

01/10/88

PAUL SCHEMBER

MASTER PLAN

U.S. NAVAL COMPLEX

ROOSEVELT ROADS
PUERTO RICO

ATLANTIC DIVISION



NAVAL FACILITIES ENGINEERING COMMAND

Table Of Contents

	<u>PAGE</u>
CONTENTS.....	i
ILLUSTRATIONS.....	iv
FOREWORD.....	vi
EXECUTIVE SUMMARY.....	vii
I. INTRODUCTION	
A. Objective.....	I-1
B. Scope.....	I-1
C. Methodology.....	I-1
D. Use of the Master Plan.....	I-1
II. PLANNING CONSIDERATIONS	
A. Community Considerations.....	II-1
1. The Region.....	II-1
2. Local Community.....	II-1
3. Labor Force.....	II-2
4. Transportation/Circulation.....	II-2
5. General Economy.....	II-5
6. Community Support.....	II-5
7. Utilities.....	II-5
8. Area Jurisdiction.....	II-6
9. Political/Cultural Environment.....	II-7
10. Puerto Rico Long Range Development Plan.....	II-7
11. Zoning/Encroachment.....	II-8
12. History.....	II-8
B. Environmental Considerations.....	II-10
1. Topography.....	II-10
2. Hydrology.....	II-14
a. Flood Plain.....	II-14
b. Ground Water.....	II-14
c. Surface Water.....	II-14
3. Vegetation.....	II-14
4. Wildlife and Endangered Species.....	II-15
5. Coastal Zone Management.....	II-18
6. Climatology.....	II-19

C. Siting Constraints.....	II-20
1. Explosive Safety.....	II-20
2. Electromagnetic Radiation Hazards.....	II-27
3. Airfield Safety.....	II-30
4. Noise Environment.....	II-31
5. Accident Potential Zones.....	II-32
6. Air Installation Compatible Use Zone.....	II-32

III. PLANNING REQUIREMENTS

A. Operational Functions.....	III-1
1. COMNAVFORCARIB.....	III-1
2. COMANTDEFCON.....	III-1
3. COMFAIRCARIB.....	III-1
4. COMSOLANT.....	III-1
5. NAVSTA.....	III-1
6. AFWTF.....	III-3
7. COMFAIRDET.....	III-3
8. VC-8.....	III-3
9. NCS PUERTO RICO.....	III-3
10. NMCB.....	III-3
11. NWSER.....	III-3
12. MARBARKS.....	III-4
13. FLTAUDVISCEN.....	III-4
14. NPPSO.....	III-4
15. NAVINVSERV.....	III-4
16. NEEC CARIB.....	III-4
17. NAVHOSP.....	III-4
18. NAVREGDENCEN.....	III-4
19. SPWARGRP.....	III-4
B. Analysis of Existing Assets.....	III-5
1. Assets - Land and Facilities.....	III-5
2. Utilities.....	III-7
a. Electrical Power.....	III-7
b. Water.....	III-10
c. Waste Disposal.....	III-11
d. Communications.....	III-15
3. Fuels.....	III-16
4. Fire Protection.....	III-17
5. Family Housing.....	III-17
6. Off Station Support.....	III-19
a. San Juan.....	III-20
b. Island of Vieques.....	III-20
c. AFWTF Remote Sites.....	III-20
d. Puerto Rico National Guard/Reserve.....	III-25
7. Circulation.....	III-25

IV. CONCEPTUAL ANALYSIS

A. Objective.....	IV-1
B. Functional Land Use.....	IV-2
C. Planned Land Use.....	IV-2
1. Short Range Planning.....	IV-2
2. Long Range Planning.....	IV-5

V. CAPITAL IMPROVEMENTS PLAN

A. Main Station Development.....	V-1
B. Remote Location Development.....	V-6

VI. APPENDIX

A. Capital Improvements Plan.....	A-1
B. Energy Conservation Program.....	B-1
C. Environmental Impact Assessment.....	C-1
D. Bibliography.....	D-1

Illustrations

FIGURE NO.	DESCRIPTION	PAGE
1	Regional Map.....	II-3
2	Vicinity Map of Puerto Rico.....	II-4 ✓
3	Aerial Photo-Roosevelt Roads.....	II-11
4	Topography Map-Roosevelt Roads.....	II-12
5	Topography Map-Vieques.....	II-13
6	Flood Plain.....	II-16
7	Natural Resources.....	II-17 ✓
8	Ordnance Area-Vieques.....	II-22
9	AFWTF Inner Range.....	II-23
10	Vieques Mosquito Pier.....	II-24
11	Explosives Anchorage.....	II-25
12	Ordnance Area-Roosevelt Roads.....	II-26
13	Table of Ordnance Waivers.....	II-28
14	Aircraft Ordnance Handling Areas.....	II-29
15	Threat Platform Simulator.....	II-30
16	Flight Paths.....	II-35
16A	Imaginary Surfaces & Flight Obstructions...	II-35A
17	Air Installations Compatible Use Zone.....	II-36
18	Command Organization.....	III-2
19	Facility and Population Concentration Areas.....	III-6
20	Electrical Distribution.....	III-9
21	Encroachment-Rio Blanco Waterline.....	III-10
22	Water Distribution.....	III-12 ✓
23	Sanitary Sewer.....	III-13 ✓
24	Capehart Housing Sewage Treatment Plant.....	III-14
25	Communications Operations Center.....	III-16
26	POL Facilities.....	III-18
27	Family Housing.....	III-19
28	Pico del Este.....	III-21
29	Crown Mt. (St. Thomas).....	III-22
30	Underwater Tracking Range (St. Croix).....	III-23
31	UTR Ops (St. Croix).....	III-24
32	Cerro Matias (Vieques).....	III-24
33	Circulation Network.....	III-26
34	Planned Land Use.....	IV-3
35	Planned Development-Airfield Area.....	IV-6
36	Proposed Ofstie Administrative Complex.....	IV-7
37	Functional Allocation Proposed Ofstie Admin Complex.....	IV-8
38	AFWTF Development/Engineering and Drone Rework Complex.....	IV-9

39	Community Center Complex.....	IV-13
40	Planned Special Warfare Group Compound.....	IV-14
41	Puerca Point Drone Launch Fac.....	IV-15
42	Capital Improvements Plan-Naval Station Roosevelt Roads.....	V-3
43	Remote Sites-Capital Improvements Plan.....	V-8

Foreword

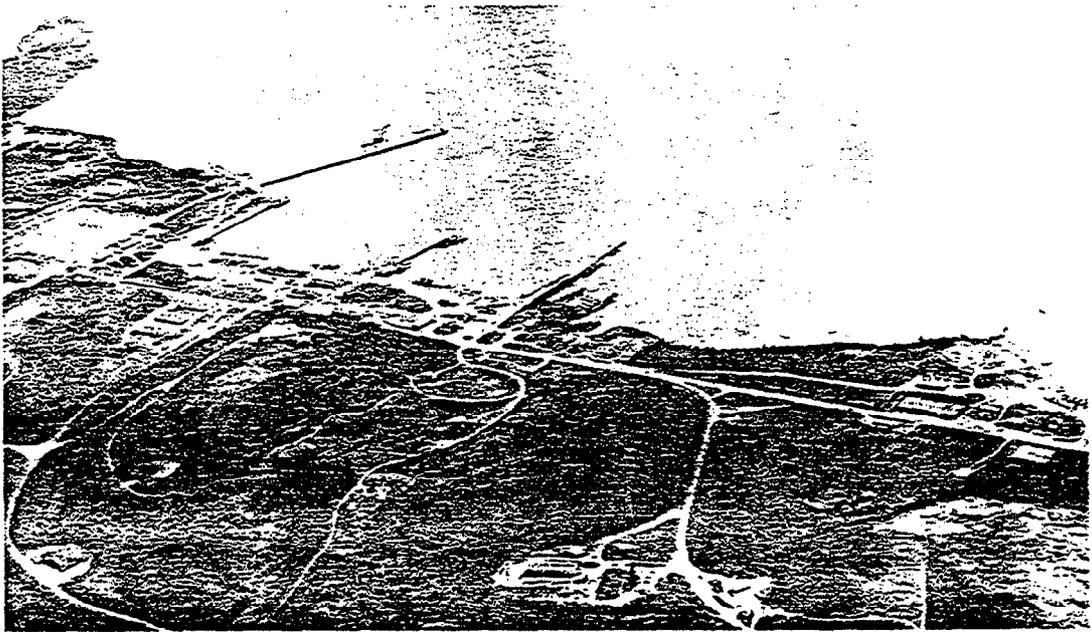
The Chief of Naval Operations (CNO) assigns the responsibility for shore installation master planning to the Naval Facilities Engineering Command by OPNAVINST 11010.1. Approval by the CNO establishes the master plan as the official planning document for the Activity.

The Atlantic Division, Naval Facilities Engineering Command, in cooperation with the Commanding Officer, Naval Station, Roosevelt Roads, and his staff, have updated the master plan which has been in use since 1973.

A master plan for the Roosevelt Roads Naval Complex was completed in 1969-70 and subsequently updated in 1973. The current tempo of operations and future projections prompted the Commanding Officer, U.S. Naval Station, Roosevelt Roads, to request that the Atlantic Division, Naval Facilities Engineering Command assist in the complete updating of both the Activity's master plan and Shore Facilities Planning System documents.

To insure that the master plan remains responsive to the Activity's assigned mission and tasks, the plan must be able to accommodate a continuous series of changes. When the cumulative sum of these frequent revisions becomes significant, or when there is a major mission change, this edition of the master plan will then undergo its periodic updating.

This master plan has been reviewed by the staffs of the Naval Station, Roosevelt Roads, tenant and supported units and those of superior command echelons. The review comments of all interested commands have been incorporated as appropriate.



Executive Summary

Executive Summary

The update of the master plan for the U.S. Naval Complex, Roosevelt Roads, Puerto Rico, has been prepared by the Atlantic Division, Naval Facilities Engineering Command in close association with the Commanding Officer and staff of the Naval Station, Roosevelt Roads and tenant units.

Numerous facility recommendations in the 1973 master plan have been built or are currently in firm programs for acquisition in the near future. The Planned Land Use map in the 1973 plan retained its basic integrity into the late seventies, attesting not only to the soundness of the proposals, but to the dedication of the Activity in the intervening years in making the plan viable. This master plan perpetuates the basic structure of the 1973 plan. The impact of planning recommendations in relation to the environment and proposals for a major increase in aircraft operations support facilities are among the major modifications in this update. Although some of the major recommendations differ from the existing plan, it is interesting to note that the new proposals can be accommodated by the 1973 Planned Land Use map with regard to the functional areas.

This master plan has also been modified to include a description of the outlying sites which are a part of the Complex and which have an impact on the operation and support provided by the Naval Station.

The Planned Land Use map included herein has allocated additional land area to administrative functions and reallocated land areas to ship and aircraft operational functions. The requirements for additional facilities that were identified during the recently completed Shore Facilities Planning System update and those which are anticipated, but not presently SFPS supported, have been incorporated into the Planned Land Use map. The supportable facility requirements are described in the Capital Improvements section of the plan.

The most critical factors affecting land use planning within the Complex are the pressures that originate externally to the station; the primary pressure being exercised by the Commonwealth in an attempt to get the Navy to reduce the level of its operations or even to terminate some completely (i.e., Vieques target ranges). The diminution or cessation of certain operations will have the net effect of making it impossible for the Activity to fulfill its assigned mission and tasks. The resolution of this specific problem can only be accomplished through a mutual understanding between the Navy and the Commonwealth; that the continued viability of the entire Complex is as important to the Commonwealth as it is to national security.

This master plan update includes the back-up data necessary to support the major segments of the plan. Additional information can be obtained

by referring to source documents, listed in the Bibliography (Appendix D), the specific project files, and other pertinent documents.

The major recommendations included in this master plan update are summarized herein and further discussed in Section V and Appendix A.

- Provide additional aircraft parking, maintenance facilities, refuelers, washrack and hangar to support transient and rotational aircraft on the south side of runway 6/24.

- Provide a tactical ordnance loading pad, support magazines and bomb build-up area on the south side of runway 6/24.

- Relocate most functions not directly related to air operations out of the terminal building and provide a full RATCC facility. New passenger and cargo terminals to be provided in the vicinity of the terminal.

- Relocate the AFWTF Development/Engineering Department to Building 378 and construct a new Drone Maintenance Facility north of Building 378.

- Relocate numerous administrative and support functions into the Ofstie Area. The majority of the functions relocating to Ofstie will come from the Bundy Area.

- Minimize the continuance of Activity functions in the Bundy area, and utilize existing facilities to house transients thereby reducing the present traffic flow between Bundy and other station areas.

- Extend and widen the ammunition pier and terminate all ordnance handling operations at pier 3.

- Provide new surface operations facilities to accommodate projected increases in harbor utilization

resulting from an expanded training mission.

- Expand storage facilities to include POL products, general supplies and those requiring cold and controlled humidity storage.

- Relocate the commands and staffs occupying the "old hospital" in Bundy to new facilities overlooking the harbor in the vicinity of Building 51 (formerly P.O. Mess).

- Continue the relocation of community support facilities to the Community Center Complex on Langley Drive, centralizing these functions between the Married and Bachelor Housing areas.

- Construct water ponding areas to contain storm water run-off and allow its discharge under controlled conditions, thereby reducing surface erosion, harbor siltation and periodic flooding.

- Provide additional ordnance related facilities on Vieques and construct a new helicopter landing pad, to improve overall support capability of the Weapons Department.

- Provide a hardened range operations center on Cerro Matias (Eastern Vieques), necessary for the control and operation of the target ranges located there.

- Acquire additional land on St. Croix at Sprat Hall, to build a new range operations center for the underwater tracking range, and discontinue use of van facilities.

- Provide expanded radar tracking and control facilities on Pico del Este which will allow greater range safety and improve the efficiency of training exercises.

- Relocate the drone launch complex from Cabras Island to Puerca Point to improve operational capability and range safety.

- Ensure all proposed projects are in consonance with the Commonwealth's Coastal Zone Management Plan and the effect of these projects on endangered species (terrestrial and marine) is fully explored during the conceptual stage.



Introduction

Introduction

A. OBJECTIVE

The objective of this master plan is to provide the Commanding Officer and staff of the U.S. Naval Station, Roosevelt Roads, with broad professional guidance in the use of existing physical resources and in the development of new facilities to meet known and projected mission requirements through FY-1983. The plan provides for orderly development; simultaneously obtaining the highest and best use of land areas and creating a pleasant working and living environment consistent with recognizable, necessary constraints.

B. SCOPE

This plan makes recommendations for the short and long-term development at Naval Station, Roosevelt Roads and the remote sites which comprise the U.S. Naval Complex, Roosevelt Roads. Construction projects justified by the methodology of the Shore Facilities Planning System (SFPS) documentation have been sited and identified by a project number in the Capital Improvements Plan (Section V) and are considered in the short-range period. The plan also includes projects beyond the FY-83 timeframe and provides guidance for consideration when expanding facilities and reserving real estate for the long term future growth of the entire complex.

C. METHODOLOGY

This master plan is the result of the efforts of a multi-disciplined

planning team with the cooperation of station and tenant personnel.

Initial data collection began in January 1978 with the development of a Basic Facility Requirements List (BFRL) for the station and tenant organizations and a field investigation of the condition of existing assets (main station and remote sites).

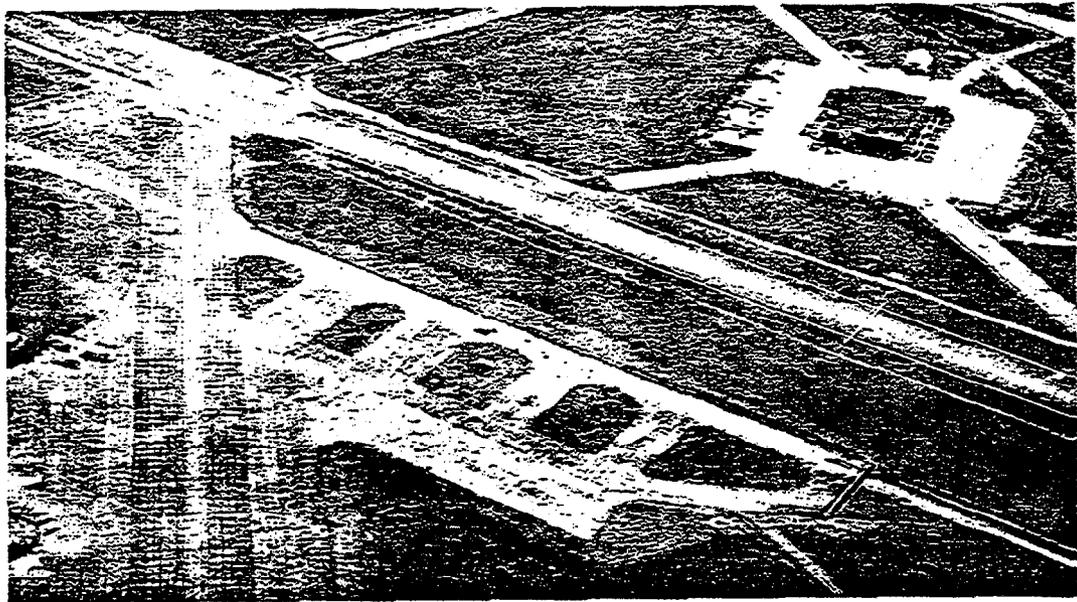
A master plan outline, developed at the beginning of the data collection phase, provided the framework for the methodology and work schedules and for the format of the final plan. Section II is devoted to a discussion of the planning considerations, off and on-station, affecting the planning for future growth. The planning considerations discussed in Section II, together with projected facility requirements and siting constraints, led to a broad development concept, which was presented to the Activity in August 1978. The recommendations included in Section V reflect their comments resulting from the August 1978 conference.

D. USE OF THE MASTER PLAN

The master plan is a basic reference source for facilities development decision making. Although the plan addresses construction requirements through the established timeframe, it is inevitable that unforeseen requirements will necessitate the construction of facilities not sited on the Ultimate Development Plan. The enduring use of a master plan is in the rationale applied in the

development of the Planned Land Use map, which provides for the siting of presently unidentified facilities in a manner consistent with the overall concept discussed in Section IV.

OPNAVINST 11010.1 provides for the approval of master plans by the Chief of Naval Operations (CNO) and requires that subsequent sitings be in consonance with the approved plan. Should sufficient cause exist for a major deviation from the approved plan, the station may submit a request for a change to CNO, via the appropriate chain of command and the Commander, Atlantic Division, Naval Facilities Engineering Command. Authority for approval for minor changes has been delegated to the Commander, Naval Facilities Engineering Command.



Planning Considerations

PLANNING
CONSIDERATIONS

Planning Considerations

A key preliminary step in the development of this master plan is the definition of the parameters within which the plan is to be developed. Once the plan boundaries were established, the specific considerations which impact upon the land and facility planning at Naval Station, Roosevelt Roads and the remote areas, under their operational and administrative control were assembled and included in this section for discussion. The subsequent sections will discuss the requirements, analyses and recommendations developed within the framework of the planning considerations outlined herein.

A. COMMUNITY CONSIDERATIONS

1. The Region

The Treaty of Paris which ended the Spanish-American War in 1898 resulted in Puerto Rico becoming a possession of the United States. In 1952, they were granted commonwealth status which provided for a popularly elected domestic government. All federal taxes collected in Puerto Rico revert to the Commonwealth treasury for use in underwriting island-wide programs. This is supplemented by the Federal government in the form of financial aid programs available to the 50 states in general. Puerto Rico, with its extensive history as a Spanish possession has retained Spanish as the island-wide language and has also retained a majority of the civil legal system bequeathed by Spain.

The Commonwealth of Puerto Rico pro-

vides a wide range of services throughout the island and all utilities (electric, phone, etc.). The majority of the island's population is concentrated in the San Juan Metropolitan Area with Ponce and Mayaguez on the South-Central and West-Central coasts respectively, being the other two major population centers. In 1976, the island-wide population was estimated to be 3,300,000. The geographic relationship of Puerto Rico to her neighboring Caribbean islands is shown in Figure 1.

The U.S. Navy, in addition to its facilities on the island of Puerto Rico, maintains active installations on the islands of Vieques and Culebra (telemetry/Microwave site) and on St. Thomas and St. Croix, which are a part of the Territory of the U.S. Virgin Islands. See Section III for a breakdown of Navy assets in the Roosevelt Roads Complex.

2. Local Community

The Naval Station is located on the southeastern coast of Puerto Rico and is in the Municipality of Ceiba (Say-Bah). The nearest major town is Fajardo which is approximately 10 miles north of the Station. Immediately to the west of the Naval Station and adjacent to its western boundary is the town of Ceiba which was founded in 1888 and was relatively small and rural until the early 1970s. As the urban sprawl headed southward from Fajardo, the need for additional space to accommodate new housing, commerce and industry reached Ceiba. Presently Ceiba has

a population of 15,000 in an area of approximately 27.5 square miles. Major population centers in Puerto Rico and the general area in the vicinity of Roosevelt Roads is shown in Figure 2.

3. Labor Force

The Island's population can provide the wide range of skills necessary to operate the varied functions of the Roosevelt Roads Complex. The majority of the labor force immediately available, however, is unskilled or semi-skilled. Many of the skilled employees in the professional and technical categories working at Naval Station, Roosevelt Roads, commute on a daily basis from metropolitan San Juan. The overall assessment is that the skilled labor force is in such demand in the civilian sector, that available people usually have multiple employment possibilities. This has resulted in numerous professional and skilled positions at Roosevelt Roads remaining vacant or requiring state-side recruitment.

4. Transportation/Circulation

The Island of Puerto Rico enjoys practically all of the transportation modes available stateside. Most major U.S. airlines and numerous foreign carriers serve the island via the San Juan International Airport. These flights are supplemented by many small inter-island air carriers tying together most of the major islands in the Caribbean. Passenger and cargo vessels also serve the Island with San Juan being the primary port facility. During the tourist season from November through April, there may be a half-dozen cruise vessels in port. Cargo vessels are crucial to the Island's economy, for most of the manufactured goods arrive by ship, with heavy emphasis

on containerized cargo. A small percentage of the shipping goes to the ports of Ponce and Mayaguez on the southern and western coasts respectively.

Intra-island travel is primarily by car with the major population centers having nominal public transportation systems consisting of buses and taxis. A less regulated class of public transport are the "publicos" (taxis) which operate outside the metropolitan area. The fares are usually negotiated and numerous fares may be in the "publico" vehicle at any one time. The road network is an aggregate of 8,000 miles of primary, secondary and tertiary roads. A coastal road encircling the island is comprised of Routes 2 and 3. The north-south connector (Rt. 1), joining San Juan and Ponce, has been paralleled by the Island's first limited access toll road.

The road network is continually being upgraded to accommodate the ever increasing number of motor vehicles. The Naval Station is approximately 40 miles from downtown San Juan via Routes 26 and 3 which diminish from six to four to two lanes as one departs from metropolitan San Juan area. The average travel time for this short distance is approximately one hour 15 minutes. As part of the Commonwealth's master road network plan, Route 3 is slowly being widened to a four lane road, and a by-pass around Ceiba is presently under construction. This will significantly decrease congestion in the town's narrow streets.

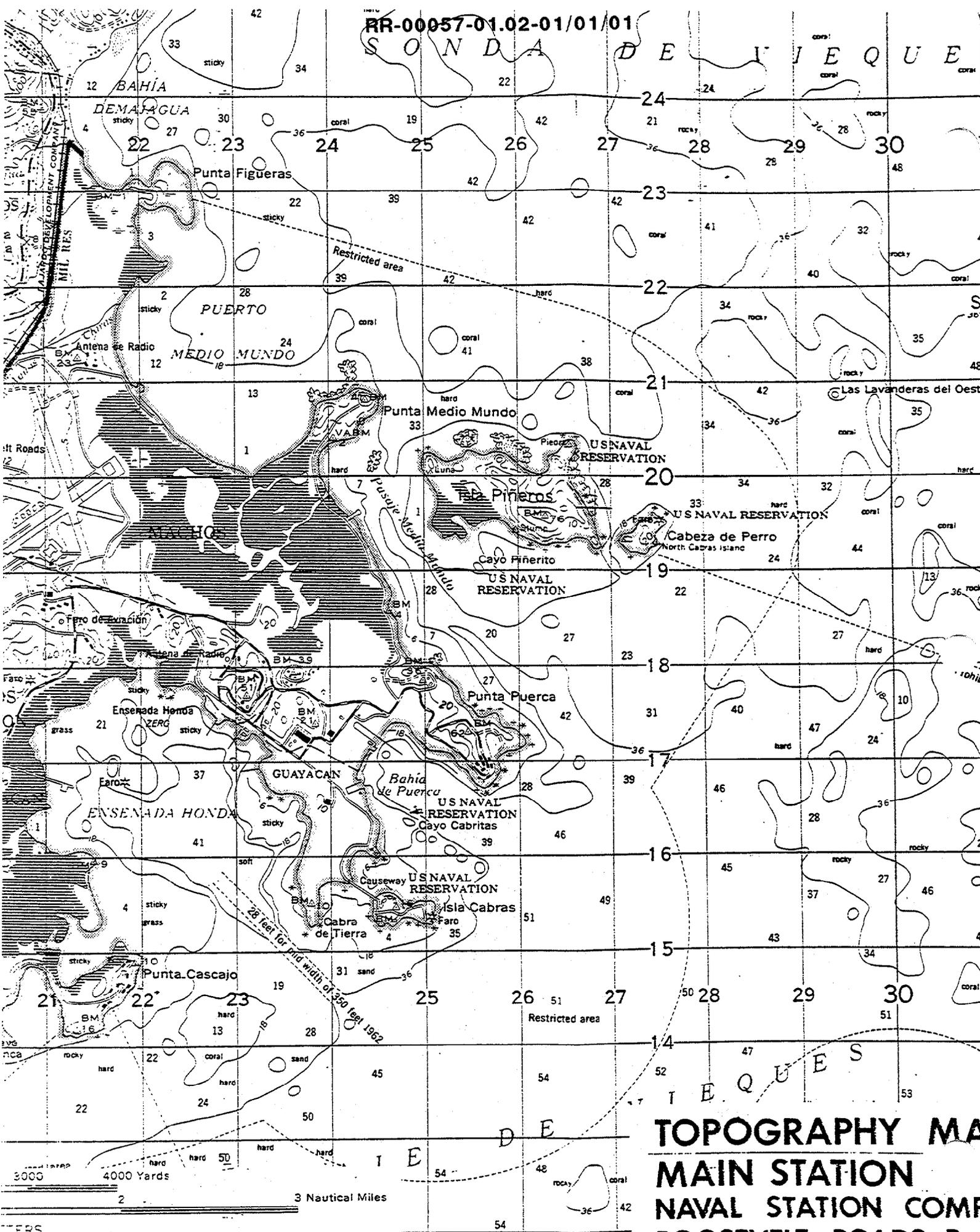
Railroads have never been developed as a major transportation mode on the Island. They have been primarily built to serve sugar cane fields and the refineries. These short rail lines are almost all narrow gauge and are well suited for hauling bulk cane. Passengers and



AERIAL VIEW
NAVAL STATION COMPLEX
ROOSEVELT ROADS P. R.

RR-00057-01.02-01/01/01

SONDA DE VIEQUE



TOPOGRAPHY MA
MAIN STATION
NAVAL STATION COMP
ROOSEVELT ROADS P. F.

FEET
 10 METER INTERVALS

finished products have access to all areas of the Island via vehicle and airplane, which precludes any consideration being given to expanding rail service beyond present capabilities.

5. General Economy

The Puerto Rican economy has been on a general upswing since the implementation of Operation Bootstrap in the 1940s. The basic goals of the program were to diversify agriculture from strictly a sugar cane base; to make a more equitable allocation of arable land to the general population and to attract new industry and commerce to the Island to support the Island's growth needs and population increases. To attract industry, the Commonwealth offered extensive tax concessions in addition to a continually growing available labor asset. In 1976, the Island's exports totalled 3.4 billion dollars and imports 5.4 billion dollars. The majority of this trade was with mainland United States. The 1976 gross product of the Island was approximately 7.5 billion dollars. Manufactured articles accounted for over 2 billion dollars of the gross product.

Despite the apparent success of the Puerto Rican economic programs, the unemployment rate fluctuates between 12 and 15 percent, however, in 1976 it reached a high of 20 percent. This was partially due to the return of a large number of Puerto Ricans from the mainland (a direct result of the high living costs in the States and a depressed job market). The town of Ceiba's unemployment rate is currently at 18.5 percent with no anticipated reduction in the near future. A majority of the manufacturing operations are found in or near the Island's major cities, although many small plants are

located throughout the Island where the entrepreneurs were given extremely attractive incentives to locate in the less populated areas.

6. Community Support

The degree of development in north-eastern Puerto Rico has made available a range of services and goods that compare favorably with many similarly sized areas in the United States. One of the major disparities is the greater merchandise cost because of high transportation rates incurred in importing the items (primarily from the U.S.).

The services available in the local civilian communities (schools, religious institutions, cultural events, etc.) use the Spanish language primarily which requires that one be bi-lingual. This markedly reduces the number of Station personnel who can avail themselves of these services. Numerous recreational facilities, however, are available where use is not diminished by language barriers.

The University of Puerto Rico, with its main campus in Rio Piedras, provides a full range of both undergraduate and graduate programs including numerous extension services normally associated with a state sponsored school. There are also three private universities/colleges on the island, with various colleges and universities from the States operating branch locations providing degree programs at military installations.

7. Utilities

The Commonwealth of Puerto Rico provides all necessary island-wide utilities through a group of public corporations. The Puerto Rican telephone system was previously an International Telephone and Telegraph

(ITT) subsidiary but was acquired by the Commonwealth in 1977. The entire system is presently being evaluated prior to embarking on a large scale modernization program. Electric service is generally available in all but the most remote areas. The major utility deficiencies are the availability of potable water and complementing waste disposal systems. The Federal government, in conjunction with the Commonwealth, is working on pilot projects for nuclear and solar power generation facilities which, if found to be practical, will provide a significant increase in the Island's power generation capability, facilitating development in many non-urban areas. Electricity is provided to the islands of Vieques and Culebra via submarine cables from Puerto Rico and a submarine waterline from Puerto Rico to Vieques provides the Island with a year-round dependable water supply.

8. Area Jurisdiction

Puerto Rico is a self-governing Commonwealth of the United States, with 3,300,000 citizens, associated with the Federal government by compact and mutual consent. Its constitution was adopted by the people of Puerto Rico and ratified by the U. S. Congress. The Commonwealth was officially proclaimed on 25 July 1952.

The Constitution of the Commonwealth, providing a republican form of government with executive, legislative, and judicial branches, is in complete harmony with the Federal Constitution. Certain human rights provisions in the Constitution of the Commonwealth are more specific than those of the Federal Constitution. Among these are a specific guarantee of freedom of the press and a provision guaranteeing minority political parties representation in the House and Senate of Puerto

Rico though their candidates fail to win a majority of the votes in a particular contest.

The Constitution also prohibits discrimination because of race, color, sex, birth, social origin or condition, and political or religious ideas.

Labor has the right to organize, bargain collectively, strike and picket according to procedures established by law.

In its structure and power, the government of the Commonwealth resembles that of the United States. Under the compact with the United States, however, Puerto Rico does not have voting representation in the U.S. Congress, and its residents do not vote for the President of the United States. In keeping with the principle of "no taxation without representation", residents of Puerto Rico are not subject to U.S. Federal income taxes.

The Commonwealth does have a voice in the U.S. Congress through a Resident Commissioner. Elected by the people for a four-year term, the Resident Commissioner sits in the U.S. House of Representatives and has all the privileges of a member of Congress except that of voting.

The Commonwealth maintains a police force for law enforcement which is supplemented by police units working within specific larger cities (i.e., San Juan). All military personnel and their dependents are subject to all local laws except for violations occurring on federal property or offenses that are strictly military in nature. As Puerto Rico is an integral part of the United States, there is no "status of forces" agreement.

9. Political/Cultural Environment

A combination of many factors set the Puerto Rican political and cultural environment apart from the regional peculiarities which exist in the various sections of the United States. Being of Latin background and added to the realm of the U.S. as a spoil of war still engenders anticolonialistic feelings in certain political groups. Currently there are three distinct groups on the island; those favoring retention of the current Commonwealth status, those desiring statehood, and the smallest but most vocal, those desiring complete independence.

The Commonwealth recently requested issuance of an injunction requiring the Navy to terminate use of the eastern end of the Island of Vieques. They claimed that its use as a target range was harmful to the environment, and was also slowly destroying the Island's fishing industry. The injunction was recently denied, though this points out the potential damage to the training mission of the activity that can be generated by political pressure. The existing ranges on Vieques are crucial to the continued readiness training of units of the Atlantic Fleet, and their loss would not only be detrimental to the nation, but will have a severe economic impact locally. If the Naval Station loses a portion of its primary mission; to support the Atlantic Fleet Weapons Training Facility, the direct monetary input into the local economy (salaries, goods and services) will be drastically reduced. The Roosevelt Roads Complex contributed approximately 75 million dollars in FY-76 into the local economy, primarily in salaries, goods and services.

Although it is difficult to separate politically motivated goals from

those based simply on quantifiable, objective requirements, it seems imperative that the Commonwealth and the Federal government develop a mutually acceptable long range program with respect to Department of Defense (DOD) activities on the Island. The current multi-million dollar investment in land, facilities and range instrumentation, located at Roosevelt Roads and outlying sites, must be assured of a certain degree of longevity to justify continued maintenance and upgrading.

10. Puerto Rican Long Range Development Plan

The island-wide development plan assembled initially in the mid-60s and revised periodically is still being implemented. The major components of the plan deal with expansion of the tourist industry, extending and improving the road network, attracting more industrial and manufacturing concerns to increase the tax base, reducing unemployment and extending utility services throughout the Island and also on Vieques and Culebra. Improvement of existing systems where extensive development has rendered them inadequate and inefficient is also a goal of the long range plan.

With the termination of most military activities at the former Air Force Base at Ramey (Punta Borinquen), the Commonwealth has planned for the conversion of this vast facility to a multi-faceted housing, commercial, and manufacturing complex. The facilities which were excessed at Ramey by DOD have provided an excellent base for this endeavor. Formal release of Ramey assets by General Services Administration (GSA) has not occurred to date (1979). All uses of the facilities are covered by use agreements. The Puerto Rican Port Authority operates

the airport (Ramey) and has instituted daily intra and inter-island commuter flights. A similar situation exists with regard to all of the excess DOD facilities in the metropolitan San Juan area, which includes the former Naval Station.

11. Zoning/Encroachment

All facets of land planning in Puerto Rico are vested in the Puerto Rico Land Planning Board, in San Juan. The individual political subdivisions or "municipios" (municipalities) have no authority over matters pertaining to land use planning or land use controls i.e. zoning and subdivision approval. The Planning Board is authorized to create for any municipality, a local planning commission which can advise the Planning Board on planning problems in the municipality.

The Planning Board may also create Regional Planning Commissions, which may perform functions delegated by the Board. The amendment of some planning functions may also be delegated to the local and regional commissions. Presently, however, all the civil planning for the areas adjacent to the Naval Station is done by the Puerto Rico Planning Board as no local commissions have been created.

In the areas contiguous to Roosevelt Roads and the outlying sites, minimal protection normally provided by zoning ordinances to prevent incompatible development does not exist. Development is almost completely in the hands of the property owners, with only a few legal restrictions placed upon them. This has resulted in the construction of buildings and structures which have hazarded air safety, interfered with radio and electronic transmission and altered surface drainage causing flooding and erosion on government property. Correcting these condi-

tions in most cases is very difficult and usually requires that litigation be initiated.

The most recent example of encroachment is the incursion of the Vieques Fisherman's Association into the restricted bombing and target ranges on eastern Vieques for the purpose of halting planned naval exercises. Individual squatters have erected makeshift homes along the remote and unguarded boundaries on Vieques. At Roosevelt Roads they have also created numerous legal and public relations problems for the Navy. Removal of the squatters or disputes with them almost always results in "bad press" for the Navy, regardless of the fact that the Navy is acting within the law. Currently encroachment and political pressure pose the greatest threats to the continued viability of the Roosevelt Roads Naval Complex.

12. History

The present site of the Naval Station was first considered for a naval base in 1919. A report of Lt. Robert L. Pettigrew, CEC, USN, discussed the possibility, availability, and comparative advantages of several sites in the Vieques Sound area. Nothing further developed until United States participation in World War II appeared inevitable. In May 1940, Captain R. A. Spruance, USN, Commandant of the Tenth Naval District, stated the need for a fleet base in the Puerto Rico area and referred to Lt. Pettigrew's 1919 report. The Roosevelt Roads site was located midway between Guantanamo Bay and Trinidad and is remote from the San Juan metropolitan area. Additional advantages included availability of supporting bases in San Juan and St. Thomas, Virgin Islands; excellent sites for coastal artillery; a large, protected anchorage; sites for an airfield; short distance to

water too deep for enemy mining; and a well-sheltered bay for the location of piers to be used in connection with a naval base.

Roosevelt Roads was envisioned as a major operating base, with a protected anchorage, a major air station, and an industrial capability of supporting a large portion of the Fleet under wartime conditions. It was intended that the base would furnish logistic support to outlying sites at Antigua, St. Thomas and Culebra and that it would have facilities to provide the necessary support services for 60 percent of the Atlantic Fleet.

The U.S. Naval Operating Base, Roosevelt Roads, was commissioned in 1943. The essential operations and industrial facilities were completed in three years. On 1 September 1944, the base was redesignated the U.S. Naval Station, Roosevelt Roads, and in November 1944, it was placed in caretaker status. In the spring of 1947, it was again reestablished as a Naval Operating Base. During these changes of status, it was utilized primarily as a training site for portions of the Atlantic Fleet and functioned as an important refueling station. During the original buildup of Roosevelt Roads in 1943, the Bolles Dry Dock (1,088 feet by 150 feet) was built and is among the world's largest.

In 1955, the Atlantic Fleet Guided-Missile Training Center was established and Roosevelt Roads, redesignated a Naval Station. The mission was to support guided missile and other training operations of the Operating Forces. Existence of two large existing air space restricted areas to the northeast and the southeast of Puerto Rico were ideally suited for missile firings. This was a distinct advantage over potential missile sites on the Atlantic Seaboard which were smaller in size

and limited by heavy air and sea traffic.

In 1957, Fort Bundy (U.S. Army), located on the southern tip of the Naval Station, Roosevelt Roads was acquired. Fort Bundy was established in 1940 as headquarters for all coastal artillery emplacements. In 1947, the post was placed in a standby status, and in 1950, became inactive again.

At dedication ceremonies on 21 May 1959, the airfield was named Ofstie Field in honor of the late Vice Admiral Ralph A. Ofstie, a distinguished leader in naval aviation. The primary runway was extended to 11,000 feet and is capable of handling any existing jet aircraft. Numerous buildings and facilities were also erected to support the guided-missile mission.

Roosevelt Roads has provided support for various special and joint exercises that are held annually in the Caribbean waters (i.e. Operation Springboard, CARIBEX, etc.) for the Atlantic Fleet as well as foreign navies.

Roosevelt Roads also provides support to tenant activities. The history of Atlantic Fleet Weapons Range Training Facility (AFWTF) began with the Guided-Missile Operations Control Unit (GMOCU). In July 1963, AFWTF was commissioned as a separate activity. In July 1967, AFWTF activated its computerized Central Command and Control System (CCCS). The new CCCS is oriented around the Naval Tactical Data System (NTDS) allowing a rapid exchange of data between ships and aircraft exercising many miles at sea. The inauguration of the CCCS marked another milestone in the evolution of the Roosevelt Roads Complex as one of the largest, most technologically advanced training complexes in the world. A Remote

Data and Drone Control System (RDDCS) was added to the CCCS in September 1968. This system provides for the control of drones from the Range Operations Center (ROC) instead of the three separate drone control sites located at the Naval Station and on St. Thomas and St. Croix, Virgin Islands.

During the early 1970's, the closure of the Naval Station, San Juan brought four major Commands to Roosevelt Roads; Commander, Tenth Naval District, Commander, Caribbean Sea Frontier Commander, Antilles Defense Command and Commander, Southern Atlantic.

B. ENVIRONMENTAL CONSIDERATIONS

Environmental considerations having an impact on facility planning are: the natural environment over whose factors man has little or no control and the man-made environment created by definite and controllable acts of man by which the natural environment is altered. The Environmental Impact Assessment, Appendix C, summarizes the existing environmental characteristics discussed throughout the plan and the effects of the proposals contained in subsequent sections on the environment.

1. Topography

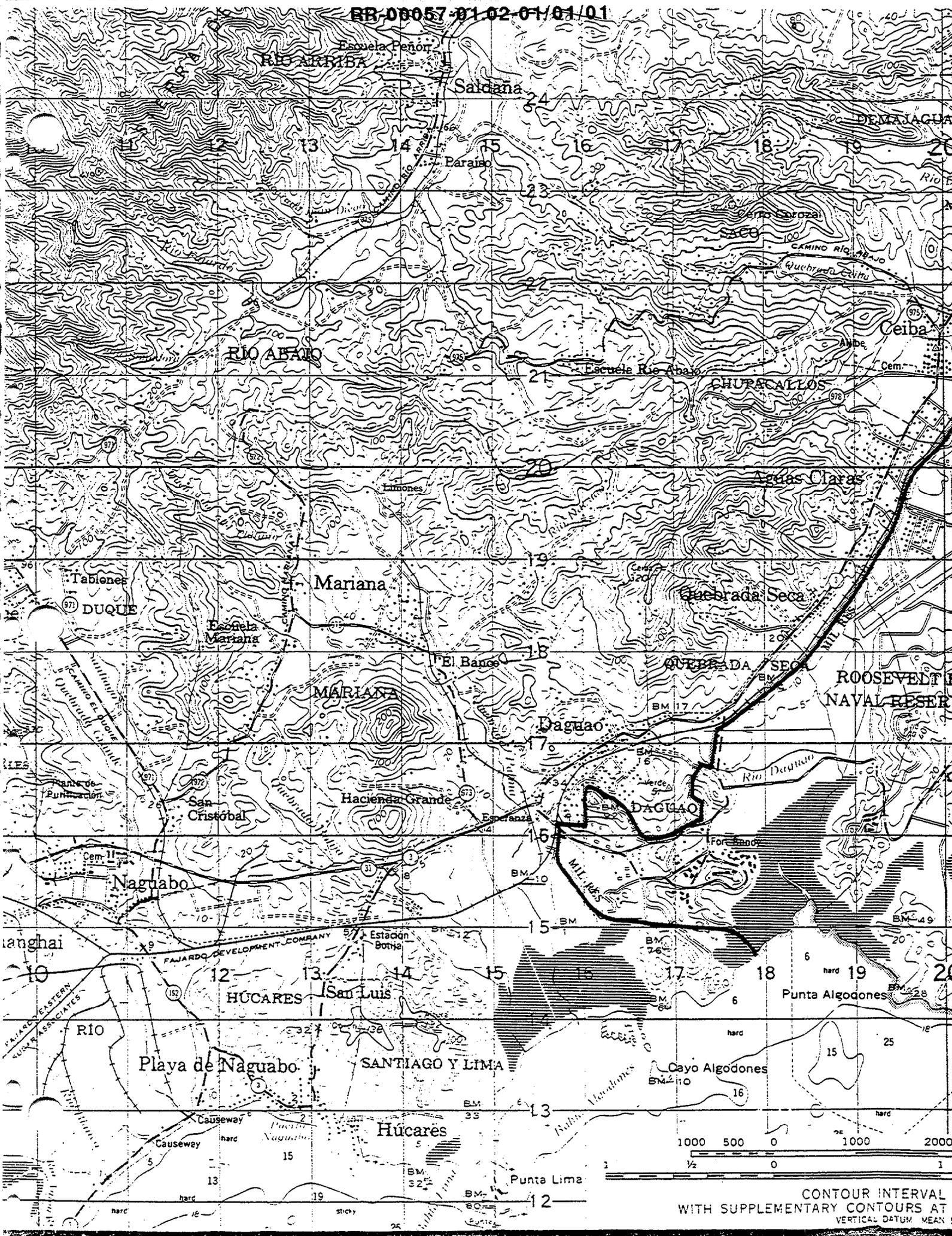
The topography at Naval Station, Roosevelt Roads, determines the net area available for facility development. Elevations range from sea level along the coastline to approximately 295 feet (90 ME) at the TACAN site. There is a series of three hilly areas on station, as shown in Figures 3 and 4. Two of these separate the southern Airfield Area from the Port/Industrial, Housing and Personnel Support areas. The third set of hills is in the Bundy area. These ridge lines not only separate sections of the Station

but dictate the degree of allowable development. The ridge line south of the airfield provides an excellent barrier, lessening the aircraft generated noise reaching the BEQ and housing areas to an acceptable level. The major topographic features on the main Station are shown in Figure 4. Immediately to the north of the Station boundary, the hills rise abruptly to heights of 800-1050 feet (240-320 ME) above sea level.

The topography on Vieques provides both challenging target areas on the eastern end of the Island and an ideal setting for ordnance storage magazines on the western end. The hillside location of many magazine groups provides additional protection for the magazines from both an explosive standpoint and for concealment as shown in Figure 5. The hilly terrain, however has created severe erosion problems on most of the roads within the ammo storage area. Figures 5 and 8 show at the same time, the benefits and shortcomings of the topography on Vieques in relation to the varied naval functions conducted on the island.

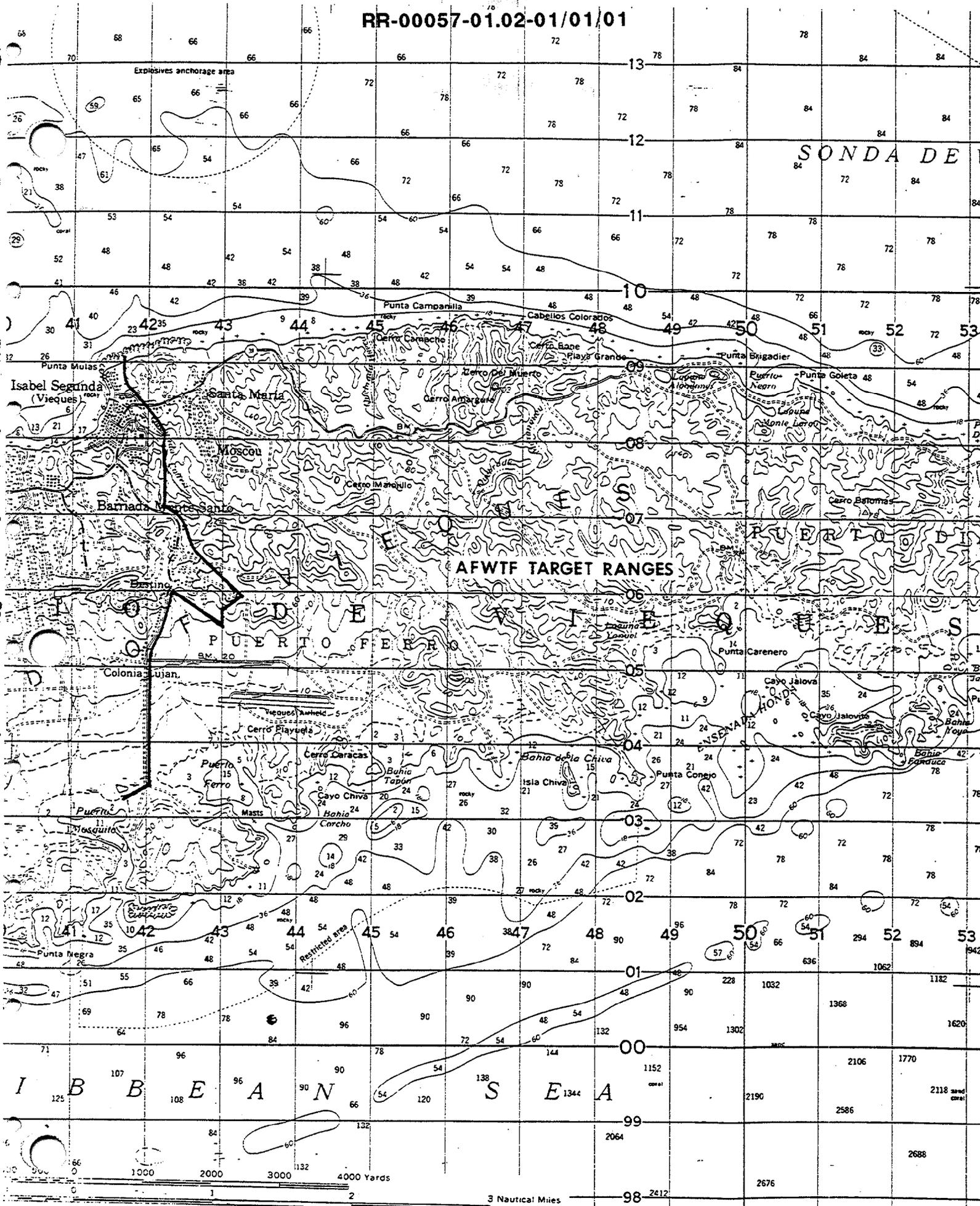
In general, the topography at Roosevelt Roads is a primary determinant relative to land use planning. The availability of a large amount of the Station's real estate is precluded by the excessive costs associated with development of hillside areas. This coupled with the large mangrove areas has left little vacant land available for any expansive development. The topography on Station has had both a positive impact (sound attenuation) and a negative effect (height of hills) on aircraft operations.

The topography of the outlying sites on Culebra, Pico del Este, St. Croix and St. Thomas have a very positive impact on the functions of the

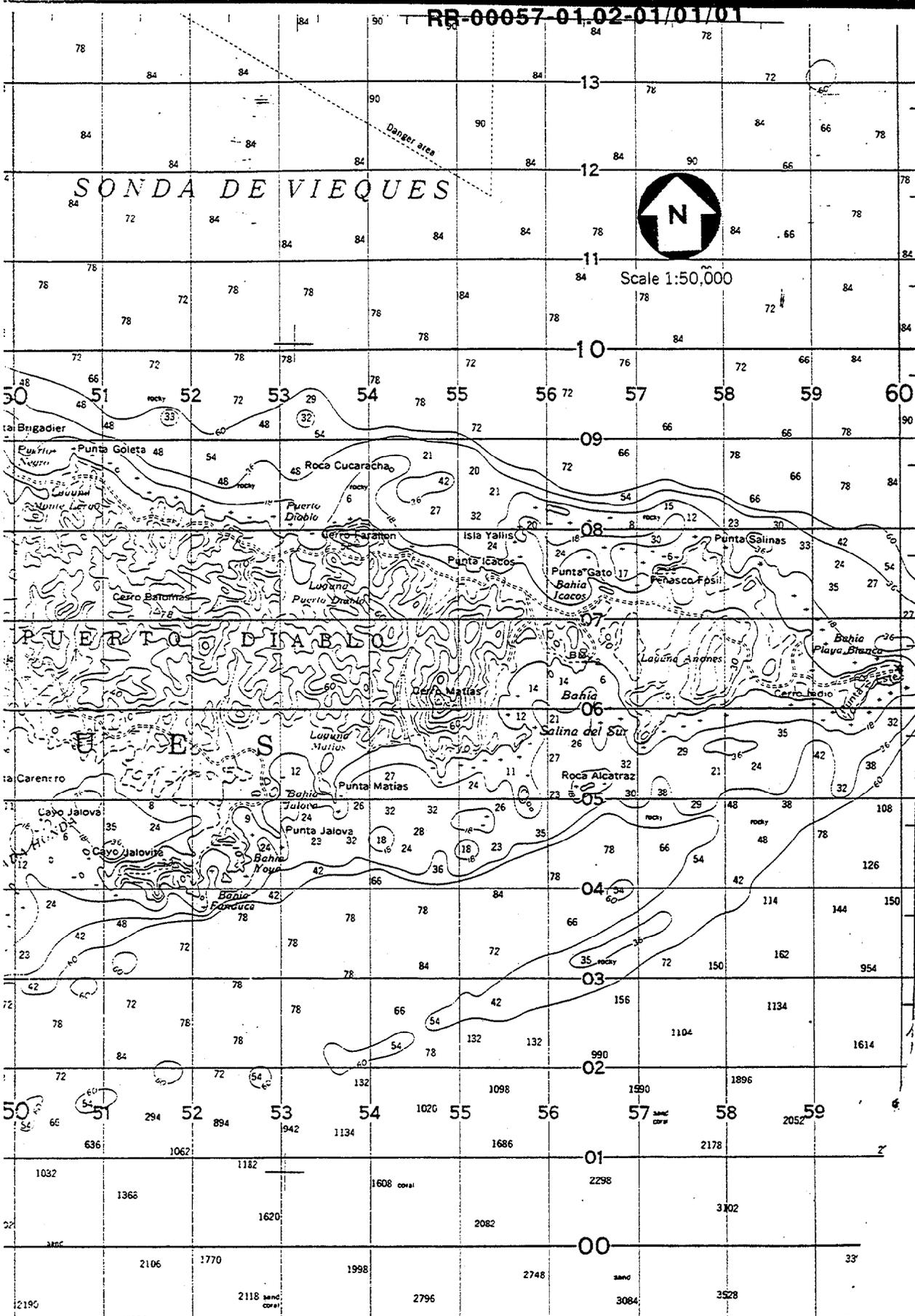


1000 500 0 1000 2000
 1/2 0 1

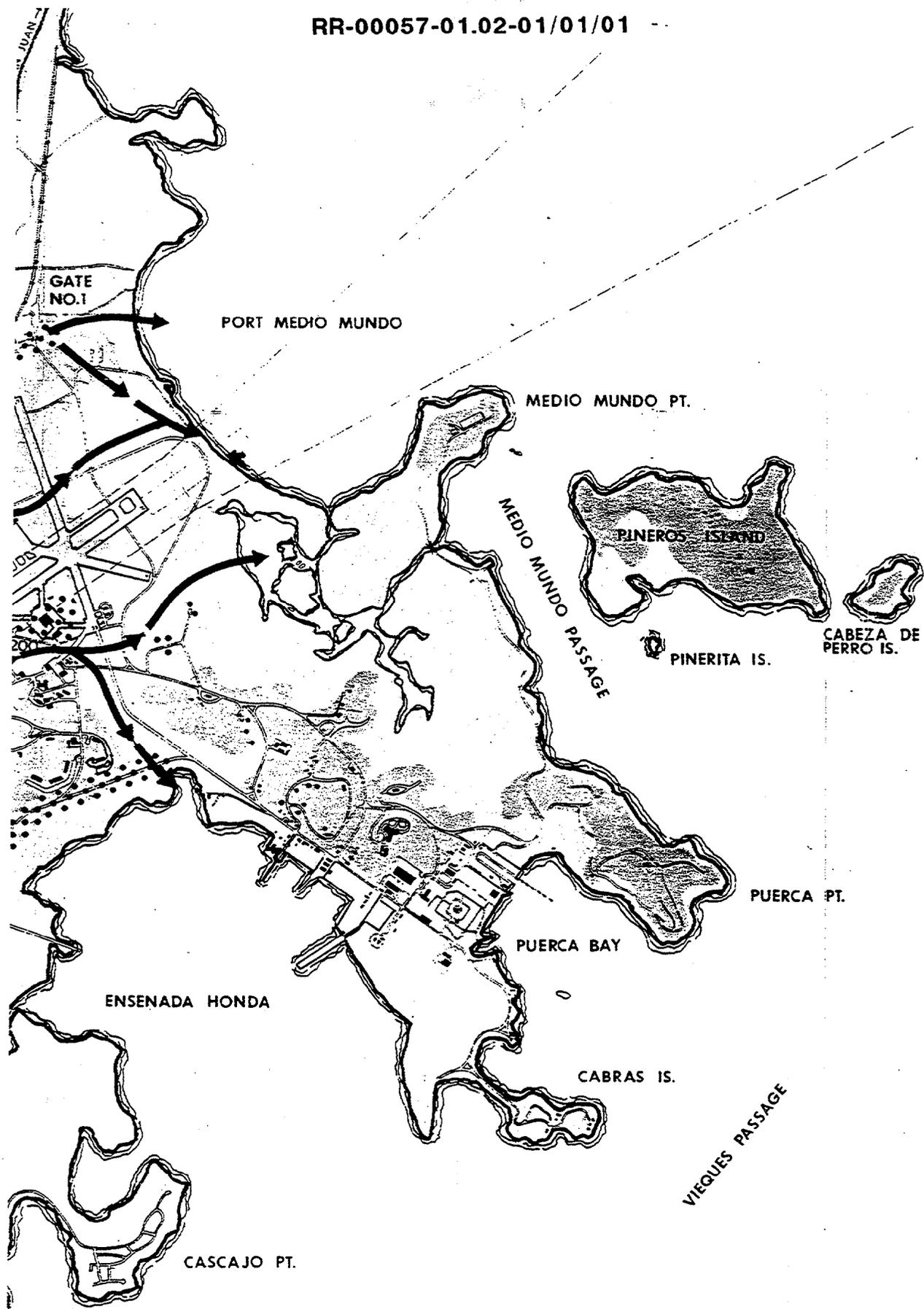
CONTOUR INTERVAL :
 WITH SUPPLEMENTARY CONTOURS AT :
 VERTICAL DATUM MEAN S



CONTOUR INTERVAL 20 METERS
 SUPPLEMENTARY CONTOURS AT 5 AND 10 METER INTERVALS
 VERTICAL DATUM MEAN SEA LEVEL

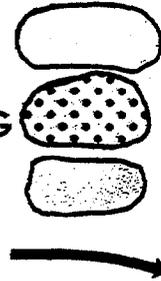


2. **TOPOGRAPHY MAP**
VIEQUES
 34: **NAVAL STATION COMPLEX** **FIGURE**
ROOSEVELT ROADS P. R. **5**





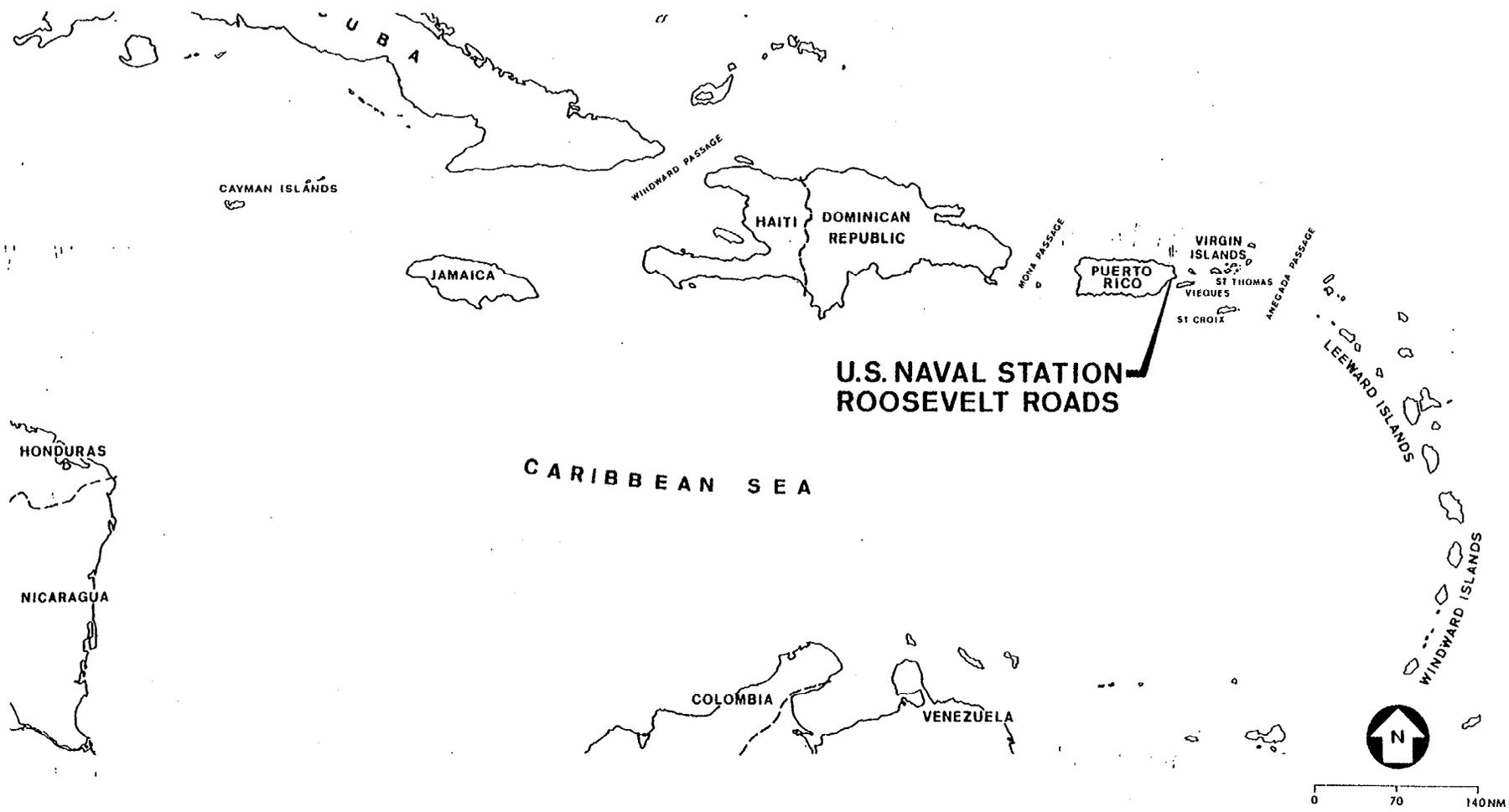
LANDS BELOW 15-FT. MSL
 SURFACE WATER FLOODING
 LANDS ABOVE 15-FT. MSL
 DRAINAGE FLOW



RCA PT.



0 2700 5400FT.



**U.S. NAVAL STATION
ROOSEVELT ROADS**

**REGIONAL MAP
NAVAL STATION COMPLEX
ROOSEVELT ROADS P. R.**

**FIGURE
1**

RR-00057-01.02-01/01/01

facilities placed there, as they all require elevated sites to function effectively. Aside from roads to the sites being occasionally impassable due to rain or rockslides, topography is a positive attribute.

2. Hydrology

a. Flood Plain - The areas most frequently subjected to flooding are shown in Figure 6. To date no specific study has been prepared solely for the determination of the flood plain, however, all future flood sensitive construction should be located in areas historically free from flooding and above elevation 15 feet above mean sea level (AMSL) wherever possible. Many prime development sites are located below this elevation but are more subject to seawater flooding resulting from storms, wind and abnormally high tides than surface water flooding. The tidal ranges in the Roosevelt Roads area are rather small, with a maximum spring range of less than three feet. Conversely, Boxer Drive for a major portion of its length is subject to surface water flooding as are Hangar 200 and AIMD Hangar (379) and adjacent apron areas which are well above 15 feet AMSL.

b. Ground Water - The available ground water is generally acceptable for most industrial, commercial and residential uses. The "hardness" of this water shows a predominance of calcium, bicarbonate and magnesium ions, but is within normally acceptable ranges. As the depths of wells increase and distances to the sea decrease, the levels of salt water intrusion rise. Most of the well water available for treatment and distribution originates at a surface water source.

c. Surface Water - The surface waters that flow across the

northeastern plain of Puerto Rico, where the Naval Station is situated, originate on the eastern slopes of the Sierra de Luquillo mountains (see Figure 4). The surface runoff is channeled into various rivers and streams which eventually flow into the Caribbean Sea. The Daguao River and Quebrada Seca Stream collect surface waters from the hills immediately north of the Station, and in periods of heavy rain, on-station flooding occurs. The Daguao/Quebrada Seca watershed comprises an area of approximately 7.6 square miles (4,864 acres), and the river falls some 700 feet from its source to sea level.

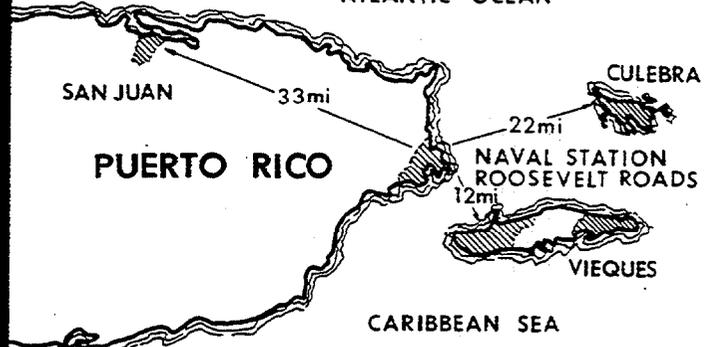
The increased development in the Town of Ceiba, especially in areas adjacent to the Station's northern boundary, has significantly increased the surface runoff reaching the Naval Station, causing ponding and erosion in the Boxer Drive area.

Under a 1942 agreement, the Naval Station gets raw water from the Rio Blanco watershed, located some 17 miles from the station, west of the Town of Naguabo. This water source is described in detail in Section III.

3. Vegetation

The vegetation types are directly related to the topographic zones on-Station, and their respective vegetative associations are shown in Figure 7. The mangrove association (tidal-forests) predominate in the very low coastal swamp and river mouths. These tidal forests are comprised of the red, black and white mangroves primarily. The red mangrove flourishes in areas of high salinity and is generally found in pure stands on the seaward edge of the mangrove forest. The red mangrove detritus provides food for the minute organisms at the start of the food chain and is, therefore,

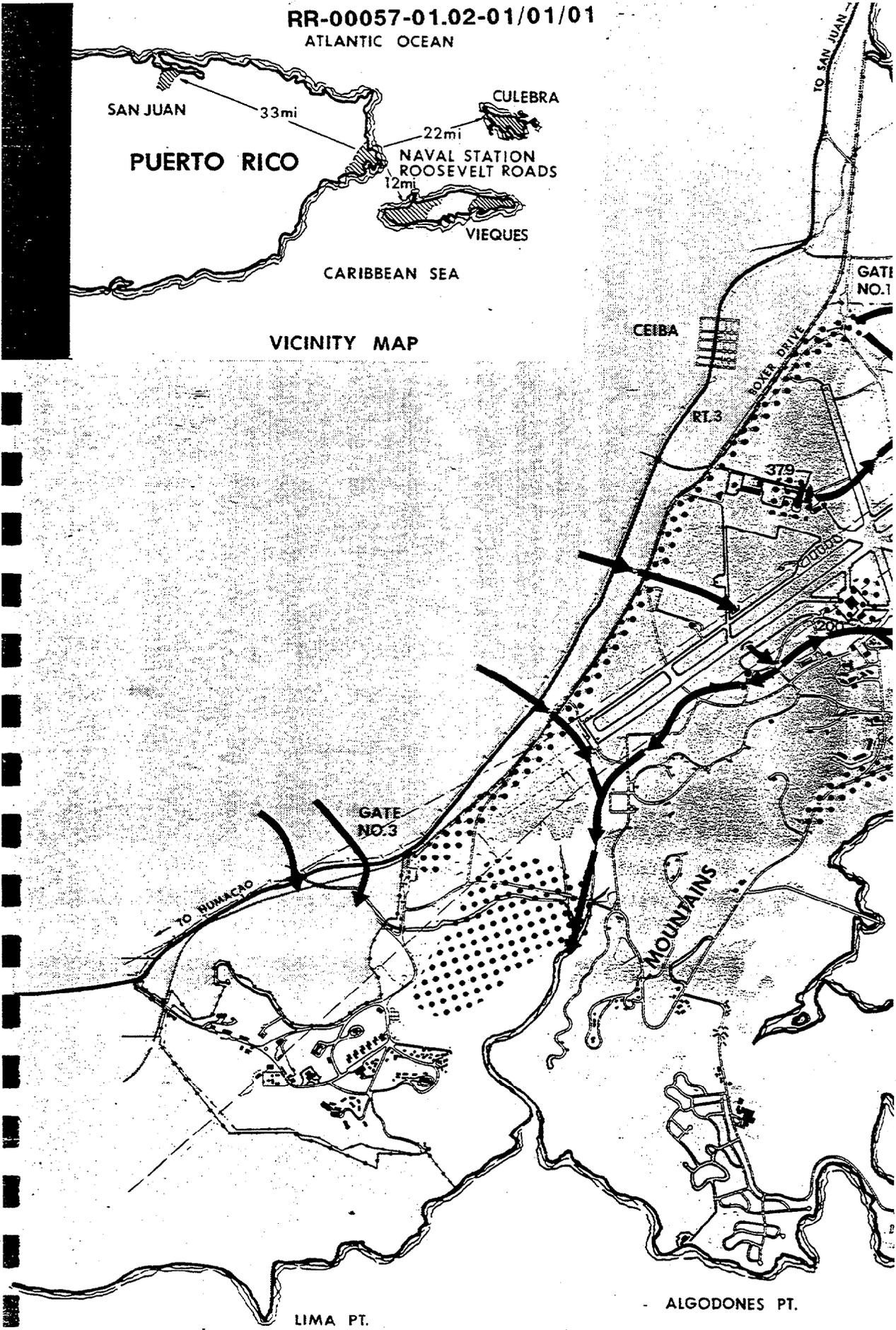
ATLANTIC OCEAN



PUERTO RICO

CARIBBEAN SEA

VICINITY MAP



ecologically a crucial species. The roots also bind together the soil at the water's edge preventing shoreline erosion. The black mangrove, though tolerant of high salinity, cannot endure prolonged periods of root submersion and usually is found just landward of the pure red mangrove stands. The white mangrove is found in the upland areas which are rarely subject to inundation by the sea.

The composition of the mangrove forests is dependent on such limiting factors as elevation, drainage tides, salinity and the geomorphology of their respective watersheds. Whereas the mangroves are coastal species, almost all the mangrove forests in Puerto Rico have been destroyed, giving way either to intensive commercial development or residential areas. The Navy's mangroves at Roosevelt Roads and on Vieques are among the few remaining large stands on both islands, and therefore are extremely important biological assets.

The mangrove species in Puerto Rico are by no means endangered in the officially accepted sense. The possibility of a species being eliminated is not a present problem. The concern for the mangroves stems from the fact that total stands have been decimated, especially in developed areas and as with many hardwood forests in North America, the species remain, but the forests are gone. Additionally, the mangroves' roots in the water provide the stabilizing network of anchors which provide food and shelter for many of the organisms at the very start of the food chain.

The Beachstrand Association occurs above the sandy beach areas and is characterized by seagrape, coconut and bay cedar trees. The upland hills, and flat flood plain areas

contain a broad variety of trees, shrubs and grasses which include tamarind, mesquite, acacia and the ever-present lead tree (Zarcilla). The remaining vegetation types are the cultivated species found on the improved and semi-improved areas. These species include the Royal Poinciana (Flamboyan), various palm species, crotons, hibiscus and lawn grasses.

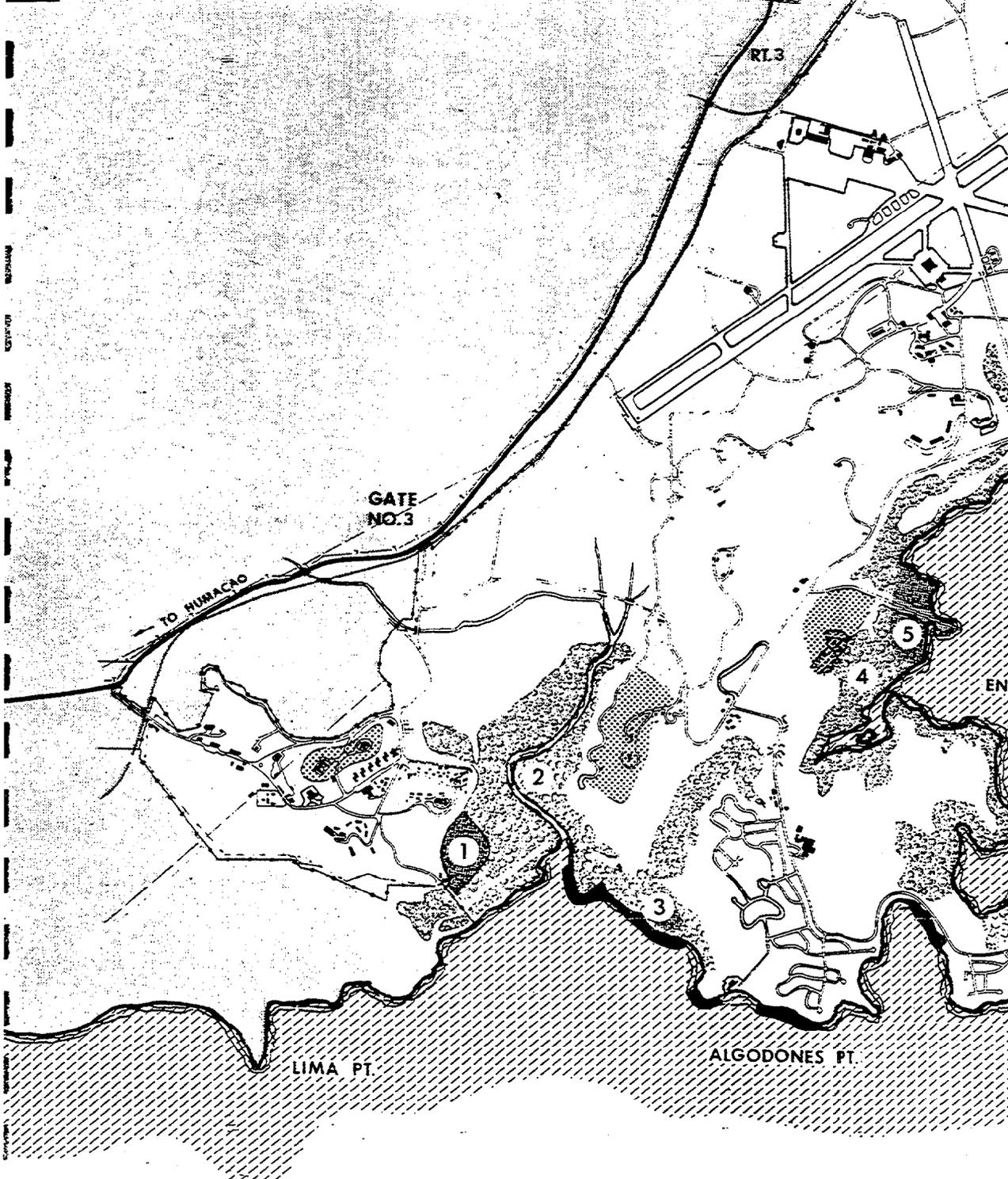
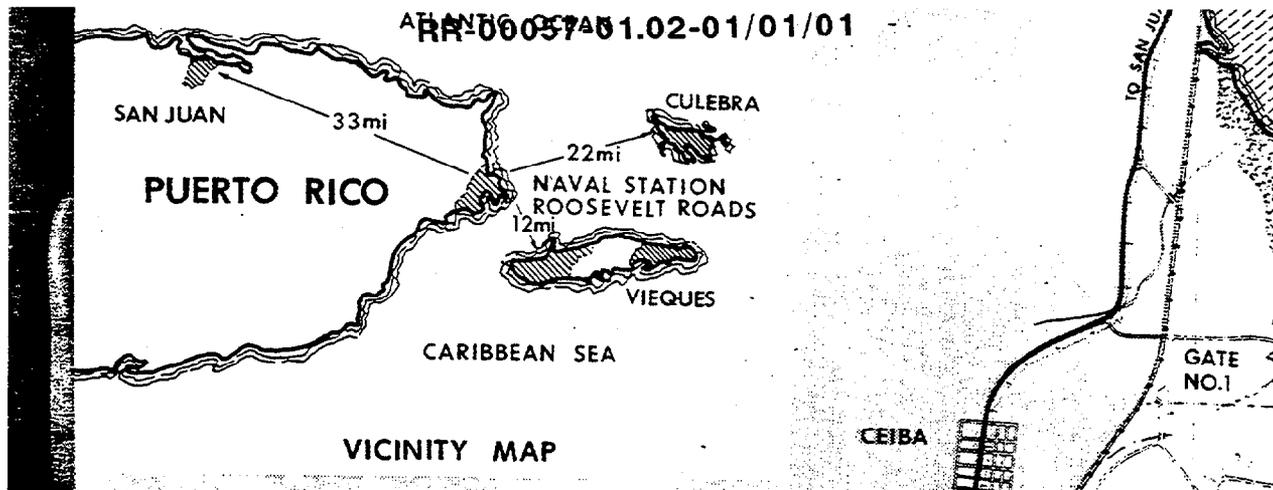
4. Wildlife

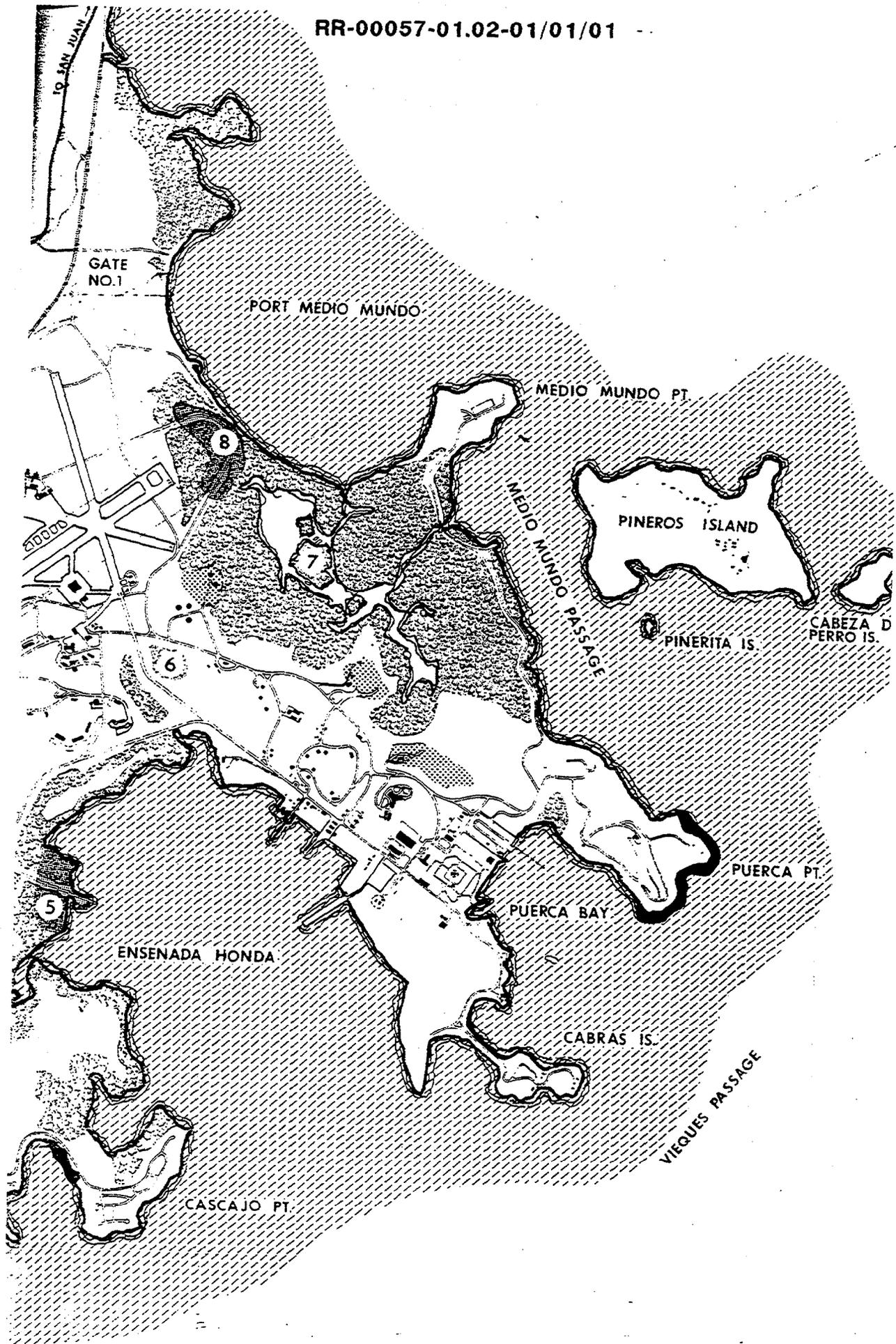
The major mammal population includes stray dogs and cats, Norway and grey bellied rats, mice and the mongoose, all of which are introduced species.

There are numerous species of frogs inhabiting the island, including the small tree frog (Coqui) whose chirping noises at night rival those of crickets. The reptile population (especially snakes and lizards), has been significantly reduced as the result of the large mongoose population.

More than 200 species of birds inhabit the island, and many North American species overwinter in Puerto Rico on their annual migration. Approximately 100 of these bird species can be found at Roosevelt Roads throughout the year, giving the station a quasi-bird sanctuary status, for hunting on station is prohibited. Similarly, the waters surrounding Puerto Rico abound in over two hundred species of fish. The fishing industry however, is not very large because of the great water depths which don't attract large schools of commercial species. Turtles, crustaceans and aquatic mammals are found in the surrounding waters.

Numerous detailed reports have been completed describing the various mammal, bird and reptile species in





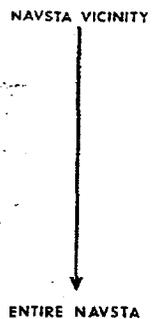


ENDANGERED SPECIES

- WHITE CROWNED PIGEON
- WHITE-CHECKED PINTAIL
- YELLOW SHOULDERED BLACKBIRD^F
- REDDISH EGRET
- COMMON EGRET
- SNOWY EGRET
- GREAT BLUE HERON
- WHIMBREL
- PROTHONOTARY WARBLER
- HOODED WARBLER
- OSPREY
- WILLET
- CARIBBEAN PARAKEET
- BROWN PELICAN^F
- AMERICAN PEREGRINE FALCON^F
- WEST INDIAN MANATEE^{F,P}
- PUERTO RICAN GIANT ANOLE^F
- LITTORAL GECKO^{F,R}
- SLIPPERY BACK SKINK^{F,R}
- PUERTO RICAN BOA^{P,F}
- ANTILLEAN PAINTED TURTLE^{F,R}
- GREEN SEA TURTLE^P
- HAWKSBILL (Sea Turtle)^{P,F}
- LEATHERBACK (Sea Turtle)^{P,F}
- LOGGERHEAD (Sea Turtle)^P
- LAND CRABS (STATUS UNKNOWN)

HABITATS

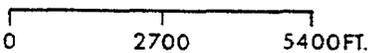
- 2,4,7
- 6,8
- 2,4,7
- 3,4,5,8
- 3,4,5,8
- 3,4,5,8
- 3,4,5,8
- 3,4,5,8
- 3,4,5,8
- 2
- 2
- 4,7
- 3,4,5,8
- 1



P = ENDANGERED IN PUERTO RICO
 F = FEDERALLY CLASSIFIED ENDANGERED SPECIES
 R = RARE

LEGEND

- MANGROVES
- MANATEE HABITAT
- SHORT-EARED OWL HABITAT
- PELICAN ROOST



**NATURAL RESOURCES
 NAVAL STATION COMPLEX
 ROOSEVELT ROADS P. R.**

**FIGURE
 7**

and around Roosevelt Roads which are on the rare and endangered species list. The known habitats of endangered wildlife species are shown in Figure 7.

Figure 7 lists species that appear on the U.S. Department of Interior and Commonwealth of Puerto Rico lists of endangered species, although the two lists are not mutually inclusive. The recently completed Environmental Impact Statement (Draft) for the continued use of the AFWTF Inner Range (Vieques), contains an extremely comprehensive evaluation of the plant, animal, bird, and fish species on the Island.

The Naval Station at Roosevelt Roads and the Navy facilities on Vieques have become virtual sanctuaries for many species endangered or not, because of the tight control that is exercised by the Federal government regarding hunting, trapping, fishing, etc. The Naval Station has been designated as containing critical habitat for the Yellow-shouldered Blackbird which is shown in Figure 7.

As part of all project reviews, the indigenous wildlife and plants are analyzed to ascertain the effect of a proposed action on them directly, or their supporting environment. The planning for facility projects, i.e. housing, community center, etc., must be very cautious in selecting potential sites based on the effect of the development on the environment. Of a critical nature at Roosevelt Roads, is the effect of increased runoff from developed, paved areas. This fresh water, laden with sediment can have very negative effects on the mangrove association and the various species dependent upon them for food, shelter, and an area to breed in.

As shown in Figure 7, there are various species found within the confines of Roosevelt Roads that are on the official U.S. Department of Interior Endangered Species list. Presently, the entire Station has been officially declared as a critical habitat for the Yellow-Shouldered Blackbird. As required by the Endangered Species Act of 1973, Section 7, Consultation, each Federal Agency shall consult with the Secretary of the Interior to determine if any proposed project will jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the habitat of such species. The consultation process begins with a request by the Naval Station to the Fish and Wildlife Service for any information relative to endangered species or critical habitats in the general project area. Since the entire Naval Station is a critical habitat for the Yellow-Shouldered Blackbird, all facility/construction proposals must include a biological assessment of the proposed action. If the assessment determines that there is no impact on an endangered/threatened species or a critical habitat, then no further action is required. If the action may involve a species or habitat on the endangered/critical list or the assessment indicates a degree of interaction greater than "may involve", then the Biological Assessment will be submitted to the FWS for a Biological Opinion.

5. Coastal Zone Management

A specific piece of legislation which addresses the criticality of development along our shorelines is the Coastal Zone Management Act of 1972. Under the auspices of the Act, the Commonwealth of Puerto Rico has prepared an extensive

Coastal Zone Management Plan which has been approved by the Federal Government on 18 September 1978, for implementation. The plan outlines the entire "Coastal Zone", areas of special importance, delicate ecosystems, potential threats by pressures or effects of development and proposed programs to manage this crucial part of the environment. Although lands owned by the federal government are exempted from the Act, it has been determined to be in the national interest for compliance by federal facilities with the approved CZM plans wherever possible when national security is not compromised. As a part of the review process for all proposed projects within the Roosevelt Roads Complex, conformance to the spirit and intent of the Puerto Rico CZM plan will be determined and a "Consistency Determination" will be filed. Similar reviews will also be made for the remote sites within the CZM (i.e. Vieques) and although the CZM plan for the Virgin Islands has not been approved as of this printing, similar evaluations will be made for navy projects there.

The combination of the reviews by the CZM, and the Endangered Species Acts provide a significant number of cross-checks to insure that the environment in general and its occupants (man, wildlife, and vegetation) will be protected to the maximum degree possible.

6. Climatology

The climate of the study area is characterized as warm and humid with frequent showers throughout the year. A major factor affecting the weather is the trade winds associated with the Bermuda High, the center of which is in the vicinity of 30 degrees north, 30 degrees west. The trade winds persist throughout the year,

producing a wind pattern varying from northeast to southeast according to season. The mean annual wind velocity is 5-1/2 knots with a minimum in November and a maximum in August. Afternoon sea breezes reinforce the easterly trade winds on the seaward side of land areas, while a decrease in velocity and variable wind direction are experienced on the leeward side. The opposite effect results from light, moving land breezes. Gales associated with westward moving disturbances in the trade winds or hurricanes passing either north or south of the area have highest probability from June through October. Uniform temperatures prevail, with small diurnal ranges as a result of the insular exposure and relatively small land areas. The warmest months are August and September while the coolest are January and February. Normally, the temperature extremes are 92 degrees F and 62 degrees F. Rain usually occurs at least nine days in every month, with an average of 60 inches per year. A dry winter season occurs from December through April. About 22 thunderstorm days occur per year with maximum frequencies of three days per month from May through October. Cloud conditions average between 3 and 5 tenths during the dry winter months and between 4 and 6 tenths during the rainy season in the summer and autumn. Over the open sea, a maximum of clouds, usually broken stratocumulus, occurs during early morning with the skies clearing or becoming scattered with cumulus by afternoon. Completely clear or overcast skies are rare during daylight while clear skies frequently occur at night. The hurricane season is from mid-June through mid-September, and maximum winds exceed 95 knots during severe hurricanes. An average of two tropical storms per year occur in the study area, one

of which usually reaches hurricane intensity. Refer to Figure 10 for the Naval Station windrose.

C. SITING CONSTRAINTS

1. Explosive Safety

Ordnance is currently handled and stored at Naval Station, Roosevelt Roads and stored on the western end of the Island of Vieques. This ordnance is primarily expended on the eastern end of Vieques when units are utilizing the various AFWTF ranges and targets. There are no ordnance siting constraints on Vieques, as all of the explosive arcs fall well within the Navy boundaries, and water areas are restricted, which strictly governs vessel traffic in the vicinity of the ranges and the ammunition storage area. The extent of the ordnance storage area Explosive Safety Quantity Distance (ESQD) arcs and range restricted areas are shown in Figures 8 and 9.

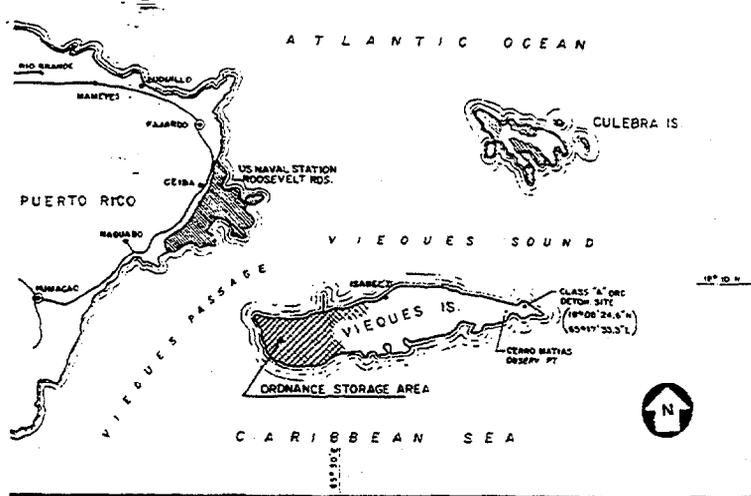
A Class "A" Demolition Range is located within the ordnance impact area on the eastern end of Vieques. The Demolition Range is east of the Cerro Matias Range Observation Point, which is also used to monitor demolition evolutions. The ordnance burn area at the western end of Vieques was decommissioned when the Class "A" Range was activated.

Ordnance is transshipped to and from Vieques at the Mosquito Pier which has an authorized N.E.W. Capacity of 3.5 million pounds. As seen by the windrose in Figure 10, the fairly consistent easterly winds can subject moored vessels to excessive movements, making ordnance handling unsafe. Additionally, damage to the pier usually results from the continual contact with the vessel's hull. When considered necessary for

safety, ordnance vessels will retire to the three explosive anchorages located in the Vieques Passage and shown on Figure 11.

At Naval Station, Roosevelt Roads, ordnance storage is accomplished in two areas as shown in Figure 12. These areas pose no current or foreseen constraints on the siting of nearby facilities as the magazines have sufficient safety clearances. Currently, when aircraft must be loaded or offloaded there is no ordnance loading pad which meets ESQD safety criteria. Explosives are loaded at a temporary site located on a portion of abandoned runway 11/29. High explosives are currently loaded/unloaded at this site without adequate inter-plane separation, due in part to the grounding point locations. This area can accommodate 24 aircraft simultaneously, loading or unloading ordnance. A waiver was submitted to CNO, 17 January 1979 to permit continuance of ordnance operations at this location pending the construction of an ordnance pad which complies with required safety criteria (MCON P-708), eliminating the requirement for the waiver. The pad will be located south of Runway 6/24 within the Ordnance Storage Area.

Similarly, ordnance is handled at Pier 3 and the Explosive Ammunition Pier. The CNO Ammunition Hazard Board (AMHAZ) in Nov. 1977 recommended that all ordnance handling on Pier 2 be terminated and that all ordnance handling on Pier 3 occur at a point no closer than 730 feet from the pierhead (1250 feet from USO Bldg). This recommendation was implemented by the Naval Station in January 1978 and approved by CNO in March 1979. This will permit the continuance of ordnance handling on the outboard 655 feet of Pier 3 until the existing ammunition pier is lengthened and widened under MILCON Project P-706.

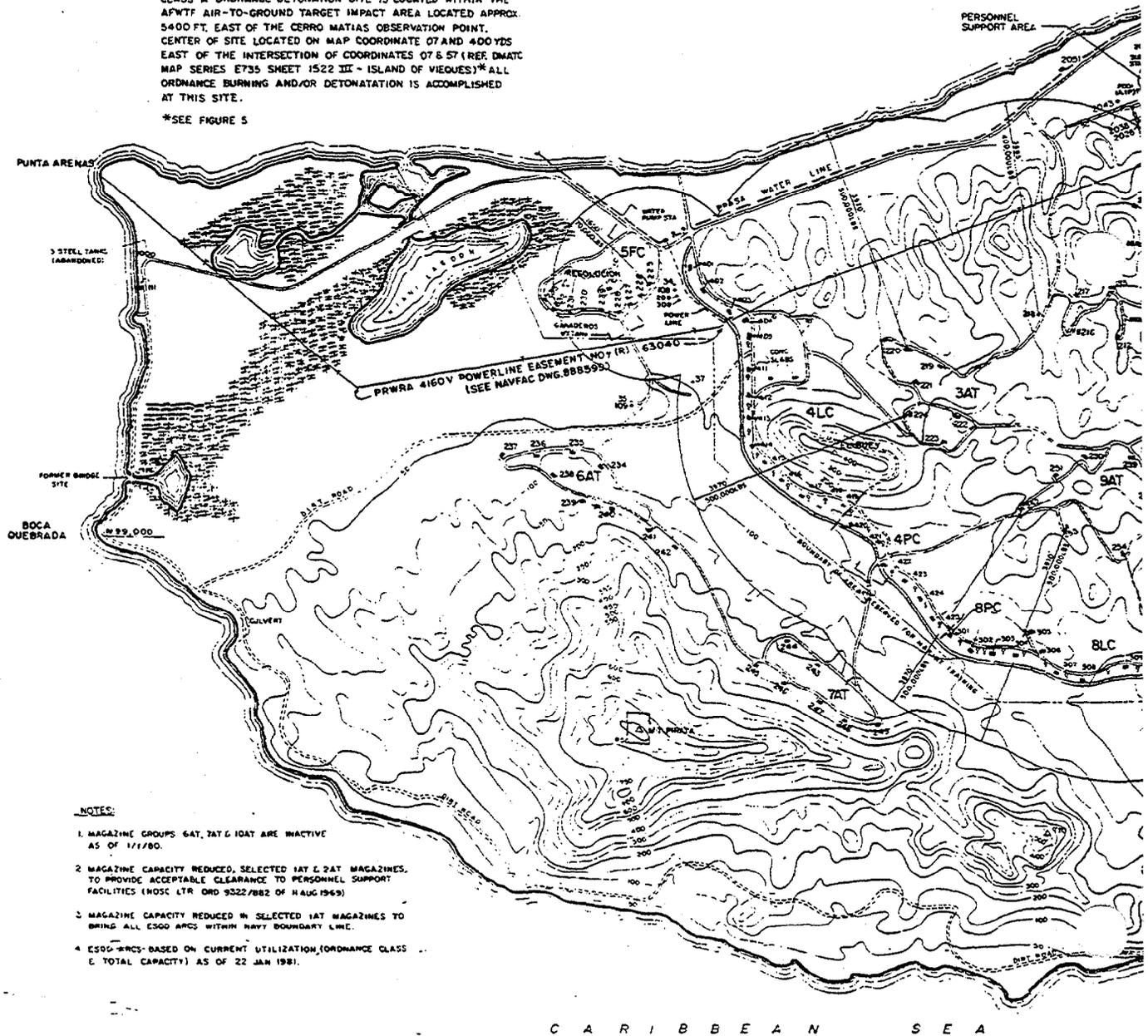


LOCATION MAP

NOTE

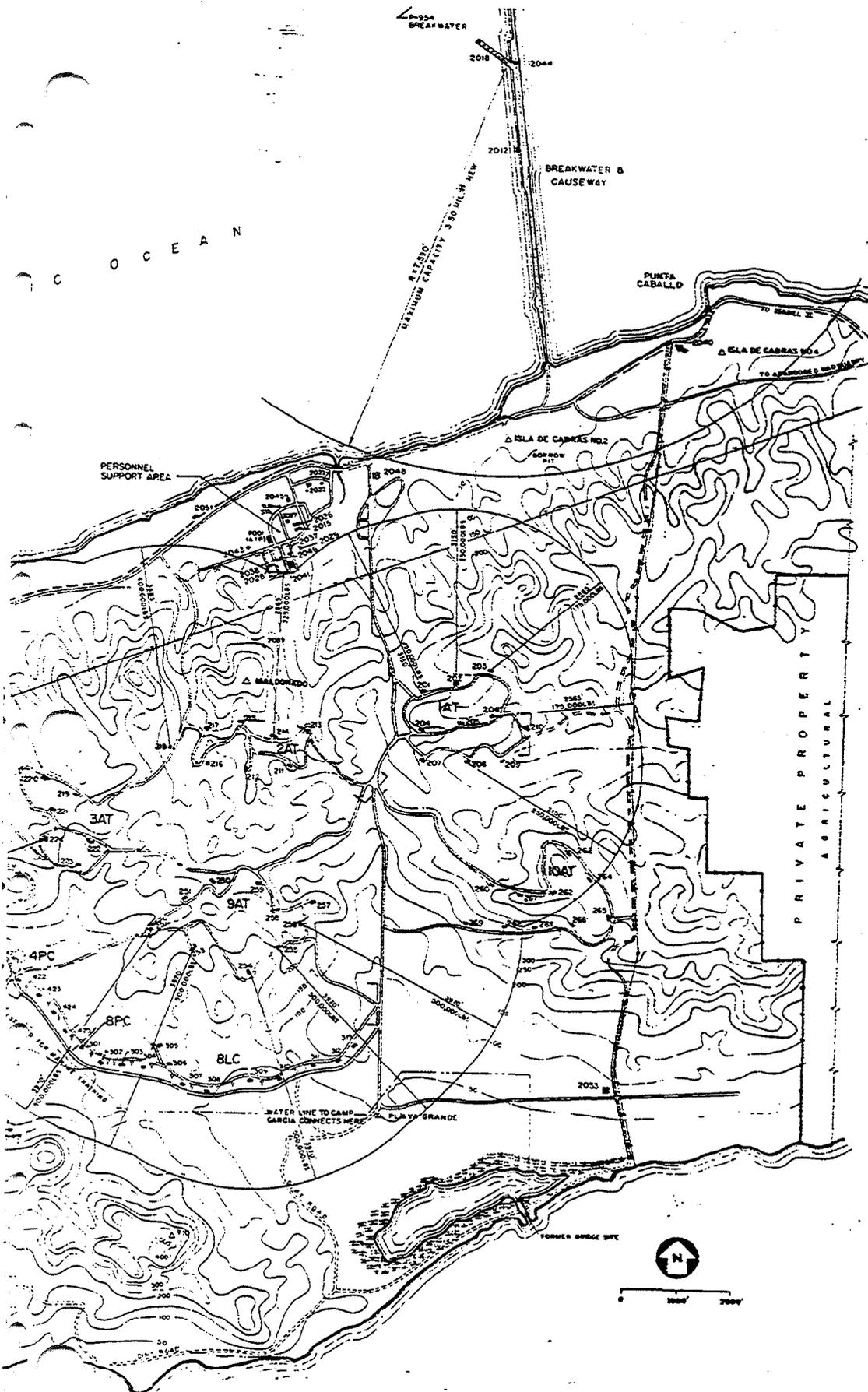
CLASS "A" ORDNANCE DETONATION SITE IS LOCATED WITHIN THE AFWTF AIR-TO-GROUND TARGET IMPACT AREA LOCATED APPROX. 5400 FT. EAST OF THE CERRO MATIAS OBSERVATION POINT. CENTER OF SITE LOCATED ON MAP COORDINATE 07 6 57 EAST OF THE INTERSECTION OF COORDINATES 07 6 57 (REF DMATC MAP SERIES E735 SHEET 1522 III - ISLAND OF VIEQUES)* ALL ORDNANCE BURNING AND/OR DETONATION IS ACCOMPLISHED AT THIS SITE.

*SEE FIGURE 5



NOTES:

1. MAGAZINE GROUPS 6AT, 7AT & 10AT ARE INACTIVE AS OF 1/1/80.
2. MAGAZINE CAPACITY REDUCED, SELECTED 1AT & 2AT MAGAZINES, TO PROVIDE ACCEPTABLE CLEARANCE TO PERSONNEL SUPPORT FACILITIES (NOSC (TR ORD 9322/882 OF NAUG 1969)
3. MAGAZINE CAPACITY REDUCED IN SELECTED 1AT MAGAZINES TO BRING ALL E500 ARCS WITHIN NAVY BOUNDARY LINE.
4. E500 ARCS BASED ON CURRENT UTILIZATION (ORDNANCE CLASS & TOTAL CAPACITY) AS OF 22 JAN 1981.



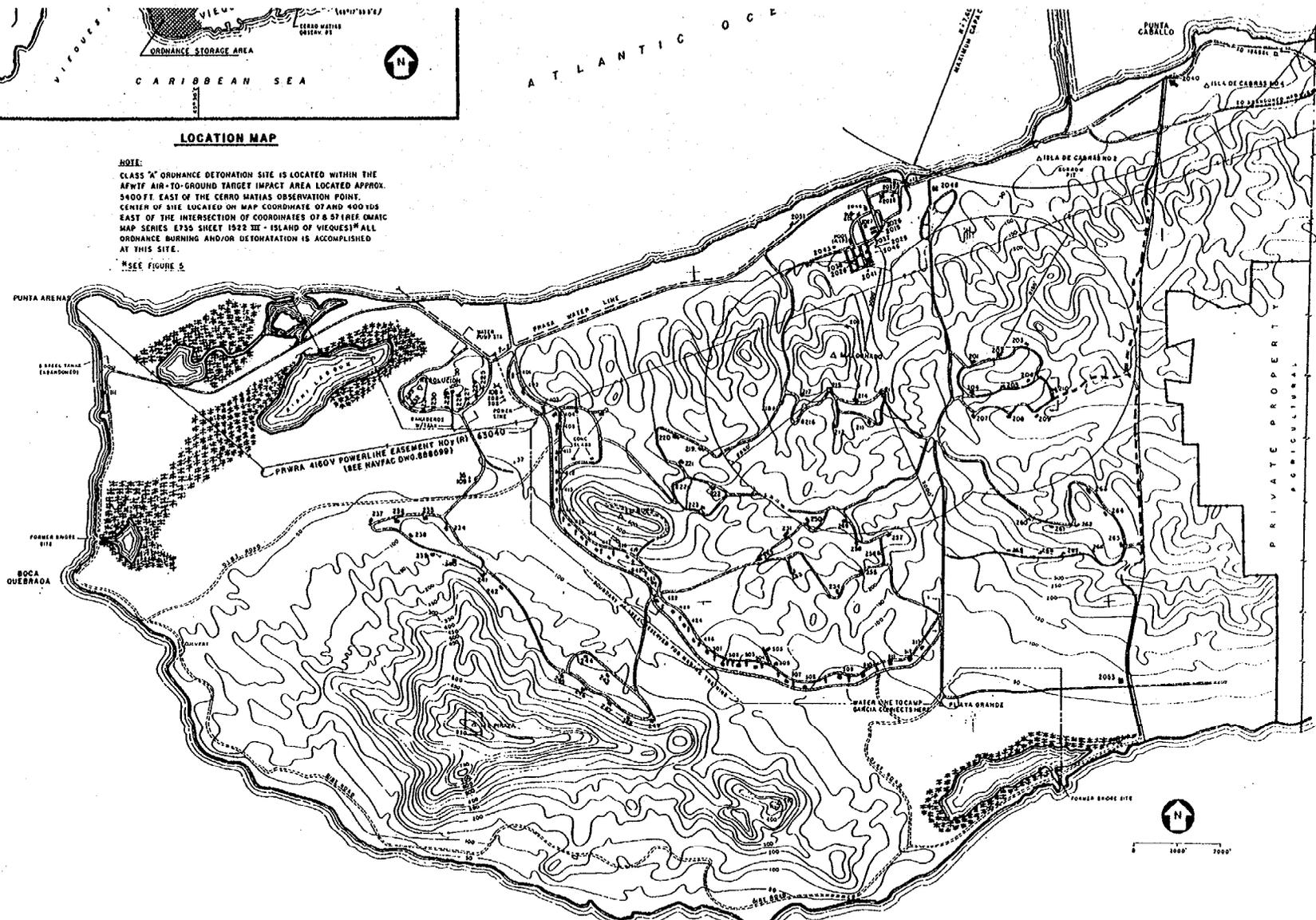
ORDNANCE AREA VIEQUES
 NAVAL STATION COMPLEX FIGURE
 ROOSEVELT ROADS P. R. 8



LOCATION MAP

NOTE:
 CLASS "A" ORDNANCE DETONATION SITE IS LOCATED WITHIN THE
 AFWIF AIR-TO-GROUND TARGET IMPACT AREA LOCATED APPROX.
 5400 FT. EAST OF THE CERRO MATIAS OBSERVATION POINT.
 CENTER OF SITE LOCATED ON MAP COORDINATE OF AND 400 105
 EAST OF THE INTERSECTION OF COORDINATES OF 8 57 (REF. ONAIC
 MAP SERIES E735 SHEET 1972 III - ISLAND OF VIEQUES) ALL
 ORDNANCE BURNING AND/OR DETONATION IS ACCOMPLISHED
 AT THIS SITE.

SEE FIGURE 5.



C A R I B B E A N S E A

ORDNANCE AREA VIEQUES
 NAVAL STATION COMPLEX
 ROOSEVELT ROADS P. R.

REF: 090570 1 02 0101 01

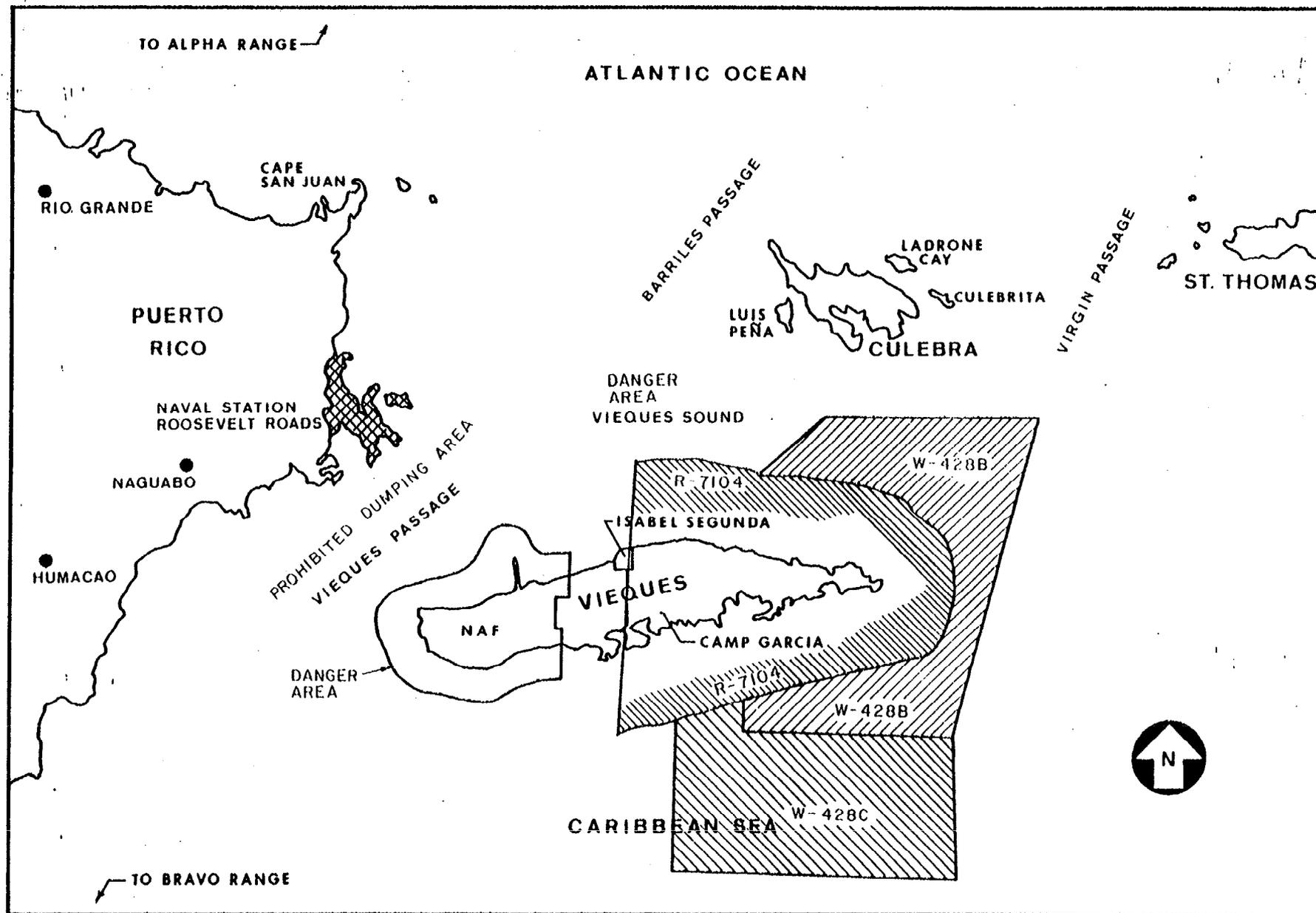


FIGURE -9
AFWTF INNER RANGE

FM 0007 0102 0170 101

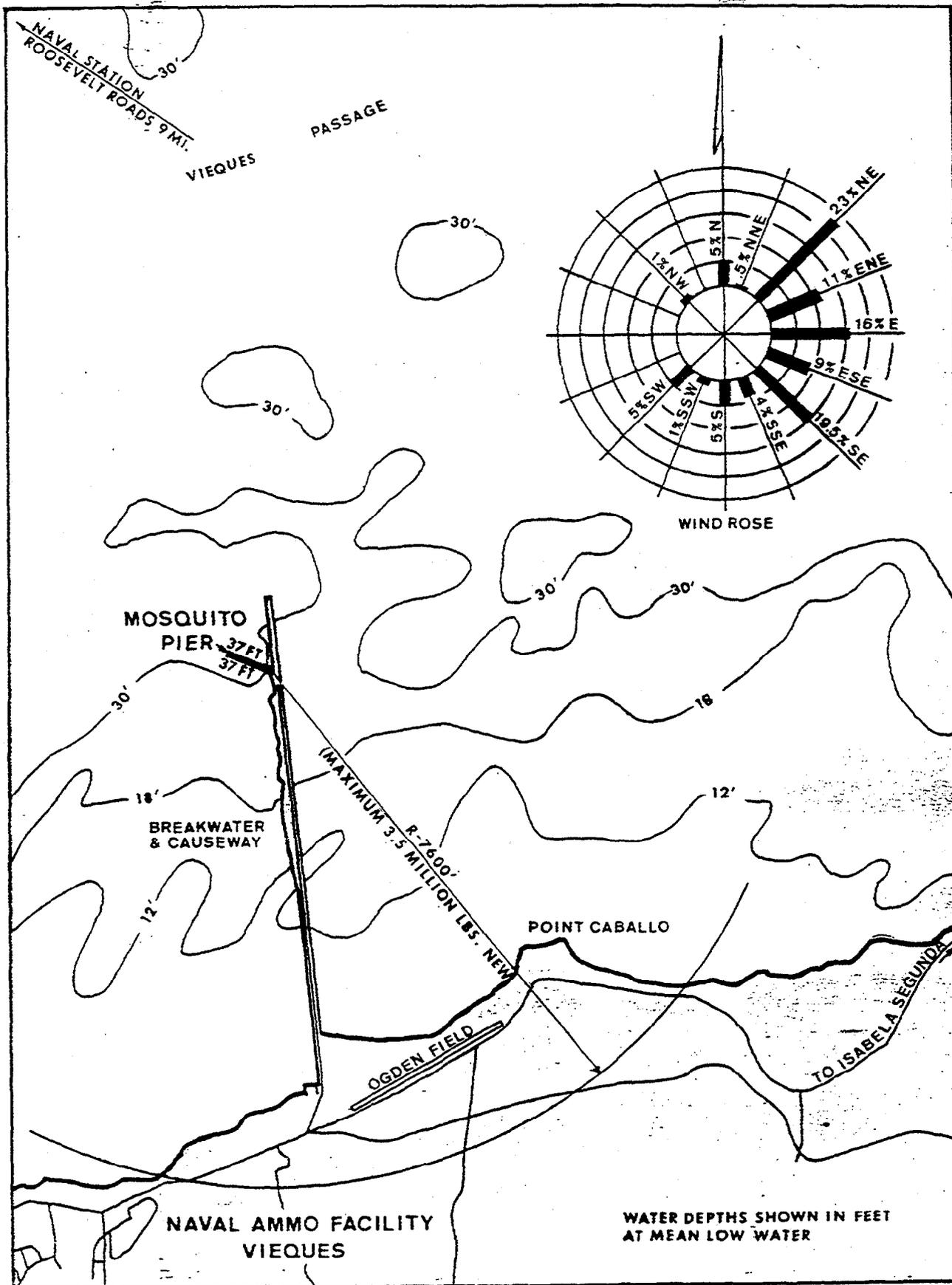
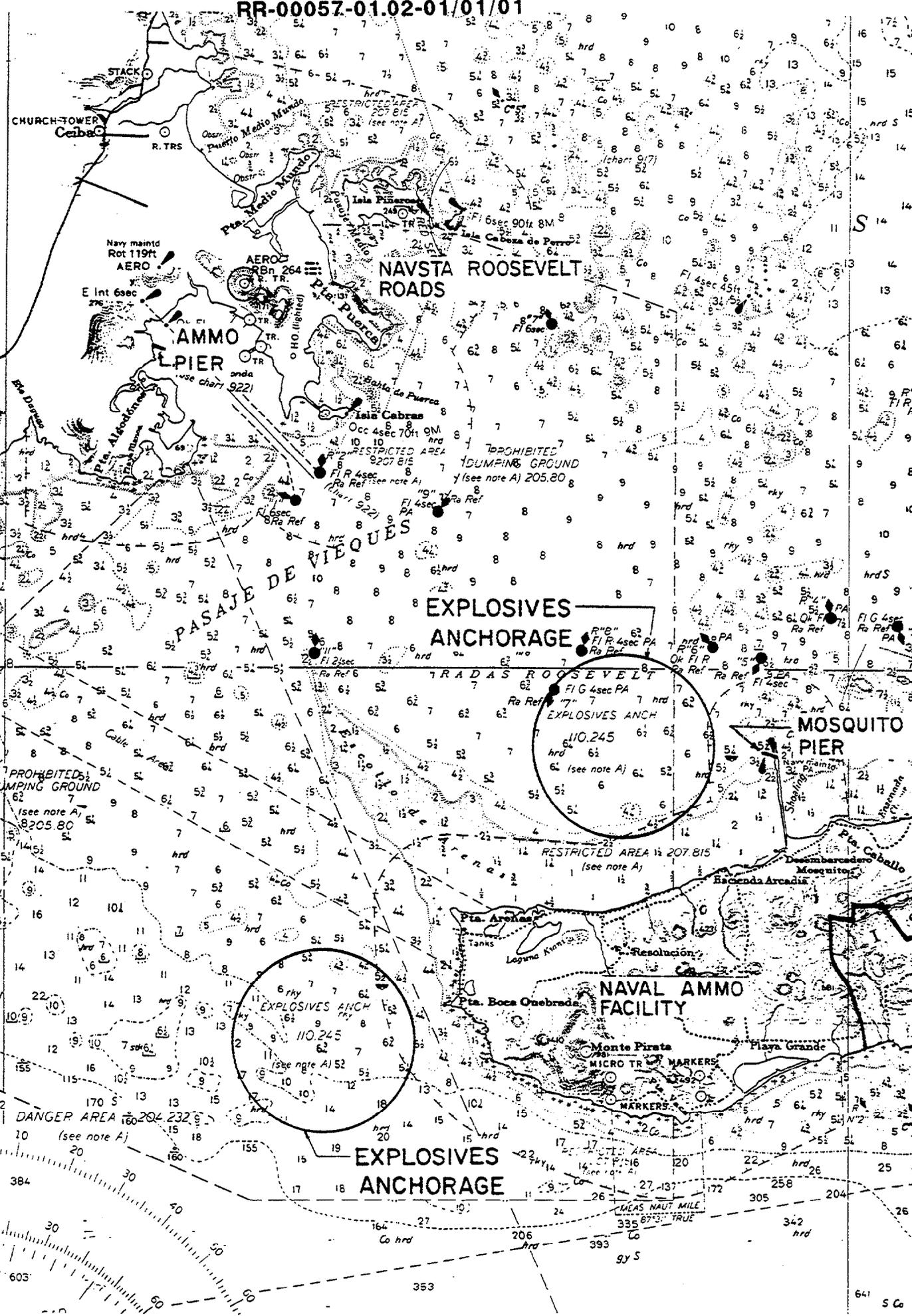


FIGURE -10
VIEQUES MOSQUITO PIER

...navigated in or
...ie limit, except in
...south side of the
...ure may be made
... Navy.
...lebra Naval De-
...Access Sea Sec-
...Control"
...ren days a
...ertz.
...nal of the
...S. Coast
...ormation.



STACK
CHURCH-TOWER
Caba

Navy maintd
Rot 119ft
AERO

AERO
RBN 264
E. TR.

NAVSTA ROOSEVELT
ROADS

AMMO
PIER

PASAJE DE VIEQUES

EXPLOSIVES
ANCHORAGE

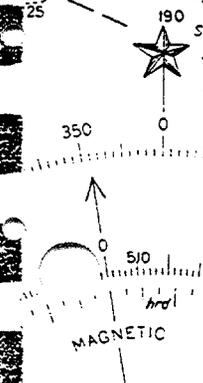
TRADAS ROOSEVELT

EXPLOSIVES ANCH

MOSQUITO
PIER

NAVAL AMMO
FACILITY

EXPLOSIVES
ANCHORAGE



DANGER AREA 204 232
(see note A)

NAUT MILE
TRUE

Upon its completion, all ordnance handling will be accomplished at the ammunition pier, completely disencumbering the entire industrial/waterfront area with the exception of the ASROC assembly line in Building 394 with a 500# N.E.W. limit (cl.1.3). A listing of the currently approved waivers is provided in Figure 13.

The provision of an Ordnance Loading Pad will require the demolition of various magazines that are in the way of proposed construction. The loss in storage space, however, will be compensated for with the construction of four new standard type II magazines and four ready service lockers which will be optimally located for supporting functions on the loading pad.

2. Electromagnetic Radiation Hazards

a. HERO - Handling and loading/unloading of HERO susceptible aircraft related ordnance is permitted in the eight areas shown on Figure 14 provided the following conditions are met:

1. All radar equipment, except that determined to be safe in accordance with OP 3565/NAVAIR 16-1-529, Radio Frequency Hazards Manual of 1971, will be secured within 1000 feet.

2. All high frequency radio transmitting equipment within 1000 feet will be secured.

Each squadron shall provide the Air Operations Department with a schedule of Emission Control (EMCON) loading times required at least 12 hours in advance of scheduled operations. The positive control on potentially hazardous emissions, in effect removes EMR sources as development constraint with relation to ordnance facilities and handling. However, as is standard practice with the siting of electronic facilities, an

individual EMR survey should be conducted at the project's conceptual stage to insure compatibility with or to define specific restrictions which must be enforced to assure a HERO unsafe condition does not develop. No attempt will be made to pinpoint all electronic emission sources in this master plan as they must be evaluated within the context of specific and unique parameters.

The Air Operations Officer, when notified that HERO emission control condition is required, shall be responsible for directing all fleet air detachments to secure all radar except that determined to be safe in accordance with OP 3565/NAVAIR 16-1-529, and high frequency radio transmitting equipment in the special HERO loading site undergoing ordnance handling evolutions. He shall also inform aircraft operating in the vicinity of the loading sites to secure high frequency transmitting equipment while ordnance evolutions are in progress. When Area 1 or 2 are required for loading, the Naval Station Weapons Department will be notified so that a red flag may be displayed from the top of the Weapons Department Building 378. This flag, when displayed, will give visual notification to the entire west ramp area that radio emission control is in effect and no transmissions will be permitted in Area 1 or 2. The flag will be lowered when notified by the Air Operations Department that HERO operations have been completed.

b. HERP - Electronic Radiation to Personnel presents no planning constraints on facility sitings. There are various radars and transmitters which would cause physical injury if a person went through the "beam" while in operation. Most RadHaz sources are above ground level with the beams above the horizontal thereby precluding a

Waiver Number	Site	Explosive Limit (NEW*)	Inhab. Bldg. ESQD Arc	Remarks
CNO Waiver # ROOS RDS 1-78.	Pier 3	30,000 #	1250' Radius	AMHAZ Board Report of 18 Nov 1977 (AMHAZ 23-77) recommended the granting of a waiver for the handling of a maximum of 30,000 # NEW at a point on Pier 3 no closer than 1250 LF from the U.S.O. Facility.
CNO Waiver # ROOS RDS 3-75	Bldg 384	40,000 #	1780' Radius	CNO ltr ser 411F/218865 of 4 Mar 1977 authorized storage of incompatible ammunition in ready service magazine(s).
CNO Waiver # ROOS RDS 1-77	Bomb Assembly Area	30,000 #	1250' Radius	CNO ltr ser 411F/218865 of 4 Mar 1977 authorized the utilization of the bomb/rocket assembly area without lightning protection for assembly of ordnance in support of flight operation.
CNO Waiver # ROOS RDS 2-77 of the	Bldg 394	500 #	75' Radius	AMHAZ Report 8023:WFV:cd AMHAZ 23-77 of 18 Nov 1977. Authorized the use of ASROC assembly station without lightning protection. Permits maximum of 500 # Class 1.3 ordnance with 75' ESQD arc.
CNO Waiver # ROOS RDS 3-77	30 Mags on Vieques Is. & 7 Mags on Roos Rds	-	-	CNO ltr ser 411F/220117 of 23 May 1977 Authorized the storage of ordnance items in magazines without lightning rods on the ceramic ventilators.

* NEW - Net Explosive Weight

Naval Station, Roosevelt Roads Ordnance Waivers
Figure 13

II-28

RR-00057-01.02-01/01/01

potential danger. All such sources are marked with warning signs. Various AFWTF sites have existing are programmed to receive the Threat Platform Simulator System, shown in Figure 15, and must maintain a 75-foot radius, personnel-free area when operating, as this unit is located at ground level.

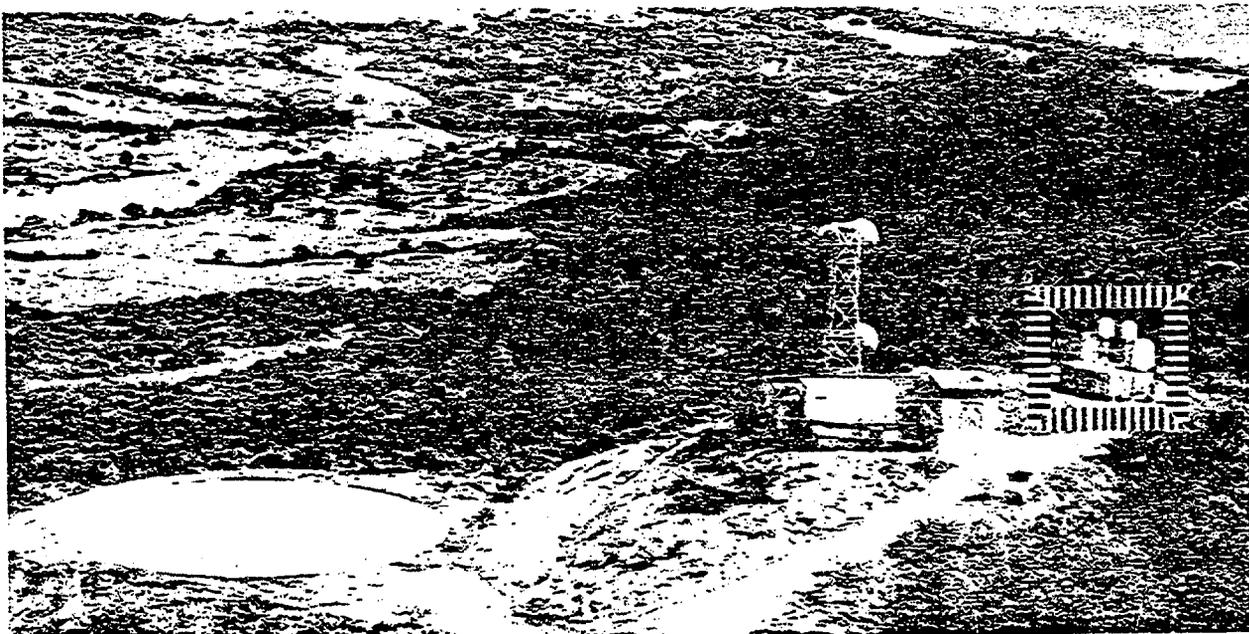
c. HERF - There are no known conditions at Roosevelt Roads where electronic radiation will affect fuel storage facilities.

3. Airfield Safety

The Roosevelt Roads airdrome consists of Runways 6/24 (11,000' x 200') and 17/35 (6,000' x 200'), a parallel taxiway north of Runway 6/24 and associated interconnecting taxiways and parking aprons both north and south of Runway 6/24. Although Runway 17/35 is classified as an active runway, it was given a unique status by CNO ltr OP-515/ACT

5091P51 of 7 Aug 1967, in that although it was to remain active, no maintenance would be performed on it. The status of the runway is currently under review as development of the areas adjacent to runway 17/35 is dependent on whether the full extent of current airfield safety criteria is to be applied or if the criteria is to be selectively modified/reduced.

The existing flight patterns and air space utilization is shown in Figure 16. The excellent and stable climatic conditions at Roosevelt Roads allow runway 6 to be used for over 95% of all flight operations. Runway 6/24 has one E-28 and two E-15 arresting barriers for bi-directional engagement and an E-5 (chain) barrier at the 9200' marker of runway 6. The main approaches to runway 6 are shown in Figure 16 and the existing flight obstructions are primarily terrain



Threat Platform Simulator

Figure 15

features; the ridge lines to the southeast and west of the runway as seen in Figure 16. There are some height restriction easements for land in the approach zone of runway 6, however, land usage is not controlled. On Station, various penetrations of the inner horizontal surface (IHS) occur primarily by terrain features in excess of 189 MSL (runway elevation 39' MSL + 150 ft IHS) with structures atop them.

The approach patterns for runway 6 are in part dictated by the surrounding terrain. Although the topography constitutes a recognized obstruction, there is sufficient maneuvering room with each pattern, so these obstructions are not considered hazards, as they are well below the 1000 ft downwind minimum altitude. The approach patterns for runway 24 are primarily over water and do not encounter any obstructions. All man-made obstructions on station are marked in accordance with FAA obstruction lighting standards. The imaginary surfaces and flight obstacles within the OFSTIE field airdrome are shown in Figure 16A.

There is sufficient land available at the Naval Station for facility expansion without infringing on any air or ground space that is reserved for flight safety clearances. There are facilities planned which could penetrate the IHS (i.e. P-883, Potable Water Tank atop Tacan Hill) however, it will be within the shadow and lower than an existing obstruction nearby. The location of P-883 at this site has been endorsed by NAVAIRSYSCOM (ltr 4106B2:LAL, 23 May 77).

4. Noise Environment

To assess the noise environment, a detailed noise survey was performed at Roosevelt Roads by the Aircraft

Environmental Support Office (NAVAIR-SYSCOM) and a final report issued in Feb 1979. The noise study utilized the average day-night noise descriptor methodology (L_{dn}) and a detailed noise contour map was developed based on a computer noise program. The detailed noise contour map was then reduced to the critical noise zones, shown in Figure 17. The area of greatest noise, Zone 3, registered noise levels above L_{dn} 75 and compatible uses within this zone are fairly restricted.

Noise zone 2 (L_{dn} 65-75) provides a greater range of compatible uses, whereas in noise zone 1 (less than L_{dn} 65), land usage is unrestricted. As can be seen in Figure 17, the ridge line south of runway 6/24 creates a noise barrier, thereby permitting the siting of facilities within an area that would normally be subjected to higher noise levels. As can be seen by comparing Figures 16 and 17, the noise contours are a direct result of established flight patterns.

Noise zone 3 is almost entirely within the boundary of the Naval Station, but impacts on some 305 acres of non-government land at the approach end of runway 6. The impact of aircraft noise both on and off Station is shown below.

Noise Impacted Areas⁽¹⁾

	On Station	Off Station	Total
Zone 3	2940	305	3245
Zone 2	5815	2775	8590
Total	8755AC	3080AC	11835AC

(1) Excludes overwater areas

The noise generated within the station has had its effect on other

base functions minimized by orienting runway locations toward unpopulated areas. Flight operations are normally conducted during daylight hours (up until 2200 hours) when aircraft noise is less objectionable. The aircraft flight patterns are configured, where possible, to avoid populated areas and reduce the noise impact.

5. Accident Potential Zones

The Accident Potential Zones for Naval Station Roosevelt Roads, as shown in Figure 17, are based upon current DOD criteria outlined in OPNAVINST 11010.36. The basis for the APZ is a composite of DOD aircraft accident history that is modified in accordance with the accident history of a specific air station. The application of criteria is further modified based upon the percent utilization experienced on each runway and for the various flight paths associated with each runway.

Experience has indicated that the majority of aircraft accidents occur within the final phases of the landing or takeoff procedure. Of the 20 accidents recorded for Roosevelt Roads between Jan 1968 to Nov 1978, 13 occurred in the immediate vicinity of or on the runway. Additionally, of the 20, 12 were of a minor nature (i.e. wheels up landing, damaged while taxiing etc.).

Applying the accident history and OPNAVINST 11010.36 guidelines, has resulted in runway 6 having APZ's I and II. Runway 17/35 has been currently assigned only a clear zone area. The impact of the clear zone and APZ's to both on and off-station land is shown below. Segments of the APZ's that are over water are not included in acreage totals.

APZ Impacted Areas

	On Station	Off Station	Total
Clear Zone & Prim. Surf	950	70	1020
APZ I	195	120	315
APZ II	535	200	735
Total	1680AC	390AC	2070AC

The 70 acres of clear zone off-station include 15 acres southwest of runway 6 and 55 acres at the end of runway 35, which is infrequently used. The portions of APZ I and II that are off-station are southwest of runway 06, as shown in Figure 17.

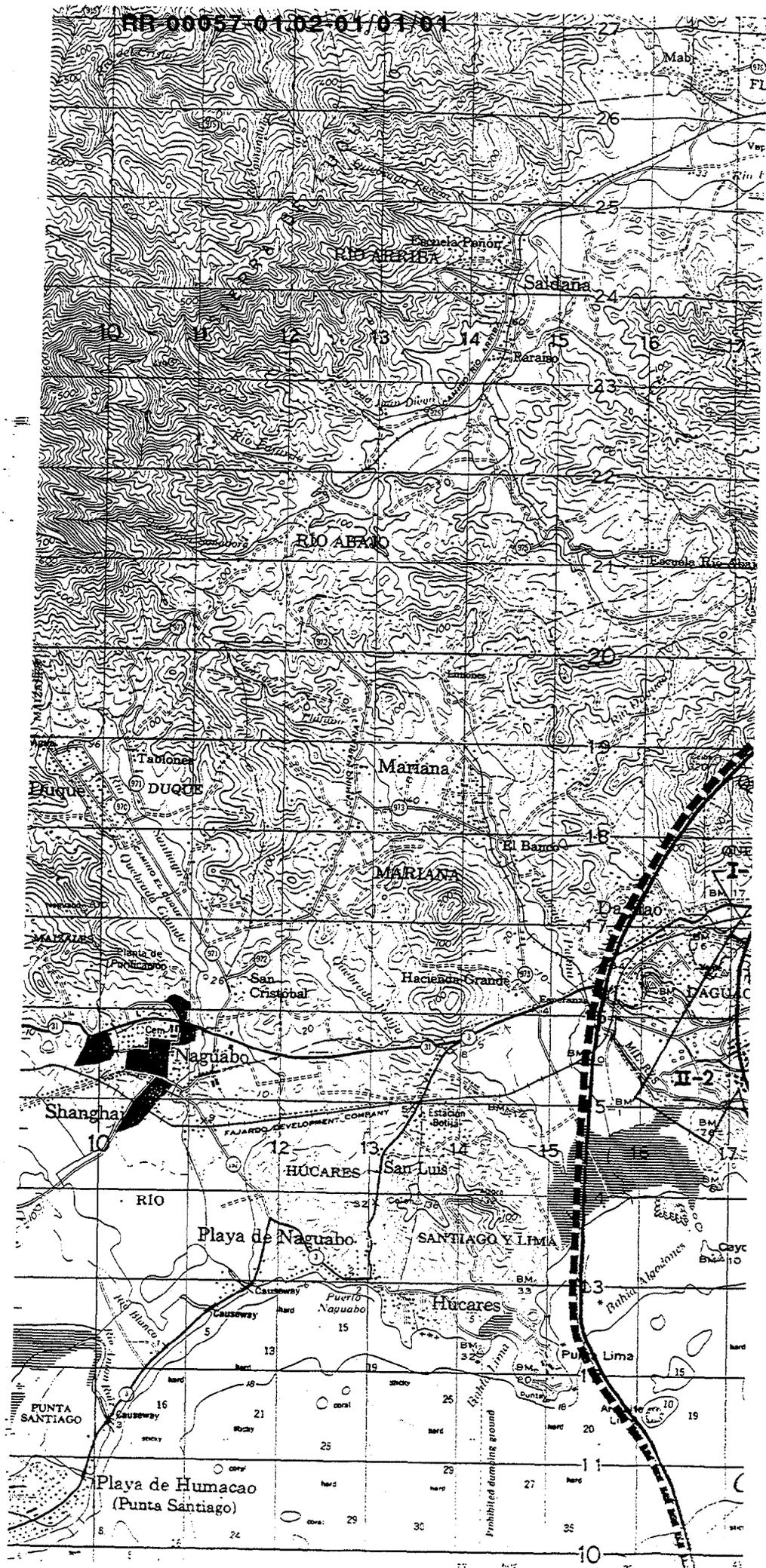
6. Air Installation Compatible Use Zones (AICUZ)

To ensure that the Naval Station can continue to perform its assigned aircraft support mission in harmony with the surrounding civilian community, an AICUZ study has been prepared. The study assesses the impact of flight operations on the civilian community and recommends compatible land uses in defined accident and noise zones. The AICUZ Zone for Roosevelt Roads has been defined as that land falling within the APZ's and the Ldn 65 contour, as depicted in Figure 17. It is within the AICUZ boundary that the Navy, desires to participate in determining what land usage is allowed. The areas within the APZ's have the smallest number of uses allowed that are compatible with airfield operations. As the distance from the airfield increases and noise levels decrease, the number of compatible uses increases proportionately. A detailed listing of compatible uses for each APZ, noise zone, and combinations thereof are included in the AICUZ study.

A portion of the AICUZ study deals with recommendations to lessen the effect of the AICUZ on the civilian community. Modification of flight patterns, operating hours, runup exhaust orientation, etc. all have been configured to minimize adverse effects on the community and no major changes to existing procedures will be recommended. The key factor for developing a compatible land use program is through close cooperation with the Puerto Rico Planning Board. A composite listing of acreage included in the Roosevelt Roads AICUZ (excluding over water areas) is listed below.

AICUZ Impacted Areas

AICUZ Zone	On Station	Off Station	Total
CZ and Prim Surf	950	70	1020
I-3	195	105	300
I-2	-	15	15
II-3	325	40	365
II-2	210	160	370
3	1565	145	1710
2	5510	2545	8055
Total	8755AC	3080AC	11835AC



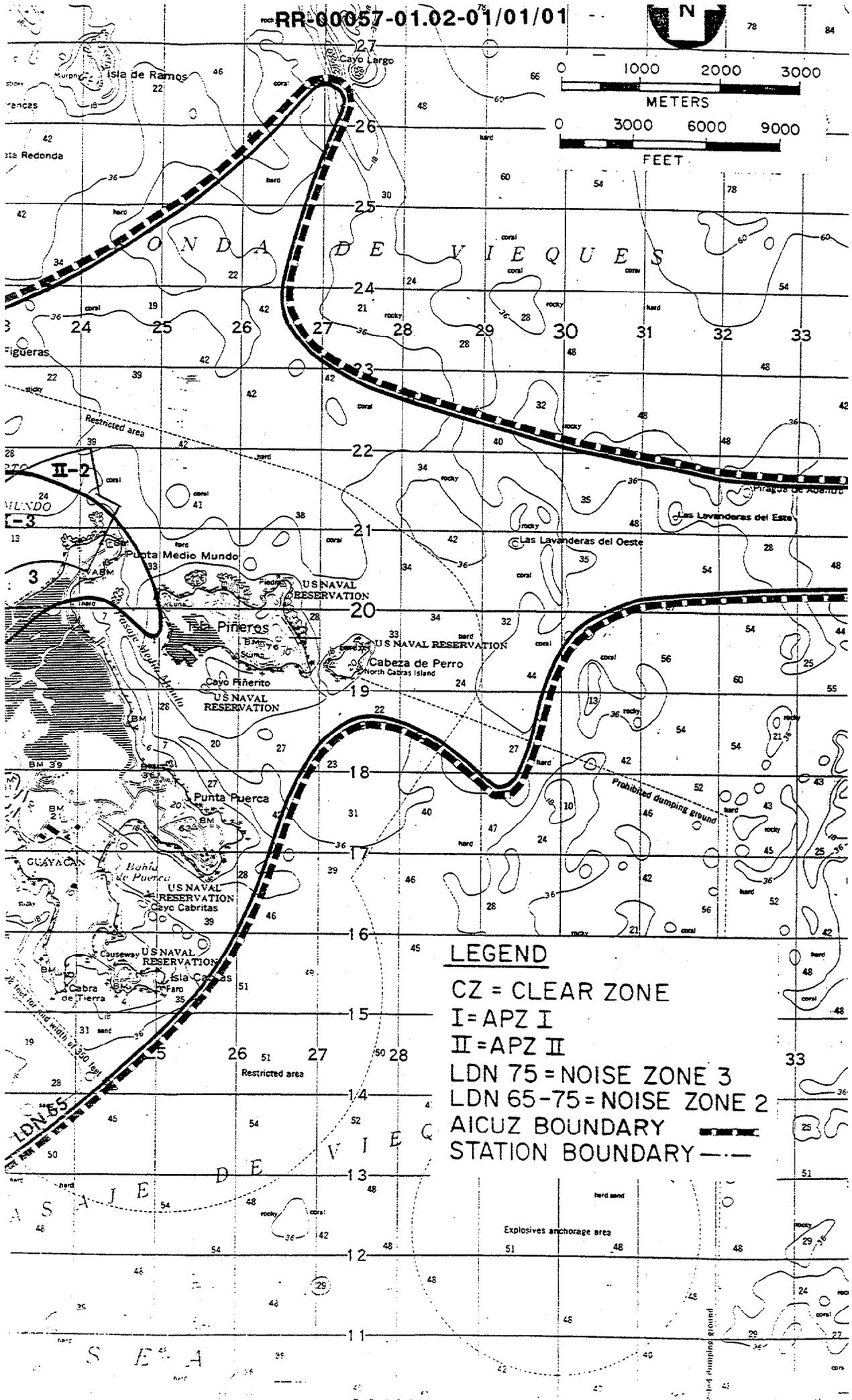


0 1000 2000 3000

METERS

0 3000 6000 9000

FEET



LEGEND

CZ = CLEAR ZONE

I = APZ I

II = APZ II

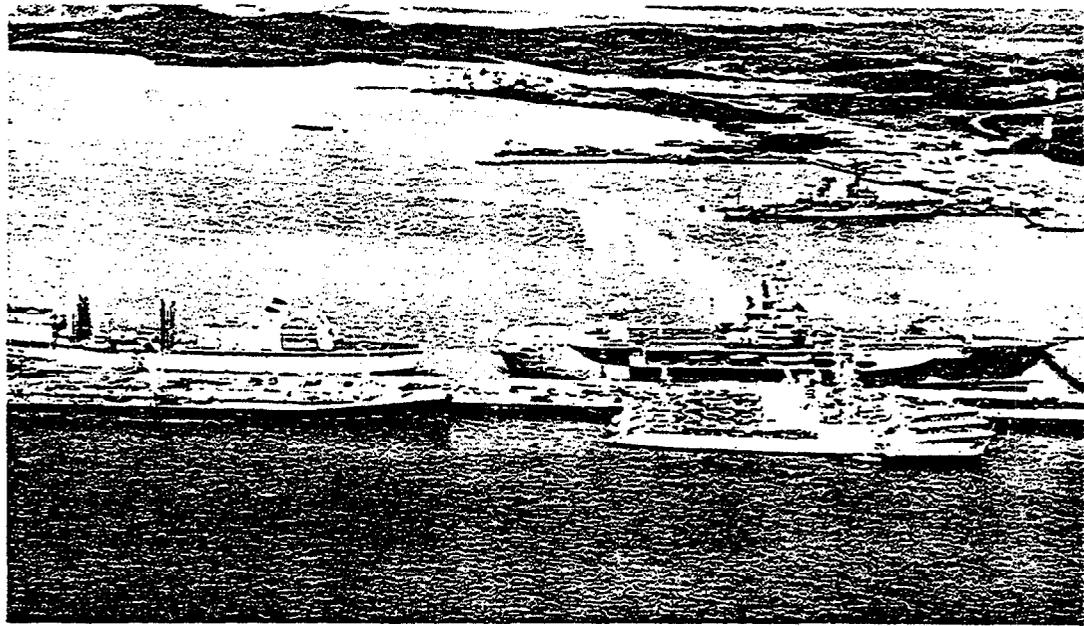
LDN 75 = NOISE ZONE 3

LDN 65-75 = NOISE ZONE 2

AICUZ BOUNDARY

STATION BOUNDARY





Planning Requirements

Planning Requirements

A. OPERATIONAL FUNCTIONS

The underlying theme for all facility planning at Naval Station, Roosevelt Roads, is the provision of physical environment (real estate, buildings, utilities, etc.) in which all assigned activities can effectively accomplish their assigned missions and tasks. Described herein are the major units on Naval Station, Roosevelt Roads, whose mission requirements have a significant impact on facility planning. The command organizational structure for the commands and activities at Naval Station, Roosevelt Roads, is depicted on Figure 18.

1. Commander, U.S. Naval Forces Caribbean (COMNAVFORCARIB)

Commander, U.S. Naval Forces, Caribbean, reports directly to Commander-in-Chief, U.S. Atlantic Fleet (CINCLANTFLT) under whom operations of the U.S. Naval Forces, Caribbean Area are coordinated and conducted. Coordinates matters concerning a national emergency, natural disasters and general or limited war. Exercises overall area coordination of naval activities in the Caribbean area.

2. Commander, Antillies Defense Command (COMANTDEFCON)

Maintains security of U.S. forces, installations and leased bases within the area of responsibility and supports CINCLANTFLT in defense of U.S. possessions and bases against attack throughout the

Atlantic Ocean and Caribbean Sea.

3. Commander, Fleet Air Caribbean (COMFAIRCARIB)

Commands and controls assigned activities in direct support of fleet weapons systems training and readiness of the Operating Forces and other activities as directed. Plans and coordinates the logistical support of fleet activities and others as directed. Coordinates support of RD&TE programs and projects.

4. Commander, South Atlantic Force (USCOMSOLANT)

Sub-area commander responsible to CINCLANTFLT for the Atlantic Command Area between the Tropic of Cancer and the Antarctic Circle excluding the Eastern and Caribbean Sea Frontiers and including portions of the Pacific and Indian Oceans. He exercises military command and control of assigned ships and units and represents CINCLANTFLT in naval matters in the countries of South and Central America and Africa which border on the Atlantic Command Area, south of the Tropic of Cancer.

5. Commanding Officer, U.S. Naval Station, Roosevelt Roads, Puerto Rico (CO NAVSTA ROOS RDS)

The U.S. Naval Station, Roosevelt Roads, Puerto Rico, is under the command of the Commander, Fleet Air, Caribbean (COMFAIRCARIB) and receives primary support from Commander Naval Air Force, U.S. Atlantic Fleet (COMNAVAILANT). The Commander-in-

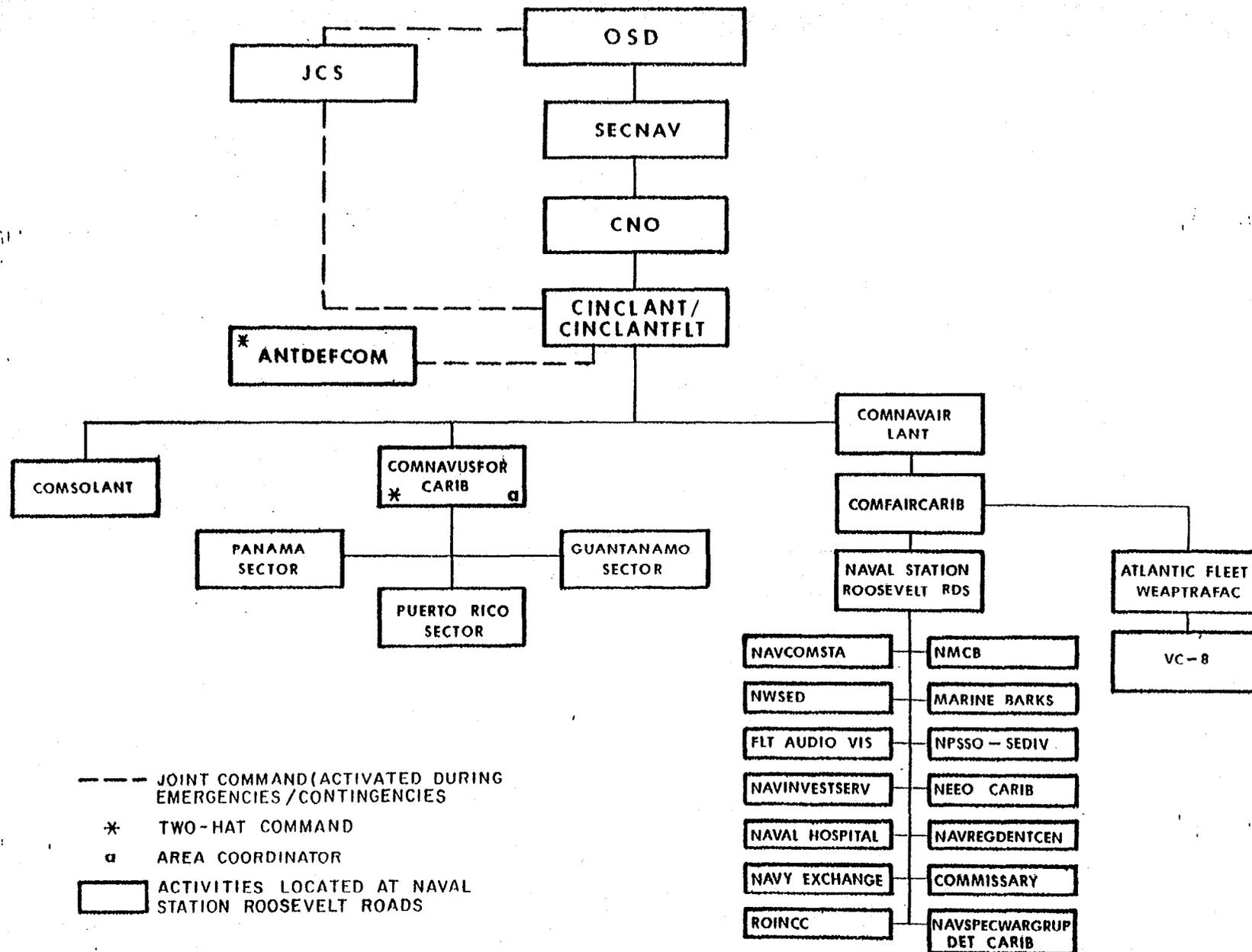


FIGURE-18
COMMAND ORGANIZATION

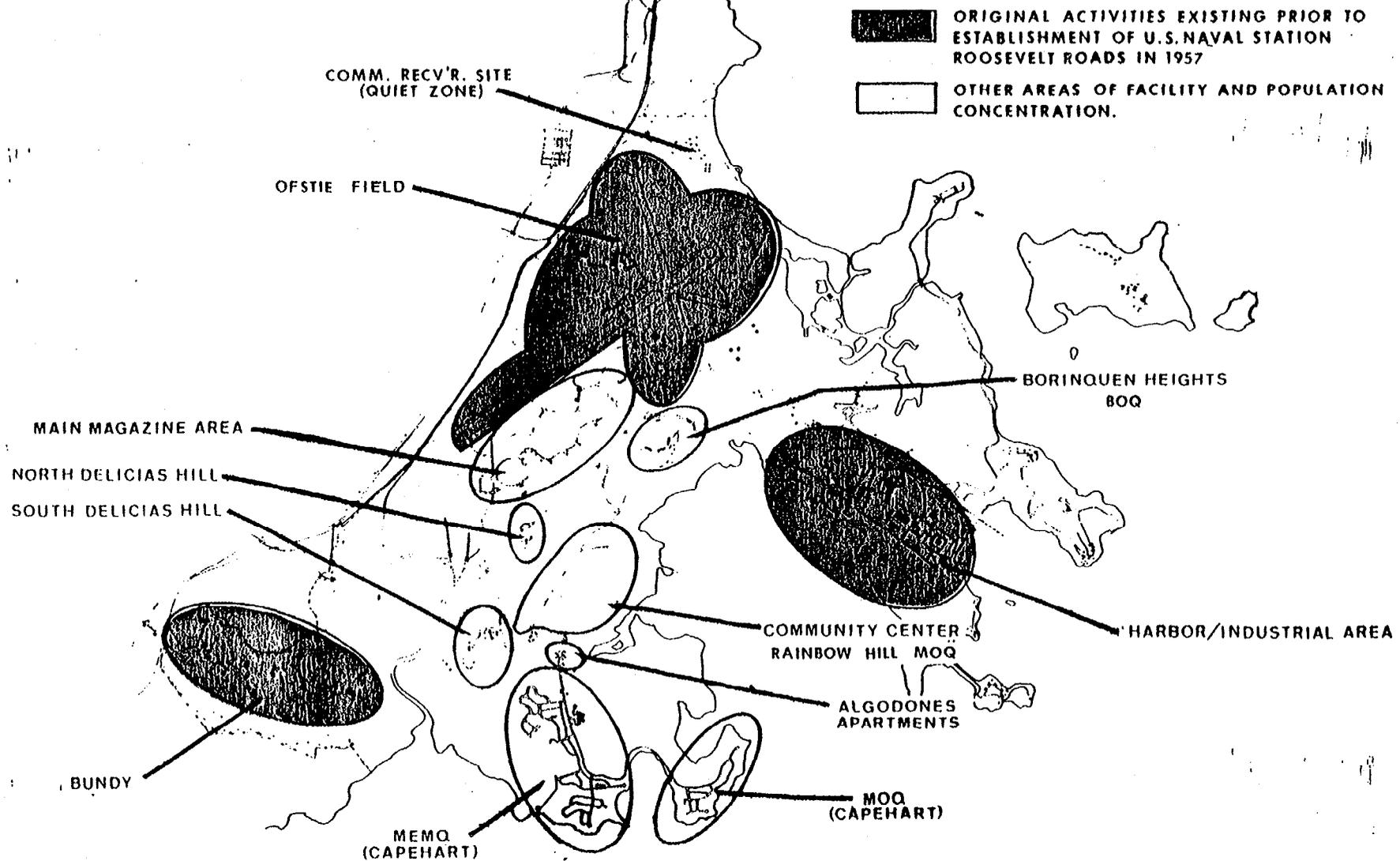


FIGURE -19
 FACILITY AND POPULATION CONCENTRATION AREAS

RR-00057-01.02-01/01/01

Chief, U.S. Atlantic Fleet, exercises area coordination.

The Commanding Officer, U.S. Naval Station, Roosevelt Roads is designated SOPA ADMIN and maintains and operates facilities and provides services and material to support operations of aviation facilities and units of the Operating Forces and other activities and units.

6. Commander, Atlantic Fleet Weapons Training Facility (LANTFLTWPNTAFAC)

The mission of the LANTFLTWPNTAFAC is to operate, maintain and develop weapons training facilities and services in direct support of fleet forces and other activities and for the development, test and evaluation of weapons systems.

7. Commander, Fleet Air Detachment (General)

The Commander, Fleet Air, Caribbean, acts as Commander, Fleet Air Detachment (CFAD). Fleet aviation personnel and aircraft based at the Naval Station constitute the Fleet Air Detachment. Squadrons and larger tactical units of the Fleet Air Detachment retain their identity, including operational control of all their assigned military personnel.

8. Fleet Composite Squadron EIGHT (VC-8)

Under the direct command of the Commander, Fleet Air, Caribbean, provides air and target service for the LANTFLTWPNTAFAC. Both sub and supersonic drones (AQM-34 and BQM-34) are the squadron's main target presentation. The drones are launched from ground launching facilities or from an airborne mother craft. VC-8 effects recovery of the drones from the water impact area, monitors the refurbishment of the recovered drones

and flies range safety surveillance sorties.

9. U.S. Naval Communications Station, Puerto Rico (NAVCOMMSTA)

The mission of the U.S. Naval Communications Station, Puerto Rico, is to provide tactical communications to the fleet; serve as the primary Defense Communication Agency in Puerto Rico and perform specialized duties in connection with communications research and engineering. NAVCOMMSTA PUERTO RICO is charged with coordinating all naval communications in the area extending from the Gulf of Mexico to the South Pole and extending into the Atlantic and Pacific Oceans as well as the Caribbean Sea.

10. Naval Mobile Construction Battalion

A SeaBee Construction Battalion is continually deployed to Roosevelt Roads on a rotational basis to perform operational readiness training to meet contingency commitments and is the Atlantic Fleet Alert Battalion. The heavy construction capability of the battalion has been invaluable in meeting the schedule for urgently required projects throughout the Caribbean which would not have been possible under the MILCON program timetable. The SeaBees operate Camp Moscrip as a self-contained entity, capable of fulfilling all operational requirements.

11. Naval Weather Service Environmental Detachment (NWSED)

Provides, as directed, meteorological and oceanographic services to military activities, staffs, units and to all transients at the host station.

12. Marine Barracks

Provides local security guards for the Naval Station including sentries at the gates, classified projects and perimeter patrols. Provides additional security as directed for short term military and emergency operations.

13. Fleet Audio-Visual Center, Caribbean

Provides official photography and coordination of Navy photographic activities for the naval establishment in the Caribbean area. Additionally, photographic services provided to other elements of the U.S. armed forces and other agencies of the federal government as directed.

14. Navy Publication and Printing Service Office, Southeastern Division (NPPSO SEDIV)

The mission of the NPPSO SEDIV, Bevelt Roads, is to provide publication and printing services to all naval activities in accordance with the Navy Industrial Fund Charter and assure the economical and efficient provision of the publication and printing requirements.

15. Navy Investigative Service Resident Agency (NAVINSERV)

The Naval Investigative Service Resident Agency, Roosevelt Roads, mission is to fulfill investigative and counterintelligence requirements in the COMNAVFORCARIB area (with exception of Cuba) and provide direct support to Navy and Marine elements so located.

16. Naval Electronic Engineering Office Caribbean (NEEO CARIB)

Provides electronics material support for systems and equipment in Caribbean area for which the

Naval Electronic Systems Command is assigned responsibility. Maintains a Fleet Electronics Calibration Laboratory, coordinates Radiac Equipment calibration; provides electronic equipment technical assistance and shore electronics project engineering and technical support.

17. U.S. Naval Hospital

Provides general clinical and hospitalization services for active duty Navy and Marine Corps personnel, active duty members of the other armed services, dependents of active duty personnel and other authorized persons.

18. U.S. Naval Regional Dental Center

Provides a complete dental service to Navy and Marine corps shore activities, units of the operating forces and other authorized personnel within the assigned geographical area. Provides coordinated dental health care services as an integral element of the Naval Regional Health Care System including shore activities as may be assigned. Perform such other functions or tasks as may be directed by the Chief, Bureau of Medicine and Surgery.

19. Special Warfare Training Group Two - Carib Det.

Provides training scenarios for the acquisition of intelligence and neutralization of obstacles by unit members, performing singularly or in small groups and necessary for the success of Naval and Marine operations utilizing larger task forces. The Group has the capability to deliver its members to their operating location by sea, air or land.

B. PHYSICAL REQUIREMENTS1. Assets - Land and Facilities

The Roosevelt Roads Naval Complex is comprised of numerous major and minor land areas and surface/sub-surface water operating areas. A portion of the Navy's real estate assets in Puerto Rico are currently in the process of being excessed with the potential recipient being the Commonwealth. The major facilities/land areas in this status are:

Naval Station San Juan and
other facilities in Metropolitan San Juan
NAVCOMMSTA - Fort Allen
Roosevelt Roads West Annex
(Ramey)

A majority of the lands on
Culebra and off shore Cays
Vieques - Monte Santo Tract
Santa Maria Tract
Martineau Tract

The remaining major real estate assets that currently comprise the active complex are listed below, with an aggregate Class I and II Replacement Value in excess of \$820 million as of 1 Oct 1978.

Naval Station Roosevelt Roads	- 8,638Ac
Vieques East (AFWTF Ranges)	-15,479Ac
Vieques West (ORD Stor Area)	- 9,234Ac
Culebra (Flamingo Pt)*	- 87Ac
St. Thomas (Crown Mt)	- 7Ac
St. Croix (UTR & St. Geo Hill)	- 7Ac
Pico del Este	- 76Ac
	<hr/>
	33,528Ac

*This figure represents the active U.S. Navy site at Flamingo Pt which is to be retained after all excessing actions are completed.

After considering the basic requirements a facility is to fulfill, an equally important consideration is functional consolidation. The elimination or complete rehabilitation of facilities dating to the World War II era have become a major drain on the whole range of station resources and is also basic to the planning

process. Some of the older facilities are well situated and bear consideration for modernization. As can be seen in Figure 19, the station is long, stretching 14 road miles from east to west. This distance can require a 20 minute one-way trip from the pier area to the support facilities in Bundy. When this is related to manhours, equipment maintenance and fuel costs on an annual basis, the cost is considerable. A consolidation of the areas east of South Delicias recommended in the previous master plan, is progressing slowly. It is planned to reduce the utilization of facilities in the Bundy area to an absolute minimum.

During the updating of the Shore Facilities Planning System (SFPS) documents (OPNAV Forms 11000/1, 2, 3), all facilities and structures were evaluated on-site and specific space requirements were determined using the SFPS methodology.

Using personnel, ship and aircraft loading data, deficiencies or excesses in each functional category were determined. The current facility acquisition program is outlined in the activity Capital Improvement Plan (CIP) in Appendix A. The projected FY-83 personnel loading for NAVSTA ROOS RDS, including tenants, supported units and transients consists of 6,041 military personnel and 934 civilians. Military dependents total an additional 3,450 persons.

A large number of the existing facilities on the Station date back to World War II and earlier. These structures are of metal, concrete masonry units and wood and approximately 60 percent have been evaluated as substandard.

2. Utilities

a. Electrical Power - Electrical power is purchased from the Puerto Rico Water Resources Authority at 38 KV. The Authority serves the Naval Station over three radial feeders from their Daguao substation. The feeder to substation "A" at the airfield area has an intertie with the town of Fajardo. The number of radial feeders will be increased to four with the completion of MILCON P-940, Utilities. This project will provide a closed loop system via the airfield area and increase the shore power capability at the waterfront. The primary distribution system is shown in Figure 20.

For clarity, the Naval Station has been divided into four areas. The existing electrical systems for these areas are as follows:

(1) Airfield Area

The Airfield Area is served from Substation "A", containing two identical, parallel 1500 KVA Load Tap Changing (LTC) transformers (38-13.2 KV). The Airfield Area 13.2 KV system has three inter-ties between two other 13.2 KV substations. One tie to the Industrial Area is operated closed. Two ties to the 13.2 KV system from Substation "C" are operated in an open mode.

(2) Industrial Area

The Industrial Area is served from the berthing pier Substation which contains a 5 MVA transformer with three windings (38-13.2 KV - 480 V), Substation "I", which contains a 3750/ 5250 KVA LTC transformer (38-13.2 KVA), and Substation 7 which contains 3-1250 KVA single phase transformers (38-2.4/4.16 KV). The Industrial Area 13.2 KV system has two inter-ties; one tie to the

airfield area 13.2 KV system which operates closed and one tie to substation C which is operated opened. The berthing pier Substation serves only the Berthing Pier 3 at 480 volts.

(3) Bundy Area

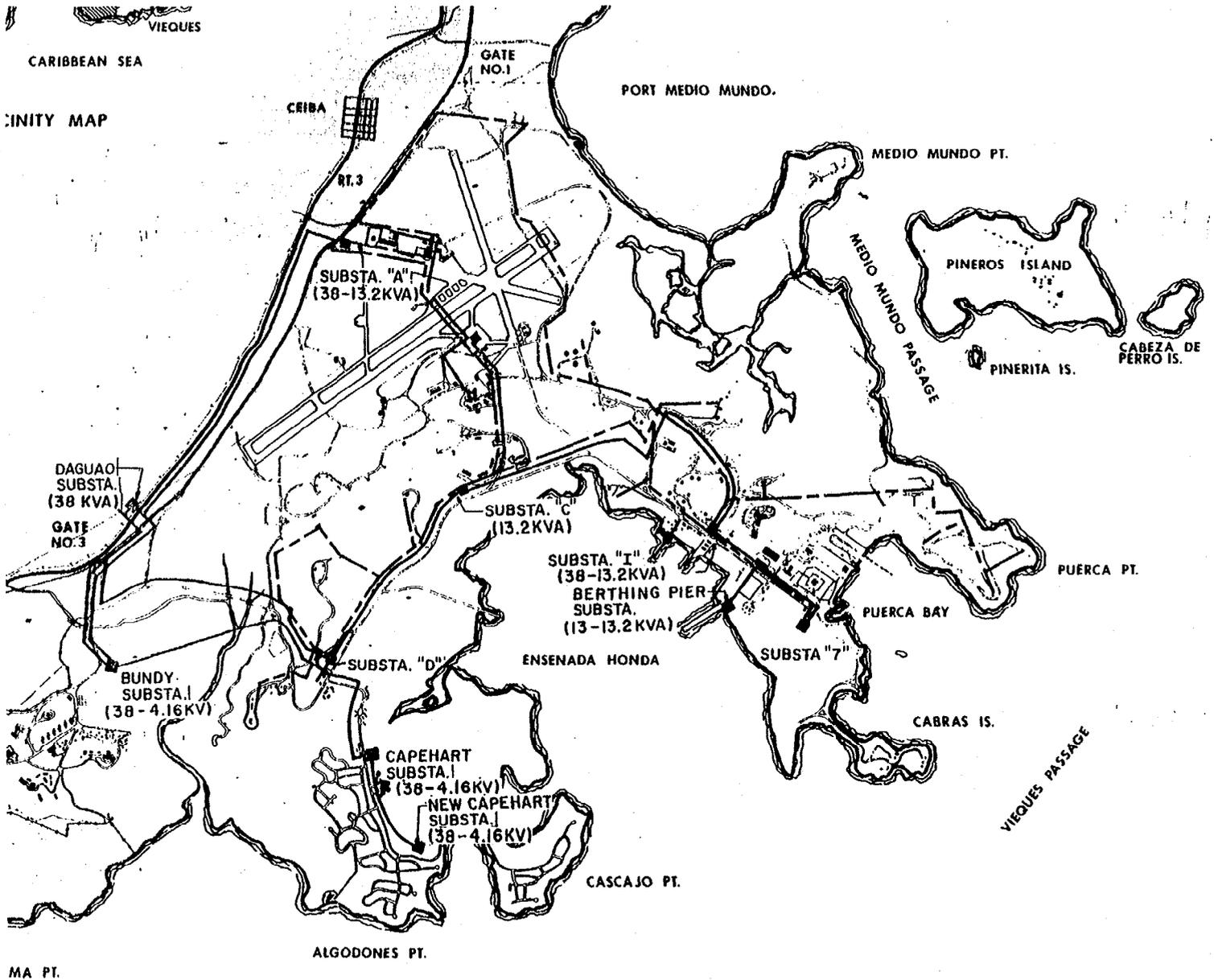
The Bundy Area is served from the Bundy substation containing two 1500 KVA transformers (38-4.16 KV). The transformers have different impedance values and the turn ratios are set differently. The transformers are not parallel at their secondaries but are connected through a closed loop resulting in a circulating current between them.

(4) Housing and all other areas

The Ofstie area south of the airfield, the underwater weapons shop, filtration plant, etc., are served from Substations "C" and "D". Substation "C" contains two identical parallel 1500 KVA LTC transformers (38-13.2 KV). The Substation "C" 13.2 KV system has three inter-ties between two other 13.2 KV substations. One tie to the Industrial Area and two ties to the Airfield Area 13.2 KV system are operated opened. Substation D contains a 3750/5250 KVA LTC transformer (38-13.2 KV).

The Capehart housing area is served from both the original Capehart substation which contains a 2500/3125 KVA LTC transformer (38-4.16 KV) and the new Capehart substation which contains a 2500/3500 KVA LTC transformer (38-4.16 KV).

Key facilities on-station, which must continue to function in the event of the loss of commercial power, are provided with emergency generators. The loss of commercial power due to natural phenomena or equipment breakdown occurs with



POWER LINES:

- 38KV. SYSTEM ———
- 13.2KV. SYSTEM - - - -



0 2700 5400FT.

RR-00057-01.02-01/01/01

ELECTRICAL DISTRIBUTION

regularity. The off-station power sources are also highly susceptible to sabotage directed against the U.S. Government and the Navy specifically, by disgruntled strikers or politically militant groups demonstrating against the Commonwealth. This potential for total disruption of electrical service is perhaps one of the most critical characteristics of the existing system, about which little can be done short of generating all power required on station; an option which is not currently being considered.

The existing station-wide electrical distribution system shown in Figure 20 is capable of accommodating a 20 percent expansion without the need for additional commercial primary power. This existing growth potential will permit acquisition of all currently identified electrical requirements without major expansion.

b. Water - Naval Station, Roosevelt Roads, filtration plant draws raw water from Rio Blanco by gravity through a 27 inch reinforced concrete pipe, with the intake located at the foot of the rain forest. The Puerto Rico Water Resources Authority can provide up to six million gallons of raw water daily to the Naval Station from Rio Blanco under the terms of a 1942 agreement with the Commonwealth. The supply line traverses some 14 miles from the intake to the station boundary and is buried within a totally owned right-of-way. With the intake being in a remote, unsecured area, the entire station water supply could be compromised by an act of sabotage or catastrophic natural event. Encroachments of the water line and the right-of-way are a continuing problem. Figure 21 shows a road and houses on the right-of-way. Reconciliation of this problem is underway.

NAVY OWNED WATER LINE RIGHT-OF-WAY



Encroachment - Rio Blanco Waterline

Figure 21

The raw water reservoir is located near the water treatment plant and has a capacity of 45,000,000 gallons. In addition to this there are six potable water storage tanks (Figure 22) with an aggregate capacity of 2.65 million gallons. Also, there are two raw water fire protection storage reservoirs with 400,000 and 120,000 gallon capacity at the airfield and AFWTF Range Operations Center respectively.

The potable water filtration plant consists of a rapid mixing chamber where alum is added, flocculation chamber, sedimentation tank, and rapid sand filtration. Fluoridation, disinfection using chlorine gas, and pH control using lime are provided. The plant has the capacity to treat 4 million gallons per day. The current monthly usage is well below plant capacity and can accommodate known expansion with adequately treated water. Results of a physical, chemical and bacteriological analyses of potable water have indicated a safe drinking water in compliance with U.S. Public Health Service Drinking Water Standards is provided. In general, the major deficiency of the water distribution system consists of the lack of a closed loop between Langley Drive and the Industrial Area and a deteriorated reinforced concrete line in the Industrial Area. MCON Project P-885, Water Lines, Industrial Area, will provide for correction of above deficiencies. The existing deficiency at the Naval Hospital is being corrected by the provision of domestic water and fire booster pumps in the vicinity of Public Works Building 31.

c. Waste Disposal

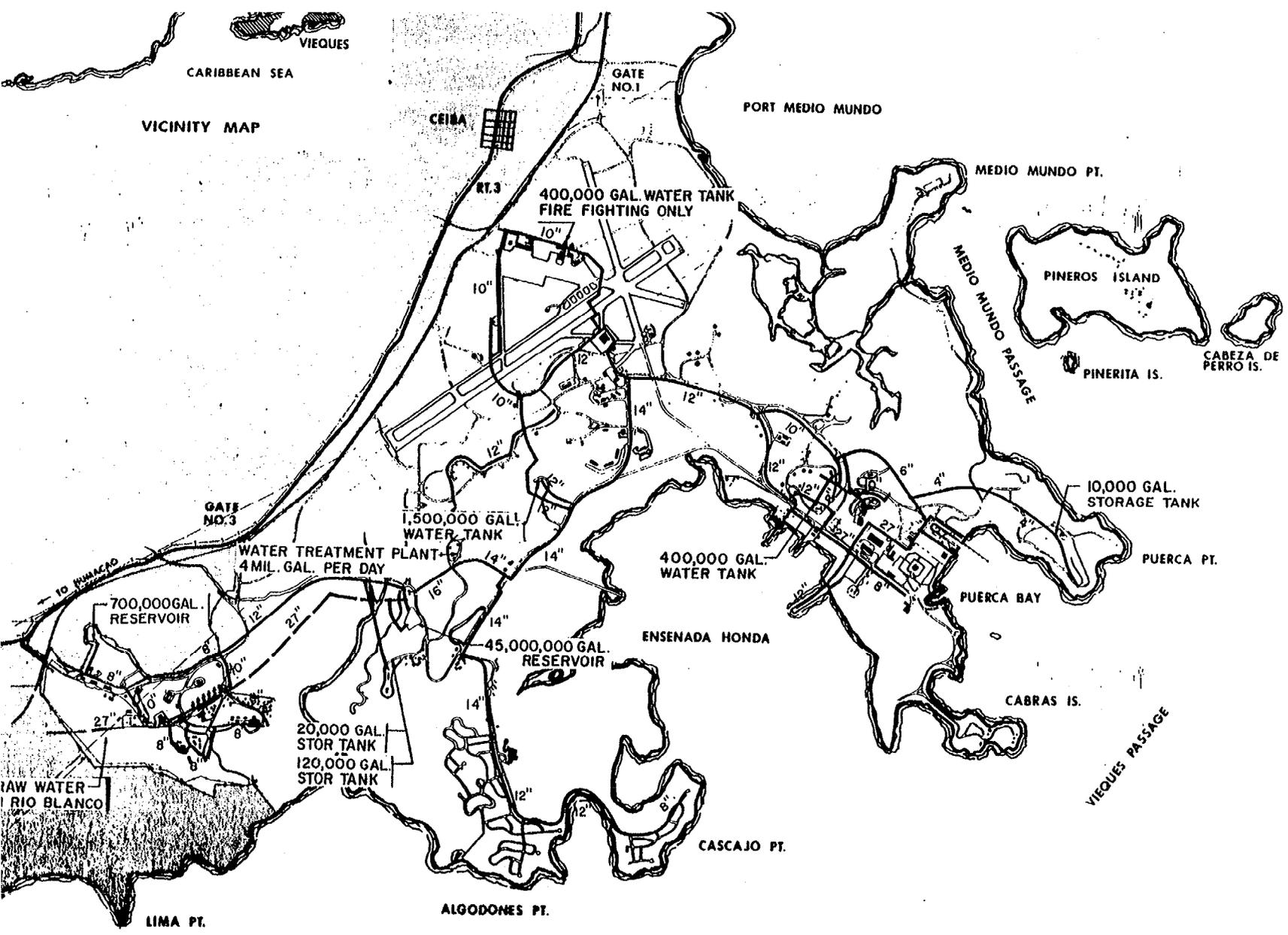
(1) Sanitary Sewage

The Naval Station treats shore and

ship generated liquid wastes at three treatment plants which are located as shown in Figure 23. The three plants (Bundy, Capehart and Industrial Area) have a treatment capacity of .655 million gallons per day (MGPD), .46 MGPD and .937 MGPD respectively. All three plants provide secondary treatment with the Bundy and Industrial Area plants utilizing trickling filters and the Capehart plant (shown in Figure 24), employing activated sludge. The treated effluent is then discharged into the adjacent coastal waters. In the pier area, the capability exists to tie shipboard waste systems into a collector network terminating at the Industrial Area plant for treatment. The ability of all vessels to tie into such a system will become mandatory by 1980. MCON Project P-703 will upgrade the three existing sewage treatment plants to ensure compliance with the 1977 standards for waste water treatment and will augment the capacity of the Industrial plant to handle ship waste water. P-703 will furthermore upgrade the sanitary system basewide. The collector systems that terminate in all three plants are a composite of gravity and force mains.

Currently the Bundy and Industrial Area plants are operating at 22 percent and 47 percent of capacity respectively and the Capehart plant is functioning almost at 101 percent of its design capacity. These figures represent the average rates for a 14 month period (June 1977 through July 1978). The Capehart plant received in August 1977 1,300,000 gallons of sewage in a 24-hour period exceeding its design capacity by 184 percent. The Industrial Area plant has exceeded its design capacity twice, during October and November 1977, and the Bundy plant once in November 1977. Included in P-703 also is a complete check of

VIEQUES
 CARIBBEAN SEA
 VICINITY MAP

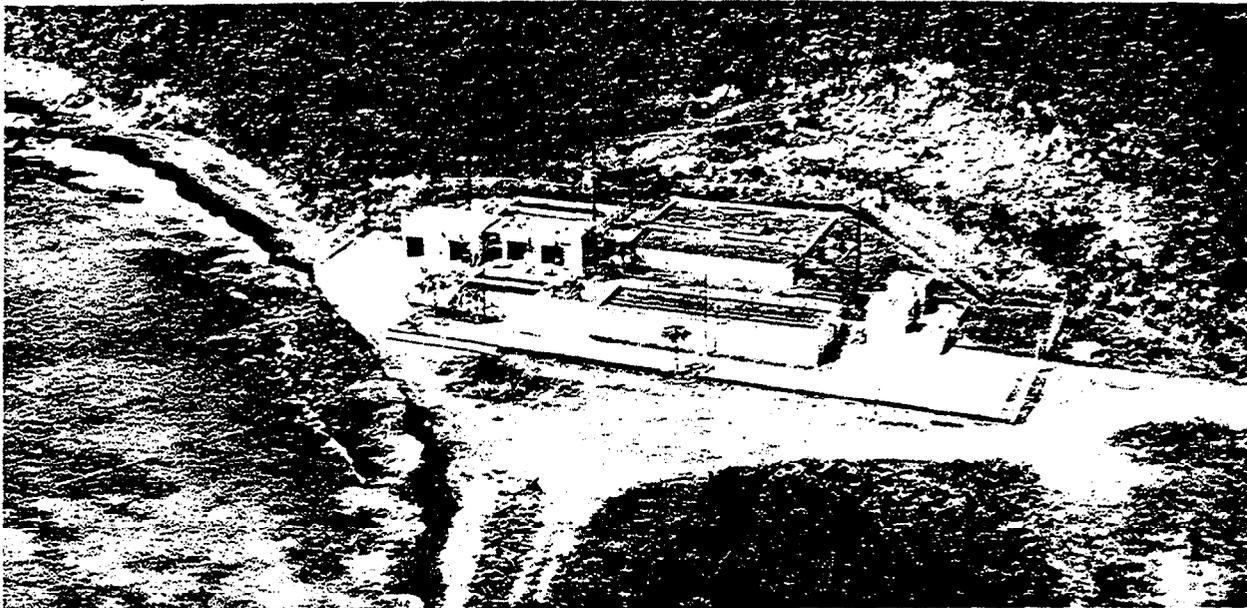


WATER LINES

FR-00057-01.02-01/01/01



0 2700



Capehart Housing Sewage Treatment Plant

Figure 24

the collection network, to see if there is any ground water infiltration, which may be causing temporary plant overloads.

The Station is engaged in a continuous program for the gradual elimination of or the upgrading of septic tanks. The sewage lift stations will be equipped with emergency generators and/or portable pump connections in compliance with EPA regulations.

(2) Oil Pollution Control

Bilge and ballast waste water in vessels nested or anchored at Roosevelt Roads is collected and treated by the Oil Waste Collection and Treatment System. This system consists of a waste Oil Raft (Donut), two Ships Waste Offload Barge (SWOB) 75,000 gallon capacity each, and a special skid-mounted oily waste, waste oil, and water handling unit termed the Donut Servicing Subsystem (DSS) on shore.

The Oil Spill Removal System is used for cleaning oil spills in the harbor. This system is comprised of floating oil containment booms, oil skimmers and support equipment to contain and remove an oil spill. The oil/water mixture removed by the skimmer may be temporarily stored or treated before final disposal.

MCON Project P-703 will provide new Oil Spill Shore Support Facilities that will improve the operations and response capability. Improvements of all oil storage/handling facilities to prevent oil spills and correct related deficiencies is also included in P-703.

(3) Solid Waste Collection and Disposal

Solid wastes are collected station-wide by a refuse collection contractor. The collected waste materials

are transported to the sanitary landfill operated by the Public Works Department. Open trenches are to specific levels above the ground water table and receive an average of three covering lifts of soil daily. The landfill operation presently causes no leachate pollution into surrounding waters as confirmed by recent United States Geological Survey (USGS) tests. Bird attraction problems are minimized by the frequent daily earth coverings. The existing landfill area has a projected useful life of 24 months and locations for a new landfill are being investigated by the Station.

The recycling of certain types of clean refuse (paper, metal, glass, etc.) is a future alternative for reducing the quantity of solid wastes requiring disposal at the landfill. Until a market for recycled materials is developed on the Island, this type of waste will continue to be buried. The Defense Property Disposal Office maintains a collection, redistribution and sales facility at Roosevelt Roads, however, the large quantities of scrap, primarily metal, do not attract ready buyers due to long hauling distances to reprocessing facilities on the Island.

Naval Station, Roosevelt Roads, is visited by numerous foreign vessels and their solid wastes are removed in special containers, sterilized and disposed of in specially dug pits at the landfill.

(4) Storm Water

The primary drainage routes for storm waters are shown in Figure 6. The continued addition of developed areas, both on and off station, has resulted in upsetting the natural drainage patterns causing flooding in many areas following heavy rain storms. Recently, detailed studies

proposing long and short term solutions to the flooding problem have been completed for some areas and implementation will soon begin. The collected and channeled storm waters are eventually discharged into the surrounding bays, either by sheet surface drainage or via culvert, outfalls or channels.

d. Communications - The Naval Station, Roosevelt Roads, has available numerous communications systems such as: commercial telephone, AUTOVON, Autosevcom, message transmission capability and microwave communications. The Atlantic Fleet Weapons Training Facility (AFWTF) is the prime user of the microwave facility for communicating with the AFWTF facilities on outlying islands comprising the Inner Range and the Underwater Tracking Range. The Receiver Site is located in an electronically "quiet" zone in the northern corner of the Station, near Gate 1 (See Fig. 19). The Transmitter Site is located at the junction of Forrestal Drive and Antietam Road. On North Delicias Hill, the Armed Forces Radio and Television Service studios and transmitting facility is co-located with the UHF transceivers and radar facilities used for drone surveillance downrange. The UHF facility is used by both NAVSTA ROOS RDS and AFWTF. The communications facilities at Sabana Seca, and Isabela provide the Naval Station additional support in satisfying its communications requirements. The low-frequency facility at Aguada is currently inactive. Recent completion of the Naval Communications/Operations Center (MCON P-030) has provided modern, up-to-date facilities for NAVCOMMSTA PUERTO RICO at Roosevelt Roads and allows their relocation from Ft. Allen (Ponce).

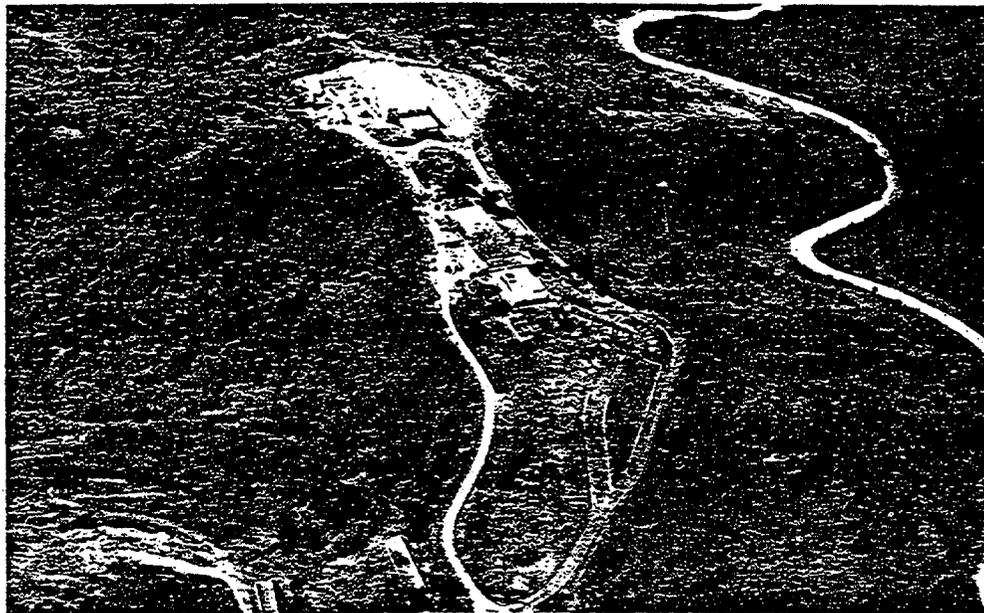
Private telephone service to family housing units is available through the Puerto Rican Telephone Company which ties directly into the state-

side telephone network. The entire telephone system has a total capability of 2714 lines with 2392 now in use. The addition of 200 more lines is scheduled in the near future. Direct Distance Dialing was recently added to the system's capability. The Naval Communication Station, presently located at Ft. Allen on the south-central coast of Puerto Rico will be co-located with AFWTF on South Delicias Hill as shown in Figure 25. This facility coupled with the other communication facilities in existence will provide up-to-date, sophisticated communication and command and control capabilities for effective employment of Atlantic Fleet Units.

3. Fuels

The Naval Station Fuel Division is capable of providing facilities necessary for the receipt, storage and issue of aviation fuels, lubricants, gasoline, and diesel fuel

marine (DFM). The fuel storage facilities with major connecting supply lines to the aircraft direct fueling outlets and the fuel pier are shown in Figure 26. Fueling of vessels is accomplished at Pier 3. Pier 1 is the primary fuel receiving point for the Station and has recently undergone major repairs and alterations. The aviation gasoline (AVGAS) and JP fuels are pumped directly into their respective storage tanks. The JP fuel is pumped from tank 429 to the high speed refueling hydrants on the north side of the flight line where aircraft are refueled. AVGAS is supplied to aircraft via refueler vehicles. FY-78 MCON P-834 (currently under construction) will provide for the expansion of fuel delivery/issue capability of Pier 1 by providing one 16-inch diameter DFM, one 16-inch diameter JP-5 and one 12-inch diameter AVGAS line and additional fueling points on Pier 3. Completion of P-834 will allow servicing



Communications Operations Center

Figure 25

of most vessels presently in the inventory at Pier 5, by adding two 100,000 barrel tanks, one each for and JP-5. Pier 1 will be used primarily for the receipt of POL products from tankers.

4. Fire Protection

Fire protection at the Naval Station is adequate. Response time, however, lengthens as the fire location becomes more westerly. This is a direct result of the local topography and the one structural fire station being located in the far eastern portion of the Station. The structural fire station is located on Forrestal Drive and is within a few minutes driving time to the Industrial/Waterfront Area, and the Borinquen Heights/Ofstie Area. Transit time to the Family Housing and Bundy areas, however, takes significantly longer. The Bundy Area fire station was deactivated as a result of a management engineering study made in the early 1970s. Bundy is a 10 to 15 minute drive away from the structural station. The aircraft crash/rescue station is located on the north side of Runway 6 between the 3-4,000 foot runway markers. The crash/rescue station provides some backup for major structural fires in emergencies.

Many facilities on Station have individual fire alarm/warning and deluge systems, however, there is no station-wide fire reporting network. The use of concrete block, cast concrete and other non-combustible building materials has played a major role in the reduction of potential fire sources.

The station-wide water supply system is adequate to handle most firefighting requirements. To provide adequate pressure in locations where large volumes of water are necessary to protect high cost/operationally critical assets, the fire hydrant

system is supplemented by salt water fire pumps at Pier 3, 400,000 gallon fresh water reservoir, and fire pumps at Hangar 379/1625 area, and 120,000 gallon reservoir and pump at the AFWTF Range Operation Control Center (ROCC).

There is no formal mutual firefighting aid agreement with any of the nearby local communities as they lack firefighting capability which could adequately supplement the Station's.

5. Family Housing

On-station family quarters are provided by 972 units (213 married officers quarters and 759 married enlisted quarters). All of the housing is centrally located with the majority of the officer and enlisted housing being south of Langley Drive (Capehart 676 units) and the latest addition, the Rainbow Hill/Caribreeze Turnkey housing (248 units), being north and south of Langley Drive. The Algodones Apartments on F.D.R. Drive have 48 MEMO units. The predominant housing types are single or duplex units which impart a pleasing residential neighborhood atmosphere. Obtaining housing on the local economy is very costly and utility services are less than adequate in many instances. These factors plus a reduction of travel time, make on-station living very attractive.

The housing area is one of the largest consumers of utilities and various programs to reduce costs have been implemented. The recent installation of solar hot water heaters will further reduce electrical consumption by taking advantage of almost continual sunlight the year round. As can be seen in Figure 27, the housing areas on Roosevelt Roads are attractive and desirable places to live. Current projections indicate

ATLANTIC OCEAN

SAN JUAN 33mi

PUERTO RICO

CULEBRA

22mi
NAVAL STATION
ROOSEVELT ROADS

12mi
VIEQUES

CARIBBEAN SEA

VICINITY MAP

CEIBA

RT.3

GATE NO.1

PORT MEDIO M

429

213 212 214 215

381 1084 1086

GATE NO.3

TO HUMACAO

AVGAS/2-OL
JP-5/3-OL
DFM/3-OL

UNDER CONST.
AVGAS/2-OL
JP-5/6-OL
DFM/6-OL

JP-5/2-OL

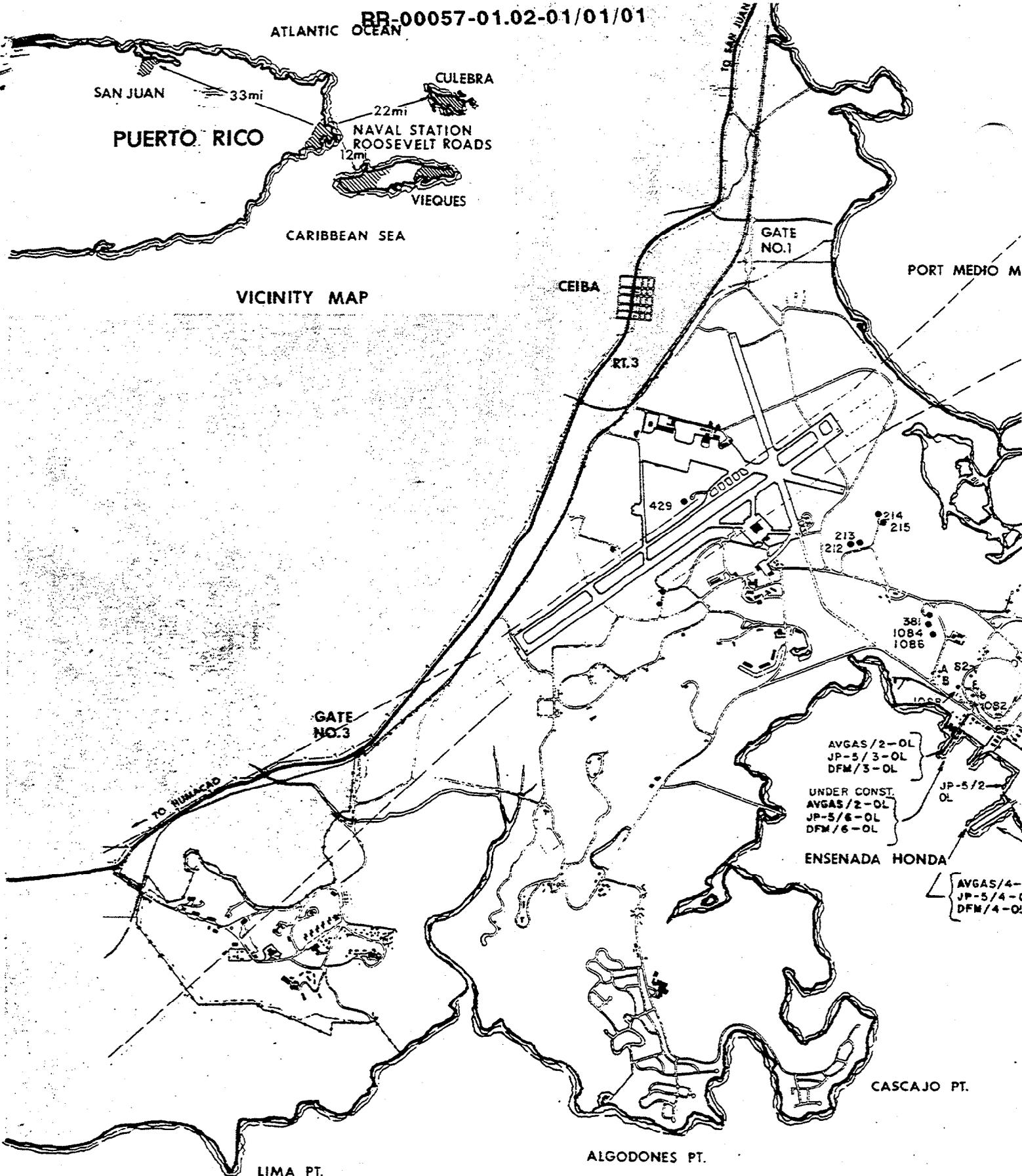
ENSENADA HONDA

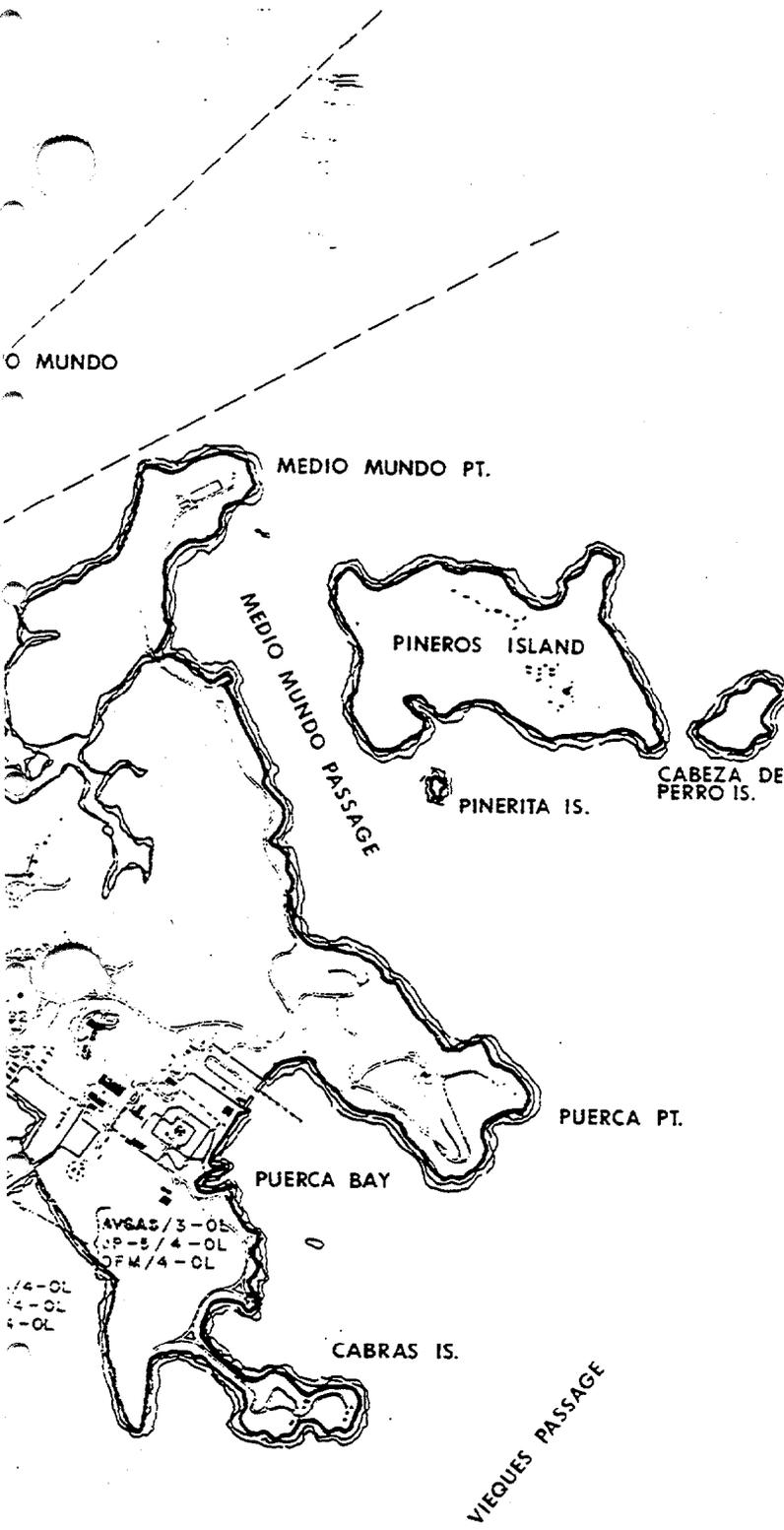
AVGAS/4-OL
JP-5/4-OL
DFM/4-OL

CASCAJO PT.

ALGODONES PT.

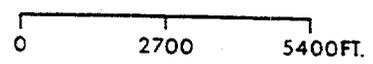
LIMA PT.



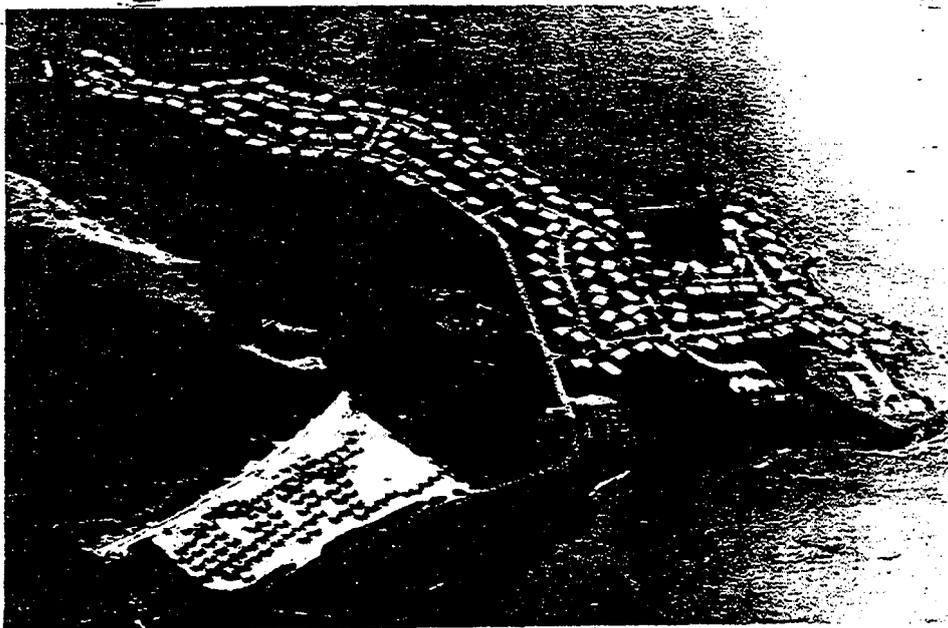


TANK NO	PRODUCT	QUANTITY
212	AVGAS	1,127BL
213	AVGAS	1,127BL
214	AVGAS	5,783BL
215	AVGAS	5,786BL
381	JP-5	27,373BL
62	DFM	50,364BL
83	DFM	27,552BL
64	JP-5	13,920BL
85	JP-5	27,433BL
1080	DFM	27,078BL
1082	DFM	27,067BL
1084	JP-5	27,404BL
1086	JP-5	27,404BL
1088	JP-5	9,751BL
A	JP-5	100,000BL
B	DFM	100,000BL
429	JP-5	4,743BL

OL = OUTLET



POL FACILITIES
NAVAL STATION COMPLEX
ROOSEVELT ROADS P. R.



Family Housing

Figure 27

that existing housing assets can accommodate all authorized personnel in accordance with current housing assignment directives.

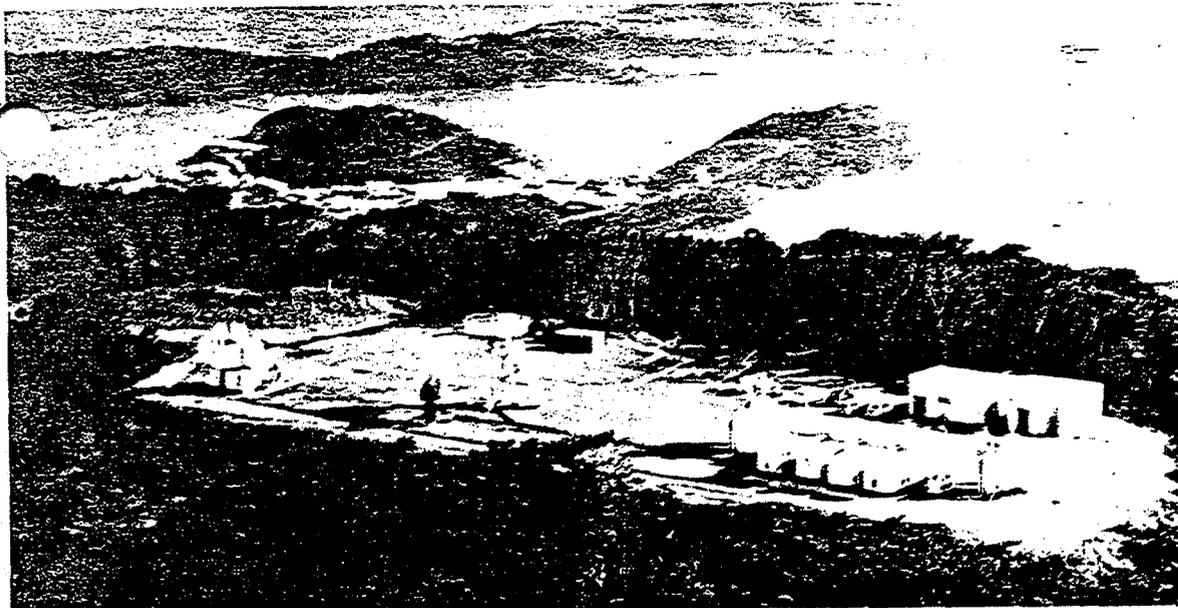
6. Off-Station Support

The Naval Station, Roosevelt Roads, in its role as the major DOD installation in Puerto Rico has assumed or has been tasked with varying degrees of support for Naval and other Federal Agencies on Puerto Rico and at other locations in the Caribbean. Tasking ranges from providing support to the Air Force Solar Observatory located east of the West Annex (Ramey AFB) and Armed Forces Induction Center in San Juan to the distant sites comprising the tracking network and operating areas of the Atlantic Fleet Weapons Training Facility. Roosevelt Roads support includes logistics (air and supply), real estate maintenance, administrative and medical/dental services. The major activities/sites supported by

the station are shown in Figure 2.

a. San Juan - Prior to the major phase-down of military activities in the late 1960s to the early 1970s, all branches of the Armed Forces maintained major installations in Puerto Rico. The Navy now maintains the largest installation (Naval Station, Roosevelt Roads) and consequently the station has become the primary support activity for a wide range of DOD and other Federal agencies island-wide and especially in the San Juan Metropolitan area.

Located within the confines of the former Naval Station San Juan-Drydock Area is the Navy Sea Cargo Liason Office, a branch of the Naval Station Supply Department. This office handles all Navy out/inbound cargo coming through the port of San Juan. Additionally, they provide the same service to many other Federal agencies. The Naval Station through



Crown Mt. (St. Thomas)

Figure 29

(5) Cerro Matias (Vieques East) - The eastern half of the island of Vieques consists of maneuver areas and amphibious landing zones and the AFWTF bombing, rocket and naval gunfire support ranges. A small range operations center comprised of vans and trailers is located atop Cerro Matias hill (Figure 32). From this point, range control, safety procedures and visual scoring of the accuracy of units using both live and dummy ordnance on the range is exercised. Cerro Matias has microwave links to North Delicias and the ROCC. The tracking radar at Cerro Matias has a 26 NM coverage which can "see" all but the northwestern quadrant. Operation and maintenance of the tracking and communications equipment is done by a civilian contractor and operational control is exercised by AFWTF personnel. The Cerro Matias OP is also used to monitor the ordnance demolition range, located within the air-ground target impact area.

(6) Mt. Pirata (Vieques West) - This AFWTF remote site is located at the far western end of Vieques. It provides a microwave link to the ROCC and St. Croix and has a Threat Platform Simulator for posing electronic simulations of enemy units. Mt. Pirata is tied into the ROCC and Crown Mt. via microwave link. This site is also contractor operated and maintained.

(7) Culebra - Residual facilities have been left on Culebra since use of the Island has been relegated to a passive microwave telemetry relay role. The Navy still retains its helopad there. AFWTF has retained a small complex of facilities within the Flamingo Pt. area on Culebra and the remainder of

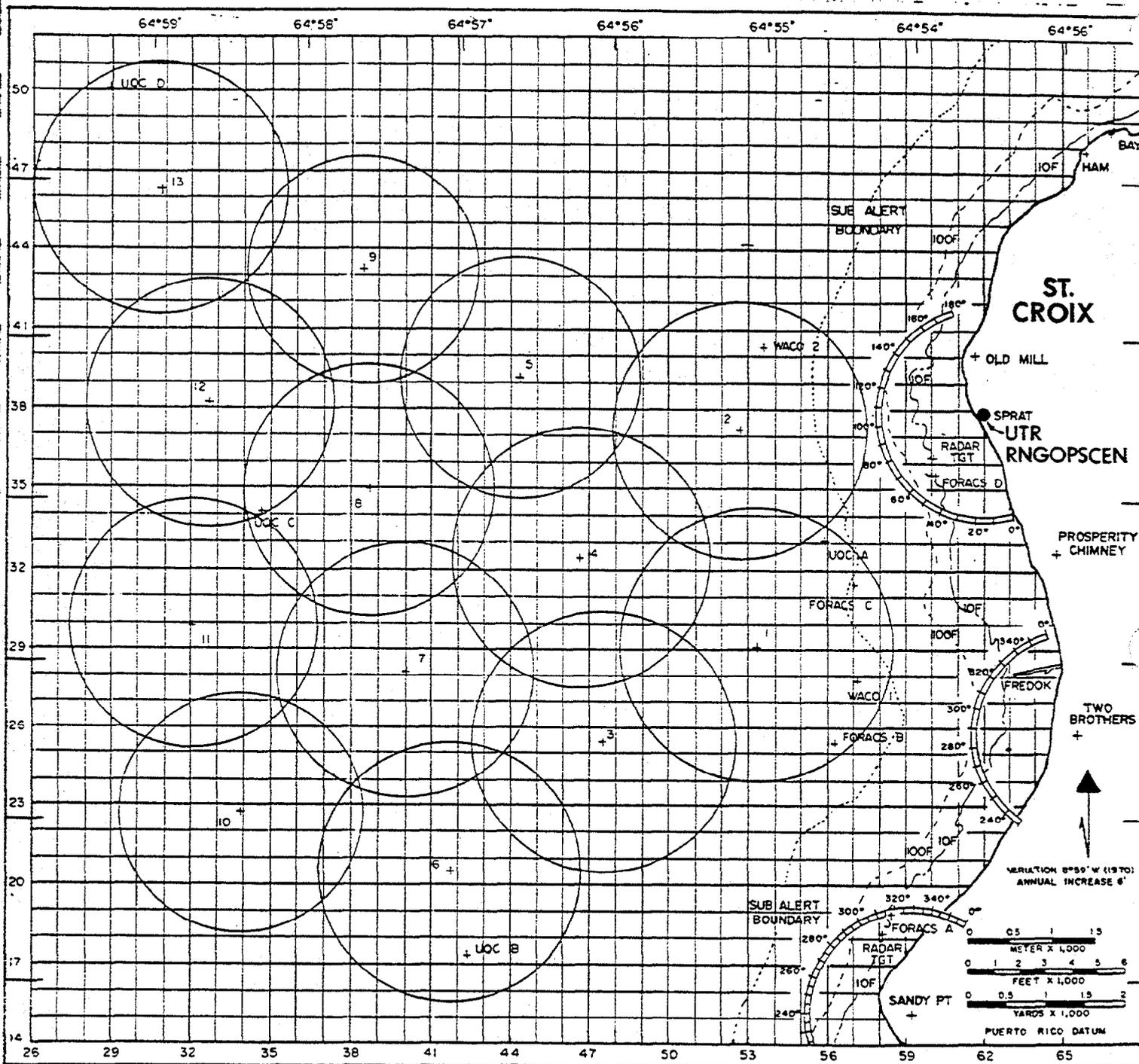
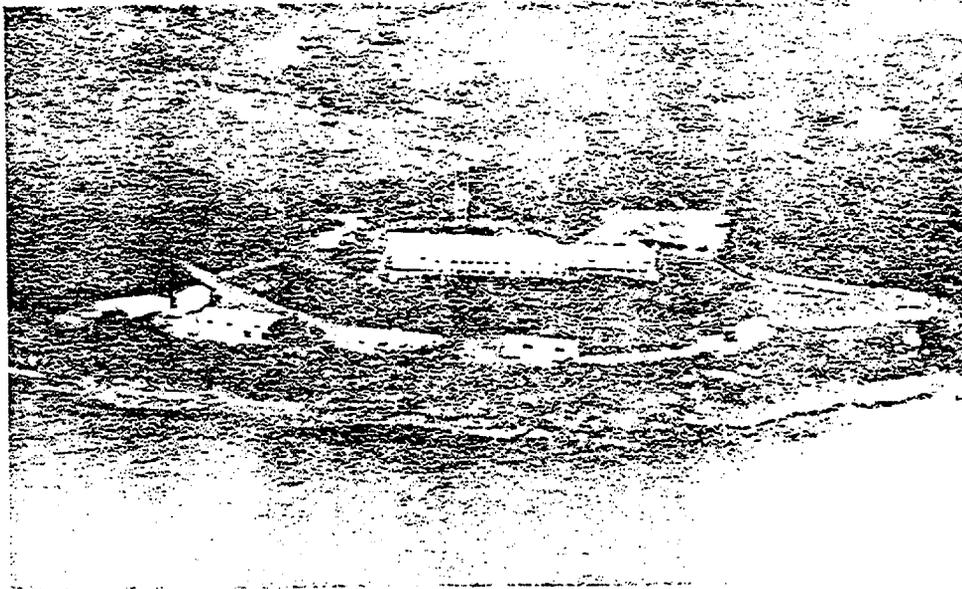
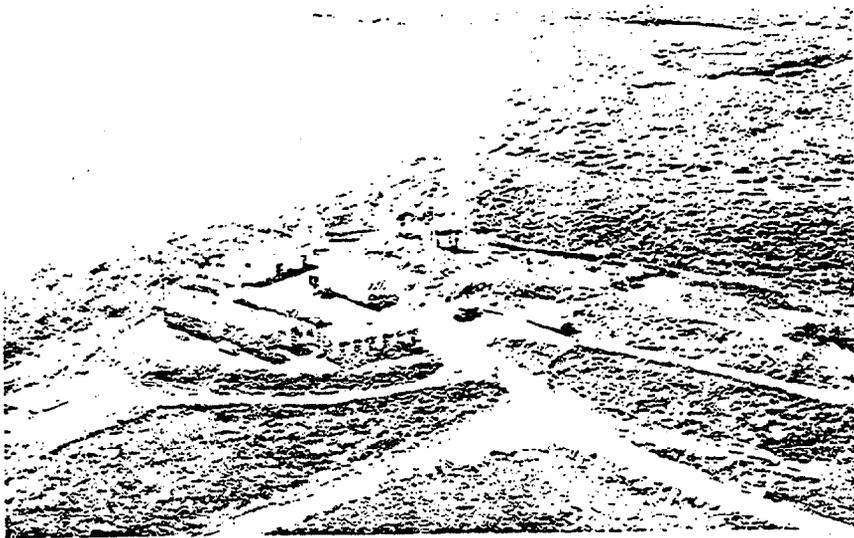


FIGURE-30
UNDERWATER TRACKING RANGE



UTR Ops (St. Croix)

Figure 31



Cerro Matias (Vieques)

Figure 32

the Navy's real estate holdings have been processed to GSA for eventual disposal.

d. Puerto Rico National Guard/Reserve - Both the Army and Air Force components of the Guard and Reserve are extremely active in Puerto Rico. These units are supported to varying degrees by Roosevelt Roads when using Station facilities for training purposes. All ordnance shipments destined for or coming from a Guard or Reserve unit are channeled through the Naval Station for accounting purposes. Large quantities of ordnance are stored at Roosevelt Roads and issued to units upon request. Sea cargo associated with Reserve/Guard units is handled by the Military Sea Liason Office in San Juan. All Guard/Reserve construction projects are monitored by the ROICC office, at Roosevelt Roads.

7. Circulation

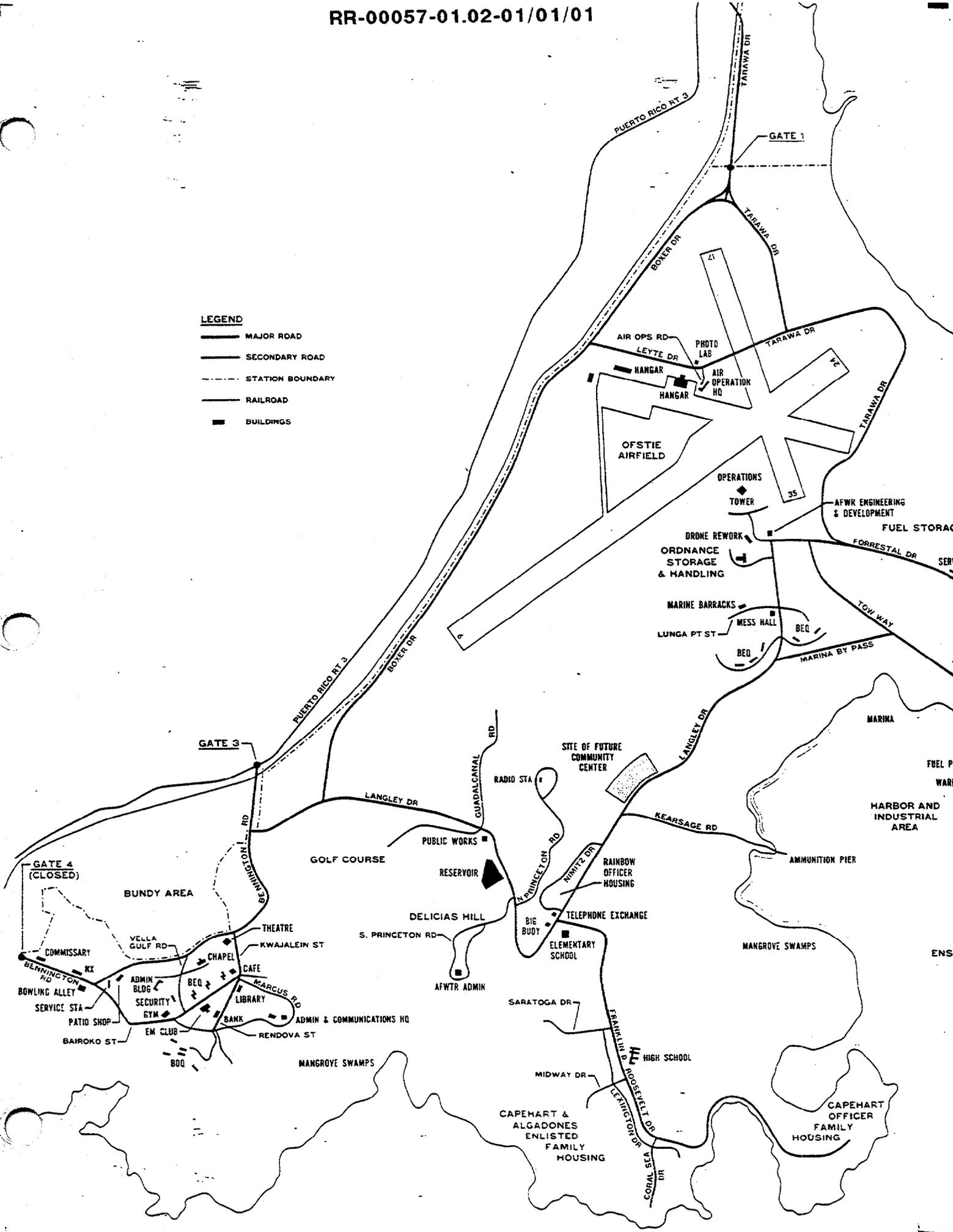
Access to Naval Station, Roosevelt Roads, is from Puerto Rico Route 3 through Gates 1 and 3. Other gates exist but are opened only for specific short term requirements. The main arteries in the station road network are shown in Figure 33. Traffic control and channelization is accomplished station-wide with standard traffic control signs and pavement markings. An exception to this is the single traffic light at the intersection of Langley and FDR Drive. This intersection has the highest traffic flow on-station as it is the only approach to the Capehart housing area and the elementary, middle and senior schools. Traffic channelization plans have been completed for the widening of Langley Drive between the FDR Drive intersection and the Marina Bypass Road. This is necessary to accommodate the projected increase traffic resulting from completion of the Commissary and Exchange facilities at the

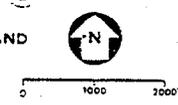
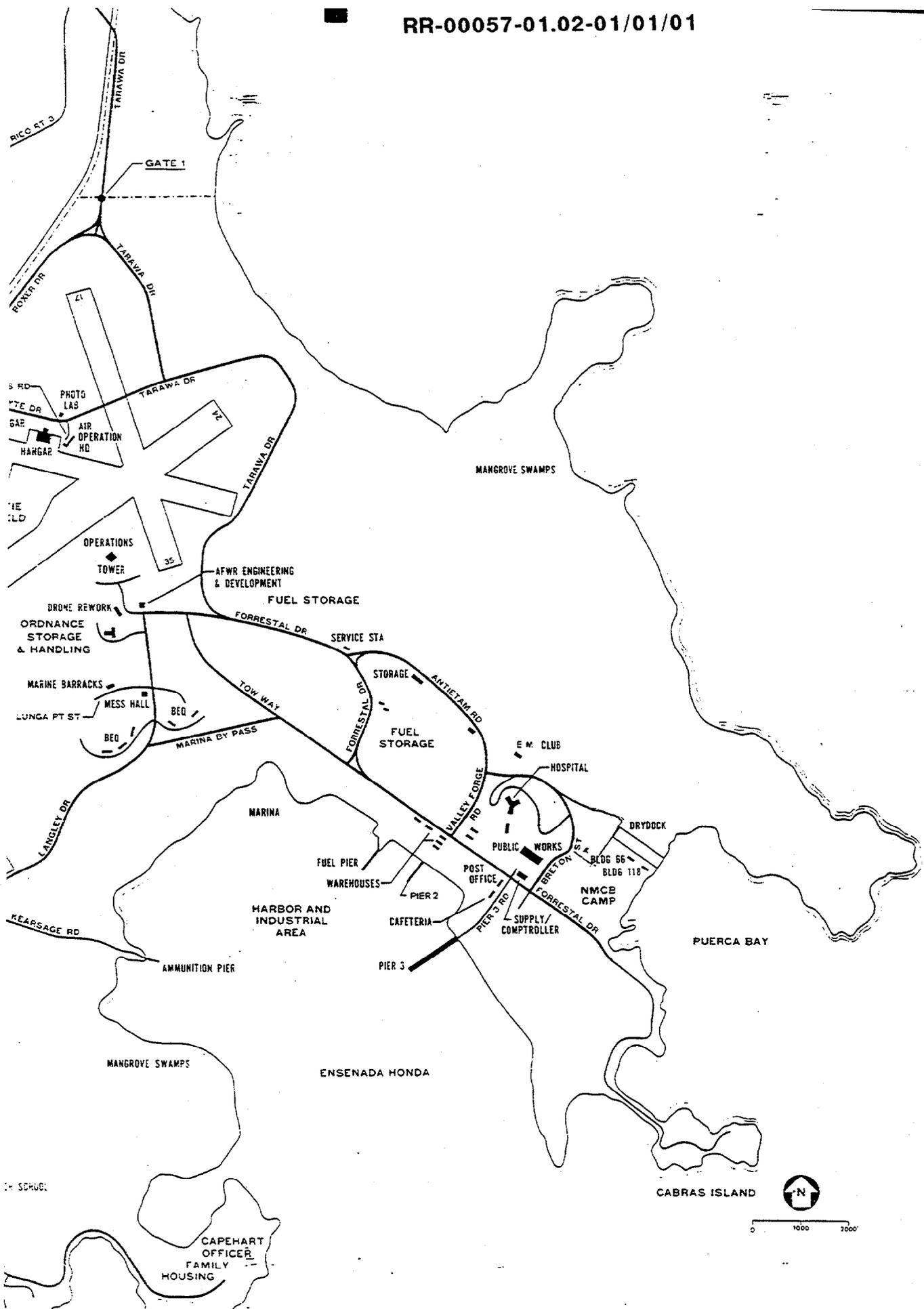
Langley Drive Community Center Complex.

Although portions of some roads on station are dangerous due to topography and road geometry, low speed limit restrictions can adequately compensate for these conditions. Traffic congestion on station is almost non-existent with occasional tie-ups resulting from unique situations or construction projects. Traffic tie-ups do occur outside of Gate 1, as this is on a two lane road and there is at this time no provision for diverting cars and trucks around stopped vehicles to speed up the entry/exit flow.

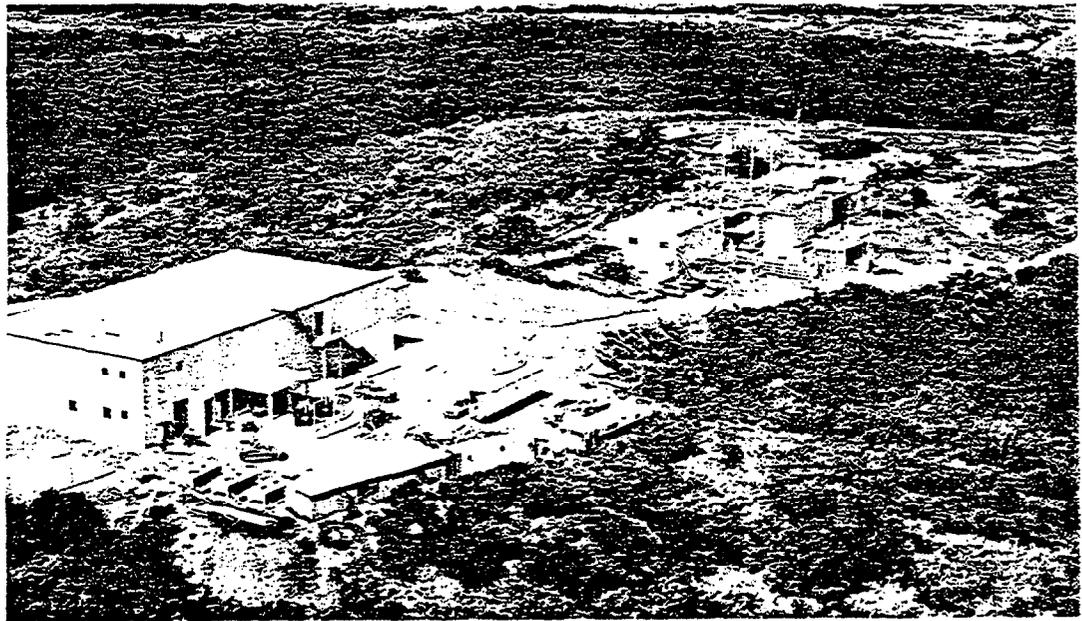
LEGEND

- MAJOR ROAD
- SECONDARY ROAD
- - - STATION BOUNDARY
- RAILROAD
- BUILDINGS





CIRCULATION NETWORK
 NAVAL STATION COMPLEX
 ROOSEVELT ROADS P. R. FIGURE 33



Conceptual Analysis

Conceptual Analysis

A. OBJECTIVE

This section of the master plan contains future land use and developmental plans for the U. S. Naval Complex, Roosevelt Roads, based on the parameters and requirements discussed in previous sections. Additionally, specific requirements developed as part of the recently updated Shore Facilities Planning System documents have a significant influence on future land use proposals. Environmental considerations resulting from or impacting upon concepts and proposals presented herein, are addressed in Appendix C, Environmental Impact Assessment.

To complement the known parameters and requirements, a group of assumptions was developed addressing the potentiality of various situations which could affect land use and facility requirements. The planned land use as developed herein, therefore, should have the necessary flexibility to accommodate a reasonable degree of change in assigned mission(s) and/or loading, without requiring major modification. The assumptions are:

1. The missions and tasks of the Naval Station, Roosevelt Roads and its assigned tenant and supported units will continue as outlined in Section III, during the Short Range Planning Period (through 1985).

2. The Commonwealth of Puerto Rico will continue as a political

subdivision of the United States and the use of land, air and water areas in and around the Commonwealth and the U.S. Virgin Islands by the U.S. Navy will continue unhampered.

3. The consolidation of most U.S. Naval training functions in the Caribbean will occur at Roosevelt Roads within the short range planning period.

4. The provision of replacement ranges by the Commonwealth in accordance with Public Law 93-166, Section 204, for those abandoned on and around Culebra will not occur within the short range planning period.

5. The utilities purchased from commercial sources will be adequate to meet projected facility growth demands through the short range planning period.

6. The Basic Facilities Requirements List (BFRL), and updates thereto, will support all valid facility requirements. Facilities that are envisioned as necessary beyond the short range planning period and not defined nor supported by the BFRL, will also be included in the plan where appropriate to insure that total planned land use projections are addressed.

7. Policies and guidance will be adopted at both the Federal and Commonwealth levels insuring that civilian encroachment and incompatible land development will not restrict or cause curtailment of

any functions within the entire Roosevelt Roads Naval Complex.

8. All planning proposals will be evaluated as to their effect (direct and indirect) both long and short-term on the habitats/environment of the wildlife and plant species listed on Figure 7.

B. FUNCTIONAL LAND USE

Land use at Roosevelt Roads is a function of two basic factors; topography and history. The topography provided the framework into which the three main base areas shown in Figure 19, (Bundy, Ofstie and the Waterfront/ Industrial,) were developed in the early 1940s. The magnitude of the investment was such, that most new development in the ensuing years, was primarily concentrated at one of these three locations. Historical use, coupled with topographic features, therefore, has "guided" functional land use to a major degree. The planned land use projections included in the 1973 master plan provided new rationale for the development of certain areas (i.e., Borinquen Hts/ Langley Drive Area) and a gradual withdrawal from others. The 1973 planned land use scheme has evolved with minor modifications and has become today's existing land use plan. The principal unfulfilled recommendation of the previous plan was the severing of the Bundy area from the Naval Station and establishment of a separate Naval Communications Station there replacing the communications station at Ft. Allen (Ponce) scheduled for closure in FY-80. The existence of sound, usable facilities in Bundy (BOQ, BEQ, Gym, etc.) and the construction of a new communications/operations building adjacent to the AFWTF Range Operations Center, has resulted in this proposal being dropped from the new plan.

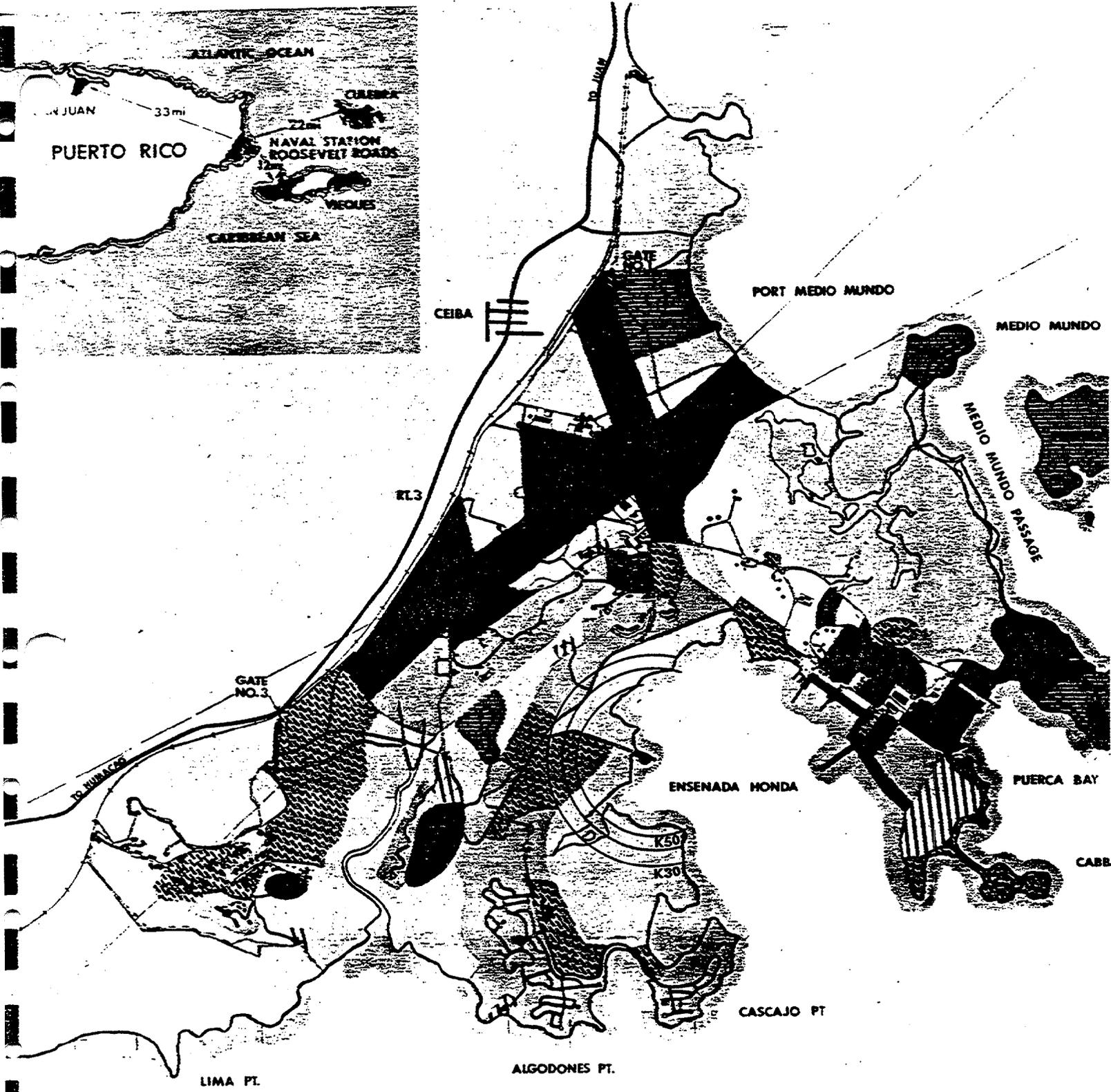
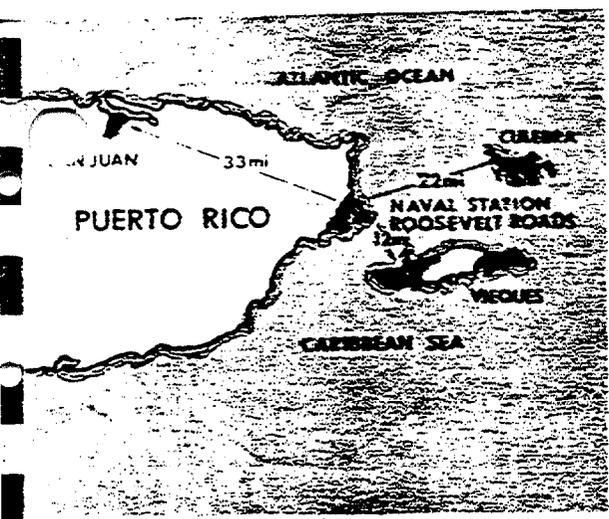
C. PLANNED LAND USE

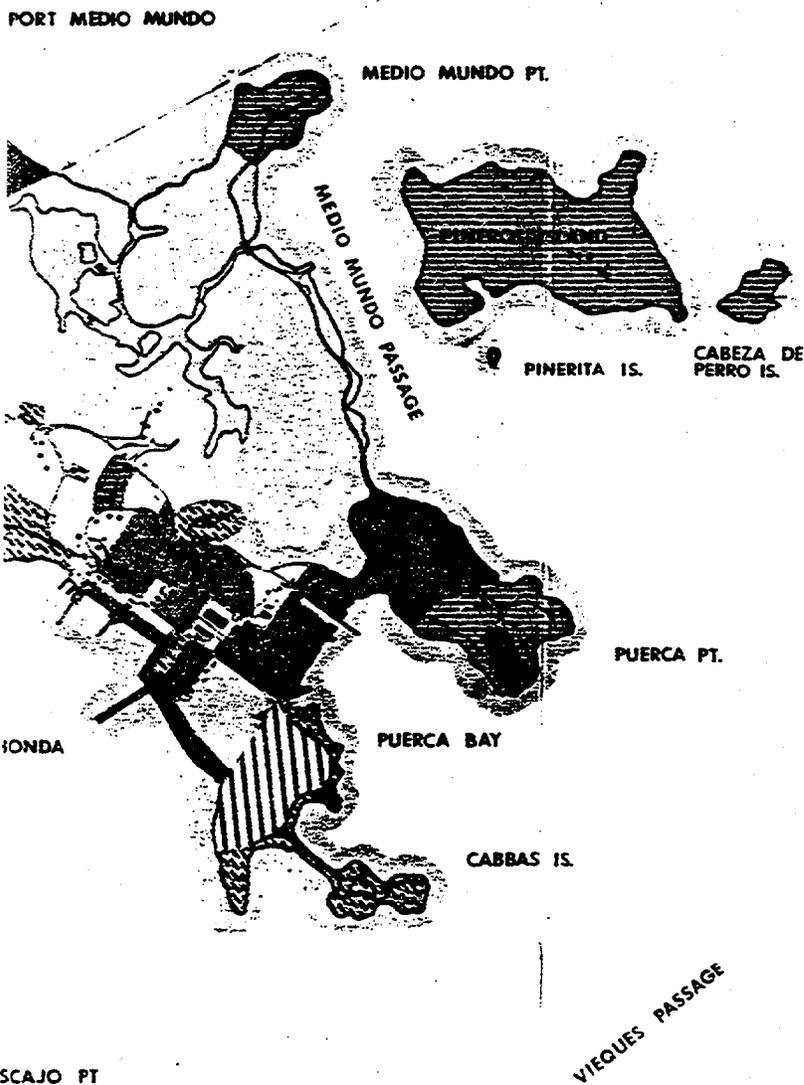
The major thrust of the Planned Land Use plan, depicted in Figure 34, is twofold: (1) to provide the framework within which further consolidation can occur to improve functions/interrelationships, and (2) to outline specific areas which should be reserved for future requirements (known and projected) which support the goal of achieving an idealized functional land use network. It is well understood that the numerous financial and priorital constraints, characteristic of all Federal programs, will permit only a portion of the "idealized solutions" to ever be realized. However, master planning tempered with logic should never aim at anything less than the total idealized goals. This is especially imperative for the Roosevelt Roads Complex, for future utilization of this Activity's assets by naval components of the United States and allied nations is projected to increase significantly.

1. Short Range Planning

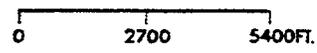
This period extending through FY-85, will include some very comprehensive geographic shifts of functions and should perpetuate the slow but orderly move of major functions from the Bundy Area. This will result in three major functional groupings with Bundy becoming basically a "bedroom" community, having but a few basic station operational functions still located there.

As the result of a comprehensive review of both existing assets, operational modes and facility deficiencies, the following proposed major facility expansions/improvements are the prime causative factors affecting the new planned land use map.





- OPERATIONS
- TRAINING/COMMUNICATIONS
- MAINTENANCE
- SUPPLY/FUEL STORAGE
- AMMUNITION STORAGE
- MEDICAL/DENTAL
- ADMINISTRATION
- TROOP/FAMILY HOUSING
- COMMUNITY FACILITIES
- UTILITIES
- MANGROVE/GREEN AREA
- OFF BASE
- WATER



**PLANNED LAND USE
NAVAL STATION COMPLEX
ROOSEVELT ROADS P. R.**

**FIGURE
34**

a. The construction of an addition to the Ammunition Pier (P-706) will result in an ordnance operations area totally free from any handling restrictions. When this pier is activated, the waterfront area will be free for development without any ordnance restrictions. The exception to this is the 75' inhabited building distance ESQD Arc for 500 lbs of Class 1.3, around Building 394.

b. The provision of a tactical ordnance loading/unloading pad, as shown in Figure 35, will provide a single location to accomplish this function in a secure and unencumbered location. By siting the pad between the runway and the ordnance storage area, both ordnance logistics and aircraft operations will be made more efficient.

c. Currently, deep draft vessels are unable to enter the Roosevelt Roads harbor due to lack of sufficient water depth. Existing depths in the approach channel to Ensenada Honda range from 39.6 ft to 44.1 MLW, however, the average depth is 40' MLW. The turning basin also averages about 40' MLW. The depths at pierside range from a 32ft MLW at Pier 1 to 37.7ft MLW in the vicinity of Pier 3. These depths currently permit safe berthing of most commissioned vessels with the exception of CVAs (all classes) and fully loaded AOE's. Additionally, the most straightforward approach to the harbor from the southeast via the Vieques Passage is also hindered due to shallow waters and rock formations. The two proposed dredging projects (P-681 and P-987) will permit full utilization of Ensenada Honda by all classes of vessels in the inventory and access to the harbor by the shorter southern Vieques Passage route will also be possible.

P-987 will dredge the entire harbor and entrance channel to a MLW depth of 42 ft + 1 and the area east of Pier 1 to a depth of 40 ft + 1 MLW. The dredging of the Vieques Passage (P-681) will provide a 1000-ft wide by 13,000-ft long approach channel to Ensenada Honda at an average MLW depth of 43 ft + 1.

d. Perhaps the severest strain on station resources, for which no beneficial payback can be expected is the physical separation of the majority of the administrative functions (located in Bundy) and the operating departments located in the waterfront/industrial and airfield areas. The annual loss in manhours, increased vehicle maintenance and fuel costs and general inefficiency caused by this trans-station commuting is enormous. The proposal to rehabilitate and convert the Ofstie Barracks into a centralized administrative complex is shown in Figures 36 and 37. Ofstie is convenient to the major operating areas on station and the proposal should permit amortization of rehabilitation expenses within a relatively short period.

Although the Ofstie Area facilities were potential candidates for demolition in the 1973 Master Plan, the possibility for renovation was recently investigated with positive results. The concrete decks and first floor walls were found to be in usable condition and the wood in upper floor in one building was in a similarly good condition. With ever decreasing fund availability and the central location of Ofstie, the potential for rehabilitation was adjudged to be a definite option. The inclusion of sound attenuating features as part of the rehabilitation project will ensure the uninterrupted use of these buildings, although they are close

to the Air Operations Area, immediately to the North

e. As an extension of the administrative move to the Ofstie area, the AFWTF Development/Engineering Department will relocate into Building 378 and the drone rework functions into a new facility on the north side of the airfield as shown in Figure 38. This will allow for closer intergration between AFWTF, the Range Contractor (RCA) and VC-8, located in hangar 1625 on the north side of the field, which launches and recovers the target drones and tows aerial targets.

f. The above AFWTF move will allow the relocation of the Weapons Department to Bldg 376, thereby putting all ordnance functions on the south side of the airfield. Additionally, the Fuels Department will also move into Bldg 376, thereby making available valuable land on the waterfront for functions requiring a pierside location.

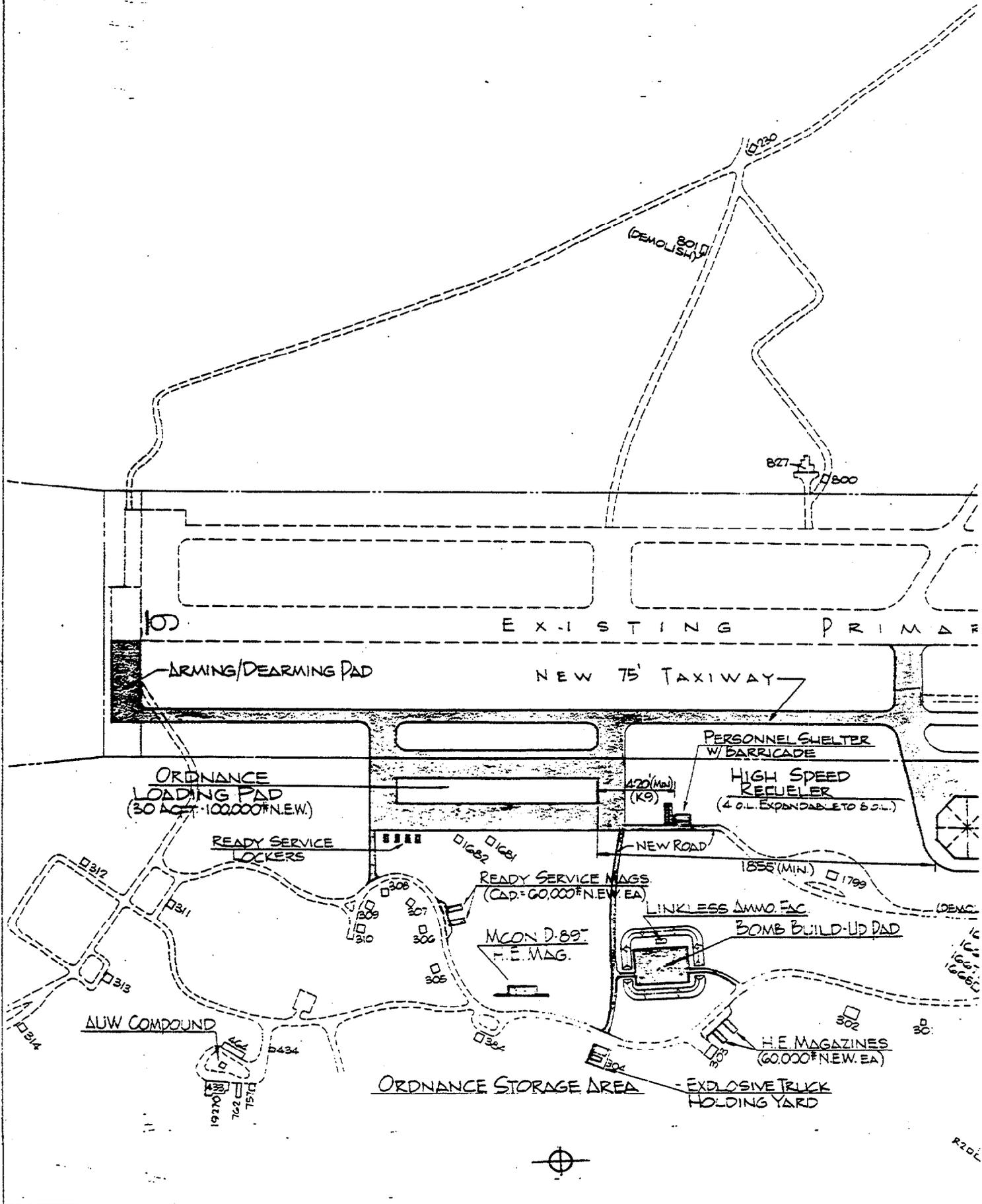
g. The effect of the proposed consolidation of training functions in the Caribbean at Roosevelt Roads within the short range planning period will be felt by almost every functional component at the Naval Station to varying degrees. The provision of an administrative and training facility near the piers for the Fleet Training Group (FTG) will be one of a group of FTG related facility requirements. To more efficiently handle the projected vessel increase, the provision of up-to-date surface operations facilities, including small craft berthing and ship repair facilities are also programmed during the short range planning period.

h. Although not a specific land use category as previously de-

lined in this plan, water impoundment areas to provide temporary water catchment during periods of heavy rainfall and surface runoff, should be implemented during this planning period. As can be seen in Figure 6, the flooding that occurs on-station has three basic causative factors, (1) increased surface runoff due to on and off-station development, (2) disruption of natural drainage patterns, and (3) the inability of certain drainage structures to carry increased water flows. By constructing relatively inexpensive earth berms in specific areas, (primarily in the vicinity of the airfield,) large volumes of water can be temporarily retained in large, shallow ponds and released at a rate compatible with the design capacity of existing drainage structures (i.e., culverts, ditches, storm sewers, etc.). The result of this land use feature should eliminate a major portion of the current flooding problems and preclude the need for costly and disruptive repairs or additions to drainage structures. Additionally, with the reduction of storm runoff flow rates, the problems caused by siltation (lessening water depths and infusing fresh water into a marine organism environment) will be markedly reduced.

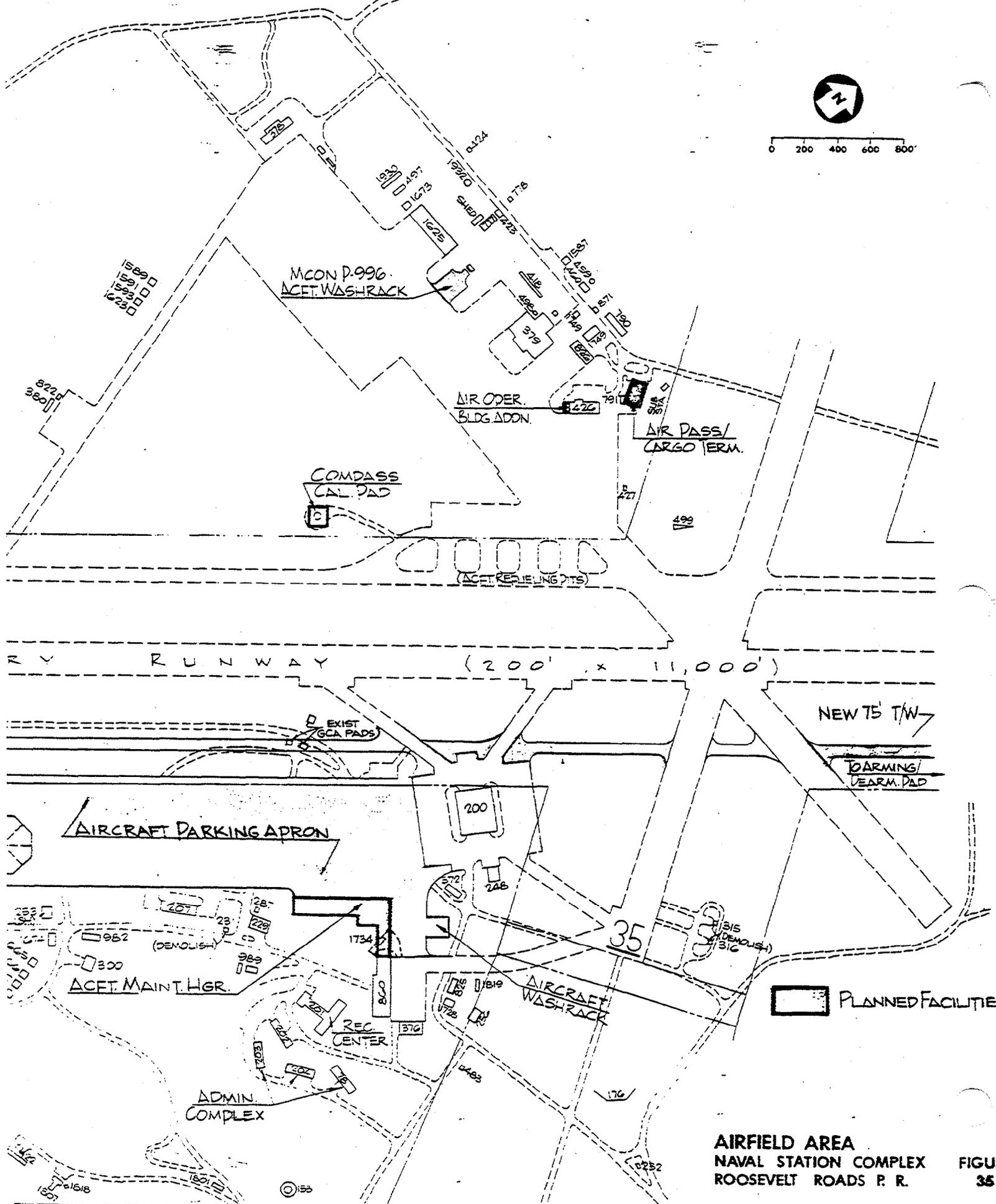
2. Long Range Planning

This period commences with FY-86 and extends approximately 15 years beyond, to the year 2000. The requirements shown in this planning period are those which have been identified as current deficiencies but which do not warrant immediate acquisition. Also included in this planning period are those facility requirements which are not presently supported by the SFPS system, but which may materialize into firm requirements in this outyear period. The inclusion of these requirements allows the master plan to fully meet

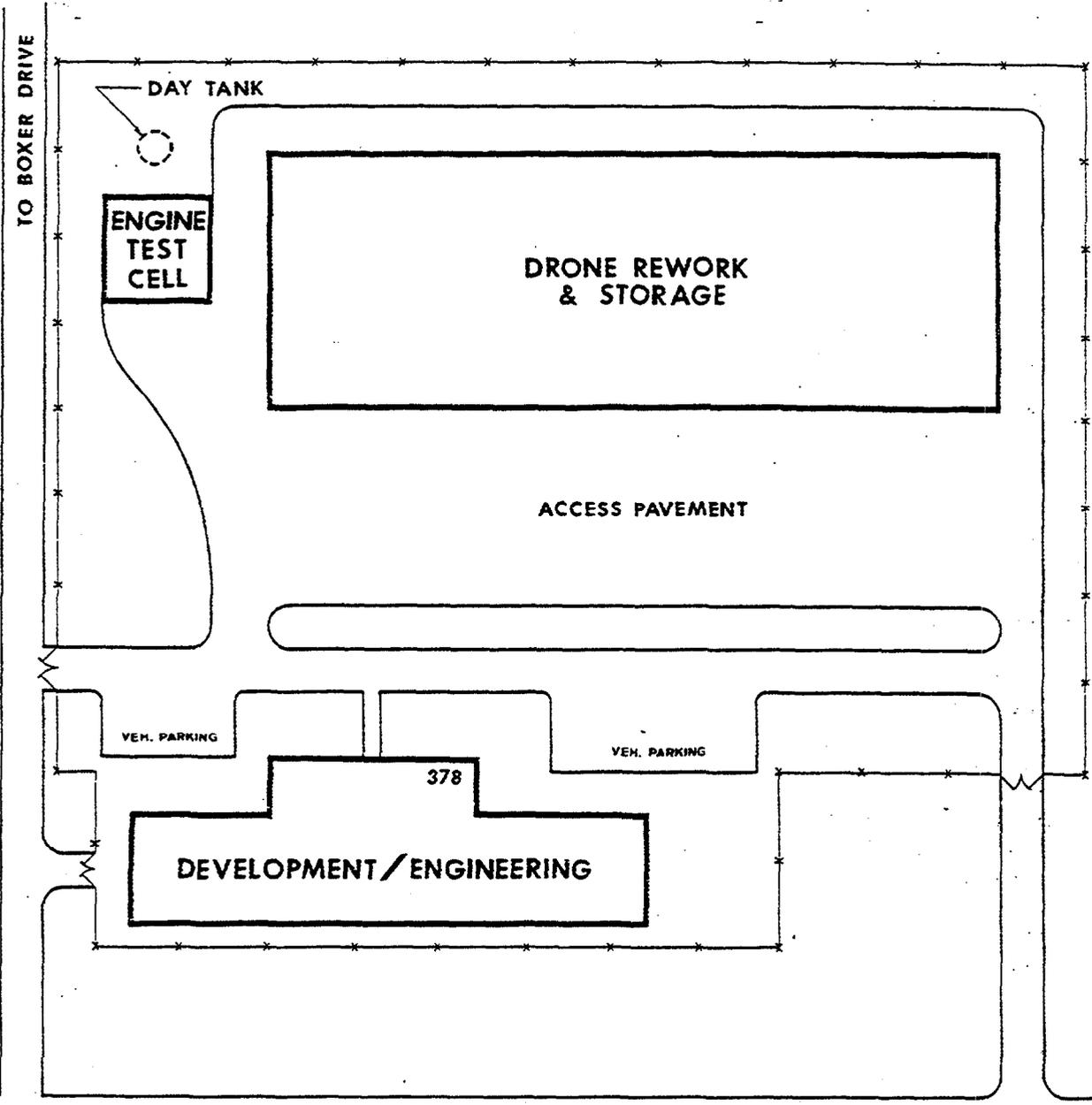
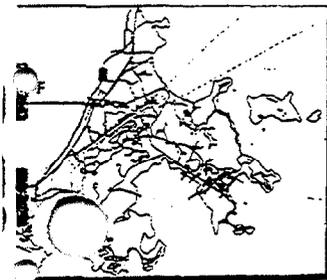




0 200 400 600 800'



AIRFIELD AREA
NAVAL STATION COMPLEX
ROOSEVELT ROADS P. R. FIGURE 35



HELO DRONE DELIVERY ZONE

EXISTING ACFT RAMP



0 40 80 FT.

TO HANGAR 1625/ VC-8

AFWTF DEVELOPMENT/
ENGINEERING & DRONE
REWORK COMPLEX
NAVAL STATION COMPLEX
ROOSEVELT ROADS P. R.

FIGURE
38

its mandate to plan logically for today, tomorrow and beyond!

a. Employing projected utilization figures of the entire Roosevelt Roads training complex by Fleet aircraft, significant deficiencies were uncovered for aircraft hangar and apron space in addition to the ancillary maintenance support functions. Figure 35 depicts the total scope of all proposed development directly related to aircraft operations. The real estate to accommodate these requirements has been set aside in the planned land use scheme, however, programming for additional parking/access apron and hangar space should be predicated on firm usage data to preclude acquisition of facilities exceeding actual requirements.

The proposal encompassing the aircraft facilities on the south side of Runway 6/24 will also require the demolition of eight magazines and eight ready service lockers to permit the planned construction. The magazines recommended for demolition are included in Appendix A. In conjunction with the planned ordnance loading pad, four new H.E. magazines (Cap 60K# NEW each) and four appropriately sited ready service lockers (See Figure 35) will provide ordnance storage to replace magazines recommended for demolition.

b. The basic airfield developmental concept is to locate all of the permanently assigned aircraft and associated support functions on the north side and the majority of the transient and rotational aircraft on the south side of Runway 6/24. To supplement the facilities available at Hangar 200, additional parking apron and maintenance hangar(s) have been sited on the south side of the field. The flow lines for aircraft using the south side area are efficiently

laid out to provide all necessary services in the proper geographic sequence, which will markedly improve the "ground time" efficiency factor. An additional parallel taxiway is also planned to facilitate southside aircraft movement. The expansion capability is also available if future requirements warrant it. The total development in the Hangar 200/ southside air operations area is shown in Figure 35.

c. To further improve the efficiency of the south side flight operations, a modified octagon high speed refueling facility (four position, expandable to eight positions) has been sited adjacent to the parking apron area. As usage increases, this facility can be expanded to accommodate eight aircraft simultaneously. The provision of an aircraft washrack facility on the southside will complete the initial group of aircraft related facilities planned for the southside of the runway.

d. The provision for an ordnance loading pad in the short range planning period, blocked out a piece of land that presently falls under existing explosive quantity distance safety (ESQD) arcs. To further optimize use of this encumbered real estate, a new bomb build-up and linkless ammunition loading facility has been located to the southwest of the ordnance loading pad. The co-location of the storage magazines, bomb buildup area and the ordnance loading pad provides a highly efficient ordnance flow.

e. As outlined in the 1973 master plan, the land along the northside of Langley Drive will continue to be developed as a community center complex. However, this complex will be limited to the Commissary, Exchange and Consolidated

Package Store. The development of the North Langley site has been limited to ensure that surface runoff can be adequately accommodated without requiring a significant investment to increase ditch and culvert sizes. To compensate for the reduction of the North Langley site, development on the south side of Langley is proposed and is shown in Figure 39. The South Langley site will include service oriented facilities while the North Langley site will be primarily a retail complex. In addition to the support functions at the South Langley site, the area will also include a Navy Lodge and a new Service Station. Adjacent to the Navy Lodge, in the area encumbered by the Ammo Pier ESQD Safety Area, it is proposed to locate a Golf Course to replace the one which is flooded annually by the Daguao River. The new course will have to be laid out with special attention to the location of Mangrove areas, wildlife habitat(s) and be farther than 2005 ft (K=30) from the Ammo Pier. The two should be able to mutually exist and compliment each other, however such a major land usage will require a well documented EA prior to final project approval.

The Community Center will contain a majority of the personnel support functions a relatively short distance from both the bachelor and married personnel quarters area. The provision of a site for an exchange service station at the South Langley Community Center site coupled with the other facilities noted, will greatly assist in the reduction of (official and personal) vehicle trips into the Bundy area, thereby reducing station-wide fuel consumption.

f. Although the Special Warfare Group does not require a large land area, specific state-of-the-art equipment additions to

their inventory will require additional facilities within the general area they now occupy. A proposed utilization of this area is shown in Figure 40, providing for a self-contained compound for this supported unit. A primary consideration at this site will be for security of various equipment employed by the SWG. Although ordnance is utilized in various training scenarios, no explosives will be stored at this site with the exception of small arms ammunition.

g. The gradual conversion of the Puerca Point area for support of AFWTF functions will be furthered by the relocation of the drone launch facility to a site southeast of the existing Fleet Analysis Center facility. This location has three major advantages over the existing site at Cabras Island: (1) Puerca Point is the easternmost portion of the Naval Station and the elevation of the proposed site (150 feet \pm above MSL) greatly increases the safety aspect for ground launched drone operations. The potential for a uncontrollable drone returning to land and impacting into a populated area is greatly reduced at the new site. Presently, operations within the Special Warfare Area are suspended when launches from Cabras Island are in progress. (2) The elevation of the proposed site and open water to the east provides unobstructed tracking of the drone during pre-launch and in-flight modes from both North Delicias and Mt. Pirata (on Vieques), (3) Sufficient room is available immediately adjacent to the launch site for a composite facility for drone storage, weight and balance and minor maintenance as seen in Figure 41. The Cabras Island area can then be returned to the Coast Guard for navigational aid usage, and permitting unrestricted use of the recreational beach area on Cabras Island.

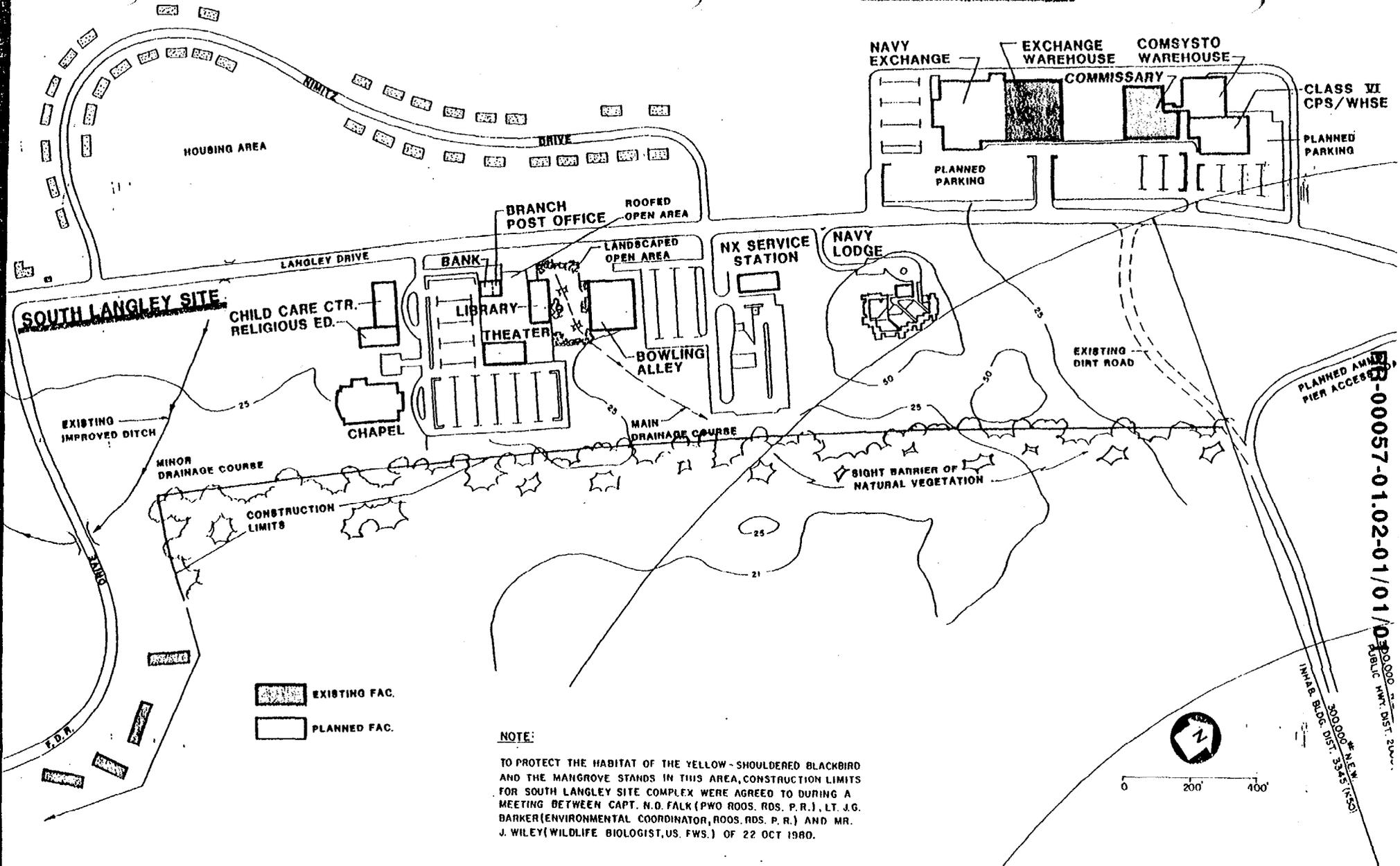
Exhaustive research done for the Environmental Assessment of the target areas at the Eastern end of the Island of Vieques disclosed no adverse affects on brown pelican rookeries even though they are located in the immediate vicinity of the target run - in lines, and subject to both high aircraft and ordnance detonation noise. Based on these findings, the use of Puerca Point for launching drones should not adversely affect the rookeries and nesting areas there. Prior to commencing design for the facility, informal "consultation" with the U.S. Fish and Wildlife Service should be initiated.

The AQM34 Drones are fueled with JP-5 and are capable of sub and supersonic speeds, dependent on the specific model employed. The primary safety criteria involved with a ground-launched drone is to secure the area around Cabras Island and terminate recreational use of the beaches there. Activity within the Special Warfare Group Compound is also curtailed. In the event of a misfire, the launch safety officer can destroy the drone. The area in and around Cabras Island is somewhat populated, creating the potential for an errant drone to cause structural damage or personnel injury. The proposed Puerca Point site is remote from all facilities with the exception of the FLTAC Complex to the north. From Puerca Point, a misguided or destroyed drone could impact in the open area to the north with a chance for some mangrove damage, but it is anticipated to be minimal and the effects to be felt for an extremely short time. The great probability would be for impact in the sea which would have an almost negligible effect, thereby underwriting the desirability of the Puerca Point site versus Cabras Island.

h. The ship berthing facilities, (existing and programmed,) are adequate to meet present and projected requirements. The land use plan, however, has allocated additional waterfront area to the southeast of Pier No. 3 for the exclusive use of future berthing and waterfront related operational facilities. This area, in addition to areas to become available in the pier area (by demolishing substandard buildings) will provide adequate expansion room for future requirements which are currently unquantified.

i. The relocation of administrative functions from Bundy to the area now occupied by the Petty Officers Open Mess (Bldg 51) was included in the 1973 Master Plan. This proposal, with modifications, is still valid. The hillside site has a commanding view of the entire waterfront and harbor area and is within a short drive of the airfield facilities and new station headquarters complex proposed for the Ofstie area. By relocating the staffs of COMNAVFORCARIB/COMANTDEFCON/COMFAIRCARIB and COMSOLANT to this area, they can interact more efficiently with the Naval Station departments and staff and continue the trend of withdrawal from the Bundy area. It is anticipated that the facilities currently occupied in Bundy (old hospital area) will require significant maintenance/repair work in the latter part of the long range planning period (1990-2000), which supports this land use proposal.

NORTH LANGLEY SITE



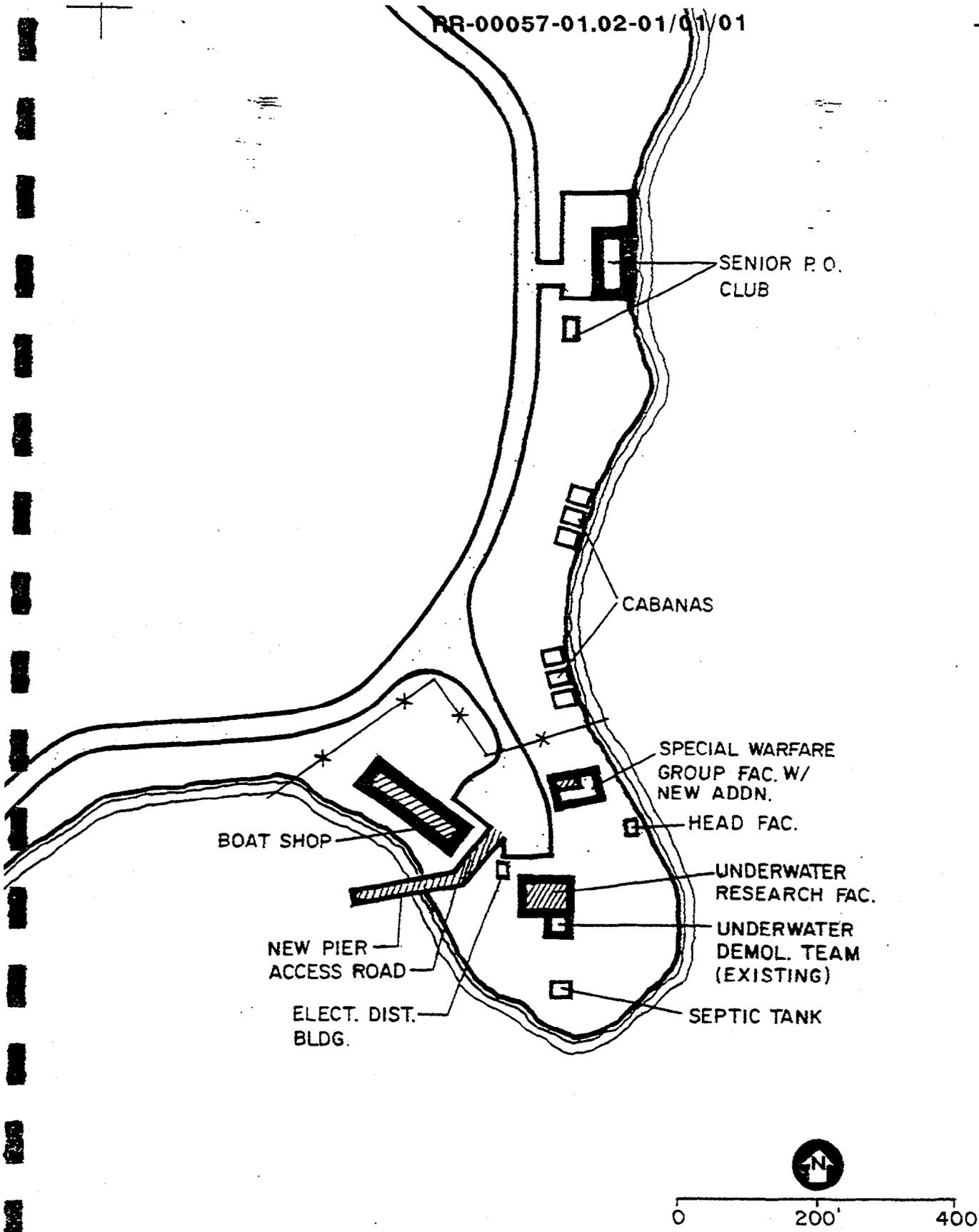
NOTE:

TO PROTECT THE HABITAT OF THE YELLOW-SHOULDERED BLACKBIRD AND THE MANGROVE STANDS IN THIS AREA, CONSTRUCTION LIMITS FOR SOUTH LANGLEY SITE COMPLEX WERE AGREED TO DURING A MEETING BETWEEN CAPT. N.O. FALK (PWO ROOS. RDS. P. R.), LT. J.G. BARKER (ENVIRONMENTAL COORDINATOR, ROOS. RDS. P. R.) AND MR. J. WILEY (WILDLIFE BIOLOGIST, US. FWS.) OF 22 OCT 1980.

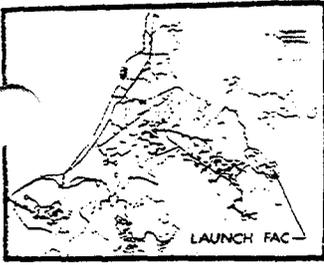


COMMUNITY CENTER COMPLEX
NAVAL STATION COMPLEX **FIGURE**
ROOSEVELT ROADS P. R. **39**

BR-00057-01.02-01/01/03
 30000 N.E.W.
 PUBLIC HWY. DIST. 2000



**PLANNED
SPECIAL WARFARE
GROUP COMPOUND
NAVAL STATION COMPLEX** **FIGURE**
ROOSEVELT ROADS P. R. **40**



TO FLTAC

EMERG. GEN DAY TANK

PAVING

DRONE MAINT

WEIGH&BALANCE

VEH. PARKING

LAUNCH CONTROL (2nd. FLOOR)

DRONE STOR.

PAVING

LAUNCH PADS

TO DRONE OPER. AREA

LAUNCH PADS



0 20 40 FT.

PUERCA POINT
DRONE LAUNCH FAC.
NAVAL STATION COMPLEX
ROOSEVELT ROADS P. R.

FIGURE 41

Capital Improvements

V. CAPITAL IMPROVEMENTS PLAN

The Capital Improvements Plan (CIP) quantifies the various planned land use recommendations and functional/operational requirements described in previous sections in terms of actual projects or other methods of acquiring necessary facilities. The overall complex development is shown in Figures 42 and 43 which locates the general siting for each MILCON project supported by the Shore Facilities Planning System. The CIP illustrates how to implement the master plan recommendations. As an implementation plan, it provides a blueprint of "how to get there from here". In addition to the military construction projects identified during the master plan update, the project listings also include those projects to be accomplished by station, special project non-appropriated and other funding sources. This produces a complete picture of the total facility project requirements.

The Capital Improvement Plan presented here and in Appendix A includes all of the MILCON projects included in the latest Program Objectives Report (#1360) and those appearing on the recently approved OPNAV Form 11000/3 for the Naval Station, Roosevelt Roads and its tenant activities. All of the projects, both on the main station and at the remote locations, are sited (where appropriate) in Figures 42 and 43, which comprise the Capital Improvements Plan(s) for the entire complex.

The Capital Improvements Plan will be updated currently with the periodic updating of the Master Plan unless, in the opinion of the Activity, sponsor or Engineering Field Division (EFD), earlier or more frequent revisions are necessary to accurately portray and support the needs of the Activity.

A. MAIN STATION DEVELOPMENT

The developmental recommendations contained herein are broad brush, providing general siting and conceptual comments. The specifics of costs, configuration, etc., are components of a project that are finally resolved during the design phase of the specific project. Inclusion of the projects/recommendations in the Capital Improvements portion of the Master Plan should not be construed as approval of the project itself; authorization and appropriation for each specific project must satisfy the statutory and review requirements governing that type of project (i.e. MILCON authorization/appropriation by U.S. Congress).

The following major recommendations are grouped by functional use and combine both host and tenant requirements.

1. Operations and Training

- Provide additional aircraft access and parking apron on the south side of runway 6/24 to accommodate the major portion of projected transient and rotational aircraft.

- Provide parallel taxiway on the south side of runway 6/24 equal to the total length ~~of~~ the runway.

- Provide additional facilities to support transient aircraft including maintenance hangar, washrack, high speed refueler and fixed aircraft start system.

- Provide new compass calibration and power check pads.

- Provide additional ordnance related facilities to include: tactical ordnance loading pad, support ready magazines/lockers, bomb build-up/ linkless ammo facility and arm/dearm pads at each end of runway 6/24.

- Relocate functions not directly related to the air operations functions from the terminal building and expand the terminal complex to include a full RATCC facility and new passenger and cargo terminals.

- Relocate the ordnance operations functions from Building 378 into Building 376.

- Demolish Building 304 and provide an explosive truck holding area to accommodate two tractor/trailers at the same site.

- Extend the ammunition pier and improve the rock quarry haul road west of TACAN site providing direct access to the ammunition storage area. Upon completion of the pier extension, (P-706), terminate all ordnance handling on pier 3.

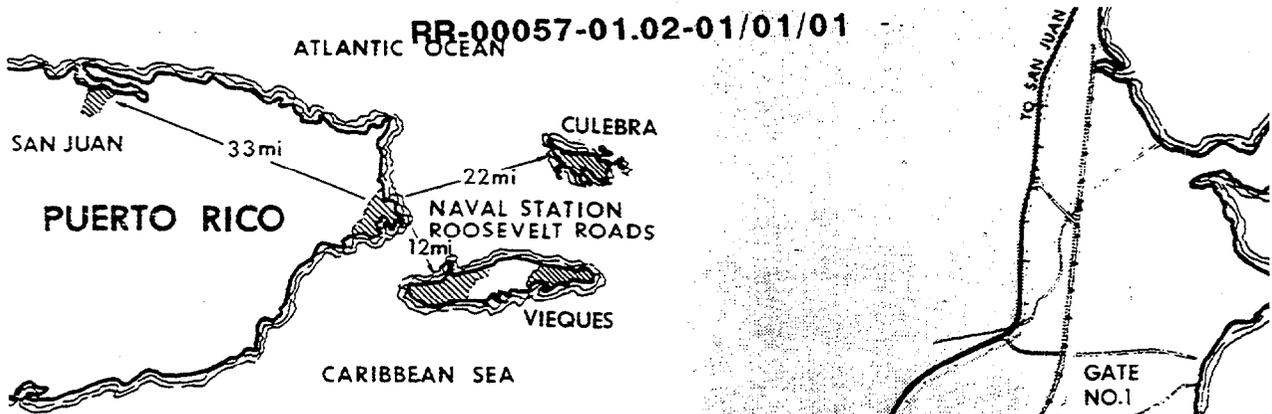
- Provide new waterfront operations facility including small craft berthing with cold iron capability and a marine railway to facilitate repairs.

- Provide addition to the AFWTF Range Operations Center to accommodate need for increased instru-

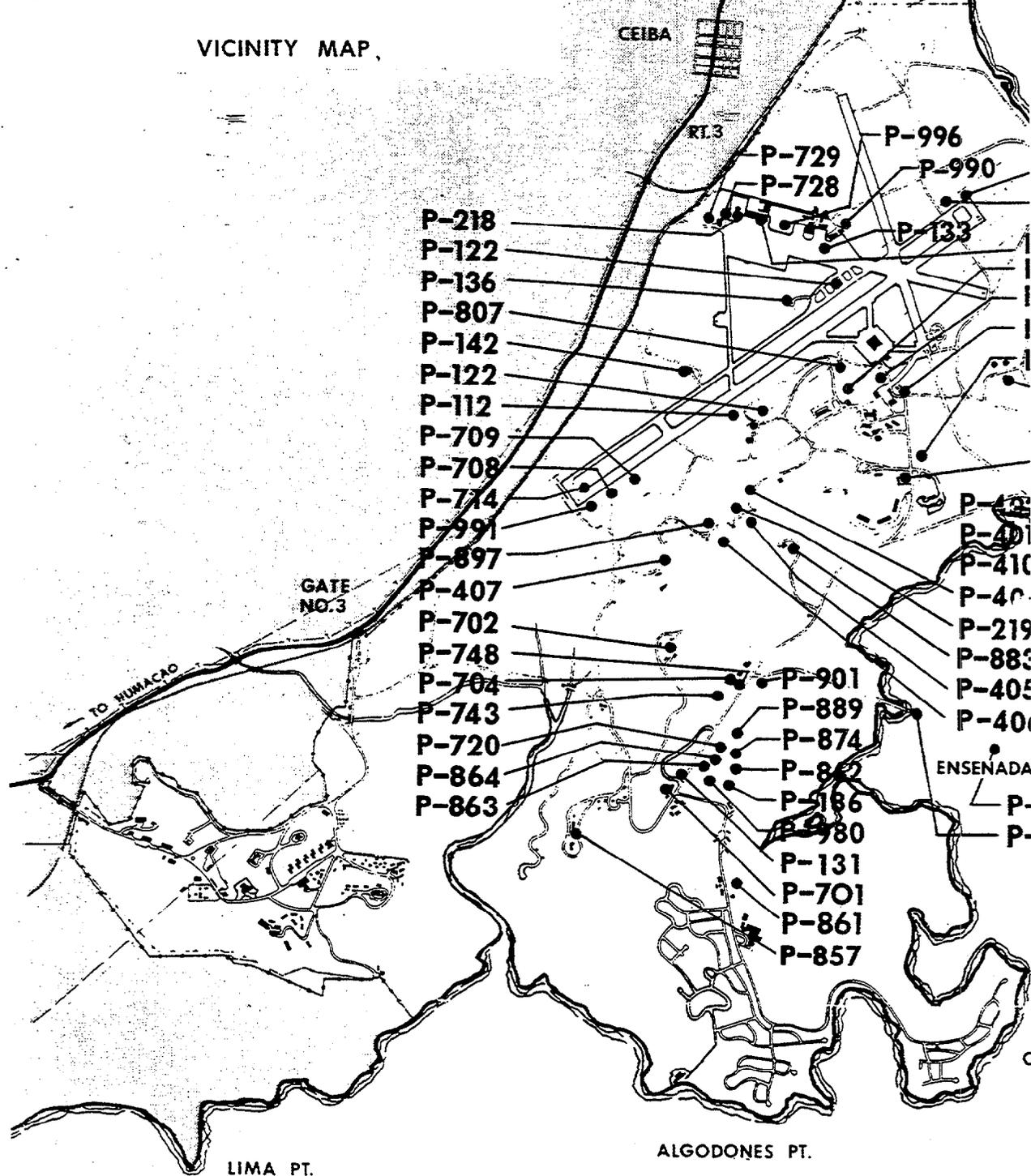
mentation and support areas related to the operation of the entire range complex.

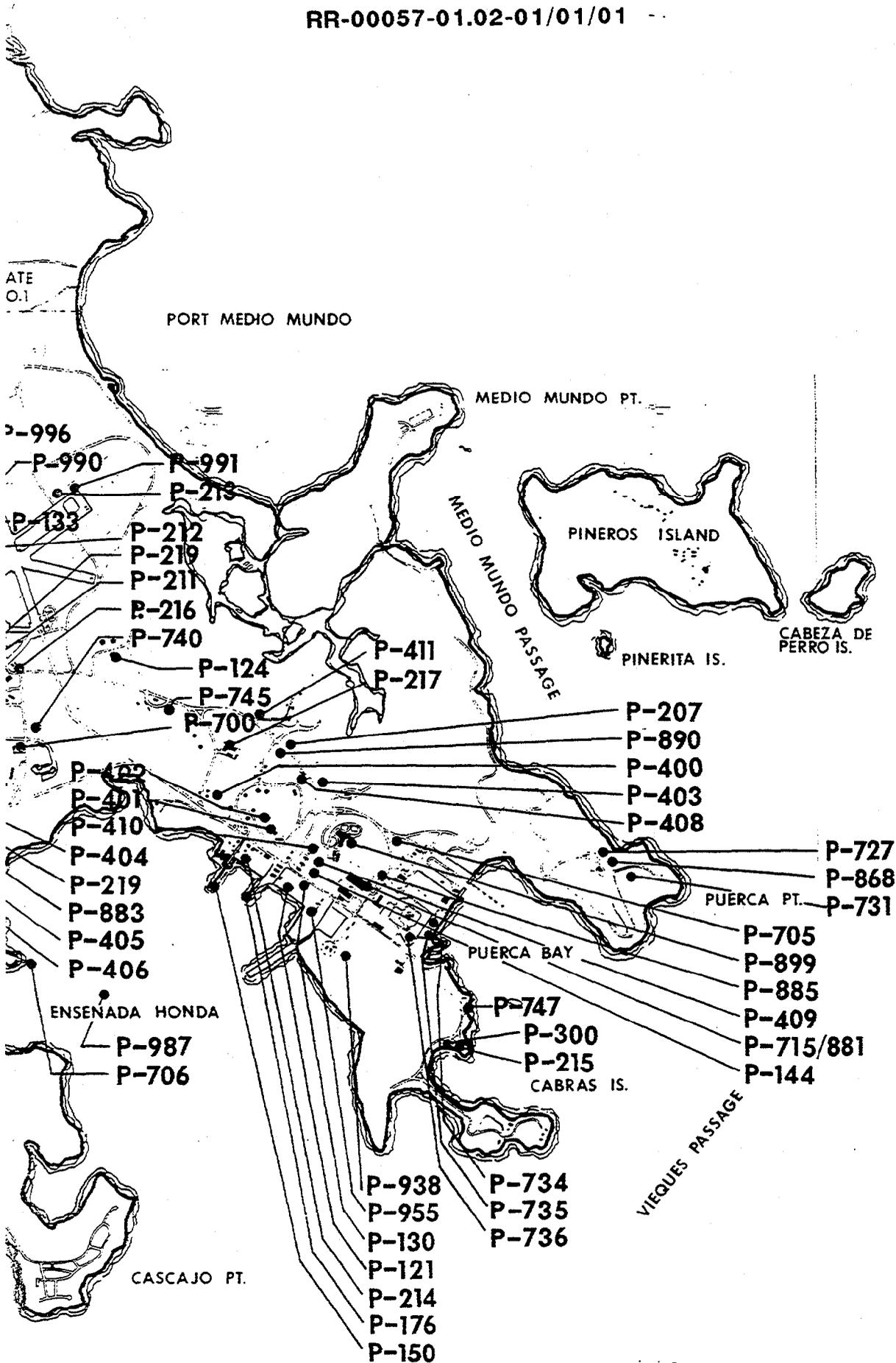
- In conjunction with the relocation of Naval Station functions into the Ofstie area (Building 376 area,) the AFWTF Drone Maintenance and Development/Engineering functions will relocate to Building 378 on the north side of the airfield. In addition to occupying Building 378, it is recommended that a new drone overhaul and maintenance shop and associated engine test cells be provided (see Figure 38). This relocation permits easy delivery of helo-recovered drones to the maintenance area. Proximity to VC-8, which provides aerial target and drone recovery service for the range, will increase operational efficiency. The proposed relocation is one of the key moves necessary to make the "Bundy to Ofstie" move a reality. Functionally, the move is ideally adapted to the needs of AFWTF.

- Relocate the existing drone launch facility from Cabras Island to the ridge line on Puerca Point. The elevation of the proposed site and its more easterly location will permit superior tracking by radars at Crown Mt. and Mt. Pirata, immediately after drones are launched. The Puerca Point site is in a very sparsely populated area (FLTAC is the only nearby function) which improves the safety potential of launch operations. Activity must currently be curtailed at the Cabras recreation area and the Special Warfare Group compound during launch events. Drones that may be uncontrollable can impact harmlessly in the waters east of Puerca Point with a relatively high degree of recovery expentancy. The Puerca Point site will be capable of accommodating four drones on the launching rails and will have nearby, a combination storage,



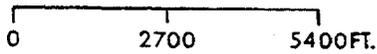
VICINITY MAP,







- P-727
- P-868
- RCA PT. — P-731
- P-705
- P-899
- P-885
- P-409
- P-715/881
- P-144



maintenance and weight/ balance facility. A hardened launch control center will also be included in the composite building.

2. Maintenance and Production

- Provide shipfitting shop for the establishment of a Ship Repair Department in conjunction with the realignment of training functions in the Caribbean.

3. Supply/Storage

- Provide additional ordnance storage facilities to accommodate known current requirements for ready ammunition, smokeless powder/ projectiles, missiles and liquid propellants.

- Increase general, cold, controlled humidity and hazardous/flammable storage capability to overcome present deficiencies.

- Provide area for the relocation of the Defense Property Disposal Office (warehousing and open storage) from Ft. Buchanan to Naval Station, Roosevelt Roads.

- Expand the capability to store the total requirement for aircraft, ship and vehicle fuels by adding additional tanks. Also, provide storage capability for contaminated fuels.

4. Medical/Dental

- As an interim measure, upgrade dental facilities in the Bundy Area and aggressively pursue the construction of a new dental clinic in the harbor/industrial area.

5. Administration

- Through a series of phased renovations and moves, the Ofstie area buildings should be rehabilitated

to accommodate a variety of functions (Figure 37). This proposal has a dual effect:

- It will relocate some of the functions from the Bundy Area to a more central location in relation to the major concentration of functions and people at Roosevelt Roads.

- The partial withdrawal from Bundy will permit the abandonment or reallocation of facilities and will markedly reduce time lost and vehicle operating expenses now experienced by the long drives to and from Bundy.

- Relocate the staff functions now located in the old hospital complex at Bundy to a new administrative facility at the site of the old Petty Officer's Club.

6. Personnel and Community Support

There are many recommendations affecting personnel and community support facilities. Appendix A and the OPNAV 11000/3 should be reviewed for detailed coverage in this area. Recommendations having a major impact on facilities in this category are outlined below:

- The continued concentration of both personnel and facilities east of the water treatment plant necessitates an additional structural fire station located in the general vicinity of the intersection of F.D. Roosevelt and Langley Drives.

- The construction of the Navy Exchange and Commissary facilities should continue as presently planned, in the Community Center complex. This will permit further reduction of functions in the Bundy Area and bring services and customers closer together in a centralized location.

•The chapel, religious education and theater facilities should be relocated into the Community Center complex as soon as possible. Both age and location of the existing facilities place a severe restriction on station personnel able to derive full benefit from the existing facilities.

•Provide an additional gymnasium in the Borinquen Heights area to adequately meet the needs of this high density population area.

•Relocate the station library and educational services office to the Ofstie area. This will bring these functions considerably closer to the population they serve.

7. Circulation

With the exception of the internal roads incident to the Ofstie administrative complex development and those associated with the air operations development south of runway 6/24, the station-wide road network adequately handles the traffic volumes imposed upon it. The recently completed traffic study accomplished by the Military Traffic Management Command includes various recommendations for improvements, some of which have already been completed or are under way.

One potential traffic problem is the encroachment of the right-of-way connecting Gate 1 to Route 3. This is the primary access route to the station. Commercial and private facilities have infringed upon the right-of-way which could be a source of future problems for the station. It is recommended that all infringements of the right-of-way be reconciled to the Navy's satisfaction. Additionally, the right-of-way becomes a parking strip for vehicles denied station access. All such vehicles should be prohibited

from parking in this area as it severely restricts traffic flow during peak hours.

8. Landscape and Architectural Design

With the advent of major programs to more effectively utilize our energy resources, the role of landscape and architectural design becomes more critical. Proposed facilities should make maximum use of materials that have inherent insulating characteristics and where necessary, these should be supplemented with additional insulation for retention of conditioned air. Facility orientation must be carefully considered to minimize solar exposure, which could adversely affect interior temperatures. Similarly, orientation should be considered for use with solar collector units which could provide supplemental energy for cooling purposes and for hot water needs. Minimal fenestration markedly reduces the heat transmitted to building interiors.

Careful selection of plant materials and their strategic placement around buildings could provide as much as a ten degree differential for a specific facility, thereby saving energy in addition to the aesthetic benefits derived.

9. Surface Water Control

The necessity to provide water impoundment areas has been underscored by recent studies. Not only will this approach negate the need to enlarge existing drainage structures, but it will provide an additional use for land currently restricted from full use (i.e., aircraft clear zones) by people oriented functions. Additionally, retardation of storm waters to a controllable flow will alleviate the siltation of the man-

grove areas, reduce sedimentation in the harbor and retain valuable topsoil which supports vegetative cover.

B. REMOTE LOCATION DEVELOPMENT

1. Vieques Ammunition Storage Facility

The ammunition storage facility is a component of the Weapons Department and is located on the western third of the island. See Figure 8.

Construct new helicopter landing pad. Existing pad is the foundation slab of a demolished building and a safety hazard, as it is undersized and above ground.

- Provide an explosive truck holding facility to provide a safe area for vehicles which, for various reasons must delay offloading (i.e., weather, ship schedules, etc.).

2. Mt. Pirata (AFWTF Vieques West)

This small telemetry site is located atop Mt. Pirata, which is entirely within the ordnance storage area on western end of Vieques (Figure 8).

- Provide small range operations center to replace the house trailers currently accomplishing these functions.

3. Cerro Matias (AFWTF Vieques East)

The Cerro Matias site provides the on-site control and scoring for users of the naval gunfire and air-to-ground target ranges located on the eastern end of Vieques (Figure 32).

- Construct a new hardened range operations center on Cerro Matias

to provide improved communications and scoring capability for units utilizing the various ranges and targets on the eastern end of Vieques. The proximity of the Cerro Matias observation facilities to various impact areas places controllers and others at the site during operations in constant danger of a "hit" by a stray or uncontrollable piece of ordnance. The hardened facility will replace the existing house trailers now used for this function.

- Provide small craft berthing with associated boat ramp and small boat house. Safe operation of the ranges and targets involves clearing any stray vessels/boats out of the restricted area prior to commencement of operations. There is at this time no safe or secure storage area or launching/berthing facilities for the range safety patrol boats.

4. St. George's Hill (AFWTF St. Croix)

This telemetry site is located at the peak of St. George's Hill on St. Croix (Figure 2).

- Construct a permanent range operations facility at this key drone control and telemetry site. Currently, this function is being accomplished by using converted trailers.

5. Underwater Tracking Range (AFWTF St. Croix)

The Underwater Tracking Range is a combination of submarine hydrophone displays located on the sea floor off the west coast of St. Croix and a range operations center which evaluates surface and submarine vessels utilizing the range (Figure 31).

- Acquire by fee simple approximately 14 acres of land (2 parcels)

which includes the existing leased site at Sprat Hall, St. Croix. The new parcel has a higher elevation, than the existing leased site, and accommodate a permanent range operations facility. The site will provide excellent visual, as well as electronic monitoring of the entire range. The existing range operations facilities are a series of interconnected trailers, containing multi-million dollar, range surveillance equipment. The site now being leased will also be acquired in fee to be utilized for range maintenance facilities. The total UTR will comprise approximately 14 acres owned in fee.

- Provide a berthing facility adjacent to the existing underwater tracking range site to accommodate vessels utilizing the range. To improve logistic support, a helicopter pad should also be built within the underwater tracking range complex.

6. Crown Mountain (AFWTF Thomas)

The Crown Mt. site provides the initial real time tracking and evaluation data back to the AFWTF range operations control center at Roosevelt Roads after a drone is launched. The site also provides area search capability to insure range safety (Figure 29).

- As with the other telemetry sites previously described, outmoded and old trailers are being used for a range operations center and associated support functions. A new permanent range operations center should be constructed.

7. Pico del Este (AFWTF-Mainland Puerto Rico)

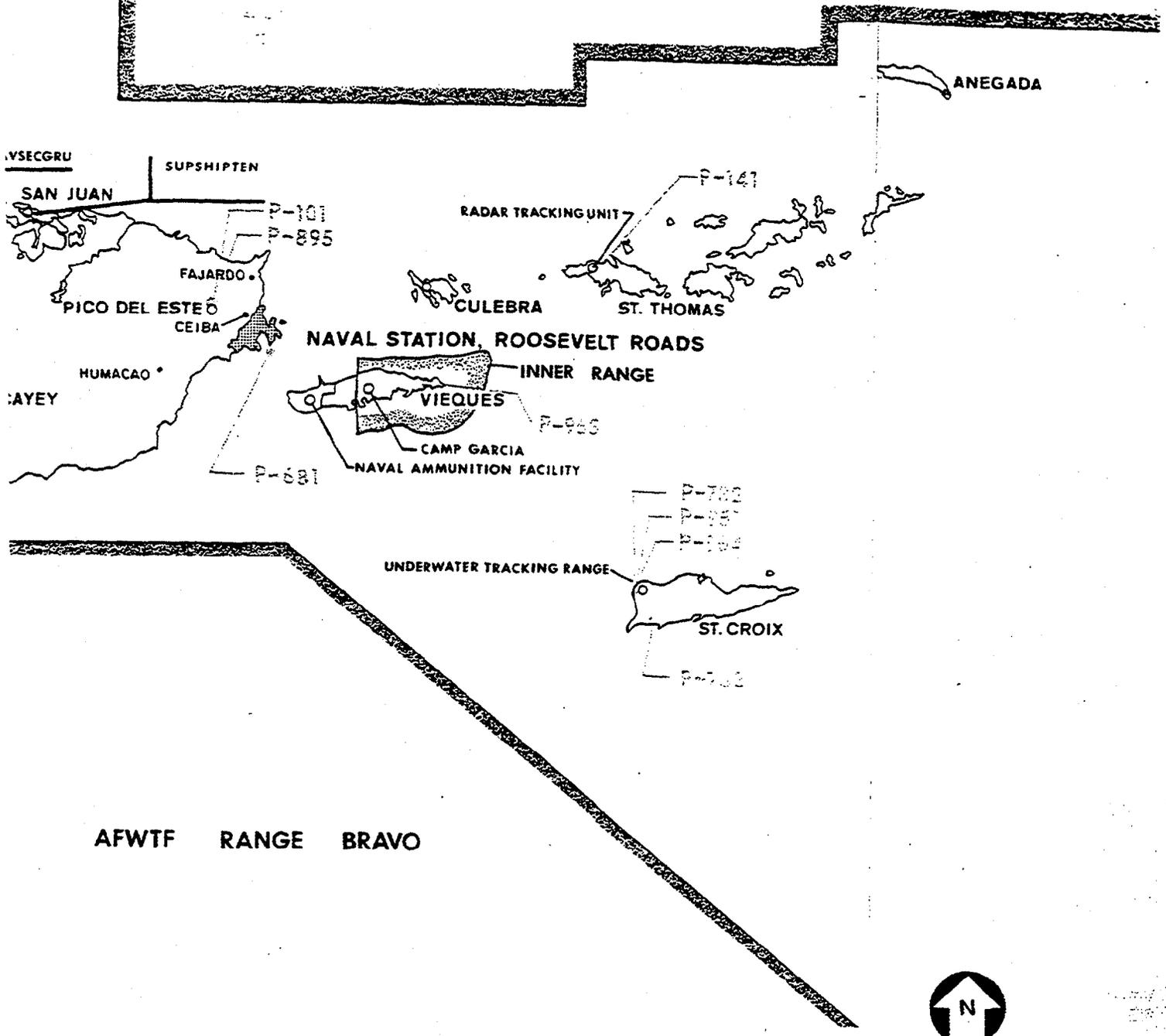
The primary function of the Pico del Este site is to provide air and

surface search radar coverage for the AFWTF operating areas. This involves long range scanning radars providing input for the safe operation of the range (Figure 28).

- Modify existing facilities at Pico del Este to accommodate the Wide Area Active Surveillance System (WAAS) radar. This will permit superior drone and missile tracking capability, markedly improving range operations and safety.

- Construct facilities to house the instrumentation necessary to control six airborne and four surface targets (airborne drones/radio controlled vessels) simultaneously. The Integrated Target Control System (ITCS), when combined with the WAAS system, provides for tracking, command and telemetry of range targets in the entire AFWTF operating area.

AFWTF RANGE ALPHA



REMOTE SITES
 CAPITAL IMPROVEMENTS PLAN
 NAVAL STATION COMPLEX
 ROOSEVELT ROADS P. R. **FIGURE 43**

Appendix A

APPENDIX A

CAPITAL IMPROVEMENT PLAN

To amplify the recommendations included in Section V - Capital Improvements Plan, the following project listings have been included for the Naval Station, Roosevelt Roads, and its tenant and supported units. The costs for all projects identified in this Appendix can be obtained from the latest Military Construction Program Objectives Report (#1360), in which cost estimates are updated frequently.

TABLE A-1

INVESTMENT CATEGORY (IC) NUMBERS AND DESCRIPTIONS

I.C. NO.	DESCRIPTIONS
1	Aviation Operational Facilities
2	Communication Operational Facilities
3	Waterfront Operational Facilities
4	Other Operational Facilities
5	Training Facilities
6	Aviation Maintenance/Production
7	Shipyards Maintenance/Production
8	Other Maintenance/Production
9	RDT&E
10	POL Supply/Storage
11	Ammo Supply/Storage
12	Other Supply/Storage
13	Medical
14	Administrative
15	Troop Housing/Messing
16	Other Personnel Support & Service
17	Utilities
18	Real Estate & Ground Structures
19	Continuing Authority
20	PSEUDO Investment Category used for Family Housing purposes only

TABLE A-2

PLANNED MILITARY CONSTRUCTION PROGRAM PROJECTS

Category Code	Project No.	Description	Scope	I.C.
112-10	P-112	Taxiways	86,700 SY	01
113-20	P-807	Aircraft Parking Apron/400 Hz Pow	170,000 SY	01
116-10	P-996	Aircraft Washrack	1,822 SY	01
116-20	P-136	Compass Calibration Pad	1,600 SY	01
116-35	P-991	Arming/Dearming Pads	16,800 SY	01
116-55	P-708	Ordnance Handling Pad	114,208 SY	01
121-10	P-122	Aircraft Direct Fueling Stations	10 OL	01
124-30	P-124	Rehab. Acft Read Fuel Stor Facs	4,297,776 GA	01
131-40	P-131	Telephone Exchange Bldg. Addn.	3,250 SF	02
141-12	P-990	Air Passenger/Cargo Terminal	14,470 SF	01
141-20	P-142	Acft Fire & Rescue Station Addn	2,100 SF	01
141-30	P-143	Acft Line Operations Building	6,500 SF	01
141-40	P-133	Air Ops Bldg Rehab and Addn	22,040 SF	01
143-55	P-144	Transit Shed	19,687 SF	12
151-10	P-706	Ammo Pier	1,680 FB	03
151-20	P-176	Berthing Pier Rehab & Addn	1,300 FB	03
151-20	P-150	Berthing Pier Addition	400 FB	03
159-64	P-121	Waterfront Ops Building	14,550 SF	03
171-20	P-130	Fleet Training Facility	30,000 SF	05
211-05	P-211	Aircraft Maintenance Hangar	100,000 SF	06

TABLE A-2 PLANNED MCON PROGRAM PROJECTS (CONTD)

441-72	P-411	SERVMART	5,960 SF 12
722-10	P-700	Dining Facility Addition	790 MN 15
740-01	P-743	Navy Exchange Facilities	44,624 SF 16
740-10	P-186	Chapel	21,012 SF 16
740-11	P-980	Religious Education Facility	7,215 SF 16
740-20	P-901	Navy Lodge	25,000 SF 16
740-30	P-889	Exch. Service Station	4,390 SF 16
740-33	P-720	Branch Post Office	1,500 SF 16
740-40	P-874	Bowling Alley (24 Lanes)	22,800 SF 16
740-43	P-742	Gymnasium	25,282 SF 16
740-55	P-861	Youth Center	5,450 SF 16
740-56	P-862	Theater (500 SE)	10,900 SF 16
740-70	P-747	NCO Club (E6-E9) Addn to Bldg 1685	6,382 SF 16
740-71	P-748	Class VI Package Store/whse	18,000 SF 16
740-74	P-863	Child Care Center	7,600 SF 16
740-76	P-864	Library	8,000 SF 16
740-80	P-744	Golf Club House	10,000 SF 16
740-85	P-745	Exchange Central Warehouse	25,457 SF 16
750-40	P-852	Golf Course	18 holes 16

TABLE A-4

PLANNED MILITARY CONSTRUCTION PROGRAM PROJECTSAFWTF

131-25	P-868	Telemetry Building	7,000 SF	02
133-75	P-101	Air Surveillance Radar Bldg Rehab	5,890 SF	01
137-33	P-727	NAVAIDS Test Ctr	1,000 SF	04
143-15	P-141	Range Ops Center (Crown Mt.)	8,302 SF	04
143-15	P-733	Range Ops Ctr (St. Croix)	2,500 SF	04
143-15	P-857	Addn to Range Op Ctr	12,652 SF	04
143-15	P-895	Range Ops Center (Pico del Este)	LS	04
143-15	P-963	Range Ops Center (Cerro Matias)	7,000 SF	04
143-15	P-964	Und Opcon Ctr - St. Croix	5,738 SF	04
143-77	P-728	Operational Storage	12,000 SF	04
151-10	P-732	Gen. Purpose Berthing Pier	2,075 FB	03
211-05	P-729	Drone Maint. Shop	42,362 SF	06
211-77	P-731	Acft Spares Storage	7,400 SF	06
216-40	P-938	Torpedo Shop	21,800 SF	08
911-10	P-951	Land Acq. - St. Croix	14.0 AC	18

NAVHOSP ROOS RDS

740-54	P-741	Recreation Bldg	6,000 SF	11
--------	-------	-----------------	----------	----

NAVREGDENCEN ROOS RDS

540-10	P-899	Dental Clinic	11,828 SF	11
--------	-------	---------------	-----------	----

TABLE A-5

DEMOLITION LISTNAVAL STATION - ROOSEVELT ROADS

Bldg No.	Category Code	Description	Quant.	U/M
28	730-77	Security Storage	2,491	SF
29	310-26	Underwater Equip. RD&T Bldg	3,116	SF
38A	411-30	Diesel Fuel Storage	1,191	BL
38B	411-30	Diesel Fuel Storage	1,191	BL
40	219-77	Housing Warehouse	8,029	SF
44	159-64	Ship Marine Repair	7,500	SF
45	159-64	Waterfront Oper. Bldg	9,600	SF
46	159-64	Waterfront Oper. Bldg	8,000	SF
48	143-75	Fuels Maint. Repair Shop	6,068	SF
51	740-69	EM Mess (E4-E6)	14,432	SF
60	441-10	General Warehouse	8,118	SF
64	219-10	Public Works Shop	306	SF
88A	154-77	Operational Storage	378	SF
113	219-10	Public Works Shop	612	SF
205	740-85	Navy Exchange Central Warehouse	16,700	SF
206	740-40	Bowling Alley	7,059	SF
253	143-20	Ordnance Operations Building	2,537	SF
258	219-10	Public Works Shop	1,162	SF
304	421-42	Weapons Storage	1,404	SF

TABLE A-5 DEMOLITION LIST (CONTD)

315	421-48	Small Arms/Pyro Magazine	700	SF
316	421-48	Small Arms/Pyro Magazine	700	SF
359	421-48	Small Arms/Pyro Magazine	111	SF
371	159-64	Waterfront Oper. Bldg	4,000	SF
373	441-30	Hazardous/Flammable Storage	4,020	SF
419	423-10	OTTO Fuel Storage	1,100	GA
443	143-75	Fuels Dept. Repair Shop	300	SF
467	740-36	Hobby Shop	3,321	SF
480	441-30	Hazardous/Flammable Storage	216	SF
498	211-37	Avionics Shop	600	SF
508	740-16	Exchange Maintenance Shop	352	SF
509	740-71	Consolidated Package Store	3,276	SF
510	214-20	Vehicle Maintenance Shop	3,420	SF
511	740-16	Exchange Maintenance Shop	833	SF
512	740-09	Exchange Service Outlet	352	SF
515	740-30	Exchange Auto Service Station	3,420	SF
520	740-31	Exchange Filling Station	1,160	SF
523	740-85	Exchange Central Warehouse	1,948	SF
524	740-85	Exchange Central Warehouse	495	SF
525	740-85	Exchange Central Warehouse	832	SF
526	740-85	Exchange Central Warehouse	1,541	SF
527	740-85	Exchange Central Warehouse	2,231	SF
529	740-01	Exchange Retail Store	18,240	SF

TABLE A-5 DEMOLITION LIST (CONTD)

531	740-16	Exchange Maintenance Shop	3,104	SF
539	740-09	Exchange Service Outlets	-	
540	740-09	Exchange Service Outlets	1,237	SF
544	740-38	Auto Hobby Shop	575	SF
545	740-37	Special Services Storage	560	SF
547	740-25	Family Services Center	1,519	SF
548	740-38	Auto Hobby Shop	2,459	SF
550	740-16	Exchange Maint. Shop	1,790	SF
572	740-09	Exchange Service Outlets	2,199	SF
575	740-18	Bank	2,383	SF
576	740-03	Exchange Central Admin Storage	825	SF
577	740-88	Educational Services Office	3,284	SF
578	740-36	Hobby Shop	2,199	SF
579	740-03	Exchange Central Admin	1,922	SF
580	740-37	Post Office (Abandoned in Place)	1,922	SF
581	740-37	Special Services Issue Office	3,252	SF
589	723-30	Laundry	657	SF
605	740-25	Family Services Center	3,382	SF
606	740-81	Recreational Lodge	3,382	SF
609	740-81	Recreational Lodge	1,989	SF
615	730-76	Animal Shelter	2,338	SF
629	740-56	Theater	10,060	SF
630	740-63	EM Club (E1-E3)	17,420	SF
639	740-10	Chapel	9,051	SF

TABLE A-5 DEMOLITION LIST (CONTD)

673	219-20	Pavmt. & Grounds Equip. Shed	351	SF
745	740-30	Exchange Auto Repair Station	4,100	SF
755	740-40	Bowling Alley	10,393	SF
764	421-72	Missile Magazine	1,200	SF
765	421-48	Small Arms/Pyrotechnics Magazine	1,200	SF
766	421-22	High Explosive Magazine	1,200	SF
783	740-16	Exchange Flammable Storage	240	SF
791	141-12	Air Cargo Terminal	1,600	SF
792	213-58	NAVSPECWARGRU Boat Shop	4,000	SF
801	740-75	Aero Club Facility	900	SF
1026	214-30	Refueling Vehicle Shed	158	SF
1045	610-10	Administrative Office	800	SF
1047	610-10	Administrative Office	800	SF
1051	610-10	Administration Office	800	SF
1055	610-10	Administrative Office	800	SF
1589	421-35	Ready Magazine	48	SF
1591	421-35	Ready Magazine	48	SF
1593	421-35	Ready Magazine	48	SF
1623	421-35	Ready Magazine	48	SF
1665	421-35	Ready Magazine	48	SF
1666	421-35	Ready Magazine	48	SF
1667	421-35	Ready Magazine	48	SF
1668	421-35	Ready Magazine	48	SF
1681	421-22	High Explosive Magazine	1,250	SF
1682	421-22	High Explosive Magazine	1,250	SF
1741	740-55	Boy Scout Center	960	SF

Appendix B

APPENDIX B

ENERGY CONSERVATION PROGRAM

A. CURRENT CONDITIONS

The two main energy sources utilized at the Naval Station, Roosevelt Roads, Puerto Rico are electricity and fuel oil. Limited quantities of liquid propane gas (LPG) are also used.

Fuel oil is acquired under contract stateside, off-loaded at Pier 1 and pumped to storage. Fuel is also delivered to the station by tank truck from San Juan. Electrical power for station use is purchased from the Puerto Rico Water Resources Authority.

1. Major Energy Uses

The major portion of purchased electrical power is utilized in direct support of airfield operations and maintenance.

2. Problem Areas

In the interest of conserving energy resources, policies and programs are being formulated at the national level which seek to further reduce consumption in the future. In support of the Navy's contribution, objectives now seek to reduce, by 1985, the energy consumption at shore installations by 20 percent using 1975 rates as base levels. Present efforts to investigate various energy saving methods are being expanded. One of the comprehensive programs, the

Energy Technology Application Project (ETAP) will provide, beginning in FY-79, a means for developing and funding energy conservation projects within the \$5,000 to \$100,000 range.

Over the next few years studies, both in-house and by A/E contracts, are planned which would investigate a wide range of potential energy saving methods. Those considered feasible will be implemented to assist the activities located in the Roosevelt Roads Complex to make their contribution to the overall Navy conservation effort.

Naval Station, Roosevelt Roads, experiences some of the same energy problems which beset the nation stateside: structures with high internal cooling losses; large areas of uninsulated glass and deteriorated window and door seals. These are a few conditions which contribute to the continual rise in energy requirements. Specific facilities or utilities requiring alteration or modification to realize energy savings have been identified by on-going Activity programs and by a study of facilities by the Atlantic Division, Naval Facilities Engineering Command.

B. RECOMMENDATIONS FOR EFFICIENT ENERGY CONSUMPTION

1. Existing Facilities

As a result of the cited studies six projects have been developed which range from providing solar hot water collectors to the conversion to fluorescent lighting and

thermal window installations in existing facilities.

2. Future Land Planning

The grouping of similar facilities minimizes the need for long utility runs which waste energy through line losses. Building orientation must be considered to minimize effects of temperature extremes on energy requirements. Retention of natural cover should be exercised in lieu of the expediency of complete site clearing to secure the advantages of temperature, moisture and wind flow control provided by such cover throughout the year. Locate parking areas to avoid creation of heat islands adjacent to buildings.

3. New Construction

Designs for new facilities should incorporate to the maximum extent practicable, energy saving features which are compatible with proposed functions. Suggested features which should be incorporated into construction design include:

- large operable windows to permit natural ventilation
- double-paned (thermal) windows and insulated walls
- high efficiency/low energy lighting (flourescent) fixtures
- specify light colored surfaces on walls and roofs

Tree species which develop good leaf crowns in from six to ten years, which placed strategically around a new building, have a significant effect in reducing cooling loads.

4. Alternate Energy Systems

Presently, no plans are formulated incorporate any systems using

other than electricity or fossil fuels as energy sources. Emphasis is currently placed on upgrading existing systems to obtain the maximum efficiency. To date, the use of solar energy or nuclear generated electricity has been used only on a limited experimental basis at DOD installations. In accordance with recent DOD instructions however, all facilities projects must investigate the potential for the application of solar energy systems in the project justification submission.

5. Energy Conservation Projects

Projects developed primarily for energy conservation and included in the Navy Energy Conservation Investment Program total \$4.5 million and are listed in Table B-1. Future projects will be developed as requirements become known.

TABLE B-1 - ENERGY CONSERVATION PROGRAM

Project No.	Project Title	Scope	Est. Cost (\$000)
P-717	*Solar Hot Water Collectors		672
P-718	Solar Hot Water Collectors	633 EA	630
P-719	Lighting Conversions	LS	598
P-721	Energy Monitoring and Control System	LS	992
P-722	Installation of Storm Windows	214,093 SF	1,511
	TOTAL		\$4,403

* Contract awarded 7 March 1978

Appendix C

ENVIRONMENTAL IMPACT ASSESSMENT

I. GENERAL

The evolution of this Master Plan required the consideration of many variables to develop land use plans and associated proposals and recommendations. One of the fundamental concepts upon which the plan is based is the recognition and minimization of potential adverse effects on the environment. Unfortunately, it is impossible to develop a plan of this magnitude without some impact on the environment. The purpose of this section of the plan is to identify and assess these effects. No attempt will be made to provide a detailed assessment for each specific facility proposal. These assessments can best be made as each project is entered into the MILCON Program. This section of the plan focuses upon the impact of major planning and land use proposals and identifies those environmental constraints that must be considered during detailed facility design and siting.

A. PLAN DESCRIPTION

The purpose of the master plan is to identify specific facilities required through FY-85 and beyond and recommend a long range development scheme for the Roosevelt Roads Complex. Major proposals include:

1. Relocate numerous functions from the Bundy Area to the Community Center Complex and the Ofstie area.

2. Relocate the Weapons Department to the Ofstie area and construct a new complex for drone maintenance near Building 378, which will house the AFWTF Development/Engineering Department.

3. Provide new aircraft pavements, and maintenance facilities on the south side of Runway 6/24 to support transient/rotational aircraft requirements.

4. Provide a tactical ordnance loading pad to accommodate 30 aircraft and provide additional ordnance support facilities.

5. Relocate the drone launch facility from Cabras Island to Puerca Point and provide support/storage facilities at the new site.

6. Provide the administrative and maintenance facilities to support the relocation of Caribbean training functions to Roosevelt Roads from other locations.

7. Extend the ammunition pier and terminate all ammunition handling at pier 3.

8. Expand POL storage facilities to include tanks for contaminated fuels.

9. Provide water catchment/ponding areas to reduce flooding, siltation and loss of topsoil in critical areas.

10. Continue to centralize personnel support facilities in the area be-

tween the Capehart/Rainbow Hill family housing areas and the Borinquen Heights bachelor housing area.

B. EXISTING ENVIRONMENT

The U.S. Naval Complex, Roosevelt Roads consists of the main Naval Station on the southeast coast of Puerto Rico with the following remote locations:

1. Island of Vieques

Aerial and surface target ranges
Ammunition storage facility

2. St. Thomas - Crown Mt.

Radar acquisition site

3. St. Croix - St. Georges Hill

Radar acquisition site

4. St. Croix - Sprat Hall

Underwater tracking range with submarine and surface restricted operating area

5. Puerto Rico - Pico del Este/Luquillo National Forest

Radar acquisition site

Numerous facilities throughout the Island of Puerto Rico for which the Naval Station has cognizance (i.e., excess facilities at Naval Station, San Juan, Ramey AFB, Culebra Island, etc.).

6. Overwater Operating Areas - Alpha and Bravo

Northeast and south of Puerto Rico respectively, and the restricted areas around the Island of Vieques.

7. Naval Station Roosevelt Roads

The main station is surrounded primarily by agricultural lands with

the town of Ceiba the only concentrated population area in the immediate vicinity of the Station. The facilities on Vieques can also be categorized as being in agricultural/rural areas. The other outlying sites are all small and in isolated areas. All segments of the complex are susceptible to continued and increasing development from the civilian sector, based either on political or economic pressure or a combination of the two. All of the land in the active part of the complex is owned in fee simple, with some leases at the outlying sites.

C. OPERATIONAL REQUIREMENTS

1. Present Operations

The diversity of operations conducted at Roosevelt Roads requires the provision of: airfield facilities, with the inherent noise and accident potential zones; port facilities for the movement of personnel and material; handling and storage of ordnance and large land and water areas for the launch and recovery of drones by VC-8 and operational maneuvering areas for air, surface and subsurface fleet components. Other requirements include personnel support facilities for single and married military personnel (i.e., medical, BEQ, BOQ and family housing).

2. Projected Operational Changes

The major projected operational changes which will have an effect on all facilities at Roosevelt Roads are:

Increased usage of the Atlantic Fleet Weapons Training Facility target ranges by full aircraft carrier wings and other DOD air components.

D. OTHER AREA MILITARY INSTALLATIONS

In addition to the active components of the Roosevelt Roads Complex, the Navy operates a Security Group Activity at Sabana Seca and the Army maintains Fort Buchanan southwest of San Juan. Numerous military facilities in Puerto Rico have been closed within the past 12 years and either transferred to the Commonwealth, operated as National Guard facilities, or have been turned over to the General Service Administration for disposition.

II. RELATIONSHIP OF THE MASTER PLAN TO LAND USE PLANS, POLICIES AND CONTROLS FOR THE SURROUNDING ENVIRONMENT

The plan was developed with respect to the compatibility of surrounding land uses. Provisions of the Clean Air Acts, Federal Water Pollution Control Act, Coastal Zone Management Act, Endangered Species Act, OMB Circular A-95 and other implementing environmental control/coordination directives are applicable. The impact of these regulations has been discussed in detail in Environmental Impact Statements prepared for MCON project P-681, Dredging Vieques Passage; P-987, Dredging of Ensenada Honda and the DEIS relative to the Navy's role on the Island of Vieques.

The master plan has also been developed in conformance with the environmental quality regulations enacted by the Commonwealth of Puerto Rico and the Territory of the Virgin Islands. In situations where the master plan and the Commonwealth's long range development plans have common grounds, the master plan recommendations have attempted to assure a smooth interface between the two. There are no known conflicts between the master plan's

proposals and existing regulations, however, the interpretation of these regulations may cause future potential conflict.

To assure that all proposals at the Naval Complex conform to all existing laws, both Federal and those of the Commonwealth, a continual review procedure must be established, in accordance with OMB Circular A-95, which sets up the coordinating requirements to screen all projects. Where potential divergences exist, the Station should establish a standing group responsible for consulting with the appropriate Commonwealth agency to eliminate potential conflicts. As previously noted in Sections IIB4 and IIB5, the provisions for initiating "Consultation" or filing "Consistency Determinations" in accordance with the Endangered Species and Coastal Zone Management Acts respectively must be included in the developmental stages of all facility construction and land alteration projects.

III. PROBABLE IMPACT OF THE MASTER PLAN UPON THE ENVIRONMENT

The majority of the recommendations in this master plan will have a minimal long-term negative impact on the environment, except as noted. A prime beneficial effect will be the increased potential for employment, services and goods should the projected increases in operational and support uses of Roosevelt Roads materialize.

1. Social

Roosevelt Roads is a fairly self-contained activity and additional personnel will have little impact on the surrounding community on a direct relation bases. However, the potential for political and social objections to the very existence of the activity is an ever present problem.

2. Economic

Undoubtedly, the increase in projected mission at Roosevelt Roads and the numerous support facilities identified will effect a major increase in goods and services necessary for adequate support. This results in an economic boost in both the primary and secondary sectors providing all types of increased support.

3. Utilities

The major demand for utilities will be placed on electrical service. Roosevelt Roads provides its own water and sewage treatment. As both the complex and the east coast of Puerto Rico expand, they will compete for available power and this could pose a potential conflict unless the Commonwealth adequately expands the capability to satisfy total requirements.

Conversely, as the functions at Roosevelt Roads become more centralized, the use of fossil fuels, primarily for automotive uses, should be reduced.

4. Water Pollution

A general increase in fleet support at the Naval Station will cause proportional increase in the sewage generated. With the programmed upgrading of the three on-station treatment plants (FY-81 MCON), adequate treatment capacity will be available, precluding the potential for pollution of nearby waters by accidental spills of untreated effluent. To preclude the possibility of water pollution from tank farm fuel spills, earth berms or containment ditches will be provided where none currently exist.

5. Solid Wastes

The existing landfill has almost

reached its capacity to accept additional refuse and other potential on-station sites have been evaluated as having either a limited potential capacity or are unsatisfactory from an environmental standpoint. The increase in fleet support as anticipated in this plan will place an additional burden on an almost full landfill site, accelerating the need to find an alternative site or some other acceptable disposal mode (i.e. contract for off-station disposal). The use of dredged material to cover over and "mound-up" on the landfill and create a "landhill" is another possibility.

6. Transportation

The interaction between the Complex's transportation requirements and Commonwealth's systems will remain relatively unchanged. The importance of the Port of San Juan will continue as the primary entry point for a majority of the products entering or leaving the island. Although proceeding at a slow pace, the widening of Puerto Rico Route No. 3, when completed, will greatly improve the Roosevelt Roads/San Juan traffic flow. The anticipated increase in operations on the Station will not have any noticeable effect on existing off-base transportation facilities.

7. Noise

The proposed increase in use of the Complex by carrier air wings will undoubtedly increase the noise levels for short periods of time in the general region. However, use of the southside of Runway 6/24 for transient aircraft will move most of the aircraft generated ground noise further away from the civilian community. This should have a positive impact on the Navy/civilian community relationship.

8. Health and Safety

The primary impact of certain master plan recommendations is the improvement of the safety environment within the Station boundaries. This has been effected by placing ordnance handling in isolated areas, away from population concentrations. Furthermore, the centralization of various functions will reduce the total annual road miles driven, thereby reducing the potential for vehicle accidents.

The provision of various fire protection and fire suppression projects in the plan should create a safer environment with respect to fire hazards.

9. Air Quality

There are no specific recommendations in the master plan which will have a detrimental impact on air quality in the general vicinity of Roosevelt Roads. Increases in fleet operations (air and sea), equipment with internal combustion engines, and greater use of the AFWTF Ranges will however, undoubtedly add additional particulate matter into the atmosphere. An almost constant easterly breeze however, should quickly disseminate and render harmless these added emissions which are primarily from a single point source, thereby keeping the air quality at its currently acceptable level.

10. Local Housing

As previously noted in the plan, Roosevelt Roads is able to house a majority of the military population authorized housing with quarters on station. The transient and rotational loading will have no impact on off-station family housing. There is occasion when transient personnel must utilize off-base quarters due to non-availability on station. The relatively few state-

side hire personnel and the civilian work force, which is expected to remain relatively stable, also will have a negligible impact on off-station housing. These people reside in the large area between the Station and San Juan, and their impact is not felt in any one specific community.

The transfer of NAVCOMMSTA Puerto Rico to Roosevelt Roads will also have no impact on housing, as their needs were factored into the recently completed 248 units of family housing. Similarly, the potential housing requirement to accommodate an expanded training mission, can be satisfied within existing asset levels.

11. Local Schools

The Antilles School System operates a full K-12 curriculum on the Naval Station and has three school facilities for elementary, middle and high school classes. All eligible students living both on and off-station are enrolled in the Antilles School System and there is no impact on local school resources.

12. Aesthetic Impact

The relative isolation of the facilities located on station in relation to the off-station community does not result in any aesthetic/design conflicts. Internally, the separation of various functional areas allows them to harmoniously interrelate without any aesthetic conflicts. The basic design material, reinforced concrete, allows for great design flexibility while maintaining an overall homogeneity.

13. Wildlife and Vegetation

The wildlife and vegetative populations located at the various complex sites (Naval Station, Vieques, Pineros, etc.) have flourished under

the Navy's stewardship. Financial pressures to develop prime real estate do not exist within the Complex's holdings. The result has been a very sensitive evaluation of land uses and construction projects in relation to potential effects on the environment. Within the Roosevelt Roads Complex there are habitats for fauna which once flourished island wide, but are now found in very few small areas. The species involved are in the following table and on Figure 7.

ENDANGERED SPECIES

WHITE CROWNED PIGEON
 WHITE-CHECKED PINTAIL
 YELLOW SHOULDERED BLACKBIRD^F
 REDDISH EGRET
 COMMON EGRET
 SNOWY EGRET
 GREAT BLUE HERON
 WHIMBREL
 PROTHONOTARY WARBLER
 HOODED WARBLER
 OSPREY
 WILLET
 CARIBBEAN PARAKEET
 BROWN PELICAN^F
 AMERICAN PEREGRINE FALCON^F
 WEST INDIAN MANATEE^{P,P}
 PUERTO RICAN GIANT ANOLE^F
 LITTORAL GECKO^{P,R}
 SLIPPERY BACK SKINK^{F,R}
 PUERTO RICAN BOA^{P,F}
 ANTILLEAN PAINTED TURTLE^{F,R}
 GREEN SEA TURTLE^P
 HAWKSBILL (Sea Turtle)^{P,F}
 LEATHERBACK (Sea Turtle)^{P,F}
 LOGGERHEAD (Sea Turtle)^P
 LAND CRABS (STATUS UNKNOWN)

P = ENDANGERED IN PUERTO RICO
 F = FEDERALLY CLASSIFIED ENDANGERED SPECIES
 R = RARE

Similarly, the vegetated areas adjacent to the water have not been destroyed or exploited as they have been in the civilian sector. The environmental impact statement completed for the Navy operations on the eastern portion of Vieques has shown that fish, birds and land fauna are more plentiful on Navy owned land, even in areas used for target practice. By removing the hunting, trapping and fishing

pressures in these areas, the Navy has, in effect, created a "quasi-game preserve".

The master plan has made no recommendations having a significant and long term negative impact on flora or fauna within the Navy owned lands. The mangroves, which provide homes to the majority of the wild-life listed above, would require costly construction methods if they were to be used for future development due to the minimal bearing capacity of the subsoil. This factor coupled with the mangrove's habitat status has resulted in no recommendations which would alter their current status. As is required for all proposed projects, detailed environmental assessments are made a part of each proposed project to identify any potential negative impact.

IV. ALTERNATIVES TO THE MASTER PLAN

A. Recommended Action

In the course of developing the master plan, proposals have been sensitive to minimizing adverse environmental effects and, accordingly, it represents a rational approach to future development for the Naval Station Complex.

B. No Action

Failure to implement the master plan concepts and recommendations and to take no action in planning for future land-use changes will leave the environment exposed to the random effects of both natural and manmade events, which will probably not be based on a broad range of interrelated facts and requirements. This would result in the environment undergoing adverse alterations from which there may be no way to return to the unaffected state.

C. Other Alternatives

The master plan currently is the only document which addresses the whole range of factors and requirements affecting the environment. The soil conservation plan, hunting and fishing regulations, aircraft operations manuals (noise levels, run up times, etc.) all speak to specific segments of the environment. The master plan correlates all of these diverse data sources, either in the body of the plan or identifying related data sources in the Appendices and Bibliography.

Partial utilization of the master plan or other related documented study recommendations may be acceptable to meet specific short range needs, but will not satisfy the requirements for a rational approach to long range development.

V. ADVERSE ENVIRONMENTAL IMPACTS

The relocations, construction projects and other proposals in the master plan will definitely alter the wildlife and vegetative balances that now exist, primarily in the areas that are not heavily developed. The paving of large areas for aircraft operations will have a definite effect on existing drainage patterns. The noise environment will be altered as different types and numbers of aircraft operate out of Roosevelt Roads. The change however, will affect primarily the duration of increased noise (i.e. an Ldn level will persist for eight weeks vice six.) and not cause the intensity of the noise (greater Ldn) to increase appreciably. The harbor area will experience increased usage with the resultant potential for oil/sewage spills, etc.

The sum of the above effects, however, are determined to be both minimal and of a short duration. The preliminary planning which is required

for all projects, operational changes, etc., should pinpoint any potential problem areas before the proposal is implemented. This allows sufficient time for the development of tactics which will minimize or eliminate the negative effects of the proposal and shorten the period during which the negative effect exists.

An exception to this is the large scale development of aircraft support facilities as shown in Figure 35. The total development will include extensive paved areas which will dramatically increase surface runoff water. The anticipated increase must be adequately addressed during design to ensure that existing drainage structures can handle the loading or make recommendations to enlarge specific structures. The crucial item is to not disturb existing drainage patterns or cause excessive siltation at discharge points.

VI. SHORT/LONG TERM ENVIRONMENTAL RELATIONSHIPS

The majority of the proposals included in the master plan will have long term significance in terms of facility construction and land utilization. These land allocations will be permanent. Reclamation and return to its original state is unlikely. However, for the old, small facilities located primarily in Bundy, they will be demolished and the land will be allowed to vegetatively regenerate. The net effect of the master plan is to insure that an acceptable environment and development balance is maintained, with neither adversely infringing on the other.

VII. COMMITMENT OF RESOURCES

The land utilized for future development will be the major resource (including building-materials) permanently committed and necessary for

the continued development of the Naval Station Complex. No extractive operations, (with the exception of rock and gravel from existing borrow areas), are anticipated, nor are any major alterations to surface or ground water sources proposed by this plan. The proposal to create storm water ponding areas to prevent erosion could have the beneficial effect of recharging the subsurface water strata when large quantities of water are impounded for a period of time.

VIII. CONSIDERATIONS OFFSETTING ADVERSE ENVIRONMENTAL IMPACTS

The master plan provides for facilities which are necessary to enhance the overall defense posture of the United States. Consideration has been afforded in every area to the compatibility of these recommendations with the preservation of the natural environment in all its many aspects, wherever consistent with national defense readiness requirements.

Appendix D

A. DEPARTMENT OF DEFENSE DIRECTIVES

DODINST 4165.45 - Military Family Housing Requirements

DOD MANUAL 4270.1M - Construction Criteria

DODSTD 5154.4S - Ammunition and Explosives Safety Standards

SECNAVINST 6240.9 - The National Environmental Policy Act and
Environmental Impact Statements

SECNAVINST 7000.14 - Economic Analysis of Proposed Department
of the Navy Investments

OPNAVINST 5000.19 - Navy Planning and Programming

OPNAVINST 6240.3 - Environmental Protection Manual

OPNAVINST 8023.20 - Waivers and Exemptions of Explosive Safety
Requirements; policies for requesting

OPNAVINST 11010.1J - Policies, Responsibilities, and Procedures
for Facilities Planning of the Naval Shore
Establishment

OPNAVINST 11010.5 - Navy Military Construction Review Board

- OPNAVINST 11010.20 - Facilities Project Manual
- OPNAVINST 11010.22 - Evaluation of Flood Hazards at Naval Shore-
(Field) Activities
- OPNAVINST 11010.32 - Forms for Presentation of MILCON Line Items
and Supporting Data
- OPNAVINST 11010.11 - Utilization of Military Real Property
- OPNAVINST 11011.12 - Safeguarding Navy Investments in Real Property
- NAVFACINST 4100.4 - Conservation of Energy in Space Heating and
Domestic Water and Heating
- NAVFACINST 4100.5 - Conservation of Energy in Buildings by Reducing
Heating/Cooling Loads and Utilizing Heat and
Recovery Techniques
- NAVFACINST 11010.14 - Project Engineering Documentation (PED)
for Proposed Military Construction Projects
- NAVFACINST 11010.32 - Military Construction Program Projects;
preparation of supporting documents for
- NAVFACINST 11010.44 - Shore Facilities Planning Manual
- NAVFACINST 11010.48 - Facility Planning in the Vicinity of Historical
Places
- NAVFACINST 11010.53 - Economic Analysis of Proposed Military
Construction Investments
- NAVFACINST 11010.57 - Site Approvals for Naval Shore Facilities;
procedures for obtaining
- NAVFACINST 11010.63 - Planning Services for Navy and Marine Corps
Shore Installations

NAVFACINST 11015.9A - Land Use Conservation Planning

NAVFACINST 11101.91 - Survey of Family and Bachelor Housing Requirements

B. OTHER PUBLICATIONS

Candidate Environmental Impact Statement - Harbor and South Approach Improvements - U.S. Naval Station, Roosevelt Roads, P.R. - Corps of Engineers, Jacksonville, District, Jacksonville, Fla., January 1978

Survey of Mangrove Forest and Rio Daguao Watershed - U.S. Forest Service, Rio Piedras, P.R. - Sept 1976

Preliminary Report on the Conservation of the West Indian Manatee, Naval Station, Roosevelt Roads - National Fish and Wildlife Laboratory, U.S. Fish and Wildlife Service, Gainesville, Florida - August 1976

Fish and Wildlife Resource Management Plan, Naval Station, Roosevelt Roads - U.S. Fish and Wildlife Service, Division of Ecological Service, Mayaguez, P.R. - August 1977

Excerpts from Rare and Endangered Animals of Puerto Rico

AMHAZ Board Report - Naval Station, Roosevelt Roads - Naval Safety Center, Norfolk letter 8023:WFV dtd 18 Nov 1977

COMNAVFORCARIBINST 8023.3D - Ammunition Handling - 16 Dec 1974

NAVSTAINST 3710.4A - Air Operations Manual

NAVSTAINST 5100.15C - HERO Emission Control - 25 Oct 1973

NAVSTAINST 5400.1N - SOPA Manual - 1977

NAVSTAINST 8023.1A - Naval Station, Roosevelt Roads Weapons Operations and Safety Manual - 16 Jan 1969

Atlantic Fleet Weapons Training Facility - Five Year Development Plan - (FY 81-85) of 6 Jun 1978

Commonwealth of Puerto Rico - Coastal Zone Management Plan

Draft Environmental Impact Statement of the Naval Operations on the Atlantic Fleet Integrated Weapons Training Ranges - Supplement
- April 1978

Draft Environmental Impact Statement - Continued Use of the Atlantic Fleet Weapons Training Facility - Inner Range (Vieques)
- 19 March 1979

Military Traffic Management Command - Traffic Engineering Planning Study - U.S. Naval Station, Roosevelt Roads, Puerto Rico
of 27 Jul 1977

NAVFAC DM-8 - Fire Protection Engineering

NAVFAC P-72 - Category Codes for Classifying Real Property of the Navy

NAVFAC P-73 - Real Estate Administration

NAVFAC P-78 - Real Property Inventory Instructions for Reporting Class 1 and Class 2 Properties

NAVFAC P-80, Parts I and II - Facility Planning Factors for Naval Shore Activities

NAVFAC P-272 - Definitive Designs for Naval Shore Facilities

NAVFAC P-328 - Military Construction Program Management

NAVFAC P-352 - Housing Administration

NAVFAC P-970 - Planning in the Noise Environment

OPNAV P-09B3-105 - Catalog of Naval Shore Activities

OPNAV 90P-1 - Navy Programming Manual

NAVELEX 0101,107 - Naval Shore Electronics Criteria Manual

NAVSEA - Ordnance Pamphlet OP-5, Volumes I & II, 4th Revision

Site Planning, Kevin Lynch, 1962, M.I.T. Press Library of
Congress Catalog Card No. 62-13231

Manual on Uniform Traffic Control Devices for Streets and Highways
(MUTCD)

Endangered and Threatened Species of the Southeastern United States
(Region IV - Includes Puerto Rico and Virgin Islands) - 1979

Air Installation Compatible Use Zones - U.S. Naval Station
Roosevelt Roads, Puerto Rico - Raymond, Parish, Pine, & Weiner, Inc.
Dec 1979

Noise Survey Report - Day/Night Average Sound Level - Naval Station
Roosevelt Roads, Puerto Rico - Aircraft Environmental Support Office
(NAVAIRSYSCOM) Feb 1979

Endangered Species Act of 1973

Coastal Zone Management Act of 1972