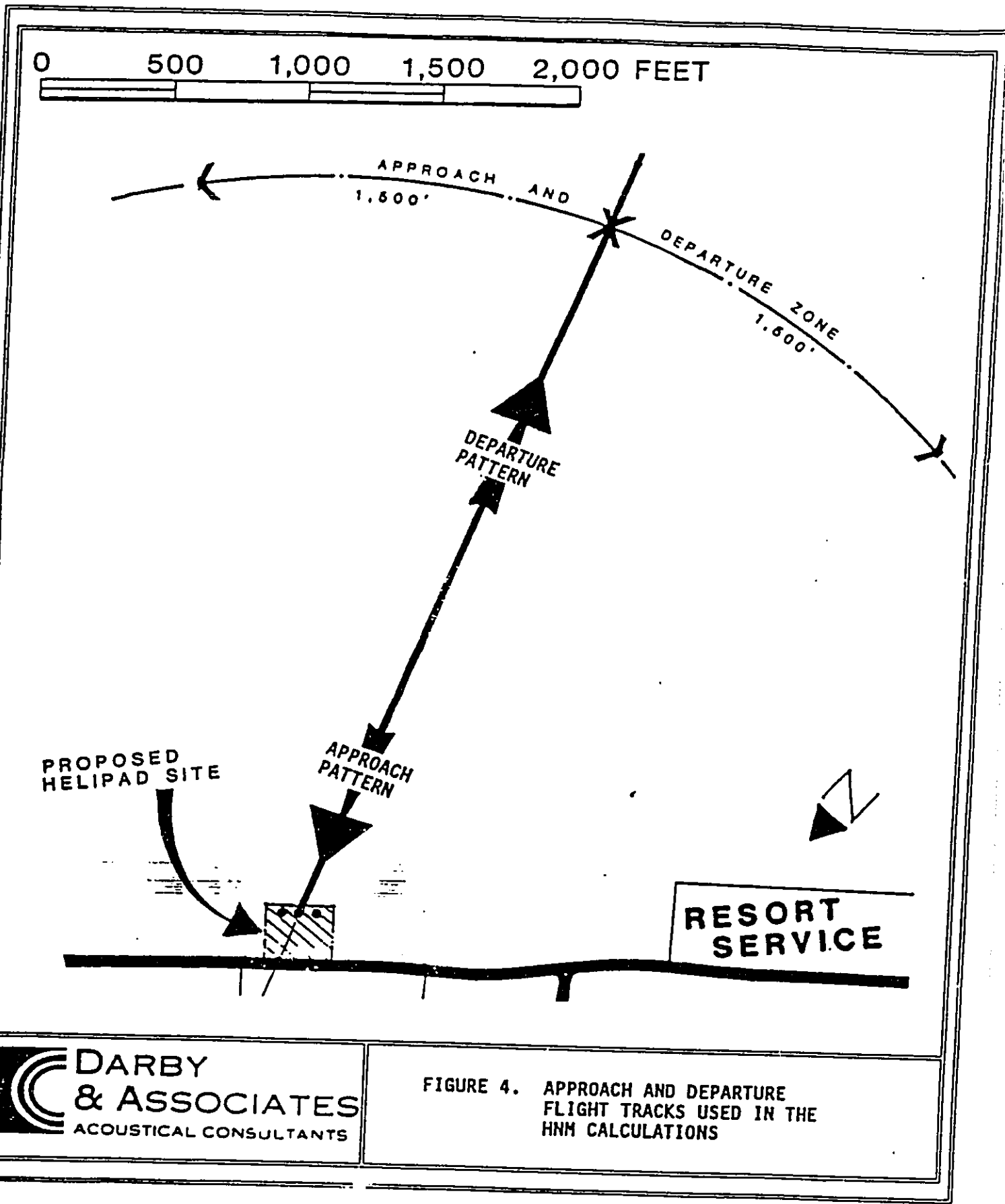
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FIGURE 2. LOCATION OF THE EXISTING AND FUTURE NOISE SENSITIVE AREAS WITHIN THE MAUNA LANI RESORT AND WITHIN THE 3,000' ZONE



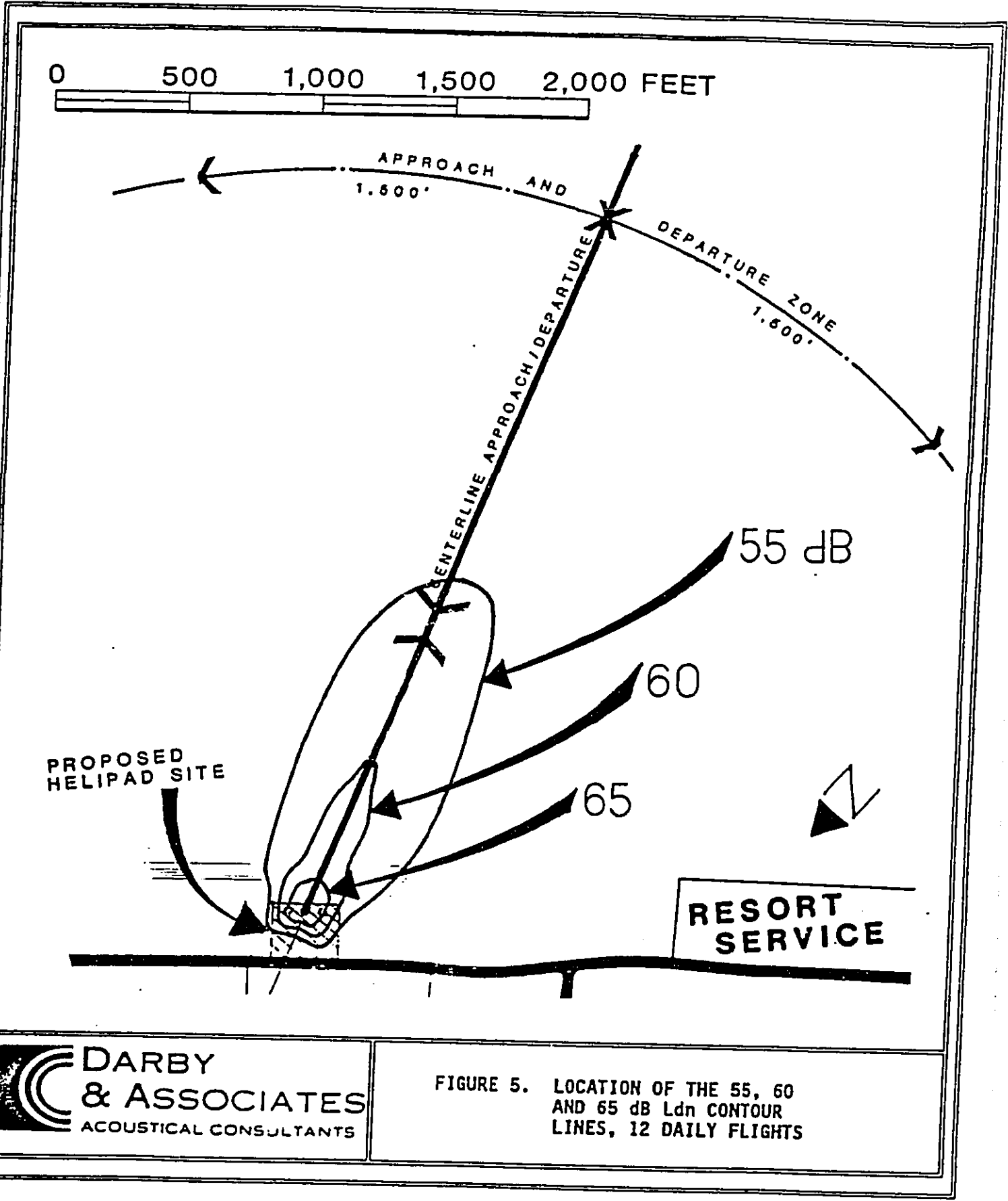

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FIGURE 3. LOCATION OF THE AMBIENT NOISE MEASUREMENT POSITIONS



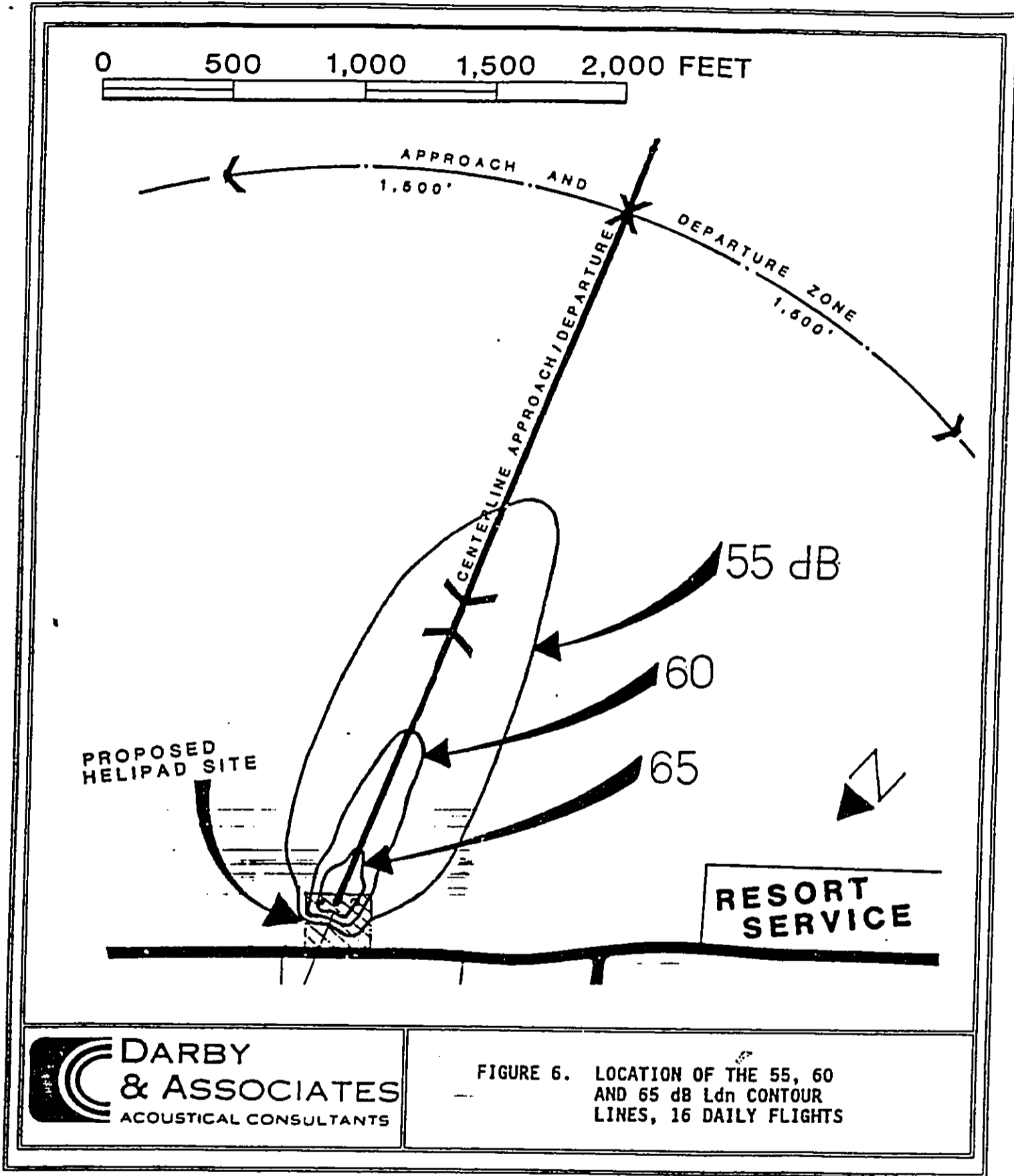
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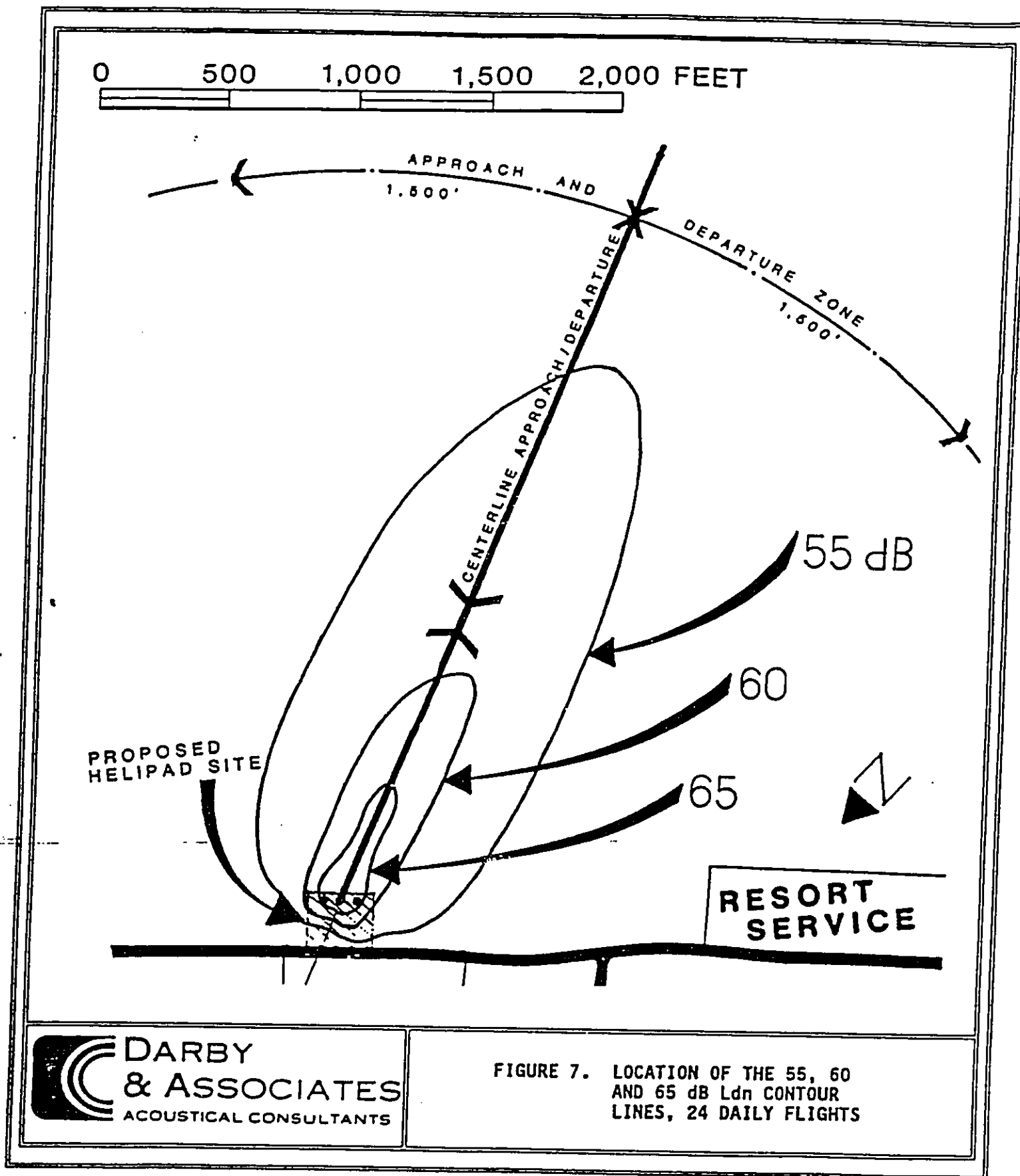
FIGURE 4. APPROACH AND DEPARTURE FLIGHT TRACKS USED IN THE HNM CALCULATIONS



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FIGURE 5. LOCATION OF THE 55, 60 AND 65 dB Ldn CONTOUR LINES, 12 DAILY FLIGHTS

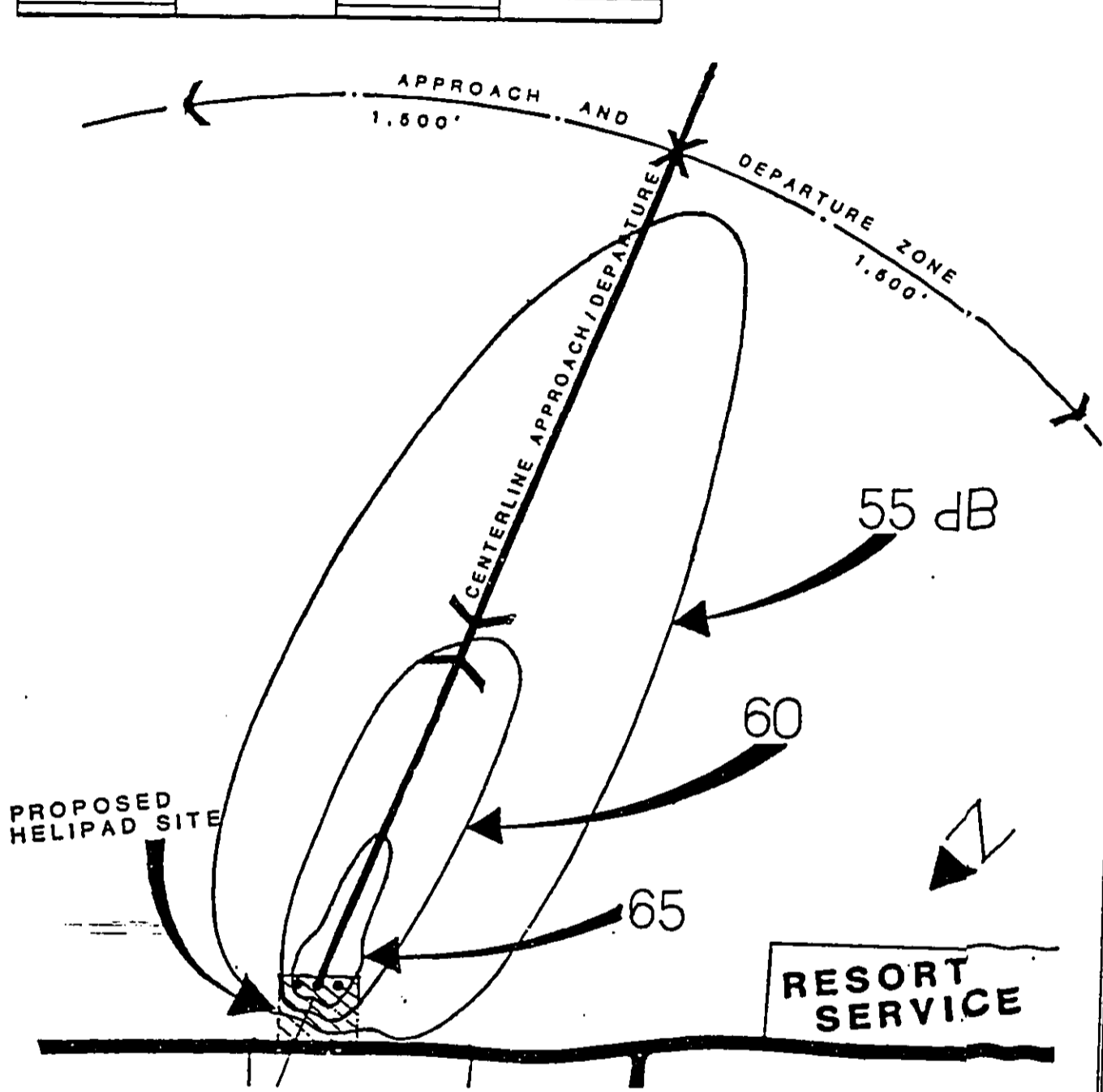




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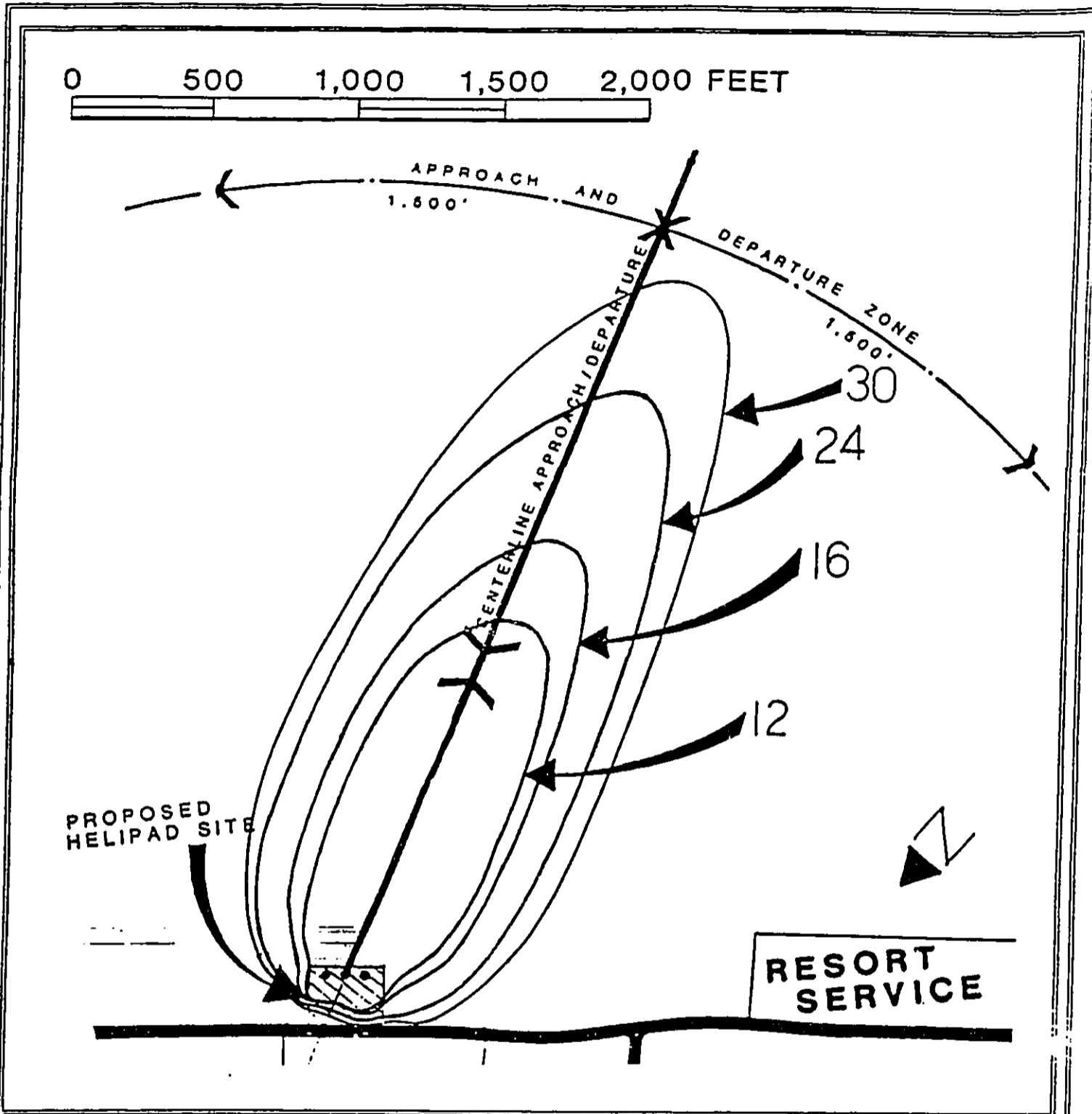
FIGURE 7. LOCATION OF THE 55, 60 AND 65 dB Ldn CONTOUR LINES, 24 DAILY FLIGHTS

0 500 1,000 1,500 2,000 FEET



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FIGURE 8. LOCATION OF THE 55, 60 AND 65 dB Ldn CONTOUR LINES, 30 DAILY FLIGHTS

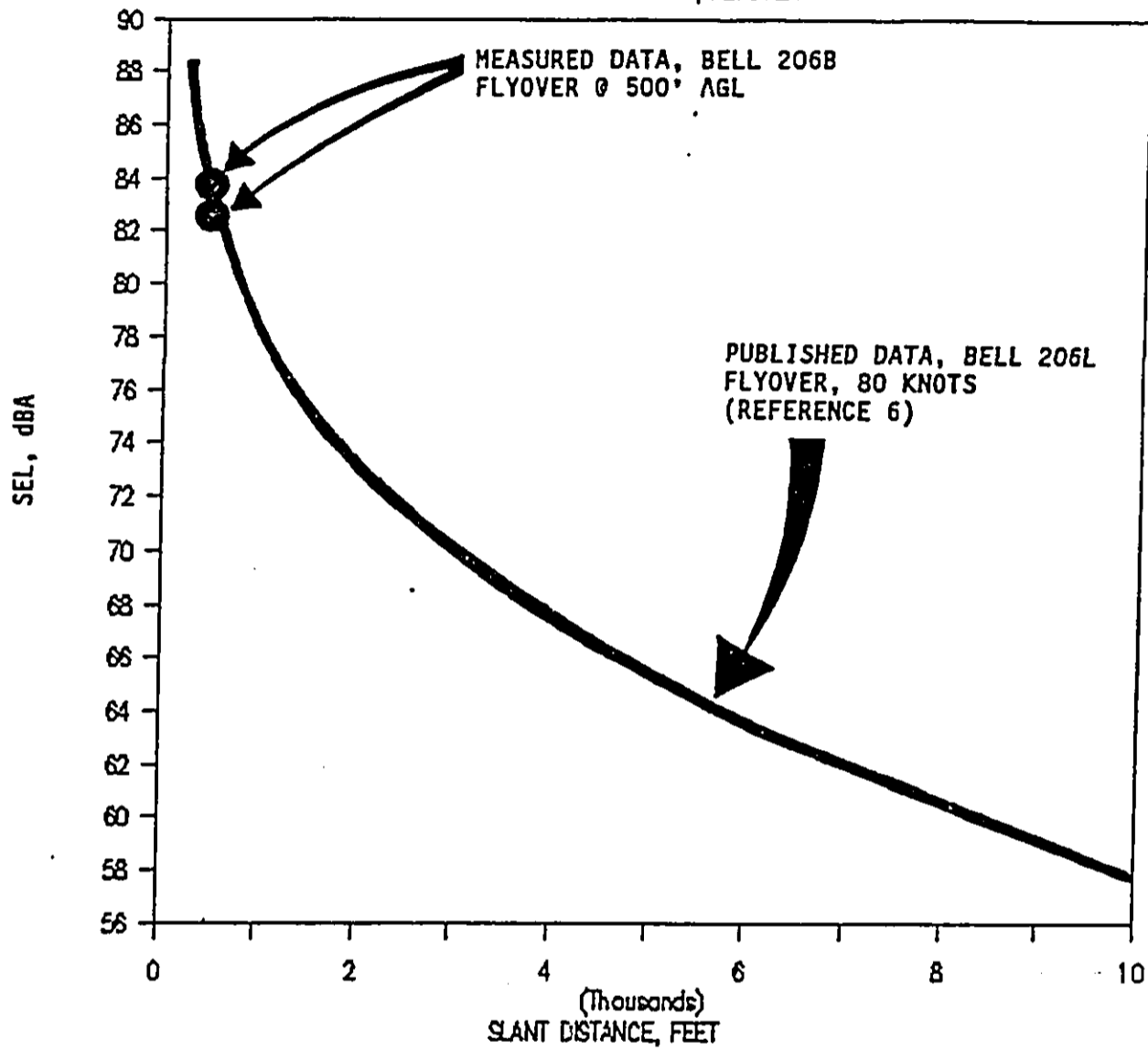


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FIGURE 9. LOCATION OF THE 55 dB Ldn CONTOUR LINES, 12, 16, 24 AND 30 DAILY FLIGHTS.

SEL vs SLANT DISTANCE

BELL 206 HELICOPTERS, FLYOVER



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FIGURE 10. SOUND EXPOSURE LEVEL (SEL) VS SLANT DISTANCE, MEASURED AND PUBLISHED DATA.

APPENDIX I

DAY-NIGHT AVERAGE SOUND LEVEL

It is recognized that a given level of noise may be more or less tolerable, depending on the duration of exposure experienced by an individual. There are numerous measures of noise exposure which consider not only the A-weighted sound level variation of noise but also include the duration of the disturbance. The United States Environmental Protection Agency (EPA) has adopted a Federal Policy of noise control and acceptable levels of noise exposure. The measure of exposure used by the EPA is the day-night average noise level, Ldn. This measure is essentially an average of the A-weighted sound levels experienced for each 24-hour period. Noise levels occurring during late evening and early morning hours (10:00 pm to 7:00 am) are more annoying and, therefore, are increased by 10 dB(A) and averaged along with the daytime levels.

A comparative description of outdoor Ldn values is provided in Figure I-1.

TABLE I-1 QUALITATIVE DESCRIPTION OF THE AVERAGE DAY-NIGHT SOUND LEVEL (Ldn) AND SELECTED LOCATIONS ON OAHU EXPOSED TO THE INDICATED Ldn LEVEL

