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東アジア多国間安全保障枠組創出のための研究—米軍プレゼンスの態様—

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資料

1) MCAS FUTENMA, MASTER PLAN, June 1992

MCAS FUTENMA
OKINAWA, JAPAN

MASTER PLAN

Prepared for:
Department of the Navy
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
Facilities Planning and Real Estate Department
Pearl Harbor, Hawaii

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MCAS FUTENMA MASTER PLAN

AERIAL VIEW

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A. EXECUTIVE SUMMARY

1. Introduction

This Master Plan is an update of the 1980 Master Plan for Marine Corps Air Station (MCAS) Futenma. (A Draft Master Plan was also prepared in 1985, but was never adopted.) It covers in detail the Marine Corps and Navy activities located at the Air Station.

Included in the Plan are guidelines on land use and a basis for the siting of facilities for both the mid-range (3-7 years) and long-range (beyond 7 years) time frames. Its purpose is to promote orderly development of Marine Corps facilities based on mission requirements, current planning criteria and development constraints.

The Master Plan was prepared by Group 70 International, Inc. of Honolulu, Hawaii, a planning and architectural consulting firm, under the guidance of Pacific Division Naval Facilities Engineering Command (PACNAVFACENGCOM). Also assisting with its preparation was the Office of Public Works, Facilities Engineer Division, MCB Camp S. D. Butler.

2. Major Planning Proposals

Major proposals of this Plan to meet operational, maintenance, housing and community service needs include the following:

- a. Upgrade and expand the aircraft parking and access aprons to accommodate aircraft base loading.
- b. Provide a new air traffic control tower, aircraft compass calibration pad, Runway 6 paved overrun and Runway 24 instrument landing lights to improve operational safety and efficiency.
- c. Construct two new Type I hangars for the HMM Squadrons based at MCAS Futenma.
- d. Provide a tactical air operations center, a moving target simulator, four aircraft full motion simulators, and a combat training pool to fulfill operational training capability requirements at the Air Station.
- e. Build new wing and group headquarters buildings, and expand squadron/battalion and

detachment/battery headquarters space as necessary to satisfy current requirements.

- f. Reduce the shortage of warehousing space by constructing new consolidated unit storage warehouses.
- g. Improve station security through the provision of a central guardhouse and a flightline security fence and patrol road.
- h. Construct two new bachelor officers (O-3 and above) quarters (172 total rooms) and a new 196-room staff non-commissioned officers (SNCO) quarters to correct existing shortfalls in bachelor housing.
- i. Increase community support services through the addition of a gas station, alcohol and drug rehabilitation center, and an arts and crafts hobby shop. In the long term, construct a new community services center which includes the full range of exchange facilities, a bank, a post office, and a theater.
- j. Significantly expand indoor and outdoor recreational opportunities by providing a new physical fitness center, outdoor swimming pool,

bathhouse complex, 10 new outdoor playing courts, and 4 new outdoor playing fields.

- k. Upgrade the Air Station's entire electrical distribution system in order to provide the level of reliability, security, and stability necessary to properly service operations and support functions.

3. Advantages of the Plan

The advantages of adoption and implementation of this plan include:

- Satisfaction of the Air Station's facility requirements.
- Enhanced unit integrity.
- Improved operational efficiency.
- Reduced land use conflicts and improvement of the relationship between operational and support functions.
- Efficient use of vacant land.
- Enhanced quality of life for military personnel working and living on the Air Station.

B. INTRODUCTION

This document describes the existing physical and operational setting, development constraints, functional relationships, and the planning concepts and objectives which guide the formulation of the Master Plan for Marine Corps Air Station (MCAS) Futenma. Implementation proposals are provided for projects which fulfill current shortfalls at the Air Station. Sites are also identified for projects which meet long-range needs.

The Okinawa Regional Profile, dated September 1985 and prepared by Pacific Division, Naval Facilities Engineering Command, is considered a companion document to this Master Plan. Readers are invited to review the regional profile for general background on Okinawa and the U.S. military holdings located on the island.

1. Camp Butler Overview

MCB Camp Smedley D. Butler is the base support command for U.S. Marine Corps ground forces on Okinawa and at Camp Fuji on Honshu Island, Japan. The major facilities on Okinawa are Camps Kinser, Foster, Lester, McTureous, Courtney, Hansen, and

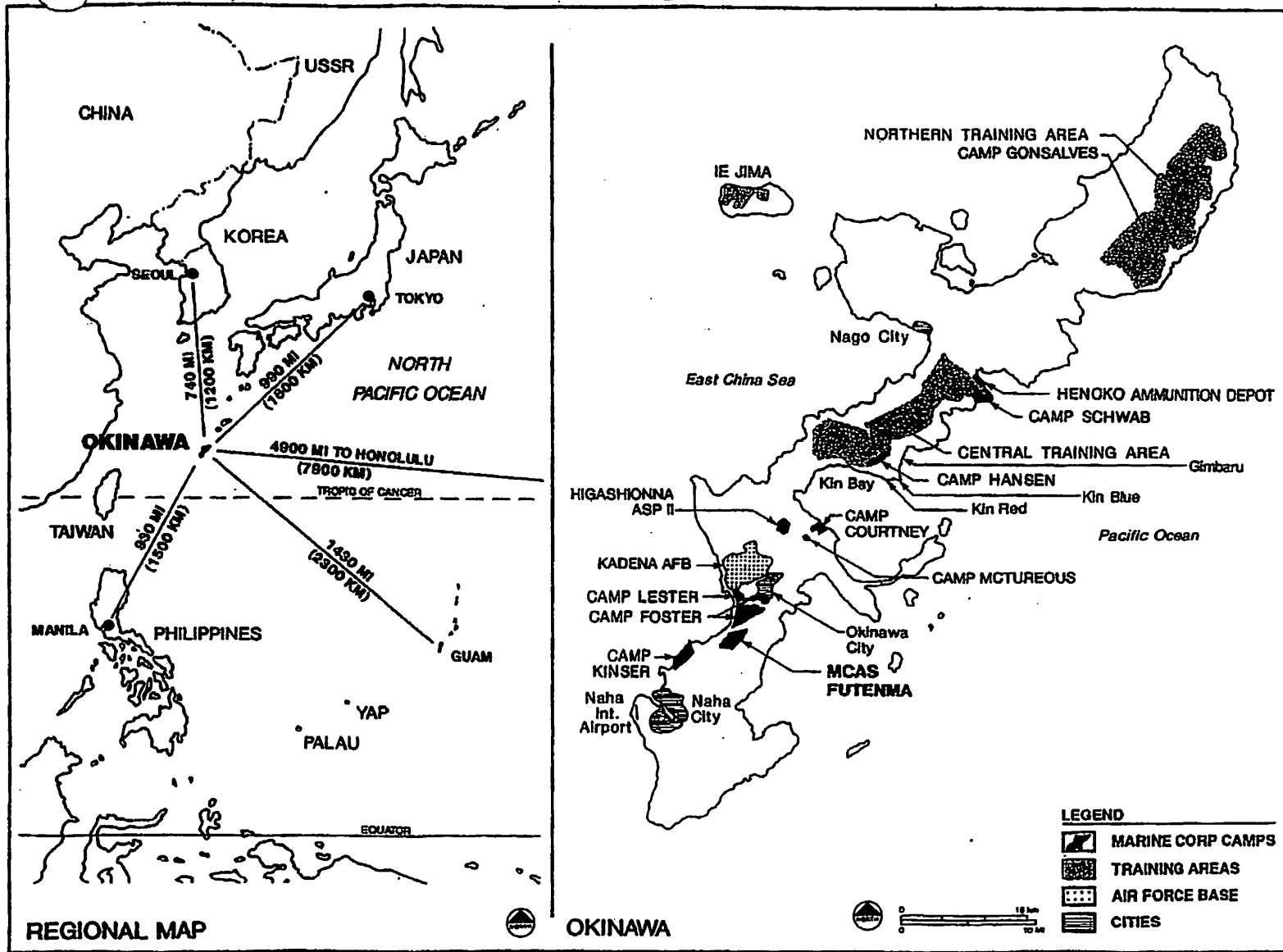
Schwab. Camp Butler also includes the Central Training Area, the Northern Training Area/Camp Gonsalves, Henoko Ammunition Depot, Higashionna Ammunition Storage Point II (ASPII), Kin Blue Beach, Kin Red Beach, Gimbaru Training Area, and Ie Jima Auxiliary Airfield (Figure B-1).

Marine Corps Air Station (MCAS) Futenma, also located on Okinawa, has an operational chain of command which is separate from MCB Camp Butler. However, support services such as facilities engineering and maintenance, fire department, post office and MWR, etc. are operated by Camp Butler.

The mission of MCB Camp Butler is to provide training facilities, limited logistic support and limited administrative support for Fleet Marine Force units located on Okinawa and at Camp Fuji, Japan. The Headquarters for MCB Camp Butler is located at Camp Foster.

a. III Marine Expeditionary Force (III MEF)

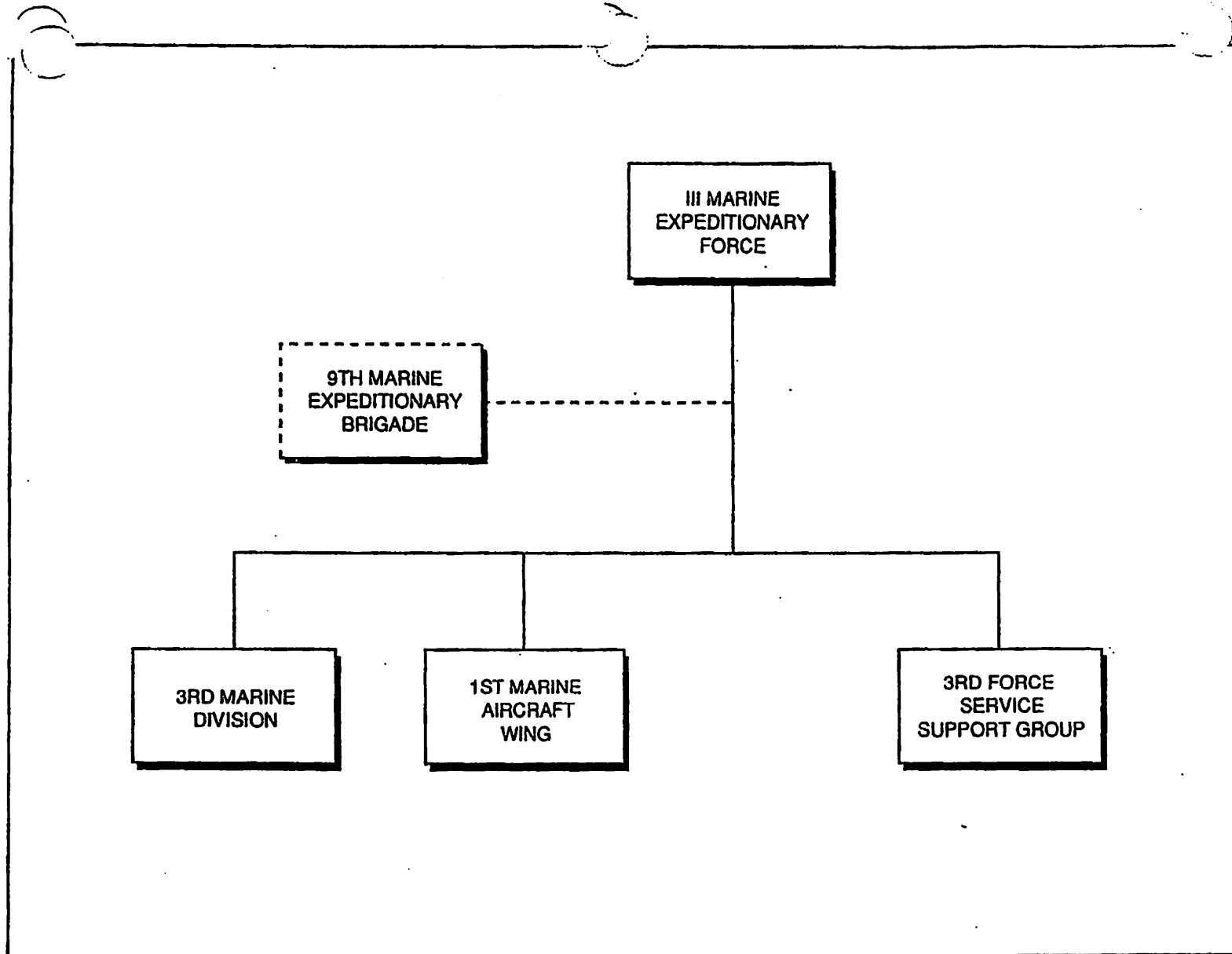
The III Marine Expeditionary Force is the major tenant of MCB Camp S. D. Butler. The major units comprising the III MEF are shown in Figure B-2. III MEF Headquarters is located at Camp Courtney.



MCAS FUTENMA MASTER PLAN

MCB CAMP S.D. BUTLER - CAMP LOCATIONS ON OKINAWA

FIGURE B-1



b. 3rd Marine Division (3rd MARDIV)

The 3rd MARDIV Headquarters is also located at Camp Courtney. Its three regiments are located at Camps Schwab, Hansen, and Foster. (The 12th Marine Regiment will relocate from Camp Foster to Camp Hansen in 1995.) The Division's mission is to execute amphibious assault operations that are supported by Marine Corps aviation and U.S. Navy forces. Its primary function is to maintain a combat ready force of Marine Corps personnel capable of attacking, closing with, and destroying or capturing the enemy.

c. 1st Marine Aircraft Wing (1st MAW)

The 1st MAW Headquarters is currently located at Camp Foster, but is scheduled to move to MCAS Futenma. Approximately one-half of the 1st MAW is located at MCAS Futenma, with the remainder divided between Camp Foster and MCAS Iwakuni. Its primary mission is to participate as the air component of III MEF in the seizure and defense of advanced naval bases and to conduct such land operations as may be essential to the prosecution of a naval campaign.

d. 3rd Force Service Support Group (3rd FSSG)

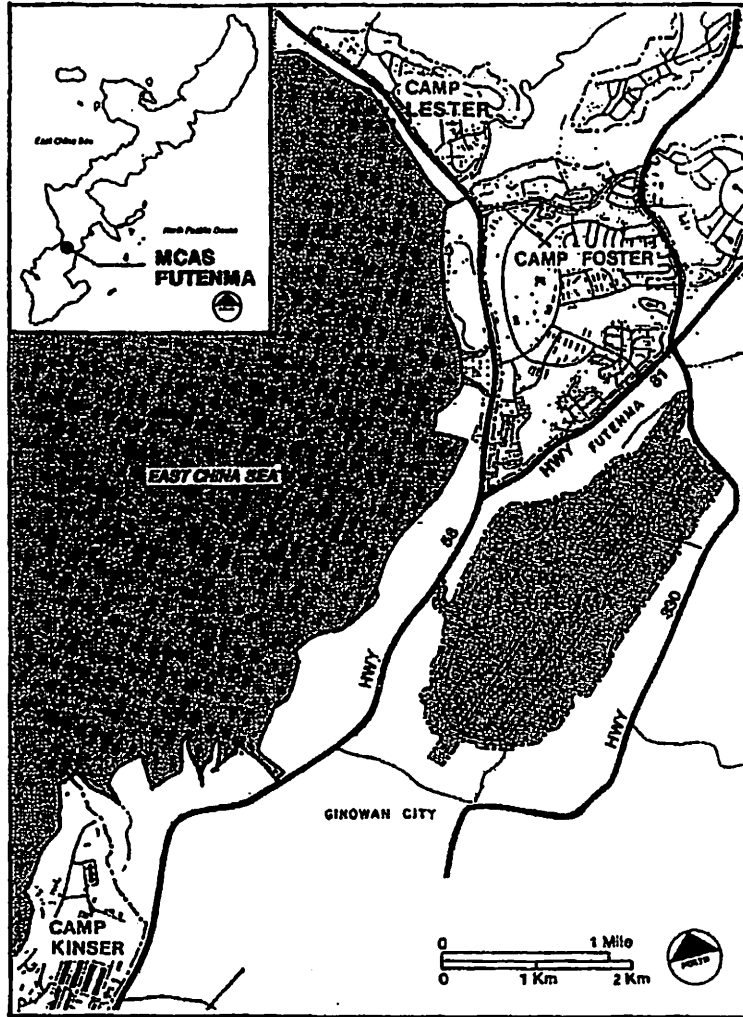
The 3rd FSSG Headquarters is located at Camp Kinser, along with the majority of its units. Two battalions each are located at Camps Foster and Hansen. The Group's mission is to provide sustained combat service support (maintenance, supply, engineering and medical support) to the 1st MAW and 3rd MARDIV.

2. MCAS Futenma Location and Mission

a. Location

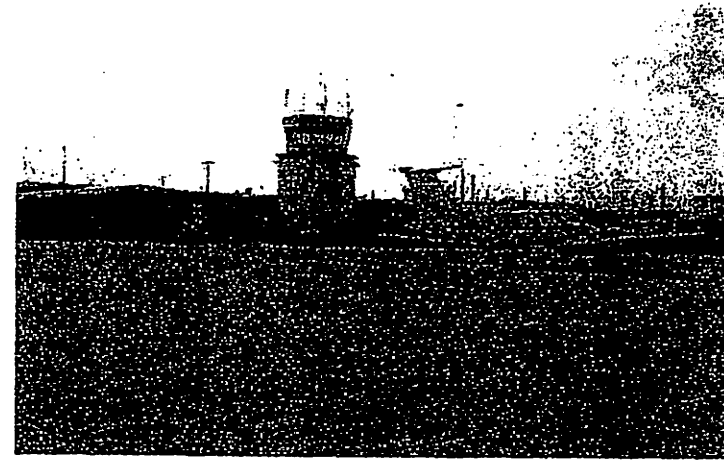
MCAS Futenma is located near the southwestern coast of Okinawa, 7 kilometers south of Kadena Air Base. It is between National Highway 58 (along the coast), National Highway 81 (to the north), and National Highway 330 (inland to the east). (See Figure B-3.)

The Air Station contains 1,188 acres of land and is completely surrounded by the extensive urban development of Ginowan City. Approximately 480 acres (40 percent) of the land is utilized for runways, clear zones, taxiways and aircraft parking aprons. The remaining portions of the Air Station are dedicated to air operations facilities, personnel support facilities,



LOCATION MAP

FIGURE B-3



MCAS Futenma Air Operations

bachelor housing, and administrative functions. For additional information regarding existing land use, see Section C.

b. Mission

The mission of the Air Station is to maintain and operate facilities and provide services and materials to support operations of elements of a Marine Aircraft Wing or units thereof, and other activities and units as designated by Commandant of the Marine Corps (CMC) in coordination with the Chief of Naval

Operations (CNO). In addition, MCAS Futenma is a designated United Nations Command Air Base.

The Air Station is tasked to provide facilities to support operations of the Fleet Marine Force aircraft in support of ground forces; to provide organizational and intermediate aircraft maintenance facilities; and to provide operational, logistical and administrative support for tenants.

3. Organization and Base Loading

The Commandant of the Marine Corps (CMC) exercises command and provides support to MCAS Futenma via the Commander, Marine Corps Bases, Pacific (COMMARCORBASESPAC) and the Commander, Marine Corps Bases, Japan (COMMARCORBASESJAPAN). Facilities utilization, planning and military or Government of Japan (GOJ) construction at the Air Station are coordinated through COMMARCORBASESJAPAN. In addition, area coordination is provided by the Commander, Naval Forces Japan via COMMARCORBASESJAPAN. Consolidated support in 14 functional areas for MCAS Futenma is provided by the Commanding General, Marine Corps Base, Camp S. D. Butler. Figure B-4 shows these command relationships.

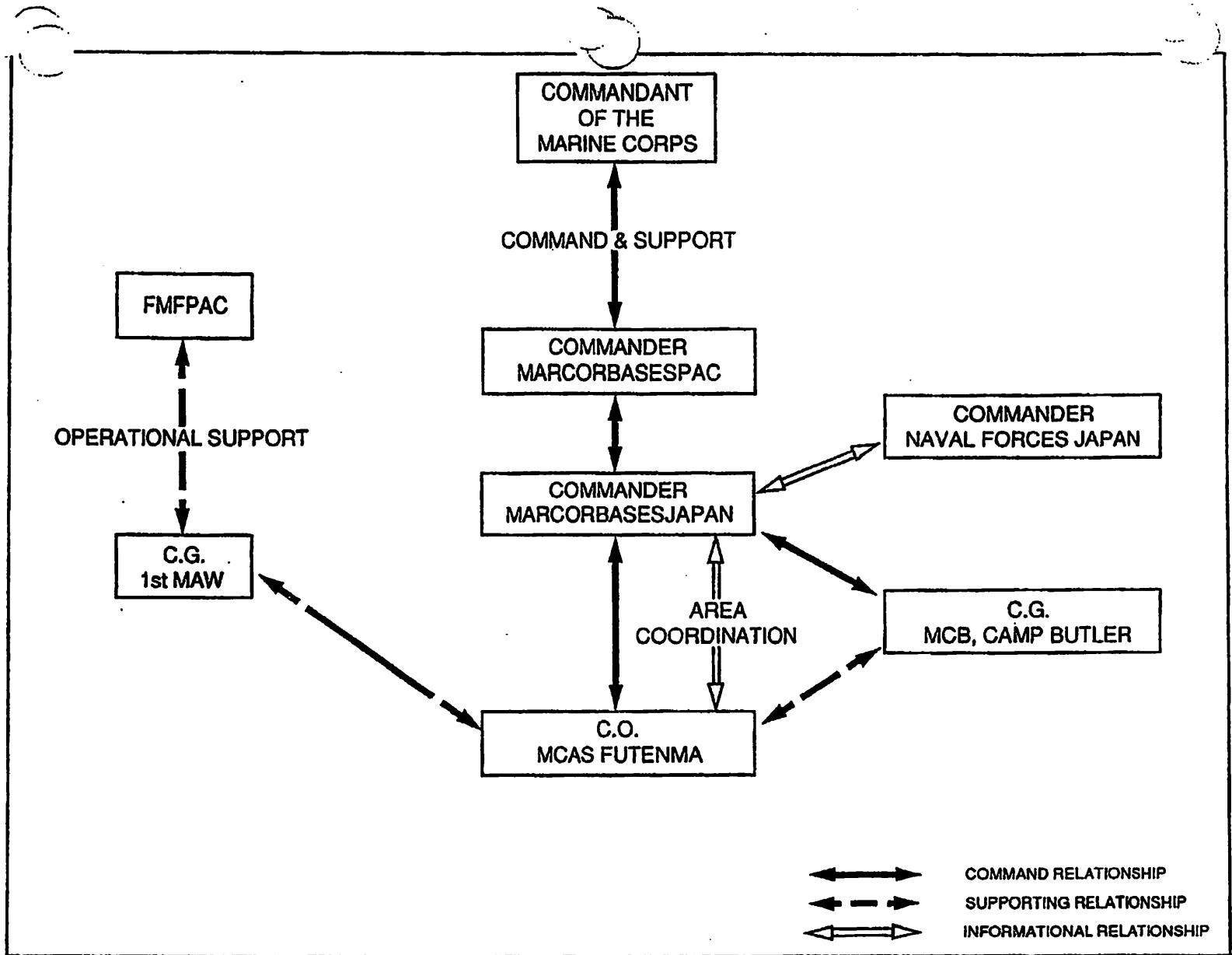
a. Station Command

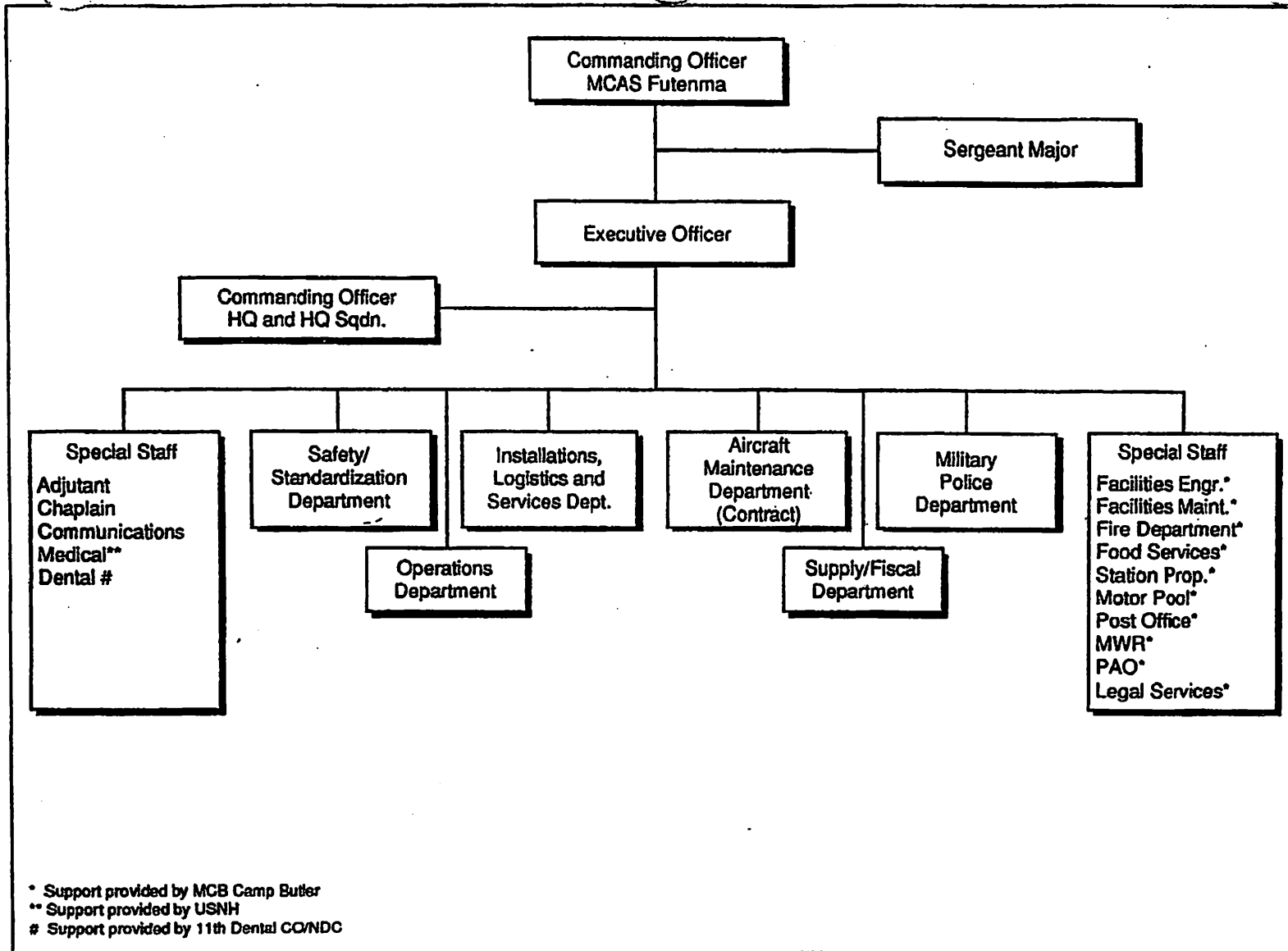
Staff responsible for the operation of MCAS Futenma are organized under the structure shown in Figure B-5.

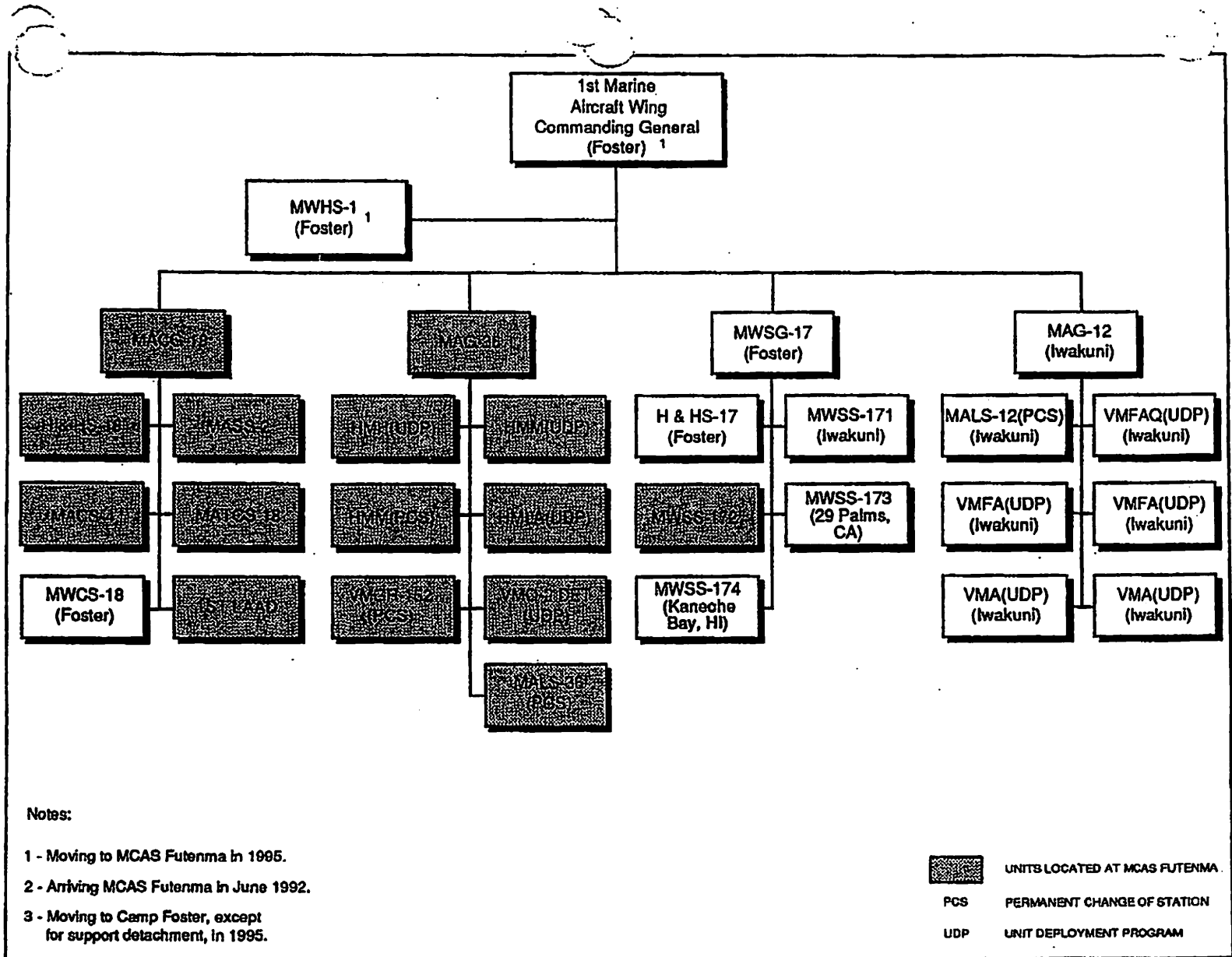
b. 1st Marine Aircraft Wing

Figure B-6 shows the organization and unit locations for the 1st Marine Aircraft Wing (1st MAW). As indicated in this chart, three of the seven squadrons within Marine Aircraft Group-36 (MAG-36) are Permanent Change of Station (PCS) units, and four are part of the Unit Deployment Program (UDP). These terms are defined as follows:

- PCS units are those that have personnel on both one year dependents-restricted tours and three year dependents-accompanied tours. Personnel movement/assignment is done on an individual, rather than unit basis.
- UDP units are FMF units where personnel are assigned three year dependent-accompanied tours stateside but the unit deploys to Okinawa for approximately six months, while dependents remain stateside.







1st MAW's operational units are for the most part divided between MCAS Futenma and MCAS Iwakuni, with most support group units stationed at Camp Foster. The Wing Headquarters and its Headquarters Squadron (MWHS-1) are also presently located at Camp Foster. However, their relocation to the Air Station is planned for 1995, when a new wing headquarters building is to be completed.

The major activities under the 1st MAW that are located on the Air Station include the following:

Marine Air Control Group 18 (MACG-18): MACG-18's mission is to coordinate air command and control for 1st MAW. Units stationed at the Air Station are:

- Headquarters and Headquarters Squadron 18 (H&HS-18) -- administrative support and operation of the Tactical Air Control Center (TACC).
- Marine Air Support Squadron 2 (MASS-2) -- provision of facilities for control of aircraft operating in close or direct support of Fleet Marine Force operations.
- Marine Air Control Squadron 4 (MACS-4) -- provision of air surveillance and control of

aircraft and surface-to-air missiles for anti-air warfare.

- Marine Air Traffic Control Squadron 18 (MATCS-18) -- provision of tactical air traffic control for the 1st MAW.
- 1st Low Altitude Air Defense Battalion (1st LAAD) -- provision of low altitude air defense for Fleet Marine Force operations.

Marine Aircraft Group 36 (MAG-36): Support of MAG-36 is the primary mission of the Air Station. MAG-36 provides tactical fixed and rotary-wing support for Fleet Marine Force operations. Just over one-half of the U.S. military personnel and 71 of the 74 aircraft at the Air Station are under the control of MAG-36. Units at MCAS Futenma and their primary tasks are:

- Marine Heavy Helicopter (HMH) Squadron -- transport of equipment, supplies, and combat troops during amphibious operations and subsequent operations ashore
- Two (2) Marine Medium Helicopter (HMM) Squadrons -- transport of troops during ship-to-shore movement.

- Marine Light Attack Helicopter (HMLA) Squadron -- airborne control of tactical air support operations (UH-1); and attack helicopter fire support for aerial and ground forces (AH-1).
- Fixed-Wing Marine Refueling Transport Squadron 152 (VMGR-152) -- transport of fuel and supplies to forward areas, and provision of aerial refueling capability.
- Detachment from Marine Observation Squadron 2 (VMO-2 Det.) -- day/night observation, reconnaissance, and fire support coordination.
- Marine Aviation Logistics Squadron 36 (MALS-36) -- provision of air base facilities and services to other units in the Group.

c. Base Loading

Programmed personnel (PN) loading of all units at MCAS Futenma is 3,640 PN. A breakdown between 1st MAW and Air Station personnel is shown in Table B-1. The Aircraft Base Loading for the Air Station is given in Table B-2.

TABLE B-1
MCAS FUTENMA BASE LOADING

Organization	Marines	Others	Civillians
<u>1st Marine Aircraft Wing Personnel</u>			
Officers	502	14	N/A
Enlisted	<u>2,709</u>	<u>53</u>	<u>N/A</u>
Subtotal	3,211 PN	67 PN	0 PN
<u>Air Station Personnel</u>			
Officers	17	15	N/A
Enlisted	<u>150</u>	<u>79</u>	<u>N/A</u>
Subtotal	167 PN	94 PN	101 PN
Total	3,378 PN	161 PN	101 PN

Source: MCB Camp S. D. Butler, 17 April 1991

4. Planning Objectives

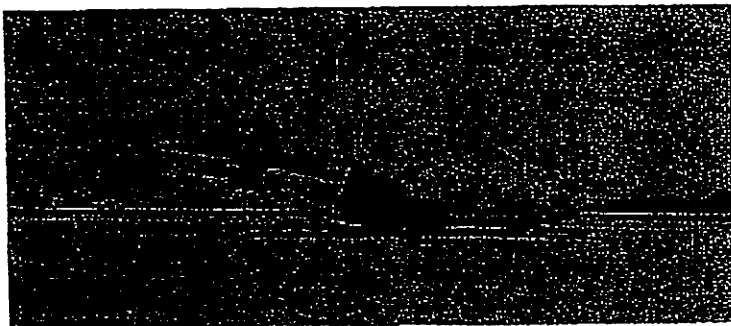
The reasons for preparing and adopting this master plan are to:

- Establish a comprehensive plan for the orderly and efficient development of all required new facilities.

**TABLE B-2
MCAS FUTENMA AIRCRAFT**

Unit	Aircraft Type	Quantity
MCAS	UC-12F	2
MCAS	CT-39G	1
HMM(PCS)	CH-46F	12
HMM(UDP)	CH-46F	12
HMH(UDP)	CH-53E	12
HMLA(UDP)	AH-1W	8
HMLA(same as above)	UH-1N	9
VMGR-152(PCS)	KC-130T	12
VMO-2(UDP)	OV-10D	6
Total		74 Aircraft

Source: MCB Camp S. D. Butler, April 1991



KC-130T Aircraft

- Identify sites for all facilities needed to fulfill mission requirements and enhance quality of life.
- Eliminate incompatible land use and maintain compatibility between adjacent land uses.
- Provide a five year Capital Improvements Plan with detailed project sitings.

Further considerations in carrying out these objectives are to:

- Retain as much land area as possible for future expansion while providing adequate sites for current mission requirements.
- Avoid "domino" construction by siting planned facilities in vacant areas or in areas occupied by facilities which are to be demolished by the time planned projects are funded.

5. Methodology

The methodology for preparing this master plan is shown on Figure B-7. It included the following steps:

a. Data Collection

Data collection consisted of the accumulation of all available information about the activity and surrounding area, including planning documents, maps, and environmental data. Land use constraints (natural and man-made) and historical data were also considered. An Engineering Evaluation was then conducted to update the records on all existing assets. Lastly, the Basic Facilities Requirements (BFRs), the Facilities Planning Document (FPD), and the Facilities Requirements Plan Summary (FRPS) were all updated to identify projects to be included in the Air Station's Development Plan.

b. Development of Planning Objectives

These were developed in coordination with the activity following review of the basic data.

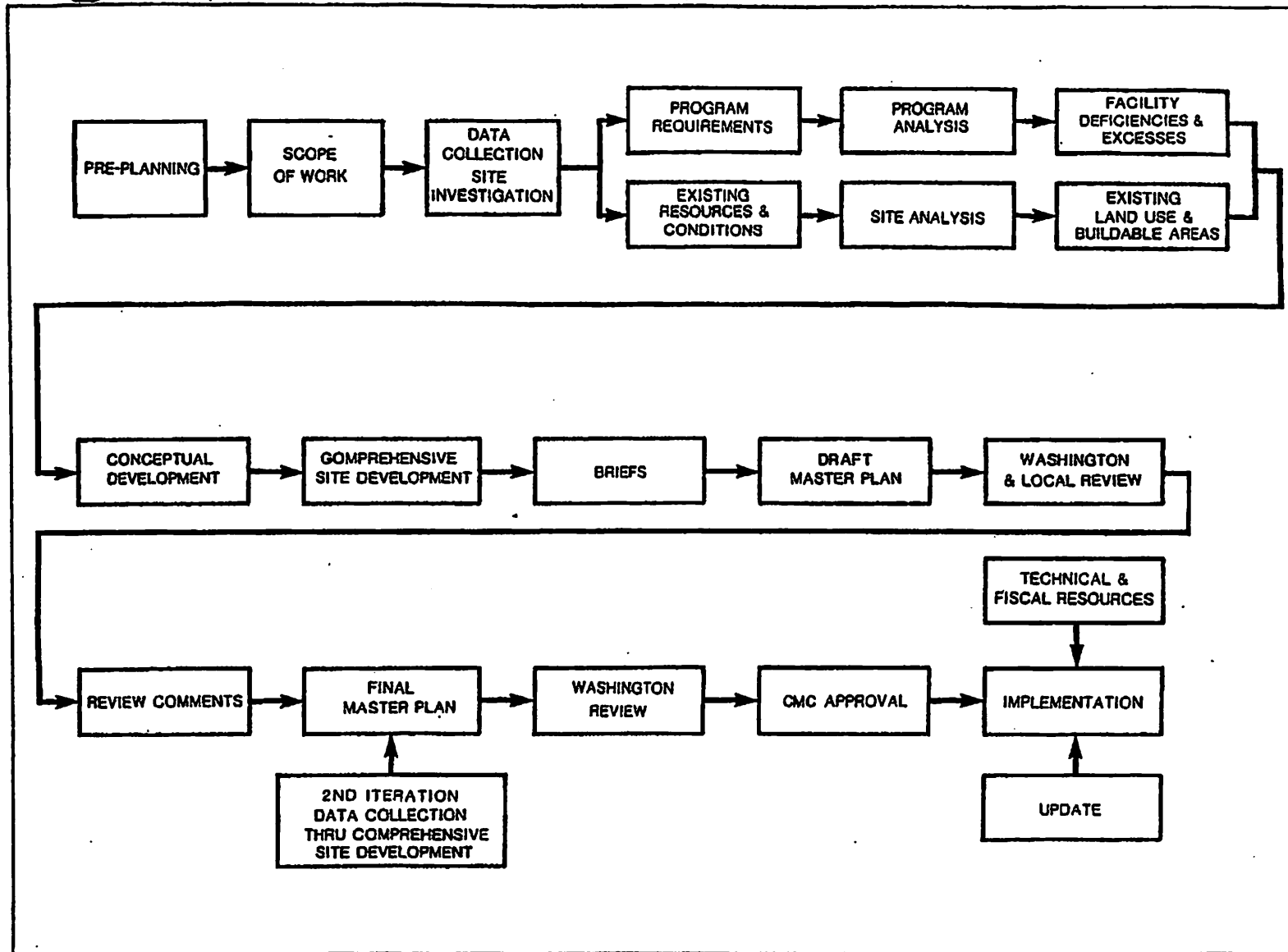
c. Evaluation and Analysis

On-site visits were made by the planning team to review problem areas and discuss alternative solutions with personnel from each activity. The data gathered from existing documents, the on-site visits, the BFR/FPD/FRPS updates, and discussions with

activity personnel were then analyzed to determine the ability of each activity to accommodate future requirements. Conclusions and recommendations were developed to support the activity's mission and planning objectives, with priority consideration given to environmental and fiscal constraints.

d. Draft and Final Master Plans

The results of the above steps were included in a Draft Master Plan, which was distributed to all interested commands within the Marine Corps and Navy for review and comment. Comments on the Draft Plan have been incorporated in this Final Master Plan. Upon approval by the Commandant of the Marine Corps (CMC), the Master Plan becomes the guide for all future development at MCAS Futenma.



C. EXISTING CONDITIONS

This section describes the legal and physical characteristics of MCAS Futenma and its relationship to the existing and proposed land uses of the adjacent Ginowan City.

Legal characteristics include land ownership and the current off-station land use adjacent to the Air Station. Physical characteristics include both natural and manmade attributes such as topography and utility systems. Individual buildings and land areas are classified by eleven use categories and mapped to show the overall land use pattern. The location and groupings of buildings are also mapped by user and type of facility.

1. Land Ownership and Control

The land at MCAS Futenma is leased from 2,047 private owners by the Government of Japan (GOJ), and is provided at no cost to the United States. The official GOJ name for MCAS Futenma is Futenma Air Station (FAC 6051). This arrangement has existed since the Okinawa Reversion Agreement of June 1971, and has as its basis the 1960 Treaty of Mutual

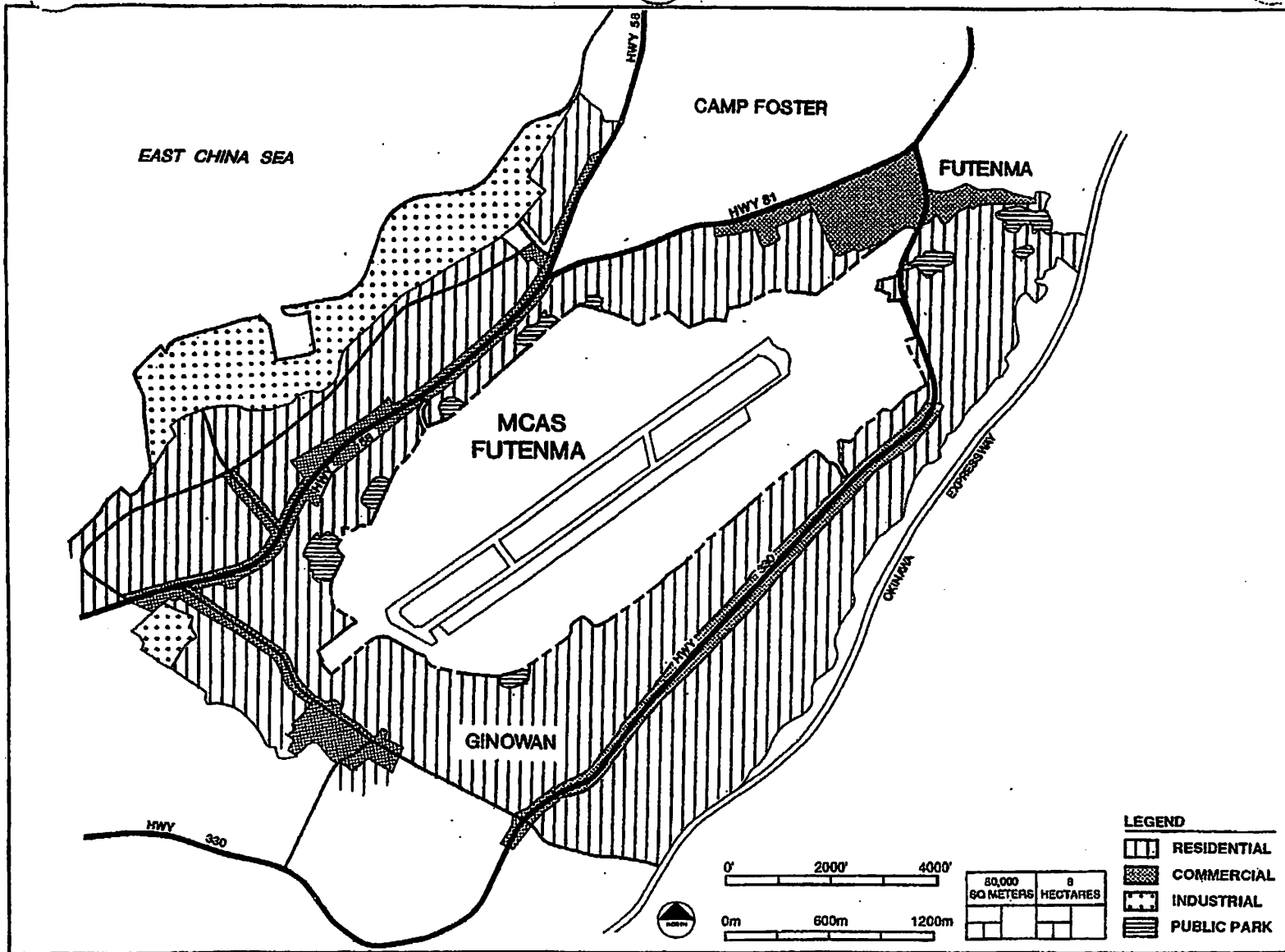
Cooperation and Security between the United States and Japan.

2. Off-Station Land Use/Development

The Air Station is located in Ginowan City, which is densely populated. In recent years much development has occurred around and up to the edges of the Air Station, leaving little open space around it. Most of the development consists of residential and commercial uses. (Figure C-1.)



Off-Station Residential Development
(at upper right)



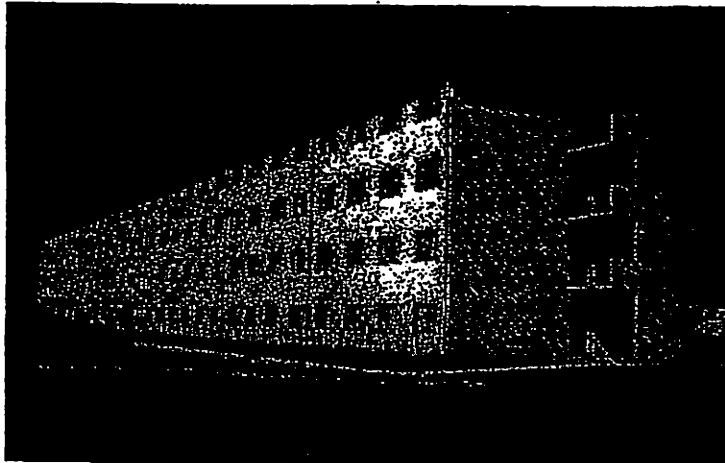
MCAS FUTENMA MASTER PLAN

OFF-STATION LAND USE

FIGURE C-1

3. Existing Facilities

Existing facilities on MCAS Futenma house operational, or work related, functions, unaccompanied personnel housing, and community support activities. Air Station and 1st MAW operational facilities are shown on Figure C-2. Housing and community support facilities include those operated by MCB Camp S. D. Butler and the Army Air Force Exchange Service (AAFES). Their locations are shown on Figure C-3.



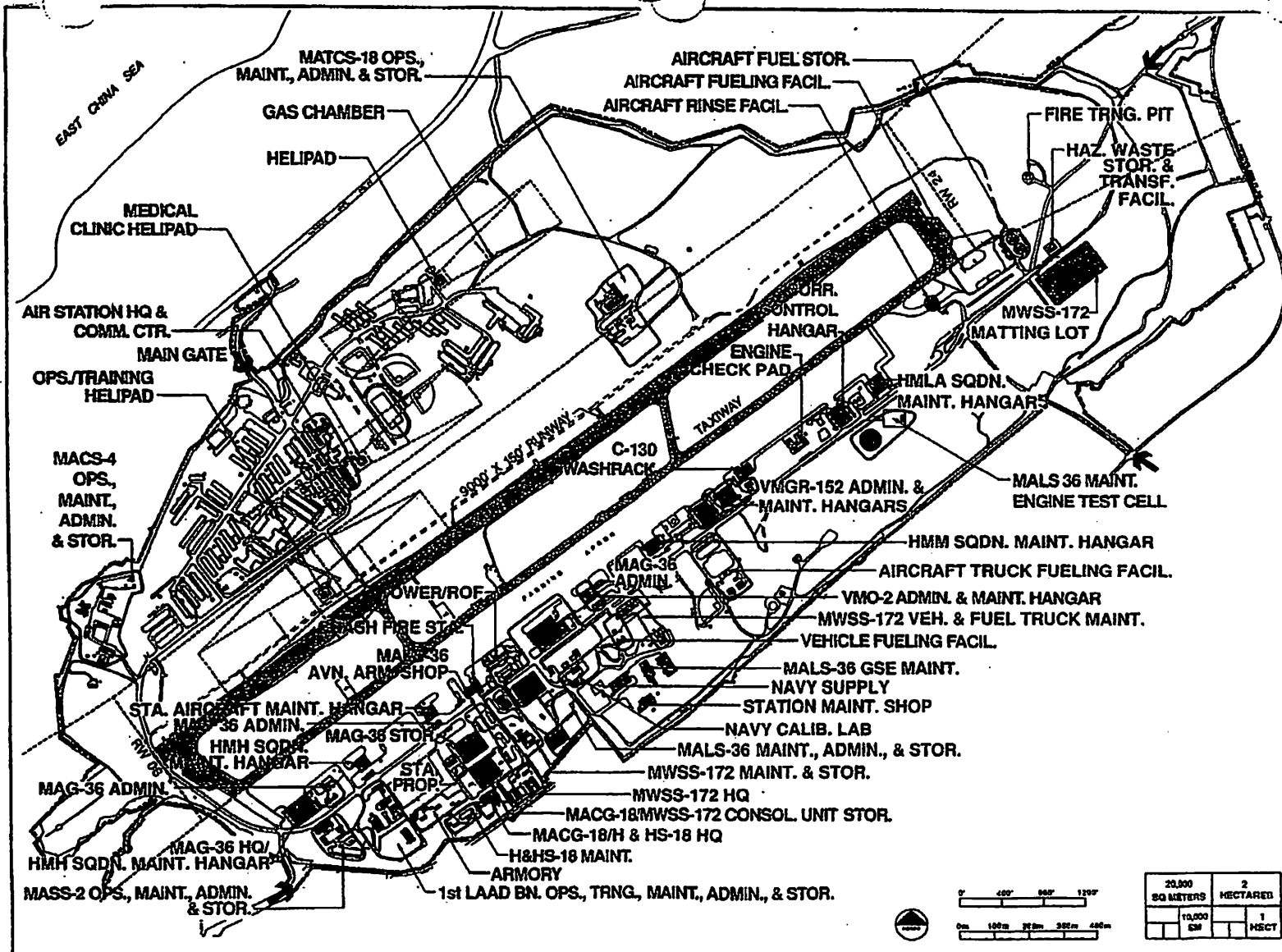
Troop Housing

4. Existing Utilities

a. Electrical Distribution System

MCAS Futenma receives power from the Okinawa Electric Power Company (OEPC) through its Futenma Substation. Power to the Substation is from the 66 KV, 60 Hz Zukeran transmission line. The Substation has a 16/21/26 MVA, OA/FA/FA, 66KV delta - 13.8 KV wye transformer, from which three feeders supply power to MCAS Futenma. Feeder F-1 supplies power to the administration, BEQ/BOQ and community support areas; Feeder F-2 supplies the air operations area on the southeast side of the Air Station; and Feeder F-3 supplies MACS-4 and MACG-18, and also a portion of Camp Foster. Most of the electrical distribution system is overhead, except for a portion of the air operations area which is underground.

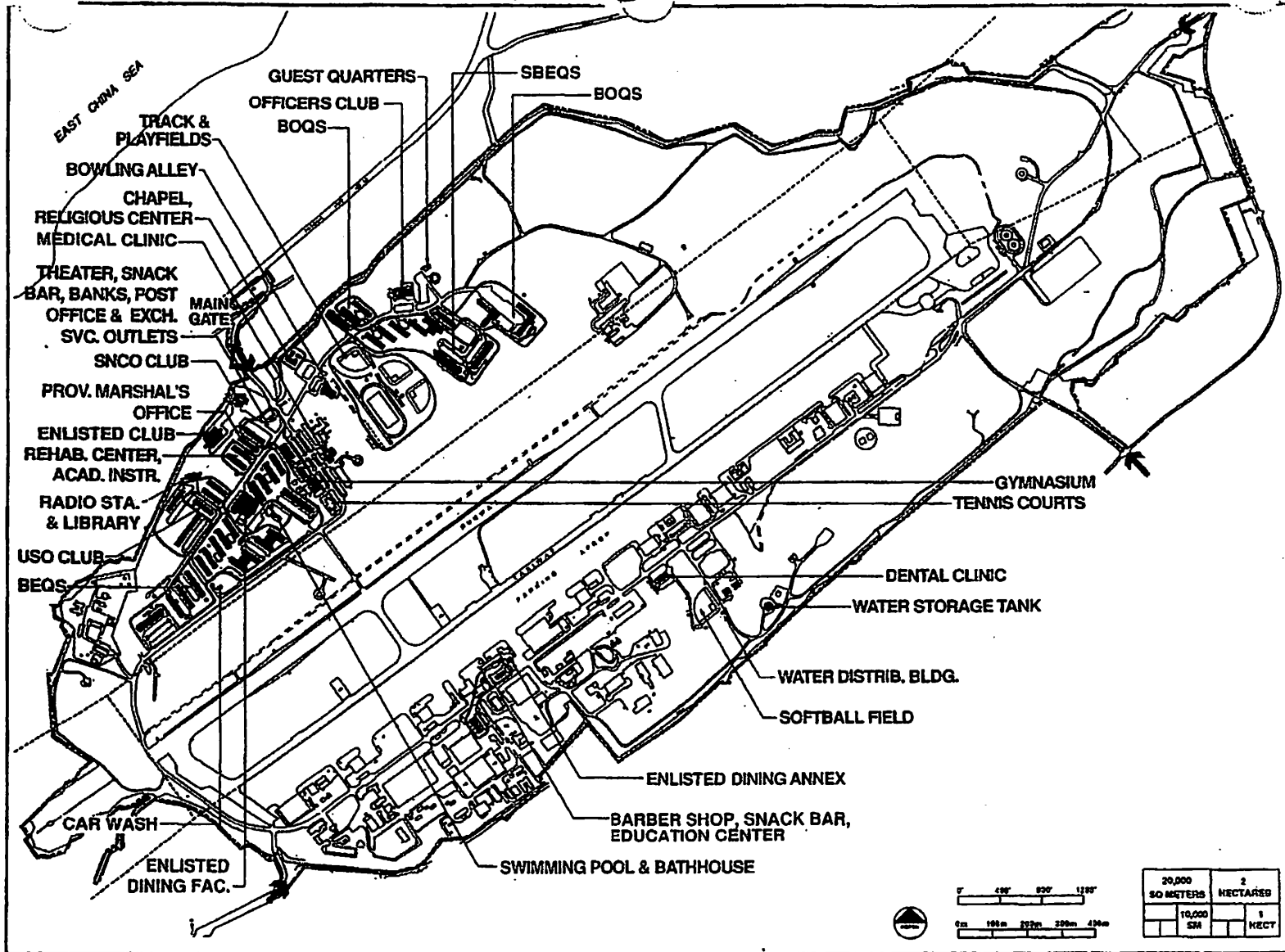
The circuit breakers and meters for the MCAS Futenma feeders in the OEPC substation are inaccessible to the base electricians. With only one transformer serving MCAS Futenma, it is vulnerable to an extended power outage should that transformer fail. The lack of an automatic load tap changer for the transformer also causes undesirable voltage



MCAS FUTENMA MASTER PLAN

CURRENT FACILITY LOCATIONS - 1ST MAW/STATION OPERATIONS

FIGURE C-2



MCAS FUTENMA MASTER PLAN

CURRENT FACILITY LOCATIONS - HOUSING/COMMUNITY SUPPORT

FIGURE C-3

fluctuations. In addition, the overhead lines are vulnerable to lightning, typhoons, and corrosion from salt air.

A further problem is limited capacity. Feeders F-1 and F-2 are near maximum capacity, and Feeder F-3 is already overloaded. Construction of the Japanese Facility Improvement Program (JFIP) projects will place additional loads on the feeders.

To improve reliability and maintainability of the electrical distribution system, dual underground feeders with interspersed vacuum switches to backfeed or to isolate small sections of the circuits are required. Two projects in the CIP address this need. The locations of the existing substation and feeders are shown on Figure C-4.

b. Water Supply System

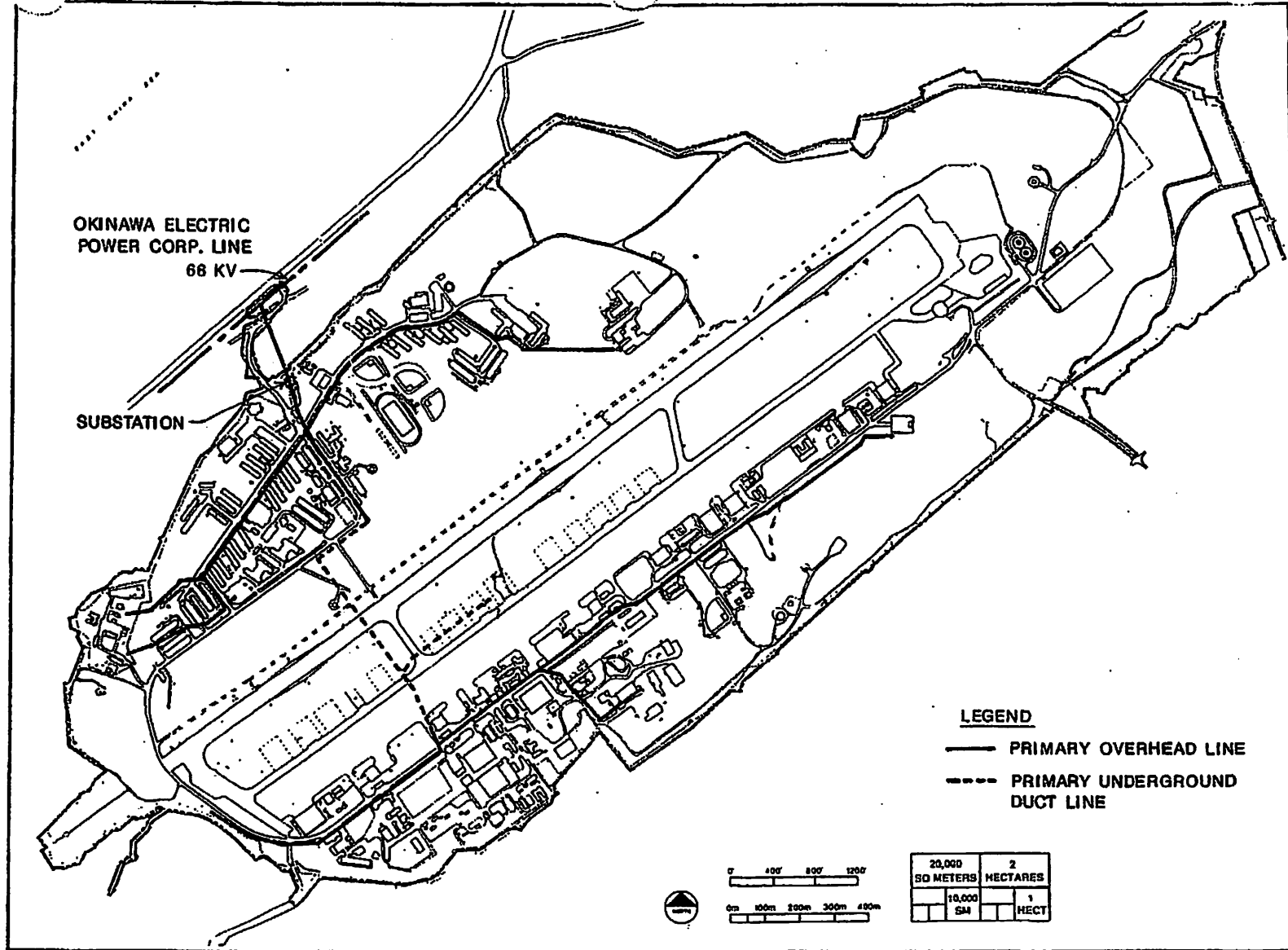
Potable Water System -- Potable water to MCAS Futenma is provided by Ginowan City from the existing Okinawa Prefecture Enterprise Bureau (OPEB) island-wide system.

Water is supplied from a 750,000 gallon storage tank which is fed from an 8-inch main from Highway 330 in

Ginowan City. An Officer In Charge of Construction (OICC) Far East contract completed in April 1990 replaced or increased the size of the main water distribution system. Two parallel 14-inch mains were constructed, replacing the single 18-inch main from the water storage tank to the water distribution system. A single 14-inch main was also constructed at the western end of the runway, replacing a 10-inch main which crossed the runway. Except at isolated locations, all potable water distribution lines at MCAS Futenma are closed loop systems with the capability of providing potable water to each facility from more than one direction.

The current water distribution system is inadequate for present and planned requirements of the Capital Improvements Plan (CIP) included in this Master Plan. To meet the maximum fireflow requirements of the planned hangars, their designs must incorporate in-line booster pump systems to provide the minimum 100 PSI residual pressure in their sprinkler systems.

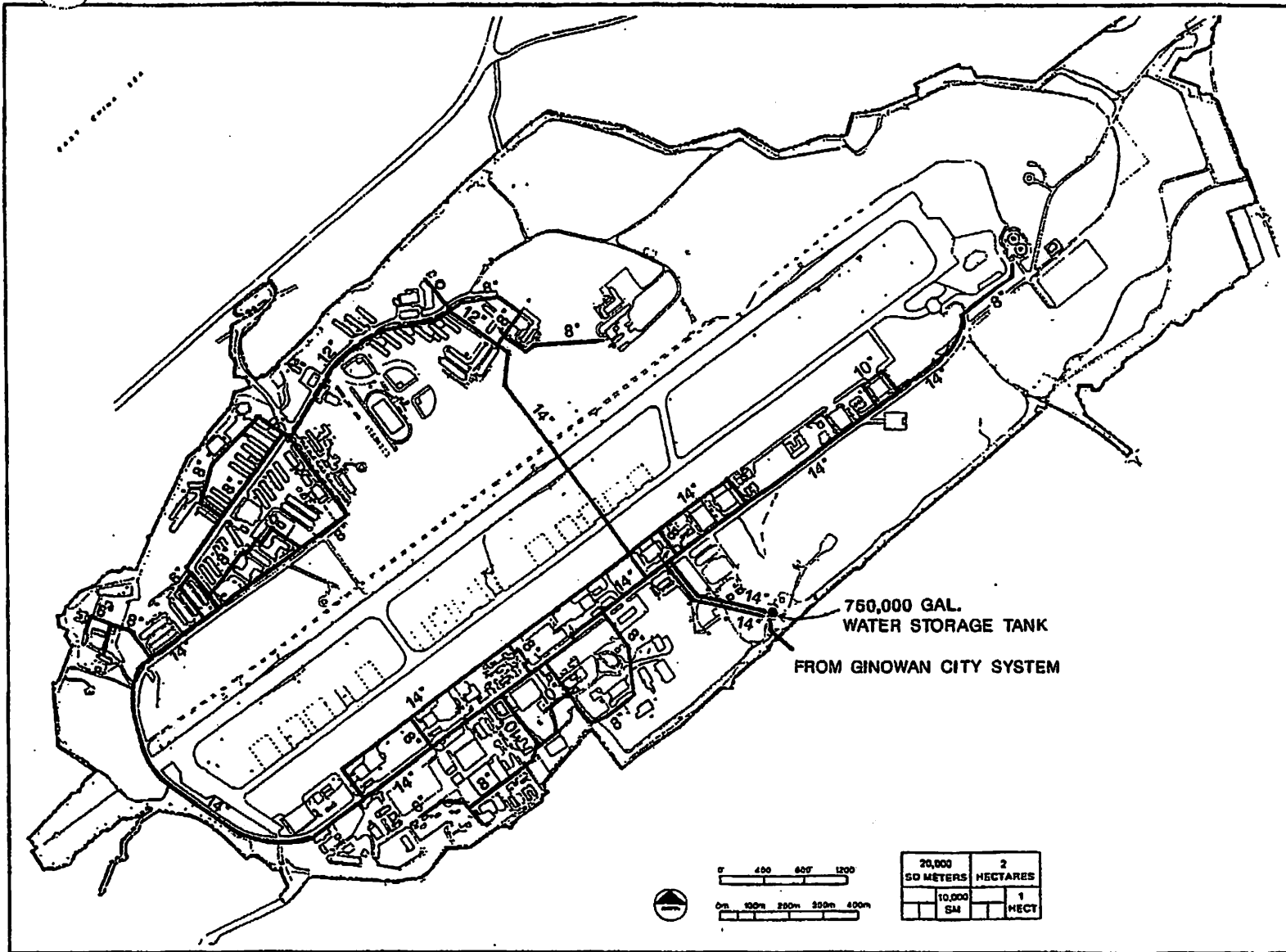
Additional storage capacity will be required to supply all proposed projects. A project is included in the CIP to take care of this need. The existing water supply system for the Air Station is shown in Figure C-5.



MCAS FUTENMA MASTER PLAN

ELECTRICAL DISTRIBUTION SYSTEM

FIGURE C-4



Non-Potable Water System -- There are no existing sources of non-potable water at MCAS Futenma, and none are planned for the foreseeable future.

Conservation Measures -- As with all of the camps that make up MCB Camp Butler, MCAS Futenma is subject to water use goals and procedures established by the Prefecture government. During periods of water rationing, the Prefectural government normally enacts consumption reduction measures to stretch available supplies.

MCAS Futenma follows the conservation measures of Camp Butler's Utilities Conservation Advisory Board. In addition, water meter readings are monitored regularly in an effort to reduce losses through leaks. The Air Station has consistently been able to meet its conservation goals during all past periods of water rationing. As such, existing water conservation measures appear to be effective.

c. Sewerage System

Sewage from MCAS Futenma is treated by the Okinawa Prefectural Government (OPG) Sewage Treatment Plant located near the southern end of the

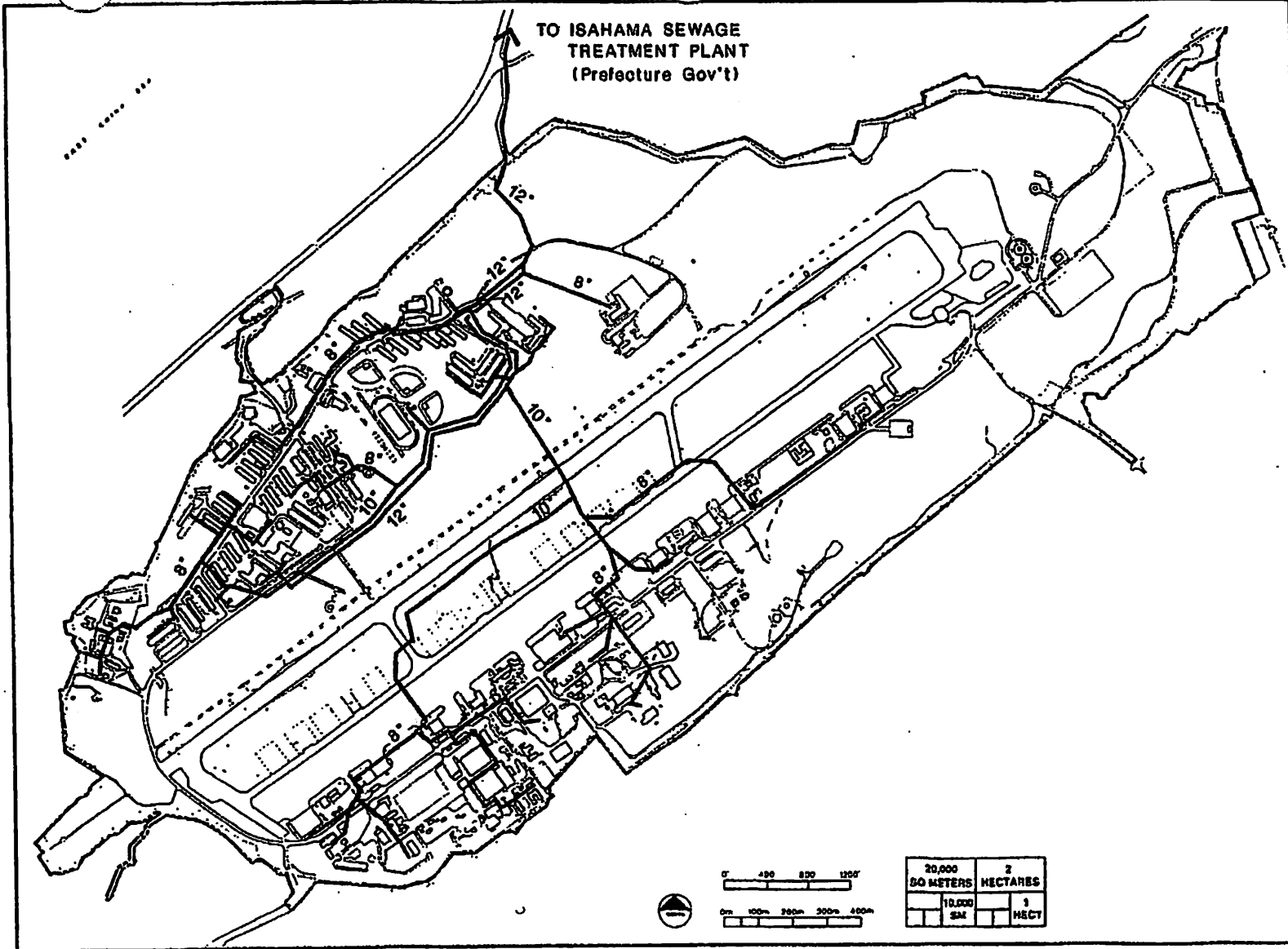
former Hamby Airfield. The current treatment rate is 27 yen/cubic meter of potable water consumed.

The existing sanitary sewerage system has the capacity to support the immediate and long-range projects proposed for the Air Station. The existing Air Station sewerage system is shown in Figure C-6.

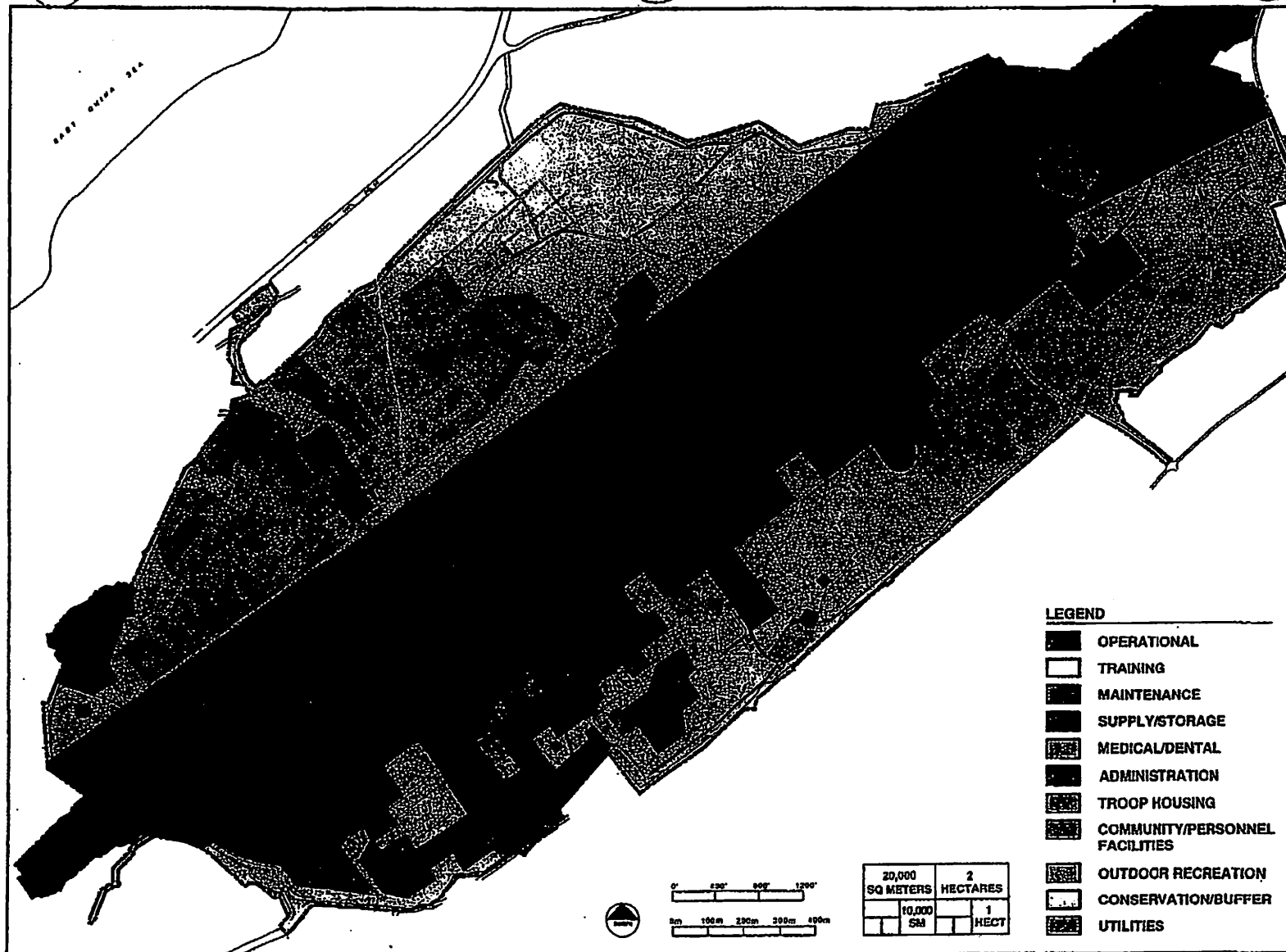
5. Existing Land Use

Figure C-7 shows existing land use for MCAS Futenma according to function. As can be seen, the largest single land use is the runway and the surrounding clear zone which run through the center of the Air Station. Maintenance, supply/storage and troop housing utilize large pieces of land, while community/personnel facilities and outdoor utilities take up smaller pieces.

Most air operations facilities are located along the southeast (inland) side of the Air Station, with aircraft maintenance operations adjacent to the parking aprons, and supply and support activities to the rear. Air Station command and administration elements, and community support facilities are centrally located on the opposite (northwest) side of the runway, with unaccompanied officer and enlisted personnel



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MCAS FUTENMA MASTER PLAN

EXISTING LAND USE

FIGURE C-7

quarters on either side. Beyond the quarters areas, at each end of the airfield, are compounds for the MATC-18 and MACS-4 air control squadrons.



Aircraft Maintenance Operations

D. DEVELOPMENT CONSTRAINTS

Land development at MCAS Futenma includes consideration of operational, natural and socio-cultural constraints, and environmental effects. These constraints provide an important framework for the evaluation of alternative sites for future facilities.

For example, in some instances, such as the clear zone, land use restrictions have been set forth by DOD regulations and criteria which clearly prohibit most uses. In other instances, such as in high noise areas, mitigation measures can sometimes be implemented to permit compatible development within the zones.

Awareness of these and other constraints during the evaluation of a potential development site will help to avoid possible future problems during the design and construction of a project.

1. Operational Constraints

a. Air Installations Compatible Use Zones (AICUZ)

The AICUZ program was initiated by the Department of Defense to recommend land uses which may be compatible with noise levels, accident potential and

flight clearance requirements associated with military airfield operations. It is detailed in OPNAVINST 11010.36A and is applied to all U.S. Navy and Marine Corps airfields within the United States.

Although AICUZ studies may be prepared for U.S. airfield activities in foreign countries, it is not a requirement. The recommendations contained in the OPNAVINST are included in this Master Plan for consideration in the on-station land use decision making process along with other relevant factors, such as availability of real property and existing land use.

The initial step in the AICUZ process is preparation of a noise study which shows approximate noise level boundaries, measured in Day-Night Average Sound Level (Ldn). Ldn is generated by a weighted averaging of all aircraft operations, jet engine runups and the flight patterns flown over a 24-hour period. The contours are interpreted to mean that over time the short bursts of high noise and long periods of low noise are equal to a continuous noise level. Because the contours' values are weighted, only a radical change in type of operations, aircraft mix or flight patterns will affect their configuration.

Figure D-1 depicts the noise level boundaries at MCAS Futenma, and Appendix G-2 shows land use compatibility in noise zones. (Other constraints shown on Figure D-1 are discussed in later sections of this plan.) Noise levels below 65 Ldn have essentially no impact on land use, while noise levels of 65 to 75 Ldn require some land use controls and/or noise attenuation.

Figure D-2 depicts arrival flight tracks, and Figure D-3 shows departure flight tracks at the Air Station.

b. Aircraft Accident Potential Zones

Accident Potential Zones (APZs) are another component of the AICUZ program. APZs extend beyond runway clear zones, and describe the probable impact area if an accident were to occur, based on historical accident data. While established for military airfields in the United States, the APZ concept is not applied in foreign countries.

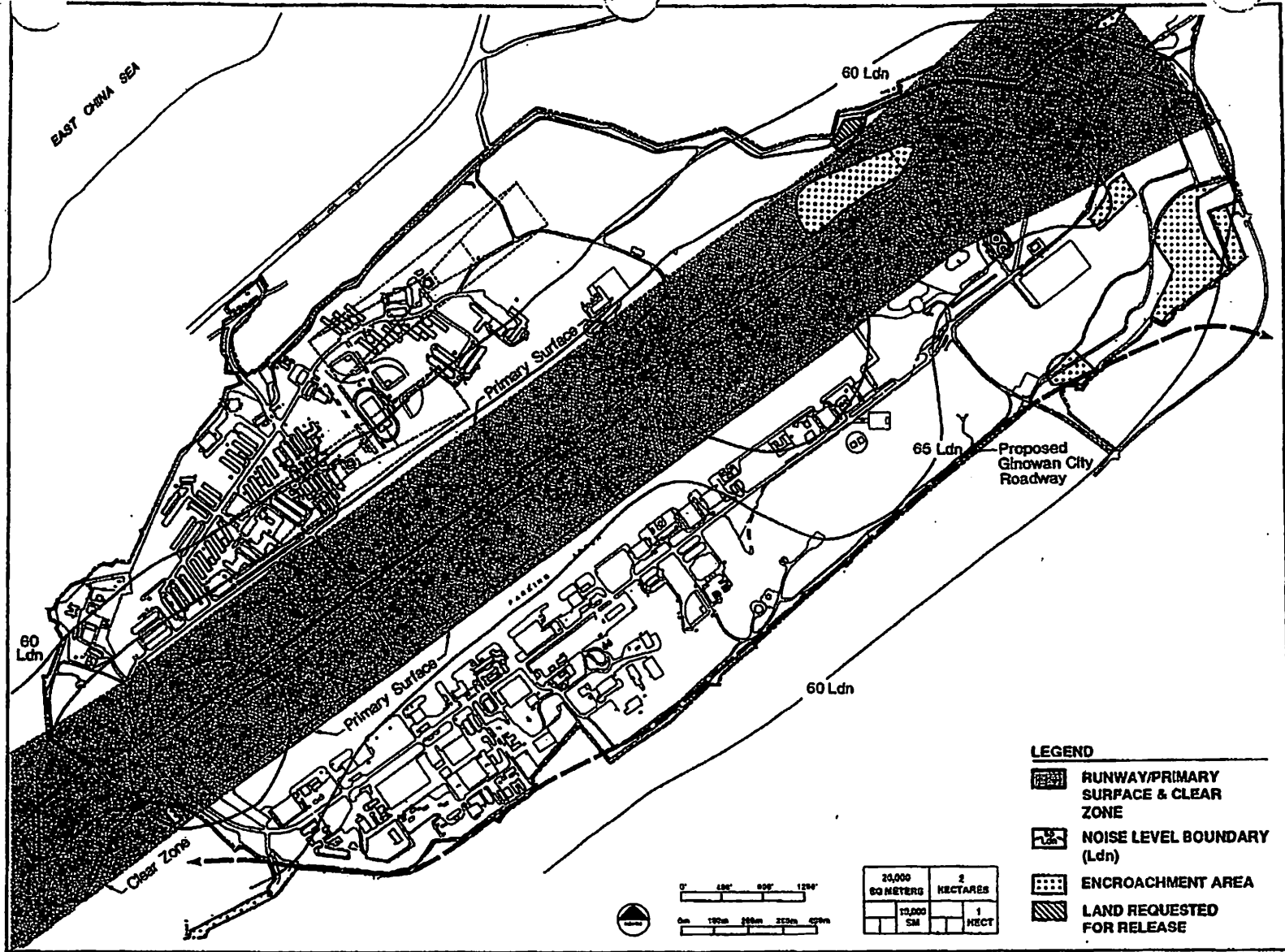
c. Airfield Safety Clearances

Airfield clear zones have been established at MCAS Futenma on either side of the runway centerline, and

beyond the ends of the runway, to preclude vertical obstructions for arriving and departing aircraft. The clear zones at each end of the runway are trapezoidal in shape, with widths of 1,500 feet at the end of the runway and 2,312 feet at a distance of 3,000 feet beyond the end of the runway. These clear zones are development constraints. Suggested land use compatibility is provided in Appendix G-2.

Beyond the clear zones, outwardly and upwardly sloping imaginary surfaces have been delineated to identify where there may be potential obstructions to navigation (Figure D-4). These zones primarily relate to the heights of proposed structures/objects. The imaginary surfaces include:

- The primary surface, extending 750 feet on either side of the runway center line and 200 feet past each runway end, at runway elevation.
- The approach surfaces which are fan shaped inclined and horizontal planes at each end of the primary surface. The inclined surfaces have 50:1 slope and the horizontal surface is 500 feet above the runway. They mark the approach and departure patterns of aircraft.



MCAS FUTENMA MASTER PLAN

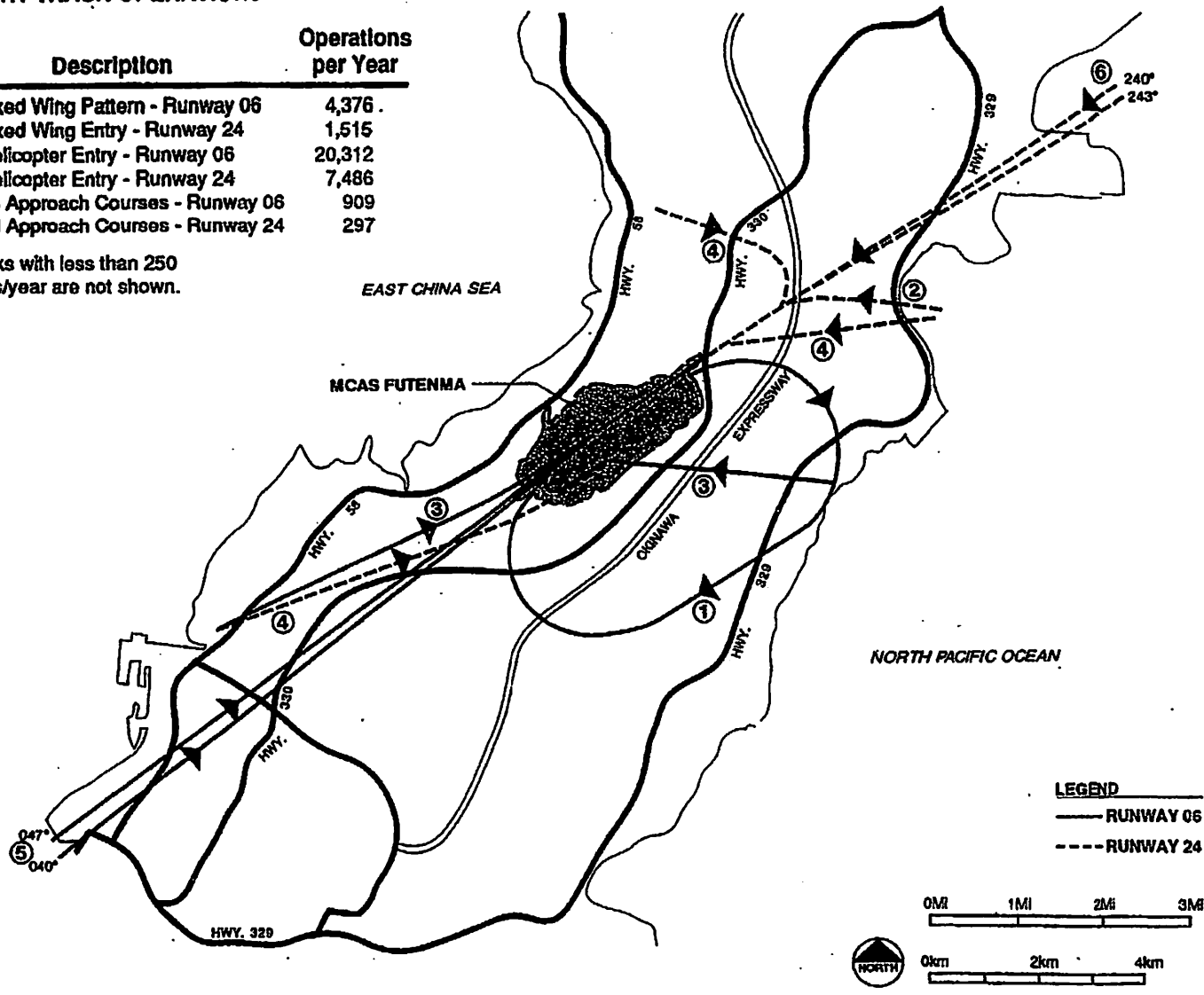
OPERATIONAL CONSTRAINTS AND ENCROACHMENTS

FIGURE D-1

ARRIVAL FLIGHT TRACK OPERATIONS

Track No.	Description	Operations per Year
1	VFR Fixed Wing Pattern - Runway 06	4,376
2	VFR Fixed Wing Entry - Runway 24	1,515
3	VFR Helicopter Entry - Runway 06	20,312
4	VFR Helicopter Entry - Runway 24	7,486
5	TACAN Approach Courses - Runway 06	909
6	TACAN Approach Courses - Runway 24	297

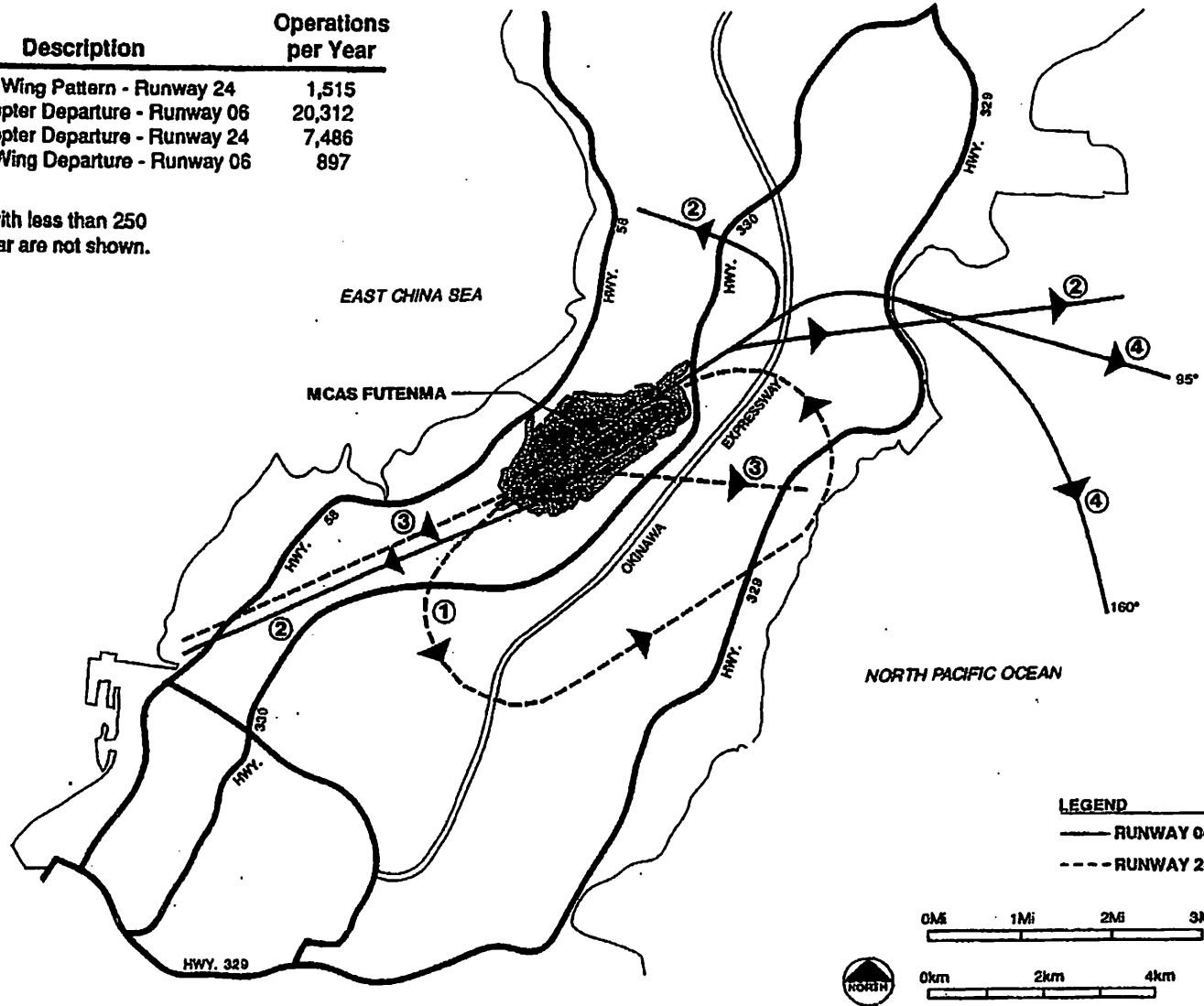
Note: Flight tracks with less than 250 operations/year are not shown.

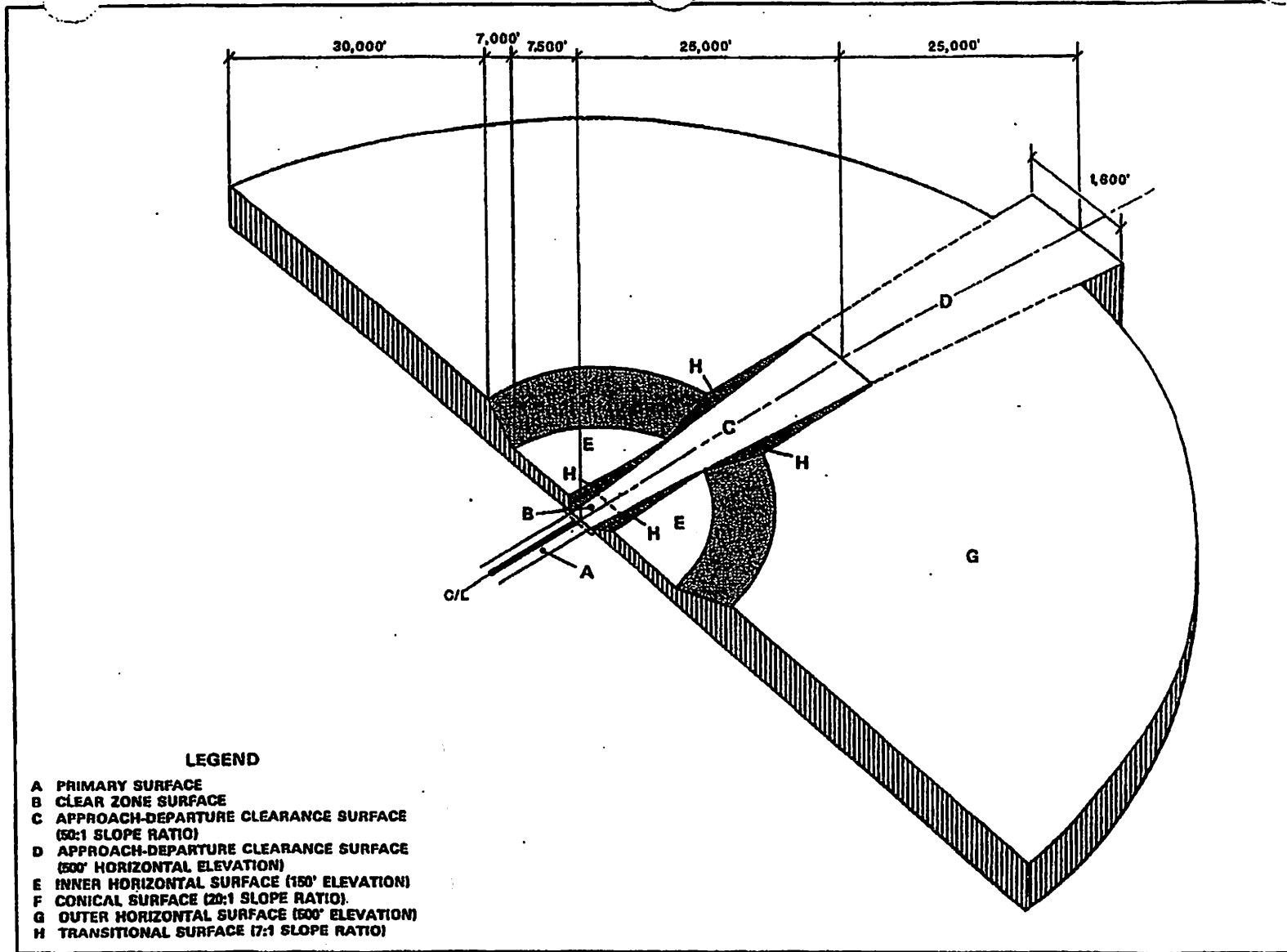


DEPARTURE FLIGHT TRACK OPERATIONS

Track No.	Description	Operations per Year
1	VFR Fixed Wing Pattern - Runway 24	1,515
2	VFR Helicopter Departure - Runway 06	20,312
3	VFR Helicopter Departure - Runway 24	7,486
4	IFR Fixed Wing Departure - Runway 06	897

Note: Flight tracks with less than 250 operations/year are not shown.





- The transitional surface which is an inclined surface connecting the primary and approach surfaces to the inner horizontal surface. Slope is 7:1.
- The inner horizontal surface which is an oval plane 150 feet above runway elevation extending out 7,500 feet from the runway.
- The conical surface which connects the inner and outer horizontal surfaces at a slope of 20:1.
- The outer horizontal surface which is an oval plane 500 feet above runway elevation extending out 30,000 feet from the outer periphery of the conical surface, or about 44,500 feet from the runway.

Existing airfield safety waivers for clear zone violations are found in Appendix G-3.

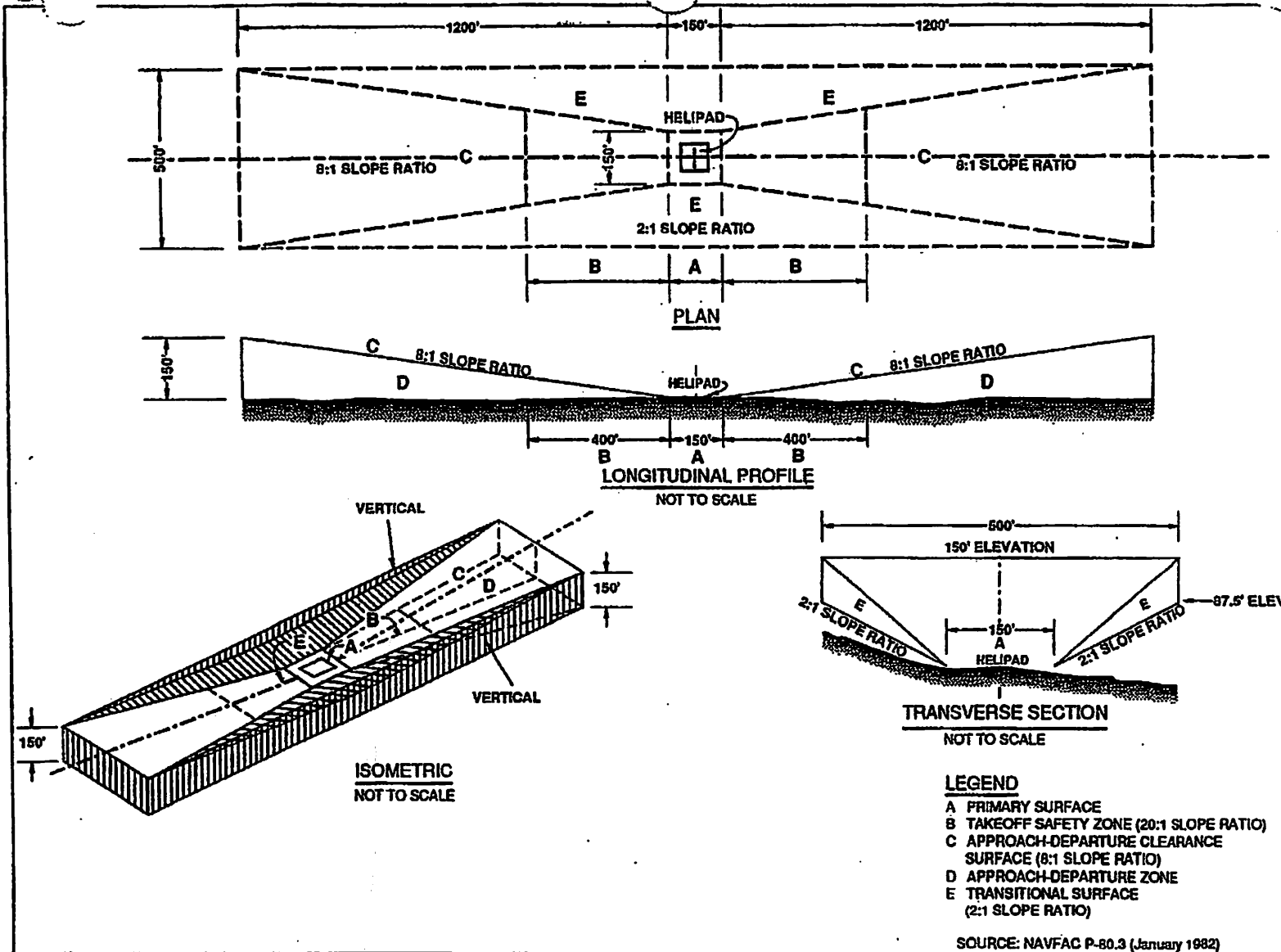
Imaginary surfaces, as shown in Figures D-5, D-6 and D-7, define the airspace required for helipads. Objects must be sited outside of the imaginary surfaces to prevent the obstruction of airspace.

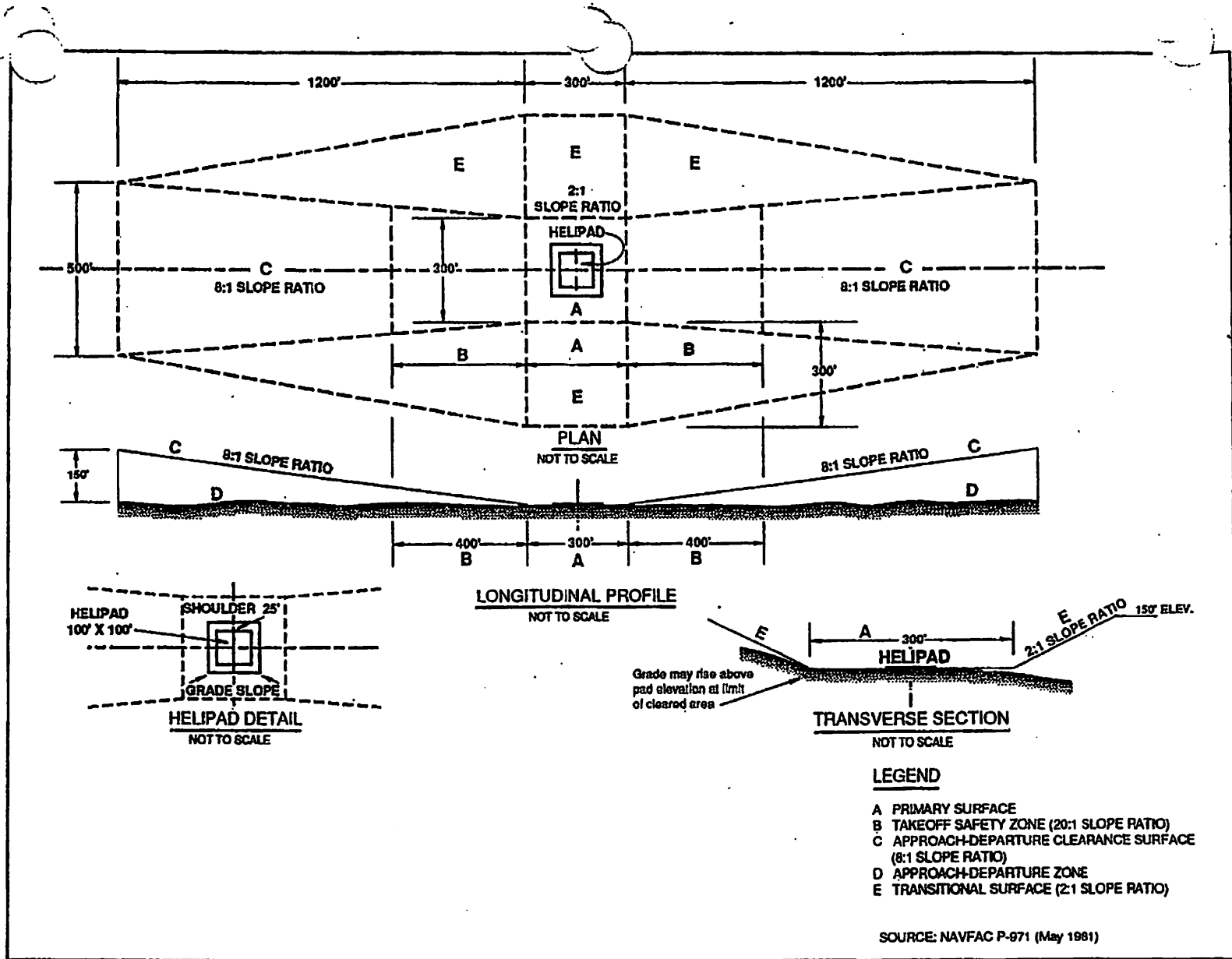
d. Electromagnetic Radiation/Interference

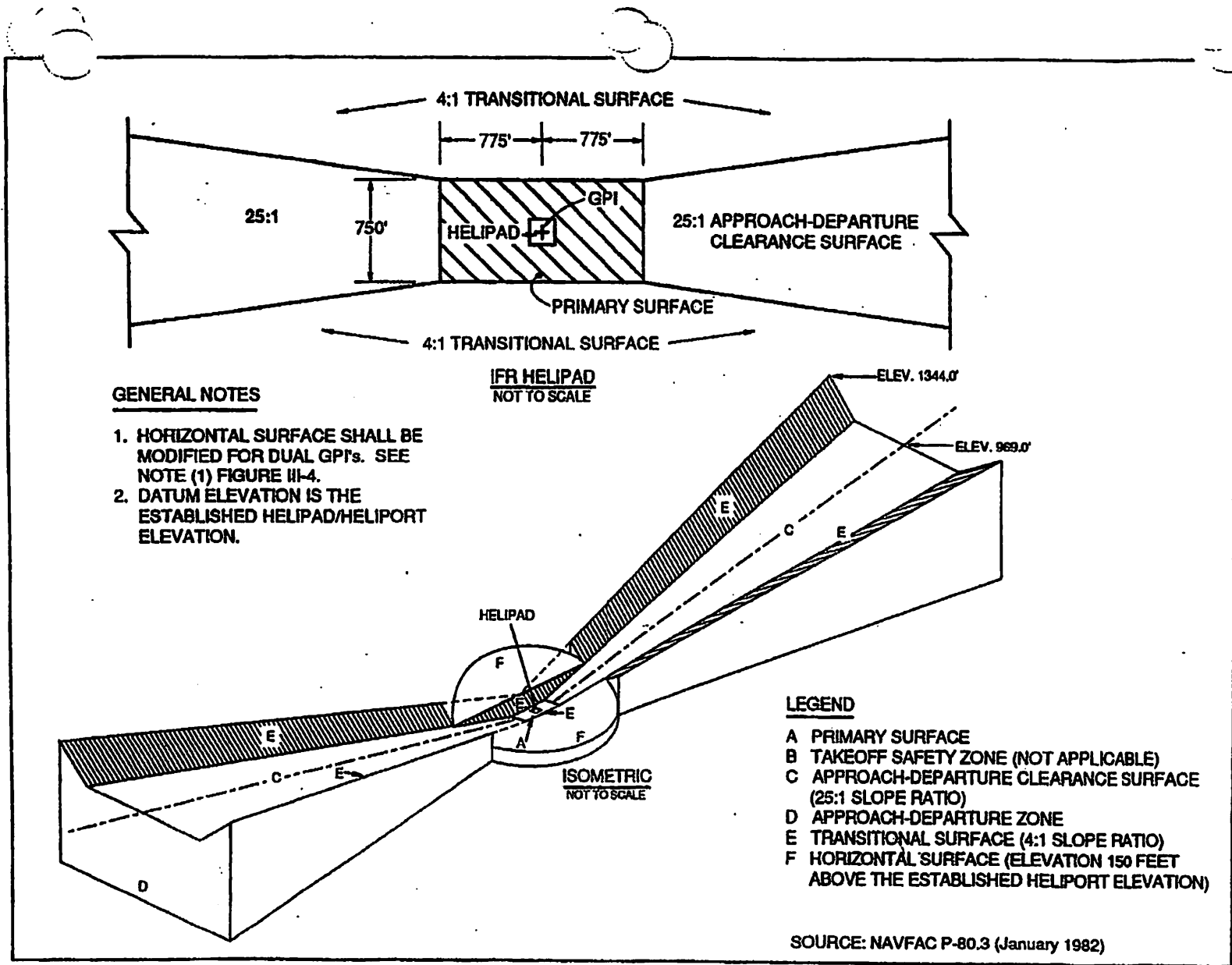
MCAS Futenma has fixed, mobile, portable and hand-held transmitting units. Electromagnetic radiation (EMR) and electromagnetic interference (EMI) constraints include all of the various impacts on personnel, ordnance and fuels caused by the emissions of transmitting antennas.

EMR hazards are evaluated for their impact on Ordnance (HERO), to Personnel (HERP), and to Fuels or other volatile liquids (HERF). A Radiation Hazard Analysis for MCAS Futenma was conducted by Naval Electronics Engineering Activity Pacific (NEEACT PAC), located at Pearl Harbor, in 1991. The fixed transmitter sites and HERP and HERF separation distances are listed in Appendix G-4.

A HERO survey has also been conducted for MCAS Futenma by the Naval Surface Warfare Center, located in Dahlgren, Virginia. The survey conclusions were as follows: "While station's fixed transmitters pose no threat to ordnance in the hangar areas, analysis shows that mobile HF (high frequency) transmitters erected in proximity to hangar areas, where electric cartridges are installed, could pose a threat to HERO susceptible cartridges. Worst case calculations indicate the need







for a minimum separation distance of 715 feet (218 meters) between the transmitter and HERO susceptible ordnance. HERO EMCON (emission control) is necessary for mobile HF transmitters when electric cartridges are being installed on or removed from aircraft."

EMR safety certification and site approval must be obtained for any proposed on-shore installations that (1) include transmitters/antennas or (2) involve personnel, fueling operations, explosives/ordnance, sensitive electronic equipment or military electronics in areas illuminated by electromagnetic radiation.

Areas exist around transmitting antennas within which electronic equipment can experience interference or performance degradation. The Engineering Field Activity (EFA) at NEEACT PAC Pearl Harbor should be consulted, during the project siting process, for advice and guidance concerning the potential for EMI and the prevention of EMI.

e. Explosives Safety Hazard Zones

Storage or handling of aviation ordnance (except for electric cartridges) is not conducted at MCAS Futenma. Consequently, there are no explosives safety hazard zones.

2. **Socio-Cultural Constraints**

a. Encroachments

Tacit Farming -- Encroachment on MCAS Futenma consists mainly of agricultural plots tended by local farmers. These areas are located in the primary surface, adjacent to Runway 06 at the northwest end of the Air Station (Figure D-1). Relocation of the farm plots is planned to a site which, while in the clear zone, will be adjacent to the Air Station boundary, closer to Gate 3, and in an area of lessened accident potential.

Highways -- A highway proposed by the Okinawa Prefecture (Figure D-1) will also encroach on some perimeter areas, if built as planned.

Buildings -- There are no laws in Okinawa prohibiting the owners of properties beyond each end of the runway from erecting buildings which pierce the airfield clearance surfaces (Figure D-4) extending over their property. In one instance such a building was constructed, and it had to be subsequently purchased and torn down. While cultural values in Japan usually cause most landowners to voluntarily refrain from such actions, it is possible that this could happen again.

b. Land Release Requests

Land release requests consist of approximately 10 acres along the east side of the Air Station for road improvements (Figure D-1), and approximately one acre at the southern end of the runway for private development. Eight acres at the northern end of the runway have also been requested for release (Figure D-1). This area is adjacent to the clear zone.

c. Cultural/Historical/Archaeological Sites

A listing of cultural sites and areas at MCAS Futenma, and a cultural overview are found in the document, "Cultural, Historical and Archaeological Documentation - MCB Camp Smedley D. Butler and MCAS Futenma, Okinawa, Japan," prepared by Paul H. Rosendahl, Ph.D., Inc. (PHRI) in 1991. Their locations are indicated on Figure D-8.

Cultural sites are categorized into two groups, each with its own review procedures:

- **Assets of scientific value.** These include shell mounds, village and agricultural remains, castle remains, and ancient tombs. Review and preservation procedures are clearly defined by

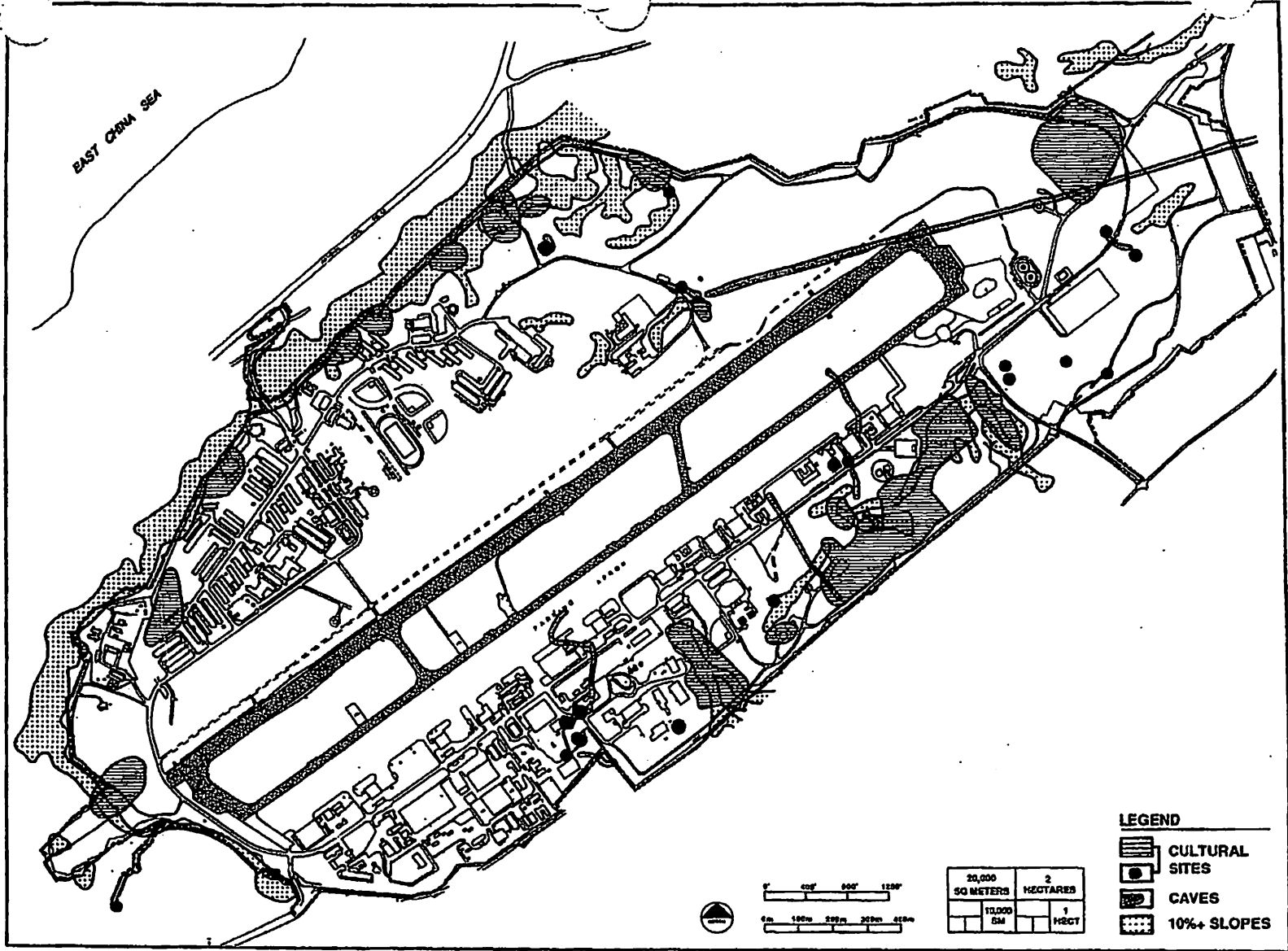
the Government of Japan.

- **Assets of cultural value.** These may be further categorized as tombs, sacred or religious sites, and natural monuments (such as springs, wells, and caves). Procedures for these non-designated sites of cultural value are less clearly defined by the Government of Japan.

A total of 55 cultural sites were located at MCAS Futenma. These include burials, village ruins with sacred areas and alters, agricultural wells, a spring, and memorials. None of these is officially registered as an archaeological site. However, when their cultural potential is considered within the context of several important archaeological finds in the Municipality of Ginowan, these sites may contribute to the understanding of human habitation and the evolution of the native culture over a very long period.

c. Underground Caves

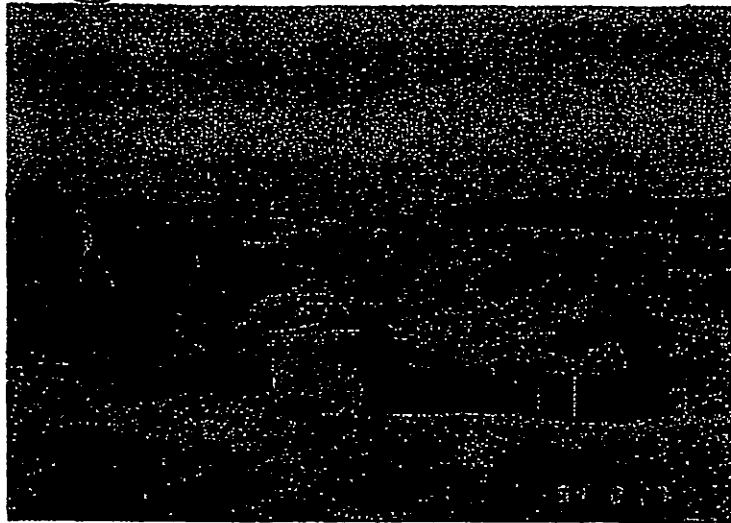
Natural cave formations have been found to exist under MCAS Futenma, with some yielding pottery shards and other evidence of early human habitation. Fossilized human and animal bones of the Pleistocene



MCAS FUTENMA MASTER PLAN

NATURAL AND CULTURAL CONSTRAINTS

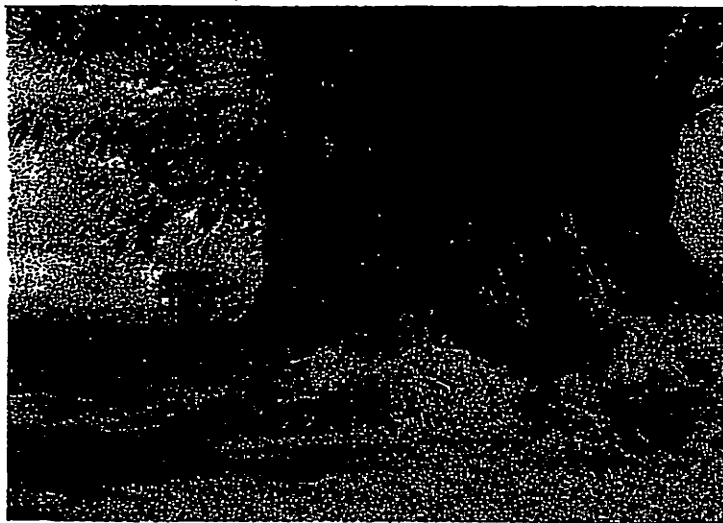
FIGURE D-8



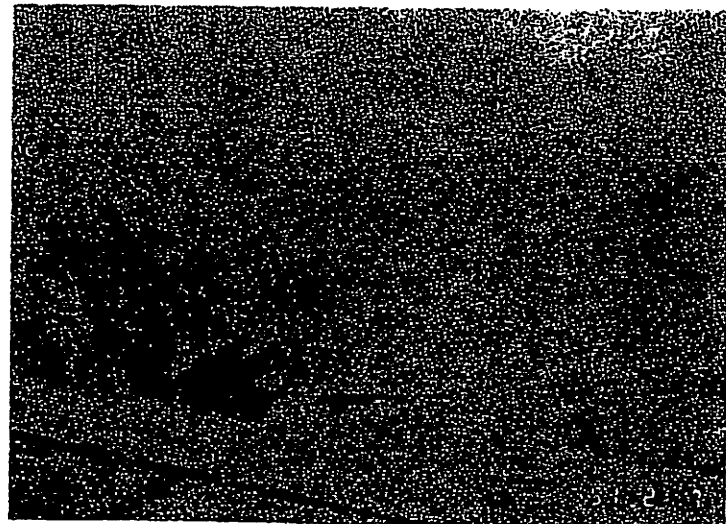
Agricultural Plots



Turtleback Tomb



Worship Area



Opening to Natural Cave

Period (2-1/2 million to 8,000 years ago) have also been found.

There are 21 identified caves which contain cultural deposits, midden deposits and burials. Seven caves have a scientific value, with 14 other caves having a cultural value. Approximate locations of major caves are depicted on Figure D-8.

3. Natural Constraints

a. Topography

MCAS Futenma is sited on a plateau, with elevations from 195 feet (60 meters) along the northwestern boundary to 330 feet (100 meters) along the southeastern boundary. The runway area is level, with an airfield elevation of 245 feet (75 meters). A 65 foot (20 meters) high bluff runs along the western boundary and physically separates the Air Station from Ginowan City. There is also a strip of moderately sloping terrain along the southeastern boundary.

Land that has a slope gradient of greater than ten percent is generally considered unsuitable for construction. Areas with these relatively steep slopes are shown on Figure D-8.

b. Flood Prone Areas

Some flood prone areas do exist on MCAS Futenma, but they are not considered severe enough to hinder development.

4. Consideration of Environmental Effects

The National Environmental Policy Act (NEPA) of 1969, as amended, requires all federal agencies to give appropriate consideration to the environmental effects of their proposed actions, if these actions are within the United States, its territories and possessions. This consideration is documented in an Environmental Impact Statement (EIS), when the action is one which will significantly affect the environment; or in an Environmental Assessment (EA), when the action is one for which the impacts are not known or may not be significant. There are also specific categories of actions that either have no potential for significant impacts or provide beneficial impacts, which are excluded from further NEPA documentation.

DOD Directive 6050.7, which implements Executive Order 12114 of 4 January 1979 (Environmental Effects Abroad of Major Federal Actions), requires DOD to

take account of environmental considerations when authorizing or approving certain federal actions that may significantly harm the environments of places outside the United States. Procedural requirements of DOD Directive 6050.7 must be followed if the proposed action (i.e., MILCON, Special and NAF Projects) is to be implemented or funded directly by the U.S. Government. However, the following are not federal actions covered by DOD Directive 6050.7.

- actions in which the U.S. participates in an advisory capacity, but does not fund the action;
- actions taken by a foreign government or in a foreign country in which the U.S. is a beneficiary, but does not fund the action;
- actions in which foreign governments use funds derived indirectly from U.S. funding.

This Master Plan, in and of itself, does not comprise a federal action. However, as planning documents are developed and submitted to higher authority decision-makers for possible implementation, each proposal in the master plan must be individually evaluated to determine the appropriate level of environmental

documentation required to comply with NEPA regulations.

E. PLANNING ANALYSIS

This section discusses idealized and existing functional relationships, investigates use constraints, describes the concepts that underlie this Master Plan, and recommends a land use plan which will promote continuity in the development of future facilities at MCAS Futenma.

1. General Requirements

The major components for an air station such as MCAS Futenma are runways, taxiways, parking aprons, flight operations and maintenance facilities, personnel billeting facilities and miscellaneous facilities such as administration, public works, community support and recreation facilities. The Facilities Requirements Plan Summary (FRPS), developed from the U.S. Navy's Shore Facilities Planning System (SFPS), translates the basic mission, tasks and base loading of an activity into facility requirements, and then compares these requirements with existing assets to identify facility shortfalls and surpluses. A copy of the FRPS for MCAS Futenma is included as Appendix G-5.

2. Idealized Functional Relationships

Since the major mission of an air station is to provide the facilities needed for aircraft operation and maintenance, the primary functional elements are the operational pavements. The orientation and the number of runways affect the relationship and siting of all other facilities, with taxiways and parking aprons being an integral part of the aircraft pavement complex.

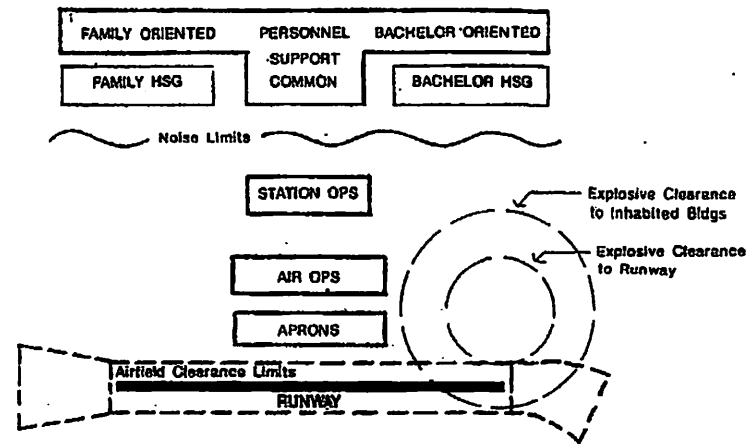
Today's aircraft require sophisticated support complexes. These aircraft support complexes have a direct functional relationship to the pavement areas, with each type of support related to a specific pavement function (i.e., maintenance to parking aprons, fueling to aircraft taxiways, airspace control to runway utilization, etc.).

Facilities associated with the personnel who fly or support aircraft operations do not require a direct "tie-in" with the aircraft pavement complex. Housing is a basic function in this area. While there is no direct functional relationship between housing and aircraft operations, housing should be sited within a reasonable commuting distance. At the same time it should be far enough away to minimize the potential

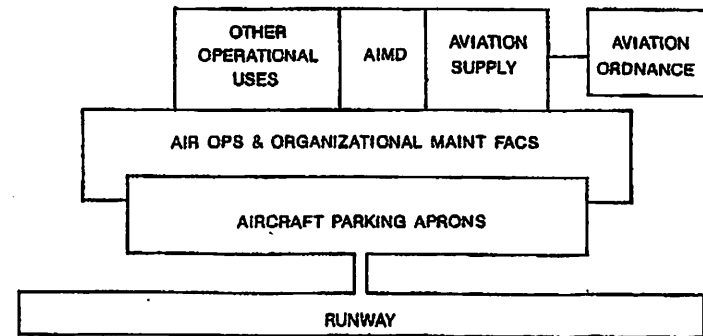
impact of negative aspects of aviation, such as noise. All other personnel support facilities have direct relationships to either family housing or bachelor housing, with certain facilities being oriented toward both bachelors and families.

Figure E-1 is a diagrammatic scheme for a typical air station that shows the functional elements discussed above in an idealized layout. Those encumbrances that form an integral part of any airfield development have been added. Their impact on the basic functions is graphically illustrated.

Figure E-2 shows a refinement in the airfield area of the idealized development scheme. Air operations and aircraft maintenance facilities are usually located near the aircraft parking aprons so that aircraft are easily accessible to flight crews and maintenance personnel. Ideally, the aircraft parking aprons are fronted by organizational maintenance facilities (squadron hangars) and air operations buildings (control tower, air operations, passenger terminal, etc.) since these functions require direct access to the aircraft. The organizational maintenance/air operations area is supported, in turn, by the intermediate maintenance activities, aviation supply, and other functions.



IDEALIZED AIR STATION DIAGRAMMATIC FUNCTIONAL RELATIONSHIPS FIGURE E-1



AIRFIELD AREA IDEALIZED FUNCTIONAL LAYOUT FIGURE E-2

3. Existing Functional Relationships

Figure E-3 illustrates the existing functional relationships at MCAS Futenma. These relationships follow the basic principles of the "ideal" pattern, with the main difference being that the runway is located in the center of the Air Station. Most air operations facilities are located along its southeast side, with aircraft operations and maintenance activities adjacent to the parking aprons, and additional supply and support activities to the rear.

Rather than being behind air operations, the Air Station's command and administration elements, and the community support facilities are centrally located on the opposite (northwest) side of the runway, with unaccompanied officer and enlisted quarters located on either side of these facilities. Beyond the quarters areas at each end of the runway is the compound for an air control squadron.

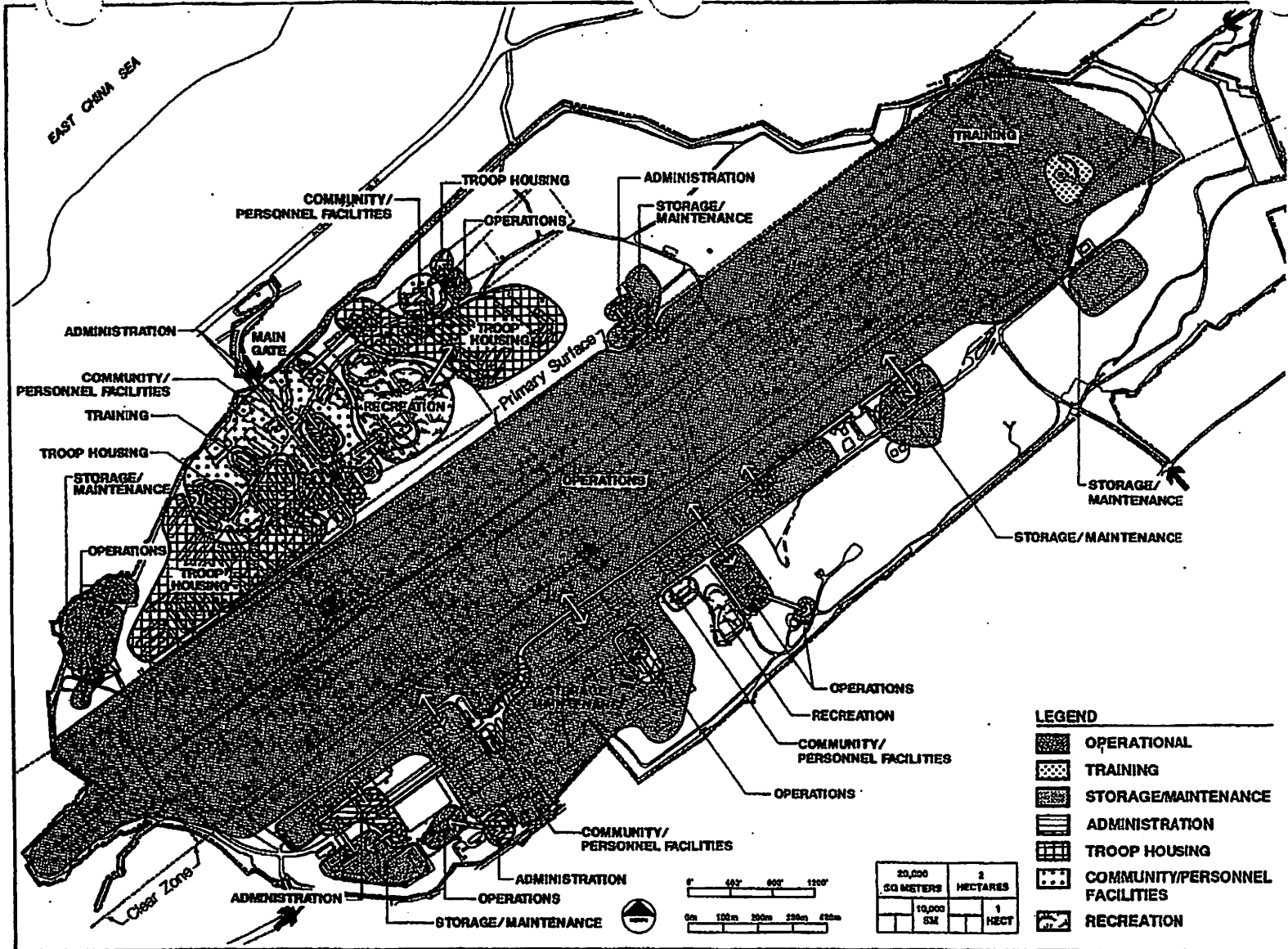
The considerable distance between the living (barracks) and work (air operations) zones exceeds convenient walking distance. However, this situation cannot be improved because of the fixed location of the runway and the lack of vacant land.

Due to land availability constraints, there are no family housing units at MCAS Futenma. This need is met at nearby installations, particularly Camp Foster, Camp Lester, Camp Kinser, and Kadena Air Base.

Another departure from the idealized pattern is the considerable distance between related functions for several units. This is particularly significant for the two air control squadrons located across the runway from other air operations activities.



Aircraft Parking Apron



MCAS FUTENMA MASTER PLAN

EXISTING FUNCTIONAL RELATIONSHIPS

FIGURE E-3

For example, an auto vehicle maintenance facility programmed to serve these two and other MACG-18 units will be on the opposite side of the airfield from them, and in one of these cases more than two miles away. A similar situation exists for major warehousing space as a result of the consolidation of several units' spaces into a few large buildings. The lack of land and the limitations on its use imposed by the runway location are also the reasons for these departures from the idealized pattern.

4. Planning Concepts

The relatively small land area, the inability to extend the Air Station's boundaries due to the encroachment of private development right up to its perimeter, and the further constraints imposed by the terrain and cultural sites together severely limit the options for siting new projects at MCAS Futenma. The few remaining pieces of vacant land should be preserved and conservatively used to support unmet requirements. Wherever possible, new development should be sited in areas that become available when substandard facilities are replaced with new construction.

These conditions, along with the existing shortfalls and projected future requirements, give rise to the following three broad planning concepts:

a. Minimization of Required Land

Four techniques are proposed for keeping to a minimum the land area required for siting new facilities:

- Consolidate individual unit components (e.g., operations, maintenance and administration) into a single building.
- Consolidate compatible functions (e.g., vehicle maintenance or supply/storage) for several different units within an air group into a single building.
- Utilize multi-story construction where this will not compromise mission accomplishment.
- Locate new facilities on vacant sites within developed areas, or on sites occupied by substandard and surplus buildings.

In addition to reducing land coverage, each of these techniques will in many cases improve operational efficiency. Siting new buildings in vacant areas along the Air Station boundary will also help to prevent further encroachment.

b. Provision for Future Requirements

To maintain some flexibility to meet new or expanded operational requirements, as many potential development sites as possible need to be held in reserve. For master planning to be truly comprehensive and effective, it must look beyond the mid-range time frame and reflect all projects for which there is a foreseeable need. Projects which are currently not supported by the SFPS should also be included as long-range (beyond 7 years) proposals where there is an apparent future need to reduce land use incompatibility, improve functional relationships, or satisfy future facility shortfalls.

Specifically, the northwest corner of the Air Station needs to be held in reserve for future development. This area will be needed to accommodate a maintenance hangar and parking apron for a squadron of MV-22 Osprey aircraft, should they be approved for deployment. Existing facilities are not

adequate or adaptable for this purpose, and there are no other suitable alternate sites at the Air Station.

c. Enhanced Quality of Life

High priority should be placed on enhancing the quality of life for those who live and work at MCAS Futenma. One of the most effective means of accomplishing this, especially given the shortfalls at the Air Station, will be by expanding community support and both indoor and outdoor recreational facilities. Specific recommendations are to:

- Satisfy requirements for an exchange cafeteria and food store, a credit union, a rehabilitation center, and an arts and crafts hobby shop, all facilities which currently do not exist.
- Consolidate and centralize compatible functions, such as education services and the library, and exchange service and retail outlets.
- Group outdoor recreation facilities near the users they serve.
- Provide open spaces to preserve the existing vegetation and natural landscape, including cultural sites.

- Link the outdoor recreation clusters and the open space areas with jogging paths.

5. Proposed Land Use

Figure E-4 illustrates proposed land use for MCAS Futenma. It shows the planned functional uses for each portion of the Air Station, and is based on planning principles, projected base loading and mission requirements. Also reflected are the planning concepts discussed in the previous section.

Primary emphasis is placed on providing for SFPS supported projects which are likely to be constructed in the three (3) to seven (7) year, or mid-range, time frame. However, sites are also proposed for meeting more long-range needs, even though they may not be SFPS supported at this time.

a. Parameters

The basic parameters for preparing the proposed land use pattern are as follows:

- It should be as close to an ideal plan as is practical, taking into consideration natural and

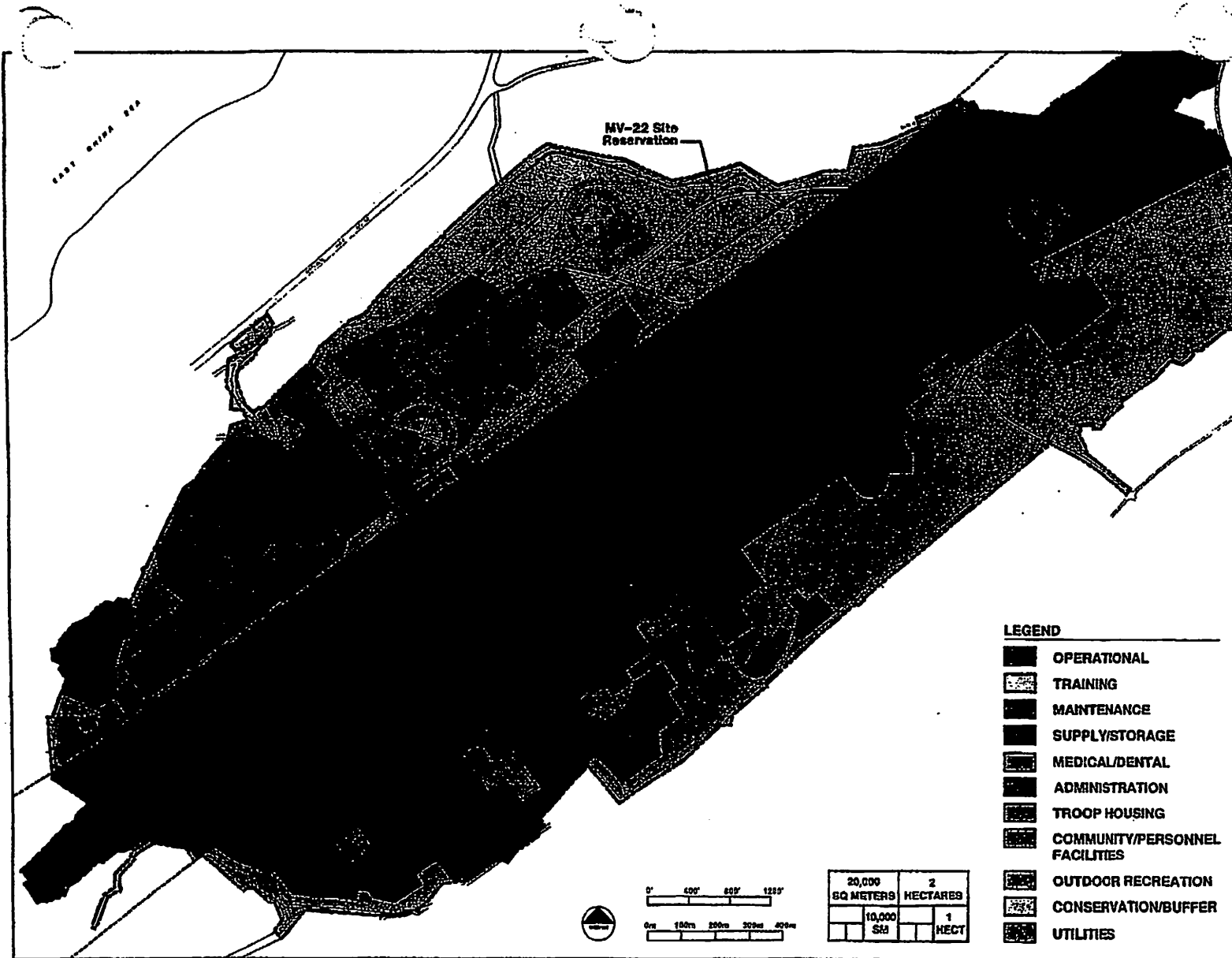
man-made constraints, existing patterns of development, and available funding.

- It should be used as a framework for the preparation of development plans and for making future land use decisions. The designation of specific uses for land will help to prevent the uncontrolled development of facilities at MCAS Futenma and will reduce conflicting land uses. Because the proposed land use pattern will be used to influence the siting of all new facilities at MCAS Futenma, it is the major product of the Master Plan.
- It should require only minor modification from one update to the next.

b. Major Proposals for Change

Comparison of the existing and proposed land use patterns (Figures C-7 and E-4, respectively) shows that no major shifts in the basic use pattern are envisioned. Most changes have to do with the expansion of existing functional areas to meet current and projected requirements. These include:

- Major expansions to facilities for the four largest functions located on the northwest side of the



runway -- community support facilities, recreation space, troop housing, and headquarters (administration) space.

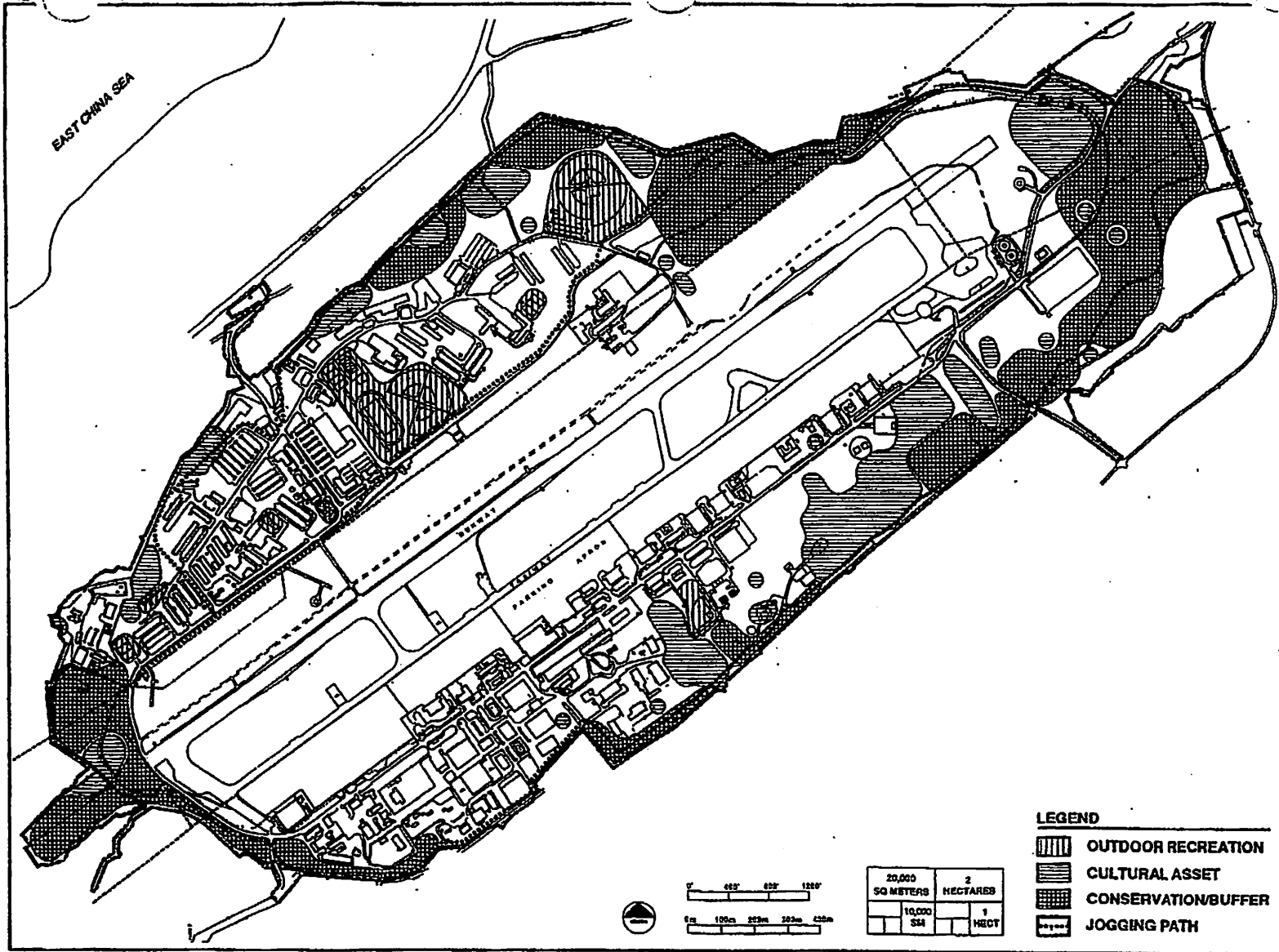
- Relocation of the medical clinic to the operations side of the runway, next to the dental clinic.
- Infill of vacant areas along the flightline with additional hangars and other maintenance facilities, and with aircraft parking space.
- Further consolidation of supply/storage functions in large warehouses located behind the flightline maintenance facilities.
- Consolidation of academic and applied instruction facilities in a centrally located complex behind the flightline.
- Reservation of a site at the northwest corner of the Air Station to accommodate operations and maintenance facilities for the MV-22 Osprey, in the event that this aircraft is developed and stationed at MCAS Futenma.

c. Proposed Open Space/Pathway Network

A proposed land use element which is highlighted by Figure E-5 is an open space and pathway network for MCAS Futenma. The establishment of this network is intended to play a major role in beautifying and enhancing the quality of life at the Air Station.



Habu Trail/Jogging Path



MCAS FUTENMA MASTER PLAN

PROPOSED OPEN SPACE/PATHWAY NETWORK

FIGURE E-5