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FOREWORD

The Master Plan Update, Camp Lejeune Complex, North Carolina was prepared for the Atlantic Division Naval Facilities Engineering Command.

The Master Plan Update contains an introduction, a regional profile, a Complex-wide analysis and four separate "Activity Plans." The "Activity Plans" are as follows:

- Marine Corps Base Activity Plan
- Marine Corps Air Station, New River Activity Plan
- Naval Hospital Activity Plan
- Naval Dental Clinic Activity Plan

The text is organized to permit each Activity Plan to be bound separately, if desired, and has been written to avoid needless repetition between sections.

Data was coordinated through the office of the Chief of Staff, Facilities, Marine Corps Base, Camp Lejeune, North Carolina. The cut-off date for the supporting statistical data used in the analysis contained throughout the Master Plan Update is September 30, 1983. However, in some instances, the consultant received more recent data which was incorporated into the planning analyses when possible. A July 1984 cut-off date was used in recording Military Construction projects so that existing land use maps and concept plans would reflect accurately existing physical conditions.

EXECUTIVE SUMMARY

The Camp Lejeune Military Complex covers an area of approximately 110,000 acres. Four major activity areas exist at Camp Lejeune: Marine Corps Base; Marine Corps Air Station (H), New River; Naval Hospital; and Naval Dental Clinic.

The major commands which occupy the Marine Corps Base (MCB) include: the Marine Corps Base host; the 2nd Marine Division; II Marine Amphibious Force; and the 2nd Force Service Support Group. Located adjacent to the MCB is the Marine Corps Air Station, New River. The Navy Medical and Dental commands are separate units which occupy the Complex.

The purpose of the Master Plan for the Camp Lejeune Complex is to provide a basis for logical and efficient use of real estate and facilities to meet assigned mission requirements for the 1980s. The Plan is intended to establish an integrated scheme for the use of all resources.

The following factors should be considered in planning future development at the Camp Lejeune Complex:

1. Small-scale development appears to have evolved in a piecemeal fashion, resulting in conflicting land use arrangements.

2. The evolution of the Camp Lejeune Complex from extensive beach operations to vertical envelopment warfare has caused changes in training requirements, as well as land area requirements. This has caused pressure on developed areas, both inside and outside the Complex.

3. The proximity of the flood plains to the developed areas of the Complex.

4. Sensitive wetland areas which interfere with training areas.

5. Endangered species' habitats which create conflicts with training areas.

6. Built-up areas which occupy Noise and Accident Potential Zones at MCAS, New River and at Montford Point.

7. Existing development has not taken full advantage of the natural features unique to Camp Lejeune.

As part of the Master Plan for Camp Lejeune a Special Training Analysis was completed. As a result of this analysis, both short term and long term actions are recommended which would decrease training impacts on the civilian and military community while meeting the mission requirements for training assigned to Camp Lejeune. The most significant long term recommendation is to acquire an additional 52,000 acres of land west of Camp Lejeune to meet range and maneuver needs.

The Master Plan contains a detailed analysis of each of the developed areas located at Camp Lejeune. The result of this analysis led to the preparation of a Land Use Plan to guide future development. The following is a summary of the major land use recommendations:

Hadnot Point

1. Enhance the visual appearance and formal character of Holcomb Boulevard as a main entrance;

2. Maintain the regimental area;

3. Expand and consolidate industrial uses, concentrating this development east of West Road;

4. Preserve the New River Shoreline for passive recreation, increasing access and visibility; develop a segregated pedestrian/running course;

5. Provide for a vehicular circulation system which alleviates existing traffic congestion, improves safety by separating service vehicles and automobiles, and supports recommended land uses;

6. Reserve the undeveloped area west of Holcomb Boulevard and east of the industrial area to accommodate future facilities.

French Creek

1. Consolidate heavy industrial uses north of the Main Service Road, providing direct access from Sneads Ferry Road;

2. Extend the passive greenway along the New River Shoreline to provide a pedestrian/running course, linking Hadnot Point;

3. Retain locations for troop housing, administration, and community facilities.

Courthouse Bay

1. Provide two new administrative areas for the AMTRAC and Engineers' School operations;

2. Retain maintenance and storage areas, and centralize community, commercial and clinic facilities near barracks and classrooms.

Onslow Beach

1. Provide for expanded recreational opportunities which are well separated from military activity areas;

2. Preserve the southwestern beach area for training;

3. Separate maintenance and storage uses from troop housing and administrative areas, using training classrooms as a buffer.

Camp Geiger

1. Implement a campus-like environment which integrates separate classroom and administrative areas for unrelated tenants;

2. Relocate FMSS to Camp Geiger;

3. Group troop housing near personnel support and classroom facilities;

4. Link administrative areas with open space;

5. Consolidate incompatible supply/storage and maintenance uses away from student activity areas.

Montford Point

1. Create a more dense and efficient land use scheme which allows for the increased size of the Driver Training Course and for easily accommodating future physical expansion needs;

2. Designate distinct areas for occupancy by a particular school and include troop housing and personnel support activities;

3. Promote the sharing of computer facilities through the location of users.

Marine Corps Air Station

1. Restrict operational uses to the area east of the railroad tracks to minimize noise and accident potential;

2. Provide for the future expansion of the airfield and the embarkation area;

3. Designate a new service gate to promote the separation of service vehicles from passenger cars;

4. Locate the Army Reserve Training Center near Highway 17 and the new service road.

Naval Hospital

1. Segregate housing from medical service areas;

2. Consolidate clinics on the west side of the entrance road;

3. Promote efficient site access and separation of patient and service traffic.

The total cost of implementing these recommendations is $381 million for operational/training facilities and $265 million for personnel and base support facilities. Based on a Capital Improvements Plan phased over five years, this would require an annual commitment of $129 million.

PURPOSE

The purpose of the Master Plan for the Camp Lejeune Military Complex is to provide a basis for logical and efficient use of real estate and facilities to meet assigned mission requirements for the 1980s and 1990s. The Plan is intended to establish an integrated scheme for the use of all resources.

The Master Plan is structured to comply with and incorporate all elements required for a complete Military Complex Master Plan, as defined by NAVFACINST 11010.63B. It serves as a comprehensive document which generally addresses planning issues and expands upon those issues relevant to each Activity. The Plan describes briefly the Military Complex in its local and regional context, addresses issues relating to the Complex as a whole, and provides detailed planning analysis and land use plans for each of the four Complex Activities: Marine Corps Base; Marine Corps Air Station; the Naval Hospital; and the Naval Dental Clinic.

PLANNING METHODOLOGY

A pre-planning conference was held on November 8, 1983, at which personnel from LANTDIV and each of the Complex Activities reviewed and discussed the process involved and the assistance required in the preparation of a Master Plan. Following the conference, interviews were undertaken with commanding officers and key personnel for each of the Activities and major tenant commands. Data was collected and field investigations were initiated for the purpose of identifying problem areas and deficiencies. The appropriate jurisdictional agencies were contacted and data was obtained for the purpose of identifying local planning goals and objectives, economic climate, transportation systems, zoning regulations, development objectives and other factors which have an impact on the assigned Activity missions.

After completion of initial data collection activities, a detailed planning analysis was initiated. Current and immediate future facility requirements were determined from the respective Activity Facility Plans, field surveys, interviews with personnel Complex-wide and the analysis of other data. Physical constraints, both natural and man-made, were identified and then compared with functional and operational requirements.

The above procedure established the physical facility and land requirements necessary to accomplish the mission of each Base Activity. Future development goals and objectives were then established for each Activity. Alternative conceptual plans for future development, supporting the established goals and objectives, were developed for each Activity. These concept plans were reviewed by Base personnel who selected a Land Use Plan for each Activity area.

USE OF THE PLAN

The Master Plan serves as a basic guide in determining future facility development at each Activity. Although emphasis is often toward expansion or enhancement of an Activity facility, the Master Plan is also useful in planning repair, maintenance, additions, or alternations of facilities.

The Land Use Plan Maps, shown in each of the four Activity Plans, provide a fundamental blueprint for logical, orderly development of Camp Lejeune through the 1980s. Included in the Master Plan is a description of the extensive amount of data and analysis used to derive these Land Use Plans. The supporting planning rationale which guided the Master Planning process is described in detail. By consulting the Master Plan, new facility sitings can be selected that are compatible with existing and planned facilities. Implementation of this Master Plan will result in optimal functional effectiveness of Complex operations.

Marine Corps Order P11000.12C provides for Master Plan approval by the Commandant of the Marine Corps and requires subsequent siting and project development to be in accordance with the Master Plan. If sufficient cause exists for deviation, however, the Activity may submit a request to the Commandant of the Marine Corps via the chain of command requesting a change.

DESCRIPTION

Location

The Camp Lejeune Military Complex is located approximately 300 miles south of Washington, DC and 222 miles north of Charleston, South Carolina (Figure II-1). The main port-of-embarkation for the Complex is located 45 miles to the northeast, in Morehead City, North Carolina.

The Military Complex is located within Onslow County in southeastern North Carolina, approximately 45 miles south of New Bern and 47 miles north of Wilmington (Figure II-2). The county seat, as well as the primary commercial center, is the City of Jacksonville, which is the largest developed area in the County. Jacksonville's southern boundary is adjacent to the northern boundary of the Camp Lejeune Complex. The second largest developed area in Onslow County is West Onslow Beach. This rapidly growing resort community lies directly south of the New River Inlet which separates the Camp Lejeune beachfront from the County limits. Two smaller County communities that have seen recent increases in residential growth are Verona and Sneads Ferry. These are older residential communities, typified by single family mobile home residential growth, that are adjacent to the southern boundary of the Camp Lejeune Complex.

The two forest preserves existing in the County, Great Sandy Run Forest and Hofmann Forest represent two large areas of undeveloped land which are in close proximity to the Camp Lejeune Complex.

Other military activities which exist within the region include:

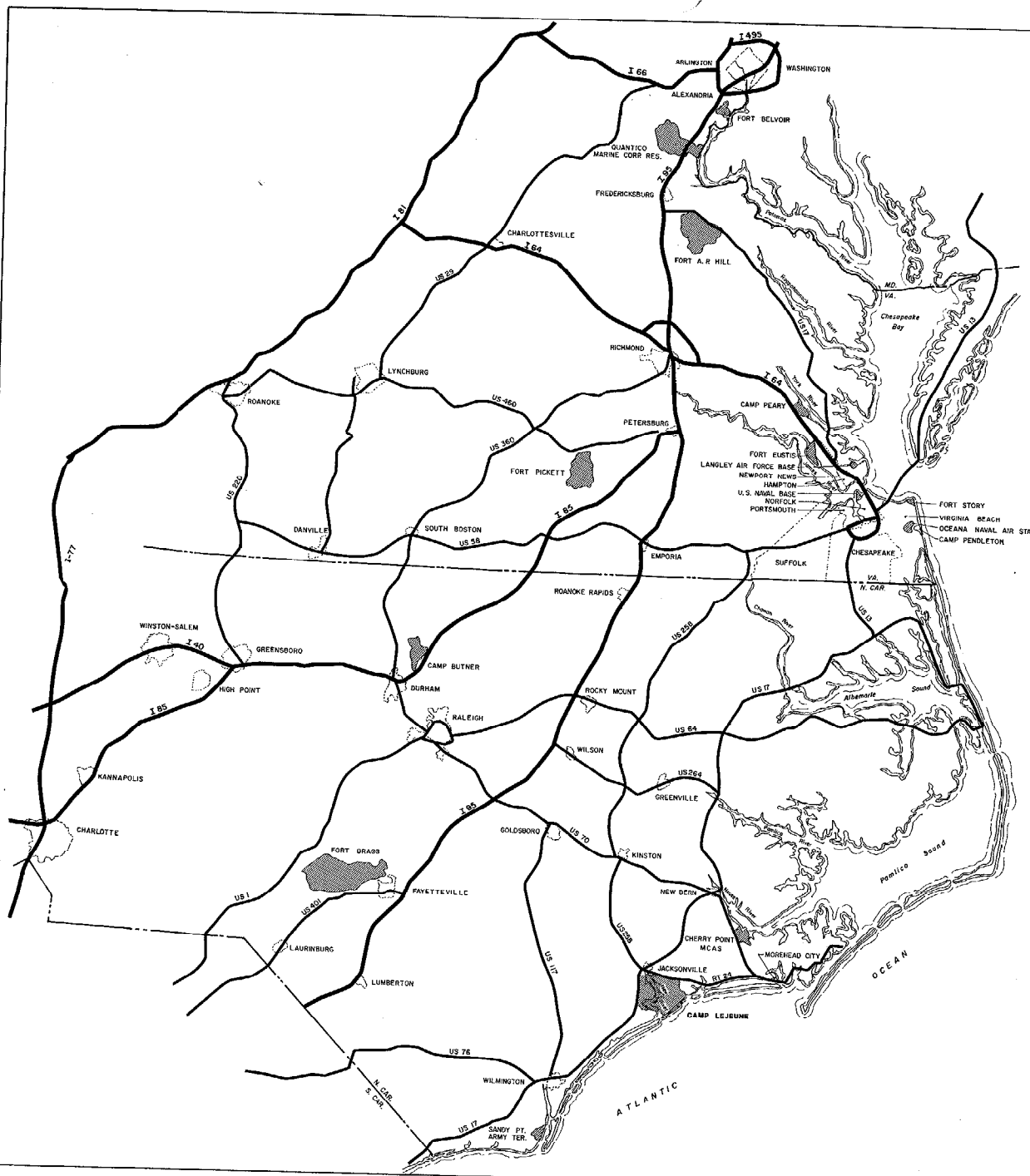
1. Marine Corps Air Station, Cherry Point which is located in the southeastern portion of Craven County, is bounded on the north by the Neuse River and on the east by Hancock Creek, and is approximately 46 miles from Camp Lejeune via Routes 24 and 70. The Croatan National Forest provides a buffer to the south and west.

2. The Marine Corps Air Station, New River has one outlying field under its control, OLF Camp Davis, located 10 miles to the southeast. Two other fields, Oak Grove and Bogue, each located at a distance of 12 miles, are used extensively by MCAS units.

3. The Port of Embarkation at Morehead City is utilized for major troop deployments which involve the use of amphibious warfare ships during the Mount Out operations.

Climate

Onslow County has a warm, temperate climate. The average annual mean temperature is 63°, ranging from an average of 44° in January to an average of 81° in August. The average humidity on the area is 73%, and the average rainfall is 57.9 inches, with the highest rains occurring during June, July and August. Prevailing winds are from the southwest in the summer and from the northwest in the winter. The average annual wind velocity is approximately seven knots.



LOCATION MAP

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

NORTH

Graphic Scale in Miles

0 10 20 30

FIGURE II-1

VICINITY MAP

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

FIGURE II-2

HISTORY

Early Historical Development

The region has had a history of limited growth and development since its founding. Over the centuries, the region and coastal plain lands in general have remained largely unchanged, while the rest of the state of North Carolina developed.

Without major seaports, canals, railroad lines or large manufacturing centers, North Carolina grew slowly during the first half of the nineteenth century and was quickly surpassed by its bordering states, Virginia and South Carolina. During these times, the eastern part of the state, including parts of Onslow County, was suitable for cotton and rice production and became the most densely settled and prosperous area. Much of the land surrounding Camp Lejeune, however, consisted of vast freshwater swamps or pocosins which were wooded and largely unsuitable for development.

It is generally accepted that the New River area began to be settled about 1713. Settlers were primarily of English and Scottish descent and, secondarily, black slaves, Welsh and French. Most of the earliest settlers were migrants from other colonies, however, and came from New England, Maryland, Virginia and the northeastern area of North Carolina.

By the late 1720s, New River was showing the first signs of developing commerce. A lower ferry over New River was established, and agriculture and the naval stores industry were becoming the basis of the County's economy. By 1732, the County Court was held in a building owned by John

Williams on Jarrett's Point at Courthouse Bay. Williams' building became the first County Courthouse and gave Courthouse Bay its name.

The two dominant social aspects of the region's Colonial history were the spreading dependence upon slave labor and the rise of a landed aristocracy who dominated the political and cultural life of Onslow County. At the end of the 18th century, the granting of out-of-state land warrants to Revolutionary War veterans or their heirs as payment for military service resulted in increased emigration from the area, which peaked gradually in the years between 1830 to 1840. During this time, Onslow County lost some of its wealthiest families.

Nevertheless, the members of the planter class who remained in Onslow County remained influential despite their small number. Agriculture and naval stores remained the economic backbone of the region throughout the 19th century. The emergence of the timber industry by the late 19th century began to reverse the earlier population declines and reduce economic uncertainty in the County.

Recent Historical Development

During the 20th century, the central and western areas of the State far surpassed the coastal plains in growth, due to the influx of the rich textile and tobacco industries, which are centered around the Winston-Salem, Greensboro and Raleigh-Durham areas. In addition, the major commercial and manufacturing activities of the State were located in central area of North Carolina near the intersection of transportation routes. The area surrounding what is now Camp Lejeune remained remote, with little population influx as the natural resources of timber, fish and shellfish were developed. This all changed with the beginning of the Second World War.

In 1939, the maintenance of American neutrality became the responsibility of the U.S. Marine Corps. Initially, Marine Corps activities included patrolling of the eastern and western coastlines. With the subsequent expansion in size and mission of the Marine Corps, it was decided that additional training on both coasts was required. After surveying a series of locations from Maine to Florida, a selection board chose the land surrounding the New River estuary for the east coast site. Approximately 720 families were relocated from Camp Lejeune land. Originally known as Marine Barracks, New River, the Base was established on May 1, 1941, and was the home of the First Marine Division until their departure for Guadalcanal in May 1942. The Marine Corps Air Station at Cherry Point was constructed shortly after Camp Lejeune.

The advent of two Marine Corps Bases to the completely rural environment of the region produced substantial changes. With the addition of new commercial and residential developments, the small town of Jacksonville increased in population from 900 in 1940 to 3,900 in 1950. Financial investment in Onslow County increased as service-type businesses flourished to support the military population. The requirement for off-Base housing for married officers and enlisted personnel, as well as for civilians employed at both Bases, caused the proliferation of residential subdivisions at Jacksonville and Cherry Point.

POLITICAL JURISDICTIONS

The Camp Lejeune Complex lies within Onslow County, which is subdivided into five townships. The Complex is federally owned and operated and, as such, the Marine Corps maintains exclusive jurisdiction of all matters within Camp Lejeune boundaries. It has long been federal policy, however, to cooperate to the fullest extent with state, county and municipal authorities.

The area of NC Highway 24, which borders the Camp Lejeune Complex, has been established as an area of concurrent jurisdiction between the Complex and the State of North Carolina for purposes of traffic law enforcement. The right-of-way for Highway 172, which runs through Camp Lejeune, was granted to the State of North Carolina in December of 1953. The area of Highway 172 granted to the State extends from Triangle Outpost to Sneads Ferry Gate. Law enforcement responsibility along this stretch of the highway rests with Camp Lejeune.

Various easements for utilities have also been granted to the City of Jacksonville, the State of North Carolina, Carolina Power and Light Company and Carolina Telephone and Telegraph Company. In addition, 14 acres of unimproved timber land, located in the northeast corner of Midway Park, are held in concurrent jurisdiction with the State of North Carolina.

The Marine Corps owns all land within the Camp Lejeune boundaries to the highwater mark and also owns the site of the USO Club in Jacksonville. Creeks and waters adjacent or within the Camp Lejeune Complex are owned by the State of North Carolina and all navigable waters fall under U.S. Army Corps of Engineers jurisdiction, with the exception of drawbridges, which are controlled by the U.S. Coast Guard.

POPULATION

The selection of the New River area as the site of a major east coast Marine Corps Base (MCB) took into consideration the rural character and low population density of the region. Before the development of MCB Camp Lejeune and MCAS Cherry Point in the early 1940s, New Bern was the predominant city in southeast North Carolina with a population of 11,800 people. Jacksonville was a small town with a population of 900. Establishment of the Marine Corps Bases at Camp

Lejeune and Cherry Point produced an immediate regional population increase of approximately 35,000 (Table II-1). This growth strengthened and stabilized the economic base of the region. The towns of Jacksonville and New Bern began developing as supporting communities and increased rapidly in size. This was especially true of Jacksonville, which increased in population from 900 in 1940 to 13,500 by 1960. County population growth has slowed significantly since 1960 due to the levelling-off of troop strength at Camp Lejeune.

The character of the region's population changed dramatically between 1940 and 1970. In 1940, 80 percent of the population was classified as rural by the Bureau of Census. By 1970, 88 percent of the population resided within urbanized areas. It is evident that military population trends have had a direct effect on regional growth in the Jacksonville/Onslow County area while outside of this area, the impact on regional growth has been indirect.

Much of the population growth has occurred and will continue to occur in and around Jacksonville. It is notable that Jacksonville's population increased 37 percent between 1970 and 1980, while Onslow County's population increased by only five percent. Annexation contributed in large part to the City growth. In the unincorporated sections of Onslow County, poor soil conditions, causing building foundation and septic tank problems, have constrained development.

Household size decreased from an average of 3.20 persons in 1970 to 2.96 persons in 1980, compared to a 2.78 persons per household statewide average. This continuing trend underlies the fact that more land and housing units are being demanded to support the population. The City of Jacksonville estimates that a 45 percent increase in housing starts occurred between 1970 and 1980. Between 1982 and 1983, the pace of housing starts expanded an estimated 150 percent and is anticipated to continue at a similar rate through at least the mid-1980s.

Table II-1

Population Trends
Onslow County, North Carolina

	1940	1950	1960	1970	1980	1990[2/]
Population						
Onslow County[1/]	17,939	42,047	86,208	103,126	112,784	122,447
Jacksonville	873	3,960	13,491	16,021	18,237	25,000
Percentage Increase						
Onslow County	-----	134.4%	105.0%	19.6%	9.4%	8.6%
Jacksonville	-----	353.6%	240.6%	18.8%	13.8%	37.1%

[1/] Includes City of Jacksonville population

[2/] Local jurisdictions' projections

Source: U.S. Bureau of Census; Onslow County and Jacksonville Planning Departments

ECONOMY

Prior to 1940, Onslow County had a rural economy based primarily on agriculture and forestry. While agriculture and forestry remain important to the region's economy today, industry, services and retail trade have surpassed them in importance since development of the Camp Lejeune Complex. A direct relationship exists between the economic vitality of Onslow County and the level of activity occurring within the Camp Lejeune Complex since new business development is most likely to concentrate in close proximity to established regional employment and commercial centers. The shift in the economic base of the region toward a more service-oriented economy emphasizes the indirect relationship that the rural part of the region has with the Camp Lejeune Complex.

Employment

County employment increased 25.8 percent between 1973 and 1982 (Table II-2). All major industry groups showed employment gains, except the "Finance, Institutional and Real Estate" and the "Agricultural Services; Forestry; Fisheries and Mining" categories. Declines in the finance-related labor force can best be explained by the recent economic recession, while the decline of agricultural-related employment can best be attributed to the continued transformation of Onslow County to an urban economy. Employment in the manufacturing and service sectors increased significantly in number during the same time period. Government employment, which includes only civilian employees, increased at a much slower pace due to the leveling-off of military activity at Camp Lejeune and the Air Station, as well as to budget cuts at all levels of government.

The impact of the Camp Lejeune Complex on the economy of Onslow County can be further illustrated by a comparison of annual payrolls for each of the five major employment sectors (Table

Table II-2

Employment by Place of Work
Onslow County, North Carolina
Actual 1973 and 1982

Industry Employment Type	1973	1982	Change 1973-1982	Percent Change 1973-1982
Manufacturing	1,830	2,920	+ 1,090	+ 59.6
Construction	1,150	1,250	+ 100	+ 8.7
Transportation; Communication and Public Utilities	890	1,110	+ 220	+ 24.7
Trade	4,340	5,940	+ 1,600	+ 36.9
Finance; Institutional and Real Estate	970	870	- 100	- 10.3
Service	1,710	2,400	+ 690	+ 40.4
Government	6,960	8,010	+ 1,050	+ 15.1
Agricultural Services; Forestry; Fisheries and Mining	90	60	- 30	- 33.3
TOTAL	17,940	22,560	+ 4,620	+ 25.8

Source: North Carolina Employment Security Commission, Onslow County Labor Force Estimates by Industry, 1983.

II-3). The Marine Corps' 1982 payroll was three and a half times that of the other four employment categories combined. Compared over time, the ratio of Marine Corps annual payroll to total County annual payroll has remained relatively constant at 78 to 80 percent. However, travel and tourism industry has shown the largest percentage increase in annual payroll, demonstrating continued regional growth.

Income

Another useful indicator of the local economy is Effective Buying Income (EBI). This includes all household income, less taxes and insurance payments, and reflects the amount of income a household may spend on housing, personal services, retail purchases, savings, etc.

Median household EBI in Onslow County increased 45 percent between 1976 and 1982 from $10,299 per household to $14,880 per household (Table II-4). This compares to a State increase in median household EBI of 47 percent from $12,352 to $18,170. Both County and State increases resulted primarily from inflation and a greater number of workers per household. Thirty-two percent of Onslow County households had more than $20,000 annual disposable income in 1982, compared to 50 percent of households statewide.

The 45 percent increase in County median household income between 1976 and 1982, combined with the fact that presently over 32 percent of the county's households earn more than $20,000 annually, underscores the economic vitality of the County and region. As the center of regional economic activity, the County will continue to experience business expansion and job creation.

Table II-3

Annual Estimated Payroll for the Five Sources of the Economy
Onslow County, North Carolina
1975, 1980 and 1982

Sector	1975	1980	1982	Change 1975 to 1982	Percent Change 1975-1982
1. Marine Corps Base, Camp Lejeune	244,000,000	355,000,000	420,000,000[1/]	+ 176,000,000	+ 72.1
2. Manufacturing	22,000,000	32,000,000	40,000,000	+ 18,000,000	+ 81.8
3. Agricultural	20,000,000	28,000,000	36,000,000	+ 16,000,000	+ 80.0
4. Travel and Tourism	12,000,000	26,000,000	31,000,000	+ 19,000,000	+158.3
5. Seafood Industry	8,000,000	13,000,000	12,000,000[2/]	+ 4,000,000	+ 30.0
TOTAL	306,000,000	454,000,000	539,000,000	+ 233,000,000	+ 76.1

1/ 1983 payroll estimated to be $483 million
2/ 1983 payroll estimated to be $10,502,226

Source: Onslow County Economic Development Commission, Jacksonville, North Carolina, 1984.

Table II-4

Distribution of Effective Buying Income (EBI) by Household
Onslow County, North Carolina
1982

EBI	Percentage Households Onslow County	Percentage Households State
$ 0-999	27.2	20.8
$10,000-19,999	40.7	29.3
$20,000-34,000	25.2	33.1
$35,000-49,000	5.6	12.1
$ 50,000 +	1.3	4.7
TOTAL	100.0%	100.0%

Source: Sales and Marketing Magazine, 1982.

TRANSPORTATION

Surface Transportation Network

The quality of the transportation systems within the region is directly related to the level of land use development. Throughout the region, transportation demand is low due to the predominantly rural character of the area. Onslow County lies east of the major north-south routes of travel and does not contain any of the major interstate road systems. However, the areas around Camp Lejeune and the City of Jacksonville are exceptions within the region and as a result, most of the traffic and road improvements exist in this area. The completion of I-40, which will improve regional access, also has the potential to facilitate local population and economic growth especially in the area to the west of the Sandy Run Training Area.

The two major roads existing in the region are NC State Route 24 and U.S. Highway 17 (Figure II-2). Route 24 runs east-west and is parallel to the northeastern boundary of the Camp Lejeune Complex and is the major route to MCAS Cherry Point and Morehead City. Presently Route 24 is two lanes with the exception of that portion running along Camp Lejeune, which has been widened to four and six lanes.

U.S. Highway 17, which runs north-south, passes along the western boundary of Camp Lejeune and extends to New Bern on the north and Wilmington on the south. Presently Highway 17 is two lanes wide with the exception of a short four-lane section near the MCAS, New River. Traffic on NC 24 and U.S. 17 is attributable mainly to Camp Lejeune personnel and is heaviest near Jacksonville and the Camp Lejeune Complex.

A highway project that would provide a bypass route for Highway 17 around the City of Jacksonville has been proposed by the State. Diverting some of the traffic generated by Camp Lejeune to the proposed Highway 17 Bypass would help to relieve congestion in Jacksonville. The actual alignment has been debated for the past several years; however, it appears at the time of the implementation of this Plan that the "Jack's Point" alignment, which parallels the northernmost boundaries of Camp Geiger and Montford Point, will be selected.

The State Transportation Department has prepared a five-year plan for the development of NC 24 to a four-lane divided highway from Fayetteville to Morehead City. The section of NC 24 from Swansboro to Morehead City, the last phase of the project, would significantly enhance USMC development/mobilization avenues. The proposal has been postponed and has been reverted to long-range planning.

Bus transportation is the major public mass transit system in the Onslow County area and trucks serve as the principal freight movers.

The region has been served in the past by the Seaboard Coast Line Railroad which has tracks extending throughout much of the east coast, including a connector between Wilmington and New Bern, via Jacksonville. A spur off the main line enters the Marine Corps Base east of the main gate and serves the supply and warehouse areas at Hadnot Point, Geiger and MCAS, New River. A portion of this railroad line was in the process of abandonment at the time this Plan was written. The line from Hadnot Point to Jacksonville, and northward to Kellum, is functional and being retained. Site storage requirements are expected to rise dramatically as a result since MCAS must revert to fuel delivery by truck. The Marine Corps also has cognizance over a Department of Defense rail line which extends from the supply area at Camp Lejeune to Cherry Point. The Camp

Lejeune rail line is used to move Marine Corps equipment between the Base and Morehead City, and also handles the entire coal-fuel supply. However, the tracks are in a poor state of repair and used on a limited basis.

The Intracoastal Waterway, which extends almost the entire length of the east coast, passes through the Camp Lejeune Complex in the area of natural protected waterways formed by the barrier banks and the mainland (Figure II-2). The waterway carries a heavy volume of private pleasure boats during the warmer months of the year and a steady flow of commercial barges and fishing craft year around. Several regional towns and cities along the route have developed water-oriented commercial areas having marinas and boat maintenance and storage facilities to serve the waterway.

Air Transportation Network

Commercial air transportation within the region is conducted out of both the Albert J. Ellis Airport near Jacksonville and the New Bern Airport (see Figure II-2). Ellis Airport has one runway, which has recently been extended to 7,000 feet in length, capable of serving jet aircraft. The New Bern Airport has two runways capable of handling jet aircraft and is served by more than one commuter airline.

Sky Manor Airport, a general aviation facility located four miles due west of MCAS, New River, has a lighted, 2,600-foot runway.

A proposal to construct a 4,000 foot runway northwest of Sneads Ferry has been submitted to the Federal Aviation Administration. This would be a public use facility based with 40 multi-engine and 90 single-engine aircraft.

LAND USE AND ZONING

Approximately four percent of Onslow County is developed, with most of that development located within the corporate limits of Jacksonville. The remainder of County land use is divided as follows: Marine Corps facilities - 22 percent, Hofmann Forest - 11 percent; commercial forest - 42 percent; agriculture - 13 percent; and water and marshland - 8 percent.

The City of Jacksonville controls planning and zoning both within its limits and within a one-mile radius of its border. The Land Use Plan was prepared in 1981 and was in the process of being updated at the time this Master Plan was written. While the City has a zoning ordinance, only the West Onslow Beach area of Onslow County is zoned. In 1979, the first County subdivision regulations were adopted and have resulted in more orderly development of the County.

Commercial development is contained primarily within municipal boundaries (Figure II-3). There is, however, substantial strip commercial development along U.S. 17, U.S. 258 and NC 24 in Onslow County. Residential units are interspersed with this commercial development, creating an unattractive, congested land use pattern.

Residential development is concentrated primarily in the City of Jacksonville. In Onslow County, concentrated residential development exists along Piney Green Road, U.S. 258, in the Bear Creek Area and extending along NC 172, and in the Southwest, Sneads Ferry and Owen's Creek communities. Extensive vacation-home construction has occurred at West Onslow Beach.

The water supply is from water wells within the Camp Lejeune boundaries and the source is groundwater. Wastewater treatment plants are located on Camp Lejeune and discharges are directed into the New River Estuary or tributary streams and into the Intracoastal Waterway. The supplier of electrical power is Carolina Power and Light which serves much of eastern North Carolina. Commercial telephone trunk connections are to the Carolina Telephone and Telegraph Company facilities.

Water Supply

Geology and Hydrology

The water supply for Camp Lejeune is entirely from water wells located within the boundaries of the installation. Groundwater is the source of water for Camp Lejeune, as is the case for most of the central Coastal Plain of North Carolina. Information regarding groundwater conditions in the Coastal Plain is provided in the report Groundwater Evaluation in the Central Coastal Plain of North Carolina, the North Carolina Department of Natural Resources and Community Development.

Sediments underlying the area are subdivided into four principal aquifer systems; the unconfined Water Table Unit, the confined Castle Hayne and the Cretaceous Upper Sand and Lower Sand Units. The Cretaceous Lower Sand Unit is the principal water-bearing unit in the Coastal Plain. The unit dips to the southeast and ranges from 200 to 700 feet in thickness. Since the late

EXISTING LAND USE

CITY OF JACKSONVILLE AND ONSLOW COUNTY

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

LEGEND

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- COMMUNITY / DEVELOPED
- CONSERVATION
- TRANSITION
- RURAL
- FUTURE GROWTH

Source:

Onslow County Land Classification, 1980, Revised 1983

City of Jacksonville, Department of Public Works, 1984

Harland Bartholomew & Associates, Inc. 1984

NORTH

Graphic Scale in Feet

0 8000 16000 24000

FIGURE II-3

1960s, water levels in the Cretaceous aquifer system have declined due to large-scale municipal and industrial withdrawals. Water levels near some pumping centers have declined 80 feet since 1965.

The Pee Dee Stratigraphic Unit of the Cretaceous Lower Sands underlies the Castle Hayne Unit. It is a semi-confined aquifer whose water-bearing sands yield moderate amounts of water. The water is a soft, sodium bicarbonate type except in those areas where calcareous beds cause it to be moderately hard. Heavy withdrawals from the Cretaceous Lower Sand Unit are reflected in leakage from the Upper Sand Unit. The Cretaceous Upper Sand Unit consists of dark green or gray glauconitic or clayey sands interbedded with massive dark gray clay beds. The unit outcrops in Duplin, Greene, Lenoir and Pitt Counties. It thickens to the east to between 60 and 80 feet. The unit is overlain by the Castle Hayne Unit and separated from it by a massive clay layer 20 to 30 feet thick.

The Castle Hayne Unit is a highly permeable semi-confined aquifer capable of yielding large amounts of water. It is an important aquifer in the eastern part of the state. It yields a hard, calcium bicarbonate type water. The Castle Hayne Unit varies from shell limestone to sand with shell fragments. It occurs as a continuous unit in Onslow and nearby counties. The unit thickness increases to more than 400 feet in the eastern part of the central Coastal Plain.

The elevation of the top of the Castle Hayne Unit is zero feet, while the thickness of the Unit is 300 to 350 feet at Jacksonville. Interpretation of the data of the above-mentioned groundwater report indicates that the wells of Camp Lejeune are all in the Castle Hayne Unit. It is also overlain partly by the individual clay layers present throughout the overlying Yorktown aquifer.

Hydrographs of the Castle Hayne Unit exhibit cycles of increasing water levels during the late fall, winter and early spring, followed by decreasing water levels during the remainder of the year. Static water levels in the Castle Hayne wells generally are within 0 to 20 feet below the land surface. Indications are that the Castle Hayne Unit is not being affected by withdrawals from the unit itself or from the underlying Cretaceous aquifer system. Typically, the yields of municipal and industrial wells in the Castle Hayne Unit range from several hundred to one-thousand gallons per minute.

Water Quality

In terms of water quality, the Cretaceous Lower Sand Unit is favored as a source of water over the other units.

In the Water Table Unit, water is typically soft, lower in total dissolved solids and corrosive. It also contains excessive concentrations of dissolved iron. Water in this unit was classified in the above-referenced report as sodium chloride sulfate type.

As water moves into the Castle Hayne Unit, it reacts with calcium and magnesium ions in the marl and shell beds, becoming typically hard and highly alkaline. Iron normally does not present a problem except at those locations where the water has a short residence time as in areas of direct recharge. Water from this unit is a calcium bicarbonate type.

Hard, alkaline water enters the Cretaceous aquifer system from the Castle Hayne Unit and undergoes cation exchange, losing calcium and magnesium ions and gaining sodium and potassium ions, resulting in softer water of relatively good quality. Since the overall quality of the water from

the Cretaceous Lower Sand is excellent, requiring little or no treatment, the unit has become widely favored as a water source by Jacksonville and Onslow County.

Salinity

In the extreme eastern area of the Coastal Plain, saline water underlies the freshwater within the lower sections of the Cretaceous aquifer system. Minor amounts of saline water in the aquifer systems today represent residual sea water that has not been completely flushed out of the system due to tidal effects. Water becomes progressively more saline toward the coast and with depth. Large-scale withdrawals from the Cretaceous aquifer could affect the distribution of saline water within the system. Chloride concentrations near eastern pumping centers may increase in the future due to increased movement of water toward the wells. At the time of the above-mentioned report, date from water quality monitoring wells did not indicate any significant change in the salinity of the water at sites near the eastern boundary of the Coastal Plain.

Camp Lejeune Water Wells

There were 95 water wells investigated for the purpose of this study, of which 77 were operational and are to remain in service. The other wells were either scheduled to be replaced, repaired or were out of service. Additionally, many other wells are to be completed in the near future, including 20 wells involved in the program to expand the Holcomb Boulevard Treatment

Plant. Also, there are many wells throughout the installation that have been removed from service for various reasons. Operational wells were of the following depth and yield:

SYSTEM	AVERAGE DEPTH	AVERAGE YIELD
Hadnot Point	177'	170 gpm
Holcomb Boulevard	240'	236 gpm
Tarawa Terrace	95'	109 gpm
Montford Point	98'	121 gpm
MCAS	207'	150 gpm
Camp Geiger	113'	130 gpm
Rifle Range	138'	184 gpm
Courthouse Bay	118'	174 gpm
Onslow Beach	108'	213 gpm

The shallow wells at Tarawa Terrace and Montford Point not only provide the lower yield, but the quality of water is not good, specifically as related to iron content and hardness. The hardness is virtually all calcium bicarbonate. The most recently constructed wells characteristically are deeper wells with better water quality. The 20 wells proposed for expansion of Holcomb Boulevard Treatment Plant are spaced about 2,000 feet apart to minimize overlapping draw from effects between the wells.

Wastewater

General

Wastewater from six of the seven wastewater treatment plants of Camp Lejeune discharge into the New River Estuary or its tributary streams and bays. The remaining treatment plant, Onslow Beach, discharges into the Intracoastal Waterway. New River, located entirely in Onslow County, is the principal stream in the county, draining an area of 475 square miles. The Estuary begins at the southern extremity of Camp Lejeune, at the Atlantic Ocean, and extends 19 miles to the approximate location of the northwest boundary of Camp Lejeune at Jacksonville near Wilson Bay. Much of Onslow County and all of Camp Lejeune, except a small portion on the east of Camp Lejeune, drains to New River and the New River Estuary. Major tributaries are Northeast Creek and Southwest Creek, both of which join the New River within the Camp Lejeune boundaries.

201 Facilities Plan

The City of Jacksonville and the County of Onslow had a 201 Facilities Plan prepared in December 1976 which covers the Jacksonville Planning Area. A 201 Facilities Plan is a document aimed at establishing the most cost-effective means of meeting established water quality goals, recognizing environmental and social considerations. Data on the flow of New River is limited; however, the 201 study indicated the average flow of New River at Half Moon Creek (north of Camp Lejeune) as 255 cubic feet per second (cfs), with the seven-day flow with a recurrence interval of 10 years (7Q10) at Jacksonville being 7 cfs. The average flow of Northeast Creek at its confluence with New River is 36 cfs with a 7Q10 of 1.27 cfs.

The 201 Facilities Plan identified 22 point discharges in the planning area. The 22 waste treatment facilities ranged from primary lagoons to secondary biological treatment. Essentially all the point discharges were to New River or its tributaries. The two municipal discharges were the Jacksonville Trickling Filter Plant, located on New River (Wilson Bay) at Mile Point 20.4, and the Jacksonville Oxidation lagoon located at Mile Point 23.0 on New River. The trickling filter plant capacity is 2.56 million gallons per day (MGD), with an average daily discharge of 1.56 MGD, and the oxidation point is 0.514 MGD with an average daily discharge of 0.49 MGD. The only industrial discharges were from the Weyerhaeuser Plywood Plant having an extended aeration facility of 0.0033 MGD and an aerated lagoon having a design capacity of 1.8 MGD, with an estimated average daily discharge of 0.027 MGD. The remaining point discharges were low flows, with a maximum capacity of 0.20 MGD. The character of waste discharged to New River and its tributaries is almost entirely treated domestic waste except for the Weyerhaeuser plant which discharges to Northeast Creek about five miles north of Camp Lejeune. The average Biochemical Oxygen Demand - 5 day (BOD_5) measurement of the oxidation pond effluent was 22 parts per million (ppm). The trickling filter facility had an average BOD_5 effluent of 25 ppm.

The 201 Planning Study recommended that the City's two separate collection systems be revised to provide one regional collection system. Based upon an average daily flow of 4.46 MGD, secondary treatment standards and the continued use of the existing trickling filter plant site, the study recommended an activated biological filter plant which would continue to discharge to Wilson Bay. Therefore, the selected plan consisted of the upgrading and enlargement of the present plant on Wilson Bay to serve a population of 39,000. It would be designed for an average daily flow of 4.46 MGD with peak flows of 12.2 MGD. Effluent would be discharged at the present point in Wilson Bay with the plant meeting the adopted requirement of 30 mg/1 BOD_5, 30 mg/1SS, MG/1 TKN and 5 mg/1 D.O. The present oxidation pond would be abandoned. Collection lines would be extended to

presently unserved areas of urban Onslow County; the transmission system would be extended to pick up existing package treatment plants; and modification would be made to the existing Jacksonville transmission system necessary to accommodate flow to the several specific projects mentioned in the report. Several of the existing point discharges would remain after the program is completed and the study made recommendations on changing or upgrading the facilities. Approximately 5,500 septic tanks would be eliminated. Recently the State has reduced Jacksonville's effluent limits which will require the City to install more treatment technology. This indicates a growing concern for New River water quality and is being exhibited by tighter limits on all discharges.

The recommendations of the 201 Facilities Plan recognized that the location of wastewater outfalls must coincide with locations that best meet and maintain water use classifications adopted by the North Carolina Department of Natural Resources. From that Plan report, the New River channel is classified SB from Blue Creek to the Atlantic Coast line Railroad trestle. From the trestle to a line extending across the river from Grey Point to Pint of Land, approximately 2,200 yards downstream from the mouth of Duck Creek, the New River is classified SC. From the latter point to the Atlantic Ocean, the river is classified SA. The SA classification is designed to protect the shellfish in the New River Estuary within Camp Lejeune, south of Jacksonville. The present City trickling filter plant discharges into Wilson Bay, which has a SC classification, and the oxidation lagoon outfall is located in SB waters. The difference between SB and SA classifications is the fecal coliform standard. Classification SA reiterates the bacteriological standards of the "National Shellfish Sanitation Program Manual of Operations: Part I, Sanitation of Shellfish Growing Areas." SB use classification denotes less stringent bacteriological standards. Neither SA nor SB use classes permit discharge of floating or setteable solids or the accumulation of sludge deposits. Class SC, a less stringent classification than SA or SB, allows such amounts of solids or sludge which

will not render receiving waters unsuitable or unsafe for fish. This less stringent classification also provides significantly greater numbers of fecal coliform microorganisms per 100 ml of sample.

Wastewater Treatment Plant Discharges

There are seven wastewater treatment plants at Camp Lejeune. The plants are operating under Permit No. NC0003239, Authorization to Discharge under the National Pollutant Discharge Elimination system of the U.S. Environmental Protection Agency. A draft revised permit has been issued which will expire in 1991. Effluent limits are shown in Table II-5.

Electrical Power Supply

The major supplier of electrical power in the vicinity of Jacksonville is Carolina Power and Light Company (CP&L). The utility has both 230 KV (Kilovolts) and 115 KV, three phase transmission networks in the area. The Jacksonville Havelock 230 KV line provides bulk power to the CP&L substation that serves Tarawa Terrace housing located on Government property at Building 45. A radial mid-span tap is located across North Carolina State Highway 24 from the north boundary of Camp Lejeune one-half mile west of the Holcomb Boulevard interchange and the transmission line crosses the highway and is routed to the CP&L substation. The 230 KV tap line continues along a route parallel to Holcomb Boulevard (offset 500 feet to 1,000 feet west) to the Marine Corps Base substation near Ash Street. The Camp Lejeune power delivery was upgraded to 230 KV in the mid-1970s, but a parallel Jacksonville-Havelock 115 KV line remains in service.

A 23 KV distribution system originates at the CP&L substation. It is routed across New River with an underwater crossing to the Tarawa Terrace housing area and follows the streets within the area to Camp Knox and the Knox Trailer Park. The system is owned and maintained by CP&L.

Table II-5

Effluent Limits*

Wastewater Treatment Plant Discharges*

	Design Capacity	Permitted Flow	Average Daily Flow Per Million FY-85	Max Flow 24-hour Per Million FY-85	Allowable BOD5 mg/1	Fecal Coliform	Receiving Stream
Hadnot Point**	8	8.0	4.58	7.56	22	14	New River
Tarawa Terrace	1.25	1.25	.93	1.84	30	1000	Northeast Creek
Montford Point	1.0	1.0	.40	.95	30	1000	Northeast Creek
Camp Geiger	1.6	1.6	1.06	1.64	30***	200	New River
Rifle Range	0.525	0.525	.25	.61	30	14	New River
Courthouse Bay	0.525	0.60	.43	.69	30	14	New River
Onslow Beach	0.195	0.195	.12	.19	30	14	Atlantic Intra-coastal Waterway

* Units expressed as follows: Flow-MGD, BOD5-mg/1, Fecal Coliform per 100 mil; All effluent limits for pH are 6.0-8.5 and for TSS are 30 mg/1: All limits shown are monthly average concentrations.

** Limits for BOD and ammonia nitrogen are 30 mg/1 and no ammonia limit, respectively up to flows of 5.9 MGD; Above 5.9 MGD, the limits would decrease with increasing flows until 8.0 MGD when the limits would be 22 mg/1 and 19 mg/1 - winter, 13 mg/1 - summer, respectively.

*** Calculated with diffuser installed on outfall line.

The Castle Hayne-Jacksonville 115 KV transmission line routing west of U.S. Highway 17 is tapped for bulk power delivery to the Camp Geiger/New River Marine Corps Air Station substation. The line crosses the highway south of the Curtis Road entrance and enters the installation near the Geiger Trailer Park. The line terminates at the electrical substation at Curtis Road and the connecting street with Camp Geiger (A Street).

Steam and Heating

Steam is generated by central plants within the individual areas. Heating is supplied by steam and fuel fired equipment. Fuels for steam and heating are transported to the point of use; natural gas is not available in the vicinity of Camp Lejeune.

FUTURE DEVELOPMENT

Regional development activity is expected to continue to occur. Concentrating primarily in Jacksonville and Onslow County, this growth will continue in the form of residential and vacation home construction and expanded service industry and retail opportunities. Additional development in this urban part of the region has a direct impact on the Camp Lejeune Complex. The physical changes associated with this growth ultimately present encroachment issues which are discussed in the next section.

More land and housing units are being demanded to support increases in population, especially in the City of Jacksonville, where population is projected to increase 37 percent between 1980 and 1990. The bulk of the City's growth is anticipated to be residential in character, occurring in the

northwestern sector of the City, in the area west of Highway 17 (see Figure II-3). In the north Piney Green corridor, over 1,000 new homes are expected to be built between 1984 and 1990.

County development activity in the 1980s is being focused within the Southwest community, located between Highways 17 and 53. The primary emphasis has been in the form of individual lots, small subdivision and mobile home residential development. The installation of a sewer system at the West Onslow Beach area will increase the already rapid pace of beachfront home construction, resulting in a steady increase in the seasonal population for the area. Future industrial development is being channeled into the northeastern area of the County, where development within the Town of Swansboro is expanding westward along Route 24.

The proposal to build a Route 17 Bypass which would re-route traffic south of the main part of Jacksonville, will have a significant impact on the surrounding development trend as well as on the Camp Lejeune Complex. Final alignment of the Bypass has not been determined and whether the Bypass will be constructed at all remains in question. State and local officials have indicated that, should the Bypass be built, an alignment having the least land impact on Camp Lejeune will be selected. At the writing of this Master Plan, the "Jack's Point" option, an alignment which would transverse the western-most boundary of the Camp Lejeune Complex at Montford Point, was under serious consideration by City and Marine Corps officials.

ENCROACHMENT

This issue is of crucial importance, both toward Camp Lejeune personnel in meeting-assigned missions and toward civilian residents who are entitled to safe and quiet enjoyment of their property. Development pressures on land and water immediately surrounding the Military Complex

constrain the future expansion potential of Marine Corps operations at Camp Lejeune. Noise, military vehicle traffic, and aesthetic impacts of military operations on existing land and waters have created conflict.

The rapid pace of development, especially residential subdivisions, is directly attributable to the regional military population. Steady increased off-Base housing demand created by growing military families with relatively high disposable incomes has produced scattered housing development in close proximity to the Camp Lejeune Complex. The result of this residential sprawl has been increased conflicts with military training operations and a further constraint upon the expansion potential of Camp Lejeune.

As Camp Lejeune's population has grown, so have those of the City of Jacksonville and Onslow County. The City of Jacksonville and the commercial development along North Carolina Highway 24 permanently block any expansion of the Base to the north. Furthermore, the use of the ranges in the "F" area is constrained due to noise complaints and vandalism. To the east of the installation, development is currently low-density residential with some well established communities, such as Willis Landing. The City of Swansboro is gradually expanding to the northwest along Highway 24. This growth may in turn create additional development pressure in the Bear Creek and Queen Creek areas. Already, 500-pound bombs cannot be dropped on Brown's Island due to noise from the explosions disturbing these residents. Southwest of the installation is the established community of Sneads Ferry. South of Sneads Ferry on the Atlantic beachfront, much development of vacation homes and condominiums is now occurring. This development represents a further hindrance to training and does not allow for expansion of the installation to the southwest.

The western portion of the Base's perimeter is the sole area not currently developed. Aside from the community of Verona, the land to the west of Camp Lejeune is largely uninhibited. In part, this is because much of the land is held by a single owner for commercial timber production.

The location of North Carolina Highway 172 hinders the use of the G-6 tank range. The Highway must be closed for safety purposes and traffic is detoured whenever firing exercises are conducted on this range. In the future, the location of the Highway between impact areas G-10 and N-1 restricts the possible expansion of the impact areas.

The Intracoastal Waterway is another serious impediment to range training, particularly for large-caliber weapons firing out to impact areas BT-3 and N-1. As it now stands, the Waterway can be closed for one hour after which time it must be reopened for one hour. Although current efforts are directed toward extending the closure from one to four hours, it is yet unclear if this request will be approved. If not approved, an alternative solution would be to push back the firing lines of those ranges whose safety fans now cross the Waterway.

The issue of encroachment, the impact on training activities/requirements and the growing demand for additional training land at Camp Lejeune was the subject of a special study prepared in conjunction with this Master Plan. Reference should be made to, Special Training Analysis, Camp Lejeune, North Carolina for further details of the analysis and recommendations contained in this study.

CONCLUSIONS

A symbiotic relationship exists between Camp Lejeune and the region which surrounds it. Onslow County and the City of Jacksonville continue to prosper from the economic stability provided by Marine Corps active duty and retired personnel and their dependents. Conversely, Camp Lejeune Complex relies upon the surrounding areas to provide civilian housing and many community support facilities, such as churches, movie theaters and commercial facilities. In addition, the Marine Corps uses local, state and federal roads and forests for troop and equipment transport and training activities.

The military and civilian communities can mitigate conflicts and coordinate planning activities by taking the following recommended actions. First, an effort should be made to open the lines of communication with City and County elected officials and staff. This can be accomplished by heightening the involvement of selected Camp Lejeune officials on local and regional planning boards. Secondly, planning-related information should be shared between the civilian and military communities in the region. For example, local officials could be made aware of any major mission changes which might impact the civilian community. Major development proposals for areas adjacent to the Camp Lejeune boundary should be communicated to military officials prior to final commitments. The military and civilian communities in Onslow County have many shared interests and common goals that should be recognized and preserved.

DESCRIPTION

The Camp Lejeune Complex covers an area of approximately 110,000 acres. The boundary for the installation is approximately 68 miles in length and includes 14 miles of ocean front that is paralleled by the Intracoastal Waterway. The Complex consists of 12 identifiable developed areas, as shown in Figure III-1.

Complex Overview

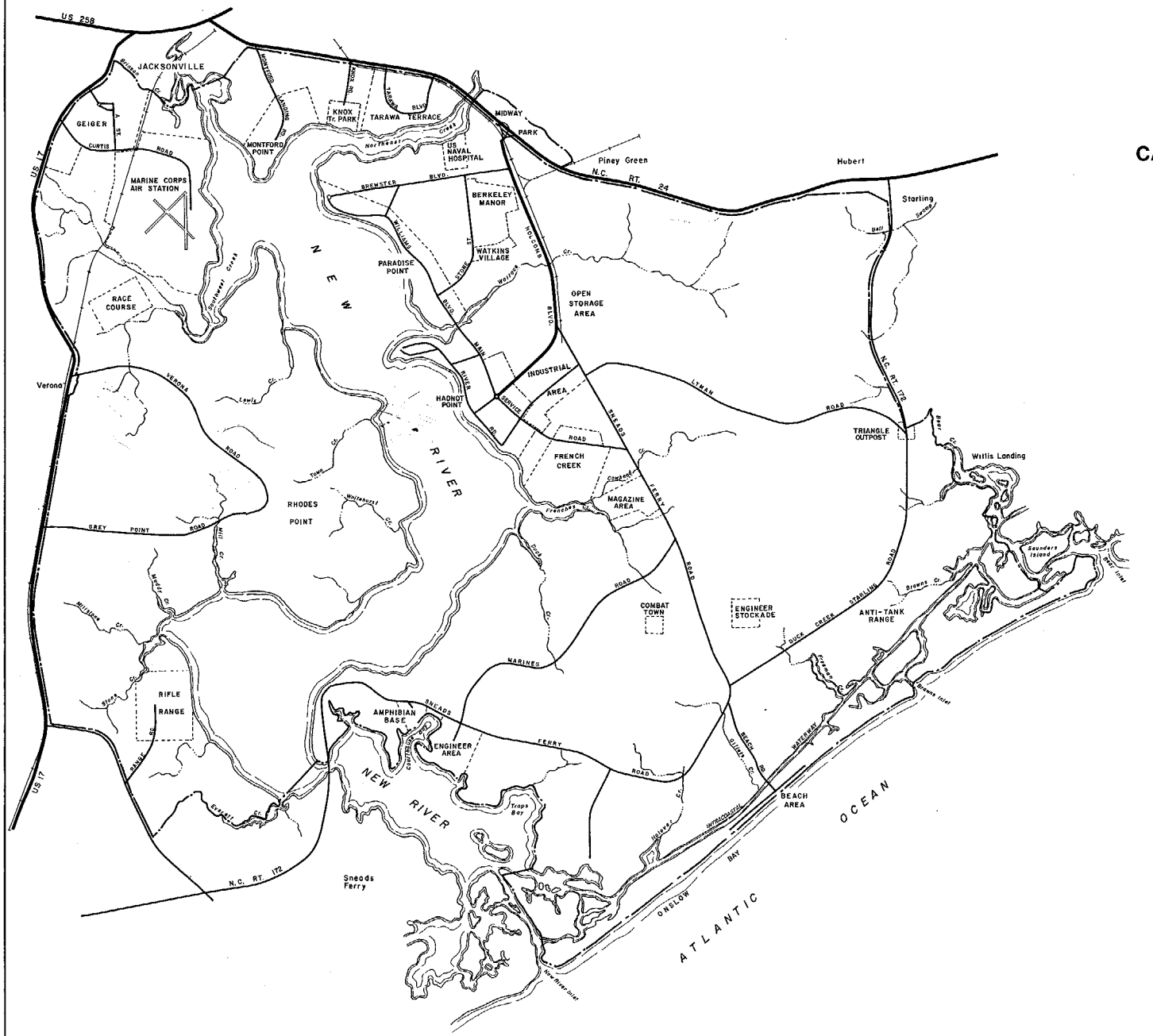
Of the developed areas, Hadnot Point comprises the most concentrated area of development. This area includes the organizational offices for the Host Activity and for the Headquarters, 26 Marine Amphibious Unit, as well as the Headquarters and regimental areas for the 2nd Division of the Marine Corps, 2nd Marine Amphibious Force, 6th Marine Amphibious Brigade, 22nd Marine Amphibious Unit, 24th Marine Amphibious Unit, the Central Exchange & Commissary and the Naval Dental Clinic Headquarters. Directly north of Hadnot Point are the family housing areas concentrated throughout the wooded areas of the central Complex and along the shores of the New River. Also located in this north central area are major personnel support land uses, including the newly-constructed Naval Hospital, school sites, recreational areas, as well as additional family housing areas (quarters developments, Midway Park and Tarawa Terrace I and II).

The Air Station and Camp Geiger are considered as a single urban area possessing two separate missions and supported by two unrelated groups of personnel. The MCAS, New River encompasses 2,772 acres and is located in the northwestern section of the Complex and lies approximately five miles south of Jacksonville. The Air Station include air support activities, troop

housing and personnel support facilities, all of which immediately surround the aircraft operations and maintenance areas.

Camp Geiger, located directly north of MCAS, New River, contains a mixture of troop housing, personnel support and training uses. Currently, the area is utilized by a number of groups which have no direct relationship to one another. The majority of the land surrounding this area is comprised of buffer zones and unbuildable marshland.

The Camp Lejeune Complex contains five other areas of concentrated development, all of which are much smaller in size and population than either Hadnot Point or the MCAS/Camp Geiger area. The oldest of these is the Montford Point area which is bounded by the New River to the south and west and by Route 24 on the north. New development in Montford Point has been limited, with most of the facilities for troop housing, maintenance, supply and personnel support having been converted from their intended uses. A majority of the Marine Corps Base training schools requiring classroom instruction are located here and use surrounding undeveloped areas for training operations when required. The French Creek area located directly south of Hadnot Point is occupied by the 2nd Force Service Support Group (2nd FSSG). Its activities are directed toward providing combat service and technical support as required by Headquarters, II Marine Amphibious Force. Expansion of the French Creek Complex is constrained by the Ordnance Storage Depot explosives safety arc on the south and by the regimental area of Hadnot Point. Onslow Beach, located along the Intracoastal Waterway east of the New River Inlet, presents assets for amphibious training as well as recreational use. Courthouse Bay is located on one of a series of small bays which are formed by the New River. This area is used for maintenance, storage and training associated with amphibious vehicles and heavy engineering equipment. The Engineering School, also located here, conducts training activities in the large open area located to the southeast of the Courthouse Bay. Another



DEVELOPED AREAS

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

LEGEND

FIGURE III-1

concentrated area of development is the Rifle Range. This area is located on the southwest side of the New River, is singular in purpose and has only a small number of assigned personnel. It was constructed in the early stages of Base development and is used solely for rifle qualification training. The small group of barracks, located at the Rifle Range, are used for two-week periods by troops assigned to range training.

Areas located outside the Camp Lejeune Complex which are used by Camp Lejeune personnel include the Oak Grove and Bogue Airfields, Camp Davis Outyling Field, Port of Morehead City and Radio Island. Each located about 12 miles from MCAS, New River, the Oak Grove and Bogue Airfields are used extensively by MCAS for training. The Camp Davis Outlying Field is located 16 miles southeast of MCAS, New River, near the community of Holly Ridge and is also used primarily by MCAS for training. The Port of Morehead City and Radio Island, situated directly east of the Newport River in Morehead City, are used as an embarkation and disembarkation area for the Marine Corps 2nd Division.

HISTORY

In 1940, shortly before the outbreak of World War II, the Marine Corps made the decision to establish an amphibious training facility on the eastern seaboard. In 1941, 170 square miles of farm land surrounding the New River, including 11 miles of coastline, was purchased and accelerated plans were made to establish an amphibious training base on this site. Originally the area was called Marine Barracks, New River but was renamed at the end of 1942 as Camp Lejeune in honor of Lieutenant General John A. Lejeune, commander of the Marines in France during World War I and, later, the 13th Commandant of the Marine Corps.

Marine Corps Base

The development of Camp Lejeune occurred in three major phases of construction. Early in 1941, the first phase of Base development was begun and included the construction of temporary troop quarters and temporary administrative facilities in the Camp Geiger and Montford Point areas, as well as a CCC camp for civilian workers built at Camp Knox. These areas were selected for the original development due to their proximity to Jacksonville, which provided a major source of labor and materials and access to existing roads and rail lines.

In April of 1941, the second phase of construction began at Hadnot Point. A development plan was prepared which sited the major Marine Corps organizational units along the shores of the New River and sited support and industrial facilities inland.

The third phase of development occurred with changing war requirements and involved additional construction of barracks and support facilities in the outlying areas of Montford Point, Camp Geiger and Courthouse Bay.

During World War II, the original tent camp at Montford Point was converted to a facility for black Marine personnel and involved the construction of semi-permanent and permanent buildings. Basic tactical training of all black troops, including anti-aircraft artillery and steward personnel battalions, was conducted there. The original CCC camp at Camp Knox was then converted into a war dog facility at this same time. Due to the planned isolation of these units, separate community facilities were established in each of these areas, decreasing dependence upon the Hadnot Point area for social, recreational and tactical support.

With the disestablishment of the black Marine training operations at the end of World War II, the maintenance program diminished and the facilities in the Montford Point area fell into a state of disrepair. For the past ten years, the Montford Point area facilities have been utilized as a Marine Corps Service Support School complex, which includes the Field Medical Service School and the Camp Lejeune Regional Staff NCO Academy. Many of the schools facilities have had to adapt to buildings that were not originally intended to be used as specialized training facilities.

Camp Geiger was established early in 1942 as the location of primary unit tactical training for recent recruits from the Parris Island basic training complex. Because of the pressure of the war effort, the buildings in the Geiger area were temporary in nature and subject to a minimum of maintenance once the hostilities were ended. A series of new barracks was constructed for the Infantry Training Regiment (ITR) in 1972. These three-story, open-bay facilities were designed to meet the criteria required for Marine recruits in 1972, but do not meet the present space requirements for permanent enlisted personnel. In 1973, the ITR training functions were relocated to Parris Island and the Camp Geiger barracks are now occupied by the 8th Marine Regiment, which are slated to be relocated to new facilities at Hadnot Point by 1990.

Courthouse Bay development was initiated in 1942 with the construction of barracks, training and support facilities for one battalion of Balloon Barrage Training and Amphibious operations. The area provided an excellent amphibious training site for the harboring, repair and servicing of landing boats, tank lighters and amphibious tanks. Courthouse Bay was chosen for balloon barrage operations because portions of the training were conducted from the water and also because the area was remote from flying fields, main roads, power lines and combat areas. The amphibious operations, which were originally a part of the 2nd Division, eventually became the AMTRAC Battalion when the Force Troops Command was formed. After balloon training became obsolete,

these facilities were occupied by a series of Marine Corps units and eventually became the home of the Engineers' School.

During the early development of the Camp Lejeune Complex, operational and training activities were limited to various types of amphibious warfare. When Camp Lejeune was founded, amphibious training was envisioned as the major Base function. The remaining Base area was acquired for general infantry training and was under-utilized for many years.

Since the Second World War, Marine Corps tactical theories have evolved away from extensive beach operations to a concept of vertical envelopment warfare. This concept involves combining various tactical air operations with new types of amphibious assault. As a result, the inland areas of Camp Lejeune and their accompanying airspaces are now filled with new training ranges and facilities.

The Force Troops Command was activated in January 1951. In the mid-1970s it evolved into the 2nd FSSG with a mission to provide combat service support required by Headquarters, Fleet Marine Force Atlantic, and other specialized technical skills not organic to the 2nd Marine Division. From a facilities standpoint, 2nd FFSG has had a history of scatteration and relocation. As a "stepchild," interspersed among the 2nd Division and Marine Corps Base areas, 2nd FFSG had no distinct geographical location of its own until the French Creek Complex was constructed in the late 1960s and early 1970s.

When originally activated, the Force Troops Command was located at Camp Geiger in the renovated temporary barracks which were built originally for the Infantry Training Regiment (ITR) units. These became available when permanent facilities were built at Camp Geiger for ITR. The

renovated barracks soon proved to be an unsatisfactory solution, due to the overwhelming maintenance problems and poor living conditions associated with them. The physical separation of Camp Geiger from the major training areas located in the eastern side of the Complex created constant logistics problems which also contributed to the undesirability of the Camp Geiger location.

In 1958, most of the Force Troop units were moved to locations scattered throughout Hadnot Point. Barracks were relocated to sections of the regimental and industrial areas. The maintenance shops and open storage areas assigned to Force Troops were located on the opposite perimeter of the existing warehouse and storage area, however, the distances between the barracks and working areas immediately created transportation problems for the enlisted men who had to rely on a daily bussing system or private vehicles. The scattering of the individual barracks detracted from any feeling of identity for the 2nd FSSG, when the reorganization from original Force Troops Command occurred.

These inefficient operating conditions prompted the development of a new, consolidated barracks and shops complex designed solely for the 2nd FSSG at French Creek. During the summer of 1968, 2nd FSSG units were relocated to the first phase of the newly-constructed French Creek Complex. The barracks constructed were the first in a series of modern configurations which included private two- and four-man air-conditioned rooms and integrated mess facilities.

Marine Corps Air Station - New River

The site of the Air Station, originally called Peterfield Point, was included in the land acquired for Camp Lejeune in 1941. Initial construction at Peterfield Point included a single 800-foot runway which had no supporting facilities. The 800-acre site was then designated the

Marine Corps Air Facility, Camp Lejeune, North Carolina. In 1942, the facility was expanded with the addition of three 500-foot runways, a seaplane ramp and glider repair shops, and became a satellite of MCAS, Cherry Point.

The station reverted to caretaker status in 1945, under the management of Camp Lejeune. In September, 1968 it was designated Marine Corps Air Station (Helicopter), New River and in May, 1985 was redesignated Marine Corps Air Station, New River.

In July 1954, Marine Aircraft Group-26 (MAG 26), became the first helicopter group at the New River Air Facility. Today MAG-26 plays a major role, with their troop transport helicopters, in support of the 2nd Marine Aircraft Wing and 2nd Marine Division.

Marine Helicopter Training Group (MHTG-40) arrived at MCAS, New River in June 1969. It was composed of Headquarters and Maintenance Squadron (H&MS)-40 and Marine Medium Helicopter Training Squadron (HMMT)-402 and later included Marine Heavy Helicopter Training Squadron (HMHT)-401 in January 1970.

A major reorganization occurred in 1972, when MHTG-40 was deactivated and Marine Aircraft Group (MAG)-29 was born. Composition of the new group included Headquarters and Maintenance Squadron (H&MS)-29, Marine Air Base Squadron (MABS)-29, Marine Light Helicopter Squadron (HML)-268 and Marine Air Traffic Control Unit (MATCU)-64. Two weeks later, Marine Helicopter Attack Squadron (HMA)-269, Marine Light Helicopter Squadron (HML)-167 and Marine Observation Squadron (VMO)-1 were detached from MAG-26 and transferred to MAG-29 to round out the new group.

New construction has included an avionics facility, simulator training building, additional enlisted housing and an Enlisted Personnel Club. HMM-263 joined MAG-26 after moving from Quantico, Virginia. Marine Air Control Squadron (MATCS)-28 and Det "A" Marine Wing Support Group (MWSG)-27 were formed.

The Air Station has been characterized by growth since the deployment of helicopters to this area in 1954. With the introduction of new helicopter weapons systems and the expansion of the number and type of large fixed-wing aircraft, MCAS, New River will continue to expand to meet increasing facility requirements.

Naval Hospital

The Naval Hospital, Camp Lejeune opened in 1943 on the small peninsula northwest of Hadnot Point. This area was later named Hospital Point. The facility became one of the largest and best-equipped hospitals in the South.

In early 1983, the new 205-bed Naval Hospital opened on Brewster Boulevard. The old hospital building on Hospital Point is being converted to administrative use by the 2nd Marine Division. The new hospital provides well-planned, up-to-date facilities which are part of a site designed for maximum expansion capability.

Naval Dental Clinic

The Naval Dental Clinic (NDC) is a relative newcomer to the Camp Lejeune Complex. Originally a part of the Naval Hospital Activity, the NDC was made a separate entity reporting to Naval Medical Command Mid-Atlantic Region in Norfolk, Virginia.

ACTIVITIES

Four major activity areas exist at Camp Lejeune: Marine Corps Base, Marine Corps Air Station, New River; Naval Hospital; and Naval Dental Clinic. In order to prepare troops for amphibious and land combat operations, specialized training in guerilla warfare and field training on modern weapon systems are conducted throughout the Complex.

At the Camp Lejeune Complex, the major commands which occupy the Marine Corps Base (MCB) are: the Marine Corps Base host; the 2nd Marine Division; II Marine Amphibious Force; and the 2nd Force Service Support Group. Located adjacent to the MCB is the Marine Corps Air Station - New River. The Navy Medical and Dental commands are separate units which occupy the Complex.

Marine Corps Base

The Marine Corps Base is considered the "host" organization and Marine Corps commands are Base "tenants." The Marine Corps Base organization provides the basic troop support requirements, such as land, utilities, housing, classrooms and administrative support services.

The following is a list of the groups which comprise the Marine Corps Base host organization:

- Headquarters Battalion
- Support Battalion
- Marine Corps Engineer School
- Marine Corps Service Support Schools

- o Rifle Range Detachment
- o Reserve Support Unit
- o Field Medical Service School
- o Infantry Training School

The Fleet Marine Force (FMF), Atlantic tenant commands occupying the Marine Corps Base are the 2nd Marine Division, the 2nd Force Service Support Group, and the Headquarters of the II Marine Amphibious Force, 6th Marine Amphibious Brigade, 22nd Marine Amphibious Unit and the 24th Marine Amphibious Unit. These tenants form two-thirds of FMF Atlantic. (The 2nd Marine Aircraft Wing, located at four other east coast bases, is the remaining one-third of FMF.)

The 2nd Marine Division is the nucleus of the Marine Corps' east coast force-in-readiness. Its primary function is to maintain a force of infantrymen, whose mission is to attack, and destroy or capture the enemy. The Division is composed of approximately 16,000 enlisted men and 1,000 officers who form the following units: the 2nd, 6th and 8th Marine Regiments (infantry); the 10th Marine Regiment (artillery); the 2nd Reconnaissance Battalion; 2nd Tank Battalion; 2nd Assault Amphibious Battalion; 2nd Combat Engineer Battalion and Headquarters Battalion.

Formed in 1951, Force Troops was the predecessor of the present-day 2nd Force Service Support Group (2nd FSSG). Force Troops was redesignated 2nd FSSG in July 1979 when its combat arms elements were moved to the 2nd Marine Division. The 2nd Marine Division acquired 2nd Tank Battalion, 2nd Assault Amphibious Battalion and three batteries of artillery.

The following elements comprise the 2nd FSSG:

- Headquarters, 2nd FSSG FMF Atlantic
- Headquarters and Service Battalion
- 2nd Dental Battalion
- 2nd Landing Support Battalion
- 2nd Radio Battalion
- 2nd Maintenance Battalion
- 2nd Medical Battalion
- 2nd Supply Battalion
- 8th Communication Battalion
- 8th Engineer Support Battalion
- 8th Motor Transport Battalion
- 2D Air and Naval Gunfire Liaison Company (ANGLICO)
- 2D Force Reconnaissance Company

The 2nd FSSG units are equipped with a high degree of mobility and provide everything from beans to bullets in support of troops. This arrangement relieves Division and Wing commands from the burden of maintaining logistic and administrative support of units that may not be required for every military mission.

Marine Corps Air Station, New River

The Marine Corps Air Station, New River is tenant separate command of the Marine Corps Base organization and is one of three activities which comprise the Marine Corps Air Base Eastern Area. (The other two activities are MCAS Cherry Point and MCAS Beaufort.)

MCAS, New River is a host command providing services to its two major tenants: Marine Air Groups (MAG)-26 and -29. Both MAG-26 and MAG-29 support the 2nd Marine Division troops by providing close airfire support and troop transport functions. These two MAGS comprise two parts of the 2nd Marine Air Wing which, together with the 2nd Marine Division and 2nd FSSG, comprises Fleet Marine Force Atlantic.

Naval Hospital

The Naval Hospital command also operates as a separate command. The Naval Hospital provides general and specialized clinical and hospitalization services for active duty Navy and Marine Corps personnel, active duty members of the other armed services who may be stationed at Camp Lejeune, dependents of active duty personnel, and other persons as authorized by current directives.

Health care system activities include provision of dispensary health services throughout the Complex in Branch Clinics. It is also the role of the Naval Hospital to cooperate with military and civilian authorities in matters pertaining to health, sanitation, local disasters and other emergencies.

Naval Dental Clinic

The Naval Dental command is an integral part of the Naval Health Care System. This activity provides comprehensive outpatient dental care services to Navy and Marine Corps units of the operating forces, shore activities and other authorized beneficiaries. Only active and retired military personnel may utilize Dental Clinic services at the present time.

Dental Clinic activities include the following: Training of personnel; development, operation and management of administrative and logistical plans and programs; liaison with shore commands and units of the operating forces; patient education; dental equipment maintenance and repair service; and presentation of preventive dentistry care programs. The command also maintains five separate dental annexes at the Marine Corps Base, one dental annex at MCAS, New River and one dental annex at MCAS, Cherry Point.

FUNCTIONAL RELATIONSHIPS

A high degree of inter-dependency exists between the Quad Camp Lejeune Command due to the host-tenant arrangement and the interrelationships of assigned exercises.

Marine Corps Base Activity

As stated earlier, the Marine Corps Base host organization provides the basic necessities, such as land, utilities, classrooms and housing, which allows other commands to function. The Marine Corps Service Support Schools (MCSSS), one component of the Base organization, provides training. The Rifle Range Detachment staffs the Rifle Range which is utilized by all Complex troops to meet proficiency requirements. Both the Marine Corps Engineer and Infantry Training Schools serve regiments within the 2nd Marine Division.

The 2D FSSG provides the logistic and administrative support to the 2nd Division forces. 2nd FSSG battalion and companies are organized by function and reflect the activities of the 2nd Division infantry and artillery units to which they provide support.

Marine Corps Air Station, New River

The Marine Corps Air Station (MCAS), New River is a separate command operating under the COMCABEAST. However, the functions of this command interrelate with the Marine Corps Base and the 2nd Division.

Land, utilities and housing are provides to MCAS, New River by the Marine Corps Base organization. The Air Station receives its supplies from the Base and, though most of its supplies are consolidated at Air Station warehouses, some supplies are stored in Marine Corps Base facilities.

MCAS, New River serves as the host organization for eight tenant activities. Two tenant activities, MAGs 26 and 29, provide helicopter air-fire support and troop transport for the 2nd Division forces. These MAGs function in direct support of the 2nd Division and serve as an integral component to the mission of the 2nd Division.

Naval Hospital Activity

The Naval Medical Command functions in support of all Complex military personnel. They provide treatment services within an inpatient and ambulatory health care setting at the Naval Hospital. Naval Hospital personnel staff the 10 Branch facilities located throughout the Camp Lejeune Complex and also support the Mobile Medical Augmentation Readiness System.

Naval Dental Activity

There are actually two separate dental activities located at the Camp Lejeune Complex. As mentioned previously, the Naval Dental Clinic operates a headquarters office, as well as dental annexes located in following areas:

- Hadnot Point
- Courthouse Bay
- Camp Geiger
- Montford Point
- MCAS, New River

The Naval Dental Clinic Command, therefore, functions in support of all four commands in the Complex.

The 2nd Dental Battalion functions in support of the 2nd Force Service Support Group only. This group is independent of the Naval Dental Clinic Command, although it is staffed by Navy servicemen. Battalion personnel wear Marine Corps uniforms and are trained to deploy with 2nd Division regiments.

PERSONNEL LOADING/PROGRAMMED STRENGTH

As can be seen on Table III-1, Camp Lejeune Complex present military population is not expected to change significantly by FY 1989. Based upon available data, 41,265 military personnel are projected to be assigned to the Camp Lejeune Complex by FY 1989. (This excludes Naval Dental

Table III-1

Personnel Loading (1983) and Programmed Strength (FY 1989)
Camp Lejeune Complex

Marine Corps Base	Officers 1983 USMC/Others	Officers Projected USMC/Others	Enlisted 1983 USMC/Others	Enlisted Projected USMC/Others	Total Military 1983	Total Military Projected	Total Civilian 1983	Total Civilian Projected
Permanent Units	212/18	254/267	2,300/23	2,320/482	2,553	3,323	---	---
Students	67/0	193/4[1]	2,522/65	2,805/160[1]	2,654	3,162[1]	---	---
2nd Marine Division	1,101/56	1,051/77	18,338/587	15,465/696	20,082	17,289	---	---
2nd FSSG	475/106	505/98	8,603/656	9,451/714	9,840	10,768	---	---
HQ 22nd MAU	13/0	13/0	24/0	24/0	37	37	---	---
HQ 24th MAU	13/0	13/0	24/0	24/0	37	37	---	---
HQ 26th MAU	13/0	13/0	24/0	24/0	37	37	---	---
2 HQII (N) MAF[2]	54/5	54/5	59/3	59/3	121	121	---	---
HNS (N) Co.[2]	5/0	5/0	68/0	68/0	73	73	---	---
Other	6/13	122/3	0	378/0	19	503	---	---
Total	2,010/198	2,274/454	32,079/1,334	30,735/2,055	35,621	35,518	3,977	4,195
Naval Hospital	0/192	0/224	0/415	0/513	0/607	0/737	327	N/A
Naval Dental[2]	0/26	N/A	0/45	N/A	71	N/A	8	N/A
MCAS[3]	691/13	654/29	4,183/35	4,268/59	4,922	5,010	115	210
TOTAL	2,701/429	2,928/707	36,262/1,829	35,003/2,627	41,221	41,265	4,427	4,405

1/ Projected figures are based on the past three years historical student loads and reflect the highest load that can be reasonably expected during any two-month period.
2/ Programmed strength were not available.
3/ Programmed strength figures were available to fiscal year 1988 only.

Source: Monthly Command Population Reports, 1983 Average.
Facilities Support Requirement Planning Document, February 1984.

Clinic Command personnel for which projections were not available.) Civilian personnel levels are anticipated to decline slightly also.

A closer examination of Table III-1 reveals some significant changes within the Marine Corps Base organization. In particular, 2nd Marine Division personnel levels are projected to decrease by roughly 14 percent between 1983 and 1989. All the other organizations within the MCB activity are expected to increase, or remain stable.

At the present time there are 31,281 dependents of personnel assigned to Camp Lejeune residing either at the installation and in the vicinity of Camp Lejeune. In addition, there are about 24,645 retired military personnel and their dependents living in the Camp Lejeune area.

NATURAL CONSTRAINTS

The following section provides a general description of the natural features characteristic to the Camp Lejeune environment. These natural features can affect the development potential of certain Complex areas and, in some cases, can make facility construction prohibitive. These natural constraints will be described and depicted in detail in the "Planning Factors" analysis included in each of the four Activity Plans.

Topography

The topography of Camp Lejeune can best be visualized as a flat plain sloping gently toward the New River. The elevation ranges from sea level to 72 feet; however, most of the land is from 20 to 40 feet above sea level. The 17 miles of Atlantic coastline are paralleled by a series of alluvial

NATURAL CONSTRAINTS MAP

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

LEGEND

- 100 YEAR FLOOD PLANE
- WET LAND
- CONSERVATION SLOPE AREAS
- RED-COCKADED WOODPECKER HABITAT
- LOGGERHEAD TURTLE NESTING AREA
- ARCHEOLOGICAL RESTRICTIONS

Graphic Scale in Feet

0 4000 8000 12000 16000

FIGURE III-2

deposits and tidal salt marshes which are protected by relatively stable sand dunes forming the barrier strip along the coast. These sand dunes generally range from 15 to 20 feet in height. The flat plain is crossed by streams which are relatively short and have strongly sloping sides with V-shaped cross-sections. The principle watershed drainage areas are the New River, Northeast Creek, Southwest Creek, Wallace Creek, French Creek, Rear Creek, Freeman Creek and Duck Creek. Because of the shallow slope of the topography and the relatively few streams, drainage is the most critical factor which determines the suitability of soil for development. The Base is encompassed by vast areas of pocosins and swampland which evolved due to these topographic features. Relatively few areas of steep slopes, defined as those exceeding 10 percent, exist at Camp Lejeune (Figure III-2).

Soil Conditions

Thirty-one soil series of varying structures exist throughout Camp Lejeune, ranging from sandy loam to fine sand and mud (Table III-2). The soil type can be classified generally as sandy loam although soil conditions are quite heterogeneous. The majority of the soils are well suited to produce abundant crops of timber and forage for wildlife, with only a small proportion of the soils being low in organic matter and fertility (Figure III-3).

Vegetation

Vegetation is typical of the southeastern coastal plain. Extensive tracts of both pure pine and pine-hardwood mixtures dominate the landscape. Pines include loblolly and longleaf, while hardwoods are represented by southern red oak, white oak, turkey oak, willow oak, red gum, type 1 gum, hickory and other types. Areas on the periphery of the forests contain several species of

Table

Soils Identification Legend
Camp Lejeune Complex
(for use with Figure III-3)

Construction Suitability - Good

Bmb	Baymeade fine sand, 1 to 6 percent slopes
BaB	Baymeade-Urban Land Complex, 1 to 6 percent slopes
Ur	Urban land

Construction Suitability - Moderate

GpB	Goldsboro-Urban Land Complex, 0 to 5 percent slopes
Le	Lenoir Loam
On	Onslow loamy fine sand

Construction Suitability - Moderate-to-Poor

AnB	Alpin fine sand, 1 to 6 percent slopes
FoA	Foreston loamy fine sand, 0 to 2 percent slopes
GoA	Goldsboro fine sandy loam, 0 to 2 percent slopes
KuB	Kureb fine sand, 1 to 6 percent slopes
Ln	Leon fine sand
NoB	Norfolk loamy fine sand, 2 to 6 percent slopes
Pa	Pactolus fine sand
St	Stallings loamy fine sand

Construction Suitability - Poor

Ax	Axis mucky sandy loam
Bo (BoH)	Bohicket soils
Ca (CaL)	Carteret soils
Ct	Croatan muck
Dc	Duckston fine sand
Ly	Lynchburg fine sandy loam
MaC	Marvyn loamy fine sand, 6 to 15 percent slopes
Mu	Murville fine sand
Pn	Pantego mucky loam
Ra	Rains fine sandy loam
Wo	Woodington loamy fine sand

Construction Suitability - Very Poor

Co	Corolla fine sand
CrB	Craven fine sandy loam, 1 to 4 percent slopes
CrC	Craven fine sandy loam, 4 to 8 percent slopes
Da	Dorovan muck
Mk	Muckalee fine sand
To	Torhunta fine sandy loam

Source: Soils Interpretations Records, Soil Conservation Service, April 25, 1980.

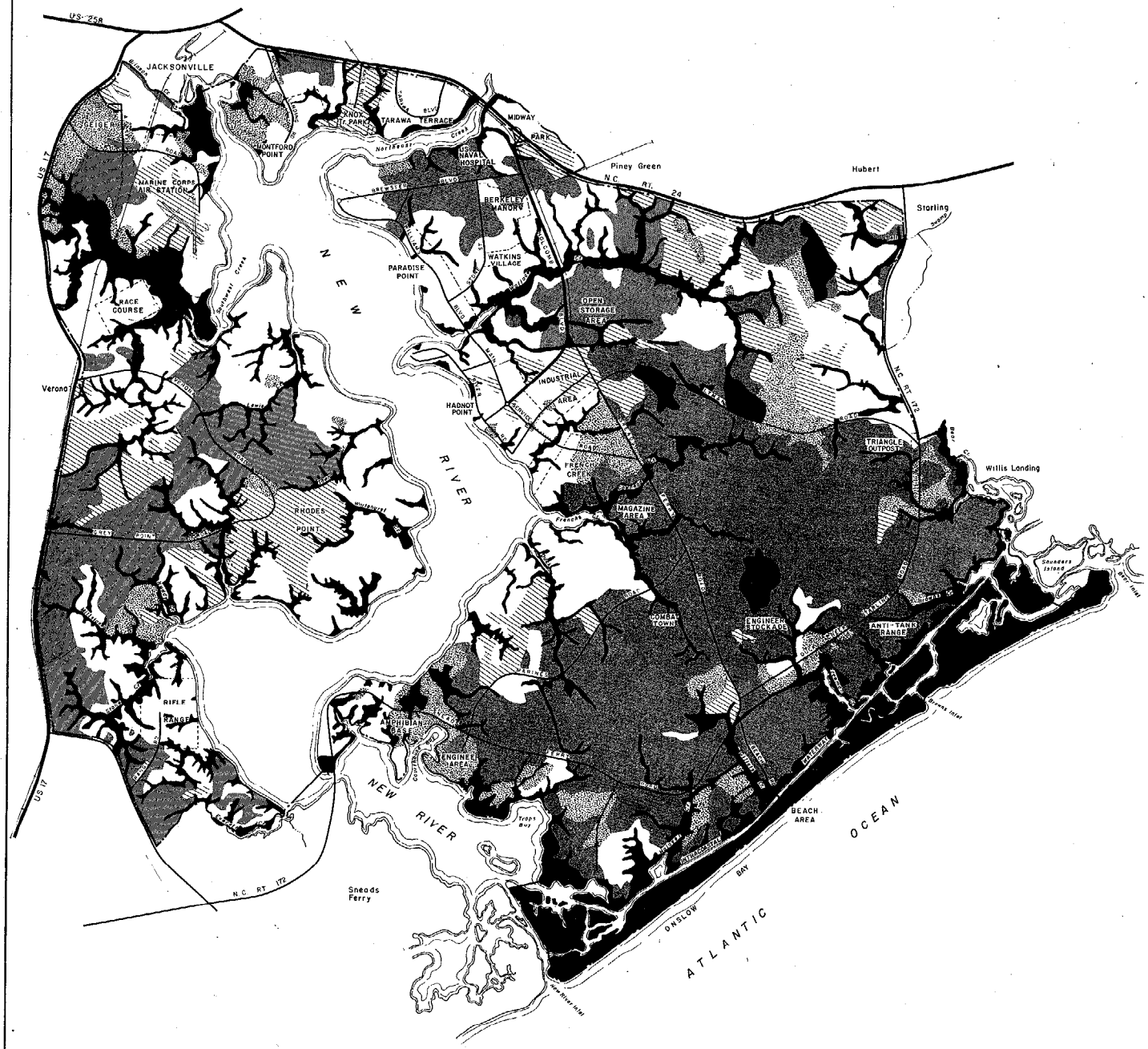
shrubs, vines and herbs. Acidic soil areas contain species of carnivorous plants including the venus flytrap, sundew and pitcher plants. The upland swamps are commonly referred to as pocosins and are overgrown with fetterbush, cyrilla, pond pine and greenbrier, and uneconomically harvested species of pine.

Flood Plains

Inlets function as channels for rising and falling tide waters and as outlets to the ocean for mainland stream flow. Since a relatively constant volume of water moves through inlets within each tidal cycle, in normal conditions, an inlet normally maintains a relatively constant cross-sectional area.

Storms can cause significant rises in sea level on both the ocean and sound sides of the barrier islands. In addition to surges, heavy rains on the mainland, which often accompany storms, result increased stream flow into the sounds. To accommodate this increased volume of water, existing inlets may enlarge, new inlets may form and/or parts of the barrier may simply be overwashed.

The proximity to the New River Inlet and its tributaries results in a significant amount of flood-prone areas throughout the Camp Lejeune Complex. The Natural Constraints Map (Figure III-2) shows the 100-year flood plain, as induced by severe hurricanes, and the sensitive wetland areas. Flood potential exists in proximity to the built-up areas of the Complex. Wallace Creek and French Creek are susceptible and, at high flood stage, could flood the main traffic routes of Holcomb Boulevard and Sneads Ferry Road. The northern portion of the New River Inlet, along



SOILS MAP

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

LEGEND

- GOOD
- MODERATE
- MODERATE TO POOR
- POOR
- VERY POOR

NORTH

Graphic Scale in Feet

0 4000 8000 12000 16000

FIGURE III-3

Wilson Bay and Northeast Creek in the vicinity of Montford Point, Camp Geiger and portions of the Air Station operation field, will be inundated during a 100-year flood.

Wetlands

Approximately 3,000 acres of sensitive estuarine areas are dispersed widely throughout the Military Complex (Figure III-2). Coastal wetlands found in these estuaries are defined as any salt marsh subject to regular or occasional flooding by tides, including wind tides.

Without wetlands, the high productivity and complex food chains found in the estuarine ecosystem could not be maintained. The roots, rhizomes, stems and seeds of coastal wetland plant species provide waterfowl and wildlife feeding and nesting materials. Secondly, wetlands serve as the first line of defense in retarding estuarine shoreline erosion. Plant stems and leaves tend to dissipate wave action, while the vast network of roots and rhizomes resists soil erosion. Most importantly, wetlands act as nutrient and sediment traps by slowing water which passes through them and by causing suspended organic and inorganic particles to settle. By doing so, the wetlands function as a "nutrient storehouse" in which valuable organic matter is retained and matter harmful to marine life is removed.

Wetland ecosystems on Camp Lejeune can be separated into five habitat types: (1) Pond Pine/Pocosin; (2) Sweetgum/Water Oak, Cypress and Tupelo; (3) Sweetbay/Swamp Black Gum and Red Maple; (4) Tidal Marshes and (5) Coastal Beaches. Aquatic ecosystems vary from the saltwater ocean to brackish tidal affected to freshwater streams and ponds. Many of these sensitive wetland areas transverse Complex training areas, creating a potentially threatening situation for the marine life and wildlife which depend entirely upon the estuarine ecosystem.

Endangered Species

Protection of endangered species is in accordance with the National Environmental Policy Act of 1969 and the Endangered Species Act of 1973. Table III-3 identifies endangered and threatened species found at Camp Lejeune and their habitat areas appear in Figure III-2. Red-cockaded woodpecker habitats shown include both the actual nesting areas and the buffer zones which must surround these nesting areas.

The species which have an impact on carrying out the mission of the Military Complex are the Red-Cockaded Woodpecker, Atlantic Loggerhead Sea Turtle, Green Sea Turtle, Eastern Brown Pelican and the American Alligator. Protection of habitat and foraging areas is essential to the survival of these species. Base Order 11015 stipulates Marine Corps policy regarding the conservation of these endangered species.

MAN-MADE CONSTRAINTS

The following section provides a general description of the man-made features present throughout the Camp Lejeune Complex. These potential constraints to development are described and depicted in detail in the "Planning Factors" analyses to be presented in each of the four Activity Plans.

Historic Preservation

The Military Complex encompasses some of Onslow County's earliest settled areas and some of its most historic sites. At the present time, only one archaeological site has been studied in

Table III-3

Endangered and Threatened Species
Camp Lejeune Complex

Species	Common Name	Preferred Habitat	Projects Involved	Status
MAMMALS				
Balaenoptera physalus	Finback whale			Endangered
Magaptera novaèangliae	Humpback Whale			Endangered
Felis concolor cougar	Eastern Cougar			Endangered
BIRDS				
Picoides borealis	Red-Cockaded Woodpecker	Primary in longleaf timber types	Inventory and marking next sites. Prescribed burning.	Endangered
Pelecanus occidentalis	Brown Pelican	Coastal fringe along beach and inlets. Summer migrant.	Photography	Endangered
REPTILES				
Caretta caretta	Atlantic Loggerhead Sea Turtle	Warm ocean water. Frequent nesting along Onslow Beach.	Marking, protecting nest sites from predation.	Threatened
Chelonia mydas	Atlantic Green Sea Turtle	Schoal waters with submarine vegetation.	Inventory and tagging. Nesting in 1980.	Threatened
Lepidochelys kempi	Atlantic Ridley Turtle	Shallow coastal waters, observed in Intercoastal Waterway.	Tagged juvenile.	Endangered
Dermochelys coriacea	Atlantic Leatherback	Open sea waters along the coast.	Awaiting nesting activity on beach.	Endangered
Eretomochelys imbricata	Atlantic Hawksbill Turtle	Reefs and shallow coastal waters.		Endangered
Alligator mississipiensis	American Alligator	Salt marshes, tidal streams and estuaries.	Inventory, protection of marshlands.	Endangered

Species	Common Name	Preferred Habitat	Projects Involved	Status
PLANTS				
Dionaea muscipula	Venus' Fly Trap	Wet margins of open savannahs		Threatened
Sarracenia flava	Yellow Pitcher Plant	Wet bogs, ditches and savannahs		Threatened
Sarracenia rubra	Sweet Pitcher Plant	Shrub bogs and savannahs		Threatened
Sarracenia minor	Hooded Pitcher Plant	Wet bogs, ditches and savannahs		Threatened
Sarracenia purpurea	Pitcher Plant; Flytrap	Wet bogs and savannahs		Threatened

*Species on the North Carolina Life of Endangered Plans (Chapter 41 NC General Statues)

Source: Environmental Quality 1982, Marine Corps Base, Camp Lejeune, North Carolina
Initial Assessment Study of Marine Corps Base, Camp Lejeune, North Carolina, April 1983.

detail and found to contain Indian artifacts (Figure III-2). "An Archaeological and Historical Reconnaissance of U.S. Marine Corps Base, Camp Lejeune," conducted for the Department of the Navy by the University of North Carolina at Wilmington in 1981 deemed a number of sites to be potentially eligible for nomination to the National Register of Historic Places (see Table III-4). Designation would be contingent upon identification of the archaeological and historical components related to each site.

Included in the report are the following recommendations for further study:

- o Further investigation of the potentially eligible sites
- o Further historical research on the study area
- o Survey of underwater archaeological resources
- o Oral history of former residents
- o Historical architectural study

The Marine Corps is obligated to promote plans to protect archaeological and historic sites that are considered eligible for inclusion on the National Register of Historic Places. Eligibility for inclusion can be based upon a number of factors which include, but are not limited to, the research potential of the site, the historical significance of the site, or the architectural or artistic significance of the site.

Sites located in the University of North Carolina survey were analyzed according to their research potential, historical significance and architectural and artistic significance. The recommendations contained in the report are only recommendations and do not constitute an actual determination of eligibility for inclusion on the National Register of Historic Places. It is the

Table III-4

Potentially Eligible Historic Sites

Camp Lejeune Complex

Home of Edward Marshburn

Home of Col. Edward War, Sr.

Home of Col. William Cray, Sr.

Home and mill site of Col. Henry Rhodes

Home and mill site of Col. George Mitchell

Home and industrial sites associated with Robert Whitehurst Snead

Home and cemetery of Gen. Edward Ward

Home of Dr. Edward W. Ward

Home (ordinary) of Joseph French, Sr.

Home (ordinary) and ferry site of Robert Snead, Sr.

Plantation complex (home, mill, cotton gin) associated with William Starkey Hill

Home of David Ward Simmons, Sr.

Home of Col. William Montfort

"Onslow Hall," mansion and plantation complex associated with Thomas A. McIntyre

The Ratliff Grist Mill

The Mitchell-Ward-Montfort Grist Mill

French's Mill

Tar Kiln Beds (selected)

Selected Dwelling Sites Associated with Poorer Classes

Onslow's First Courthouse (Jarrott's Point)

Site of Town of Johnston

responsibility of Camp Lejeune to prepare forms or contract to have the forms prepared requesting a determination of eligibility. These forms then must be forwarded through proper channels and the determination made by the Advisory Council on Historic Preservation.

Explosive Safety Quantity Distances

Explosives are stored at three major locations on the Complex: (1) the Main Ammunition Depot at French Creek; (2) a small storage area at Courthouse Bay for use by demolition students in the Engineers School; and (3) a small ordnance build-up area in the southern part area of MCAS, New River.

Buildings containing explosive materials are listed in Table III-5 along with the net explosive weight and minimum distance required from these buildings to inhabited buildings. Explosive safety arcs are depicted in Figure III-4.

Electromagnetic Radiation Hazards

No electromagnetic radiation hazards presently exist at the Camp Lejeune Complex.

Contaminated Sites

An Initial Assessment Study (IAS) was conducted at Camp Lejeune to identify and assess sites posing a potential threat to human health or the environment due to contamination from past hazardous materials operations.

Table III-5

Explosive Safety Quantity Distances
Camp Lejeune Complex

Complex Area	Building Numbers	Type of Storage	Net Explosive Weight (lbs.)	Required ESQD (ft.)
French Creek	S-FA-1 thru 8	High Explosives	100,000	N/A
	S-HE-1 thru S-HE-11	High Explosives	100,000 to 250,000	N/A
	S-SA-1 thru S-SA-9	Small Arms/Pyrotechnic	40,000 to 100,000	400[1/]
	S-FD-1 thru S-FD-14	Fuse and Detonator	10,000	N/A
Courthouse Bay	S-BB-155	Small Arms/ Rocket Motor	1,000 1,000	100[1/] 75
	S-BB-157 S-BB-158 S-BB-159	Blast Caps Pyrotechnic High Explosives	100 750 1,000	1,250[2/] 75 1,250[2/]
MCAS	AS-5012 thru AS-5017	Ordnance	N/A	1,855

Notes:

1/ The largest ESQD arc governs.

2/ This ESQD arc encompasses several routinely inhabited buildings.

MAN-MADE CONSTRAINTS MAP

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

LEGEND

- EXPLOSIVE SAFETY DISTANCE AREA
- LANDFILL AREA
- HELICOPTER TACTICAL LANDING ZONE
- HELICOPTER ADMINISTRATION LANDING ZONE
- CONTAMINATED SITE
- NOISE CONTOURS
  - ZONE 3 (75+ LDN)
  - ZONE 2 (65-75 LDN)

NORTH

Graphic Scale in Feet

0 4000 8000 12000 16000

FIGURE III-4

Based on information from historical records, aerial photographs, field inspections and personnel interviews, a total of 76 potentially contaminated sites were identified. Each of the sites was evaluated with regard to contamination characteristics, migration pathways and pollutant receptors.

In April 1983, the study concluded that, while none of the sites pose an immediate threat to human health or the environment, 22 sites warrant further investigation under the Navy Assessment and Control of Installation Pollutants (NACIP) Program to assess potential long-term impacts. A confirmation study, involving actual sampling and monitoring of the 22 sites, was initiated to confirm or deny the existence of the suspected contamination and to quantify the extent of any problems which may exist. Since the on-site survey, MCB Camp Lejeune has taken action to evaluate or mitigate Site No. 2, the former Nursery/Day Care Center, and Site No. 16, the Montford Point Burn Dump. The 22 sites recommended for confirmation are listed below in order of priority.

1. Rifle Range Chemical Dump, Site No. 69
2. Storage Lots 201 and 203, Site No. 6
3. MCAS Mercury Dump, Site No. 48
4. Former Nursery/Day Care Center, Site No. 2
5. Transformer Storage Lot 140, Site No. 21
6. Camp Geiger Dump, Site No. 41
7. Mess Hall Grease Disposal Area, Site No. 74
8. MCAS Basketball Court Site, Site No. 75

9. MCAS Curtis Road Site, Site No. 76

10. Courthouse Bay Liquids Disposal Area, Site No. 73

11. Fire Fighting Training Pit, Site No. 9

12. Industrial Area Fly Ash Dump, Site No. 24

13. Campbell Street Underground Avgas Storage and Adjacent JP Fuel Farm at Air Station, Site No. 45

14. Hadnot Point Burn Dump, Site No. 28

15. French Creek Liquids Disposal Area, Site No. 1

16. Rifle Range Dump, Site No. 68

17. Montford Point Burn Dump, Site No. 16 (Mitigation undertaken)

18. Industrial Area Tank Farm, Site No. 22

19. Crash Crew Fire Training Burn Pit, Site No. 54

20. Sneads Ferry Road -- Fuel Tank Sludge Area, Site No. 30

21. Camp Geiger Area Dump, Site No. 36

22. Camp Geiger Area Fuel Farm, Site No. 35

In July 1984 the Navy and Marine Corps began a detailed characterization study to define the extent of contamination at the 22 sites. Initial sampling detected groundwater contamination of the Hadnot Point water supply resulting in closure of 8 wells. Follow-up samples detected contamination in 2 wells of the Tarawa Terrace system which were also closed. The TT contamination has been identified as originating from an off-base source.

In 1986-1987 a Characterization Study and Feasibility Report will be completed for all sites and the Hadnot Point Water Supply System. This effort will also define remedial options as needed to control and clean up all contamination problems. In the interview, the constraints posed to development by these contaminated sites should be addressed in all phases of planing.

Aircraft Landing and Clearance Zones

The majority of aircraft accidents occur during either the take-off or landing phase of flight. Therefore, maintenance of adequate landing and clearance zones is of prime importance for safe air operations throughout the Camp Lejeune Complex. Future planning should take into consideration the need to preserve clear, safe and unobstructed approaches to and from: the airfield; the helicopter Tactical Landing Zones (TLZs) (Figure III-4); and the two Helicopter Outlying Fields at Camp Davis and Oak Grove.

Noise

Noise generated by the helicopter and limited fixed-wing aircraft operations at MCAS, New River poses the only significant noise constraint within the Complex. Most recent noise samples of the MCAS area were taken during April-May 1977 for inclusion in the Air Installation Compatible Use Zone Study (AICUZ). As stated in the AICUZ, Noise Zone 1 is defined as less than 65 IL_{DN}; Zone 2 as 65-75 IL_{DN}; and Zone 3 as 75+ IL_{DN} (levels have been adjusted for climatic conditions and typical active day flight densities). The impact-weighted noise contours for MCAS, New River are shown in Figure III-4.

The 65 impact-weighted IL_{DN} contour (Noise Zone 2) falls entirely within the Camp Lejeune Complex. Two built-up areas are situated within this impact area: Officer Family Quarters located directly east of the airfield and the western portion of Montford Point. For the most part, the current aircraft noise levels only affect the Driver's Training Course area of Montford Point. Noise impact should be considered in planning future development at Montford Point, as well as at the Air Station.

The AICUZ Study concluded that helicopter operations pose no significant noise problem at present, nor would be expected to be a problem in the future for Jacksonville and Onslow County residents. Noise problems from helicopter operations on the northeastern perimeter of the base have generated infrequent complaints. The noise impact associated with the introduction of larger fixed-wing aircraft at MCAS, New River could pose a noise problem in the future. Noise levels from these operations should be included in any updates to a Camp Lejeune AICUZ Study.

Noise generated by high explosives in the impact areas also affects areas both on and off base. These operations should be addressed in a base-wide blast noise study.

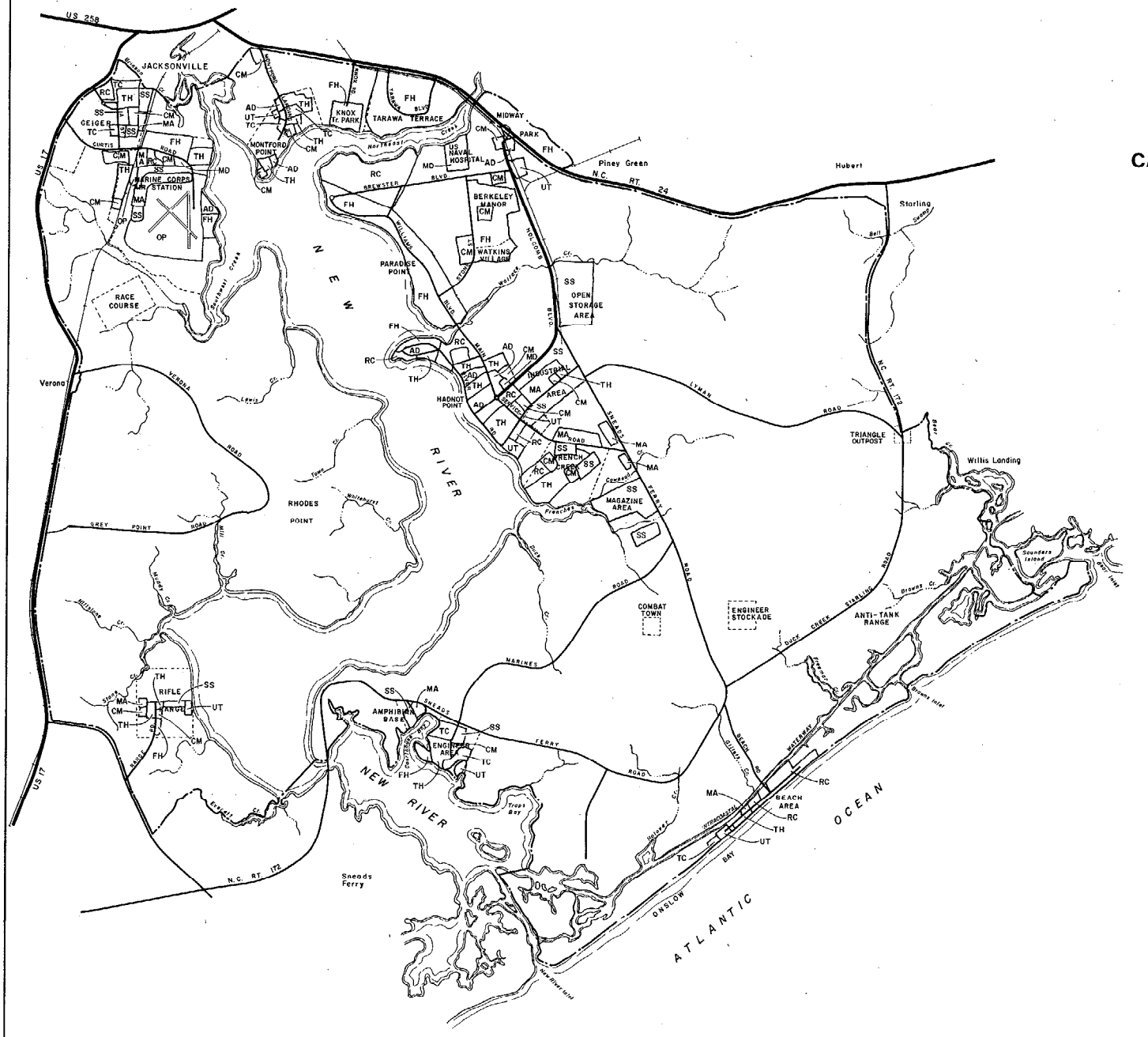
EXISTING LAND USE

The use of land is influenced generally by the physical features of the land itself or by the operational requirements which relate directly to the use. Marsh land, for example, is a physical feature which influences development. Regulations or legal restrictions, such as explosive quantity safety distances or helicopter approach and clearance zones, are examples of operational requirements which influence development.

COMPLEX GENERALIZED EXISTING LAND USE

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA



LEGEND

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY

NORTH

Graphic Scale in Feet

0 4000 8000 12000 16000

FIGURE III-5

General land use for the Camp Lejeune Complex is depicted in Figure III-5. The utilization of land, by acreage, follows on Table III-6. The table indicates the approximate number of acres associated with each land use category.

Operational Uses

Scattered throughout all the training and maneuver areas are 15 Helicopter Tactical Landing Zones (TLZ) used solely for training exercises, while Administrative Landing Zones which are located in the urbanized developed areas are used for intra-and inter-Base transport. The largest concentration of operational land use is at the Air Station where roughly three-quarters of the land area is designated for aircraft and helicopter operations and is primarily made up of airfield runways and apron parking.

Training and Maneuver Uses

A vast majority of the Complex land area is comprised of training ranges and maneuver areas. These areas are generally concentrated between Sneads Ferry Road and the eastern Complex boundary and extend from the assault area at Onslow Beach northward to Route 24. Additional areas reserved for training ranges and maneuver areas: the area from the Race Track southward to the Rifle Range and the area between French Creek and Mile Hammock Bay. Classroom training facilities are scattered throughout the developed areas of the Complex. The largest concentration of classrooms exists at Montford Point, the home of the Marine Corps Service Support Schools. A detailed analysis of the existing training areas prepared in conjunction with this Master Plan, are presented in the Special Training Analysis, Camp Lejeune North Carolina.

Table III-6

Land Utilization: Development Areas
Acres/Land Use (Percent)
Camp Lejeune Complex

Land Use	Acres	Percent
Operational	577	9.2%
Training		
Classroom	165	2.6%
Range/Maneuver	N/A	N/A
Maintenance	384	6.2%
Research	1	.01%
Supply/Storage	659	10.6%
Medical/Dental	93	1.5%
Administrative	220	3.5%
Troop Housing	622	10.0%
Family Housing	1,704	27.3%
Community	420	6.7%
Commercial	89	1.4%
Recreational	1,173	18.8%
Utility	136	2.2%
TOTAL	6,243	100.0%

Maintenance Uses

Throughout the Complex, maintenance uses are generally situated adjacent to supply and storage uses. French Creek, Hadnot Point and MCAS, New River contain the largest concentrations of maintenance uses, which in most cases are used for vehicle and equipment servicing and repair.

The existing land use configuration for the French Creek Complex reflects the heavy equipment operation and maintenance activities of the 2nd Force Service Support Group (2nd FSSG). The same is true at Courthouse Bay where the storage, maintenance and training associated with the amphibious vehicles and heavy engineering equipment takes place.

Research

Uses which are considered to be a part of the research land use category are limited to the Hadnot Point area and represent less than one percent of the total developed acreage.

Supply and Storage Uses

Approximately 10.5 percent of all the developed land in the Complex is comprised of supply and storage uses, most of which are concentrated in the area east of the Parade Field at Hadnot Point, east of Holcomb Boulevard in an open storage area and at French Creek. Directly south of French Creek is the Main Ammunitions Storage Area around which the quantity safety distance arc is shown. The fourth largest supply and storage area is located adjacent to the hangers at MCAS, New River. Ancillary supply and storage also exists at Courthouse Bay, the Rifle Range, Montford Point and Camp Geiger.

Medical/Dental Uses

The primary medical facilities have been consolidated at the new Naval Hospital, located north of Brewster Boulevard. Ancillary medical clinics are scattered throughout the Complex regimental areas at Hadnot Point, French Creek, the Rifle Range, Montford Point and the Air Station. The primary dental facilities are headquartered at Hadnot Point and ancillary dental clinics exist in the same locations as the medical clinics.

Administrative Uses

Administrative offices are concentrated at Hadnot Point and, more recently, also at Hospital Point. Concentration of the Marine Corps Base and 2nd Marine Division Headquarters organizations in these contiguous areas enhances communication between the various administrative personnel as well as permits a close physical relationship between the troops occupying the Hadnot Point regimental areas. The area is centrally located relative to the rest of the Complex and serves as a focal point for the military command structure.

Troop Housing

Troop housing is generally concentrated at Hadnot Point, French Creek, Camp Geiger and MCAS, New River, as well as in smaller numbers in scattered locations serving functional uses at Montford Point, the Rifle Range and Courthouse Bay. Troop housing for the most part is conveniently located to personnel support facilities, such as the Exchange and recreational uses. Approximately 10 percent of the developed land in the Complex consists of Troop Housing.

Family Housing

Family housing, which occupies the greatest percentage (27.3 percent) of developed land, is separated from the troop housing areas and generally concentrated in the wooded area between Wallace Creek and Brewster Boulevard, at Tarawa Terrace I and II, at Midway Park and at MCAS, New River. Typically, family housing areas are comprised of lower density single family and duplex dwelling units and occupancy is segregated between officers and enlisted personnel. Elementary schools are conveniently situated near these housing areas and middle and high school facilities are centrally situated along Brewster Boulevard.

The three housing developments located on Route 24 are situated outside the central Complex area. These residential areas are relatively close in proximity to off-Base commercial resources, while access to Marine Corps/Navy commercial community and medical facilities is less direct.

Family housing at the Air Station is even less accessible to Marine Corps/naval personnel support facilities at Hadnot Point. However, the new Curtis Road Triangle Exchange building has been completed recently in the area just west of the Air Station boundary and south of Camp Geiger.

Community Uses

Community uses include all types of non-commercial personnel support facilities such as: dining facilities, libraries, child care facilities and schools, as an example, cover approximately 6.7

percent of all developed land. These uses are distributed throughout the developed areas of the Complex and generally are situated in close proximity to residential and commercial uses.

Commercial Uses

Existing commercial uses have been decentralized throughout the Complex and exist generally in close proximity to troop and family housing areas. The primary concentration of commercial uses exists at Hadnot Point where the Main Commissary and Exchange is located. These commercial uses are generally accessible by foot to the troops assigned at Hadnot Point and to the large number of military personnel and civilians who work at Hadnot Point.

The second largest concentration of commercial land use is located at the Curtis Road Triangle, between MCAS, New River and Camp Geiger. This new "personnel support complex" is centrally located and is outside the Air Station Noise and Accident Potential Zones. Vehicular access to the area for military personnel working and residing in these two areas, as well as for those who reside off-Base, is convenient.

Other smaller commercial use areas are scattered throughout the Complex, at Montford Point, Tarawa Terrace, Midway Park, French Creek, Courthouse Bay and the Rifle Range and specifically serve housing areas.

Recreational

A wide variety of both outdoor and indoor recreational facilities are scattered throughout the Complex. Outdoor facilities generally include playing fields, tennis and basketball courts and an

amphitheater. Indoor facilities generally include swimming pools, gymnasiums and bowling alleys. Approximately 18.8 percent of the developed land at Camp Lejeune is devoted to recreational uses.

Existing recreational facilities tend to be located on the periphery of development. The natural beauty and physical diversity unique to Camp Lejeune provides the opportunity for recreational uses throughout the Complex to complement other uses. Many of the large picnic areas or wooded trails located on the river front provide spectacular views in a natural setting.

EXISTING CIRCULATION

The existing circulation system is generally adequate to support existing land use relationships. In several areas, however, traffic congestion and safety problems persist. The source of this information is the "Traffic Engineering Study, Marine Corps Base, Camp Lejeune," Military Traffic Command, November 1980. The following section briefly outlines the major circulation problems, solutions to which will be addressed in a Circulation Plan to be completed for each of the four Activity Plans.

Holcomb Boulevard/Main Gate

Holcomb Boulevard is a four-lane divided roadway except at Main Gate where there are three inbound lanes. Some 150 feet south of the gate, the inbound roadway reverts to two lanes.

To prevent a major breakdown in traffic flow during the morning and evening peak periods, reversible lanes are formed with traffic cones. In the morning peak (0615 to 0815 hours), cones are placed so that traffic on NC Route 24 from the east (direction of Swansboro) is channeled into the

inside outbound lane just south of the gatehouse. Vehicles in this lane must travel to Sneads Ferry Road where they are forced to exit onto Sneads Ferry Road.

The two lanes of traffic from the west (direction of Jacksonville) travel the two inbound lanes of Holcomb Boulevard. Vehicles in these two lanes may turn on Brewster Boulevard but cannot turn left onto Sneads Ferry Road. This places restrictions on the travel directions of inbound motorists. Its third inbound lane allows Holcomb Boulevard to accommodate the 4,000 vehicles in the morning peak hours.

Entry from Brewster Boulevard onto Holcomb Boulevard is blocked by cones from 0700 to 0745 hours to expedite the inbound traffic flow. Motorists departing the Base during this period must enter Holcomb Boulevard at some point south of Sneads Ferry Road.

During the evening peak period, Holcomb Boulevard is operated as three lanes outbound between Sneads Ferry Road and Main Gate. Cones are placed so that traffic in the left outbound lane of Holcomb Boulevard is channeled into the left inbound lane at the Sneads Ferry Road intersection.

The military policeman stationed at the Brewster and Holcomb Boulevard intersection allows Brewster Boulevard traffic to enter the Holcomb Boulevard reversed outbound lane by stopping that traffic when vehicles queue on Brewster Boulevard. At Main Gate, traffic in this third outbound lane must exit toward Jacksonville. Vehicles in the center outbound lane must also exit in the direction of Jacksonville. Vehicles in the right outbound lane must exit to the east in the direction of Swansboro.

The placement of traffic cones at Main Gate channelizes the outbound traffic into these three lanes. Outbound vehicles (3,400 in the evening peak hour) were observed to slow down as they approach these lines of cones and to increase speed as they pass the cones. Any slight interruption of the outbound flow causes vehicles to queue quickly.

The traffic cones defining the reversible lane are spaced at intervals of 1,000 feet or more between Brewster Boulevard and Sneads Ferry Road, making it very easy for drivers to enter the wrong lane if they are not alert to the situation. Fold-down traffic signs are posted along inbound and outbound Holcomb Boulevard, alerting drivers to the reversible-lane operation. The military police do an excellent job minimizing adverse traffic conditions during the peak periods.

The greatest travel delay encountered at Camp Lejeune was the 5.3 minutes in the evening peak period on the section of Holcomb Boulevard between Sneads Ferry Road and Brewster Boulevard. The overall travel speed is reduced to 20 mph on this 55-mph posted roadway. This is an every workday occurrence. The next greatest delay was 1.4 minutes between Brewster Boulevard and Main Gate. This is also an every workday occurrence.

Holcomb Boulevard/Sneads Ferry Road

The 100-foot left-turn storage lane on southbound Holcomb Boulevard is not long enough to accommodate the number of morning peak-hour vehicles turning left onto Sneads Ferry Road. Produced is an overflow of traffic onto Holcomb Boulevard.

Holcomb Boulevard at the Base Exchange

Significant traffic congestion occurs on Holcomb Boulevard at the base exchange during the noon peak period, particularly on military paydays. The primary reason for this congestion is that there are no storage lanes on Holcomb Boulevard for either north or southbound vehicles waiting to enter the base exchange parking lot. Lines of vehicles form in the through lanes of Holcomb Boulevard.

The military police place traffic cones during the noon peak period to force southbound traffic into the right lane of Holcomb Boulevard. Cones are also placed to prevent left turns from Dogwood Street onto Holcomb Boulevard. Northbound vehicles on Holcomb Boulevard must make a U-turn at the Dogwood Street median crossover to reach the exchange lot. All the median crossovers at Gum Street, the exchange entrance driveway and Fir Street are closed. Vehicles waiting to enter the exchange parking lot obstruct through-traffic along Holcomb Boulevard in both directions.

Holcomb Boulevard Between Ash Street and Main Service Road

This section of road has a high incidence of right angle collisions at intersections caused by vehicles on side streets trying to cross or enter Holcomb Boulevard. Because of the large traffic volume along Holcomb Boulevard, especially during peak periods, vehicle drivers on side streets become impatient and take risks to enter the Holcomb Boulevard traffic flow. The result is the large number of right-angle accidents.

Holcomb Boulevard and the Main Service Road

This intersection is currently operating as a traffic circle with a 117-foot radius. Such a small radius provides about 100 feet of weaving distance for lane changing, which is too little for safe maneuvers.

Upon entering the circle, drivers remain in the outside lane as they travel around the circle to their turn-off point because they fear being trapped in the inside lane and being unable to exit. The morning peak period traffic flow through the circle operated smoothly; however, during the noon and evening peak periods congestion and delays were encountered.

Main Service Road and Louis Road/N Street

At the present time, this intersection is signalized with a two-phase signal. The major problem at this intersection is the difficulty encountered by eastbound vehicles on the Main Service Road in attempting to turn left onto Louis Road during peak hours. Heavy westbound flow on the Main Service Road results in lengthy delays for those left-turning vehicles. A related problem is the conflict created by the Post Office southernmost driveway that enters Louis Road only 100 feet from this intersection.

Bicycle Prohibition Along Holcomb Boulevard

The large volume of traffic along Holcomb Boulevard and associated congestion and safety problems have resulted in the present prohibition of bicycles along Holcomb between Brewster

Boulevard and Main Street. Any roadway redesign of this route should resolve these vehicular conflicts and provide separate bicycle lanes in order to reopen this route to bicycle travel.

Lack of Regulation Three-Mile Running Courses

Throughout the Complex there is a shortage of running courses that are segregated entirely from roadways. Such courses need to be three miles in length, without any street crossings, and preferably be located on natural surfaces.

Lengthy Travel Distances Between Areas

Lengthy travel distances are involved in traveling from areas such as MCAS, New River, Montford Point and Tarawa Terrace I and II to the main community facilities located at Hadnot Point. Travel times from outlying areas should be minimized to the extent that is cost-effective.

Proposed Bypass

Construction of a Highway 17 Bypass south of the present facility would be one solution to reducing travel distances between Complex areas; however, alignment selection is critical in maintaining the integrity of the Montford Point, Camp Geiger and MCAS, New River areas. At the time this Plan was prepared, the "Jack's Point" alignment was under serious consideration. This alignment would appear to require the least amount of Camp Lejeune land and, as long as adequate access is provided from these areas onto the new roadway, would seem to offer a workable solution to congestion and access problems which presently exist along Highway 17 in the vicinity of Jacksonville.

Onslow Beach Bridge

A capacity problem exists at the Onslow Beach Bridge during the summertime months. This problem will be worse when the new recreational lodges are completed at Onslow Beach.

Conclusion

There is an overall need for traffic counts to be updated on a continuous basis in areas of high vehicular activity. The last major collection of counts was taken in 1980. New counts are needed at the problem areas described above and at other major intersections Complex-wide in order to identify and correct circulation inefficiencies.

EXISTING UTILITIES

The Camp Lejeune Complex contains numerous developed areas, some of which are remote from other developed areas and some of which are contiguous or in proximity to other developed areas. The terrain and the spatial characteristics of the developed area to be served have dictated the size and type of most utility systems at Camp Lejeune.

Several separate water systems and wastewater systems (including treatment plants) have been constructed to serve various areas of Camp Lejeune. Some systems serve only one distinct area, such as the Rifle Range system. Other systems, such as the Hadnot Point water and wastewater systems, serve several areas. Additionally, the Holcomb Boulevard water treatment plant and distribution system are connected to the Hadnot Point water distribution system, although it is normal practice to close off the system into two sections at Wallace Creek. Over the years,

changes have been made to the areas served by water and wastewater systems. Originally, Camp Geiger and the Marine Corps Air Station had separate systems and treatment plants, but now only one water system and one wastewater system serve these two areas.

Three major substations provide the electrical distribution systems for various areas at Camp Lejeune. The Marine Corps Base substation located west of Holcomb Boulevard near the Industrial area is the largest substation. The substation was located in the area during the 1970s and replaced a substation near the Holcomb Boulevard entrance into which served the entire complex. At the approximate location, however, CP&L has maintained a substation to serve Tarawa Terrace housing. There is also a substation at MCAS, New River at Curtis Road and a street that serves the Air Station and Camp Geiger.

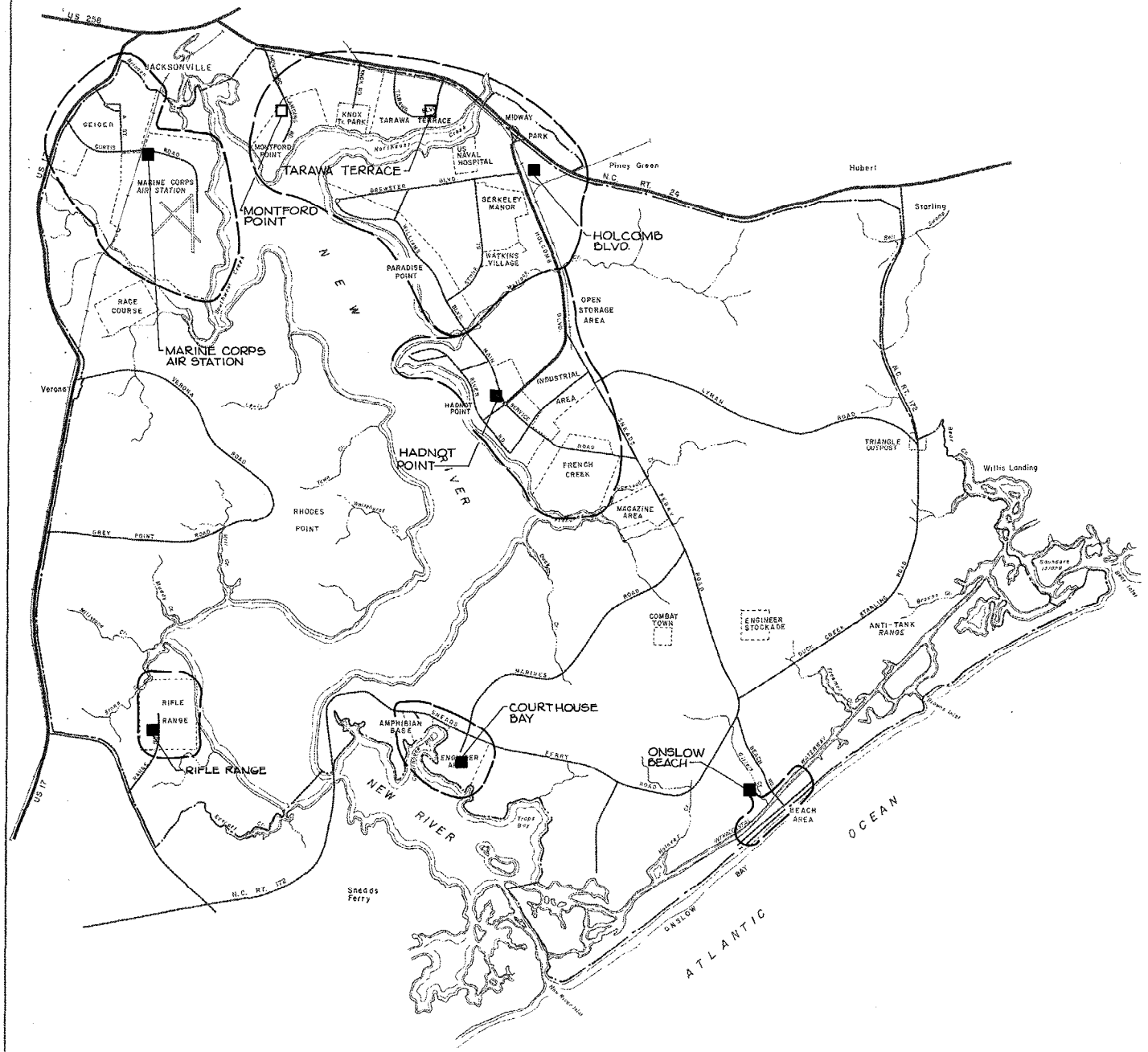
Steam and heating energy are distributed from central plants located in the distinct areas of the complex and there are no interconnections between plants.

Existing Water Systems

There are eight water treatment plants at Camp Lejeune, each of which has its own water well system, ground and elevated water storage tanks, and distribution systems. Sometimes, as mentioned above, the distribution systems are interconnected. The treatment plant locations and areas served by these plants are described below and shown on the map identified as Figure III-6.

Hadnot Point

The Hadnot Point Water Treatment Plant is located in Building 20 at "A" Street and Main Service Road in the Hadnot Point area. Its distribution service area includes the Division Billeting



WATER SYSTEM

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

LEGEND

- WATER TREATMENT PLANT TO BE ABANDONED
- *WATER TREATMENT PLANT*
- WATER SYSTEM SERVICE AREAS

FIGURE III-6

area, the Supply and Industrial area, the Open Storage area east of Holcomb Boulevard, the French Creek area and the old U.S. Naval Hospital area. The distribution system is tied to the service area of the Holcomb Boulevard treatment plant by main lines on the Main Service Road at Wallace Creek and on Holcomb Boulevard at Wallace Creek. For operational reasons, these two distribution systems are usually closed off from each other at Wallace Creek.

Holcomb Boulevard

The Holcomb Boulevard Treatment Plant is located in Building 670 located northeast of Holcomb Boulevard near the Brewster Boulevard intersection. Its distribution system includes the Paradise Point area, Officers Quarters, the Berkeley Manor and Watkins Village Quarters, the new U.S. Naval Hospital, the Midway Park Quarters, the Lejeune High School and the Brewster Junior High School area.

Tarawa Terrace

The Tarawa Terrace housing area for married enlisted personnel and their dependents is served by a water treatment plant at Building TT-38. The Tarawa Terrace area is developed as Tarawa Terrace I and Tarawa Terrace II, with connecting streets and water lines at Inchon Street and Tarawa Boulevard. The water treatment plant is located in the central area of Tarawa Terrace I near Matanikua Street.

Montford Point

The Montford Point Treatment Plant is located in Building M-178 and is situated in the northwest sector of the development west of Montford Landing Road. A line along Florence Road connects the system with the Knox Trailer Park area.

Marine Corps Air Station

The Marine Corps Air Station Treatment Plant is located in Building MCAS-110 near the intersection of Curtis Road and Bancroft Street. This treatment plant serves a large area in the northwest sector of Camp Lejeune including the air station helicopter service facilities, quarters for enlisted and married personnel at the air station, Camp Geiger Area A and Camp Geiger Area B (trailer park area).

Rifle Range

The Rifle Range Treatment Plant is located in Building RR-85 near the intersection of Range Road and Powder Lane. The area is located in the southeast sector of Camp Lejeune remote from other facilities and the treatment plant serves only the facilities of the Rifle Range area.

Courthouse Bay

The Courthouse Bay Treatment Plant is located in Building BB-190 on Marines Road about 2,700 feet south of Sneads Ferry Road. The Courthouse Bay facilities are located along the New River Estuary at Courthouse Bay at the southern boundary of the Camp Lejeune Complex. The area

is divided into the Engineers area and the Amphibian Base which are separated by Courthouse Bay. A water line along Sneads Ferry Road serves the Amphibian Base from the Courthouse Bay Treatment Plant and distribution system.

Onslow Beach

The Onslow Beach Treatment Plant is located in Building BA-138 on the Access Road to Mockup, about one-half mile northwest of the Intracoastal Waterway and Onslow Beach facilities. Onslow Beach is located in the southeast sector of Camp Lejeune between the Intracoastal Waterway and the Atlantic Ocean. It is remote from other developed areas and the treatment plant serves only the facilities of Onslow Beach.

Planned Water Systems

Construction plans are being prepared to increase the capacity of the Holcomb Boulevard Water Treatment Plant in order to serve Tarawa Terrace I, Tarawa Terrace II and Montford Point from that plant. The project includes new water lines at those areas, as well as a new water line to the Hadnot Point Water Treatment Plant. Also included are new water reservoirs, new water wells and new raw water lines. When the new facilities are provided, the water treatment plants at Tarawa Terrace and Montford Point will be abandoned. The high lift distribution pumps at the Tarawa Terrace pumping station will be retained.

Construction is underway to add facilities and upgrade the water treatment plants at Courthouse Bay and the Rifle Range. This construction will not result in changes to the service areas of these plants.

Other future facilities may be required to service the various areas of Camp Lejeune as a result of the concept plans developed by this study. Otherwise, the remaining service areas are not expected to change.

Existing Wastewater Collection and Treatment

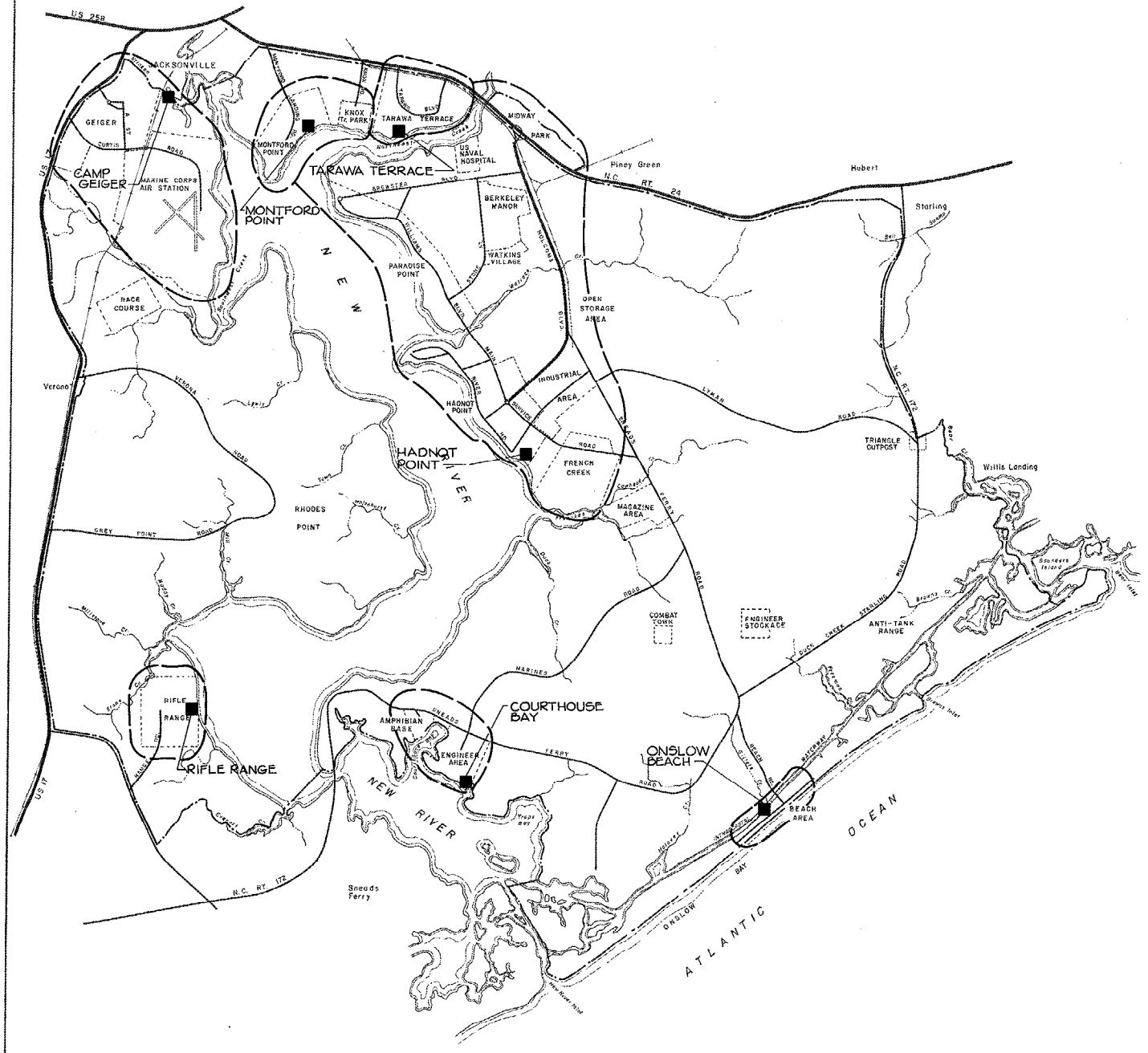
There are seven wastewater treatment plants at Camp Lejeune, each of which has its own sewerage collection system as well as interceptor sewers and lift stations where required. The plant locations and areas served by these plants are described below and shown on Figure III-7.

Hadnot Point

The control building for this plant is Building 22. The treatment plant is situated at the southeast limits of the Hadnot Point area and discharges into the New River. The plant provides primary and secondary treatment with filters. Access to the plant is from River Road and O Street. The treatment plant serves the Hadnot Point Division Billeting area; Hadnot Point Supply and Industrial area; the old Naval Hospital area; Paradise Point Officer's Quarters area; Berkeley Manor, Watkins Village and Midway Park Quarters areas; the new U.S. Naval Hospital; the Lejeune High School and the Brewster Junior High School areas; and the French Creek area.

Tarawa Terrace

The control building for the plant is Building TT-35. The wastewater treatment plant is situated south of Tarawa Terrace II with the outfall discharging to Northeast Creek. The plant



WASTEWATER SYSTEM

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

LEGEND

- ■ WASTEWATER TREATMENT PLANT
- — — WASTEWATER COLLECTION AREA

FIGURE III-7

provides secondary treatment utilizing biological filtration. Access is from Hagarn Drive. This treatment plant serves the Tarawa Terrace I and Tarawa Terrace II areas.

Montford Point

The control building for the plant is Building M-136. The wastewater treatment plant is situated in the east-central area of Montford Point near the confluence of Scales Creek and Southeast Creek. The plant provides secondary treatment utilizing biological filtration. The plant discharges to Northeast Creek. Access to the plant is from Waccamaw Road. This treatment plant serves the Montford Point area and the Knox Trailer Park area.

Camp Geiger

The control building for the plant is Building TC-563. The wastewater treatment plant is situated approximately 1,500 feet each of G Street, Camp Geiger A. The plant provides automated advanced (tertiary) treatment in addition to biological filtration in the secondary filters. The plant discharges to the New River. Access to the plant is from C Street near its intersection with Fourth Street. This treatment plant serves Camp Geiger Area A, Camp Geiger Area B and the Marine Corps Air Station.

Rifle Range

The control building for the plant is Building RR-92. The wastewater treatment plant is situated near Range Road at Stone Bay. The plant provides secondary treatment utilizing biological

filtration. The plant discharges to Stone Bay. Access to the plant is from Range Road. This treatment plant only serves the Rifle Range area.

Courthouse Bay

The control building for the plant is Building BB-4. The wastewater treatment plant is situated in the southeast sector of the Courthouse Bay area. The plant provides secondary treatment utilizing biological filtration. The plant discharges to New River. Access to the plant is from Peach Street.

Onslow Beach

The control building for this plant is Building SBM-160. The wastewater treatment plant is situated in the central part of the Beach area alongside the Intracoastal Waterway to which it discharges. The plant provides secondary treatment utilizing biological filtration. Access to the plant is from Ocean Drive. This treatment plant only serves the Onslow Beach area.

Planned Wastewater Collection and Treatment

At the time of the study of existing conditions, preparation of construction plans to modify the treatment plant, as well as construction activities, were underway at several treatment plants.

At Hadnot Point a new contact chamber was being constructed.

At Tarawa Terrace construction in progress included the construction of new comminutors, grit chamber and lift station. The existing wet well is to be filled. Two existing pumps are to be replaced with three lift station pumps.

At Camp Geiger several modifications reportedly are needed and a request has been made for four new sludge drying beds.

At the Rifle Range Treatment Plant, worn filter arms are scheduled for replacement.

At Courthouse Bay, Project P-784 will upgrade and increase the capacity of the plant.

At Onslow Beach, several minor modifications were reported to be needed.

None of the above modifications are for the purpose of revising the service areas of the treatment plants. The Courthouse Bay project is to increase capacity due to temporary overloading of the plant due to peak wet weather flows.

Other future facilities may be required to service the various areas of Camp Lejeune as a result of the concept plans developed by this study. Otherwise, the remaining service areas are not expected to change.

Existing Electrical

At three locations, substation transformers owned by CP&L provide electricity at distribution system levels. Transmission lines are owned by CP&L. The distribution circuit breakers at two

locations are owned by the government. At the CP&L substation for Tarawa Terrace, the utility owns distribution equipment. Figure III-8 shows the transmission line connections, substation locations and the electrical distribution line routings that serve outlying areas.

CP&L Substation for Tarawa Terrace

The substation rating is 25 MVA (thousands kilovolt amperes). Primary rating is 230 KV. Secondary distribution is 23 KV and the three-phase line makes an underwater crossing at New River to provide electrical power to Tarawa Terrace and Knox Trailer Park. The distribution lines are owned and maintained by CP&L. A single three-phase circuit is in the housing area and there are two radial tap metering points.

Marine Corps Base Substation

The location is north of Holcomb Boulevard approximately 600 feet along the extension of the Ash Street centerline. The substation rating is 50 MVA. Primary rating is 230 KV. Secondary distribution voltage is 12.47 KV-wye/7.2 KV.

Camp Geiger/New River Marine Corps Base Air Station Substation

The location is at the intersection of the Curtis Road entrance to the Air Station and A Street, a connecting road to Camp Geiger. Substation rating is 25 MVA. Primary rating is 115 KV. Secondary distribution voltage is 12.47 KV-wye/7.2 KV.

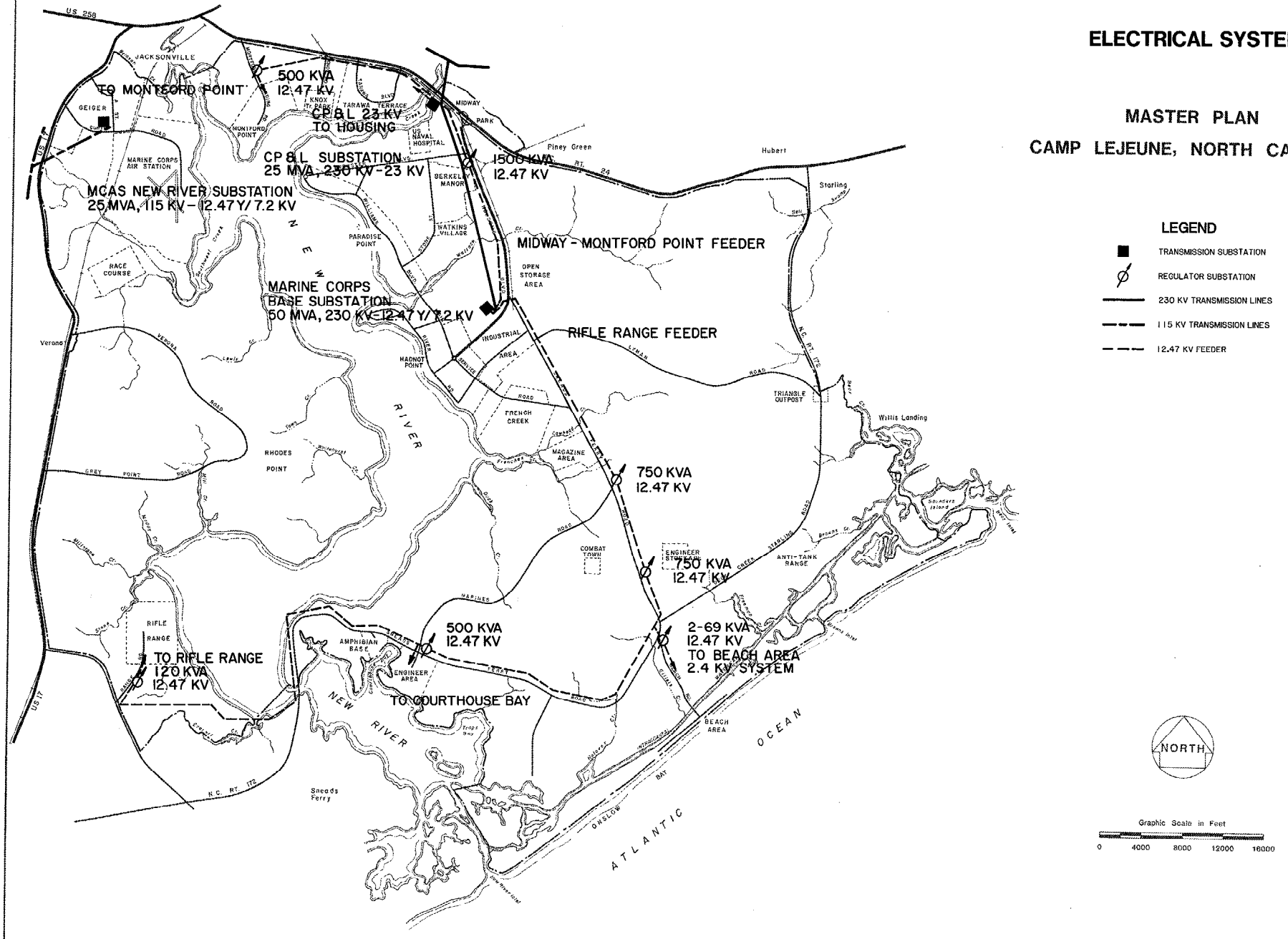

ELECTRICAL SYSTEM
MASTER PLAN
CAMP LEJEUNE, NORTH CAROLINA
LEGEND
TRANSMISSION SUBSTATION
REGULATOR SUBSTATION
230 KV TRANSMISSION LINES
115 KV TRANSMISSION LINES
12.47 KV FEEDER
500 KVA 12.47 KV
TO MONTFORD POINT
CP&L 23 KV TO HOUSING
CP&L SUBSTATION 25 MVA, 230 KV-23 KV
1500 KVA 12.47 KV
MCAS NEW RIVER SUBSTATION 25 MVA, 115 KV - 12.47Y/7.2 KV
MIDWAY - MONTFORD POINT FEEDER
MARINE CORPS BASE SUBSTATION 50 MVA, 230 KV-12.47Y/7.2 KV
RIFLE RANGE FEEDER
750 KVA 12.47 KV
750 KVA 12.47 KV
500 KVA 12.47 KV
2-69 KVA 12.47 KV TO BEACH AREA 2.4 KV SYSTEM
TO RIFLE RANGE 120 KVA 12.47 KV
TO COURTHOUSE BAY
NORTH
Graphic Scale in Feet
0 4000 8000 12000 16000

FIGURE III-8

U.S. Naval Hospital

The new U.S. Naval Hospital activity is served by two government-owned feeders at Camp Lejeune from the Marine Corps Base Substation. Within the hospital building, two substations rated at 5 MVA are on one side for primary power, with backup capacity at 5 MVA having high voltage ratings of 12.47 KV. The distribution voltage is 480Y/277.

Planned Electrical

Expanded demands for electricity can be accommodated from the CP&L network. Ratings for the substations can be increased first by adding mechanical cooling to existing transformers and, if necessary, by transformer replacement. To improve service to the Rifle Range and Courthouse Bay areas, the Castle Hayne-Jacksonville transmission line could be tapped or an existing 23 KV service identified Verona Loop can be extended. A river crossing, however, is needed to extend either line into the Courthouse Bay area.

Heating Plants and Steam Distribution Systems

The Camp Lejeune Complex has 12 active central steam plants with distribution systems that provide heating for one or more facilities. Ten of these are located at Marine Corps Base, one at Marine Corps Air Station and one at the U.S. Naval Hospital.

In addition, there are 41 smaller boiler plants for individual buildings. Of these, 34 are located at Marine Corps Base and seven at Marine Corps Air Station.

Heating fuels used at the complex are coal and fuel oil. Camp Lejeune does not use natural gas and is not connected to any gas systems within the region. Fuel is obtained from area suppliers and brought onto the base by rail or truck to points of storage.

Telephone

Telephone service throughout the area is provided by Carolina Telephone and Telegraph Company. The system within the Complex is connected to the company service facilities, but the telephone system is owned by the government.

PLANNING FACTORS

Listed below are factors which should be considered in planning future development at the Camp Lejeune Complex. Factors include general problems as well as specific natural and man-made constraints identified in the preceding analysis.

1. Small-scale development appears to have evolved in a piecemeal fashion, resulting in conflicting land use arrangements.

2. The evolution of the Camp Lejeune Complex from extensive beach operations to vertical envelopment warfare has caused changes in training requirements, as well as land area requirements. This has caused pressure on developed areas, both inside and outside the Complex, and has resulted in careful consideration of encroachment issues.

3. The proximity of the flood plains to the developed areas of the Complex.

4. Sensitive wetland areas and archaeological sites which inhibit some types of training in these areas.

5. Endangered species' habitats which create conflicts with training areas.

6. Built-up areas which occupy Noise and Accident Potential Zones at MCAS, New River and at Montford Point.

7. Existing development has not taken full advantage of the natural features unique to Camp Lejeune.

DEVELOPMENT GOALS

The goals stated below are general in nature and intended to serve only as a guide in planning future physical development at the Camp Lejeune Complex. Achievement of these goals is the purpose of doing this Master Plan. More specific goals, accompanied by measurable objectives, are presented in each of the four Activity Plans.

1. Improve the quality of life for both residents and employees at Camp Lejeune.

2. Maximize the utilization of Marine Corps Base real property.

3. Improve the physical relationship between functional facilities at Camp Lejeune.

4. Preserve and protect the natural features and endangered species at Camp Lejeune.

The goals stated above are general in nature and are intended only to serve as a guide in the planning process.

TABLE OF CONTENTS

INTRODUCTION

The purpose of the Activity Plan for the Marine Corps Base, Camp Lejeune, North Carolina is to provide a basis for logical and efficient use of the real estate and facilities to accomplish assigned mission requirements through the 1980s. The intent of the plan is to provide an integrated framework for the use of all resources.

The Activity Plan is structured to comply with and incorporate all requirements stipulated by NAVFACINST 11010.63B. This section of the Plan document expands upon general Complex-wide issues presented earlier in Section III and discusses specifically those issues relevant to the Marine Corps Base Activity.

A pre-planning conference was held on November 8, 1983, at which personnel from LANTDIV and each of the Complex activities reviewed and discussed the process involved and the assistance required in the preparation of a Master Plan. Following the conference, interviews were undertaken with commanding officers and key personnel for the Marine Corps Base Activity and its major tenant commands. Data was collected and field investigations were initiated for the purpose of identifying deficiencies and problem areas.

After collection of initial data was completed, a detailed planning analysis was initiated. Current and immediate future requirements were determined from the Basic Facilities Requirements (BFR dated March 1982), field surveys, interviews with Marine Corps Base personnel and analysis of other data. Physical constraints, both natural and man-made, were identified and were related to functional and operational requirements.

The above procedure established the physical facility and land requirements necessary to accomplish the Marine Corps Base mission. These requirements were then used as the basis for determining the goals and objectives of developing each Marine Corps Base area. Alternative concept plans supporting the established goals and objectives were derived. Informal concept presentations were made to Base personnel in order to receive comments and suggestions and to further refine the concept plan alternatives. Final alternative concept plans were presented at a formal meeting in March 1985, and a Land Use Plan for each area was selected at that time.

REQUIREMENTS ANALYSIS

The requirements analysis evaluates the current physical resources at Marine Corps Base, Camp Lejeune as they relate to the operational needs of the various tenants. Facility requirements are related directly to Base missions and personnel loadings, and are compared to existing assets. This comparison identifies facility deficiencies and forms the basis of the Military Construction Project List. The requirements analysis is then combined with alternative concepts for future development to yield the proposed Land Use Plans, and subsequently, the Capital Improvement Programs.

Prior to a specific discussion of facility requirements, Marine Corps Base mission, organization and personnel loadings are discussed below.

MISSION

The Marine Corps Base (MCB) organization functions as the host command to the two Fleet Marine Force Atlantic (FMFLANT) tenant activities -- Headquarters of the II Marine Amphibious

Force, 6th Marine Amphibious Brigade, 22nd and 24th Marine Amphibious Units, the 2nd Marine Division and the 2nd Force Service Support Group (2nd FSSG). The MCB host organization mission is to provide housing, training facilities, logistical support and certain administrative support for tenant units and for other units assigned to Camp Lejeune and to conduct specialized schools and other training maneuvers, as directed.

The mission of the 6th Marine Amphibious Brigade is to provide the Command element for a brigade-size Marine Air Ground Task Force (MAGTF) with the primary mission of preparing to join up with LantCom MPS equipment and to conduct subsequent combat operations.

The mission of the 2nd Marine Division is to execute amphibious assault operations, and other operations as may be directed, which are supported by Marine aviation and force service support units. With the aircraft wing, the Marine division provides combined arms for service with the Fleet in the seizure or defense of advanced naval bases and for the conduct of land operations essential to the prosecution of a naval campaign.

The mission of the 2nd FSSG is to command, administer and train assigned units in order to provide combat service and technical support as required by Headquarters FMFLANT and its subordinate command in accomplishment of the overall FMFLANT mission.

ORGANIZATION

The Base host command organization is depicted on Figure IV-1. Figures IV-2, IV-2a and IV-3 show the organization of the 2nd Marine Division, the Marine Amphibious Brigade Headquarters and the 2nd Force Service Support Group, respectively.

PERSONNEL LOADING/PROGRAMMED STRENGTH

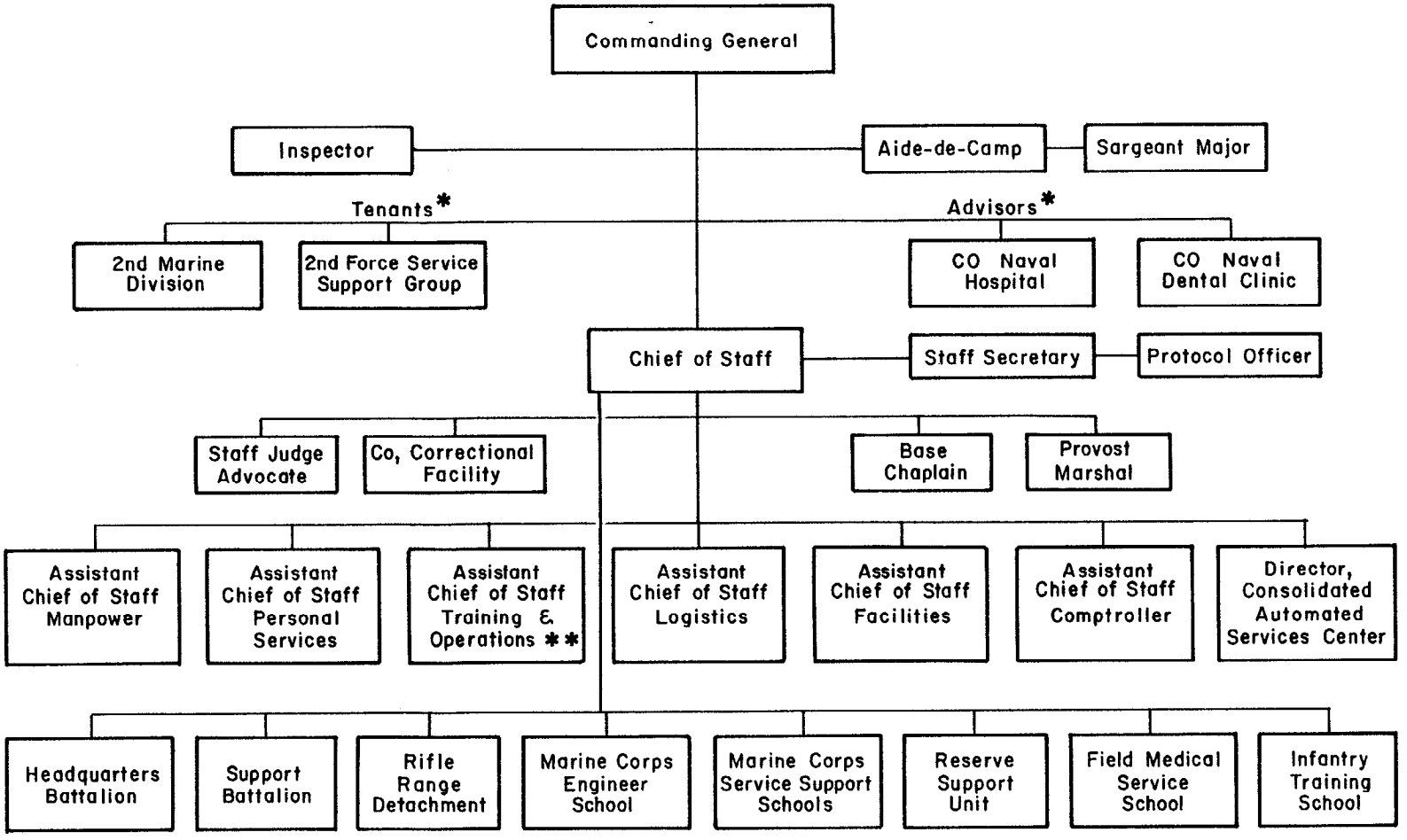
Programmed strength projections are a major criteria used to determine future facility needs, which are summarized on the Basic Facility Requirements (BFR). At the time this Plan was written the most recently available BFR was contained in the March 2, 1982, "Activity Facilities Plan." It is therefore important to include in this Plan the programmed strength figures which were used to support the BFR information contained in this plan (see "Facilities Requirements"). Table IV-1 shows the Marine Corps Base (MCB) programmed strength projections made in June 1981 for FY 1986. At that time, a less than two percent increase in total military personnel was expected to occur between June 1981 and FY 1986.

More recent population estimates appear on Table IV-2. A total of 35,621 military personnel were stationed at the MCB, Camp Lejeune in 1983, with this number projected to decline slightly to 35,518 by FY 1989. This is due to the projected decline in 2nd Marine Division personnel during this time period.

Comparison between Tables IV-1 and IV-2 reveals that FY 1986 projections were far surpassed by 1983. The fact that the March 1982 Basic Facility Requirements had to be used at the time this Plan was written will not detract from the usefulness of this Plan. Allowances were made to accommodate such a population and facility requirement increase. Land uses are arranged to maximize expansion potential and provide for optimum flexibility in terms of population decreases and increases. The enduring value of this Plan is to establish land use relationships and to serve as a guide in the siting of facilities in a logical and efficient manner.

Figure IV-1

ORGANIZATIONAL CHART
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA



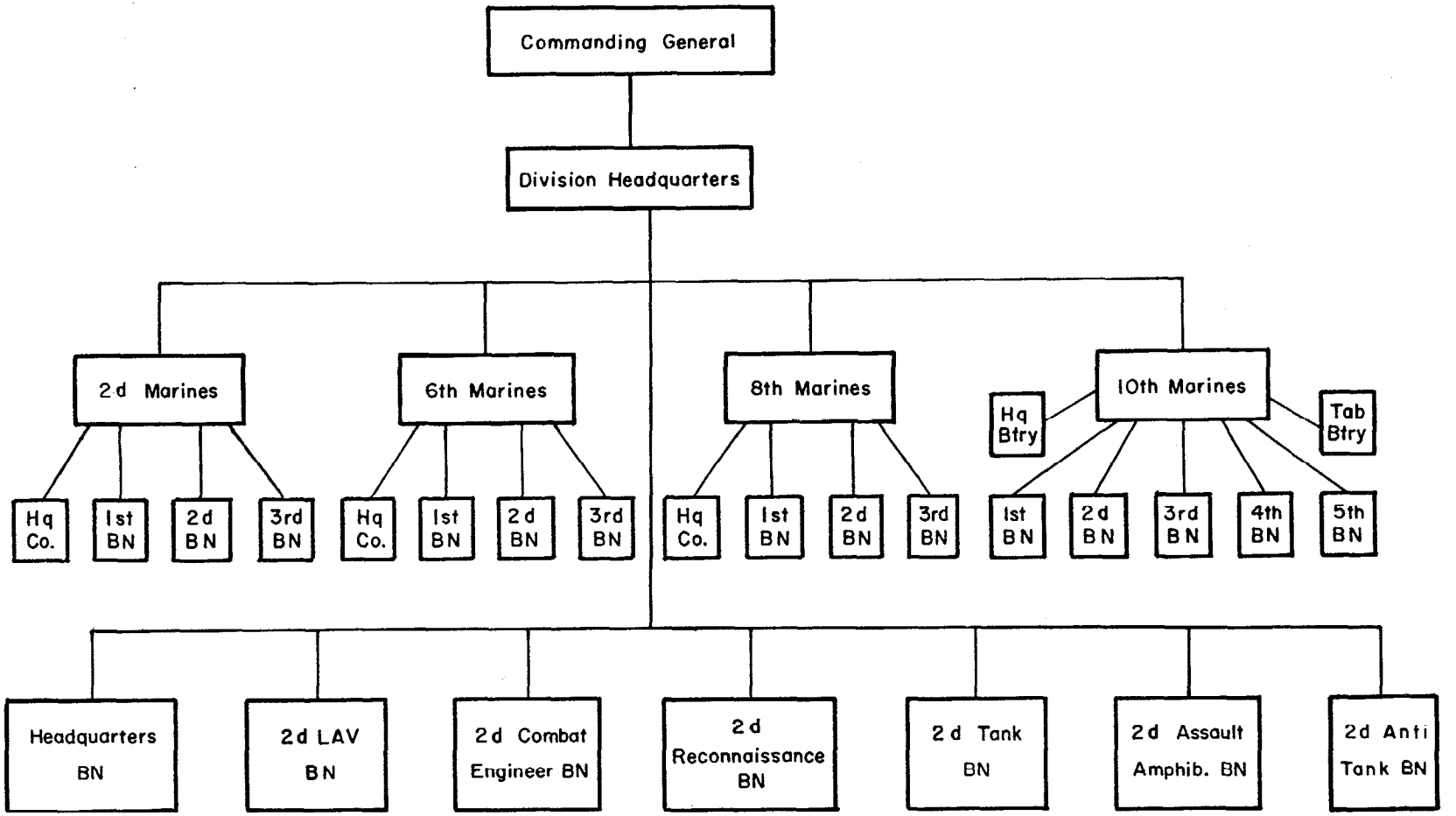
* Not under Operational Control of the Commanding General

** AC/S, Training Services has Staff Coordination for all Schools, Reserve Support Unit and Rifle Range Detachment

Source:
Base Order P5400.3D, February 26, 1982

Figure IV-2

ORGANIZATIONAL CHART
2D MARINE DIVISION
CAMP LEJEUNE, NORTH CAROLINA



Source: Base Order P5400.3D, February 26, 1982

Figure IV-2a

ORGANIZATIONAL CHART
MARINE AMPHIBIOUS BRIGADE HEADQUARTERS
FLEET MARINE FORCE
CAMP LEJEUNE, NORTH CAROLINA

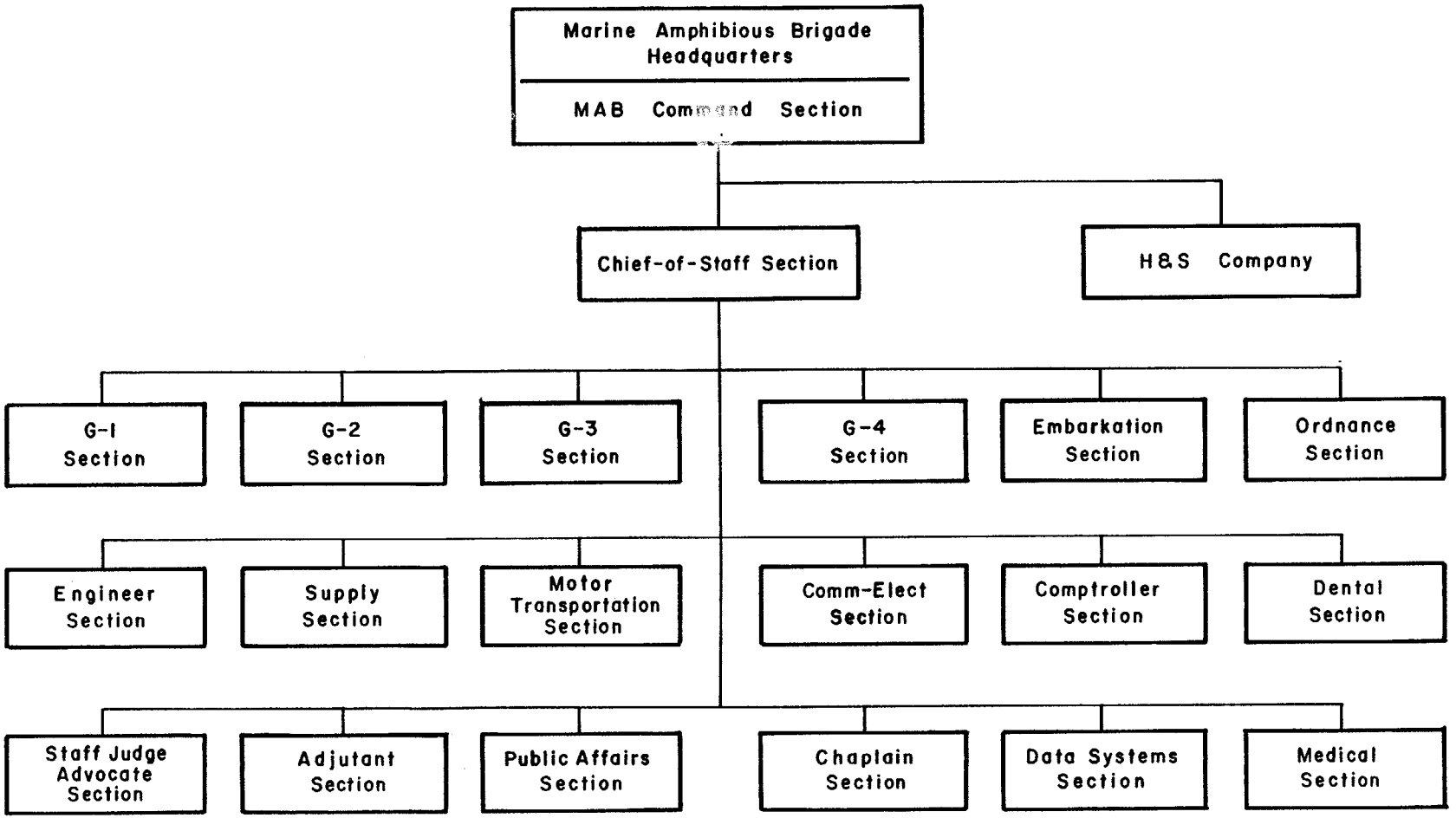
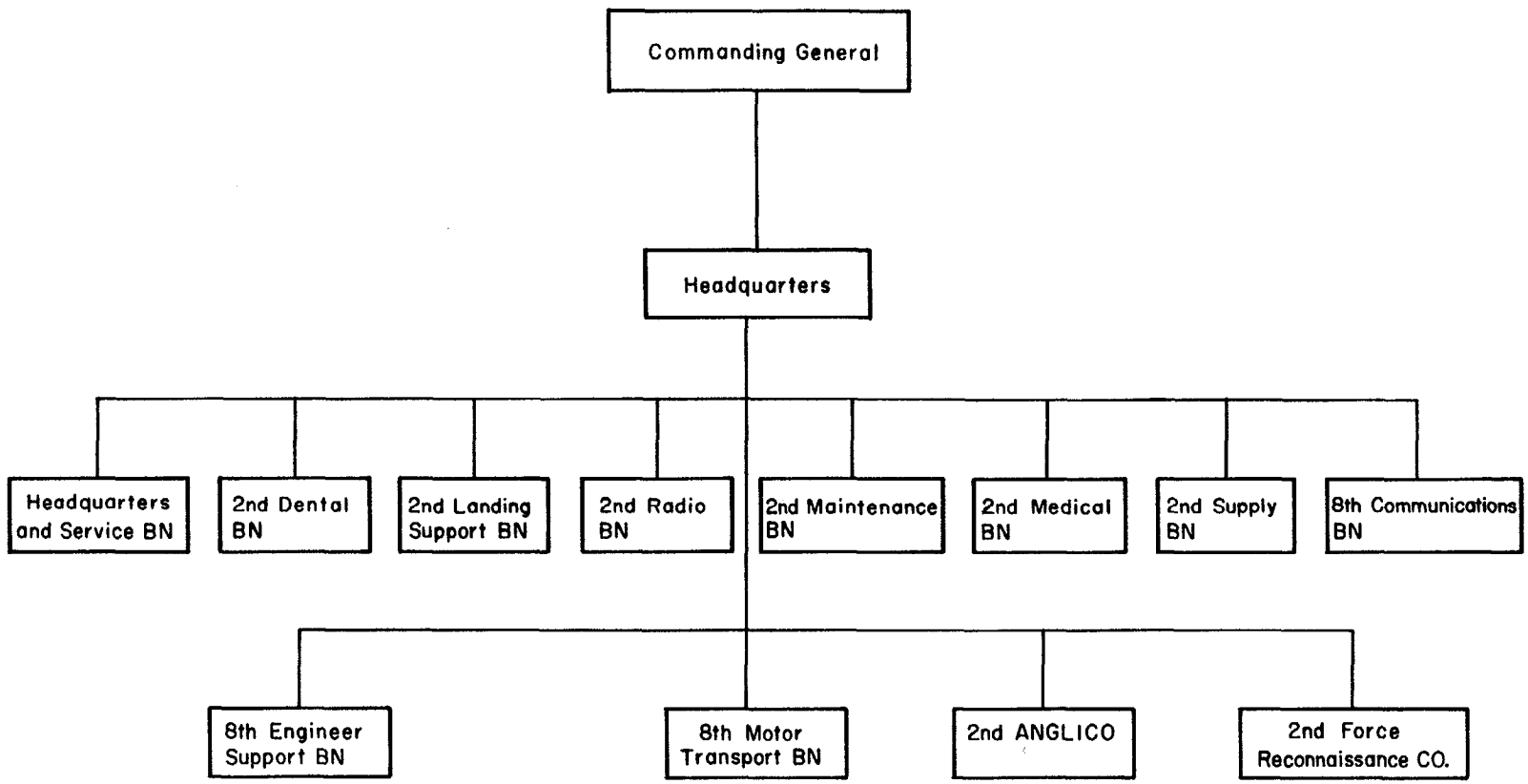


Figure IV-3

ORGANIZATIONAL CHART
2ND FORCE SERVICE SUPPORT GROUP
CAMP LEJEUNE, NORTH CAROLINA



Source: Base Order P5400.3D, February 26, 1982

Table IV-1

Personnel Loading (July 1981) and Programmed Strength (FY 1986)
Marine Corps Base

	Officers		Enlisted		Total Military	
	July 1981 USMC/Others	Projected USMC/Others	July 1981 USMC/Others	Projected USMC/Others	July 1981	Projected
Permanent Units	206/18	247/219	2,304/32	2,217/459	2,560	3,142
Students	23/0	213/4[1]/	1,866/49	2,756/160[1]/	1,938	3,133[1]/
2nd Marine Div.	935/51	954/68	15,600/431	15,008/461	17,017	16,491
2nd FSSG	419/75	501/106	7,876/474	8,632/550	8,844	9,789
HQ 22nd MAU	-----	13/0	-----	24/0	-----	37
HQ 24th MAU	-----	13/0	-----	24/0	-----	37
HQ 26th MAU	-----	13/0	-----	24/0	-----	37
2 HQ II (N) MAF	-----	54/5	-----	59/3	-----	121
HNS (N) Co.	-----	5/0	-----	68/0	-----	73
6 MAB	-----	51/0	-----	117/0	-----	168
Other Support	-----	0/3	-----	-----	-----	3
Totals	1,583/144	2,064/405	27,646/986	28,929/1,633	30,359	33,031

[1]/Projected figures are based on the past three years' historical student loads and reflect the highest load that can be reasonably expected during any two-month period.

Source: Monthly Quad Command Population Reports, July 1981.
Facilities Support Requirement Planning Document, December 1980; updated June 1981.

Table IV-2

Personnel Loading (1983) and Programmed Strength (FY 1989)
Camp Lejeune Complex

	Officers		Enlisted		Total Military	
	July 1983 USMC/Others	Projected USMC/Others	July 1983 USMC/Others	Projected USMC/Others	July 1983	Projected
Permanent Units	212/18	254/267	2,300/23	2,320/482	2,553	3,323
Students	67/0	193/4[1]/	2,522/65	2,805/160[1]/	2,654	3,162[1]/
2nd Marine Div.	1,101/56	1,051/77	18,338/587	15,465/696	20,082	17,289
2nd FSSG	475/106	505/98	8,603/656	9,451/714	9,840	10,768
HQ 22nd MAU	13/0	13/0	24/0	24/0	37	37
HQ 24th MAU	13/0	13/0	24/0	24/0	37	37
HQ 26th MAU	13/0	13/0	24/0	24/0	37	37
2 HQ II (N) MAF	54/5	54/5	59/3	59/3	121	121
HNS (N) Co.	5/0	5/0	68/0	68/0	73	73
6 MAB	51/0	51/0	117/0	117/0	168	168
Other	6/13	122/3	0	378/0	19	503
Total	2,010/198	2,274/454	32,079/1,334	30,735/2,055	35,621	35,518

[1]/Projected figures are based on the past three years' historical student loads and reflect the highest load that can be reasonably expected during any two-month period.

Source: Monthly Quad Command Population Reports, 1983 Average.
Facilities Support Requirement Planning Document, February 1984.

FACILITY REQUIREMENTS

Basic Facilities Requirements is the title given to the listing of quantities by category code, of those facilities required to perform the mission of a shore activity. It includes only those facilities necessary to support the assigned mission. The requirement for each category code is derived by applying programmed strength data to the planning criteria contained in NAVFAC P-80, "Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations."

The following section examines the adequacy of existing facilities which fall under Marine Corps Base jurisdiction. Available data, as supplied by MCB, was used as the source of this analysis. The 500-plus Marine Corps Base facilities existing on the Basic Facilities Requirements (BFR) are arranged by category code. For the purposes of the Master Plan, the category codes have been aggregated into 16 land use categories based upon planning criteria contained in NAVFAC P-80. These 16 land uses form the basis of the assets and deficiencies analyses.

It is important to note that "Medical" and "Dental" facilities described in the following analysis include both "Battalion Aid Stations" controlled by the Marine Corps Base organization, as well as Naval Hospital and Naval Dental Clinic Activity Branch Facilities which are interspersed throughout Marine Corps Base facilities. A more extensive analysis of Naval Hospital and Naval Dental Branch Clinics appears in Section VI, Naval Hospital Activity Plan and Section VII, Naval Dental Clinic Activity Plan.

Existing Assets

Marine Corps Base facilities are grouped according to land use categories, and rated as either adequate, substandard or inadequate, in accordance with definitions contained in NAVFACINST

11010.44D and as determined by the Activity Facilities Plan dated March 8, 1982. An adequate facility is defined as being fully capable of supporting its current use without modifications or repairs requiring approval and funding beyond the authority of the activity's commanding officer. Substandard describes a facility requiring approval and funding beyond that of the commanding officer in order to make the facility adequate for its function. Inadequate would describe a facility that cannot be made adequate for its present use through "economically justifiable means." The source for troop housing ratings is the July 1982 Facility Planning Document. These ratings are expressed as relative percentages to facilities in that land use category as a whole and appear on Table IV-3. Findings shown on Table IV-3 will be used subsequently to identify problem areas and to develop concept plans.

The ratings of existing assets are described below in narrative form and are arranged by the geographic areas which comprise the Marine Corps Base.

Hadnot Point

Operational Facilities. The Marine Corps Base mission is centered around amphibious assault training; and therefore, relatively few areas at Hadnot Point are designated for operational use. Included in this category are operational activities which support the training mission, such as helicopter landing zones, communications centers, liquid fueling and dispensing facilities and general operational buildings. Of the existing operational facilities located at Hadnot Point, 40 percent are adequate while over half have been deemed "substandard."

Classroom Training Facilities. This category includes all buildings used for academic instructional purposes. Classroom locations are scattered throughout Hadnot Point. Roughly

Table IV-3

Facility Requirement: Existing Assets Rating
Marine Corps Base

Location	Land Use	Percent of Total Existing Facilities[1/] Adequate	Substandard	Inadequate
Hadnot Point	Operational	42.3%	57.3%	0.4%
	Classroom Training	34.6	63.6	1.8
	Maintenance	26.6	66.9	6.5
	Supply/Storage	61.9	36.6	1.5
	Dental (SF)	73.1	---	26.9
	Medical (SF)	---	38.0	62.0
	Admin.	32.5	67.0	0.5
	Troop Housing (PN)[2/]	36.4	46.1	17.4
	Commun. Facil. (PN)	68.2	31.8	---
	Commun. Facil. (SF)	64.9	34.4	0.7
	Commer. Facil. (SF)	68.8	30.4	0.8
	Recreation (SF)	71.5	28.5	---
	Recreation (EA)	39.5	53.5	7.0
French Creek	Operational	98.6%	---	1.4%
	Classroom Training	49.7	50.3%	---
	Maintenance	85.3	14.7	---
	Supply/Storage	71.4	26.4	2.1
	Dental (OU)	100.0	---	---
	Medical	100.0	---	---
	Administrative	87.7	1.2	---
	Troop Housing (PN)[2/]	100.0	---	---
	Commun. Facil. (PN)	100.0	---	---
	Commun. Facilities	100.0	---	---
	Commercial Facilities	79.5	---	20.5
	Recreational (SF)	96.6	---	---
	Recreational (EA)	100.0	---	---

Location	Land Use	Percent of Total Existing Facilities[1/] Adequate	Substandard	Inadequate
Courthouse Bay	Operational	37.2%	62.8%	---
	Classroom Training	17.1	82.9	---
	Maintenance	---	100.0	---
	Supply/Storage	5.9	94.1	---
	Dental (OU)	---	---	28.6
	Medical	---	---	100.0
	Administrative	26.0	73.9	---
	Troop Housing (PN)[2/]	41.5	4.1	54.4
	Community	63.9	36.1	---
	Commercial	98.1%	1.9%	---
	Recreational (SF)	4.9	95.1	---
	Recreational (EA)	100.0	---	---
Montford Point	Operational	36.0%	64.0%	---
	Classroom Training	4.1	95.9	---
	Maintenance	---	100.0	---
	Supply/Storage	1.5	98.5	---
	Dental (OU)	---	100.0	---
	Medical	---	100.0	---
	Administrative	21.0	79.0	---
	Troop Housing (PN)[2/]	---	94.2	5.8%
	Community (PN)	---	100.0	---
	Community (SF)	2.6	97.4	---
	Commercial	72.9	27.1	---
	Recreational (SF)	---	100.0	---
	Recreational (EA)	30.4	69.6	---
	Utility	---	100.0	---
Camp Geiger	Operational	29.0%	71.0%	---
	Classroom Training	2.0	98.0	---
	Maintenance	9.0	91.0	---
	Supply/Storage	12.0	87.0	1.0%
	Dental	100.0	---	---
	Medical	100.0	---	---
	Administrative	12.0	88.0	---
	Community (PN)	100.0	---	---
	Community (SF)	36.0	64.0	---
	Commercial	---	100.0	---
	Recreational (SF)	---	100.0	---
	Recreational (EA)	75.0	25.0	---
	Troop Housing (PN)[2/]	48.0	2.0	50.0

Location	Land Use	Percent of Total Existing Facilities[1/] Adequate	Substandard	Inadequate
Rifle Range	Operational (SY)	100.0%	---	---
	Classroom Training	25.0	23.0%	52.0%
	Maintenance	---	100.0	---
	Supply/Storage	26.0	60.0	14.0
	Medical	100.0	---	---
	Administrative	36.0	25.0	39.0
	Troop Housing[2/]	3.0	56.0	41.0
	Community (PN)	---	100.0	---
	Community (SF)	1.0	99.0	---
	Commercial	65.0	35.0	---
	Recreational (SF)	---	---	100.0
	Recreational (EA)	27.0	18.0	55.0
Base-Wide Miscellaneous	Operational (SY)	66.6%	33.3%	---
	Operational (SF)	67.8	32.2	---
	Classroom Training	17.1	82.9	---
	Maintenance	16.7	78.6	4.7%
	Research	100.0	---	---
	Supply/Storage	19.1	75.5	5.4
	Medical	---	100.0	---
	Administrative	22.7	77.3	---
	Troop Housing (PN)[2/]	15.1	44.2	40.7
	Community (PN)	---	100.0	---
	Community (SF)	72.2	27.8	---
	Commercial	99.8	0.2	---
	Recreational (SF)	74.9	25.1	---
	Recreational (EA)	74.2	25.8	---
	Utility (SF)	83.7	14.8	1.5

[1/] Row percentages equal 100 percent.
[2/] Substandard equates to non-modernizable; inadequate equates to modernizable.

Source: Activity Facilities Plan, March 8, 1982.

one-third of these facilities are adequate, while the remaining two-thirds have been deemed substandard.

Maintenance Facilities. A major component of the mission of the Marine Corps Base 2nd Division and 2nd FSSG organizations is the maintenance of the wide variety of vehicles and equipment assigned to them. At Hadnot Point this function is conducted in the central section of the industrial area and in the northeast section of the Fifth Regimental area. Only 27 percent of these maintenance facilities are adequate compared to the 67 percent which is substandard. Buildings in the central section are classified substandard due to their age (most comprise the original permanent facilities built prior to 1948) and have building configurations which are not suitable for newer models of vehicles and equipment. For example, the ceiling heights in some of the facilities are too low for some newer vehicles. Other substandard maintenance facilities, located in the vicinity of Gum Street, are of temporary and semi-permanent construction and are scheduled for replacement.

Supply/Storage. This land use category comprises the largest use, in terms of square footage, at Hadnot Point. Of the over two million square feet of space, 62 percent of the existing facilities are adequate. Of the 37 percent deemed substandard, the vast majority fall into Category Code 441-12 "Storage of Air or Ground Organic Units" and are slated for rehabilitation and replacement with new construction to correct the deficiency.

Dental Facilities. The dental clinics at Hadnot Point are scattered throughout the regimental areas. Seventy-three percent of the total existing facilities are adequate, while 27 percent of total clinic square footage at Hadnot Point is inadequate.

Medical Facilities. Medical facilities which exist throughout the Hadnot Point regimental area are not adequate to satisfy present requirements. Thirty-eight percent of these existing facilities are substandard, while an even greater percentage, 62 percent, is inadequate.

Administrative Facilities. Existing administrative functions are dispersed throughout Hadnot Point, both in the larger Marine Corps Base headquarters building and areas adjacent to battalion headquarters buildings. One-third of the present facilities are adequate, and two-thirds are substandard.

Troop Housing. Based upon available data, the total existing troop housing at Hadnot Point consists of 11,846 billeting spaces. Approximately 36 percent of the troop housing spaces are rated adequate, 46 percent non-modernizable and 17 percent modernizable. Plumbing, physical condition and interior configuration are sited as the most common problems with the facilities.

Community Facilities. Included in this category are uses such as mess facilities, dependent schools, police stations, chapels and theaters. Generally, two-thirds of these existing facilities are adequate, and one-third is substandard.

Commercial Facilities. Nearly 70 percent of existing commercial buildings have been deemed adequate. The remaining 30 percent which has been determined as substandard space, consists of the Main Commissary/Exchange which is slated to be replaced by a larger, more modern facility.

Recreational Facilities. Recreation buildings are 70 percent adequate and 30 percent inadequate. Outdoor recreational facilities, such as courts and playing fields, are far less from

being adequate. Over half of the existing courts and fields are rated substandard, with an additional 7 percent rated totally inadequate.

French Creek

Due to the extensive amount of new construction which has taken place over the past decade, existing facilities are adequate in every category, with two exceptions: half of the existing classroom training space is substandard; 20 percent of existing commercial facilities are inadequate. All of the troop housing has been rated as adequate. Existing facilities are still less than what is required by Basic Facility Requirements, and therefore new construction will continue to be programmed at French Creek.

Courthouse Bay

The facilities located at Courthouse Bay are much older by comparison, therefore, much more of the space is substandard or inadequate. Medical facilities are 100 percent inadequate at Courthouse Bay. Almost all of the maintenance, supply/storage, classroom training and recreational building space is substandard, while two-thirds of each of the administrative and operational facilities are substandard. Existing commercial space is adequate, although the amount does not meet current BFR standards. Two-thirds of existing community facilities are adequate, with the remainder designated as substandard. The only land use category deemed entirely adequate is that of recreational playing courts and fields where no additional construction is needed to meet the BFR. About 45 percent of the troop housing is adequate; four percent are non-modernizable and 54 percent modernizable. At the time this plan was written inadequate troop housing at Courthouse Bay was being converted to classroom training facilities.

Montford Point

A majority of the buildings were constructed as temporary or semi-permanent structures during World War II and have been rated substandard. In addition to the age factor, the configuration and physical plan of existing facilities at Montford Point are not suitable for instructional activities of the various schools located there. For example, electrical and ventilation systems on existing facilities do not provide suitable environments for computers which are increasingly becoming integral to MCSSS curriculum. Workshops for vehicle maintenance training are not large enough for new equipment, and are considered inadequate for 3rd echelon repair facilities. Facilities in the classroom training, maintenance, supply/storage, dental, medical and utility categories have been deemed entirely substandard. Commercial facilities are 73 percent adequate due to the recently-completed Exchange building. Available data indicates that 94 percent of the troop housing is rated as being non-modernizable and six percent is modernizable.

Camp Geiger

A mixture of new and old facilities presently exist at Camp Geiger. Troop housing and related mess facilities, as well as dental and medical clinics, were constructed during the early 1970s. These facilities were constructed originally for use by new Parris Island recruits, but presently are being utilized by the 8th Regiment until new quarters are constructed in the Hadnot Point regimental area in 1988. While 48 percent of Camp Geiger housing is adequate, 50 percent is inadequate. The 71 percent of operational space which is considered substandard can be attributed to the existing Communications Center building utilized by the 2nd FSSG scheduled to be replaced by facilities planned for construction at French Creek. The same is true of the classroom training, maintenance, supply/storage, commercial and administrative space located at Camp Geiger: they

are mostly substandard in terms of space configuration and requirements by current tenants - 2nd Marine Division and 2nd FSSG - and are slated for future replacement at Hadnot Point or French Creek.

Rifle Range

Facilities located at the Rifle Range are utilized on a revolving basis by personnel throughout the Camp Lejeune Complex. Operational and medical facilities are considered 100 percent adequate. Classroom training facilities, on the other hand, are over 50 percent inadequate, with the other half of the space divided equally between adequate and substandard. Maintenance and community facilities are rated 100 percent substandard, while the existing Supply and Storage square footage is 26 percent adequate, 60 percent substandard and 14 percent inadequate. A majority of the administrative space located at the Rifle Range is inadequate (39 percent), 36 percent is adequate and 25 percent is substandard. Only three percent of existing barracks are rated adequate, while 56 percent are non-modernizable and 41 percent justify modernization. The indoor recreational buildings that currently exist at the Rifle Range are entirely inadequate.

Basewide Miscellaneous

Included in this category are those facilities controlled by the Marine Corps Base organization which are either located outside of the six areas described above (in areas such as Paradise Point, Midway Park, Tarawa Terrace) or relatively smaller-sized facilities that were omitted from the geographic area listing. Few facilities are designated as inadequate; however, several land use categories have a significant amount of square footage that is substandard. In terms of absolute number of square feet, the utility, supply/storage, community and indoor recreational uses have the

largest amount of substandard square footage in the Basewide category. Heating Plant buildings comprise almost all of utility substandard space, while Storage of Air or Ground Organic Units account for the majority of substandard supply/storage space. The 26,636 square feet of substandard community facilities are scattered throughout the Base and include every type of community facility. The old recreational lodges located at Onslow Beach account for a significant proportion of the substandard recreational space, and are being rehabilitated and replaced with new units. Of troop housing listed under "Basewide Miscellaneous," roughly 15 percent is adequate, 44 percent non-modernizable and 41 percent modernizable. Problems cited include: plumbing, lighting, interior configuration and environmental control system.

Family Housing Areas

Family housing areas throughout the entire Complex are owned and operated by the MCB organization and, therefore, all family housing facilities are included in this analysis. It is important to note that facilities are rated only adequate or inadequate.

Nearly 37 percent of family housing units at Camp Lejeune have been found to be modernizable (Table IV-4). Over half of the units located at Tarawa Terrace are modernizable, while all the units at Midway Park are modernizable. At the time this Plan was being written, Midway Park units were undergoing significant rehabilitation.

Occupying the family housing units listed above in June 1984 were 4,175 military personnel and 11,360 of their dependents. At that time, 7,750 military and 20,305 dependents resided in off-base housing. According to the Housing Referral Service, in June 1984 there were 378 off-base housing facilities that contained a total of 9,055 dwelling units. It can be concluded, therefore, that

Table IV-4

Facility Requirement: Existing Assets Rating [1]
Family Housing Units
Marine Corps Base

Location	Adequate Units		Inadequate Units[2]		Total Units	(Percent)
Paradise Point	510		---		510	(11.5)
Berkeley Manor	677		---		677	(15.2%)
Watkins Village	250		---		250	(5.6%)
Midway Park	---		699		699	(15.7%)
Tarawa Terrace	900		946		1,846	(41.4%)
Courthouse Bay	8		---		8	(0.2%)
Rifle Range	5		---		5	(0.1%)
MCAS						
New River	435		---		435	(9.8%)
Hospital Point	24		---		24	(0.5%)
Grand Total	2,809	(63.1%)	1,645	(36.9%)	4,454	(100.0%)

[1] Not included are the 112 spaces existing at Knox Mobile Home Park.
[2] Inadequate equates to modernizable units.

Source: "Family Housing Information Summary," Family Housing Division, Camp Lejeune, North Carolina, June 1984.

supply more than satisfies demand for adequate off-base family housing units. According to regulations stipulated in NAVFAC P-80, "Housing will not be programmed where the local housing market has the capacity to provide suitable rental housing for military facilities."

Deficiencies

The following analysis focuses upon the amount of additional new construction that needs to be undertaken in order to satisfy the Basic Facility Requirements (BFR). The analysis describes relative deficiencies in the 16 land use categories for each of the geographic areas with approved BFR numbers. Results of this analysis will be used to determine the amount of additional land area needed to meet future facility requirements. For this reason, required new construction, rather than required renovation or rehabilitation, is discussed. The Activity Facilities Plan dated March 1982 is the source of the information shown on Table IV-5.

Hadnot Point

New construction is required in every category to meet current BFR standards, but only three categories require a significant amount: medical, dental and maintenance. The largest amount of new square footage required is for medical and dental clinical space under the jurisdiction of the Marine Corps Base (the remaining clinical space is programmed by the Naval Hospital and Dental Clinic commands). Maintenance space is also deficient, with 74 percent of the BFR amount slated for new construction.

Table IV-5

Facility Requirement: New Construction Deficiency Corrections
Marine Corps Base

Location	Land Use	Required New Construction (sq.ft.)	Percent New Construction to Meet BFR
Hadnot Point	Operational	31,155	33.9
	Classroom Training	48,261	39.1
	Maintenance	560,618	73.7
	Research	0	---
	Supply/Storage	73,805	3.3
	Dental (SF)	29,732	70.6
	Medical (SF)	50,330	77.1
	Administrative	328,380	38.9
	Commun. Facil. (PN)	820	6.0
	Commun. Facil. (SF)	120,046	28.9
	Commer. Facil. (SF)	86,237	16.2
	Recreation (SF)	44,423	22.4
	Recreation (EA)	41	35.0
French Creek	Operational	4,800	12.7
	Classroom Training	N/A	N/A
	Maintenance	720,910	87.9
	Supply Storage	704,451	89.5
	Dental (OU)	20	74.1
	Medical	19,332	83.3
	Administrative	186,592	63.8
	Community Fac. (PN)		
	Community Fac.	92,296	92.8
	Commercial Fac.	61,745	100.0
	Recreational (SF)	52,152	96.6
	Recreational (EA)	17	54.8

Location	Land Use	Required New Construction (sq.ft.)	Percent New Construction to Meet BFR
Courthouse Bay	Operational	0	---
	Classroom Training	0	0
	Maintenance	92,891	55.8
	Supply/Storage	48,268	99.9
	Dental (OU)	N/A	N/A
	Medical	N/A	N/A
	Administrative	11,835	36.8
	Community	39,712	66.0
	Commercial	10,387	53.4
	Recreational (SF)	32,266	79.5
	Recreational (EA)	0	0
Rifle Range	N/A		
Camp Geiger	N/A		
Montford Point	N/A		

Source: Activity Facilities Plan, March 1982.

French Creek

An extensive amount of new construction is required to meet the BFR. The BFR was based upon parameters contained in the overall development plan for French Creek initiated during the late 1960s. The largest deficiency is in the commercial facilities category in which 61,745 square feet (or 100 percent of the BFR) of new space is required to be constructed. Existing community facilities are entirely adequate; however an additional 92,296 square feet needs to be constructed in order to meet facility requirements. Deficiencies in supply/storage, maintenance and indoor recreation space exists: 704,451 square feet of supply/storage facilities; 720,910 square feet of maintenance facilities and 52,152 square feet of indoor recreational space is slated for new construction.

Courthouse Bay

In order to meet the BFR, nearly 50,000 square feet of new supply/storage facilities needs to be built at Courthouse Bay. An even larger amount of additional maintenance facilities (92,891 square feet or 56 percent of the BFR) is required. Community facilities account for the third largest proportion of required new construction at Courthouse Bay; requiring nearly 40,000 square feet. Indoor recreational space is at a premium also - 32,266 square feet, or the equivalent of 80 percent of the BFR, are deficient.

The BFR for the Rifle Range, Montford Point and Camp Geiger do not show any deficiencies. However, future planning will be based on the correction of existing facilities as described in the previous section of this report (Existing Assets). Therefore, the requirement for each of these areas is based on existing facilities.

Troop Housing

Based upon available data, the troop housing deficiency is not broken down by geographic area, but instead is presented as an aggregate for the Complex as a whole (Table IV-6). Data derived from a survey undertaken in September 1984 includes only existing assets that were deemed "adequate" at the time of the survey. It is important to note that the "Total Programming Limit" (shown at the bottom of Table IV-6) is defined as roughly 90 percent of the "Effective Requirement." Therefore there will always be a deficiency as long as this limit is maintained.

When "Programming Limits" are compared against planned assets to FY 1989, a 632 PN space deficit in Bachelor Officer's Quarters is revealed. This deficit is even larger when assets are compared to the "Effective Requirement." In the case of enlisted personnel a surplus exists when existing and planned assets are compared to the "Programming Limit;" however, when the Effective Requirement of 25,153 PN is taken into account, a 2,000 PN space deficit is made evident. The assumption is that this FY '89 projected enlisted troop housing deficit will be met by the private sector.

Family Housing

Data used to determine the long-range family housing requirements and deficiencies were taken from the January 1982 "Determination of Housing Requirements for Project Composition" (DD Form 1378). This document projects requirements for FY 1984. Conversations with Camp Lejeune personnel indicate that these projections will remain unchanged through the 1980s.

Table IV-6

Troop Housing Deficiency Analysis
(Personnel)
Marine Corps Base

	Officer (PN)	Enlisted (PN)	Recruit (PN)	Total
Effective Requirement (FY '89)	1,025	25,153	428	26,606
Existing Adequate	82	13,292	2,008	15,382
Existing Inadequate	N/A	N/A	N/A	N/A
Other	228	210	---	438
Total Existing Adequate	310	13,502	2,008	42,426
Funded 1984	0	3,150	0	3,150
Programmed FY '85	0	1,350	0	1,350
Programmed FY '86	0	681	0	681
Programmed FY '87-'89	0	4,320	0	4,320
Total Programmed	0	9,501	0	9,501
Total Existing and Programmed to FY '89	310	23,003	2,008	25,321
Total Programming Limit 1/	942	22,900	428	24,270
Deficient (Surplus)	632	(103)	(1,580)	(1,051)

1/Established as of September 1984 as 90 percent of the "Effective Requirement."

Source: "FY 86 Unaccompanied Personnel Housing Survey," DOD Form 1657, September 1984.

The projected family housing requirement is 11,729 units. Existing assets consist of 4,450 military owned units and 7,590 "not military controlled" units (Table IV-4). (It should be noted that the family housing units which have been rated inadequate are being rehabilitated and are considered adequate assets.) Existing units exceed this requirement by 311 units. The programming limit, set at 90 percent of the requirement, increases this excess to 1,485 units.

There is no real family housing deficiency as long as off-base housing continues to be available and acceptable to military personnel. Existing data is not sufficient to determine if off-base housing is preferred and if the private housing market will be able to continue to provide adequate housing at affordable prices.

FUTURE MISSION CHANGES

No basic mission changes are anticipated for the Marine Corps Base, Camp Lejeune. While changes in the number of assigned personnel and in the number and type of weapons and equipment are anticipated, the Base will remain an amphibious assault/vertical envelopment training facility.

PLANNING ANALYSIS

This section will examine the relationship between existing land uses in each of the Marine Corps Base sub-areas and evaluate the influences of surrounding regional and Complex land uses. Acreages discussed pertain only to those areas which are developed for each of the sub-areas.

The existing land use patterns in the various geographic areas within the Marine Corps Base have been shown on a series of maps. In addition, the number of acres comprising each land use category has been estimated (Table IV-7).

Hadnot Point

The development which typifies this area evolved over a 40-year period and includes approximately 1,080 acres of land. The land uses tend to be integrated with one another, creating an environment which is pedestrian in scale (Figure IV-4). Community and recreational land uses are scattered throughout the regimental area which covers about 18 percent (196 acres) of all the developed land in Hadnot Point.

Administrative uses are situated in prominent central locations along the main entrance route, making them easily accessible to visitors and regimental personnel alike.

Segregated from the administrative personnel support and troop housing uses are supply/storage and maintenance uses which are consolidated in the eastern portion of Hadnot Point. Altogether, about 29 percent (310 acres) of all developed land falls into these two land use categories. Located in the center of this work area are troop housing and associated community uses which are segregated from other similar uses. This is a poor arrangement of land use.

While these work areas are removed from personnel support and administrative land uses, they are clearly visible from the main entrance route, Holcomb Boulevard, and detract from the more orderly and attractive environment which characterizes the central Hadnot Point area.

Table IV-7
Land Utilization: Developed Areas
Acres/Land Use
(Percent)
Marine Corps Base

Geographic Area	Oper	Training (Instruct)	Maint	Supply/ Storage	Medical	Admin	Family Housing	Troop Housing	CM	CO	Recreat	Utility	Total
Hadnot Point	31 (2.9)	15 (1.4)	154 (14.3)	157 (14.4)	10 (.9)	122 (11.3)	22 (2.0)	196 (18.1)	115 (10.7)	36 (3.3)	182 (16.9)	40 (3.7)	1,080 (100)
Paradise Point	1 (0)		3 (.4)	1 (0)			343 (34)	19 (1.9)	31 (3.1)		610 (60.4)	2 (.2)	1,010 (100)
Berkeley Manor/ Watkins Village							406 (80)		41 (8.1)	1 (.2)	57 (11.2)	2 (.5)	507 (100)
Midway Park		1 (.4)		2 (.7)		2 (.7)	248 (92.2)		8 (3.0)	3 (1.1)	4 (1.5)	1 (.4)	269 (100)
Tarawa Terrace			3 (.5)			1 (.3)	428 (77.4)		55 (9.9)	11 (2.0)	47 (8.5)	8 (1.4)	553 (100)
Knox Trailer							57 (100)						57 (100)
French Creek	8 (1.4)	1 (.2)	74 (12.7)	266 (45.6)	3 (.5)	7 (1.2)		122 (20.9)	22 (3.8)	6 (1.0)	74 (12.7)		583 (100)
Courthouse Bay		73 (28.6)	28 (10.9)	14 (5.5)		12 (4.7)	12 (4.7)	43 (16.9)	15 (5.9)	4 (1.6)	43 (16.9)	11 (4.3)	255 (100)
Onslow Beach	6 (9.8)	1 (1.6)	3 (4.8)	2 (3.2)	1 (1.6)	2 (3.2)		2 (3.2)	12 (19.3)		25 (40.3)	8 (13.0)	62 (100)
Rifle Range		1 (1.3)	1 (1.3)	7 (8.8)	1 (1.3)	5 (6.3)	7 (8.8)	30 (37.5)	5 (6.3)	1 (1.3)	9 (11.3)	13 (16.3)	80 (100)
Camp Geiger	4 (1.9)	15 (6.9)	19 (8.8)	50 (23.1)		23 (10.6)		54 (25.0)	27 (12.5)	2 (1.0)	16 (7.4)	6 (2.8)	216 (100)
Montford Point	6 (2.6)	48 (20.5)	2 (.9)	4 (1.7)	2 (.9)	9 (3.9)		82 (35.2)	20 (8.6)	1 (.4)	49 (21.0)	10 (4.3)	233 (100)
Basewide Misc.	1 (.8)			87 (68.0)		3 (2.3)			19 (14.8)			18 (14.1)	128 (100)
TOTAL	57 (1.1)	155 (3.1)	287 (5.7)	590 (11.7)	17 (.38)	186 (3.7)	1,523 (30.2)	548 (10.8)	370 (7.4)	65 (1.3)	1,116 (22.2)	119 (2.4)	5,033 (100)

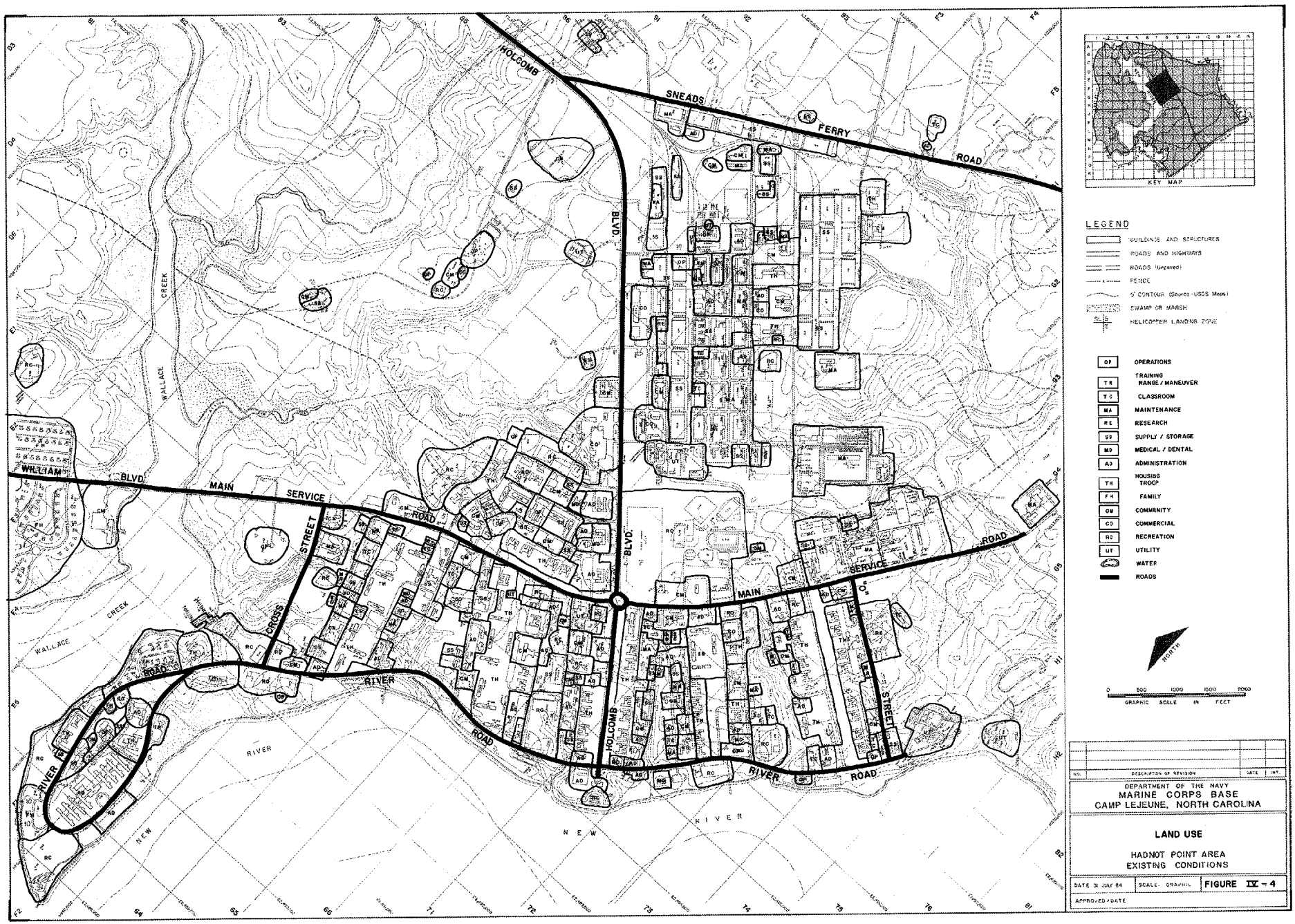
Commercial uses (36 acres) are located at three major locations at Hadnot Point. The Main Commissary Exchange is situated on Holcomb Boulevard. Vehicular access to commercial uses on both sides of Holcomb Boulevard is somewhat restrictive and poses traffic congestion and safety problems. Direct access into either the Main Commissary Exchange or the filling station area is provided via Holcomb Boulevard where vehicles must make turns across ongoing traffic. Vehicular access from the west on Virginia Dare Drive and Molly Pitcher Road is indirect from family housing situated at Paradise Point, Watkins Village and Berkeley Manor. Two smaller commercial areas are located within the 2nd Division Regimental areas west of Main Street.

The heating plant which overlooks Holcomb Boulevard and the Parade Ground presents a harsh contrast in scale relative to surrounding buildings and open areas. A landscaped buffer, such as a group of tall trees or hedges, could lessen the visual conflict of this utility land use.

Recreational/Open Space uses comprise about 17 percent (182 acres) of the developed land in Hadnot Point. They are distributed mostly on the periphery of each of the troop housing areas and are accessible by foot.

Hospital Point

The major facilities in this area are in the process of being converted from medical to administrative uses (Figure IV-4). Other uses will remain the same: troop housing exists adjacent to administrative uses, while a second group of troop housing sits between the Marina and family housing. Two enlisted personnel barracks buildings are located adjacent to the family housing area, buffered by Blackwood Road and a large stand of trees.


HOLCOMB BLVD.
SNEADS FERRY ROAD
WALLACE CREEK
WILLIAM BLVD.
MAIN SERVICE ROAD
CROSS STREET
RIVER ROAD
NEW RIVER
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source - USGS Maps)
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MD MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INIT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAND USE
HADNOT POINT AREA
EXISTING CONDITIONS
DATE JULY 84
SCALE GRAPHIC
FIGURE IV - 4
APPROVED / DATE

Recreational/open space uses in this area front the New River on either side of a smaller group of family housing, creating a picturesque environment that is easily accessible for Hospital Point residents and daytime personnel.

Paradise Point

North of Hadnot Point are low-density family housing and recreational area (Figure IV-5). These two uses make up about 94 percent (343 acres and 610 acres, respectively) of all the developed areas on Paradise Point. The golf course, also located in this area, comprises the single largest land use. Sitting in the center of the Paradise Point shoreline is the Bachelor Officers' Housing Area and associated community facilities which are accessible from both troop and family housing areas.

Additional recreational uses, including the only riding stable at Camp Lejeune, are situated between Paradise Point and Berkeley Manor.

Berkeley Manor/Watkins Village

Berkeley Manor is characterized by multifamily duplexes in medium density clusters. An elementary school is in the center of the development and the Camp Lejeune High School and a large recreational area lie directly west. Pedestrian access, however, is restricted due to the significant volume of traffic along Stone Street (Figure IV-6).

The same can be said of the commercial uses which also sit west of Stone Street. This road has turned into a major route between Brewster Boulevard and Hadnot Point. Residents and workers

alike use this as an alternate travel route to avoid traffic congestion at Holcomb Boulevard and Brewster Boulevard.

Directly south and adjacent to Berkeley Manor is the Watkins Village townhome development (Figure IV-6A). This is an attractive, relatively new development situated a short distance from schools, recreational areas and Hadnot Point.

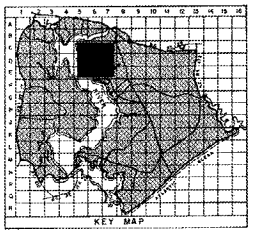
Midway Park

The 248 acres of family housing dominates land use in this area. Access for traffic traveling east on NC Route 24 results in a left turn movement across on-coming traffic traveling west on NC Route 24. At the entrance to Midway Park, community and recreational land uses are located. Behind these uses are located more unsightly administrative and storage uses (Figure IV-6).

Many Midway Park homes front directly on NC Route 24. While these homes are protected by chain-link fence, the noise and unattractiveness which characterizes the four-lane highway negatively impact the residential environment.

Tarawa Terrace I and II

The largest amount of family housing (roughly 428 acres) exists at Tarawa Terrace. Land use arrangements are logical and compatible (Figure IV-7). These duplexes are arranged around a central area of community uses and the residences are buffered from NC Route 24 by open recreational and natural wooded areas. All 70 one-bedroom housing units are located at Tarawa Terrace.



LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INT

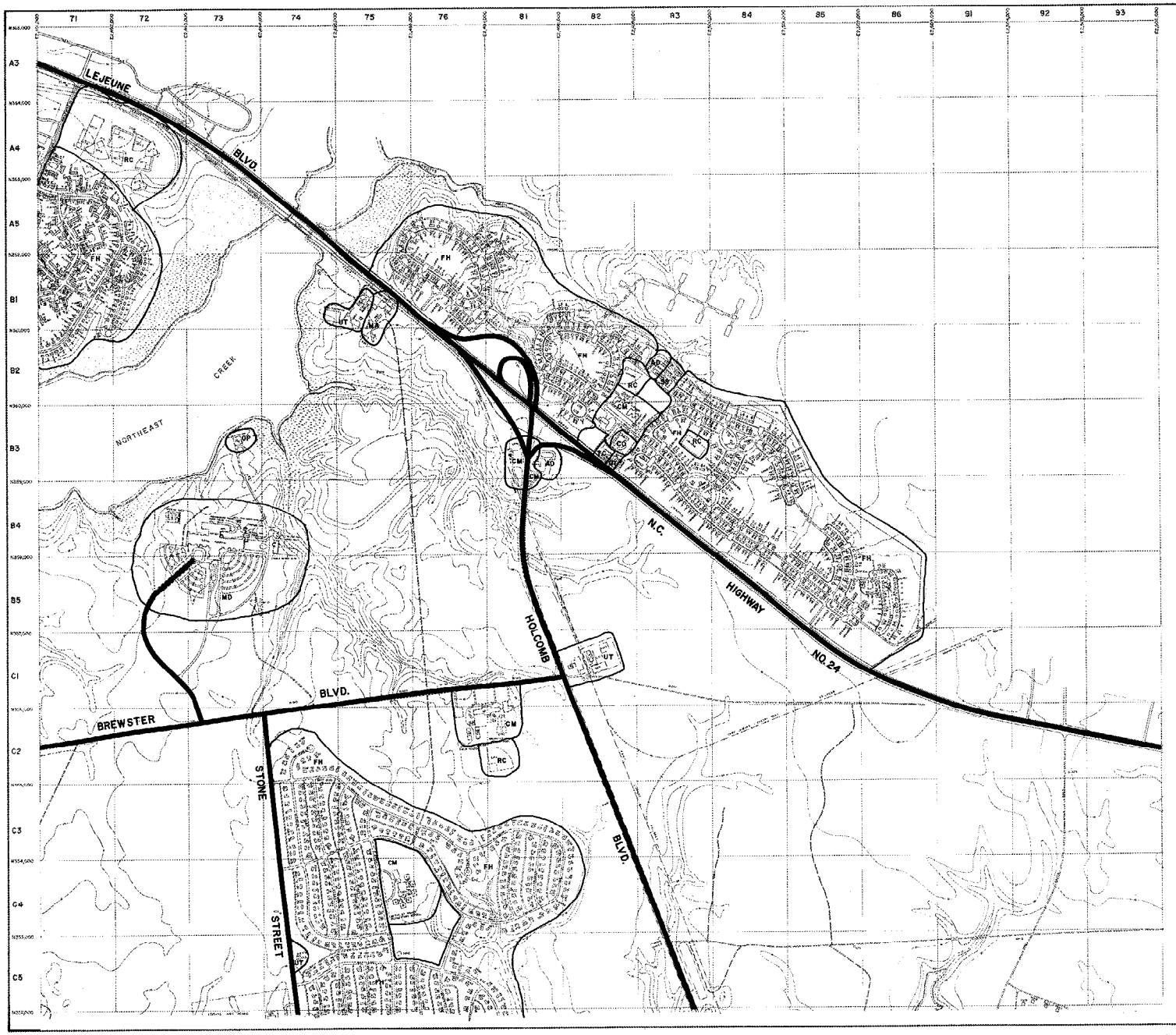
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

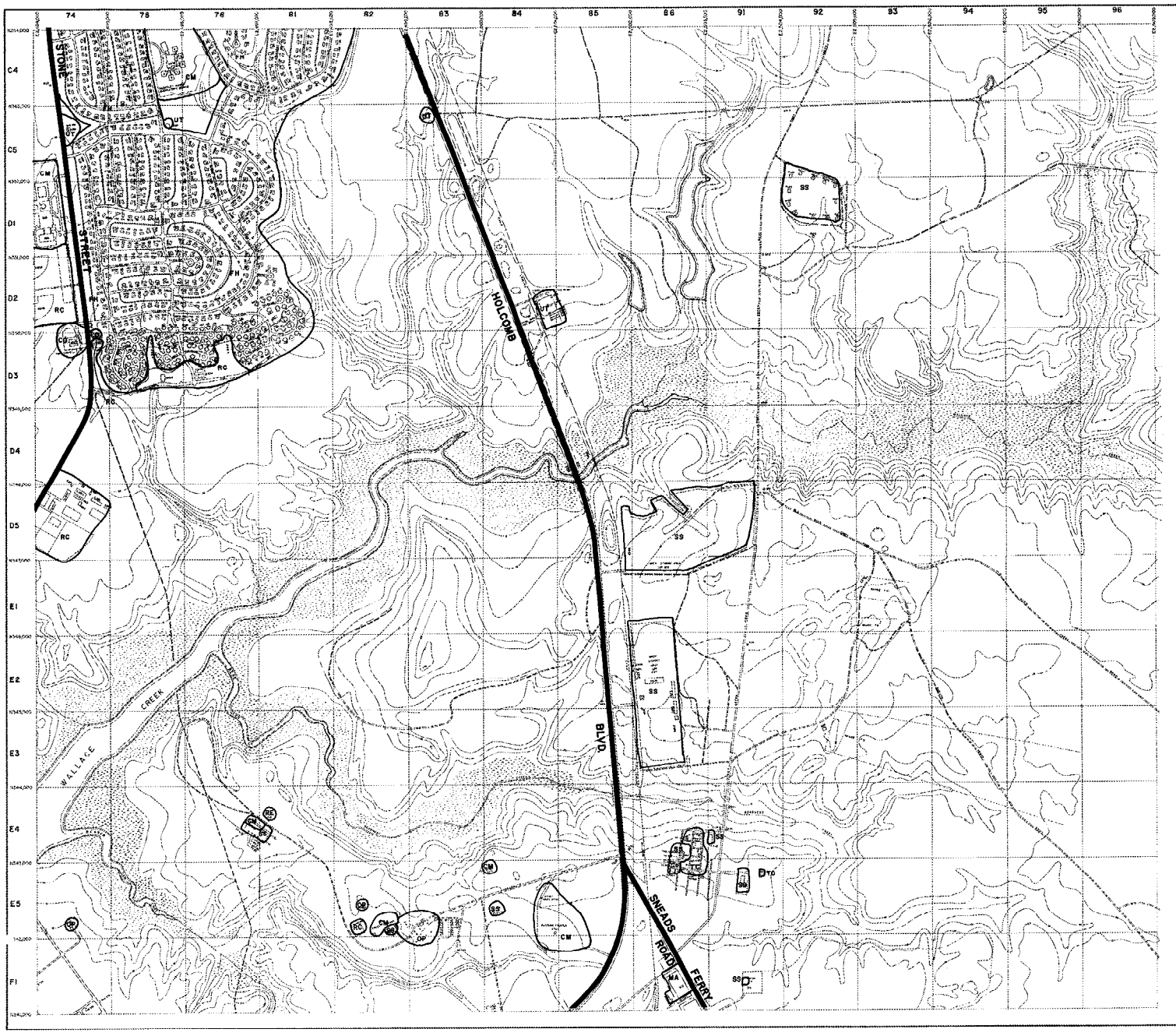
LAND USE

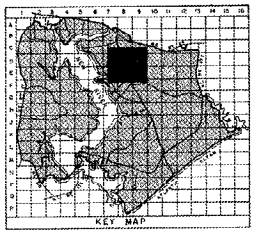
OFFICER QUARTERS, PARADISE POINT AREA
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE: GRAPHIC	FIGURE IV - 5

APPROVED / DATE


LEJEUNE BLVD
NORTHEAST CREEK
N.C. HIGHWAY NO. 24
HOLCOMB BLVD.
BREWSTER BLVD.
STONE STREET
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source-USGS Maps)
RESERVATION BOUNDARY
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MD MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INIT
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAND USE
MIDWAY PARK HOUSING AREA
AND NAVAL HOSPITAL
EXISTING CONDITIONS
DATE 31 JULY 84
SCALE: GRAPHIC
FIGURE IV-6
APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
	HOUSING TROOP
TH	FAMILY
FH	COMMUNITY
CM	COMMERCIAL
CO	RECREATION
RC	UTILITY
UT	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

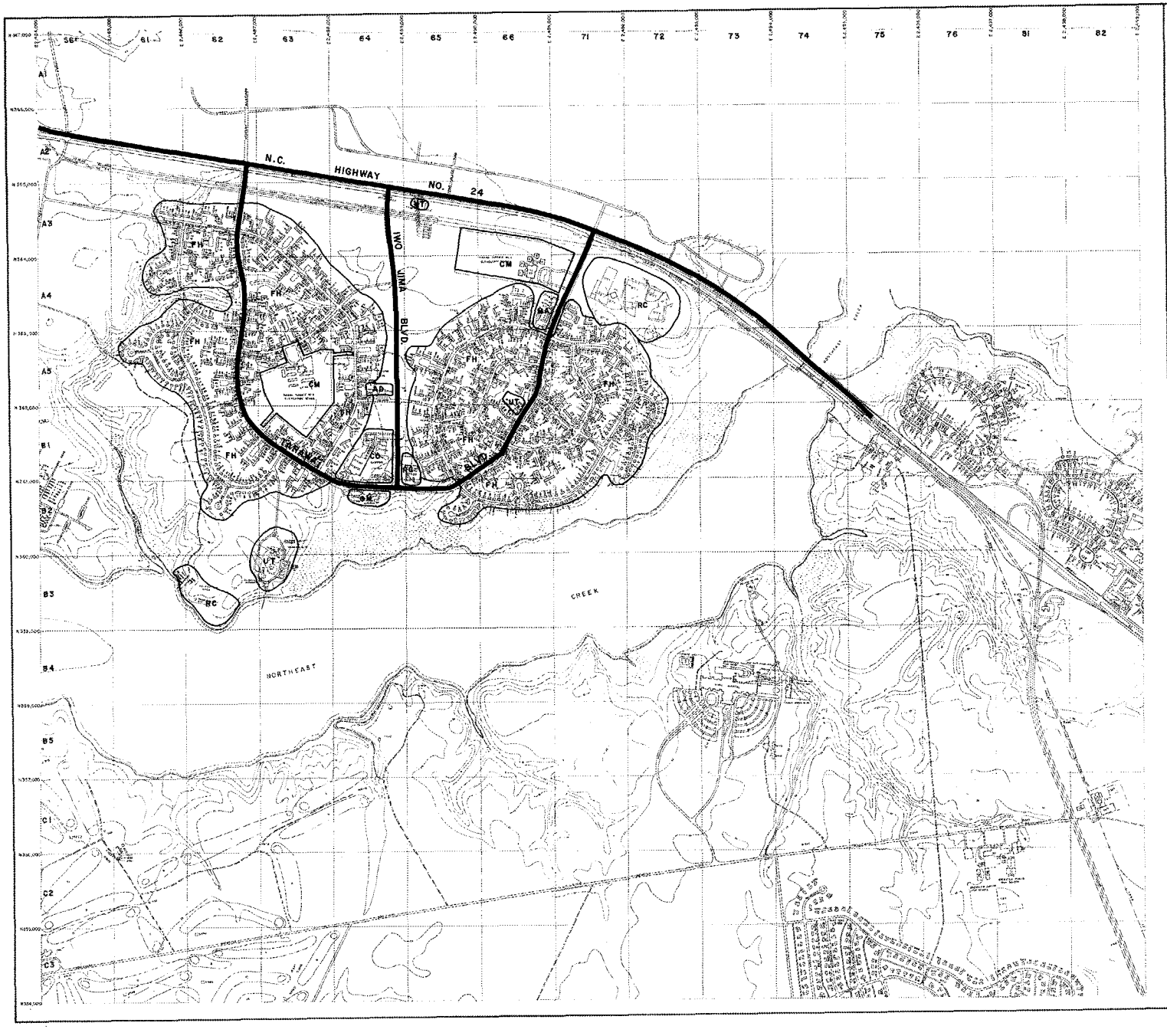
NO.	DESCRIPTION OF REVISION	DATE	INT

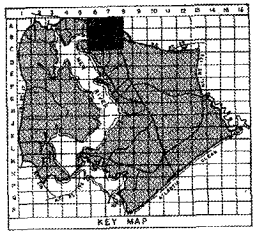
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE

OPEN STORAGE AREA
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE: GRAPHIC	FIGURE IX-6A
APPROVED / DATE		





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- SL — HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE

TARAWA TERRACE I & II, QUARTERS
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE: GRAPHIC	FIGURE IV-7
APPROVED / DATE		

French Creek

The French Creek area is located southeast of Hadnot Point and is accessible via the Main Service Road (Figure IV-8). Since its planning in the 1970 Master Plan, French Creek has evolved into a self-supportive, campus-like development. A total of about 583 acres have been developed thus far. Many of the earliest buildings developed at French Creek were sited at odd angles to one another, were not sited to interrelate functionally and were surrounded by what was considered to be an overly-complex vehicular network. The subsequent phases of development have resulted in land uses that are better integrated with one another and reinforce the campus-like theme.

The supply/storage and maintenance facilities, which are situated to the north of the housing areas comprise over 58 percent of the development of French Creek. The largest amount of supply/storage Base-wide exists at French Creek. Troop Housing occupies nearly 21 percent (122 acres) of the developed area. Ordnance Storage areas are grouped to the southeast, with an explosive safety quantity distance arc well outside the development area.

Courthouse Bay

Courthouse Bay is located south of Hadnot Point, on the eastern shore of the New River. The area is accessible via Marine's Road and North Carolina Route 172. Courthouse Bay was selected for the Engineers' School and the 2nd Amphibious Tractor Battalion (AMTRAC) because of its protected natural harbor with direct water access.

The 255 acres of development at Courthouse Bay are distributed on the north and south sides of the Bay itself, with major land uses in three clusters on the south side (Figure IV-9). Training

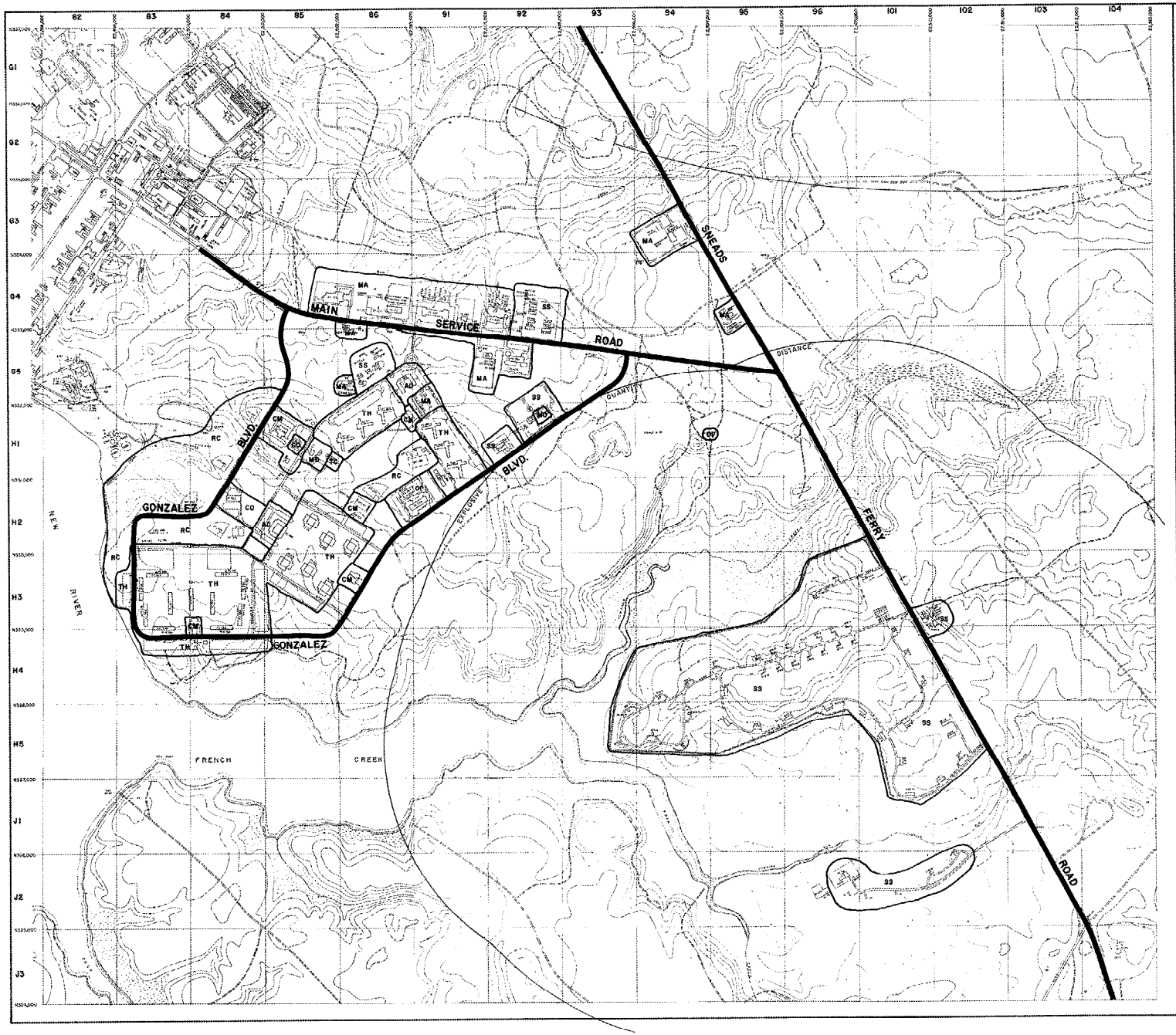
Facilities, which account for the largest single land use, cover about 73 acres of land. Classroom training facilities and supply and storage buildings for heavy equipment are located in two irregular areas on the south side of the Bay, while personnel support, administration, medical facilities, some supply buildings and all of the existing troop housing facilities overlook the New River. Nine family housing quarters are sited along the New River on a peninsula of land which forms the entrance to the Bay. Large land areas for heavy equipment training are located further to the southeast and are used by the Engineers School. An area of maintenance and supply buildings located on the north side of the Bay are solely used by the AMTRAC Battalion for maintenance and storage of large vehicles. The area includes a wharf along the bay and a vehicle loading ramp.

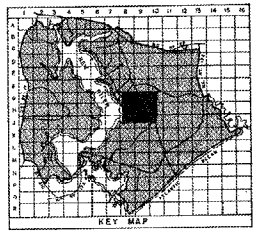
Mile Hammock Bay

Existing land use is predominantly training and consists of undeveloped trails used by heavy equipment. The existing dock is used for training purposes.

Onslow Beach

The primary land use (25 acres or 40 percent) is recreational (Figure IV-10). A large area of recreational lodges are located northeast of the Onslow Beach Bridge and they are surrounded by supporting community facilities. To the south of this recreational area is troop housing (2 acres), with associated administrative and community uses. A large utility area supports these uses. Segregated further to the southeast is an area of maintenance uses.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

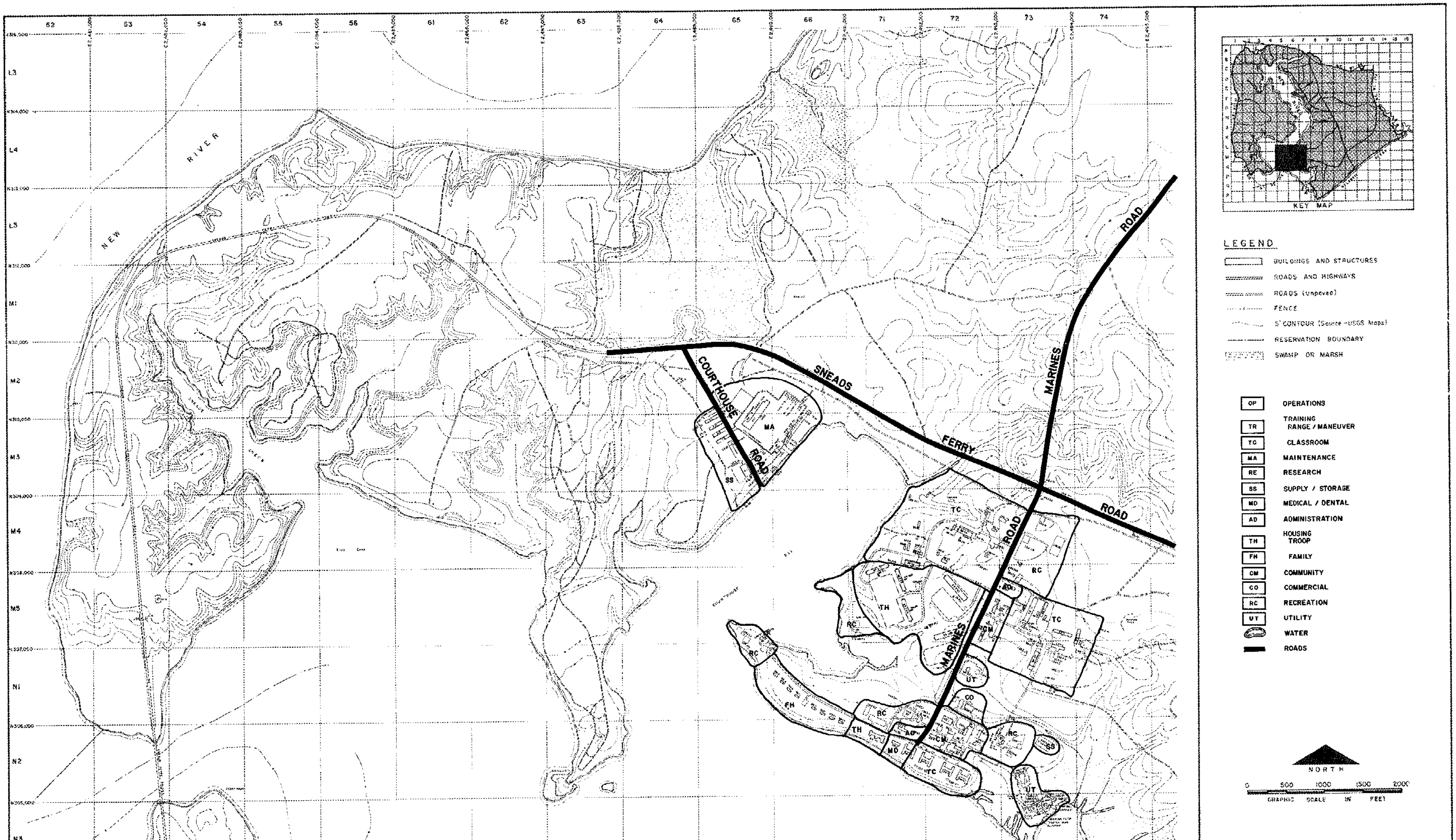
NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE

FRENCH CREEK AND MAGAZINE AREAS
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE: GRAPHIC	FIGURE IV-8
APPROVED / DATE		



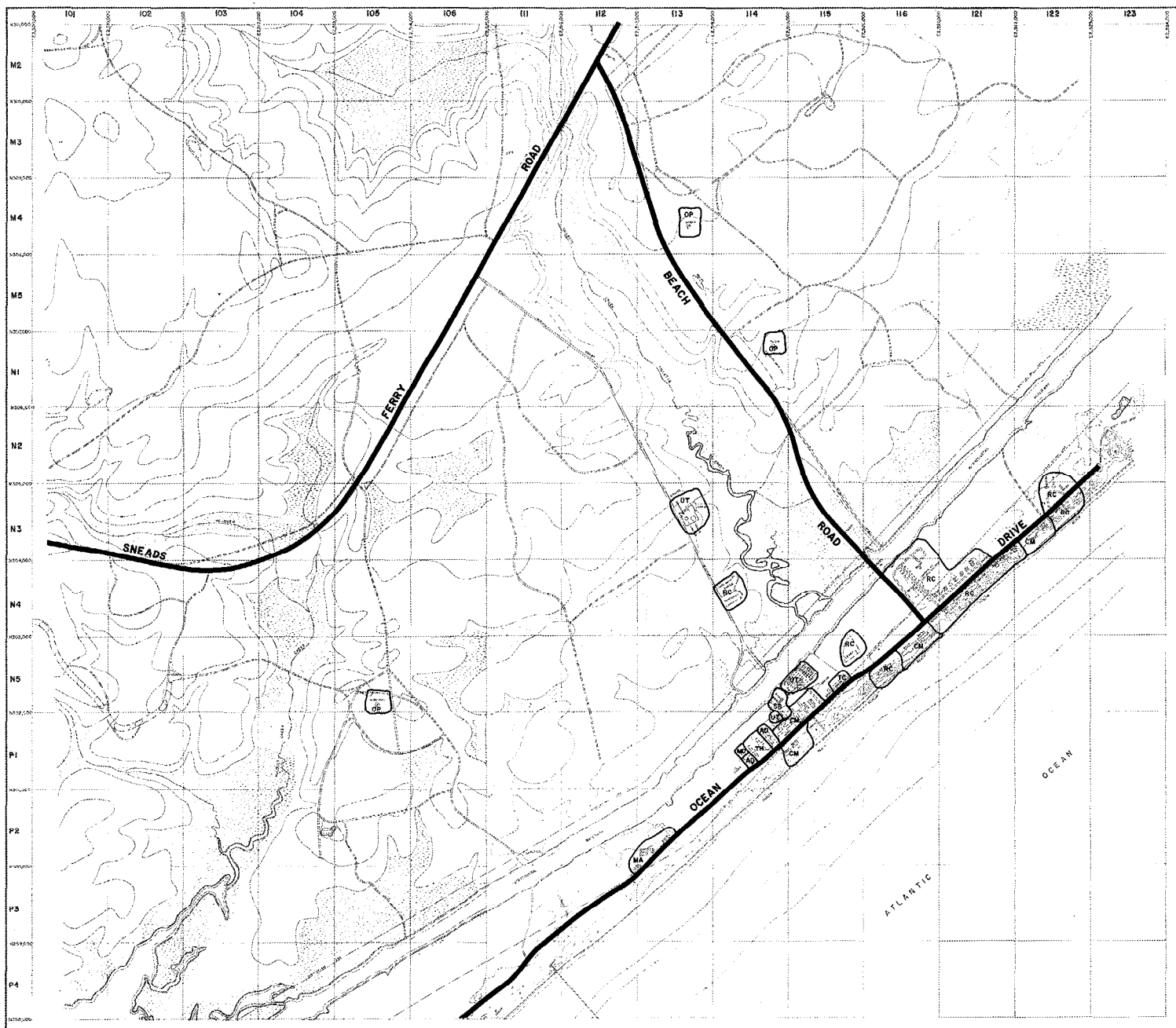
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

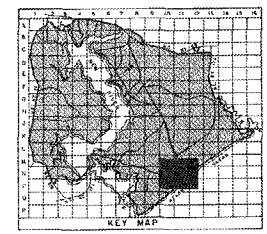
LAND USE

ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | **FIGURE IV-9**

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (unpaved)
- FENCE
- 5' CONTOUR (Source--USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE

BEACH AREA AND VICINITY
EXISTING CONDITIONS

DATE 31 JULY 68	SCALE: GRAPHIC	FIGURE IV-10

APPROVED / DATE

Rifle Range

Approximately 73 acres of development exists at the Rifle Range (Figure IV-11). Troop housing straddles both sides of the entrance road and supporting land uses sit directly behind the housing. This main area permits easy access to the large training range. A small, secondary cluster of barracks and associated administrative and classroom training uses located southeast of the main area are scheduled to be demolished.

Camp Geiger

A mixture of old and new facilities exists at Camp Geiger, the result of which is a patchwork of land uses arranged in a north to south configuration (Figure IV-12). The evolution of the approximately 216 acres of development has resulted in uses that are not interrelated, physically or functionally.

Supply and storage, which is concentrated along the eastern edge of the developed area and in the central portion, covers about 50 acres of land. Maintenance uses, which cover about 19 acres, are adjacent to the supply/storage areas. Combined, supply/storage and maintenance areas account for nearly 32 percent of the developed land in Camp Geiger.

No family housing exists at Camp Geiger. Troop housing (54 acres) is located in three areas, interspersed with community and commercial uses. Training tends to be conveniently accessible by foot from troop housing although less accessible from community uses, such as the dining facilities. The 16 acres of recreational uses are scarce in terms of number and inconvenient in terms of access.

To comprehensively evaluate existing land use in this area it is important to examine the relationship of Camp Geiger to its neighbor to the south, the Marine Corps Air Station (MCAS), New River. (See Section V MCAS, New River Activity Plan.) Recent commercial and community development at the Curtis Road Triangle serves effectively to pull the orientation of Geiger southward.

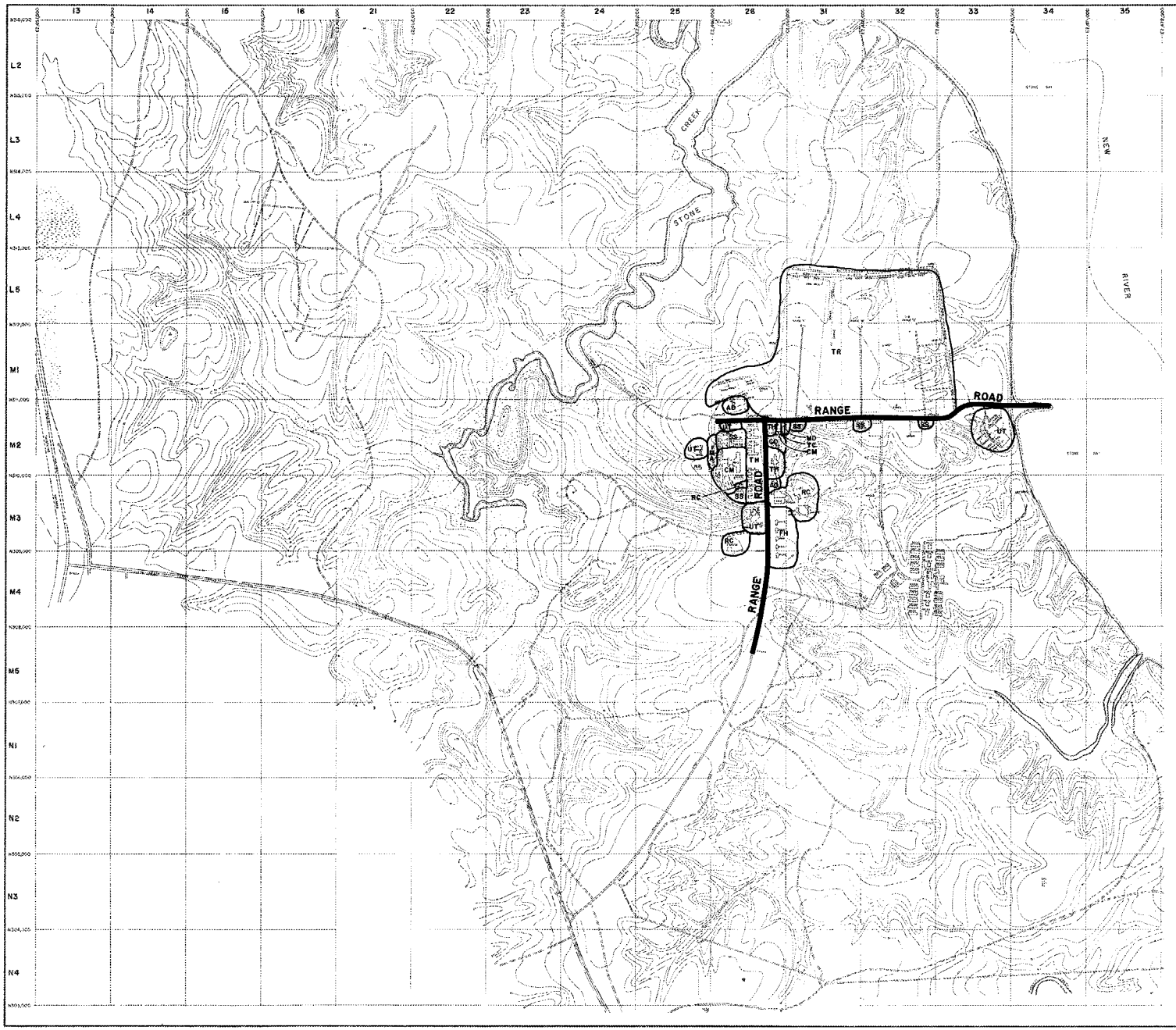
Montford Point

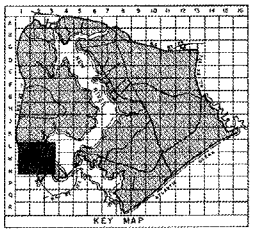
Montford Point is similar to Camp Geiger in that it too is one of the Marine Corps Base oldest areas and has seen little planning over the decades. Most of the 233 acres of development are congregated on the eastern side of Montford Landing Road (Figure IV-13). Of the 233 acres of development, 35 percent (32 acres) consist of troop housing. Community facilities are located near the troop housing in the northeast section of the area. The troop housing facilities located at the southern tip of Montford Point have very limited community facilities nearby.

Classroom training facilities are scattered throughout the developed areas of Montford Point. This use constitutes nearly 21 percent (48 acres) of the developed area and, therefore, is the second largest land use category existing at Montford Point.

EXISTING UTILITIES

The utilities serving the Marine Corps Base which will be developed in the Activity Plan include water supply, wastewater collection and treatment, the electrical system and central heating systems. The existing facilities have been analyzed, and known deficiencies have been noted.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INIT

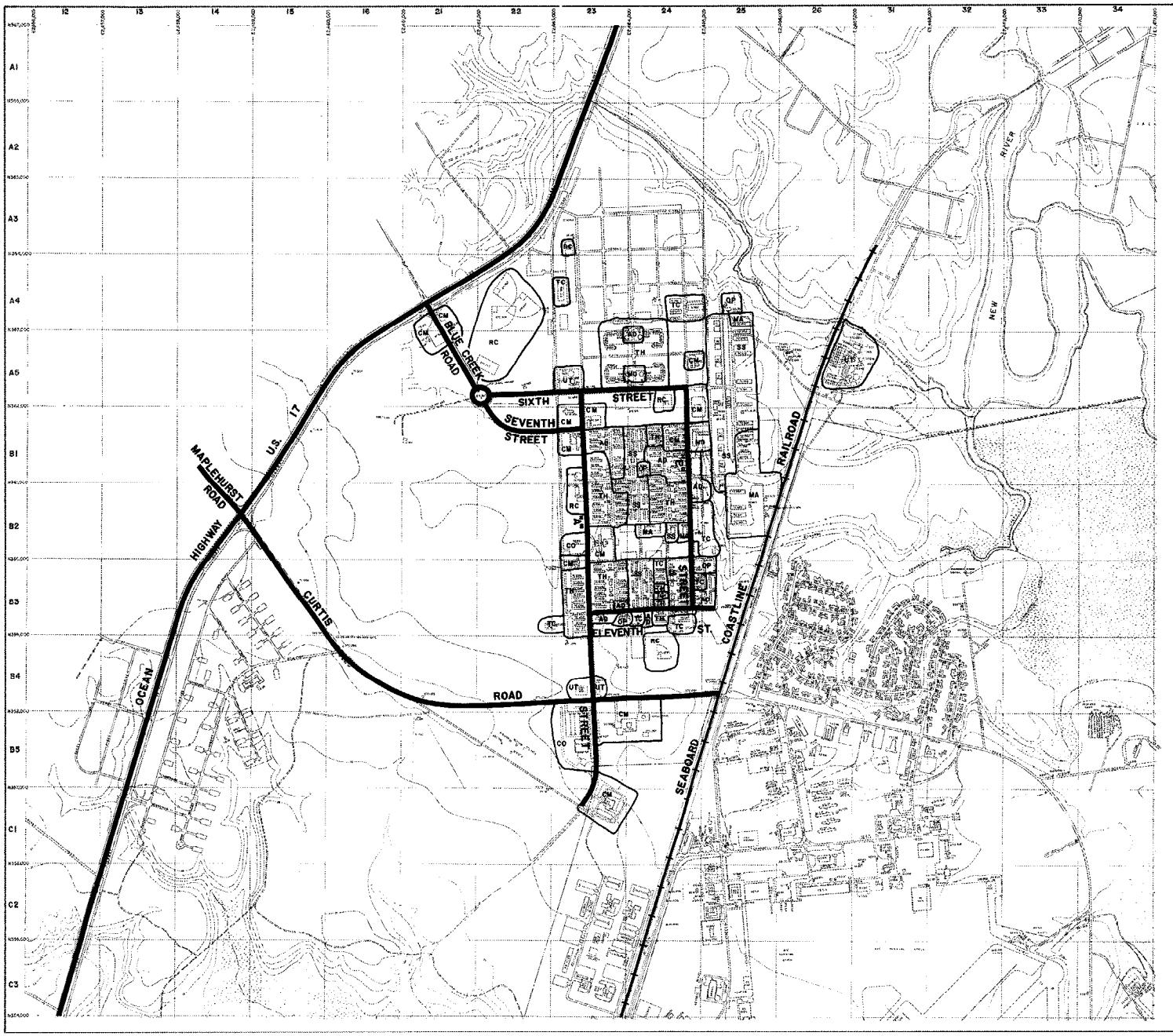
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

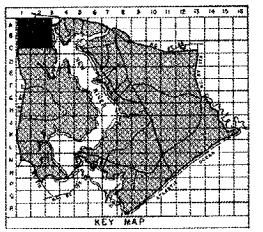
LAND USE

RIFLE RANGE AREA
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE IV-11

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS
	RAILROAD

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INIT.

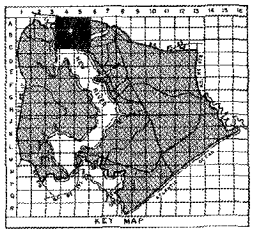
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE

GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE IV-12

APPROVED / DATE



LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE

MONTFORD POINT AND VICINITY
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE: GRAPHIC	FIGURE IV - 13
APPROVED / DATE		

Water Usage

Table IV-8 presents data on the average and maximum amounts of water used in the various areas of Camp Lejeune, exclusive of MCAS and Camp Geiger, which are presented in Section V. Areas correspond to the area served by each water treatment plant's distribution system. These amounts were developed using monthly records for the various water treatment plants for Calendar Year 1982 and Fiscal Year 1983. Data on water usage were not available for the months of March 1983 and May 1983, so the average amounts for the remaining 10 months were used for these two months in the development of FY 1983 data. Line Item 8 presents the totals for the areas served by the present Holcomb Boulevard, Tarawa Terrace and Montford Point Water Treatment Plants in recognition of plans to expand the Holcomb Boulevard Plant and to abandon the Tarawa Terrace and Montford Point Water Treatment Plants. Subtotals and totals for the maximum daily treated water delivered are show; however, the maximum amounts shown are higher than would actually be experienced since the maximum daily amounts would not likely occur on the same day for all treatment plants.

The effective service population data shown on Table IV-8 were developed from data indicating where military and civilian employees work and where military personnel and their dependents reside. The calculated data for the effective service population takes into account the proportional parts of each day that military and civilian personnel and dependents of the military personnel would be in each service area. The per capita water usage indicated for each service area includes water used for all purposes.

TABLE IV-8
WATER USAGE

MARINE CORPS BASE

WATER SUPPLY SYSTEM	Average Daily Raw Water Used		Average Daily Treated Water Delivered		Maximum Daily Treated Water Delivered		Effective Service Population	Average Per Capita Usage
	CY 1982	FY 1983	CY 1982	FY 1983	CY 1982	FY 1983		
1. Hadnot Point	3,426	3,227	3,216	3,044	4,356	4,300	20,673	156
2. Holcomb Boulevard	1,228	1,292	1,201	1,230	2,116	2,300	6,933	173
3. Tarawa Terrace	979	921	943	894	1,494	1,494	5,692	166
4. Montford Point	281	330	267	311	478	552	2,768	96
5. Rifle Range	244	259	221	233	343	363	1,249	177
6. Courthouse Bay	463	418	424	375	677	730	1,657	256
7. Onslow Beach	120	98	108	81	402	241	281	384
TOTALS	6,741	6,545	6,380	6,168	9,866	9,980	39,253	163
8. Subtotal of 2, 3, and 4	2,488	2,543	2,411	2,435	4,088	4,346		

Water Source

The source of all water in Camp Lejeune is from water wells located within the confines of the Camp Lejeune boundary. Table IV-9 provides data relative to the present well system for all areas except the Marine Corps Air Station and Camp Geiger. Data on those wells are presented in Section V of this report.

There are seven water well systems serving Camp Lejeune in addition to the water well system serving the MCAS and Camp Geiger. Data from the Raw Water Control Board located in Building 670, the Holcomb Boulevard Water Treatment Plant, indicate that 56 wells are currently in service and 15 wells are out of service -- either temporarily or permanently. In the Hadnot Point-French Creek system, eight of the nine out-of-service wells are to be replaced. Additionally, three existing operational wells are to be replaced. The remaining Well 610 is to be rescreened. In Tarawa Terrace the one out-of-service well will not be replaced. In the Montford Point system, one out-of-service well is being replaced and the other is to be rescreened. In the Rifle Range system, the one out-of-service well is to be replaced. After the above wells are replaced or rescreened, there will be 68 wells in service for the seven systems.

Average well spacing for the seven systems ranges from a low of 1,125 feet for the Montford Point system to 2,450 feet for the Hadnot Point-French Creek system -- for an overall average of 1,930 feet. Average well depths range from a low of 92 feet for the Montford Point system to 240 feet for the Holcomb Boulevard system -- for an overall average of 159 feet.

The original capacities of wells range from a low of 100 GPM for several wells in the Tarawa Terrace and Montford Point systems to 400 GPM for a well in the Holcomb Boulevard system.

TABLE IV-9
WATER SOURCE

MARINE CORPS BASE

WATER SUPPLY SYSTEM	Number of Wells In Service	Number of Wells Out of Service	No. of Wells With Emergency Power	Average Well Spacing (Feet)	Average Well Depth (Feet)	Well Capacity Range Original	Well Capacity Range Current	Combined Well Capacity Original	Combined Well Capacity Current	Existing Daily Demand FY 1982 Average (MGD)	Existing Daily Demand FY 1982 Maximum (MGD)	North Carolina Standard (MGD)	Well Deficiency or Surplus (MGD)
1. Hadnot Point-French Creek	26	9	8	2,450	176	136-320 GPM	104-266 GPM	5,468 GPM 7.9 MGD	4,091 GPM 5.9 MGD	3.4	4.6	6.8	-0.9
2. Holcomb Boulevard	8	0	4	1,700	240	230-400 GPM	175-450 GPM	2,180 GPM 3.1 MGD	1,888 GPM 2.7 MGD	1.2	2.2	2.4	+0.3
3. Tarawa Terrace	7	1	2	1,400	95	100-300 GPM	70-140 MGD	1,285 GPM 1.9 MGD	763 GPM 1.1 MGD	1.0	1.6	2.0	-0.9
4. Montford Point	5	2	4	1,125	92	100-200 GPM	100-157 GPM	750 GPM 1.1 MGD	606 GPM 0.9 MGD	0.3	0.5	0.6	+0.3
5. Rifle Range	3	1	1	1,530	138	150-250 GPM	140-250 GPM	550 GPM 0.8 MGD	552 GPM 0.8 MGD	0.2	0.4	0.4	+0.4
6. Courthouse Bay	5	0	1	1,250	118	150-355 GPM	100-240 GPM	1,170 GPM 1.7 MGD	794 GPM 1.1 MGD	0.5	0.7	1.0	+0.1
7. Onslow Beach	2	0	1	2,200	108	250-275 GPM	175-250 GPM	525 GPM 0.8 MGD	425 GPM 0.6 MGD	0.1	0.4	0.2	+0.4
TOTALS	56	13	21	1,930	159	100-400 GPM	70-450 GPM	11,928 GPM 17.2 MGD	9,119 GPM 13.1 MGD	6.7	10.4	13.4	

NOTE: Data are for well in service.

Current capacities range from a low of 70 GPM for a well in Tarawa Terrace to a high of 450 GPM for a well in the Holcomb Boulevard system. The original combined capacities of the wells currently in operation were 11,928 GPM, or 17.2 MGD, as compared with the current total capacity of 9,119 GPM or 13.1 MGD.

The State of North Carolina criteria for well fields require that the combined yield of all well fields be sufficient to provide the average daily demand within a 12-hour pumping time period. From Table IV-9, the Hadnot Point-French Creek and the Tarawa Terrace well fields fail to meet these criteria. Both systems have a deficiency of 0.9 MGD or 1,296 GPM. Assuming 250 GPM wells, both systems would require an additional six wells to meet that criteria. As stated above, eight non-operational wells and three operational wells for the Hadnot Point-French Creek area are to be replaced and one well is to be rescreened. These improvements should allow the State of North Carolina criteria to be met. As discussed below, the Holcomb Boulevard Water Treatment Plant is to be expanded and 10 new wells provided which should negate the need for additional wells in the Tarawa Terrace area.

There are extensive problems with the Tarawa Terrace and Montford Point water systems, as described in the reported titled Study of Two Water Plants, Tarawa Terrace-Montford Point, Camp Lejeune, North Carolina dated April 1979. As a result of this study and report, construction plans are essentially complete for an expansion of the Holcomb Boulevard Water Treatment Plant from 2 MGD to 5 MGD. The project would include 10 new wells for the Holcomb Boulevard plant and 10 new wells for the Hadnot Point-French Creek system. A new 24-inch trunk main would connect between the Holcomb Boulevard Plant and the Hadnot Point-French Creek Treatment Plant. Also, a 16-inch transmission main would extend from the Holcomb Boulevard plant to the Tarawa Terrace Pumping Station, Building STT-39A. A new 12-inch distribution main would connect the Tarawa

Terrace elevated storage tank with the Montford Point elevated storage tank. The existing water treatment plants at Tarawa Terrace and Montford Point would be abandoned. Since no provisions are included in the plans to bring raw water from the Tarawa Terrace and Montford Point well fields, it is concluded that these well fields are to be abandoned. These shallow depth well fields were part of the above-described problem since the raw water is high in iron content and has hardness ranging from 164 to 320.

Although the data of Table IV-9 indicate that the well field for Courthouse Bay meets state criteria, there are other factors which a report titled A Utility Study for Courthouse Bay Area, Marine Corps Base, Camp Lejeune, North Carolina dated January 31, 1979, considered in making recommendations on modification of the well field. Normally, only two wells (BB-220 and BB-221) are used. Wells BB-43 and BB-44 are seldom used because of their poor water quality. Well A5 is not directly connected to the raw water system. Recommendations were that a new 300 GPM well be provided and additional stages placed in Wells BB-220 and BB-221.

Raw Water Treatment

Water wells are connected to the water treatment plants by a separate system of underground lines for each treatment plant. Usually, the lines are operated by automatic controls between the water treatment plants and the water wells, although the Hadnot Point-French Creek system must be manually operated.

There is not a standard configuration pattern for the well field raw water transmission lines. In some instances, the water treatment plant is centrally located relative to its water wells and transmission lines, such as at Holcomb Boulevard plant, while other treatment plants are eccentric-

ally located, such as the Onslow Beach and Courthouse Bay Treatment Plants. Some systems are laid out so that the lines are in series; i.e. a line serves one or more wells and connects to a trunk main which picks up other lateral lines as it progresses to a water treatment plant area. An example is the Montford Point lines. Other systems are extensively looped, such as the Hadnot Point-French Creek system.

To a large extent, the layout of the transmission lines is dictated by the road system since wells generally are located adjacent to existing roads. The newer wells usually are located to extend from an existing line along an existing road at approximately 2,000-foot spacing.

Minimum line sizes usually are eight-inch for wells at or near the end of a transmission line, although there are a few six-inch lines in the system. Most lines are in the 10-inch to 12-inch range. The lines are adequately sized for the volume of water carried, with velocities under 4 ft./sec. and often considerably less.

The Hadnot Point-French Creek system is the most complex layout and covers the greatest area, extending from Midway Park on the north to a point on Sneads Ferry Road about two miles south of its intersection with the main Service Road near the French Creek area. There is one short segment of six-inch line; however, most of the lines are 12 inches or greater in diameter. Maximum line size is 18 inches, which occurs for a considerable distance along Holcomb Boulevard easterly and northerly from the treatment plant to a point near the lines from Berkeley Manor and Water Well 613. The large sizes of many of the lines in the system allow for the addition of water wells along lateral lines into the system.

The Holcomb Boulevard system is a good example of planning for expansion of the raw water supply system to serve the expanded plant. Most wells are located along two east-west lines -- one to the west along Holcomb Boulevard and one to the east along a secondary road generally parallel to NC Highway 24. Line sizes range from eight inches to 24 inches, with most being either 12-inch or 16-inch. The low velocity of water in the lines indicates allowances for the additional wells to be installed as a part of the Holcomb Boulevard Water Treatment Plant expansion.

The Tarawa Terrace, Montford Point, Rifle Range, Courthouse Bay and Onslow Beach systems are much smaller and less complex than the above-described systems. Most lines are in the eight-inch to 10-inch range, with Montford Point having considerable six-inch line. Line velocities are acceptably low for all systems.

Water Treatment Plants

Raw Water Storage and Delivery

Two water treatment plants have raw water storage facilities and raw water pumps. These are Hadnot Point-French Creek and Holcomb Boulevard (when the plant has been expanded according to present plans). These are the two largest water treatment plants with capacities of 5 MGD. The third largest plant is MCAS with a capacity of 3.5 MGD discussed in Section V. The remaining plants depend upon the water well pumps for delivery of raw water to the treatment plants.

The Rifle Range Treatment Plant receives raw water from the wells at a detention tank with two 400 GPM filter pumps providing pressure to the system. The Courthouse Bay Treatment Plant

receives raw water at a 25,000-gallon detention tank, with two 544 GPM filter pumps providing pressure to the system. These two pumps will be installed as part of the present program to upgrade the Courthouse Bay Water Treatment Plant. The Onslow Beach Water Treatment Plant receives raw water at the softeners and filters directly from the well field pumps.

Data regarding the raw water storage and delivery system for the Hadnot Point-French Creek and Holcomb Boulevard Treatment Plants are shown on Table IV-10. The capacity of the raw water reservoirs relative to plant capacities are 16 percent for Hadnot Point-French Creek and 20 percent for Holcomb Boulevard. The approximate firm capacity of the raw water pumps assumes the largest pump for each system to be out of service. The firm capacities are more than sufficient to meet the maximum daily demand and plant capacities. There is no emergency power supply shown on the expansion plans for the Holcomb Boulevard Treatment Plant. The piping arrangement for the Holcomb Boulevard plant allows the bypassing of the reservoir and raw water pump so that in the event of an emergency raw water can be delivered directly to the treatment plant from the well field. There is more than adequate firm capacity for delivery of raw water in an amount exceeding one-half the average daily demand of the plants.

Water Treatment

Data for the water treatment plants at Camp Lejeune are shown on Table IV-11. The data are presented on the basis that the Holcomb Boulevard Water Treatment Plant expansion has been completed and that the Tarawa Terrace and Montford Point Water Treatment Plants have been abandoned. Also, at the time of the field inventory for this report, extensive modifications were being performed for the Rifle Range and Courthouse Bay Water Treatment Plants, and treatment plant single-line drawings prepared in conjunction with this report indicates those modifications.

TABLE IV-10
RAW WATER STORAGE AND DELIVERY

MARINE CORPS BASE

WATER SUPPLY SYSTEM	Raw Water Reservoir	Raw Water Pumps	Approximate Firm Capacity	Existing Daily Demand (MGD) C.Y. 1982 Average	Existing Daily Demand (MGD) C.Y. 1982 Maximum	Plant Capacity (MGD)	Emergency Power Capacity	One-Half Average Daily Demand (MGD)
Hadnot Point-French Creek	800,000 Gal.	1-2,800 GPM 1-3,500 GPM 1-4,200 GPM	6,300 GPM 9.072 MGD	3.216	4.356	5 MGD		1.608
Holcomb Boulevard								
1. Holcomb Boulevard	1,000,000 Gal.	2-2,100 GPM	4,900 GPM	1.201	2.116	5 MGD		
2. Tarawa Terrace		2-1,400 GPM	7.056 MGD	.943	1.494			
3. Montford Point				.267	.478			1.206
Subtotal				2.411	4.088			

TABLE IV-11
WATER TREATMENT

MARINE CORPS BASE

WATER SUPPLY SYSTEM	Type Plant	Plant Capacity	Existing Daily Demand (MGD) C.Y. 1982 Average	Existing Daily Demand (MGD) C.Y. 1982 Maximum	Filters Number	Filters Surface Area	Filters Maximum Surface Loading Rate	Filtration Rate Maximum Criteria	Treated Water Reservoir	Minimum Treated Water Reservoir Criteria (Gal.)
Hadnot Point-French Creek	Lime Softening Rapid Sand Filtration	5.0 MGD	3.216	4.356	5	1,750 SF	1.984 gpm/sf	2 gpm/sf	2,000,000 Gal. 500,000 Gal. 2,500,000 Gal.	2,178,000(1) 2,340,000(2)
Holcomb Boulevard	Lime Softening Rapid Sand Filtration	5.0 MGD			5	1,800 SF	1.929 gpm/sf	2 gpm/sf	2,000,000 Gal. 1,000,000 Gal. 3,000,000 Gal.	2,044,000(1) 2,022,000(2)
1. Holcomb Boulevard			1.201	2.116						
2. Tarawa Terrace			0.943	1.494						
3. Montford Point			0.267	0.478						
Subtotal			2.411	4.088						
Rifle Range	Zeolite Softening Pressure Filtration	0.575 MGD	0.221	0.343	3			2 gpm/sf	350,000 Gal.	171,500(1) 150,000(2)
Courthouse Bay	Zeolite Softening Pressure Filtration	0.78 MGD	0.424	0.677	6			2 gpm/sf	350,000 Gal.	338,500 (1) 287,000(2)
Onslow Beach	Zeolite Softening Pressure Filtration	0.25 MGD	0.108	0.402	2			2 gpm/sf	250,000 Gal.	201,000(1) 344,000(2) 188,000(3)

(1) Twelve hours of maximum daily consumption.
(2) Capacity required with one-half of filters out of service.
(3) If maximum daily demand = 2.25 times average daily demand.

As shown on Table IV-11, the design plant capacities for all treatment plants exceed the average daily demand on the plants by an acceptable margin. The plant capacities of all plants, except Onslow Beach, exceed the maximum daily demand. The maximum daily usage of 402,000 gallons for that plant occurred in August 1982 and far exceeds the daily maximum use average of 183,000 GPD for the period January 1982 through September 1983.

Two plants -- Hadnot Point-French Creek and Holcomb Boulevard -- use rapid sand filtration. For both plants the maximum surface loading rate is within the maximum filtration rate criteria defined in NAVFAC DM-5. The Rifle Range, Courthouse Bay and Onslow Beach Water Treatment Plants use pressure filtration.

NAVFAC DM-5 lists two criteria for the minimum capacity of filtered water storage. The first is that minimum capacity shall be 12 hours of maximum daily consumption. The second is that storage capacity shall be sufficient to contain the difference between maximum day usage and plant production with one-half the filters out of service. The data of Table IV-11 indicate that the treated water reservoirs exceed criteria in all cases except for the case at Onslow Beach, when one-half of the filters are out of service on the maximum day. It should be noted that the maximum daily usage was abnormally high for this case, with the maximum amount being almost four times the average daily demand for this plant. If a maximum daily demand were calculated using coefficient K of 2.25 times average daily demand, as defined on page 5-9-3 of NAVFAC DM-5, the Onslow Beach Treatment Plant would meet the criteria for filtered water storage.

As discussed previously in this report, there are extensive improvements in the water treatment plants involving Holcomb Boulevard, Tarawa Terrace, Montford Point and Hadnot Point-French Creek. Construction plans are essentially complete for increasing the capacity of the

Holcomb Boulevard plant from 2 MGD to 5 MGD. This project resulted from a report titled Study of Two Water Plants, Tarawa Terrace-Montford Point, Camp Lejeune, North Carolina dated April 1979. The quality of water from the shallow well fields of these two plants is poor, particularly with respect to iron content and hardness. Both plants are in poor condition. To rectify this situation, several alternatives were investigated and the selected remedy was to increase the capacity of the Holcomb Boulevard Water Treatment Plant and to serve Tarawa Terrace and Montford Point from Holcomb Boulevard. A new 16-inch diameter main will connect the Holcomb Boulevard plant with the Tarawa Terrace Pumping Station, Building STT-39A. A new 12-inch diameter distribution main will connect the elevated storage tanks at Tarawa Terrace and Montford Point. Additionally, a new 24-inch diameter trunk main will be installed between the Holcomb Boulevard and Hadnot Point-French Creek system. At the Holcomb Boulevard plant, a new 800,000-gallon raw water reservoir and raw water pumps will be added along with a new 2,000,000-gallon treated water reservoir. An altitude valve will be installed at the elevated storage tank S-624 at Montford Point.

It was previously mentioned that modifications to the Courthouse Bay and Rifle Range Water Treatment Plants were being made at the time of the field inventory for this study. At the Rifle Range plant a new pressure filter is being installed. At the Courthouse Bay plant two additional softeners and three additional filters are being provided to increase capacity from 0.6 MGD to 1.0 MGD. At the Rifle Range plant there is no standby power in the event of a power outage.

During the field inventory of the Hadnot Point-French Creek Water Treatment Plant, numerous piping leaks were noted. It was also stated by a plant operator that the plant was capable of a 4.2 MGD capacity as compared with the design capacity of 5 MGD.

High Lift Distribution Pumping

High lift distribution pumps are provided for each separate water system as shown on Table IV-12. The approximately firm capacity shown in Column 2 is derived by assuming that the largest pump is inoperable at the time of a fire. The existing peak hour demand for each system is derived by use of the formula on page 5-9-3 of the NAVFAC Design Manual DM-5. Emergency pump capacities are for those pumps with an auxiliary engine to operate the pump in case of a power outage. The existing peak hour demand for the Holcomb Boulevard plant includes an amount for the maximum daily demand for Tarawa Terrace and Montford Point on the basis that the Holcomb Boulevard plant will be supplying those systems after expansion of the Holcomb Boulevard plant. The peak hour demand for Tarawa Terrace includes the peak hour demand for Montford Point since the high service pumps for Montford Point will be removed from service when the existing Montford Point plant is abandoned. Data from this table are used in the evaluation of storage capacity requirements in the event of a fire. The Holcomb Boulevard data includes those pumps which will take suction off the new reservoir to be provided. Based upon the investigations described below for elevated storage, the high lift distribution pumping system is satisfactory.

Elevated Storage

The existing elevated storage tanks for the Marine Corps Base are shown on Table IV-13. All tanks in the Hadnot Point area have altitude valves except Tank SFC-314 at French Creek. All tanks in the Holcomb Boulevard System have altitude valves except S-2323 at Paradise Point. An altitude valve will be installed for S-624 at Montford Point when the Holcomb Boulevard plant is expanded.

TAB 2
HIGH LIFT DISTRIBUTION PUMPING

MARINE CORPS BASE

WATER SUPPLY SYSTEM	HIGH LIFT PUMPS	APPROXIMATE FIRM CAPACITY	EXISTING PEAK HOUR DEMAND	EMERGENCY PUMP CAPACITY	ONE-HALF TOTAL PUMPING CAPACITY
Hadnot Point - French Creek	3-1,500 GPM 1-3,000 GPM	4,500 GPM	7,816 GPM	1-1,500 GPM 1-3,000 GPM	3,750 GPM
Subtotals	7,500 GPM 10.8 MGD	4,500 GPM 6.5 MGD	7,816 GPM 11.3 MGD	4,500 GPM 6.5 MGD	3,750 GPM 5.4 MGD
Holcomb Boulevard					
1. Existing Reservoir	1-3,500 GPM 2-1,500 GPM 2- 750 GPM	10,100 GPM	4,227 GPM(1)	1-1,500 GPM 1- 750 GPM	6,800 GPM
2. New Reservoir	2-1,400 GPM 1-2,800 GPM				
Subtotals	13,600 GPM 19.6 MGD	10,100 GPM 14.5 MGD	4,227 GPM 6.1 MGD	2,250 GPM 3.2 MGD	6,800 GPM 9.8 MGD
Tarawa Terrace	1-2,000 GPM 1-1,000 GPM 1- 800 GPM 1-1,050 GPM	2,850 GPM	3,035 GPM(2)	1-1,050 GPM	2,425 GPM
Subtotals	4,850 GPM 7.0 MGD	2,850 GPM 4.1 MGD	3,035 GPM 4.4 MGD	1,050 GPM 1.5 MGD	2,425 GPM 3.5 MGD
Rifle Range	2- 500 GPM 1- 750 GPM	1,000 GPM	537 GPM	1- 750 GPM	875 GPM
Subtotals	1,750 GPM 2.5 MGD	1,000 GPM 1.4 MGD	537 GPM 0.7 MGD	750 GPM 1.1 MGD	875 GPM 1.3 MGD
Courthouse Bay	1- 750 GPM 2- 500 GPM	1,000 GPM	1,031 GPM	1- 500 GPM	875 GPM
Subtotals	1,750 GPM 2.5 MGD	1,000 GPM 1.4 MGD	1,031 GPM 1.5 MGD	500 GPM 0.7 MGD	875 GPM 1.3 MGD
Onslow Beach	1- 300 GPM 1- 750 GPM 1-1,000 GPM	1,050 GPM	263 GPM	1-1,000 GPM	1,025 GPM
Subtotals	2,050 GPM 3.0 MGD	1,050 GPM 1.5 MGD	263 GPM 0.4 MGD	1,000 GPM 1.4 MGD	1,025 GPM 1.5 MGD

(1) Peak Hour Demand and Maximum Daily Demand to Tarawa Terrace and Montford Point.

(2) Peak Hour Demand for Tarawa Terrace and Montford Point.

TABLE IV-13
ELEVATED STORAGE

MARINE CORPS BASE

WATER SUPPLY SYSTEM	ELEVATED STORAGE TANKS	COMBINED STORAGE CAPACITY
Hadnot Point - French Creek	S-5 - 300,000 Gal S-1000 - 300,000 Gal S-29 - 200,000 Gal SFC-314 - 300,000 Gal	1,200,000 Gal
Holcomb Boulevard	S-830 - 300,000 Gal S-2323 - 200,000 Gal S-4004 - 200,000 Gal	700,000 Gal
Rifle Range	SR-44 - 100,000 Gal	100,000 Gal
Courthouse Bay	S-BB-35 - 100,000 Gal	100,000 Gal
Onslow Beach	S-BA-108 - 100,000 Gal	100,000 Gal
Tarawa Terrace	TT40 - 250,000 Gal	250,000 Gal
Montford Point	S-624 - 150,000 Gal	150,000 Gal

The basic criteria for determining storage requirements are given in NAVFAC DM-5 (Design Manual) on page 5-9-5 and NAVFAC DM-8 (Fire Protection Engineering) on page 8-7-6. Required fire flows were obtained by reviewing the types of buildings in each system's area of service and comparing those buildings with those included for the various hazard groups in NAVFAC DM-8. Comparisons were also made with the fire flows used in the various Fire Protection Engineering Survey Reports obtained in the initial data collection phase of the project. Generally, the fire flows and duration for this study were more conservative than those used in the Fire Protection Engineering Survey Reports.

Storage capacity criteria require that the total storage be sufficient to supply the peak fire flow demand plus 50 percent of the average daily demand. Calculations for this requirement are shown on Table IV-14, Maximum Fire Demand. The calculations for this table were based upon use of those high lift distribution pumps having an auxiliary engine in operation at the time of a fire. The fire demand exceeding the capacity of the standby pumps were defined as Total Storage Required, Column 6, which would come from the elevated storage tanks. In addition, the elevated storage tanks should provide storage for fluctuations in demand for a four-hour peak period, as shown on Table IV-15, Storage Requirements. This table compares the flows with all high lift pumps in operation, except the largest pump is assumed to be out of service. The capacity of those pumps is shown in column 2 of Table IV-12. Column 3 of that table shows that the high lift distribution pump capacities exceed the peak hour demand for the Holcomb Boulevard, Montford Point, Rifle Range and Onslow Beach systems. Those systems are shown as having a negative storage required amount in Column 5. The fire storage requirements are shown in Column 6 and, when added to the amounts shown in Column 5, indicate the total elevated storage required. By comparing Column 7 and Column 8 (Existing Elevated Storage), it can be seen that only Courthouse Bay has a deficiency in storage.

TABLE IV-14
MAXIMUM FIRE DEMAND

MARINE CORPS BASE

WATER SUPPLY SYSTEM	(1) FIRE FLOW GPM	(2) 1/2 AVERAGE DAILY DEMAND GPM	(3) STANDBY PUMPING GPM	(4) FIRE DEMAND RATE GPM	(5) DURATION MINUTES	(6) TOTAL STORAGE REQUIRED
Hadnot Point - French Creek (Warehouse)	3,750	$\frac{0.5 \times 3,261,000}{1,440} = 1,132$	4,500	382	195	74,490
Holcomb Boulevard (Commissary)	2,250	$\frac{0.5 \times 2,460,000}{1,440} = 854$ (7)	2,250	854	120	102,480
Tarawa Terrace (Commissary-Store)	2,000	$\frac{0.5 \times 1,249,000}{1,440} = 434$ (8)	1,050	1,384	120	166,080
Montford Point (Main Area Dining Facility)	1,500	$\frac{0.5 \times 269,000}{1,440} = 93$	1,050	543	120	65,160
Rifle Range (Barracks Building)	1,500	$\frac{0.5 \times 213,000}{1,440} = 74$	750	824	120	98,880
Courthouse Bay (UOPH BB-45)	1,500	$\frac{0.5 \times 441,000}{1,440} = 74$	500	1,154	120	138,480
Onslow Beach (UEPH BA-105)	1,500	$\frac{0.5 \times 111,000}{1,440} = 39$	1,000	539	120	64,680

(7) Daily Demand Includes Terawa Terrace and Montford Point

(8) Daily Demand Includes Montford Point

Column (1) + Column (2) - Column (3) = Column (4); Column (4) x Column (5) = Column (6)

TABLE IV-15
STORAGE REQUIREMENTS

MARINE CORPS BASE

WATER SUPPLY SYSTEM	(1) PEAK HOUR DEMAND GPM	(2) FIRM PUMPING CAPACITY GPM	(3) DEMAND FROM STORAGE GPM	(4) DURATION MINUTES	(5) STORAGE REQUIRED GALS.	(6) FIRE STORAGE REQUIRED GALS.	(7) TOTAL STORAGE REQUIRED GALS.	(8) EXISTING ELEVATED STORAGE GALS.
Hadnot Point - French Creek	7,816	4,500	3,316	240	795,840	74,490	870,330	1,200,000
Holcomb Boulevard	4,227[9]	10,100	-5,873	240	-1,409,520	102,480	-1,307,040	700,000
Tarawa Terrace	3,035[10]	2,850	185	240	44,400	166,080	210,480	250,000
Montford Point	653	2,850[12]	-2,197	240	-527,280	65,160	- 462,120	400,000[11]
Rifle Range	537	1,000	- 463	240	-111,120	98,880	- 12,240	100,000
Courthouse Bay	1,031	1,000	31	240	7,440	138,480	145,920	100,000
Onslow Beach	263	1,050	- 787	240	-188,880	64,680	- 124,200	100,000

Column (1) - Column (2) = Column (3); Column (3) x Column (4) = Column (5); Column (5) + Column (6) = Column (7)

(9) Peak Hour Demand + Maximum Daily Demand to Tarawa Terrace and Montford Point

(10) Peak Hour Demand at Tarawa Terrace + P.H. Demand at Montford Point

(11) Montford Point + Tarawa Terrace Tanks

(12) Tarawa Terrace Pumps

Water Distribution

An extensive water distribution system supplied by eight water treatment plants serves Camp Lejeune, including the Marine Corps Air Station and Camp Geiger. When the Holcomb Boulevard Water Treatment Plant is expanded, the water treatment plants for Tarawa Terrace and Montford Point will be abandoned, leaving six treatment plant distribution areas. Several areas are independent from all other distribution systems, such as Courthouse Bay, while others are interconnected, such as Holcomb Boulevard and Hadnot Point-French Creek. Sixteen elevated storage tanks with a total capacity of 3,450,000, gallons are connected to the distribution system.

The Hadnot Point-French Creek distribution system serves the Industrial Area, the Division Billeting area, the old U.S. Naval Hospital area and French Creek. It is connected to the Holcomb Boulevard area at the Main Service Road and Holcomb Boulevard at Wallace Creek. For operational reasons, the line valves are normally closed between these two systems. This distribution system consists of water main lines ranging in size from eight inches to 12 inches, with building service lines and laterals of four and six inches in size. The water mains are well looped, with many valves for isolating individual line segments. Unfortunately, many of the valve boxes are buried or have been paved over, creating a problem for maintenance personnel. This is generally true of all field inventoried areas, which consisted of Hadnot Point, French Creek, Montford Point and part of the MCAS. Fire protection surveys by others found adequate pressures and volumes for the industrial area and Hadnot Point area except a drastic decrease in water volume and pressure at the end of Warehouse Building 916 was noted. Inadequate residual pressure exists at the Parachute Tower due to the long six-inch dead end line serving the area.

The basic distribution system was built in the early 1940s; however, there have been many recent projects, including some current projects, where new lines have been installed and sometimes the old lines have been abandoned. A June 1982 Fire Protection Engineering Survey Report titled Industrial Area and Hadnot Point contained waterflow test data at 12 locations and found static pressures from 54 to 63 psi, with adequate available flow at the required pressure. A 12-inch main line along the Main Service Road provides water to the French Creek area. This line was built in the mid-1960s. Within the French Creek area, the looped water mains are eight to 12 inches in size, with a small amount of six-inch main lines. Building services lines are generally four inches in diameter. Development of French Creek proceeded from north to south with lines in the north area installed in the mid-1960s, and in the central and southern area in the mid-1970s. It was reported by maintenance personnel that water lines in French Creek were asbestos cement. Many valve boxes are buried and some could not be located, creating a problem for maintenance personnel. A Fire Protection Energy Study Report titled Outlying Areas dated August 2, 1982, indicated satisfactory pressure and flow at the French Creek Administration Building FC-400. No problems with pressure or flow were reported for French Creek by Fire Department or other personnel.

The Holcomb Boulevard distribution system serves the Paradise Point, Berkeley Manor, Watkins Village and Midway Park quarters, as well as the new U.S. Naval Hospital facility on Brewster Boulevard. The facilities served include Brewster Junior High School on Brewster Boulevard, Lejeune High School on Stone Street, the Berkeley Manor Elementary School and the Stone Street Elementary School. As mentioned previously, this system connects with the Hadnot Point-French Creek area at the Main Service Road and Holcomb Boulevard at Wallace Creek, but line valves are normally closed between the two systems. For Paradise Point, a 12-inch line along Seth Williams Boulevard connects with a 12-inch line at Stone Street and the eight-inch line along Seth Williams Boulevard connects with a 12-inch line at Brewster Boulevard to provide the major

looped system. Within the area, 10-inch, eight-inch and some six-inch lines are looped to serve the area. Occasionally, two-inch lines are provided to serve residences within a block area. The Berkeley Manor and Watkins Village areas are served by a 12-inch line along Stone Street, connecting to mains at Brewster Boulevard and Seth Williams Boulevard. Service is provided by a well-looped system of six-inch, eight-inch and 10-inch lines. The U.S. Naval Hospital is served by a 10-inch looped line connecting to the 12-inch to 16-inch main on Brewster Boulevard. Midway Park is connected to the Holcomb Boulevard treatment plant area with a 10-inch diameter main along Holcomb Boulevard. The distribution system in Midway Park consists of six-inch, eight-inch and 10-inch looped lines.

A small amount of two-inch line is included in the looped system. A September 1983 Fire Protection Engineering Surveying Report covering the Naval Regional Medical Center indicated a static pressure of 66 psi at the hospital, with 4,200 GPM available at 20 psi as compared with a requirement of 1500 GPM at 20 psi. Two 500 GPM fire pumps are also located at the hospital. An August 1982 Fire Protection Engineering Survey Report titled Outlying Areas included locations at Paradise Point and Midway Park. The report indicated that the system, as a whole, was considered adequate and produced satisfactory flows. At Midway Park (Exchange Building LCH-4014) 3800 GPM was available at 20 psi, as compared to a 2000 GPM requirement. At the Officers' Club, Building 2615 at Paradise Point, 1940 GPM at 20 psi were available, as compared with a requirement of 1500 GPM.

Tarawa Terrace I and Tarawa Terrace II are quarter's areas for married enlisted personnel. There are two elementary schools and a shopping center in the area. A water treatment plant and a pumping station are located in the central part of Tarawa Terrace I and a 250,000-gallon elevated storage tank is in Tarawa Terrace II. As previously mentioned, both treatment plants are in poor

condition and will be abandoned after the Holcomb Boulevard treatment plant is expanded. That project will include a 16-inch water main from the Holcomb Boulevard treatment plant to the Tarawa Terrace Pumping Station STT-39A. Water to the elevated storage tank will be delivered through distribution piping, utilizing the 12-inch diameter line at Inchon Street and a six-inch diameter line at Tarawa Boulevard. Due to the poor condition of the distribution lines in Tarawa Terraces I and II, these lines were recently replaced. The system is well-looped with six-inch and eight-inch diameter piping. One and a half-inch and two-inch laterals serve many of the cul-de-sac areas.

The Montford Point distribution system is presently served by its own water treatment plant, but this plant will be abandoned with the expansion of the Holcomb Boulevard treatment plant. A 12-inch diameter distribution main will be provided to connect the Tarawa Terrace elevated storage tank with the Montford Point elevated storage tank. Due to elevation differentials, an attitude valve will be installed for the Montford Point elevated tank. The distribution system is reasonably well looped with six-inch and eight-inch lines, as well as some 10-inch and 12-inch piping; however, there are several instances of small diameter piping and dead end lines. The Fire Protection Engineering Survey Report titled Camp Johnson dated February 23, 1982, points out a major deficiency in the system. The 200 area, comprised of 40 combustible buildings, is served by a single loop of approximately 8,000 feet of six-inch and eight-inch pipes. The report states that the deficient water supply is probably caused by a combination of factors such as the low static pressure, long runs of relatively small pipe and the likelihood that the mains have become tuberculated since the lines at Montford Point were installed in the 1940s. Raw water for this area is high in iron content and hardness. The present fire flow available for the 200 area is 630 GPM at 20 psig residual, whereas a minimum fire flow of 1500 GPM at the same residual pressure is

required. In the Main Dining Facility M424, 2600 GPM at 20 psi was available as compared with the required 1500 GPM at 20 psi.

The Rifle Range distribution system is served by its own water treatment plant. The distribution system is looped except for six-inch diameter dead end lines at the ranges and a four-inch diameter, with some 10-inch lines. The Fire Protection Engineering Study Report titled Outlying Areas dated August 2, 1982, reported on two sites. Target Shed RR-239 had 2800 GPM available at 20 psi as compared with 1500 GPM at 20 psi required. Barracks Building RR-4 had 3500 GPM available at 20 psi as compared with 1500 GPM required at 20 psi.

The Courthouse Bay distribution system is served by its own water treatment plant. The distribution system serves the Engineer Area on the east side of Courthouse Bay and the Amphibian Base on the west side of the Bay. A long dead end line of six-inch, eight-inch and 10-inch line connects the Amphibian Base with the distribution lines on the Engineer Area side by the Bay. Although the lines are reasonably well looped in the Engineer Area, there are several dead end lines, notably the eigh-inch line along Front Street. Piping sizes in the Engineer Area are six-inch, eight-inch and 10-inch, while lines at the Amphibian Base are six inches or less. The Fire Protection Engineer Survey reported titled Outlying Areas found 2600 GPM available at 20 psi at NOPH BB-45 as compared to the required 1500 GPM at 20 psi. At Instruction Building BB-48, 2700 GPM was available at 20 psi, while 750 GPM at that pressure was required. No problem with pressure or flow was reported for Courthouse Bay by the Fire Department or others.

The Onslow Beach distribution system is served by its own water treatment plant. The distribution system is in the shape of an inverted T due to the location of the water treatment plant and the development along the beach. The line from the treatment plant to the beach area is

10-inch diameter, while the lines along the beach area are usually six inches in diameter with a two-inch line leading to the pier. The 10-inch line was recently replaced with plastic pipe. The Fire Protection Engineer Survey report found adequate flow and pressure at BFQ BA-105 (2550 GPM at 20 psi versus 750 GPM at 20 psi required) but inadequate flow at Recreation Building BA-115 (450 GPM at 20 psi versus 750 GPM at 20 psi required). BA-115 is near the northeastern terminus of the six-inch dead end line along the beach.

Wastewater

Table IV-16 indicates data regarding flows of wastewater at the various treatment plants. Basic flow data was obtained from Camp Lejeune personnel. From this data certain other data material were derived using information also obtained from the records of the base. Effective service population data was developed for the various service areas from information obtained at the base. Population data as developed takes into account where military personnel work and reside, where dependents reside and where civilians work. To assist in evaluating wastewater flow data the average per capita water use for each service area was also tabulated. Average per capita wastewater flow varies considerably for the various areas, ranging from a low of 110 gallons per capita day (gpcd) for Montford Point to a high of 359 gpcd at Onslow Beach. The wastewater flow for those extreme cases generally matches the average per capita water use for those areas. The Rifle Range and Courthouse Bay areas also had high rates of treatment plant per capita flow but also had high average demand. The Courthouse Bay and Tarawa Terrace wastewater treatment plants processed less water than the water treatment plants produced. Two systems had relatively high ratios of maximum to average flow: Montford Point (4.0) and Tarawa Terrace (2.47).

TABLE IV-16
WASTEWATER FLOWS

MARINE CORPS BASE

Wastewater System	Average[1] Daily Flow	Maximum[1] Daily Flow	Effective Service Population	Average Per Capita Flow	Ratio Maximum To Average Flow	Average Per Capita Water Flow	% Wastewater Over Water Use
Hadnot Point	5,345	10,000	27,606	194	1.87	160	21
Tarawa Terrace	875	2,160	5,692	154	2.47	167	-8
Montford Point	305	1,219	2,768	110	4.00	97	13
Rifle Range	271	428	1,249	217	1.58	177	23
Courthouse Bay	359	570	1,657	217	1.59	256	-15
Onslow Beach	101	254	281	359	2.51	384	7
Totals	7,256		39,253	185			

[1] In Thousands of Gallons.

[2] Flows for Calendar Year 1982.

Wastewater Treatment

Table IV-17 indicates data for the six wastewater treatment plants serving the Marine Corps Base. Data is presented showing the plant capacities and the average and maximum daily flow at the plants. All plants are operating under a National Pollutant Discharge Elimination System (NPDES) permit in which the flows for the monthly average discharge limitations equal the design capacity, except for Onslow Beach where the allowable is 0.005 MGD higher than the design capacity. The average daily flows for all plants are within the design capacity of the plants. The maximum discharges exceed the plant capacities for all plants except the Rifle Range treatment plant.

At the time of the field inspection of the wastewater treatment plants, there were numerous improvements being made to the plants, as briefly described below. Also, Camp Lejeune personnel indicated several items which they believed needed to be added or changed in the treatment plants.

Hadnot Point - Building 22. Settlement of Office Building 683 and the adjacent chlorine contact chamber has required they be replaced, and construction was essentially complete at the time of inspection. Personnel expressed the need for chlorine and methane gas detectors. It was also believed that a chlorine analyzer on the effluent main to New River is needed.

Tarawa Terrace - Building TT-35. Construction in progress included replacement of comminutors and grit chamber, as well as a new lift station. The existing wet well is to be filled. There are 10 sludge drying beds instead of the six shown on sketch layouts of the treatment plant. Two existing pumps are to be replaced. The need for chlorine and methane gas detectors was expressed.

TABLE IV-17
WASTEWATER TREATMENT PLANTS

MARINE CORPS BASE

Waste Water System	Type Plant	Level of Treatment	Plant Capacity MGD	Existing Daily Flow CY 1982 Average MGD	Existing Daily Flow CY 1982 Maximum MGD
Hadnot Point	Trickling Filter	Secondary	8.0	5.345	10.0
Tarawa Terrace	Trickling Filter	Secondary	1.25	0.875	2.160
Montford Point	Trickling Filter	Secondary	1.0	0.305	1.219
Rifle Range	Trickling Filter	Secondary	0.525	0.271	0.428
Courthouse Bay	Trickling Filter	Secondary	0.525	0.359	0.570
Onslow Beach	Trickling Filter	Secondary	0.195	0.101	0.254

Montford Point - Building M-136. The filter arms for filter SM-331 need to be replaced. There were no other known problems except that the need for a chlorine gas detector and residual monitors was expressed.

Rifle Range - Building RR-92. Worn filter arms on Filter SRR-93 are scheduled for replacement. An additional pump station in the "C" range was indicated.

Courthouse Bay - Building BB-4. The combined system temporarily overloads the treatment plant. A holding basin was under construction at the time of the inspection. Project 784 will add or change several facilities. The two existing Imhoff tanks are to be converted to sludge digestors. A new trickling filter and two circular clarifiers are to be added. Two additional sludge drying beds and a new administrative office addition are to be provided. The above improvements will eliminate problems with temporary overload, suspended solids removal and dissolved oxygen.

Onslow Beach - Building SBA-160. Worn trickling filter arms are to be replaced. The shower in the chlorine room needs to be relocated.

Generally, the treatment plants were considered to be in good condition by Camp Lejeune personnel. Sludge is disposed of in the landfill or is used in road construction.

Collection System

There are six wastewater treatment plants serving the Marine Corps Base, as described above. Each treatment plant has extensive collection system of gravity sewers, lift stations and force mains for its service area. Listings of lift stations for the service areas are shown in Table

IV-18. Listings indicate pump capacities for each pump in the lift station and the existing conditions mapping area where the lift station is located. A brief description of each system is provided below.

Hadnot Point. The collection system extends from the treatment plant to the areas of French Creek, Hadnot Point, Division Billeting, Supply and Industrial, U.S. Naval Hospital, Paradise Point, Watkins Village, Berkeley Manor, new U.S. Naval Hospital and Midway Park. The system includes 32 lift stations as shown on Table IV-18. Three lift stations are in the treatment plant area. The Midway Park collection system includes mostly eight-inch, 10-inch and 12-inch diameter gravity sewers leading to Lift Station LCH-4005 from which sewage is pumped through a 12-inch diameter force main to Manhole 280A located each of the U.S. Naval Hospital in Map Area B-7. A 15-inch diameter sewer leads from that manhole southerly to collect sewage from the new U.S. Naval Hospital, Brewster Junior High School and the Holcomb Boulevard Water Treatment Plant at manholes near Brewster Boulevard and Stone Street. The Midway Park sewers and the 15-inch sewer were constructed in the early 1940s. The Berkeley Manor sewerage system consists mostly of eight-inch and 10-inch pipe draining to a continuation of the 15-inch sewer described above, which skirts and passes through the Berkeley Manor area. That sewer increases to an 18-inch diameter line near Alabama Avenue and Arkansas Street. Most of Watkins Village drains to the Berkeley Manor system, with the easternmost area draining to a 21-inch sewer outfall located east of Berkeley Manor and Watkins Village. This 21-inch sewer connects to the 18-inch sewer described above and leads to lift station S-47A near Seth Williams Boulevard at Wallace Creek. The Berkeley Manor system was constructed in the early 1960s, as was the 21-inch sewer. The Watkins Village system was constructed in the mid-1970s. A 14-inch diameter force main extends southerly across Wallace Creek to connect with the Hadnot Point gravity sewer system.

TABLE IV-18
WASTEWATER LIFT STATIONS

MARINE CORPS BASE

BUILDING NUMBER	PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4	TOTAL PUMPING CAPACITY - GPM	MAPPING AREA NUMBER	REMARKS
HADNOT POINT							
21	2,000	1,500	2,800	2,500	8,800	G-8	@ Treatment Plant
680	2,000	2,000	4,000		8,000	G-8	@ Treatment Plant
H-29	450	500			950	F-6	
S-47	800	800	500		2,100	E-7	
S-47A	500	1,000	1,000	2,400	4,900	E-7	
85	200	200			400	F-8	
34	150	150			300	F-8	
SPP-2100	50	50			100	C-5	
S-46	150	150			300	C-7	
LCH-4005	200	200	600		1,000	B-8	
672	75	75			150	C-8	
SPP-2633	400	300			700	D-6	
PT-41	100	100			200	E-7	
686	1,000	1,000	400	400	2,800	H-8	@ Treatment Plant
1761	100				100	G-8	
1776	300	300			600	G-8	
SP-1948	100	100			200	D-6	
S-FC-315	1,000	1,000			2,000	H-8	Study for Upgrade and Increase

TABLE IV-18 (Continued)
WASTEWATER LIFT STATIONS

MARINE CORPS BASE

BUILDING NUMBER	PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4	TOTAL PUMPING CAPACITY - GPM	MAPPING AREA NUMBER	REMARKS
S-FC-203	100	100			200	G-9	
S-1055	75				75	F-8	
High School No Number	100	100			200	D-7	
Orde Park No Number	75				75		
Back of FC-260	75	75			150	H-9	
New Lift Station At Force Troops	100	100			200	H-8	
Back of 702	75	75			150	F-8	
GP-22	75	75			150	G-8	
S-FC-599	550	550			1,100	H-8	
Naval Hospital No Number						B-7	
Beside 1828 No Number	120	120			240	G-8	
East of 1841 No Number	25				15	G-8	
Gas Station No Number	75				75		
PT-7	100	100			200		

TABLE IV-18(Continued)
WASTEWATER LIFT STATIONS

MARINE CORPS BASE

BUILDING NUMBER	PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4	TOTAL PUMPING CAPACITY - GPM	MAPPING AREA NUMBER	REMARKS
RIFLE RANGE							
RR-52	150	150			300	M-3	
RR-92	65	65	26	26	182	M-3	@ Treatment Plant Was RR-38
"C" Range	50	50			100		
COURTHOUSE BAY							
SBB-1	200	500	500 on Dwg. N-7		1,700	N-7	
SBB-207	26	26	400	(No. 5) 400, 130	982	N-7	@ Treatment Plant Was BB-4
SA-38						M-6	

TABLE IV-18 (Continued)
WASTEWATER LIFT STATIONS

MARINE CORPS BASE

BUILDING NUMBER	PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4	TOTAL PUMPING CAPACITY - GPM	MAPPING AREA NUMBER	REMARKS
TARAWA TERRACE							
STT-32	600	600			1,200	B-6	
STT-33	100	100			200	B-7	
STT-34	400	400			800	A-6	
STT-35	700	700			1,400	B-6	@ Treatment Plant to be replaced with 3 pumps
STT-36	175	175			350	B-6	@ Treatment Plant
MONTFORD POINT							
SM-334	260	800	800		1,860	B-5	@ Treatment Plant
M-241	150	150			300	B-4	
E-23	300	300			600	B-5	

TABLE IV-18 (Continued)
WASTEWATER LIFT STATIONS

MARINE CORPS BASE

BUILDING NUMBER	PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4	TOTAL PUMPING CAPACITY - GPM	MAPPING AREA NUMBER	REMARKS
ONSLOW BEACH							
S-BA-116	80	80			160	N-11	
S-BA-197	50	50			100	N-11	
S-BA-198	50	50			100	N-12	
No Number	150	150			300	N-11	@ Treatment Plant

The Paradise Point is divided into two subsystems considered as North Paradise Point and South Paradise Point. The North Paradise Point sewer collection system consists mostly of eight-inch, 10-inch and 12-inch gravity sewers leading to Lift Station SPP-2633. From this lift station, sewage is pumped through an eight-inch force main to manhole 183 in the South Paradise Point area near Seth Williams Boulevard and Wave Street. The sewer system was installed in the early 1940s. The South Paradise Point area sewer consists mostly of eight-inch diameter sewers leading to a 15-inch diameter sewer which traverses the length of the area. This 15-inch sewer was constructed in 1942 and leads to the northeast from South Paradise Point. Sewers in this area were constructed at various intervals from the 1940s to the 1960s. On the south of the area, the 15-inch diameter sewer leads to lift station S-47 from which sewage is pumped over Wallace Creek through a 12-inch force main to manhole number 100 alongside the Main Service Road in the Hadnot Point area.

The Hadnot Point sewer system is a complex system of lateral sewers, submain or branch sewers, main or trunk sewers, outfall sewers and intercepting sewers serving the old U.S. Naval Hospital area, the Supply and Industrial area, and the regimental areas south of the Main Service Road. The old U.S. Naval Hospital area consists of mostly eight-inch and some 10-inch and 12-inch lines leading to lift station H-29. Sewage is pumped through an eight-inch force main to a 12-inch gravity sewer leading to manhole 67 and a 21-inch intercepting sewer. In Hadnot Point Area 200, sewage from the force main originating at Lift Station S-47A is received by a 24-inch gravity main which joins a 27-inch main carrying sewage from Paradise Point, the old U.S. Naval Hospital, Hadnot Point Area 100 and Hadnot Point Area 200 North. The Supply and Industrial Area is served by a system of mostly eight-inch, 10-inch, 12-inch and 15-inch gravity sewers which lead through the Hadnot Point 400 Area in a 15-inch sewer to the 36-inch sewer line leading to the wastewater treatment plant. The Hadnot Point Area 100, 200, 300, 400 and 500 facilities are served mostly by

eight-inch, 10-inch and 12-inch lines, with some 15-inch lines, all leading to the intercepting sewer near the western boundary of Hadnot Point. Hadnot Point Area 100 is served by a 21-inch and 24-inch line, Hadnot Point Area 200 by a 27-inch line, Hadnot Point Area 300 by a 30-inch line and Hadnot Point Area 400 by a 36-inch line. It continues as a 36-inch line to the wastewater treatment plant. The line was installed in 1941. Most of the sewers in the Hadnot Point Area were constructed in the early 1940s, with some lines installed in later years to serve new buildings and developed areas.

French Creek Area 1 consists of that area along the Main Service Road between Hadnot Point and Gonzalez Boulevard which is pumped by several lift stations to tie into an eight-inch gravity sewer in Hadnot Point Area 500. This area is of recent construction, with some facilities still under construction. French Creek Area 2 is that area south of the Main Service Road containing mostly barracks facilities. Sewers are primarily eight-inch, 10-inch and 12-inch lines leading to Lift Station FC-599 and FC-315. Sewage is pumped through a 10-inch diameter force main from FC-315 to the Hadnot Point Wastewater Treatment Plant. Lines in this area were installed from the mid-1960s to the mid-1970s, with some recent construction.

In a report titled Study of Water and Sewage Systems, Hadnot Point, Camp Lejeune, North Carolina dated June 1980, it was concluded that all major lift stations were operating within their capacity and in satisfactory condition except LCH-4005. It was recommended that the two smaller pumps (200 GPM each) should be replaced with 400 GPM pumps. For that report the major gravity sewer interceptors were studied and it was found that the capacity exceeded the observed flow, in most cases by a substantial amount. The Berkeley Manor outfall was expected to be near capacity limits with the added load of the U.S. Naval Hospital. It was recommended that any future additions in the vicinity should be put into the 21-inch section of the outfall sewer east of Watkins Village.

Tarawa Terrace. Tarawa Terrace is a residential area served by two sewer collection systems having five lift stations as shown on Table IV-18. Two lift stations are at the wastewater treatment plant. The first system includes all of Tarawa Terrace I and part of Tarawa Terrace II. This area consists of a collection system of mostly eight-inch and 10-inch lines which drain by gravity to Lift Station STT-32. A small part of this area on the eastern perimeter of Tarawa Terrace I drains to Lift Station STT-33 where it is pumped through a six-inch force main to a 10-inch sewer manhole. A 10-inch force main carries sewage from STT-32 to the wastewater treatment plant. The second collection system serves the northerly area of Tarawa Terrace II. For that system, collection facilities are mostly eight-inch and 10-inch lines which drain by gravity to lift Station STT-34. An eight-inch force main carries sewage from STT-34 to the wastewater treatment plant. Facilities were constructed in the early 1950s.

Montford Point. The collection system for the area served by the Montford Point Wastewater Treatment Plant is divided into four subsystem areas. There are three lift stations on the Montford Point system, one of which is in the treatment plant area. The sewer system serving the 200 area is composed of eight-inch and 10-inch gravity sewers, with some six-inch laterals, leading to Lift Station M-241. A 10-inch diameter force main discharges to manhole 719 and that sewer extends to the general area of the treatment plant where it is joined by gravity sewers from the other areas. The 100 area is served by eight-inch and 10-inch gravity sewers leading to the treatment plant area. The 300 area sewer system serves north Montford Point and consists mostly of eight-inch to 12-inch sewers that lead to sewer mains of 15-inch to 21-inch size, discharging at the treatment plant. The Knox Trailer Park area is served by a system of six-inch and eight-inch diameter sewers leading to a 15-inch and 18-inch intercepting sewer. Lift Station E-23 pumps the Camp Knox sewage, as well as sewage from the area near Building E1 through a 10-inch force main to manhole 247L and a 21-inch sewer in the 300 area. Most of the sewage facilities in the Montford Point area were installed in the early 1940s.

Rifle Range. The Rifle Range area is divided into two sewer collection systems with three lift stations as shown on Table IV-18. One lift station is at the treatment plant. The sewer system on the west consists of eight-inch submains with six-inch building laterals which drain to an eight-inch gravity main on the north side of Range Road. That sewer continues as an eight-inch and 10-inch main and outfall line to the wastewater treatment plant. The second system serves those facilities in the southeast sector of the Rifle Range. The systems consists of eight-inch and 10-inch lines leading to Lift Station RR-52 alongside Booker T. Washington Boulevard. An eight-inch force main carries sewage to manhole 335-A, from which it drains in a 10-inch gravity sewer to connect with the 10-inch outfall sewer previously discussed. The system was installed in the early 1940s.

Courthouse Bay. The Courthouse Bay sewer system is divided into two major subsystems; one is for those facilities west of Courthouse Bay, the Amphibian Base, and one is for the area east of Courthouse Bay, the Engineer Area. There are three lift stations as shown on Table IV-18. One lift station is at the treatment plant. The Amphibian Base system consists of eight-inch lines originally built in 1942 which were connected to Lift Station 38 in 1978. A six-inch force main carries sewage to manhole 666L alongside Marines Road in the Engineer Area. The Engineer Area collection system consists of that area along Front Street and Ellen Path which is an eight-inch and 10-inch submain and the remainder of the Engineer Area which is served by sewers that are mostly eight-inch and 10-inch in diameter. The sewer lines for the two Engineer areas join at manhole 412L and are then pumped from Lift Station SBB-1 through a force main to the wastewater treatment plant. The original Engineer Area system was built in 1942 with additional lines provided in 1960 and 1982.

Onslow Beach. The collection system for the Onslow Beach Wastewater Treatment Plant consists of three principal subsystem areas. There are four lift stations in the Onslow Beach system, one of which is in the treatment plant area. The westerly area consists of eight-inch and 10-inch

gravity sewers leading to the treatment plant. The easterly segment consist of an eight-inch sewer along Ocean Drive that leads to Lift Station SBA-116. The Campsite #1 area is served by four-inch sewers leading to Lift Station BA-197 which pumps sewage to a manhole in the sewer system serving the easterly area of Onslow Beach. From Lift Station SBA-116 sewage is pumped to a 10-inch outfall sewer draining to the treatment plant. A sewer in the vicinity of Building BA-114 also drains to the outfall sewer. Most of the sewer facilities in Onslow Beach were constructed in the early 1940s, with the campsite area sewers installed in the mid-1970s.

Existing Electrical System

Primary Electrical Power Source

The 50 MVA (thousand kilovolt amperes) Marine Corps Base Substation is located north of Holcomb Boulevard along the extension of the Ash Street centerline. The substation serves the U.S. Naval Hospital at Brewster Boulevard; Industrial Area; Hadnot Point, including the Regimental Areas; Paradise Point, Berkeley Manor Military Family Housing, Midway Park and Camp Johnson at Montford Point; French Creek Area; and facilities along Sneads Ferry Road including Onslow Beach and Courthouse Bay, with an extension across New River at Sneads Ferry to the Rifle Range Area. There is a 3,000 amp bus between the Carolina Power & Light Company (CP&L) structure and the government-owned distribution circuit structure. There are 10 distribution circuits and capacity for two additional circuit breakers at the 12.47 KV-wye/7.2 KV structure. The substation reserve capacity based on 1983 demands is about 8 MVA. The metering equipment for billing purposes is located at the substation for the Marine Corps Base.

Tarawa Terrace is served by CP&L from a substation located about one-half mile west of the Holcomb Boulevard interchange with State Highway 24. There are two radial tap metering points in the housing area. The circuit continues to Knox Trailer Park where electricity is distributed through transformers to individually metered spaced. The substation serves other CP&L demands and reserve is not available.

Camp Geiger is served by the MCAS New River Substation. The demands are computed with the Air Station. The feeder analysis is for two circuits serving Camp Geiger included herein shows that existing demands and increases in demand can be served.

Electricity consumption for the past two years for Marine Corps Base and Tarawa Terrace is summarized as follows:

Item	FY-82	FY-83
Consumption (KWH)	185,385,320	204,736,148
Month Peak Demand	August	August
Peak Demand[1] (KW)	41,050	46,455
Peak Month Power Factor	0.90 (or better)	0.90 (or better)
Annual Load Factor	0.52	0.50
Total Cost	$8,345,829	$9,706,845

[1]Demand is purchased power during 15-minute intervals

Load Factor = Consumption/Demand (KW) x Hrs./Year Annual Hours = 8,760

Power factor penalties occur when there are periods during a month that power factor is less than 85 percent. An inspection of recent billings indicates that no penalties have occurred during the last two years.

Marine Corps Base Distribution

The distribution feeders are 12.47 KV-wye, 3 phase configuration; 10 circuits from the substation are routed to the listed areas. There are four circuits providing direct service to the Industrial and Hadnot Point Regimental Areas. Circuit PP provides service to Paradise Point and the Old Hospital Point Area with backup from Regimental No. 1 feeder. Circuit FC provides service to French Creek with backup from Regimental No. 2 feeder. Montford Point and Midway Park are served by Circuit MM. The feeder also provides a backup to the U.S. Naval Hospital and Capehart Housing. Circuit NH is the primary line for the U.S. Naval Hospital. Circuit C serves Berkeley Manor housing with tie capability to Paradise Point housing areas. The remaining feeder, Circuit RR, is routed to the Rifle Range. Along the routing which generally follows Sneads Ferry Road the feeder is used for serving Triangle Outpost, Onslow Beach, Courthouse Bay Engineer Area; Amphibian Base and the Rifle Range area. The feeders are listed in Table IV-19 with recent metered demands. Feeders in the Industrial and Hadnot Point Areas depend upon the substation bus for line and voltage regulation. There are regulating stations located along the feeder routings for French Creek Feeder, Paradise Point Feeder, Berkeley Manor Capehart housing Feeder, Midway/Montford Point Feeder and Rifle Range Feeder (Table IV-20). Capacitor banks also have been placed along the feeder routings. The regulating stations provide step-up in voltage level to compensate for line losses. Capacitor banks placed along the Rifle Range and French Creek feeders improve power factor, reduce line losses and maintain circuit capacity.

SUBSTATION ELECTRICAL FEEDERS

MARINE CORPS BASE

$$\text{Substation Utilization Factor} = \frac{\text{Demand (KW)}}{\text{Available Capacity x (pf)}}$$

KVA Demand = $\sqrt{3}\ I_L \times V_{L-L}$ or $3I_L \times Y_{LN}$

Individual Feeder Demands Summer 1983 (average 3 phases) (based on 15-minute demand interval)

Breaker	Feeder I.D.	6/83	7/83	8/83	9/83	% Total
2	Regm Area #1	105	153	143	83	10
4	Paradise Point	93	128	120	90	9
6	Capehart	125	213	160	97	11
8	Regm Area #2	118	220	180	128	12
9	Regm Area #3	107	124	120	60	8
7	Industrial Area	125	180	180	144	12
5	French Creek	118	143	150	121	11
3	Rifle Range	95	130	120	57	9
1	Midway & Montford Point	95	146	137	103	10
11	U.S. Naval Hospital	100	122	120	90	9
	TOTAL AMPS	1,081	1,559	1,430	973	
	TOTAL KVA	23,348	33,672	30,886	21,016	
	pf	0.93	0.90	0.90	0.93	
		(est)	(est)	(est)	(per bill)	
	Est KW	21,713	30,304	27,797	19,514	(At time of reading)
	Billing KW	33,826	36,871	37,843	36,677	(Peak)
	Utilization Factor	.73	.82	.84	.79	

TABLE IV-20
SUBSTATION ELECTRICAL FEEDER REGULATORS

MARINE CORPS BASE

CIRCUIT	REGULATOR CAPACITY	AREA LOCATION
Midway/Montford	500 KVA	Montford Landing Road
	1500 KVA	Holcomb Boulevard at Brewster Blvd.
Rifle Range	750 KVA	Sneads Ferry Road near Marines Road
	750 KVA	Sneads Ferry Road north of State Hwy. 172
	2-69 KVA	Sneads Ferry at Onslow Beach Road
	500 KVA	Sneads Ferry Road Near Courthouse Bay
	120 KVA	Rifle Range Road West of Sneads Ferry Crossing
French Creek	1500 KVA	Main Service Road West of Daly Road
Capehart	2000 KVA	Stone Street Near the Riding Stables
Paradise Point	1000 KVA	Main Service Road at Cross Street

Underground Distribution Feeders

Distribution feeders in the Hadnot Point Regimental Areas have been placed underground. The configurations include routing from an overhead 12.47 KV riser through duct banks to pad mounted transformers for building service. Sections of a circuit are placed underground with overhead spans between the substation and the riser and beyond the underground area. Splices are made in manholes and terminations are made in pad mounted equipment. Field review indicates the need for consistent termination practices with dead front load-break devices and the need for available service from either end of an underground section.

Overhead Distribution Lines

The overhead distribution circuits use wood pole and crossarm construction. Within the Industrial and Hadnot Point Areas ground conductors have been extended to permit ground detection and the use of phase to ground voltage levels. Continued extension beyond the intersection of Sneads Ferry Road and the Main Service Road is recommended.

Distribution System Improvements

Distribution feeders have been improved under contracts in FY74 (74-1345) and FY77 (77-7385). A distribution feeder to the new hospital was installed as part of contract 77-7526. Other improvements have included placing portions of circuits underground in Hadnot Point south of Main Service Road. The improvements in electrical distribution feeders have been for the purpose of increasing development primarily at Hadnot Point, French Creek and Courthouse Bay. There are routings that permit switch operation for isolating line sections. Distribution, however, is generally

a radial configuration from a single source of electric power. Alternatives for power delivery and distribution should be investigated, particularly in Hadnot Point, Hospital site at Brewster Road and French Creek.

Short Circuit Analysis

There are 10 oil circuit breakers which protect each of the distribution feeders at the substation. Six breakers were manufactured in 1966, three were manufactured in 1976 and the breaker for the U.S. Naval Hospital was manufactured in 1980. The ratings under 3 phase fault conditions are listed at 500 MVA. The short circuit values available as calculated by CP&L in 1981 are as follows:

Three Phase = 13,000 amps symmetrical (281 MVA)
Line to Ground = 13,500 amps symmetrical (292 MVA)

The available fault currents are within the ratings of the circuit breakers.

Analysis of Feeders

Analysis of the existing feeders includes calculation of the voltage drop for all feeders on the (Marine Corps Base) substation, Table IV-21, and for the two feeders serving Camp Geiger from the MCAS, New River Air Station (Table IV-22). The demand used in calculations was 60 percent of connected transformer load on each feeder. Voltage drop is greater than two percent for six MCB substation feeders at 60 percent demand factor. Using recent actual demands and correction from

TABLE IV-21
FEEDER ANALYSIS

MARINE CORPS BASE

FEEDER IDENTIFICATION	(SYMBOL)	METERED DEMAND CURRENT (A)	CONNECTED TRANSF. LOAD (KVA)	DEMAND FACTOR	LENGTH (FT)	INITIAL CONDUCTOR SEGMENT	% VOLTAGE DROP @ 0.6 DF
Regimental No. 1	(R1)	153	12,622.5	.26	12,200	336.4 MCM	2.93
Regimental No. 2	(R2)	220	11,780.0	.40	15,340	336.4 MCM	4.07
Regimental No. 3	(R3)	124	12,414.5	.22	9,250	336.4 MCM	3.05
Industrial	(I)	180	14,315.5	.27	5,850	336.4 MCM	2.08
Montford Pt./Midway	(MM)	146	7,175.5	.44	46,050	336.4 MCM	0.64
Rifle Range	(RR)	130	11,693.0	.24	70,270	336.4 MCM	To Beach Rd. Subst. 5.62 To C'House Bay Subst. 6.06
French Creek	(FC)	150	13,837.5	.23	20,060	336.4 MCM	To Reg. 3.02 Remain 1.51
Capehart	(c)	213	INSUFFICIENT DATA AVAILABLE				
Paradise Point	(PP)	128	10,787.5	.26	11,850	336.4 MCM	1.81
Old Hospital Point		67*	1,042.5 @ 12.47 KV (included with Paradise Point) 3,215.0 @ 2.4 KV (system not evaluated)				
U.S. Naval Hospital	(NH)	122	10,050.0	.26	21,900	394.5 MCM	7.52

*Measured on the 12.47 KV system in 1981 prior to Hospital relocation.

TABLE IV-22
FEEDER ANALYSIS CAMP GEIGER FEEDERS

MARINE CORPS BASE

FEEDER IDENTIFICATION	(SYMBOL)	METERED DEMAND CURRENT (A)	CONNECTED TRANSF. LOAD (KVA)	DEMAND FACTOR	LENGTH (FT)	INITIAL CONDUCTOR SEGMENT	% VOLTAGE DROP @ 0.6 DF
Camp Geiger No. 4	(CG-4)	50	2,722.5	.40	8,425	336.4 MCM	0.67
Camp Geiger No. 5	(CG-5)	95	4,885.0	.42	7,275	336.4 MCM	1.50

field regulators, however, the loadings on the feeders were more realistic and the following feeders are noted to have voltage drops exceeding the two percent level under existing conditions.

Regimental Area No. 2 Feeder - 2.7% voltage drop
Rifle Range Feeder - 4.8% voltage drop at Courthouse Bay
U.S. Naval Hospital - 3.3% voltage drop

Corrective measures including reconducting of circuits and possible redirecting feeders are necessary prior to adding programmed facilities in the above areas.

Standby power is furnished by individual generator units located at facilities as required to furnish electricity during supplier outages, to comply with state sanitary treatment requirement and to operate central data processing. At Building 1101 there is 600 KW capacity for data processing. Building 22 has 400 KW capacity for sewer plant needs, and other 200 KW capacity generators are located at Building 353 and 47. At the Marine Corps Base and associated areas there are 36 additional units with an approximate combined capacity greater than 1100 KW. At Tarawa Terrace there are four units with a combined capacity of greater than 200 KW.

Central Heating Systems

Energy Sources

The principal heating fuels used at the Marine Corps Base are fuel oil and coal which are supplied by area distributors. Electric heat pumps are used for heating of family housing at Tarawa Terrace and also at several smaller buildings at Hadnot Point. Two liquid petroleum gas (LPG) tank

farms and distribution systems that were formerly in use at Tarawa Terrace and Hadnot Point have been abandoned and have not been in service for several years. Liquid petroleum gas is now used at only a few small individual heating plants and for boiler start-up at Building 1700. Solar energy is utilized as a supplementary heat source for domestic water heating for nine buildings at Hadnot Point.

Central Heating Plants and Steam Distribution Systems

The central heating at the Marine Corps Base consists of 10 separate heating plants and distribution systems that supply steam for heating, cooking, domestic hot water, air-conditioning chiller, laundries and equipment cleaning. One additional plant at the old hospital area is no longer in operation but the distribution system is still in use, being supplied by Plant 1700. A summary of boiler information for each plant is given in Table IV-23, and a summary of historical steam production is given in Table IV-24.

Industrial Plant No. 1700

The plant is located at Gum Street and Center Road in Hadnot Point and is the largest steam plant in the complex. The plant supplies more than half the steam generated by all central plants. It is the only plant on the base that has the capability of burning coal or fuel oil. Fuel usage for 1982 consisted of about 38,150 tons of coal and 778,600 gallons of No. 6 grade fuel oil. The four largest boilers in the plant are equipped to burn coal or oil, and the fifth boiler burns No. 6 oil exclusively. The plant is equipped with air pollution equipment and precipitators to meet environmental requirements. Recent additions at the plant include new condensate receiver tanks and new chemical storage tanks for boiler water treatment. Plant 1700 furnishes steam to the

LE IV-23
SUMMARY OF TRAL HEATING PLANTS

MARINE CORPS BASE

BLDG. NO.	LOCATION	PLANT CAPACITY* (lb/hr)	BOILERS No./Size** (BHP)	Type of Fuel	Mfr.	Year	STEAM Pressure (psig) Max.	Opr.	Opr. Temp. (F^o)
1700	Hadnot Point	414,000	4-3000	Coal/No. 6 Oil	Riley	Unknown	150	150	366
			1-2901	No. 6 Oil	Trane-Murray	Unknown	150	150	366
FC-202	French Creek	6,900	2- 200	No. 2 Oil	Ames	Unknown			
H-20	Old Hospital----------Not in Service----------								
PP-2615	Paradise Point	13,800	1- 400	No. 6 Oil	Cleaver Brooks	Unknown			
			1- 200	No. 6 Oil	Erie City	Unknown		125	353
M-625	Montford Point	17,940	1- 310	No. 6 Oil	Keeler	1944	150	100	338
			2- 210	No. 6 Oil	Keeler	1965	150	100	338
M-230	Mon ford Point	13,800	3- 200	No. 2 Oil	York Shipley	1963	150	50	298

TABLE IV-23(continued)
SUMMARY OF CENTRAL HEATING PLANTS

MARINE CORPS BASE

BLDG. NO.	LOCATION	PLANT CAPACITY* (lb/hr)	BOILERS No./Size** (BHP)	Type of Fuel	Mfr.	Year	STEAM Pressure (psig) Max.	Opr.	Opr. Temp. (F^o)
G-650	Camp Geiger	59,685	2-1160	No. 6 Oil	Eng. Combustion	1969	125	100	338
			1- 570	No. 6 Oil	Keeler	1971	125	100	338
BB-9	Courthouse Bay	27,600	1- 600	No. 6 Oil	Nebraska	Unknown		100	338
			1- 434	No. 6 Oil	Nebraska	1978	200	100	338
			1- 200	No. 6 Oil	Erie City	1957	160	100	338
A-1	Amphibian Area	3,174	1- 92	No. 2 Oil	Bernham	Unknown			
RR-15	Rifle Range	6,900	2- 200	No. 6 Oil	Erie City	1955	160	100	338
BA-106	Onslow Beach	5,865	1- 170	No. 6 Oil	Mund	1951	150	50	298
			1- 100	No. 6 Oil	Superior	1977	150	50	298

* Plant capacity based on one boiler not operating and on standby and rated from and at 212° F.

** Source: Base Maintenance Department

MBTUH = 1,000,000 BTU Per Hour.

LE IV-24
SUMMARY OF STEAM PRODUCTION AND FUEL USAGE
AT MAJOR HEATING PLANTS FOR CALENDAR YEAR 1982*

MARINE CORPS BASE

PLANT NO.	1700	FC-202	PP-2615	G-650	M-625	M-230	BB-9	BA-106	RR-15	A-1
Steam Production For Year (KLB)	922,598	7,106	32,431	185,018	102,963	10,706	65,529	18,383	40,829	3,015
Peak Month Steam (KLB)	139,221	1,564	4,887	29,010	17,920	1,901	12,012	4,419	6,035	690
Peak Day Steam (KLB)	5,635	Unknown	264	1,151	777	Unknown	697	Unknown	256	Unknown
Peak Hour Steam (KLB)	264.6	Unknown	12.0	55.9	37.6	Unknown	27.0	Unknown	12.7	Unknown
Month	Jan., 1982	Dec., 1982	Jan., 1982	Jan., 1982	Jan., 1982	Mar., 1982	Jan., 1982	Dec., 1982	Jan., 1982	Feb., 1982
Fuel Consumption For Year (MBTU)	1,085,539	8,879	43,612	244,463	146,376	14,378	88,405	22,970	56,721	3,767
BTU To Produce 1 lb. of Steam	1211.7	1249.5	1344.8	1321.3	1421.6	1342.9	1,349.0	1249.5	1389.2	1249.5

* Source = Harland Bartholomew & Associates, Inc.

KLB = 1,000 lbs. steam.
MBTU = 1,000,000 BTU.

Industrial Area, French Creek Areas 100 through 500, the Headquarters Area (Buildings 1 through 99) and the old hospital area. Reserve capacity at the plant is about 149,000 lbs. steam per hour.

Hadnot Point and Industrial Area Steam Distribution

The steam distribution systems in the built-up areas noted above are direct buried underground or in tunnels. Certain long runs to French Creek and the old hospital complex are above ground, except at road crossing, and routed through undeveloped areas. There are four main trunk systems that run from Plant 1700. Three of these are in tunnels and one is direct buried underground.

The first tunnel system consists of two 14-inch steam supply mains and one eight-inch condensate return main that runs north from Plant 1700 for about 230 feet then turns south and runs parallel with Holcomb Boulevard along the west side of the parade field to the traffic circle where it splits into two branches. One branch, consisting of one 14-inch supply main and one six-inch return in a tunnel, runs to the northwest through the 100 and 200 areas and crosses River Road near "A" Street to a pit where the tunnel ends and the sizes are reduced to 12-inch supply and five-inch return. At this point they are brought above ground and run through an undeveloped area for about 900 feet where the supply main is further reduced to 10-inch diameter and continues above ground to a pit near Building H-16 in the old hospital area. Here it again drops underground and runs to a pit near Olive Street where it connects to the distribution system for that area. This turn system also supplies steam to Areas 100, 200, part of 300 and the Headquarters Area by way of a network of laterals ranging in size from six to one and one-half inches. The other branch, consisting of a 12-inch supply and a five-inch return in a tunnel, runs along the south side of Main Service Road to a point about 150 feet east of "N" Street to a pit where the tunnel ends. At this point the return

main is terminated and the supply is reduced to a 10-inch direct buried line that is routed through the vehicle maintenance area to connect with the main feeder to French Creek. This system supplies part of Area 300, Areas 400, 500 and the vehicle maintenance area through direct buried secondary mains and laterals ranging in size from one and one-half to six inches.

The second tunnel system leaves the plant as one 12-inch steam supply main and one five-inch condensate return main and runs parallel with West Road to Elm Street. At this point the mains reduce to an eight-inch and five-inch, respectively, and continue along West Road to Ash Street where the tunnel turns parallel with Ash to Michael Road and there it splits into two branches, each consisting of one six-inch supply main and one three-inch return main. One branch tunnel runs along Michael Road toward Sneads Ferry Road and ends near Building 908. The other branch tunnel runs back southwestwardly parallel with Michael Road and ends near Dogwood Street. This system serves the Industrial Area through a connected system of secondary mains and laterals ranging in size from one and one-half to six inches.

The third tunnel leaving the plant contains one eight-inch steam supply main and one four-inch condensate return main and runs parallel with Gum Street to Gibb Road where it ends at a pit. From this point the condensate main is dropped and the eight-inch steam main becomes direct buried and continues along Gum Street to Duncan Street where it turns and runs parallel with Duncan to a point of connection with the main feeder to French Creek. This system serves several facilities along Gum Street.

The direct buried system that leaves the plant is the main feeder to French Creek and consists of one 10-inch steam supply main and one six-inch condensate return main. This system runs underground for about 400 feet to a pit where it rises out of the ground and is routed above

ground, except at road crossings, through generally undeveloped areas to French Creek. The system drops back underground where it crosses H.M. Smith Boulevard and connects to an underground distribution system that provides steam for French Creek Areas 300, 400 and 500. Secondary mains and laterals in this area range in size from one and one-half to eight inches.

Older portions of the steam and condensate system have a considerable amount of leakage in the tunnels and pits, and many line segments have damaged or missing insulation. Steam and condensate pipe insulation in the tunnels is one and one-half to two inches thick asbestos or calcium silicate. Steam mains to Building 1610-1613 have four-inch calcium silicate insulation. Direct buried lines are generally of the prefabricated insulation type. The volume of condensate returned from the French Creek area is presently very low. Several buildings in the Industrial Area that use steam have no condensate return system.

Recent improvements to the distribution system include replacement of deteriorated steel condensate piping with fiberglass reinforced plastic (FRP) pipe in a large part of the system, particularly in the tunnels and at more recently constructed facilities. FRP condensate returns are planned for, or being installed in new facilities presently under construction or under contract. Condensate cooling pits have been installed alongside the system where FRP pipe is used to lower the condensate temperature since the plastic pipes will not withstand high temperatures without warpage. Cooling is accomplished in these pits by banks of finned tube coils that dissipate heat.

French Creek

Plant No. FC-202, located on Main Service Road just east of Daly Road in French Creek, operates only during the heating season from October through April and provides heating for five

buildings near the plant by a distribution system ranging in size from one and one-half to four inches. Pipe insulation is one and one-half-inch to two-inch fiberglass.

Hadnot Point and Paradise Point

Plant No. H-20, located in the old hospital complex, is no longer in operation although the boilers and equipment are still in place.

Plant No. PP-2615 supplies steam for 17 buildings at Paradise Point by way of a direct burial distribution system ranging in size from one and one-fourth to four inches in diameter. A comparison of peak-hour demand and plant capacity as given in Tables IV-23 and IV-24 shows the plant has adequate capacity for present demands and has a reserve steam capacity of about 1,800 pounds per hour. Steam supply piping is generally in good condition and the condensate system is programmed for early replacement with FRP pipe and will include finned tube cooling coils in the pits. Pipe insulation is one and one-half to two-inches calcium silicate for both steam and condensate.

Montford Point

Central heating systems at Montford Point consist of two separate plants and distribution systems. Plant No. M-625, located at the east end of Harlem Drive, supplies steam to Areas 100, 300, 400, 500 and 600. A similar comparison of Tables IV-23 and IV-24 shows that the plant does not have adequate capacity for present peak steam demands. Additional loading will be placed on this plant upon completion of construction of the new BFQ complex in the 400 area. There is a planned program to replace all boilers and equipment in this plant which should be implemented expedi-

tiously. Plant No. M-230, located on Taft Road, supplies steam to 15 buildings in the 200 area. The distribution systems for both plants are overhead and are in generally condition. Pipe insulation is one and one-half to two inches thick calcium silicate or asbestos. Plant No. M-625 has two separate feeders for the distribution system. One leaves the west side of the plant as six-inch steam and four-inch condensate return mains and supplies Areas 100, 400 and 600 by branching supply and return mains ranging in size from three-quarters to five inches in diameter. The other leaves the plant on the south side as five-inch steam and three-inch condensate mains, crosses over Harlem Drive and serves Areas 300 and 500 by branching lines ranging in size from one and one-quarter to five inches in diameter.

Camp Geiger

The central heating plant is located on "F" Street in Building G-650 and supplies most of the heating requirements for the area, with individual plants serving the remainder. Minimal operating pressure of the boilers is 125 psig, but they are presently operating at 100 psig to minimize losses in the distribution system. The plant has adequate capacity to serve present requirements and has a reserve capacity of about 3,800 pounds of steam per hour. The distribution system is partially direct burial underground and partially overhead. The underground system leaves the plant and branches to the north and to the south along "F" Street as 10-inch steam and five-inch condensate mains. The north segment turns west at 6th Street for about 270 feet and reduces to eight and four inches and continues on to "C" Street where it reduces further to six and three inches and supplies the ITR barracks complex. The south segment is routed west at 7th Street to "C" Street, then south to 9th Street, then east to "D" Street, then south again to the old boiler plant site where it is connected to the overhead distribution system which serves essentially the entire area south of 7th Street.

The overhead system ranges in size from one to eight inches. Throughout, pipe insulation is one to two inches thick calcium silicate. There is a planned program to construct new overhead steam and condensate mains which would replace the existing underground mains of the south segment mentioned above. The new system would run south from the plant on a more direct route to the point of connection with the existing overhead system near Building TC-940. Certain segments of the existing north underground system will also be replaced with new overhead lines under this program.

Courthouse Bay

Plant No. BB-9, located at Middle Street and Peach Street at Courthouse Bay, supplies steam for the Engineer Complex. Tables IV-23 and IV-24 indicate that the plant capacity is adequate for present needs but has no reserve. Summer steam demands usually require the operation of only one boiler, and in winter two boilers are generally on line with one on standby.

Steam distribution is by way of a direct burial underground system which serves the buildings west of the steam plant and the waterfront buildings and an overhead system which serves the barracks and shop areas north of Clinton Street. The underground system is in poor condition with many steam condensate leaks, especially in the waterfront area segments. The overhead system is in generally better condition but has steam leaks at many drip assemblies. Pipe insulation is one- to two-inch thick calcium silicate or fiberglass for steam and condensate except for the five-inch overhead steam feeder for Buildings 260, 265 and 270 where it is four-inch fiberglass. All the insulation in the underground system is in poor condition, and much of it on the overhead system needs replacing. There are numerous faulty elements at the equipment rooms or house pits such as pressure reducing valves, steam traps and condensate receivers.

Plant No. A-1, located on Courthouse Road in the Amphibian Area, is the smallest of the central plants and furnishes steam for facilities in Building A-1 and Building A-2 by way of three- and two-inch steam and condensate mains, respectively. The plant operates during the heating season only. Estimated peak hour steam demand is based on the following assumptions:

peak-hour production = 1/20 of peak-day production
peak-day production = 1/27 of peak-month production

then peak hour demand = 1 day/20 hr. x 1 month/27 x 690,000 lb./month = 1,278 lbs. per hour

This indicates that the plant has a reserve capacity of approximately 1,896 pounds per hour.

Rifle Range

Plant No. RR-15, located on Powder Road, supplies the steam requirements for the Rifle Range complex. Peak steam demand periods require the operation of both boilers, and based upon the capacity criteria of Table IV-23, this plant is inadequate. The boilers in this plant were direct buried underground steam and condensate system with pipe sizes ranging from two and one-half to six inches in diameter. Pipe insulation is two- and one-inch calcium silicate for the steam and condensate, respectively. A recent field study[1] shows that the amount of condensate returning to the plant is less than 20 percent, thus indicating inordaiately high energy losses for the system.

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[1] Steam Distribution Study at Marine Corps Base, Volume I: Analysis and Conclusions, June 1, 1984.

Plant No. RR-22, located near Booker T. Washington Boulevard and G. W. Carver Street, and the accompanying overhead distribution system are no longer in service.

Onslow Beach

Plant No. BA-106 supplies steam for six buildings at the Onslow Beach area by way of an overhead distribution system with pipe sizes ranging from two and one-half to four inches in diameter. The largest boiler in the plant was installed in 1951 and early replacement could be expected. The boilers are rated to operate at 150 psig, but presently operate at 50 psig since present demands are only a small fraction of plant capacity.

There is no condensate return on the system except from the dining facility and this results in poor fuel economy at the plant since the boiler feedwater is essentially all make-up. Steam pipe insulation is calcium silicate and is in fair condition.

Fuels Storage

Fuel storage equipment is based on a 30-day supply equal to the peak month usage which occurred in January 1982.

The only coal storage facility at Marine Corps Base is located at the site of Plant No. 1700 and has an estimated capacity of 11 thousand tons. Coal is transported to the site by rail. Plant No. 1700 is the only one on the Base that burns coal. About 90 percent of the fuel requirements for the plant during calendar year 1982 supplied by coal, the remainder being supplied by No. 6 fuel oil.

Peak coal usage for 1982 was about 5,000 tons so coal storage capacity at the plant is more than adequate for a 30-day supply.

Fuel oil storage for the Marine Corps Base consists of bulk storage facilities and smaller on-site tanks at the central steam plants. The individual heating plants, as listed in Table IV-25, also have individual day tanks at their sites. Bulk storage for No. 2 oil includes one 600,000-gallon tank at the fuel farm in the Industrial Area and two 15,000-gallon tanks at Camp Geiger. The 600,000-gallon tank is drawn on for No. 2 fuel oil supplies for Marine Corps Base Air Station also (see Section V, Utilities). All the above No. 2 grade tanks may be drawn upon for motor fuel also. On-site storage for major plants is summarized in Table IV-26.

Peak month usage of fuel oil at the major plants in 1982 was 73,000 gallons of No. 2 and 848,000 gallons of No. 6 oil. Considering the bulk tank and the on-site tanks for No. 2 oil, the storage is more than adequate for a 30-day supply, but there is a storage shortfall of about 174,400 gallons for No. 6 oil.

REGIONAL INFLUENCES

The constraints the surrounding region places on mission accomplishment by Marine Corps Base personnel will be addressed in this section of the Activity Plan. A high degree of interdependency exists between the Marine Corps Base and the City of Jacksonville and its environs, both in terms of geography and economics. The action of one entity impacts directly the environment of the other. A good example of this relationship is selection of the Highway 17 Bypass alignment.

SUMMARY OF INDUSTRIAL BOILER PLANTS

MARINE CORPS BASE

BLDG. NO.	NO BOILERS	BOILER HORSEPOWER	STEAM OR HOT WATER	TYPE OF FUEL	MANUFACTURER
730	2	15 Ea.	H/W	No. 2 Oil	International
825	2	140 Ea.	H/W	No. 2 Oil	Kewanee
33	1	18	H/W	No. 2 Oil	National
LCH-4014	2	50 Ea.	Steam	No. 2 Oil	Kewanee
DCH-4022	1	10	H/W	No. 2 Oil	Fitzgibbons
DCH-4025	1	15	H/W	LP Gas	Kewanee
LCH-4003	1	70	Steam	LP Gas	Power Master
45	1	25	H/W	No. 2 Oil	Terra-Haute
803	1	30	Steam	No. 2 Oil	Kewanee
TT-47	1	25	Steam	No. 2 Oil	Eclipse
TT-48	1	22	H/W	No. 2 Oil	Fitzgibbons
TT-48	3	22 Ea.	H/W	No. 2 Oil	National
TT-43	1	5	H/W	No. 2 Oil	Unknown
TT-44	1	15	H/W	No. 2 Oil	Kewanee
TT-2455	1	15	H/W	No. 2 Oil	Spencer
D-24	1	10	H/W	No. 2 Oil	Bernham
TC-601	1	12	H/W	No. 2 Oil	National
CGA-1	1	15	H/W	No. 2 Oil	Kewanee
BB-48	1	25	H/W	No. 2 Oil	Fitzgibbons
BB-49	1	26	H/W	No. 2 Oil	Fitzgibbons

TABLE IV-25 (Continued)
SUMMARY OF INDIVIDUAL BOILER PLANTS

MARINE CORPS BASE

BLDG. NO.	NO BOILERS	BOILER HORSEPOWER	STEAM OR HOT WATER	TYPE OF FUEL	MANUFACTURER
SH-8	1	12	H/W	No. 2 Oil	American Standard
738	1	10	H/W	No. 2 Oil	International
TC-1500	1	21	Steam	No. 2 Oil	Fitzgibbons
TT-2455	1	30	Steam	No. 2 Oil	Spencer
40	2	120 Ea.	H/W	No. 2 Oil	H.B. Smith
PP-1915	1	18	H/W	No. 2 Oil	Kewanee
TT-60	2	80 Ea.	H/W	No. 2 Oil	H.B. Smith
PP-5400	2	75 Ea.	H/W	No. 2 Oil	H.B. Smith
G-567	1	18	Steam	No. 2 Oil	Iron Fireman
22	1	36	H/W	No. 2 Oil	Kewanee
TT-2457	1	19	H/W	No. 2 Oil	Spencer
670	1	15	H/W	No. 2 Oil	Spencer
G-480	1	11	H/W	No. 2 Oil	American Standard
FC-260	1	34	H/W	No. 2 Oil	Bernham

Source: Harland Bartholomew & Associates, Inc.

TABLE IV-26
SUMMARY OF EXISTING TANKS FOR FUEL OIL STORAGE

MARINE CORPS BASE

PLANT NO.	FUEL OIL TYPE	ABOVE GROUND STORAGE TANKS (GALLONS)	UNDERGROUND STORAGE TANKS (GALLONS)	EFFECTIVE GALLONS NO. 2	STORAGE* NO. 6
1700	No. 6	1 - 420,000 1 - 116,000	- -	- -	357,000 98,600
PP-2615	No. 6	-	2 - 8,000	-	16,000
M-625	No. 6	- -	1 - 20,000 1 - 30,000	-	50,000
M-230	No. 2	-	2 - 15,000	30,000	-
G-650	No. 6	2 - 60,000	-	-	102,000
BB-9	No. 6	-	3 - 10,000	-	30,000
RR-15	No. 6	-	2 - 10,000	-	20,000
BA-106	No. 2	-	1 - 10,000	10,000	-
A-1	No. 2	1 - 2,500	-	2,125	-
FC-202	No. 2	-	1 - 10,000	10,000	-
			TOTALS	52,125	673,600

* Effective storage based on full capacity for underground tanks and 85 percent capacity for aboveground tanks to allow for heat expansion.

Source: Base Maintenance Department.

Most significant are the Base encroachment problems which have arisen due to the dramatic increase in the number of housing starts that has occurred and that is expected to continue to occur at an even greater rate into the early 1990s. A major source of this increased demand for new housing are military families, both active-duty and retired. Off-Base housing demand by active-duty personnel is relatively predictable due to the existence of programmed strength estimates and to future programming of family housing spaces. Given recently established federal policy not to construct new on-Base family housing units, this interrelationship will be magnified in the future.

Growth in housing demand by retired military personnel has proven more unpredictable. Only in recent years have local officials begun to see a significant trend toward retirement settlement in the area. This can be explained in several ways. Many military personnel select Onslow County and its environs because they feel a tie to Camp Lejeune, due to the tours of duty which involved numerous transfers, but during which they were assigned to Camp Lejeune several times. Many retired personnel and their dependents desire close proximity to a Marine Corps Base to take advantage of the medical and other benefits offered to them. Onslow County is relatively affordable, has a temperate climate and is located in an ocean resort setting.

The proliferation of new homes adjacent to the Camp Lejeune boundaries poses an assortment of problems to Marine Corps Base operations. Single family and mobile home development pressure is greatest on the fringes of Jacksonville at West Onslow Beach, in the "Southwest Community" and Sneads Ferry, and in the western portion of Swansboro Township. As development continues to encircle the Camp Lejeune boundary, future contiguous expansion becomes less and less an alternative. Noise and aesthetic impacts of training operations negatively influence a greater number of property owners who could potentially further constrain accomplishment of the training

mission of the Marine Corps Base organization. A more detailed examination of training constraints and requirement is contained in the Special Training Analysis, Camp Lejeune, North Carolina, prepared in conjunction with this Master Plan.

With housing development comes increased traffic volume on county roads. The traffic congestion on Highway 17 and NC Route 24 has resulted in increased travel times between Marine Corps Base areas, such as between Hadnot Point and outlying areas such as Camp Geiger and Tarawa Terrace. Traffic congestion on area highways prompted State transportation officials to plan the Highway 17 Bypass in the vicinity of Montford Point. It appears unlikely that the final alignment will require condemnation of Camp Lejeune land, however, this case demonstrates the potential impact of growth in population and traffic volume on Marine Corps Base property.

A related concern is the adequacy of off-Base roads and railway tracks for training and mobilization maneuvers and supply transport. The basic capacity of road surfaces and tracks to withstand such travel, as well as the design of bridges and tunnels to accommodate large vehicles and equipment, remains in question. In-depth study and coordination with local and state officials will be essential to resolve this problem.

Marine Corps Base training exercises are negatively impacted by traffic using the Intracoastal Waterway which transverses a significant proportion of the amphibious training ranges. Interruptions to training exercises, as well as the potential danger posed to the civilian population, makes this a major problem in immediate need of resolution.

COMPLEX INFLUENCES

An analysis of Complex-wide influences is especially important for the Marine Corps Base Activity, due to the physical and functional interdependence between tenant commands. Personnel from the three other Activities use MCB commercial facilities, recreational areas, schools and other assorted facilities. In many instances, the Air Station, Naval Hospital and Naval Dental Clinic Activities use MCB warehouses to store their supplies and vehicles. The greatest degree of interdependence is seen in the following three functions: housing (and associated personnel support uses); medical and dental services; and vertical envelopment warfare training which necessitates coordination with Marine Corps Air Station, New River.

Naval Hospital, Naval Dental Clinic, MCAS, New River, 2nd Marine Division and 2nd FSSG personnel and their dependents are assigned housing throughout Camp Lejeune. Provision of housing, in turn, is the responsibility of the Marine Corps Base host organization. Personnel increases, or mission changes which increase or decrease base loading, impact the provision of housing and personnel support resources.

The provision of medical and dental services is complicated by the fact that the MCB controls the Battalion Aid Stations and the Naval Hospital and Naval Dental Clinic Activities program of their facilities. Facility requirements established by the Naval Hospital and Naval Dental Clinic Activities correspond to programmed strength projections of Marine Corps and Navy personnel who require these services.

The most significant Complex influence arises in the training function. Integral toward accomplishment of the training mission of the Marine Corps Base Activity is the air support activity

provided by MCAS, New River. Adequate facilities, and clearance zones are necessary to accommodate aircraft throughout the Marine Corps Base and are discussed in detail in the Special Training Analysis, Camp Lejeune, North Carolina, prepared in conjunction with this Master Plan.

PLANNING FACTORS

Flood plains, slope areas and poor soils are not shown as constraints unless they occur in developed areas. For the most part, poor soils/slopes are included in the areas designated as flood plain areas. The only poor soils/slopes delineated on the "Planning Factors" maps are those lying outside the flood plain.

Problems and constraints that can be depicted graphically appear on the accompanying maps (Figures IV-14 thru IV-19). It should be noted that areas labeled as "Contaminated Site" do not pose an immediate threat to human health or the environment. These contaminated areas will require further study before any new development can take place.*

Listed below are factors which should be considered in planning any future development at the Marine Corps Base. These factors include problem areas as well as specific natural and man-made constraints identified in the preceding analysis.

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*In its 1983 study entitled "Initial Assessment Study of Marine Corps Base, Camp Lejeune, North Carolina," the Naval Energy and Environmental Support Activity identified 76 potentially contaminated sites. Twenty-two of these sites were described in detail and were recommended for further study. Only those 22 sites were considered constraints to development.

Hadnot Point (Figure IV-14)

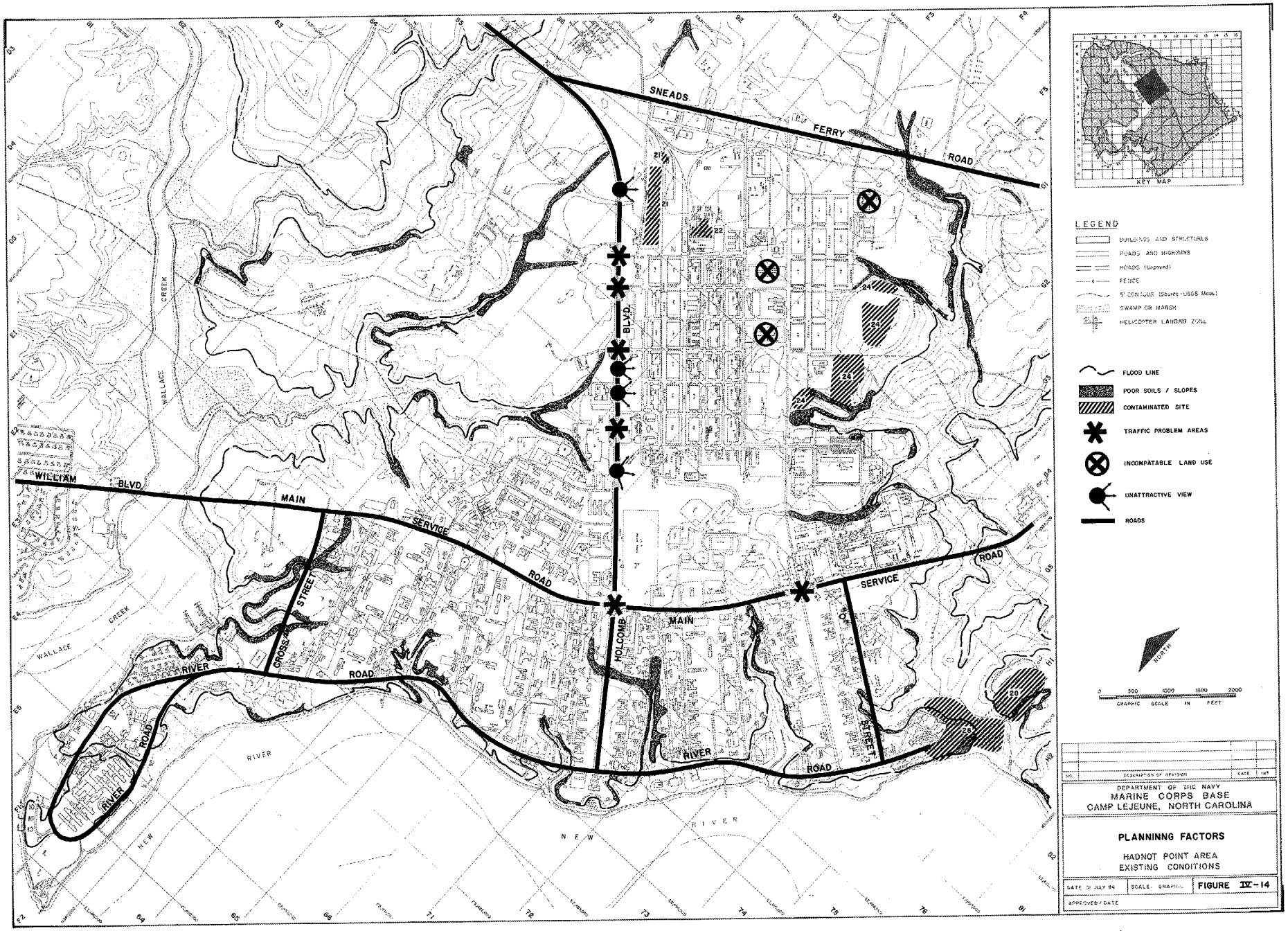
1. One-hundred year flood plain constrains facility expansion to the east.

2. Contaminated Site No. 21: Small spills of various pesticides occurred in the larger of the two areas between 1958 and 1977. The total amount is estimated to be between 100 and 1,000 gallons of various strength liquids. In the smaller area, an estimated 1,300 to 11,000 gallons of transformer oil was drained into a pit over a one-year period (1950-51).

3. Contaminated Site No. 22: About 20,000 to 50,000 gallons of diesel, unleaded and possibly leaded gasoline leaked from underground fuel lines. In 1979, a fuel leak of an estimated 20,000 to 30,000 gallons occurred.

4. Contaminated Site No. 24, Industrial Area Fly Ash Dump: An estimated 31,500 tons of fly ash, about 45,000 gallons of furniture stripping compounds and a small quantity of boiler cleaning solvents were dumped in these areas. The fly ash and solvents were dumped between 1940 and 1980 and the furniture strippings were dumped between 1972 and 1979. Construction rubble was also dumped in these areas during the 1980s.

5. Contaminated Site No. 28, Hadnot Point Burn Dump: The volume of the fill is estimated at 185,000 to 370,000 cubic yards. Because waste was burned, no approximation of remaining amount of specific material can be made. From about 1946 to 1971, mixed industrial type waste, refuse, trash oil-based paints and garbage were dumped at this site.



NO.	DESCRIPTION OF REVISION	DATE	BY

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PLANNINNG FACTORS

HADNOT POINT AREA
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | **FIGURE IV-14**

APPROVED / DATE

6. At both the Ash Street/Holcomb Boulevard and Birch Street/Holcomb Boulevard intersections, left-hand turns are dangerous. Current channelization, turning lanes, markings and lighting are inadequate, resulting in a high number of traffic accidents.

7. Traffic hazards exist at the Base Exchange and Dogwood Street/Holcomb Boulevard intersections. Turning movements across Holcomb Boulevard into the Exchange area are prohibited. Therefore, north-bound travelers wishing to enter the Exchange must make a U-turn at Dogwood Street. Because there are no turning lanes for vehicles entering the Exchange, vehicles waiting to enter often block through-traffic on Holcomb Boulevard.

8. Unnecessary congestion and accidents occur at Holcomb Traffic Circle. Vehicles tend to utilize the outside lane only rather than taking a chance of being cut off or blocked from exiting to the right. A significant reduction in both traffic congestion and accidents could result from making this two-lane traffic circle function as a single-lane traffic circle.

9. High peak-hour traffic volumes make it difficult to make a left-hand turn from the Main Service Road to Louis Road.

10. Land use incompatibility created with the siting of troop housing in the center of Supply/Maintenance work area.

11. Entrance route along Holcomb Boulevard is marred by unattractive view of Supply/Maintenance work area.

12. Power plant lacks landscaping or other buffers that can soften the transition between the open Parade Ground and the utility site.

13. Undersized, outdated Main Commissary/Exchange lacks adequate parking.

14. Pedestrian conflict created by the use of regimental area sidewalks for group running.

15. Lack of a regulation three-mile running course which is separated entirely from vehicular and pedestrian traffic.

16. Deficiency in the amount of available warehouse and maintenance space.

17. Inadequate lighting and fencing surrounding existing facilities, especially in the shop areas.

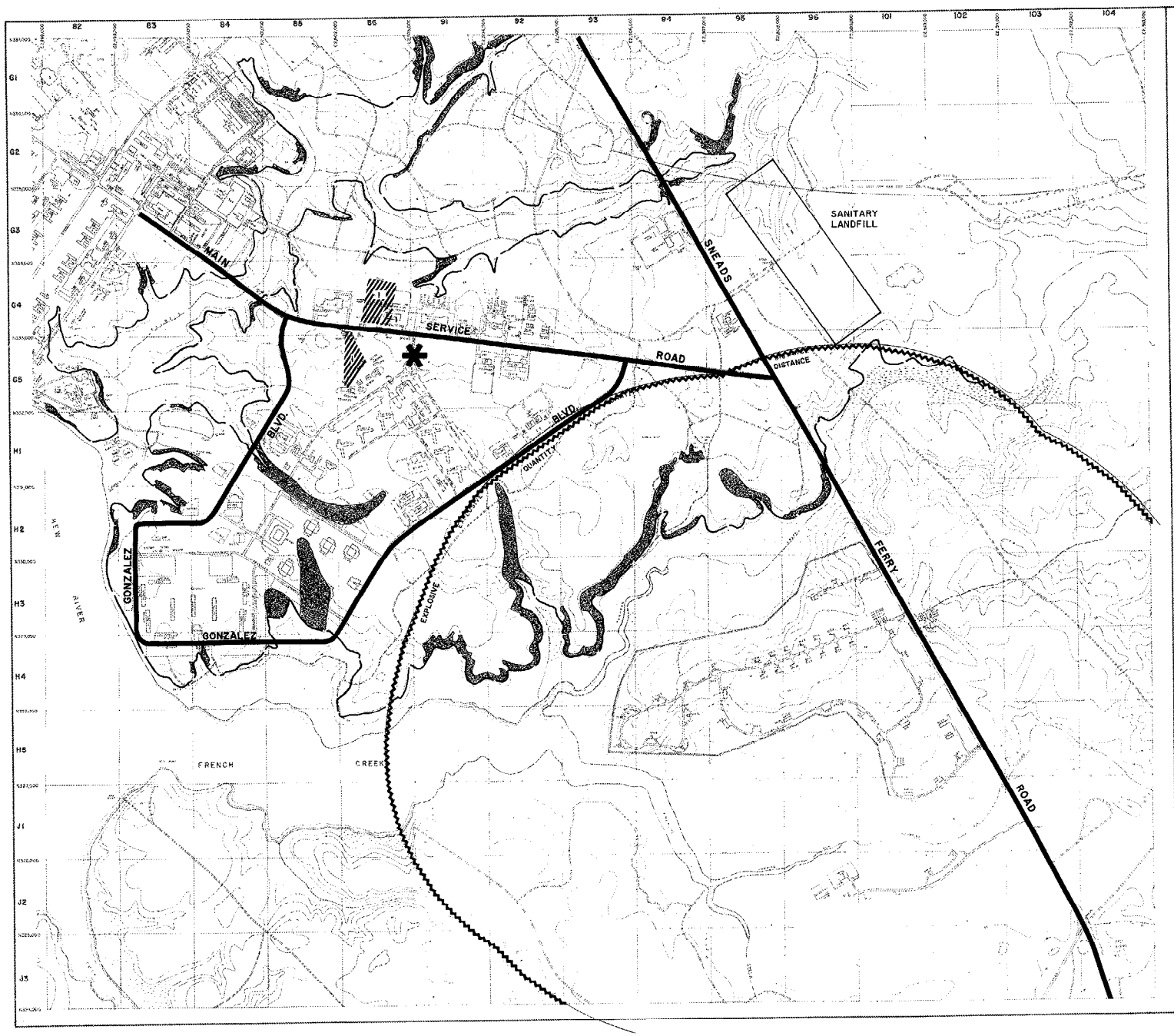
18. Undetermined site location for the new Regional Commissary Warehouse.

19. Battalion rotation has resulted in increased pressures for bachelor living units.

French Creek (Figure IV-15)

1. Large percent of the land area is in the 100-year flood plain, thereby constraining facility expansion capability.

2. There are some areas with a slope of more than 10 percent and a number of locations with poor soils.



NO	DESCRIPTION OF REVISION	DATE	INIT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PLANNING FACTORS

FRENCH CREEK AND MAGAZINE AREAS
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE - GRAPHIC	FIGURE IV-15
APPROVED / DATE		

3. Contaminated Site No. 1 (north of Main Service Road), French Creek Liquids Disposal Area: An estimated 1,000 to 10,000 gallons of battery acid was dumped in the southeast portion of this site from the late 1940s to the mid-1970s. Waste motor oil and hydraulic fluids were also dumped throughout the site.

4. Contaminated Site No. 1 (south of Main Service Road), French Creek Liquids Disposal Area: An estimated total of 5,000 to 20,000 gallons of waste motor oil and hydraulic fluids were disposed of here from the late 1940s to the mid-1970s.

5. Vehicular congestion, especially at the traffic circle on Daly Road.

6. French Creek sanitary land fill limits development.

7. The large explosive safety quantity distance arc restricts development south of Gonzalez Boulevard.

8. The site orientation of existing buildings, combined with the low overall density of existing development, limits alternative areas for new development.

9. Existing maintenance and storage facilities, as well as parking areas in the industrial area north of Main Service Road, are in scattered locations.

10. Programmed maintenance facilities are sited in scattered locations.

11. Lack of a centrally-located fire station.

12. Lack of facilities for a permanent deployment area (supply/storage, billeting and administrative space).

Courthouse Bay (Figure IV-16)

1. Size and location of 100-year flood plain severely limits potential for facility expansion.

2. Contaminated Site No. 73, Courthouse Bay Liquid Disposal Area: About 10,000 to 20,000 gallons of used battery acid were poured at the smaller portion of this site from about 1946 to 1977. Also, as much as 400,000 gallons of waste motor oil was disposed throughout the entire site during the same time period.

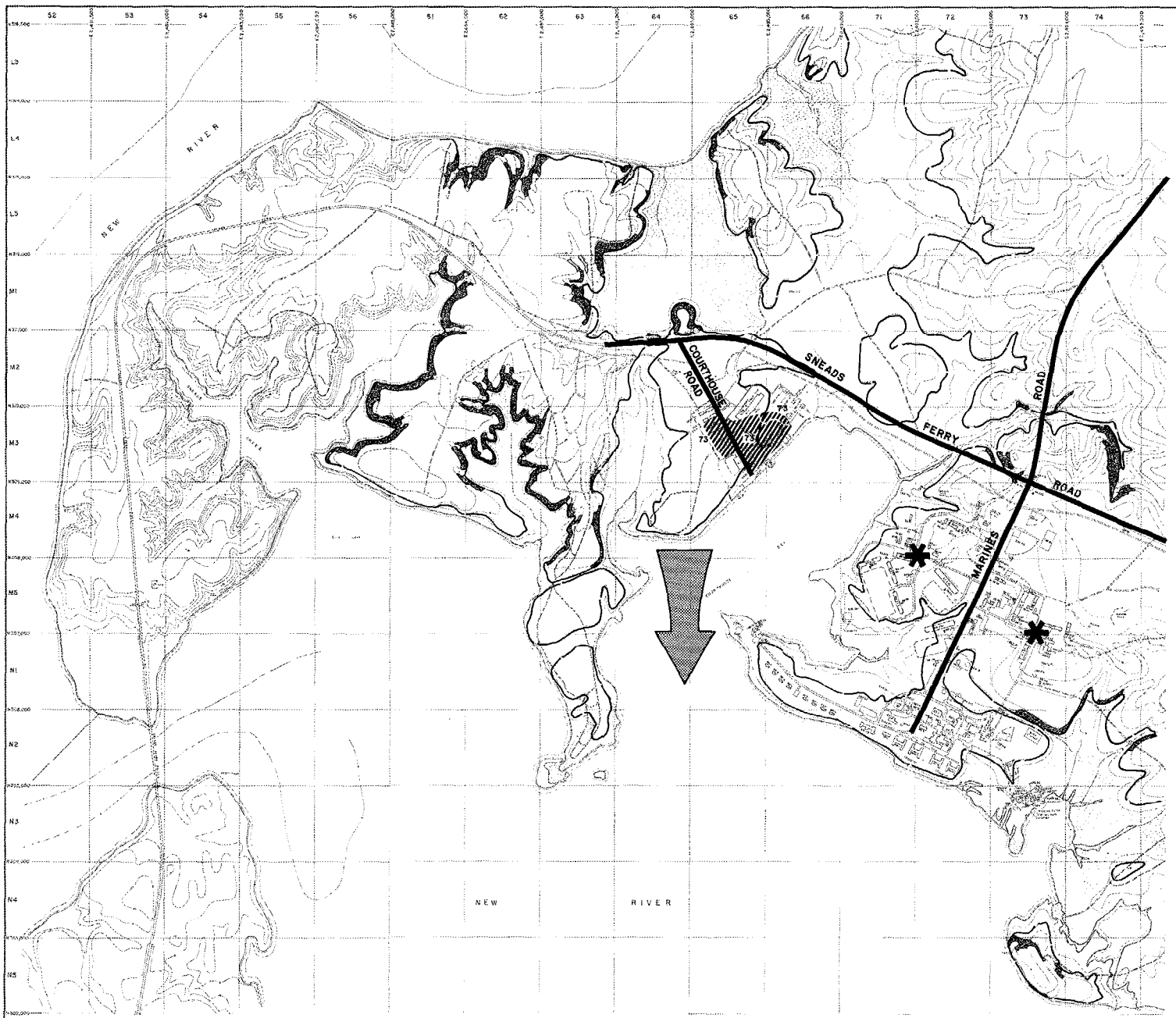
3. Several traffic congestion points exist throughout the developed area.

4. Increases in civilian use of the New River for commercial fishing operations, private boating and commercial transport has created conflicts for use of Courthouse Bay for 2nd Amphibious Tractor Battalion (AMTRAC) training maneuvers.

5. Insufficient number of parking spaces, especially for private automobiles.

6. Out-dated utilities and above-ground steam lines.

7. Many facilities are obsolete and are in poor physical condition.



NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PLANNING FACTORS

ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE 31 JULY 86 | SCALE: GRAPHIC | **FIGURE IV-16**

APPROVED / DATE

8. Large deficiency in maintenance and supply/storage space, especially in the new shop area. To a lesser degree, but also a problem, are shortages of indoor recreational and community facilities.

Rifle Range (Figure IV-17)

1. One-hundred year flood plain, steep slopes and poor soil conditions severely limit areas for development expansion.

2. Contaminated Site No. 68, Rifle Range Dump: Construction debris, water treatment plant sludge and solvents were dumped in this area from 1942 to 1972.

3. Contaminated Site No. 69, Rifle Range Chemical Dump: Hazardous chemicals dumped on approximately six acres between 1950 and 1976.

4. Lengthy travel distance makes use less than convenient to troops billeted at the Hadnot Point regimental area.

Camp Geiger (Figure IV-18)

1. Flood plain constrains expansion potential, especially in the eastern and northern sections.

2. Very poor soils limit the development feasibility of land north of Curtis Road and west of "A" Street.

3. Contaminated Site No. 35, Camp Geiger Area Fuel Farm: In 1957-58 Mogas, estimated to be "in the thousands of gallons," leaked from underground lines.

4. Contaminated Site No. 36, Camp Geiger Area Dump: Garbage, trash, waste oils, solvents and hydraulic fluids were dumped and burned at this site in the late 1940s to the late 1950s.

5. Facility vacancies to be created when the 8th Marines relocate to the 3rd Regimental area at Hadnot Point in the late 1980s.

6. Lack of a three-mile running course which conforms to Marine Corps regulations.

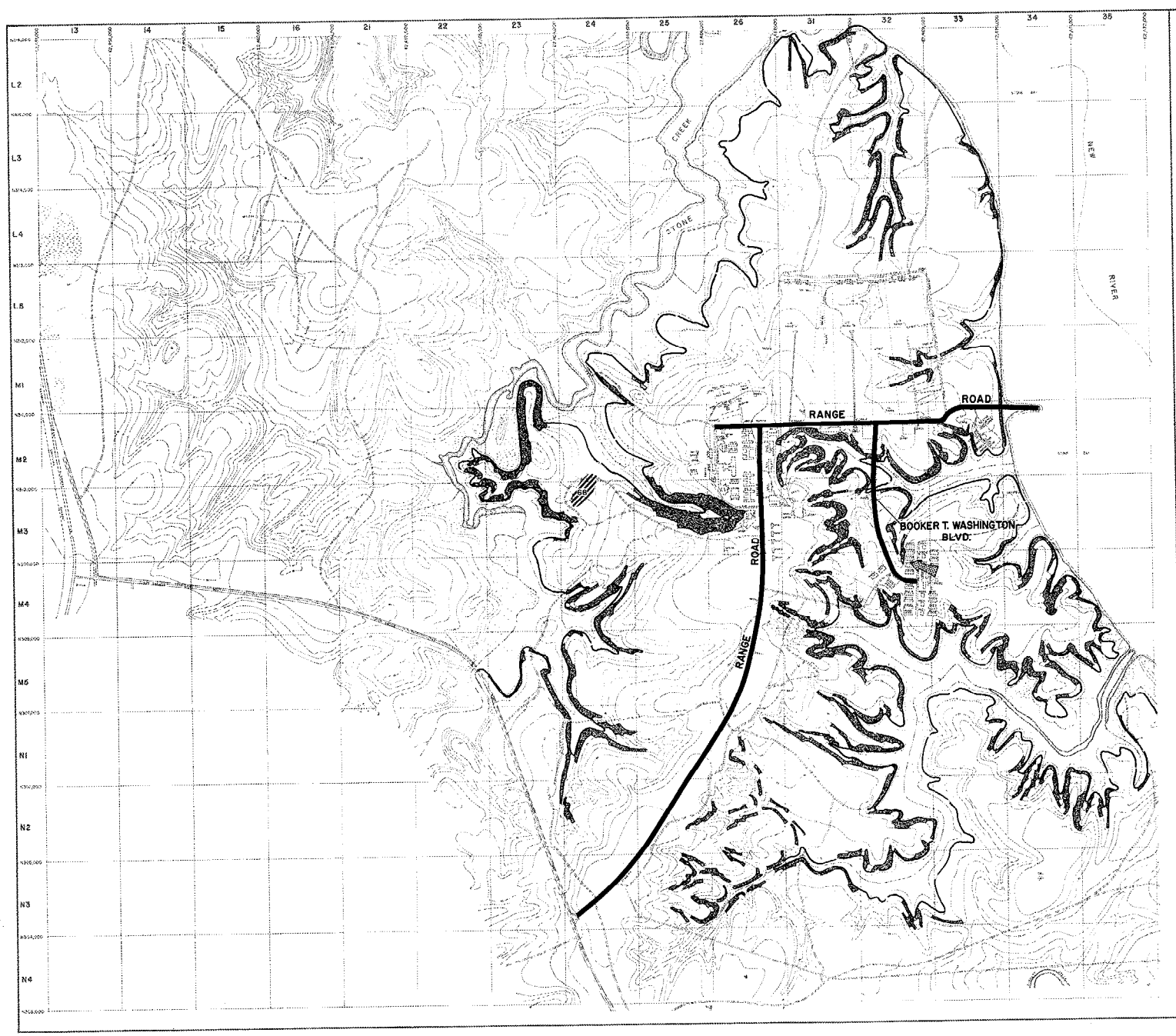
Montford Point (Figure IV-19)

1. Contaminated Site No. 16, Montford Point Burn Dump: Building debris, including asbestos, garbage, tires and waste oil were dumped at this site from 1958 to 1972. Amount of asbestos and oil are believed to be very small.

2. Due to its proximity to the Air Station, a large portion of Montford Point falls into the Moderate Noise Impact Zone 2.

3. Undetermined alignment of the proposed Highway 17 Bypass poses potential negative impact on the Montford Point living environment.

4. Limited access by Drivers' Training School students to training areas Basewide.



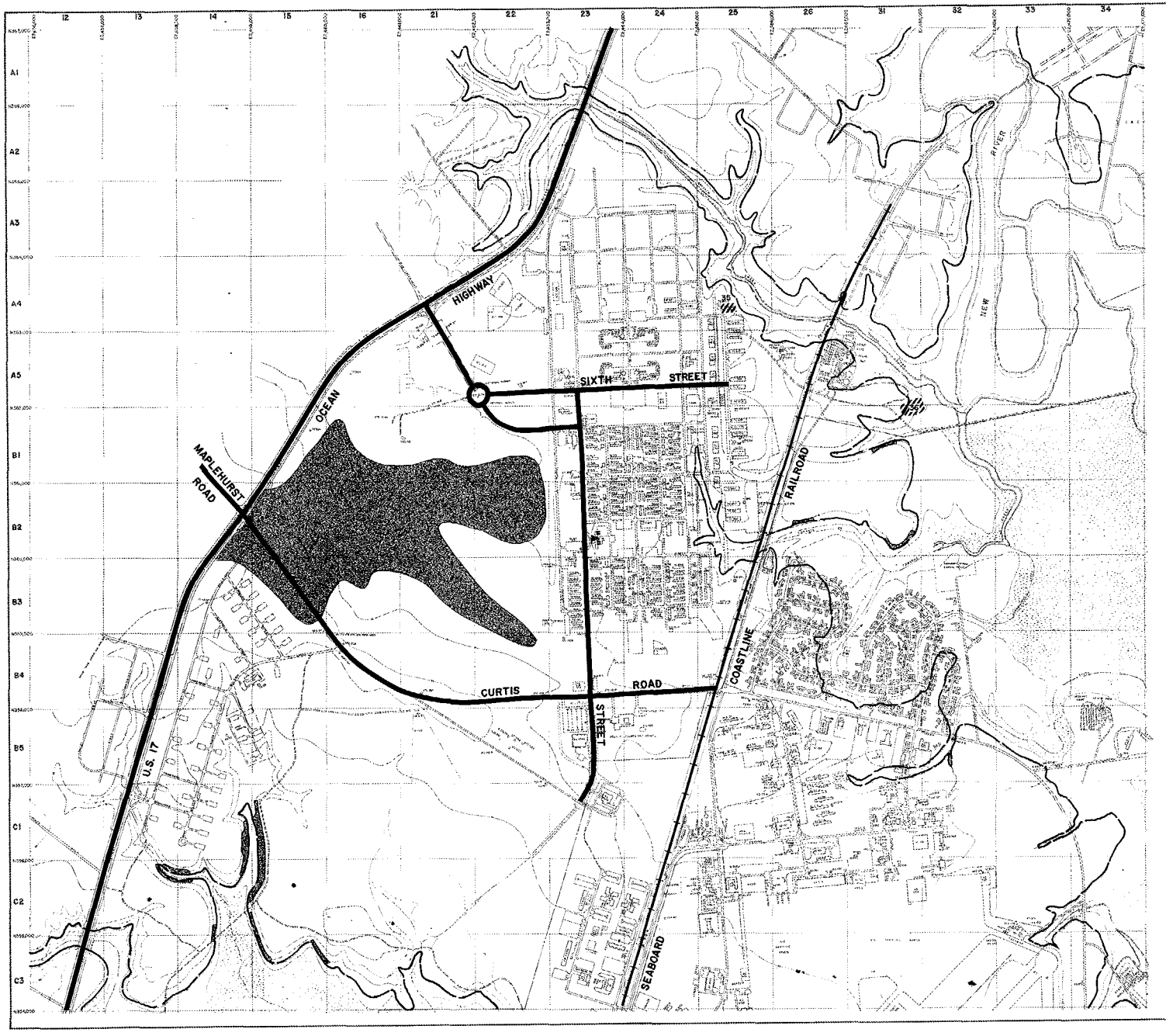
NO	DESCRIPTION OF REVISION	DATE	INIT

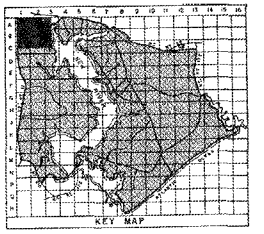
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PLANNING FACTORS

RIFLE RANGE AREA
EXISTING CONDITIONS

DATE: 31 JULY 84	SCALE: GRAPHIC	FIGURE IV-17
APPROVED / DATE		





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE
- FLOOD LINE
- POOR SOILS / SLOPES
- CONTAMINATED SITE
- ROADS
- RAILROAD

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

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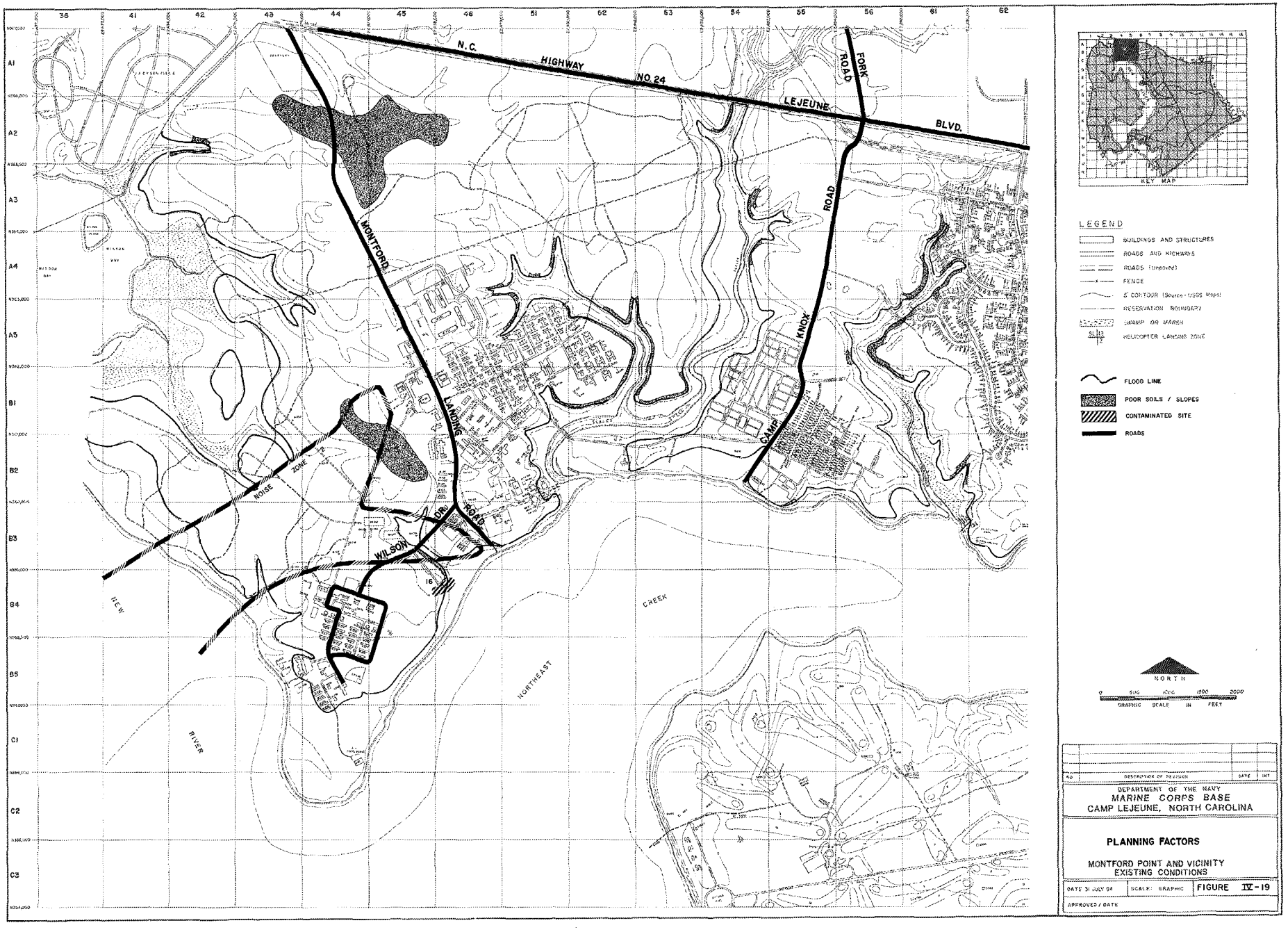
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PLANNING FACTORS

GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE: GRAPHIC	FIGURE IV - 18
APPROVED / DATE		


N.C. HIGHWAY NO. 24
LEJEUNE BLVD.
FORK ROAD
MONTFORD LANDING ROAD
CAMP KNOX ROAD
NOISE ZONE
WILSON DR.
NEW RIVER
NORTHEAST CREEK
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (unpaved)
FENCE
5' CONTOUR (Source - USGS Maps)
RESERVATION BOUNDARY
SWAMP OR MARSH
HELICOPTER LANDING ZONE
FLOOD LINE
POOR SOILS / SLOPES
CONTAMINATED SITE
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INIT
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
PLANNING FACTORS
MONTFORD POINT AND VICINITY
EXISTING CONDITIONS
DATE 31 JULY 84
SCALE: GRAPHIC
FIGURE IV-19
APPROVED / DATE

5. Outdated and deteriorated housing, community, instructional and administrative facilities.

6. Technological advances, such as the inclusion of automation training in the Supply/Personnel/Administration and Disbursing Schools, cannot be accommodated in existing facilities, due to increased electrical requirements and the need for strict climatic controls.

7. Planned transfer of the Drivers' Training School from Camp Geiger to Montford Point will create an excess of facilities at Camp Geiger and a need for a larger Drivers' Training area and additional housing at Montford Point.

8. Conflicts created by the need of Field Medical Service School to train in remoted wooded areas at Montford Point, the realignment of Highway 17 and the influx of Driver Training vehicles.

9. Deficiency in a three-mile running course, which is separated entirely from vehicular traffic.

Onslow Beach

1. Increased traffic volumes projected at the completion of the recreational lodges will exceed the existing capacity of the Onslow Beach Bridge.

2. Conflict over proposal to relocate 2nd Reconnaissance Battalion to Division barracks at Hadnot Point.

3. Lack of assault beach.

4. Lack of a maneuver non-live fire area which would enable the MAB to maneuver inland.

5. Land-sea interfacing hindered by problems encountered loading ammunition directly from the Base to ships.

Mile Hammock Bay

1. High cost associated with developing a port-of-embarkation in this area.

2. Development constrained by the presence of endangered species' habitats.

3. Impact safety distance in northeastern area.

Training and Maneuver Areas

1. Training area constraints caused by the conflict between Marine Corps Base training personnel and endangered species such as the red-cockheaded woodpecker that inhabits a significant portion of the training and maneuver areas.

2. Increased firing distance of modern weaponry created limitations which have to be imposed on existing firing ranges at Camp Lejeune.

3. Limitations on firing range areas G-5, G-6A and G-7 and N-1/BT-3 Impact Areas due to Intracoastal Waterway traffic.

4. Violation of perimeters of N-1 Impact zone by Atlantic fishermen.

5. Advent of the LAV and TOW and increased numbers of .50 cal. machine guns has resulted in the redoubling of training land requirements.

6. Training area west of Holcomb Boulevard and its proximity to off-Base development.

7. Lack of available training land due to increased mobility of vehicles and range of weapons.

8. G-10 impact area too small for the artillery to exercise their guns' full capabilities.

9. Armored vehicles do not have a large cleared area for realistic, tactical maneuvers.

10. Duplicate ranges are needed on both sides of the New River.

11. Only one range, G-3, can fire the TOW missile.

12. No live fire is allowed at Combat Town.

CONCEPTUAL DEVELOPMENT

GENERAL

Alternative concept plans represent conceptual solutions for directing growth and change at the Marine Corps Base. The purpose of this analysis is to compare alternative land use schemes and

to select the most logical and efficient land use plan, given assigned missions, available resources, and physical and operational constraints.

Defined below are a set of general goals which are intended to serve as an implementing guide for future physical development at the Marine Corps Base. Delineation of these goals was based upon the preceding planning analysis. Accompanying each goal is a series of measurable objectives which, if followed, can result in the achievement of each goal.

GOALS AND OBJECTIVES

Goal 1: ENCOURAGE COMPATIBLE LAND USE RELATIONSHIPS

Objective 1A: Site physically and functionally related facilities adjacent to one another.

Objective 1B: Maintain unit integrity.

Goal 2: CONCENTRATE DEVELOPMENT TO MAXIMIZE LAND POTENTIAL

Objective 2A: Site new facilities in locations occupied currently by temporary, sub-standard, or inadequate facilities.

Objective 2B: Prevent encroachment of development into training and maneuver areas.

Goal 3: IMPROVE THE CIRCULATION SYSTEM TO FULLY SERVE AND SUPPORT LAND USE, TO CONSERVE TIME AND ENERGY, AND TO PROMOTE SAFETY

Objective 3A: Minimize conflicts between pedestrian and vehicular traffic.

Objective 3B: Relieve traffic congestion along major arterials and at major intersections.

Objective 3C: Reduce travel times between developed areas.

Objective 3D: Improve access to personnel support areas.

Goal 4: CONSERVE EXISTING ASSETS

Objective 4A: To the extent economically feasible, repair and/or renovate substandard facilities prior to planning new replacement facilities.

Objective 4B: Relocate tenants from facilities that, although in good structural condition, are deficient in configuration or size for their needs.

Goal 5: PRESERVE AND PROTECT THE NATURAL ENVIRONMENT

Objective 5A: Maintain the integrity of all endangered species' habitats.

Objective 5B: Construct facilities outside the 100-year flood plain.

Objective 5C: Construct facilities in areas with less than 10 percent slope.

Objective 5D: Prevent contamination or destruction of soils, vegetation and wetlands.

Goal 6: ENHANCE THE OVERALL ATTRACTIVENESS OF DEVELOPED AREAS

Objective 6A: Use plant materials or fencing to buffer incompatible uses.

Objective 6B: Improve main entryways into the Marine Corps Base.

Objective 6C: Plan facilities which are well-integrated in terms of scale, materials and design.

Goal 7: IMPROVE ACCESS TO AND VISIBILITY OF THE NEW RIVER SHORELINE

Objective 7A: Establish passive recreational corridors that inter-connect the waterfront with active recreational and housing areas.

Objective 7B: Improve embarkation areas.

Objective 7C: Emphasize the unique natural setting as an important physical attribute.

Goal 8: RESERVE UNDEVELOPED LAND AREAS TO ACCOMMODATE FUTURE FACILITY NEEDS

Objective 8A: Identify potential facility requirements beyond the time frame of this plan.

Objective 8B: Identify specific areas for construction of facilities designed to meet requirements beyond the time frame of this plan.

The subsequent analysis is organized by the various geographic areas which comprise the Marine Corps Base. Each alternative concept is depicted on a map and analyzed in narrative form relative to goals and objectives presented above.

HADNOT POINT

Concept Plan A

Concept Plan A is based upon existing development and programmed MILCON projects (Figure IV-20). A major benefit of this concept is that, because existing assets would be largely conserved, less capital investment would be necessary to implement such a Plan. Development is highly concentrated and expansion capability is good for all land use categories.

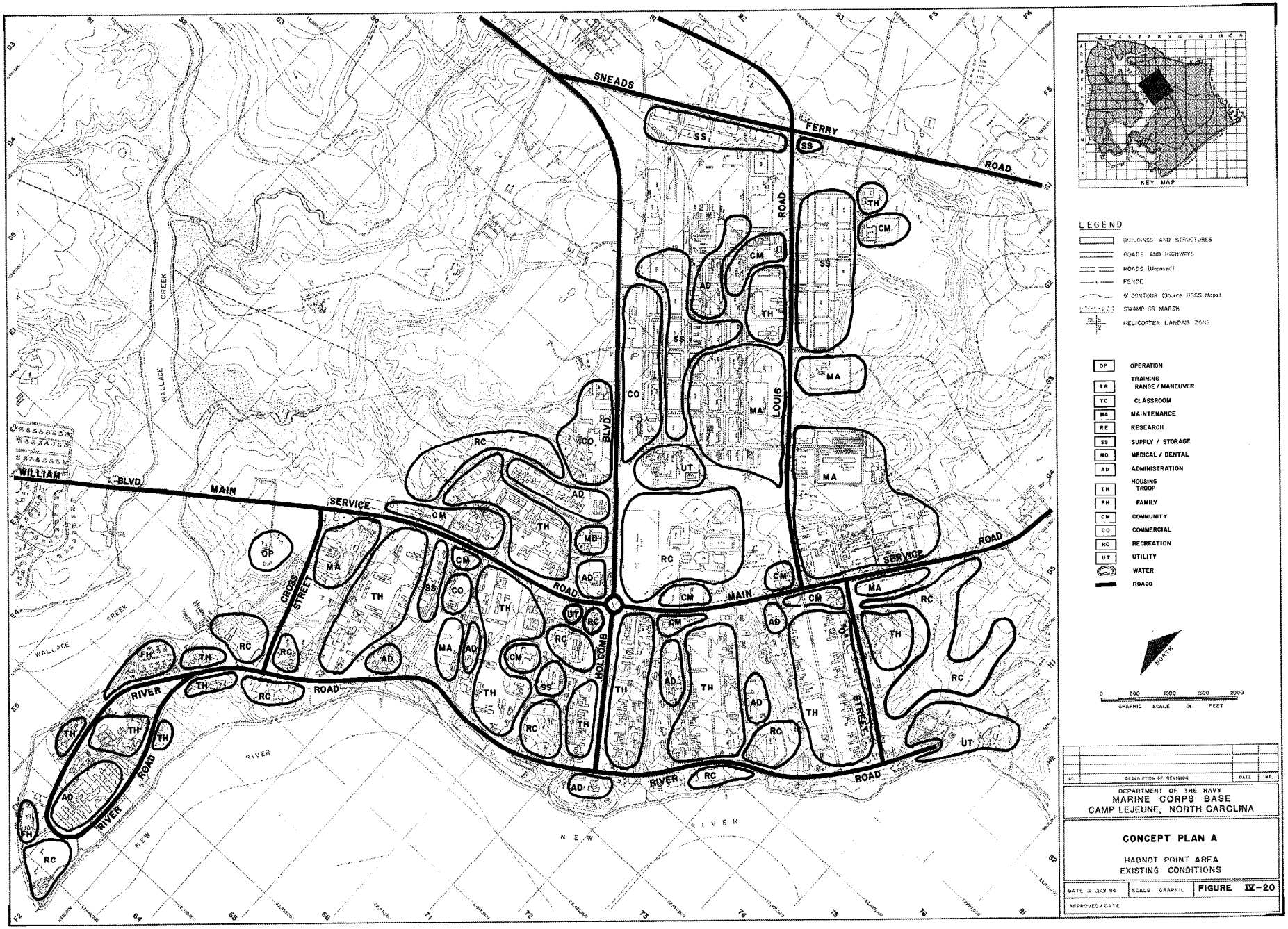
The major disadvantage of Concept Plan A is that some undesirable functional relationships are retained. For example, pockets of troop housing exist in the supply/maintenance area south of Sneads Ferry Road. Work and utility areas are clearly visible from the Holcomb Boulevard entrance route, which detracts from the overall attractiveness of Hadnot Point.

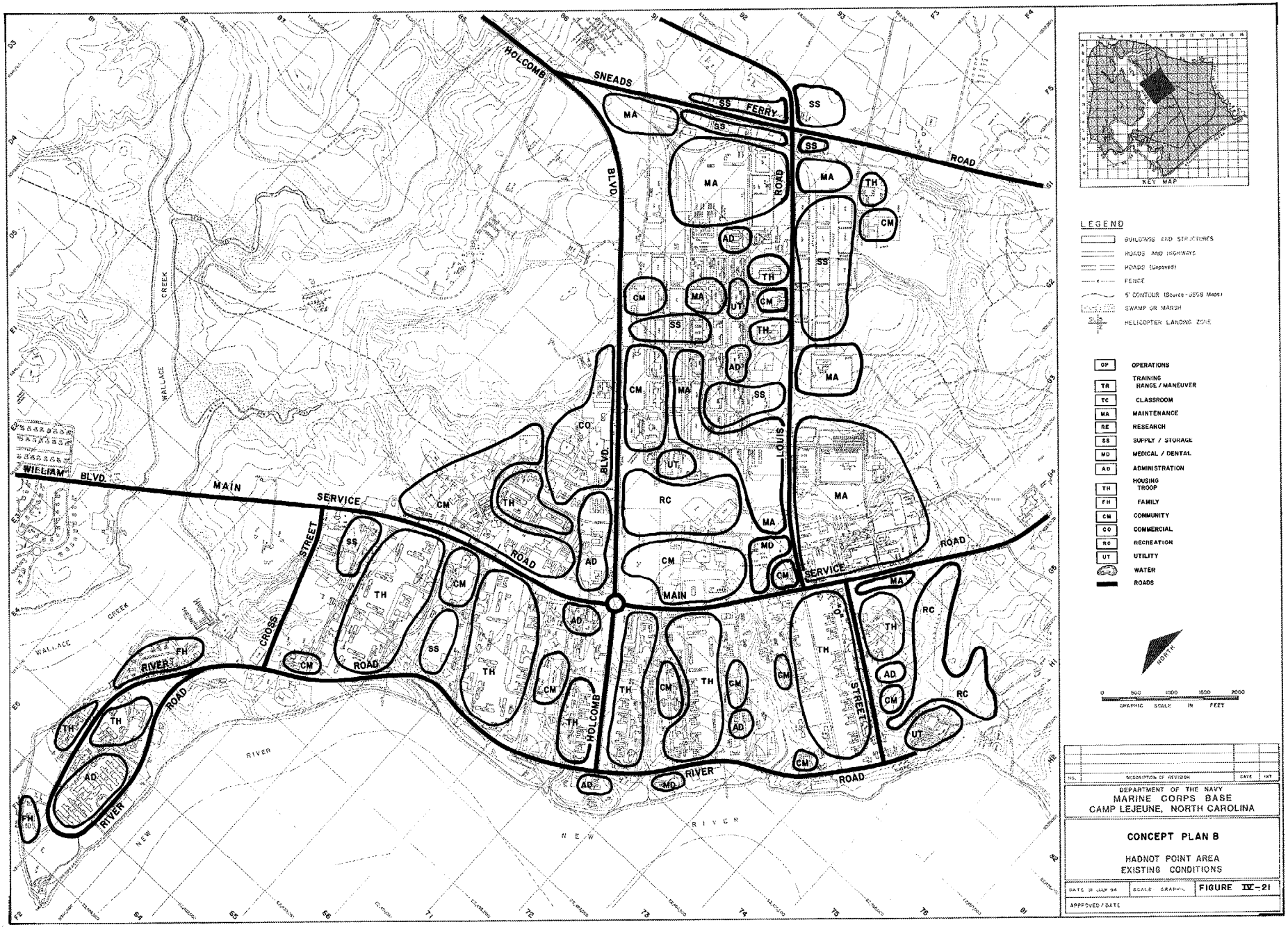
Concept Plan B

For the most part, this concept reflects ideas presented in the previous Master Plan (Figure IV-21). While land use arrangements are similar to existing patterns, several major exceptions exist. Maintenance uses are shown adjacent to Holcomb Boulevard without any visual buffers. Several existing barracks along River Road are removed. As in Concept A, troop housing is scattered throughout the entire area. The most significant change is the relocation of medical uses adjacent to the Post Office along the Main Service Road.

Concept Plan C

Concept Plan C resolves many of the less than desirable features of Concepts A and B (Figure IV-22). All the development goals and objectives are satisfied in this concept. A multi-purpose greenway along Holcomb Boulevard buffers parking and work areas from view and formalizes the entryway. Supply uses act as a buffer for the large maintenance areas which are located to the east and are compatible with adjacent maintenance facilities in French Creek. Perhaps the largest departure from the previous concepts is a greenway shown parallel to the New River Shoreline. This passive recreational area would link the more active recreational areas together, provide a segregated pedestrian course and generally orient the developed areas to the waterfront. In this concept, medical/dental uses are shown as remaining in their location due to their prominence and accessibility. While implementation of this concept would necessitate a relatively greater capital investment, the plan does not depart radically from existing physical relationships.


SNEADS FERRY ROAD
WILLIAM BLVD
MAIN SERVICE ROAD
CROSS STREET
HOLCOMB BLVD
LOUIS ROAD
WALLACE CREEK
NEW RIVER
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Improved)
FENCE
5' CONTOUR (Source - USGS Maps)
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATION
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MD MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
CONCEPT PLAN A
HADNOT POINT AREA
EXISTING CONDITIONS
DATE 31 JULY 84 SCALE GRAPHIC FIGURE IV-20
APPROVED / DATE



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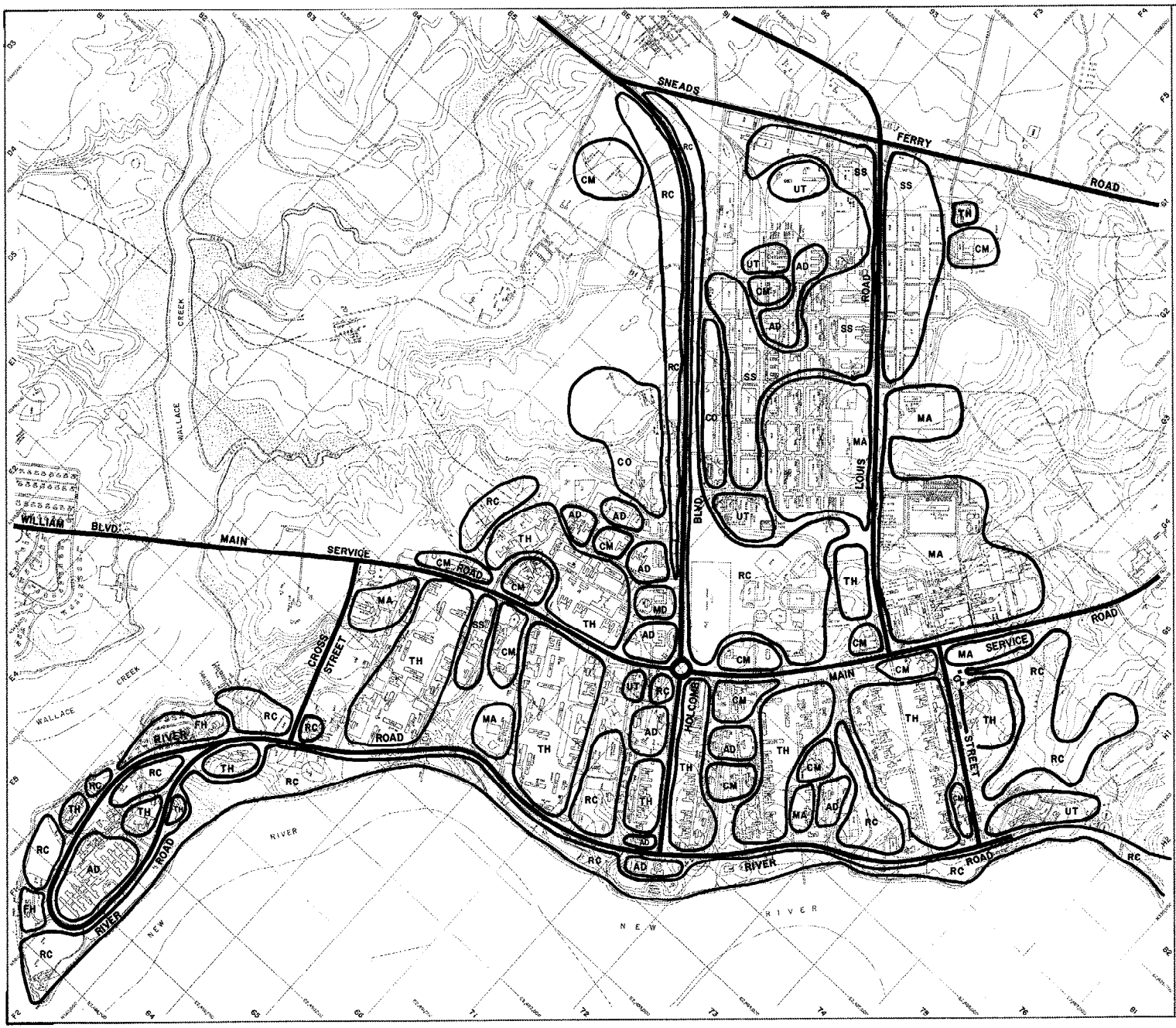
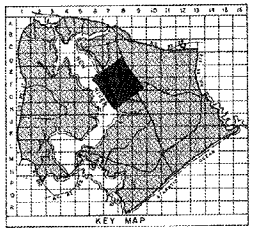
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN B

HADNOT POINT AREA
EXISTING CONDITIONS

DATE: 21 JULY 94	SCALE: GRAPHIC	FIGURE IV-21
APPROVED / DATE		





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOURS (Source -USGS Maps)
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000
GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	BY

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN C

HADNOT POINT AREA
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | **FIGURE IV - 22**

APPROVED / DATE

Concept Plan A

No major change from existing land use patterns or the previous Master Plan are proposed in this concept (Figure IV-23). The campus-like development at French Creek has closely followed land use recommendations contained in the previous Master Plan. The area has seen logical and orderly growth over the past decade. In both Concepts A and B, the passive greenway which was included in the Hadnot Point preferred alternative is continued in order to provide a pedestrian linkage between Hadnot Point and the large French Creek recreation area.

Concept Plan B

Land use relationships would remain essentially the same except for supply/storage uses which have been relocated from Gonzalez Boulevard to the Main Service Road area (Figure IV-24). The concept is to consolidate heavy industrial-related uses north of the Main Service Road, while lighter, cleaner industrial uses would be located immediately south of the Main Service Road. Access to this large industrial area would be provided from Sneads Ferry Road, eliminating some traffic from the Main Service Road and mitigating problems occurring at the angular Sneads Ferry and Main Service Roads intersection.

Included in the large work area north of the Main Service Road would be a "Deployment Area." This would include supply, storage and administrative facilities, as well as a large open area for deployment.

COURTHOUSE BAY

Concept Plan A

Concept Plan A reflects existing functional relationships and programmed MILCON projects (Figure IV-25). A major disadvantage of this concept is the distance between troop housing and mess facilities. In addition, administrative uses are not centralized between AMTRAC and Engineers' School operations.

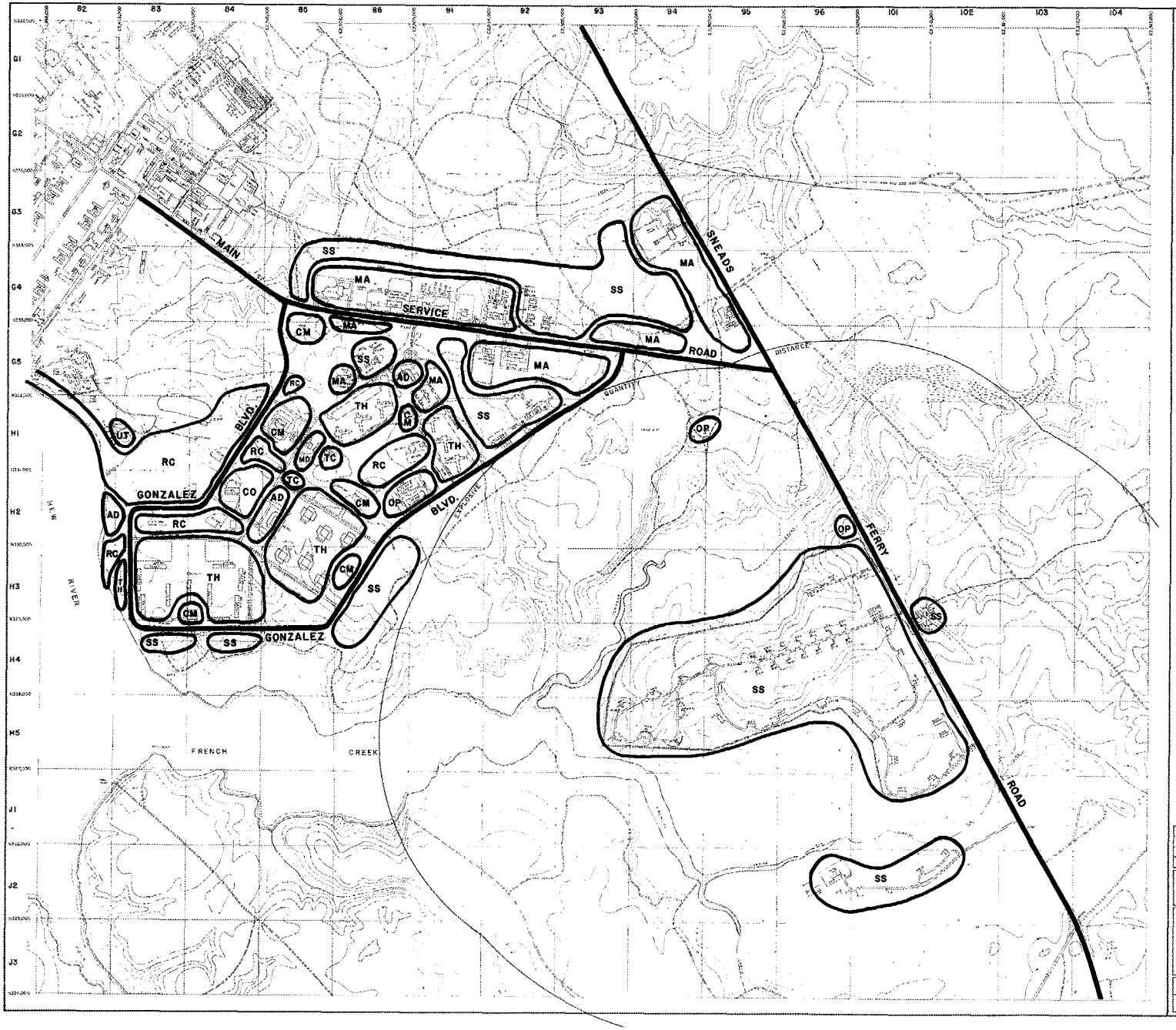
Concept Plan B

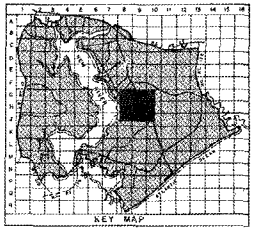
Commercial and community facilities are consolidated and centralized relative to troop housing (Figure IV-26). Administrative uses are similarly consolidated at the intersection of Marines and Sneads Ferry Roads. The Branch Medical Clinic is relocated farther northward along Marines Road away from the floodline and in a more central location. As in Concept A, the AMTRAC work area is contained to the western side of the Bay. The major disadvantage to rearrangement of land uses in this concept will be the cost associated with rehabilitation and construction, however, the long-term benefits will far outweigh this disadvantage.

RIFLE RANGE

Concept Plan A

Land uses are arranged in a concentrated area (Figure IV-27). Housing and community facilities are easily accessible to one another, as well as to classroom facilities, however,





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INT

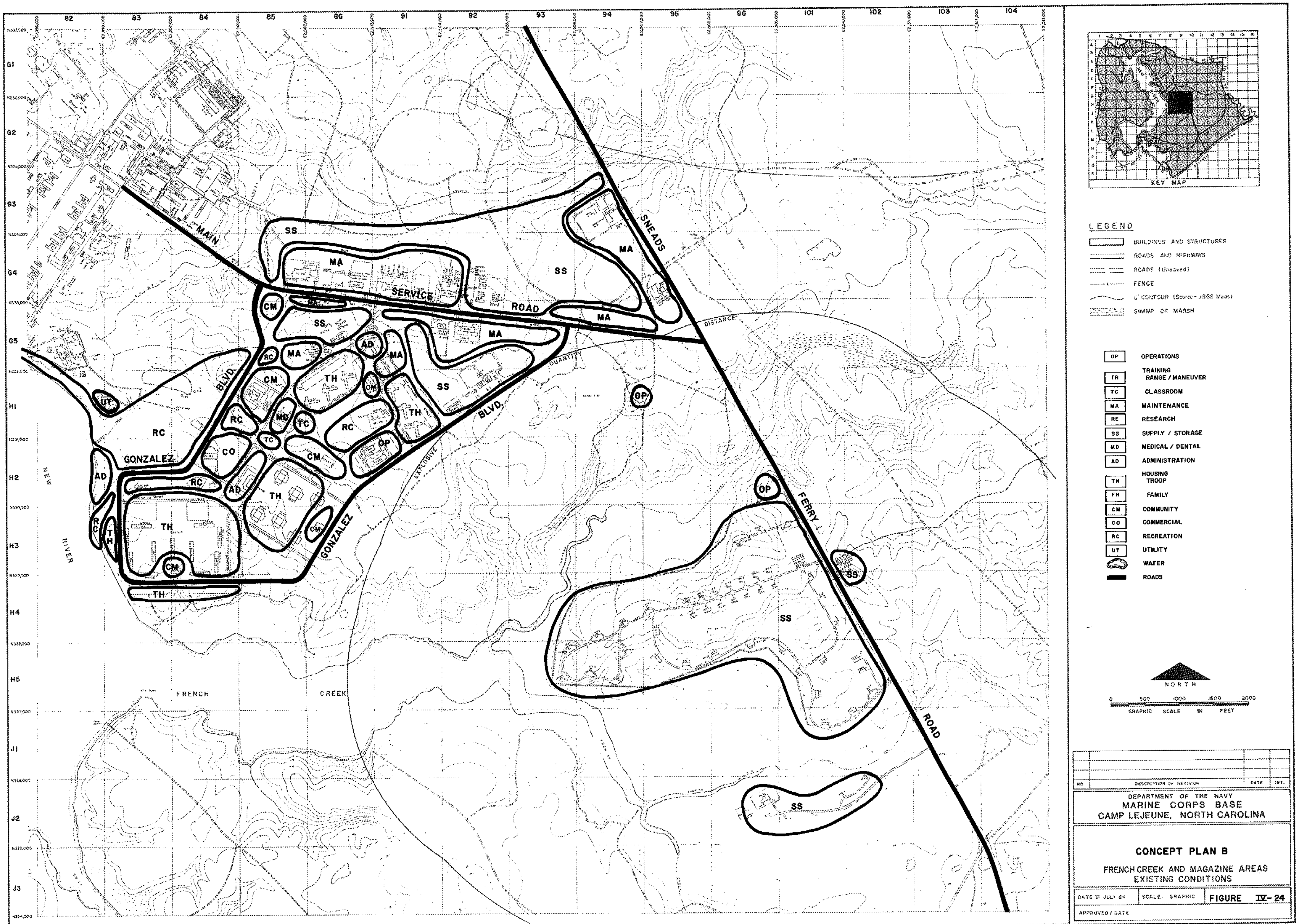
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN A

FRENCH CREEK AND MAGAZINE AREAS
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE IV-23

APPROVED / DATE



MAIN
SERVICE
ROAD
SNEADS
FERRY
ROAD
GONZALEZ
BLVD.
GONZALEZ
BLVD.
NEW
RIVER
FRENCH
CREEK
EXPLOSIVE
DISTANCE
SS
MA
SS
MA
MA
MA
CM
SS
AD
MA
RC
MA
CM
TH
CM
SS
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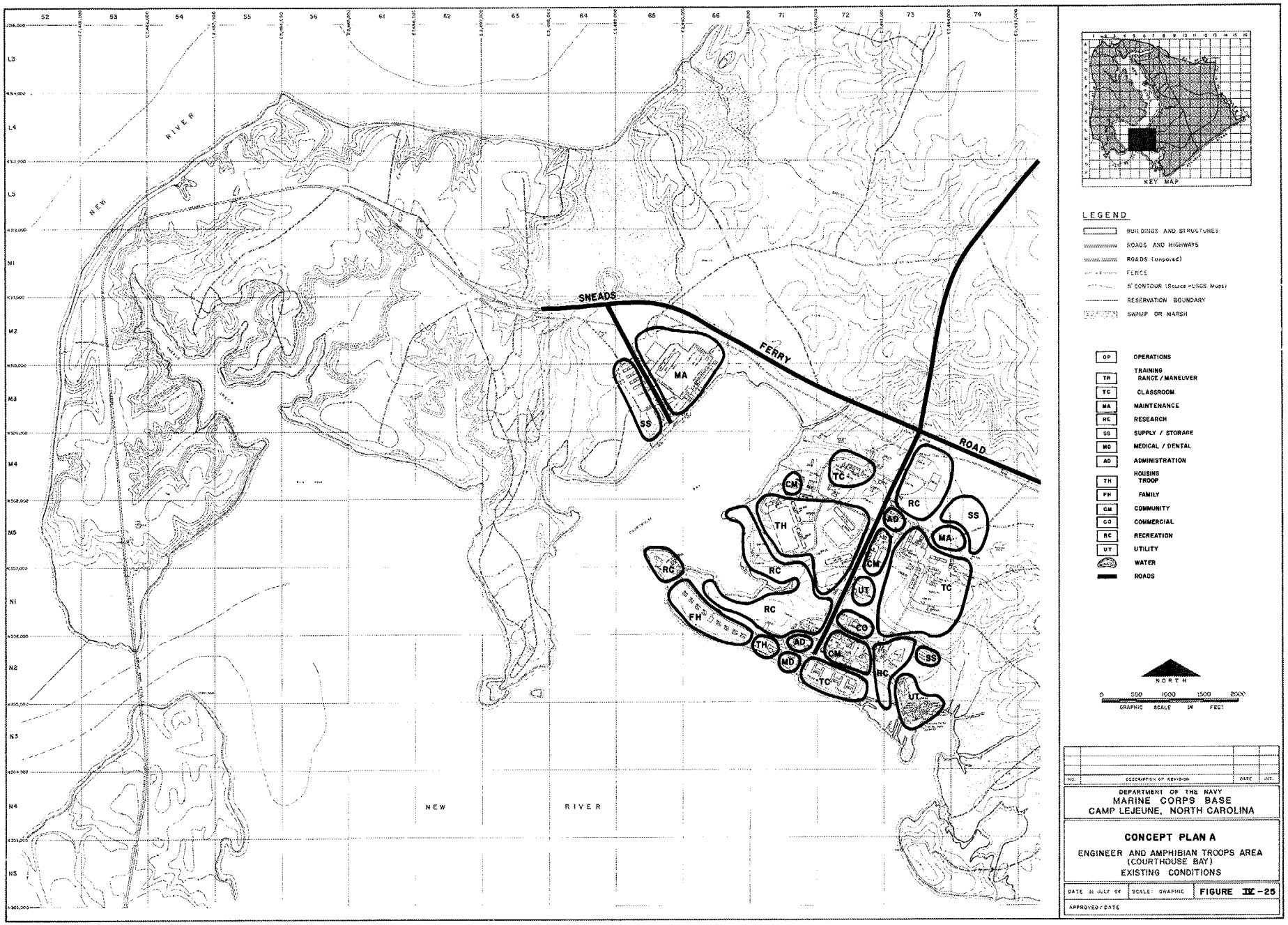
OP
SS
SS
SS
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source- USGS Maps)
SWAMP OR MARSH
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MD MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO DESCRIPTION OF REVISION DATE INT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
CONCEPT PLAN B
FRENCH CREEK AND MAGAZINE AREAS
EXISTING CONDITIONS
DATE 31 JULY 84
SCALE: GRAPHIC
FIGURE IV-24
APPROVED / DATE


SNEADS
FERRY
ROAD
NEW
RIVER
MA
SS
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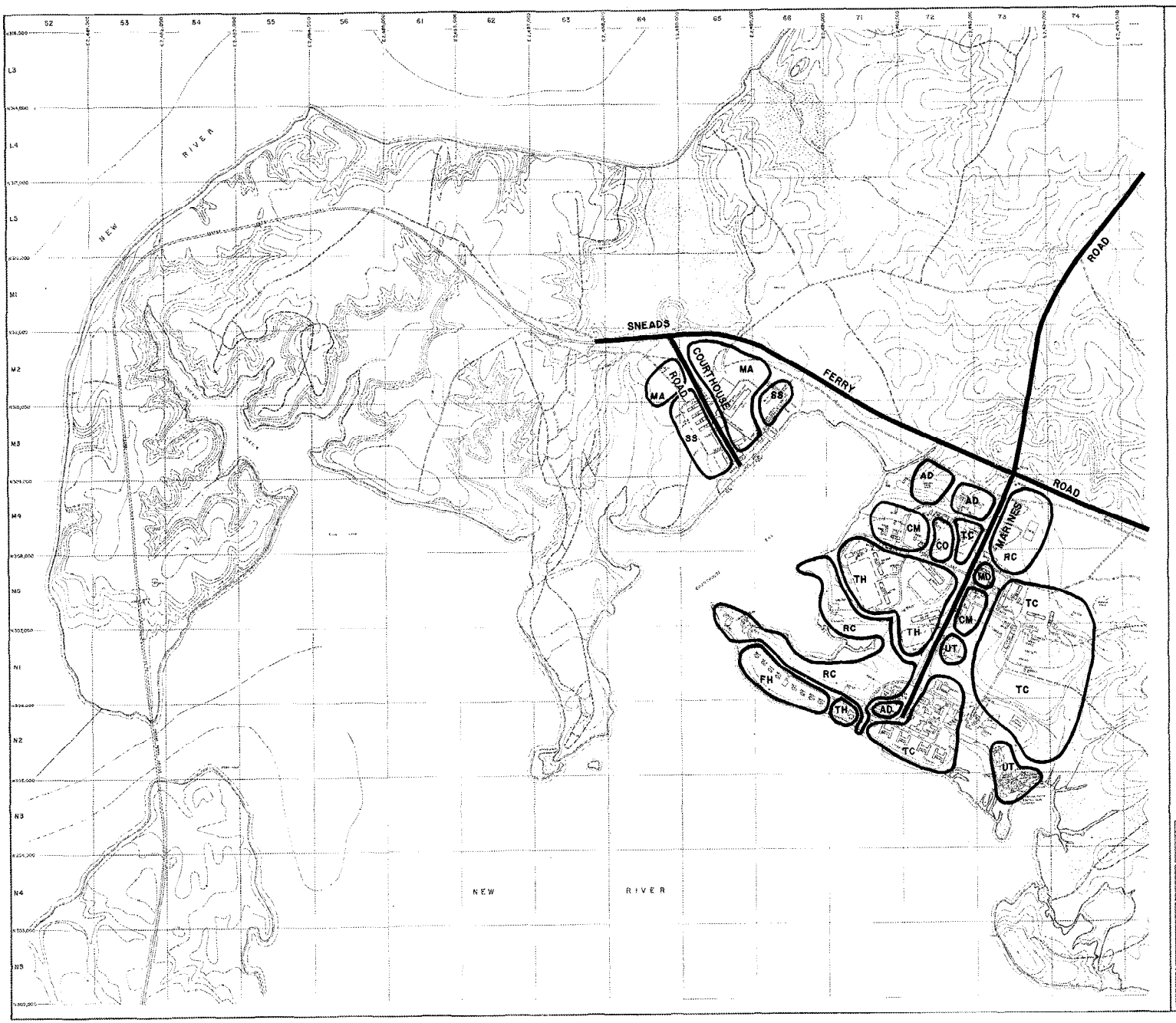
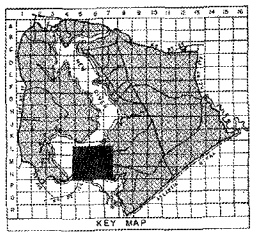
RC
MD
AD
CO
UT
FH
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (unpaved)
FENCE
5' CONTOUR (Source - USGS Maps)
RESERVATION BOUNDARY
SWAMP OR MARSH
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RC RESEARCH
SS SUPPLY / STORAGE
MD MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
CONCEPT PLAN A
ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS
DATE 31 JULY 94
SCALE: GRAPHIC
FIGURE IV-25
APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INIT.

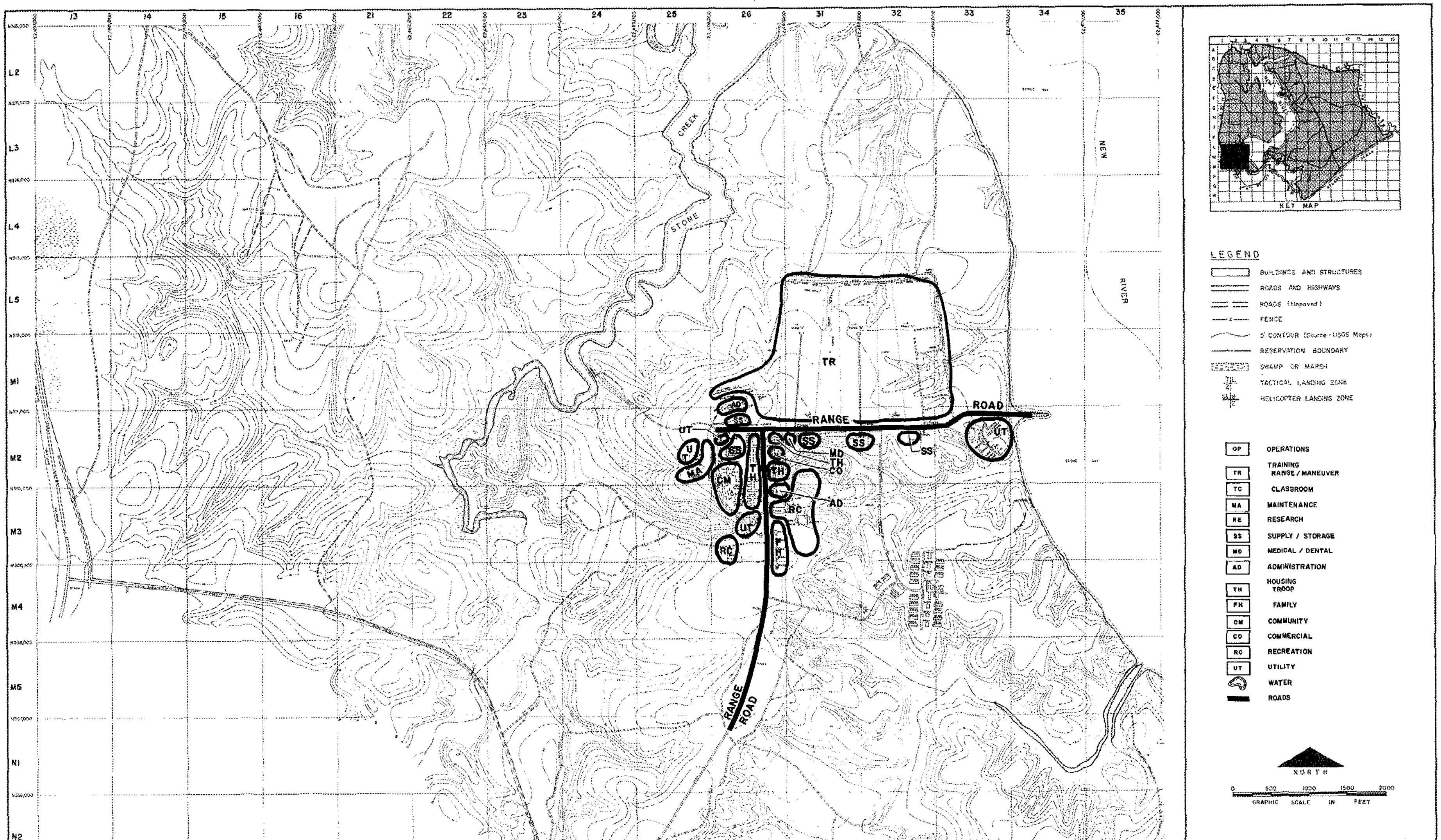
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN B

ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE IX-26

APPROVED/DATE



NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN A

RIFLE RANGE AREA
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | **FIGURE IV -27**

APPROVED / DATE

maintenance, supply/storage and range areas are in close proximity creating conflicts between the various uses.

Concept Plan B

Uses are significantly rearranged to produce a logical and efficient pattern of development (Figure IV-28); however, a large capital investment would be required to implement this concept. Housing is removed entirely from maintenance and supply/storage uses, which sit adjacent to the Range. Community and recreational uses buffer troop and family housing from one another. Administration is consolidated into one area, equidistant from housing and range-related work areas.

Concept Plan C

As a radical departure from the three above alternatives, Concept C would relocate the Rifle Range to a training area between the Hadnot and French Creek regimental areas. Relocation closer to the developed areas would negate the requirement for personnel support facilities to be maintained at the Rifle Range facility.

If the range facilities were relocated, it is proposed that the present Rifle Range facilities be converted for use as a new Combat Town facility or other training facilities. This is recommended for the following reasons: The area is isolated and adjacent to a large training and maneuver area, therefore, adjacent land uses would be compatible; expansion potential of present Rifle Range facilities is limited due to flood plains and steep slopes; and existing buildings would satisfy the requirement for a realistic, urban-like setting possessing functioning utilities.

Concept Plan A

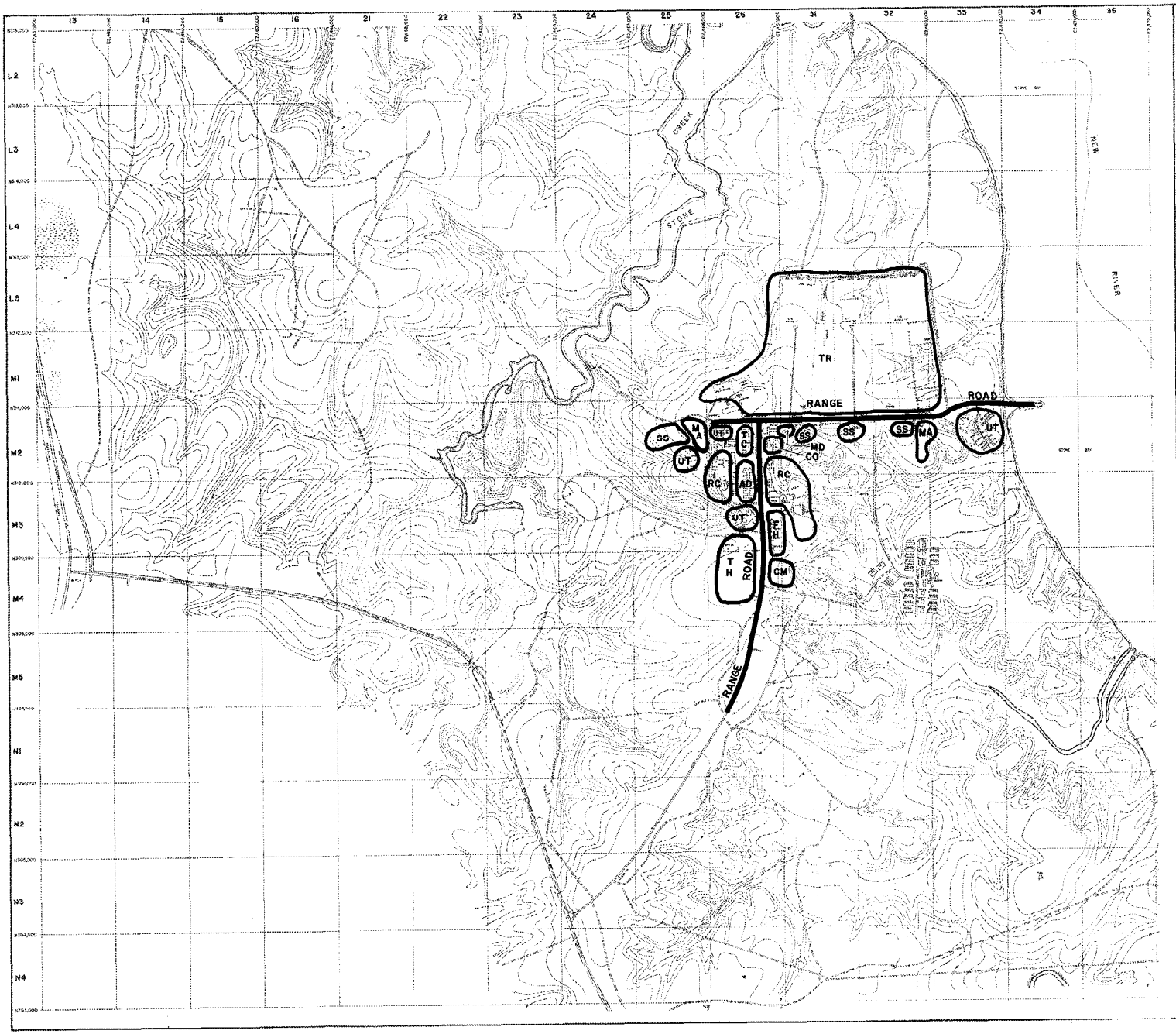
Concept Plan A retains the existing configuration of development (Figure IV-29) and shows a lack of any integrated pattern of development. Commercial, community and classroom training uses are scattered throughout the large area. One benefit, however, of retaining several separate housing and personnel support areas is that they can adequately accommodate unrelated tenants, possessing dissimilar missions.

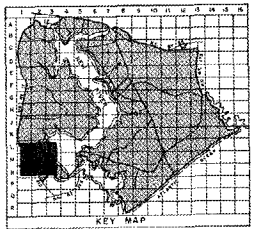
Concept Plan B

Concept Plan B (Figure IV-30) resolves some of the functional incompatibilities in land uses that are not resolved by Concept Plan A. The inadequate and substandard facilities existing in the southern half of Camp Geiger would be replaced entirely.

This concept presents an integrated, campus-like development that would provide separate facilities for unrelated tenants. Troop housing is surrounded by personnel support and training uses. Main administrative uses are centralized, with battalion-level administrative uses located adjacent to troop housing areas. Supply/storage and maintenance uses are located in the area between "E" Street and the Seaboard Coastline Railroad tracks. The Curtis Road Triangle area is developed as a "community center" in this concept, with "A" Street serving as the major north-south arterial.

In this concept, an Army Reserve Training Center is shown at the northern boundary of Geiger. This area is recommended due to its relative isolation, yet accessibility to personnel support facilities at Geiger, MCAS, New River and major transportation routes.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (UNPAVED)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
YC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INIT.

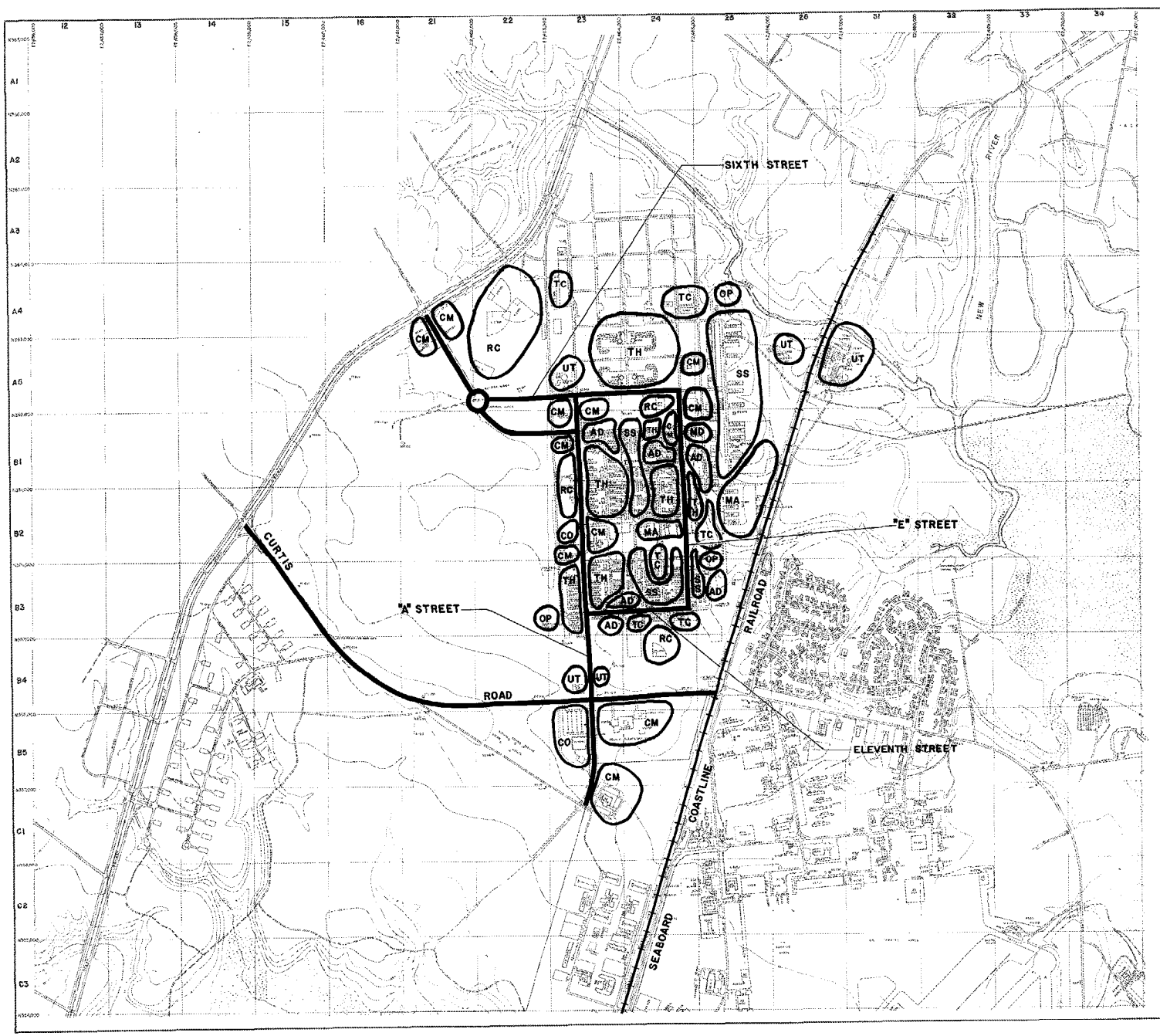
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

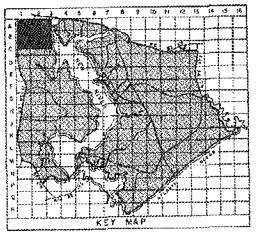
CONCEPT PLAN B

RIFLE RANGE AREA
EXISTING CONDITIONS

DATE: 31 JULY 84 | SCALE: GRAPHIC | FIGURE IV-28

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS
	RAILROAD

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INT.

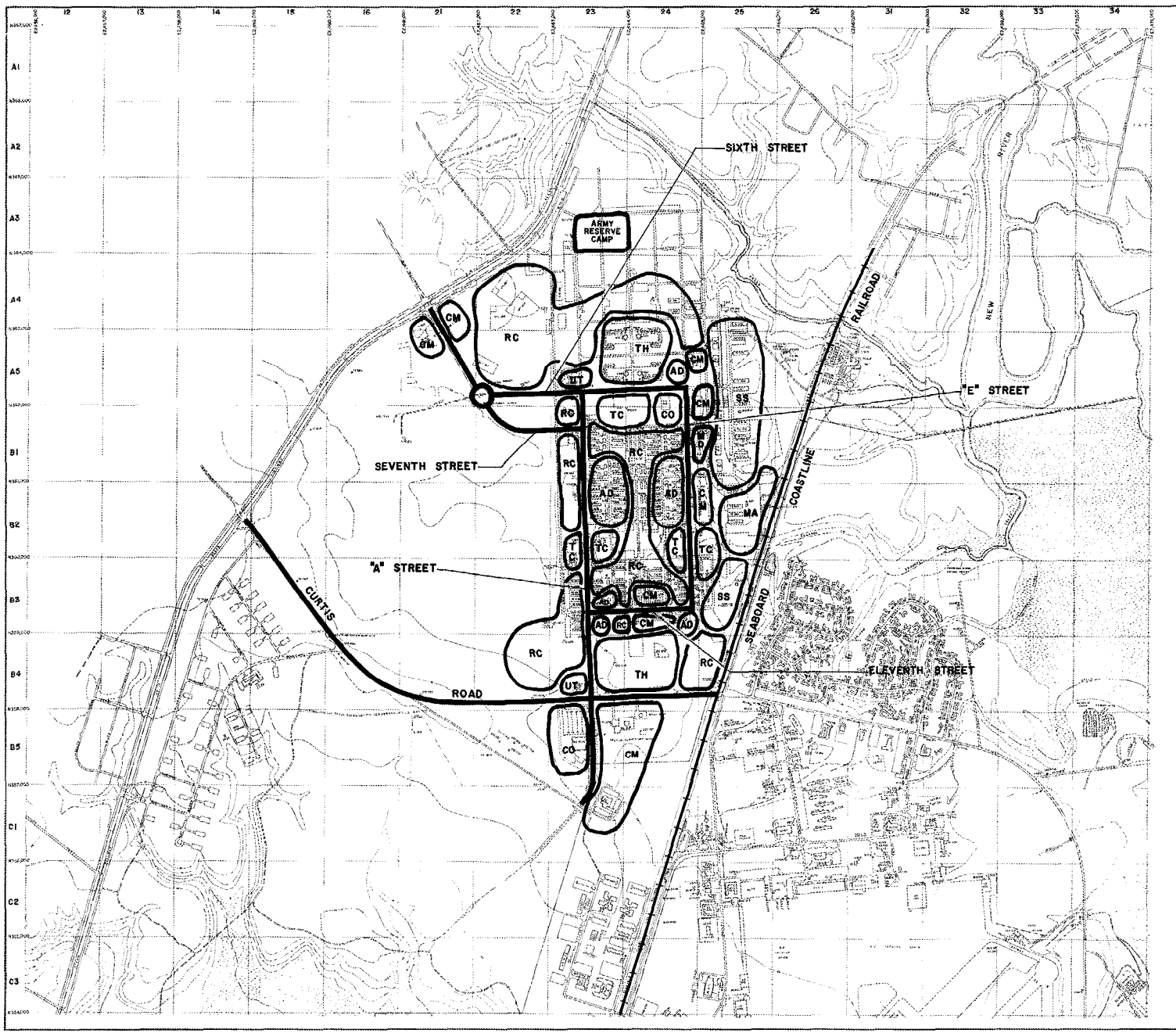
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

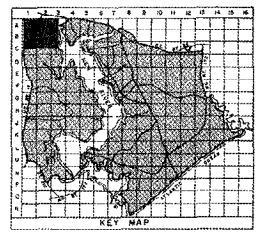
CONCEPT PLAN A

GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | **FIGURE IV-29**

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS
	RAILROAD

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INIT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN B

GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE IX-30

APPROVED / DATE

Concept Plan C

The only change presented in this concept plan relative to Concept Plan B is the relocation of the Field Medical Service School (FMSS) from Montford Point to Camp Geiger (Figure IV-31). This is proposed for several reasons. First, consolidation of the Drivers Training School with the rest of the Motor Transport School will strain land and facility capacities at Montford Point. Secondly, FMSS prefers for their students to train with Marine Corps personnel. FMSS prefers that their students reside and train alongside Marines in order to facilitate their adjustment into Marine Corps life. Since Camp Geiger has the squad-bay barracks, is closer to the Verona Loop training area, has adjacent isolated wooded areas for medical training, and has the capacity for additional berthing, storage and classrooms, the relocation of FMSS to Camp Geiger is presented as a viable alternative.

MONTFORD POINT

Concept Plan A

The existing arrangement of land uses is reflected by Concept Plan A (Figure IV-32). The only relocation of uses occurs in the case of the Motor Transport School, which had been planned for replacement adjacent to its present site but was relocated to a more isolated location closer to the Drivers Training Course.

Existing land use relationships are weak and unplanned, which detracts from the goal of a campus-like environment. Development is spread throughout the entire peninsula, which results in lengthy distances between uses. In addition, community and commercial uses are not planned adjacent to troop housing. Schools are distributed throughout a broad area and troops residing in one

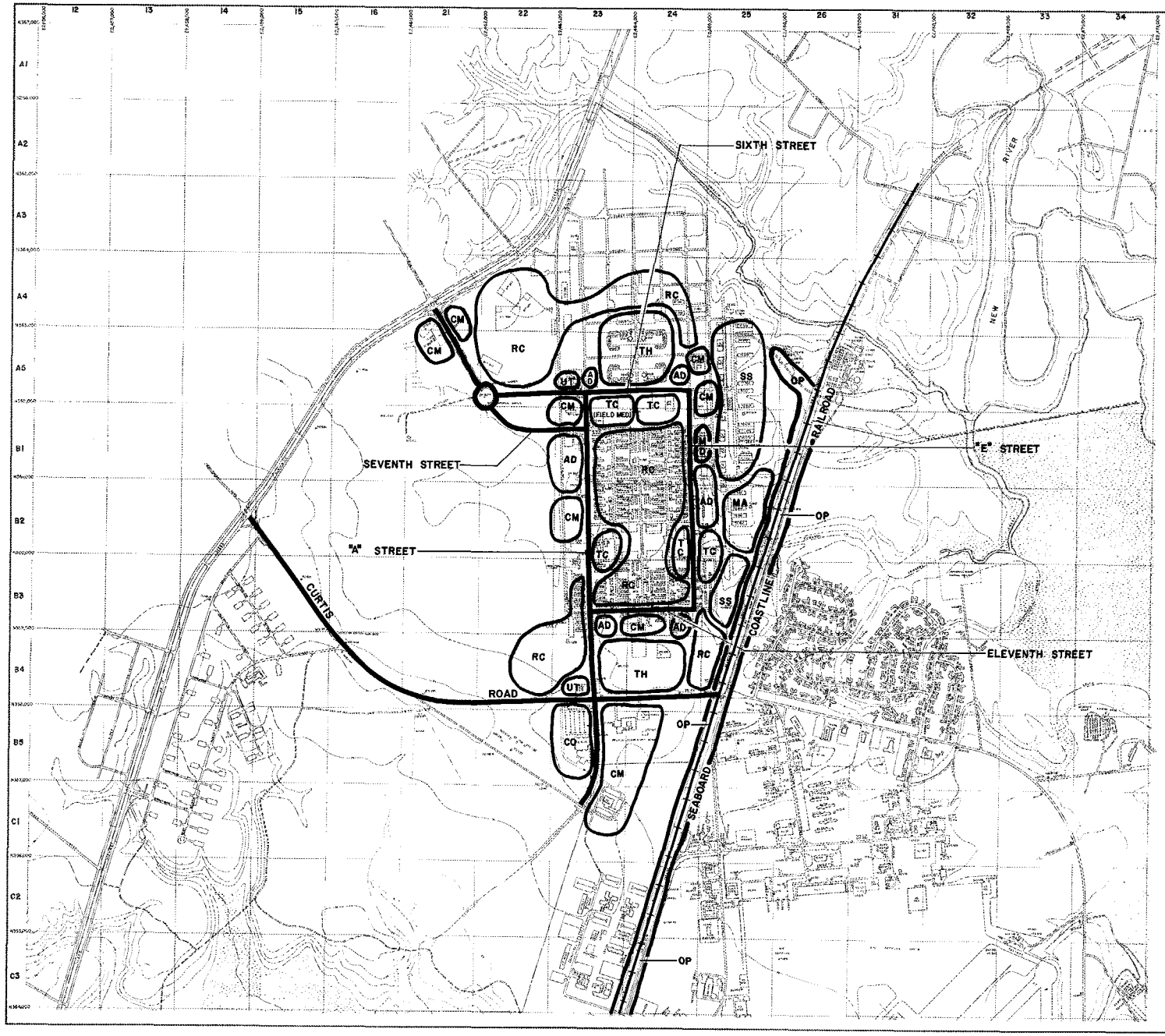
barracks may not necessarily be assigned to the adjacent school. Little definition amongst school facilities exists. Schools may share buildings, and personnel are mixed throughout the troop housing areas. As is the case for all three concepts, no development is planned in the Noise Zone.

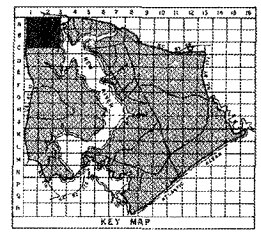
Concept Plan B

Concept Plan B differs dramatically from Concept Plan A (Figure IV-33). In this concept, it is assumed that the Field Medical Service School has been relocated to Camp Geiger. The developed area has been reduced to a much smaller area, creating a more dense and more efficient land use scheme in terms of walking distances and land utilization. Many substandard and inadequate existing facilities would be replaced through the implementation of this concept. Physical expansion is incorporated into this concept by locating facilities adjacent to open undeveloped areas.

This concept promotes distinct areas designed to be occupied by a particular school. Nearby schools share common needs and activities. As a rationally-integrated development, the campus-like theme is reinforced. Student housing is segregated from officer housing, although they are joined by a common open space area. The waterfront is set aside for mostly passive recreation; however, a small portion is retained for operational motor vehicle access by the Motor Transport School.

By increasing the density of the built environment at Montford Point, the size of the Drivers' Training Course could nearly double in size. Construction of the Route 17 Bypass could reduce the isolation of this training area, but it could also quicken access to Verona Loop and other areas. A separate entrance road to the Motor Transport School buildings is included in Concept Plan B.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS
	RAILROAD

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INT

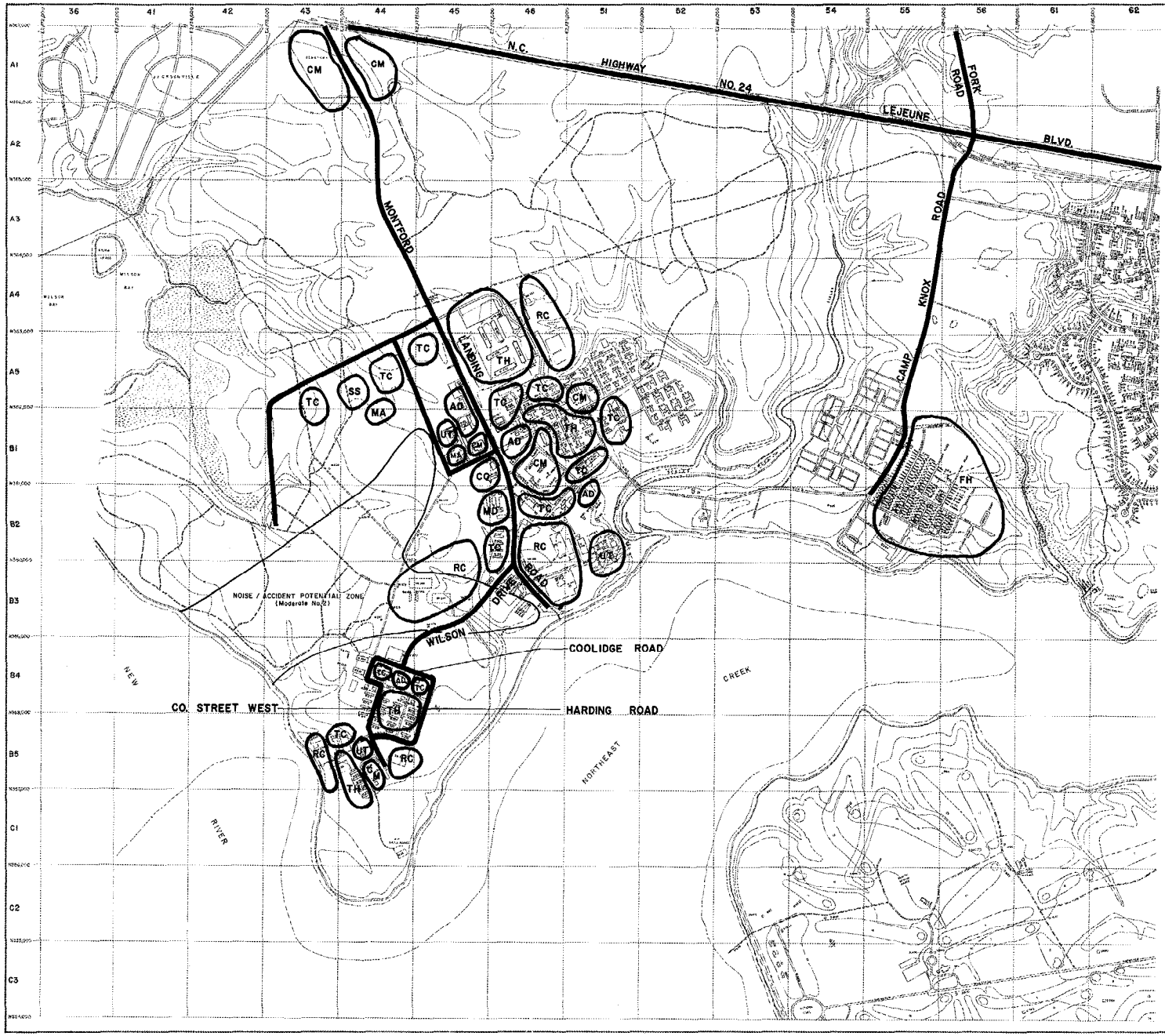
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

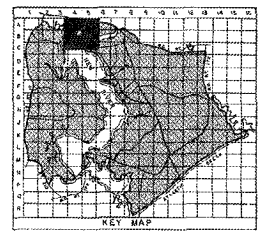
CONCEPT PLAN C

GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE IV - 31

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

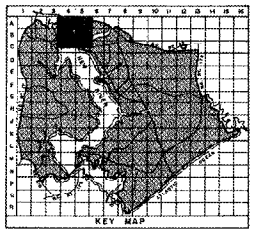
NO	DESCRIPTION OF REVISION	DATE	INIT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN A

MONTFORD POINT AND VICINITY
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE: GRAPHIC	FIGURE IV - 32
APPROVED / DATE		



LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN B

MONTFORD POINT AND VICINITY
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE: GRAPHIC	FIGURE IV - 33

APPROVED / DATE

Concept Plan A

The existing arrangement of land uses is reflected by Concept Plan A (Figure IV-34). The Maintenance and Storage/Supply areas, located south of Beach Road along Ocean Drive, are expanded somewhat to accommodate the 2d Reconnaissance Battalion's MILCON projects (Combat Vehicle Shop, Comm Elec Shop) scheduled to begin in FY-90.

Generally, the land uses are consolidated in one area with the exception of recreation and community facilities which are dispersed along Beach Road.

Concept Plan B

Concept Plan B allows for expansion of community facilities, administration, training areas, troop housing, supply/storage and maintenance uses to accommodate the assignment of the 2d Reconnaissance Battalion to the Beach area. (Figure IV-35). This recommendation is based on logistical, training and security considerations. Substandard and inadequate existing facilities would be replaced through implementation of this concept.

A significant portion of the battalion's training requires work at the beach and in the open ocean. Centralizing the battalion's facilities would reduce costs of transporting personnel and equipment, increase time available for scheduling of training exercises, eliminate potentially hazardous transportation of pressurized equipment, and enhance protection of the base shoreline.

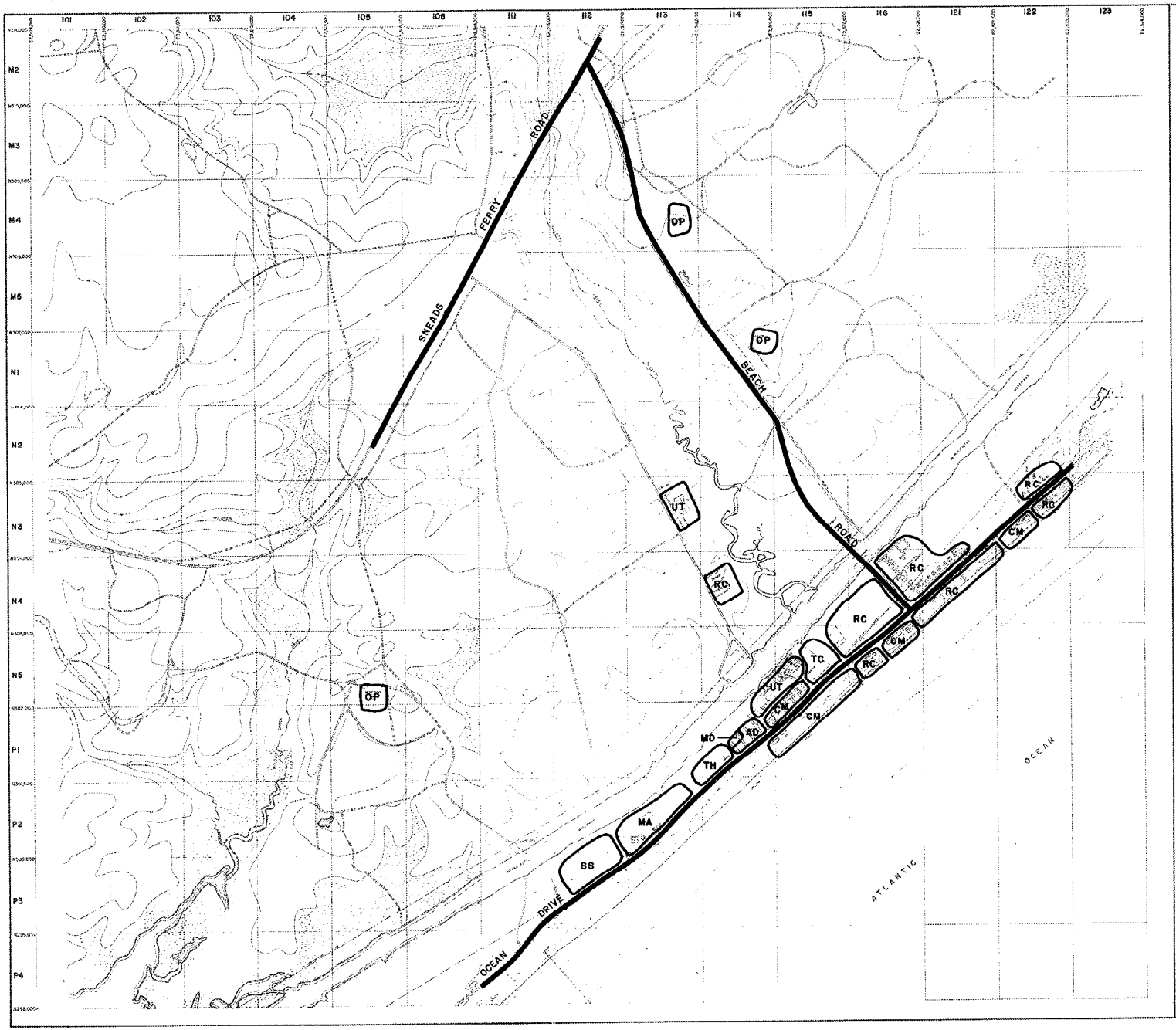
Recreation areas are expanded along Ocean Drive to the Atlantic Ocean and at the intersection of Beach Road and Ocean Drive. By concentrating recreation uses along the northeastern end of the beach, visitors are less likely to enter troop activity areas, supply/storage and maintenance areas on the southwestern stretch of Onslow Beach.

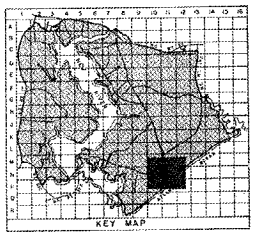
Supply/storage, maintenance and training uses are located at the southwest end of the Onslow Beach development, away from public and troop recreation, troop housing and community facilities. A buffer area should be maintained between Ocean Drive and maintenance and supply/storage areas.

Administrative and medical land uses are accessible from Ocean Drive along the northeastern part of development at Onslow Beach. Community facilities, adjacent to administrative and medical areas, are centrally located in relation to troop housing, classrooms and other land use areas at Onslow Beach.

LAND USE PLANS

The Land Use Plans for future physical development at the Marine Corps Base are described below and are shown on Figures IV-36 through IV-42. Each Land Use Plan is the result of the analysis of facility requirements, planning factors, and comments provided by the activity as a result of their review of alternate Concept Plans. The Land Use Plans represent the most logical and efficient use of the activity's assets given assigned missions, available resources, and physical and operational constraints. They provide a sound basis for directing growth and change, and have been used to site Capital Improvements Program projects.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

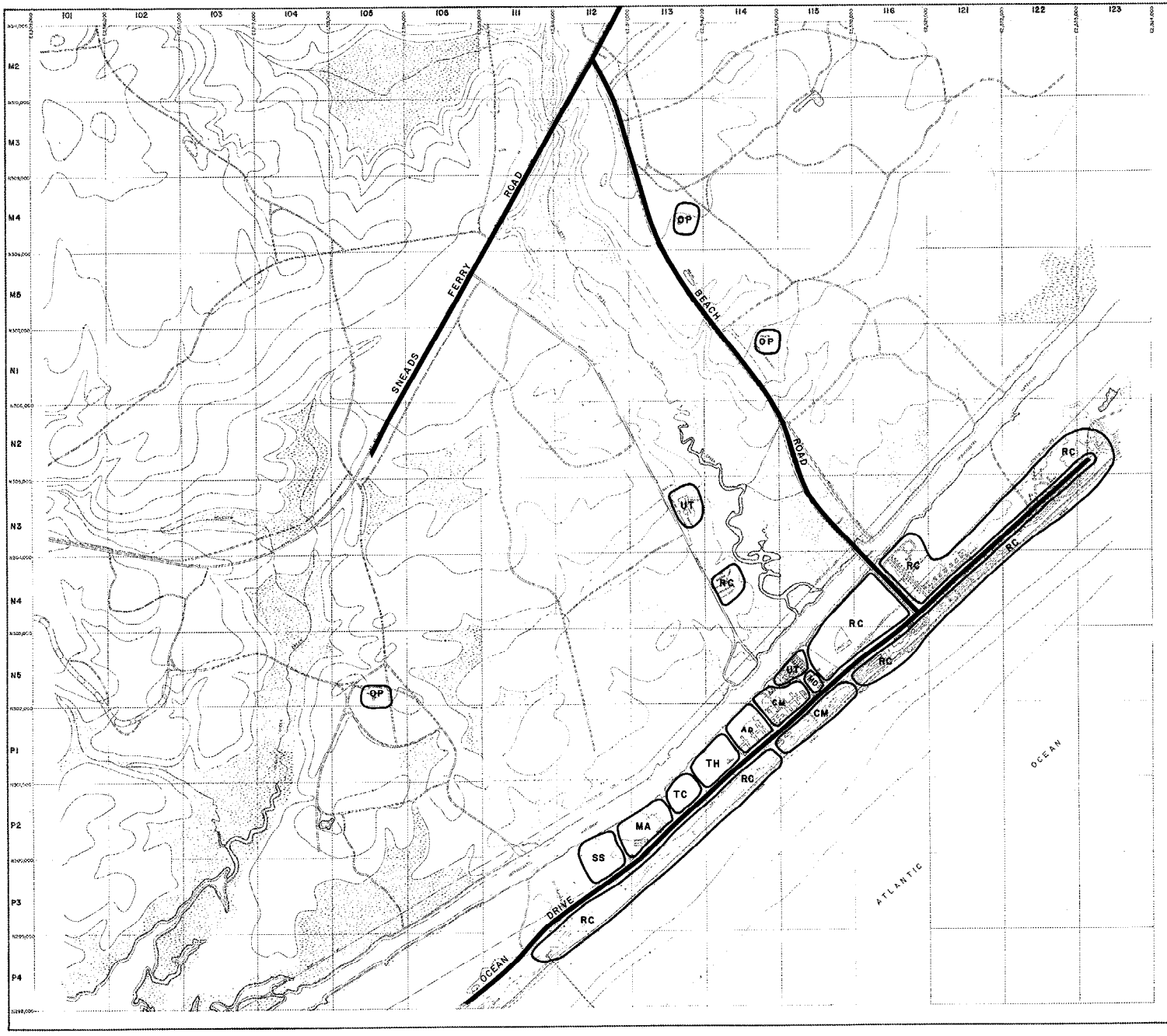
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

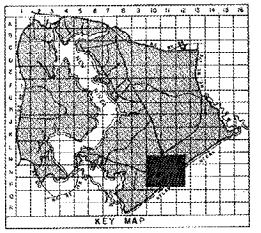
CONCEPT PLAN A

BEACH AREA AND VICINITY
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE IV-34

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
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UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INIT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN B

BEACH AREA AND VICINITY
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE IX-35

APPROVED / DATE

HADNOT POINT

The pattern of land uses shown in the Land Use Plan for Hadnot Point (Figure IV-36) improves upon the arrangement of existing uses, resolving incompatibilities and promoting the overall attractiveness of Hadnot Point. All of the Master Plan development goals and objectives are achieved in this approach.

The visual appearance of the area will be enhanced by establishing a greenway along Holcomb Boulevard. In addition to creating a more formal character for the entrance road, the greenway will buffer parking and the less attractive work areas from view. Expanded areas for commercial, administrative and community facility uses are located in close proximity to Holcomb Boulevard and the parade ground for high visibility and easy access. Medical/dental uses have been consolidated on a site adjacent to the Post Office which provides additional space, high visibility and direct access from the Main Service Road and Louis Road.

Supply uses act as a buffer for the large maintenance areas which are generally located to the east of Center Road. By concentrating intensive uses into this area, more efficient use can be made of land resources. In this location, such uses are compatible with adjacent maintenance facilities located in French Creek. Other, smaller concentrations of supply and maintenance uses are designated close to troop housing to fulfill special troop and equipment readiness requirements.

The New River Shoreline offers a unique opportunity for providing additional acreage for passive recreation. The more active recreational areas are linked together by developing a segregated pedestrian/running course. Developed areas should be oriented to the waterfront which provides a scenic focus.

Traffic circulation will be improved within the Hadnot Point area with the completion of three road construction projects. Piney Green Road will extend northward from Louis Road to provide a second direct link between Hadnot Point and NC Route 24. This will alleviate existing traffic congestion on Holcomb Boulevard and improve safety by promoting the separation of service vehicles and automobiles. In addition, Duncan Street will be extended to provide another access east of Louis Road to serve the large maintenance area. Another new road, located west of Holcomb Boulevard, will provide direct access into the Exchange Complex and other facilities to the south, thus diverting these trips off Holcomb Boulevard.

HOSPITAL POINT

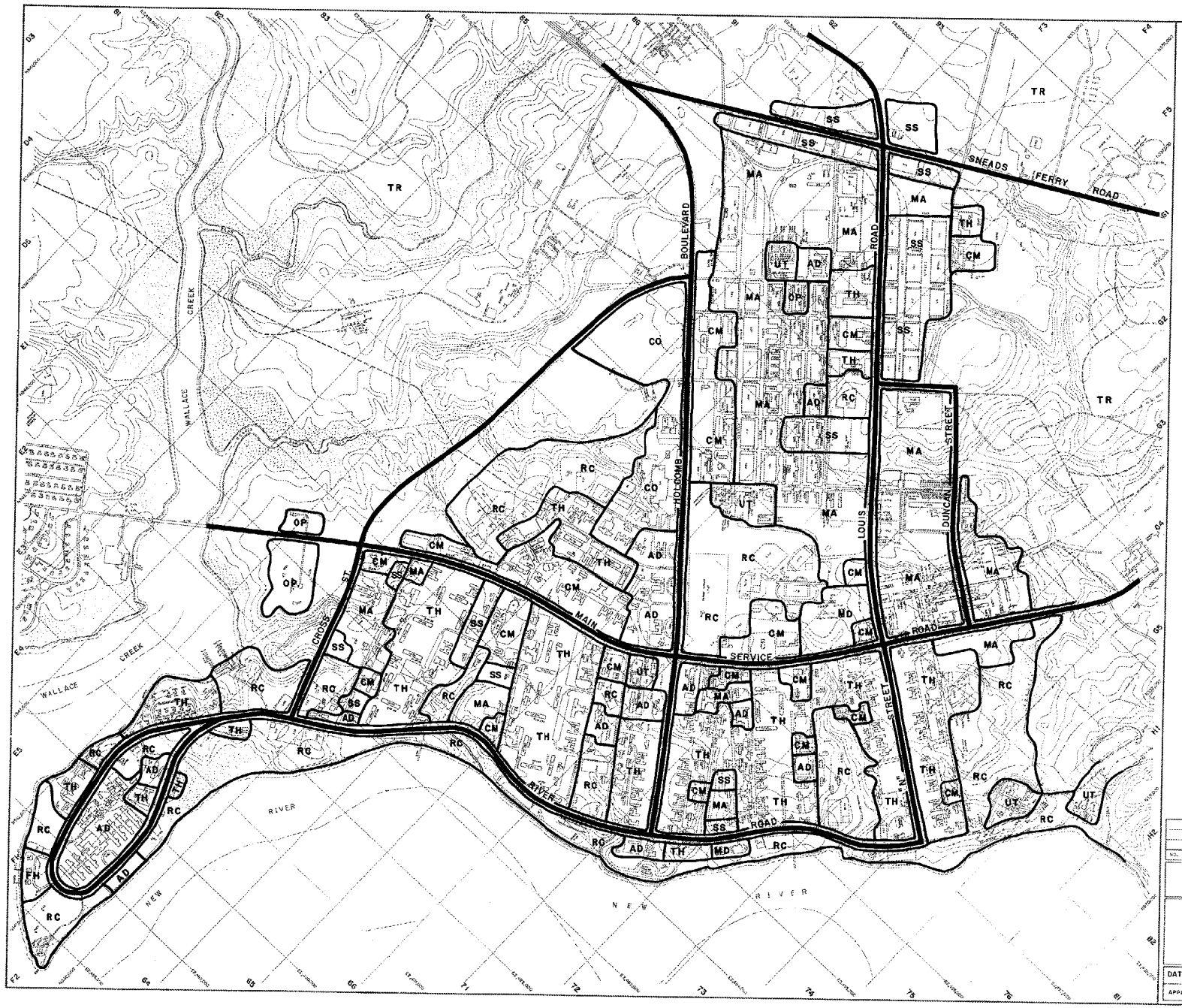
Despite the conversion of major facilities in this area from medical to administrative activities, the character of Hospital Point will remain largely unchanged. Existing uses, including troop and family housing, will continue to support this function. Picturesque open space/recreation areas along the New River, will remain easily accessible for residents and daytime personnel.

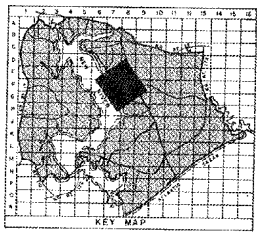
PARADISE POINT

With no new uses proposed for this area, the predominately low density residential and recreational character of Paradise Point will be maintained. Stone Street Elementary will continue to serve dependents from this area.

BERKELEY MANOR/WATKINS VILLAGE

The existing medium density residential character of this area should be retained since these neighborhoods are located near work areas and other essential community resources such as schools,





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INIT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN

HADNOT POINT AREA
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE IV-36
APPROVED / DATE		

recreation and shopping facilities. The new dependent high school is being constructed immediately west of these housing areas and adjacent to the rehabilitated junior high facility. Heavy traffic volumes currently impacting Stone Street will be reduced when improvements are completed at the intersection of Brewster and Holcomb Boulevards, thus returning Stone Street to its intended neighborhood collector status. Brewster Boulevard will be extended in conjunction with the construction of the commissary warehouse to provide an additional linkage to Piney Green Road and NC Route 24.

MIDWAY PARK

Family housing is recommended to remain the predominate land use in this area with community and recreational uses near the Midway Park entrance continuing as the neighborhood focus.

TARAWA TERRACE I AND II

Residential uses at established densities should be preserved in the Tarawa Terrace area since this location offers neighborhood amenities, including two elementary schools, in a setting buffered by recreational and natural wooded areas.

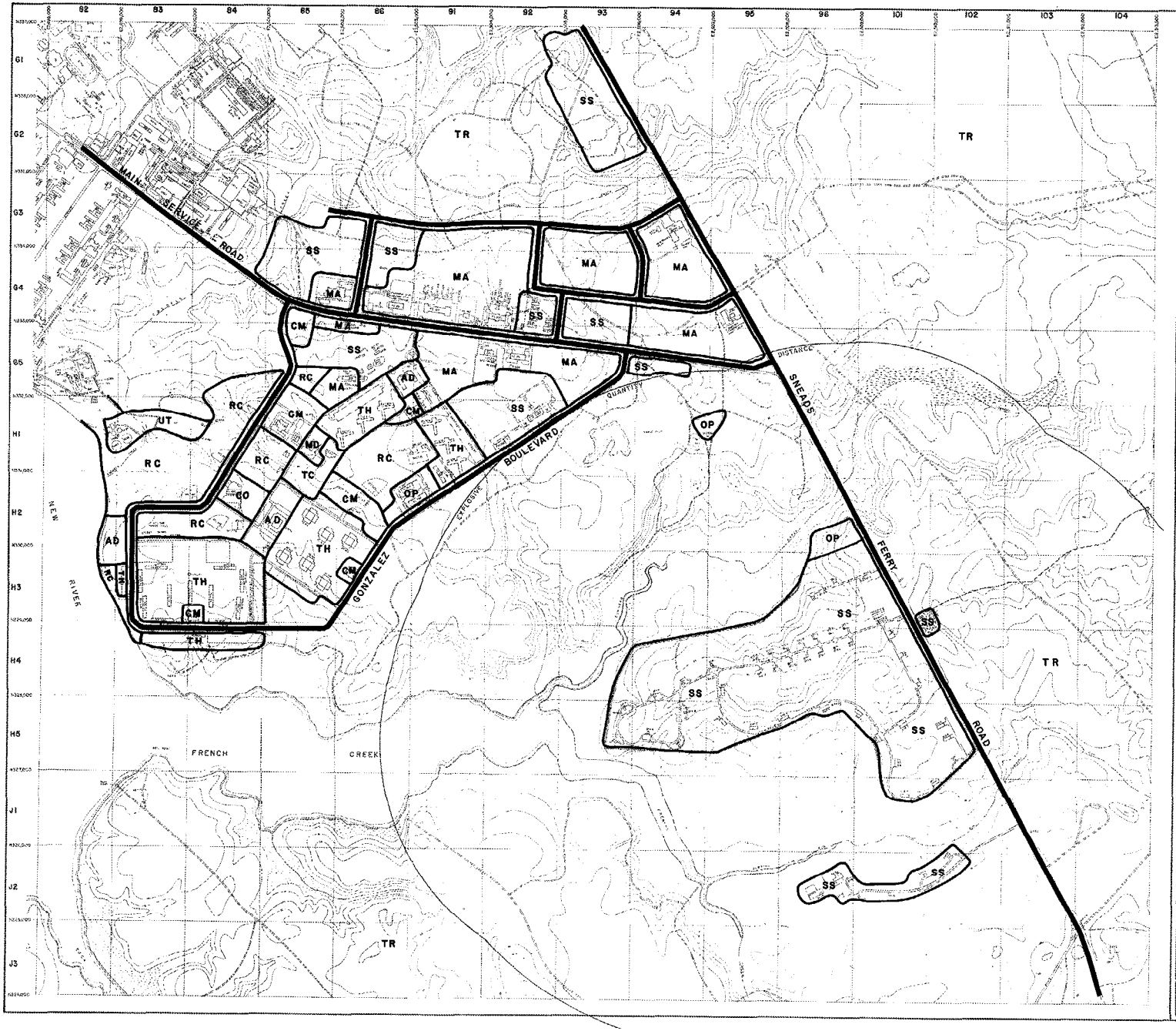
FRENCH CREEK

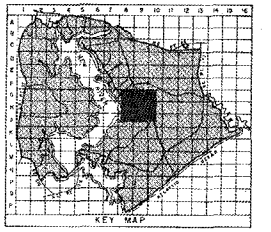
The Land Use Plan for the French Creek area is intended to reinforce the campus-like development pattern which resulted in logical and orderly growth during the past decade. Land use

relationships remain basically unchanged from existing patterns as shown on the Land Use Plan for French Creek (Figure IV-37).

The exceptions are supply/storage uses which are relocated from Gonzalez Boulevard to the Main Service Road area. By consolidating heavy industrial-related uses north of the Main Service Road, lighter, cleaner industrial uses located south of the Main Service Road would serve as a transitional zone to adjacent personnel support facilities. Included in the large work area north of the Main Service Road would be a "Deployment Area." This would centralize storage and administrative facilities adjacent to a large open space. Circulation within this industrial area will be provided by new roads with direct access from Sneads Ferry Road, thus eliminating some vehicles from the Main Service Road. Other planned roadway improvements include the widening of Sneads Ferry Road to 4 lanes and improvement of its angular intersection with the Main Service Road. Ordnance storage areas are grouped to the southeast with the development area outside of the explosive safety quantity distance arc.

Personnel support activities are separated from more intensive industrial uses. Troop housing is located in close proximity to training classrooms, recreation areas, medical/dental clinics and administrative buildings. Community facilities are well integrated within this area. A new fire station site, at the intersection of Gonzalez Boulevard and the Main Service Road, will improve response time to French Creek's industrial, ordnance storage, and personnel support areas. The passive greenway, recommended in the Land Use Plan for Hadnot Point, is extended to provide a pedestrian/running course along the New River Shoreline, linking Hadnot Point with the French Creek recreation area.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN

FRENCH CREEK AND MAGAZINE AREAS
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE IV-37
APPROVED / DATE		

COURTHOUSE BAY

The pattern of land uses shown in the Land Use Plan for Courthouse Bay (Figure IV-38) improves upon existing functional relationships by consolidating administrative uses formerly separated between the AMTRAC and Engineers' School operations. A larger and more visible location is designated at the intersection of Marines and Sneads Ferry Roads. AMTRAC work activities would continue to be concentrated on the Western side of the Bay where noisier, industrial uses can be expanded without affecting the quality of the eastern side for residential, classroom and recreational uses.

Commercial, community and medical facilities are consolidated and centralized relative to troop housing and training classrooms. For example, the Branch Medical Clinic is moved further north on Marines Road, away from the floodline and in a location which is more accessible to barracks and work areas. Similarly the new Enlisted Club is planned in a more central location which takes advantage of a waterfront view.

MILE HAMMOCK BAY

No changes in the existing land use pattern of this area are recommended since the dock facility and undeveloped trails should adequately meet future requirements for troop training on heavy equipment.

ONSLOW BEACH

The Land Use Plan for Onslow Beach (Figure IV-39) provides for expanded recreational opportunities at the northeastern end of Ocean Drive and for improved troop activity areas

concentrated southwest of Beach Road. Expansion of the existing recreational area reduces the number of visitors entering troop areas. Permanent assignment of the 2nd Reconnaissance Battalion is accommodated by expanding land use areas which would accommodate facility requirements in a more functional pattern. Community facility areas are consolidated to allow for the future construction of a new mess hall. Expanded supply/storage and maintenance areas, essential to improving the logistics and safety of the battalion's training program, are located next to classrooms which serve as a transition to troop housing. These intensive uses should be buffered to protect the visual character of Ocean Drive.

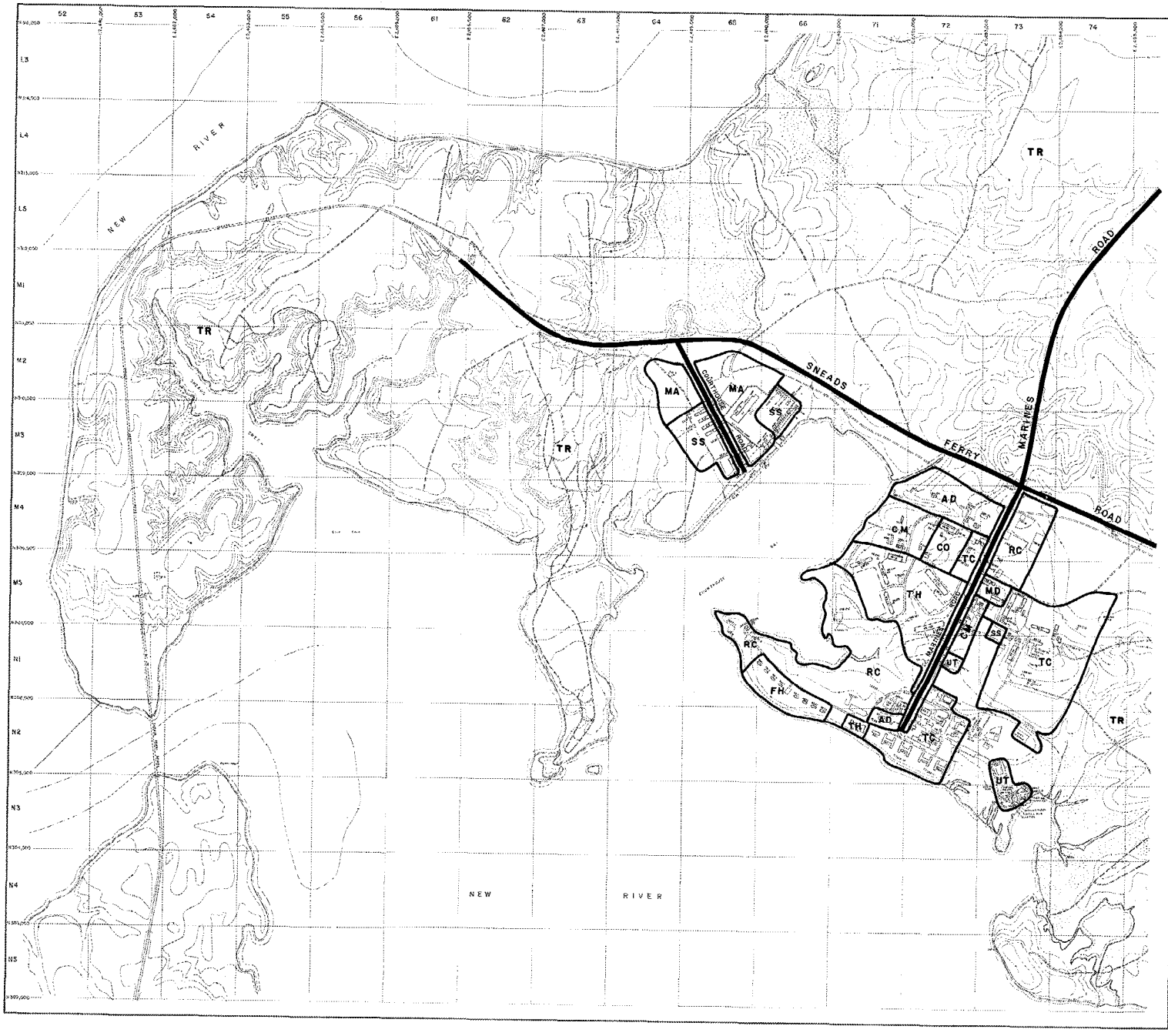
RIFLE RANGE

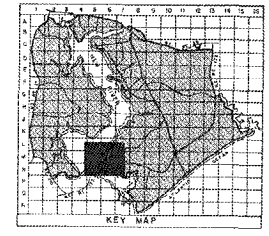
The Land Use Plan for the Rifle Range reflects the existing pattern of land uses which provides easy access to the large training range and adequately accommodates future training and support requirements (Figure IV-40).

CAMP GEIGER

The Land Use Plan for Camp Geiger (Figure IV-41) addresses functional incompatibilities resulting from the existing arrangement of land uses. The need to replace inadequate and substandard facilities located in the Southern half of Camp Geiger provides an opportunity to implement an integrated, campus-like development.

The identity of unrelated tenants is maintained by providing separate activity areas. Troop housing is surrounded by personnel support facilities including battalion training and administrative uses.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source -USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE/MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

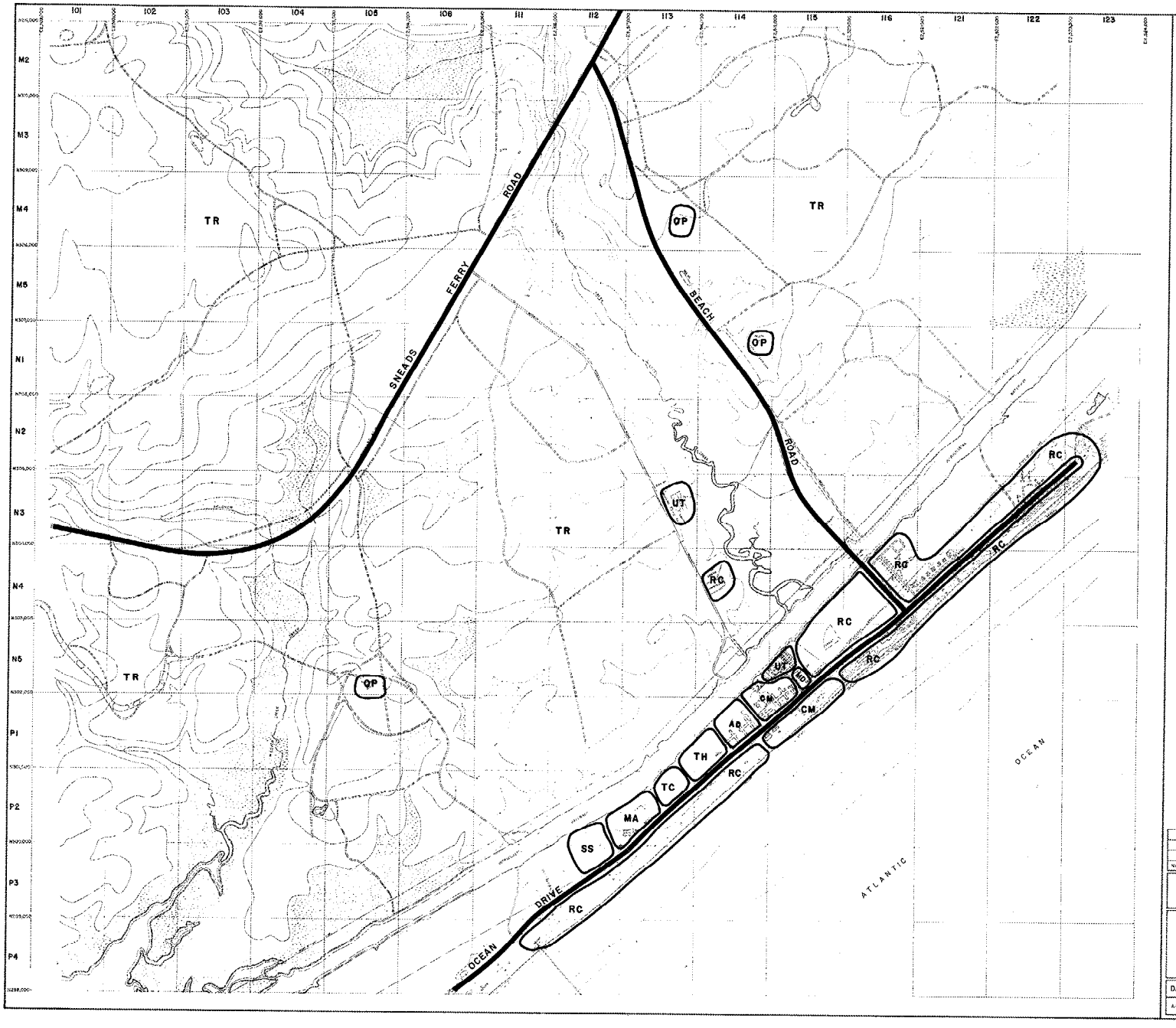
NO.	REVISION BY DIVISION	DATE	APP'D

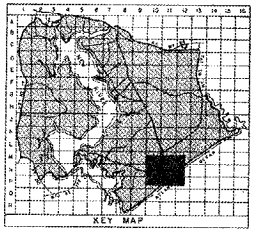
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN

ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE IX-38
APPROVED / DATE		





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE

QP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	REVISIONS OF PREVIOUS	DATE	INIT.

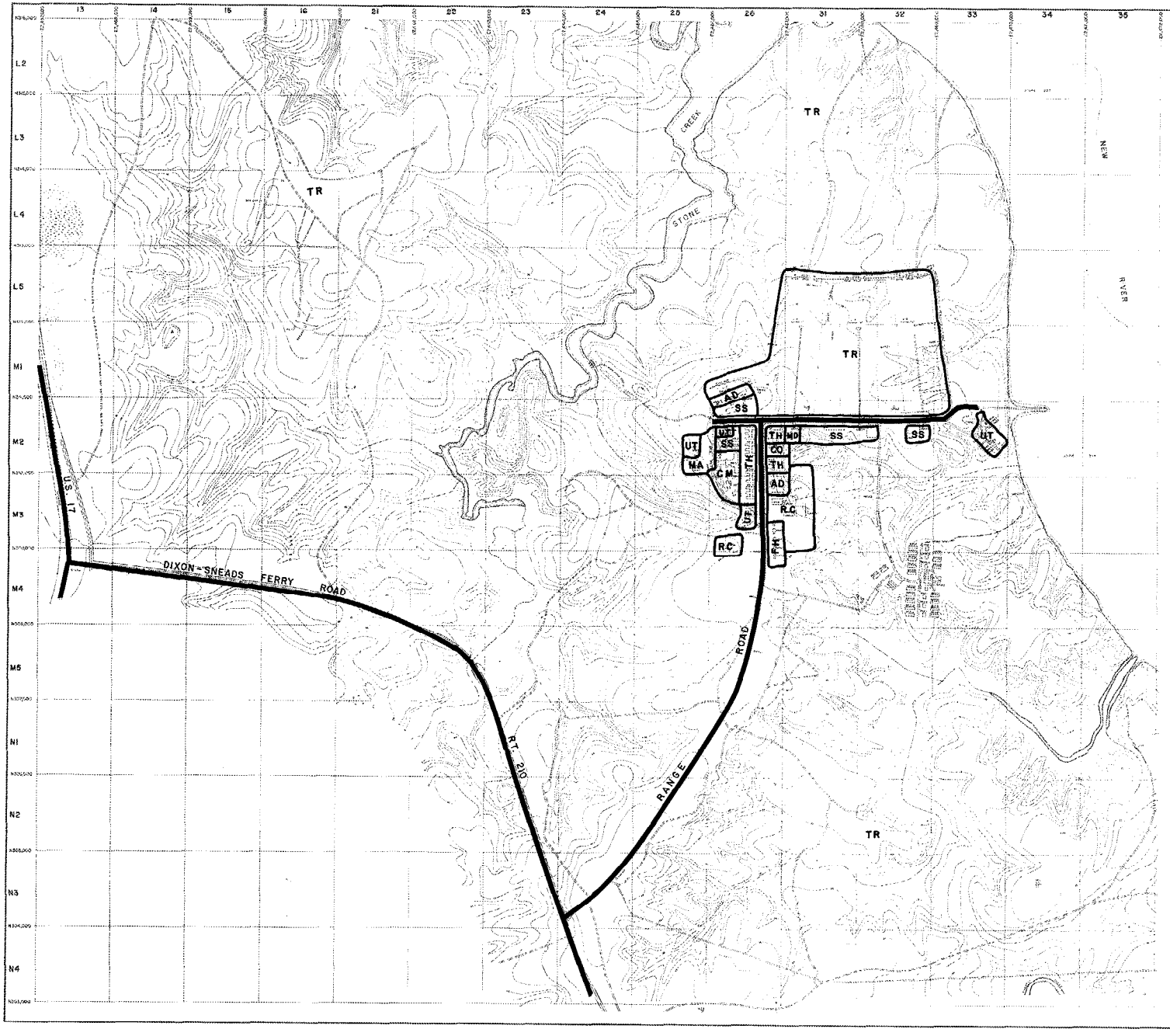
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN

BEACH AREA AND VICINITY
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE IV-39

APPROVED / DATE


TR
STONE CREEK
NEW RIVER
AD
SS
UT
MA
CM
TH
CO
RC
MD
FH
DIXON-SNEADS FERRY ROAD
US 17
RT 210
RANGE ROAD
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (unpaved)
FENCE
5' CONTOUR (Source - USGS Maps)
RESERVATION BOUNDARY
SWAMP OR MARSH
TACTICAL LANDING ZONE
HELICOPTER LANDING ZONE
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MD MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
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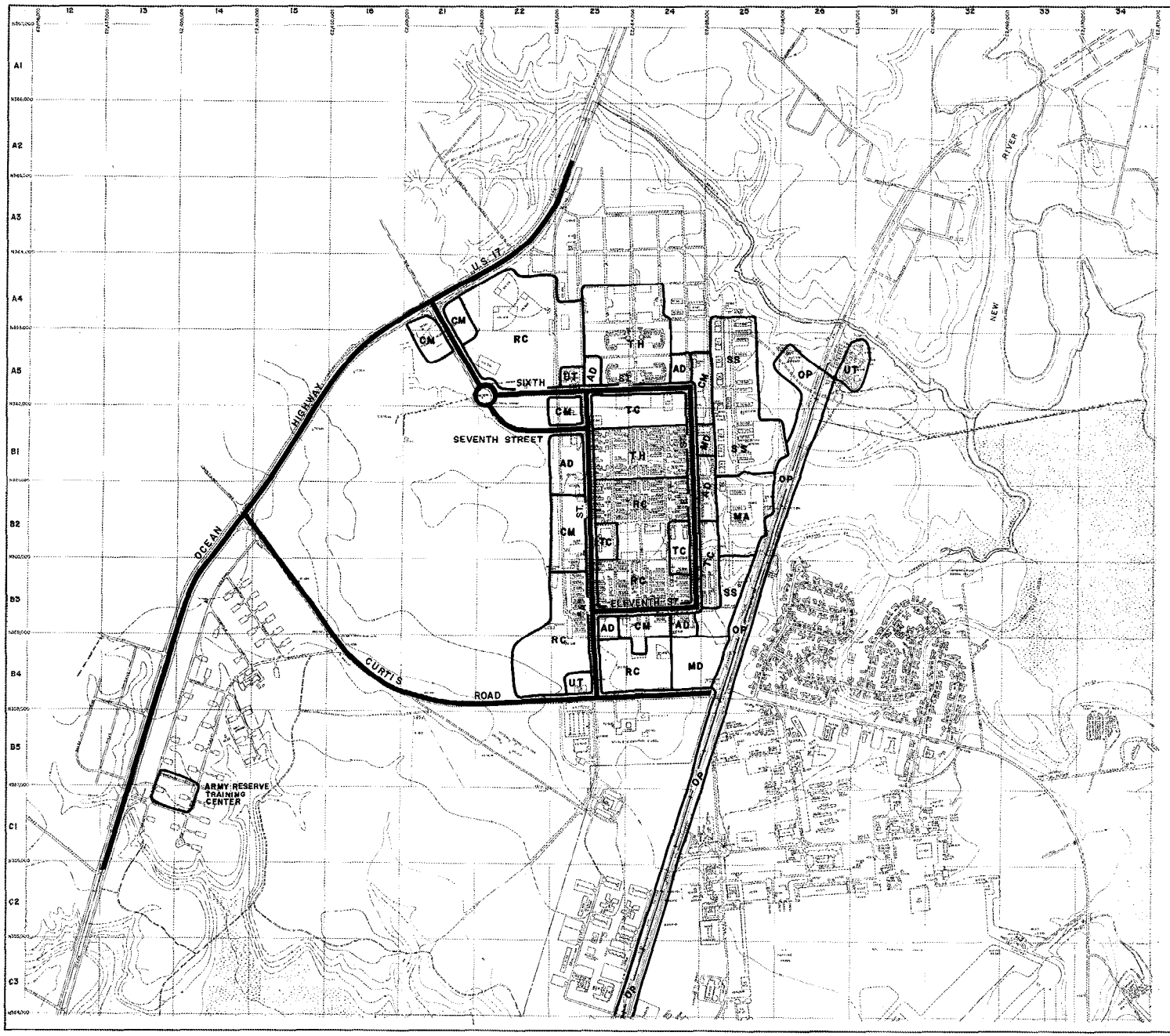
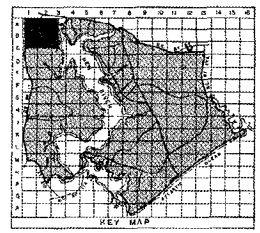
GRAPHIC SCALE IN FEET
NO. DESIGNATION OF REVISION DATE INT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAND USE PLAN
RIFLE RANGE AREA
EXISTING CONDITIONS
DATE: MAY 1986
SCALE: GRAPHIC
FIGURE IV-40
APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN

GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE IX-41

APPROVED / DATE

All remaining personnel support uses are centralized in locations easily accessible to all tenants. Likewise, supply/storage and maintenance uses are concentrated in the industrial area between "E" Street and the Seaboard Coastline Railroad tracks which reduces conflicts between personnel support and work activities. The Curtis Road triangle area is developed as a "community center", with "A" Street serving as the major north-south arterial.

In addition to accommodating the new School of Infantry at Camp Geiger, the Plan also provides for the relocation of the Field Medical Service School (FMSS) from Montford Point. FMSS students would be more fully integrated with Marine Corps personnel, facilitating their adjustment and training. Camp Geiger also offers locational and environmental advantages for medical training as well as adequate space to meet facility requirements.

MONTFORD POINT

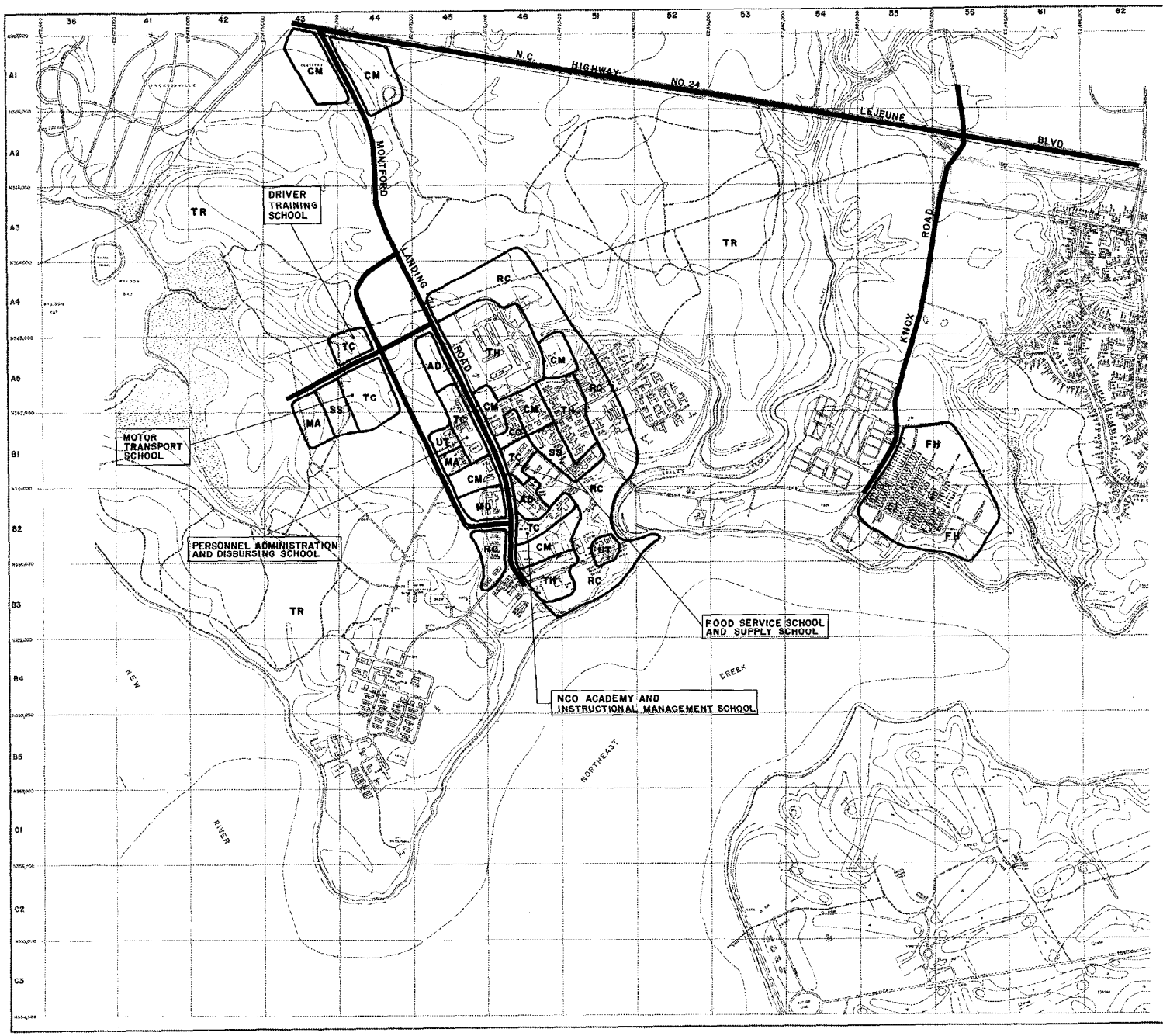
The Land Use Plan for Montford Point (Figure IV-42) organizes the existing weak and unplanned land use relationships into a campus-like environment. Since the needs of the Field Medical Service School (FMSS) are more effectively met at Camp Geiger, this particular activity is not incorporated in the Plan for Montford Point. Those schools remaining include the Motor Transport School, Driver Training School, Supply School, Personnel Administration/Disbursing School, Food Service School, NCO Academy, and Instructional Management School.

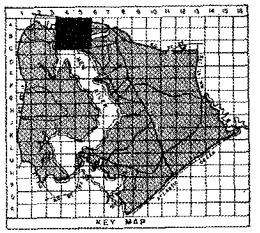
The developed area is reduced to a much smaller size, creating a more dense and efficient land use scheme in terms of land utilization and walking distances. Many substandard and inadequate existing facilities are replaced. By locating new facilities adjacent to open, undeveloped areas, future physical expansion needs can be easily accommodated.

As a rationally-integrated development, the campus-like theme is reinforced. Distinct areas are designated for occupancy by a particular school which promotes their visibility and identity. The overall development pattern emphasizes compatibility of adjacent land uses and the close proximity of schools which share common needs and facilities. For example, the Motor Transport School is relocated to a more isolated site closer to the Driver Training School and Training Course. Those schools requiring computer equipment are located in close proximity to facilitate shared use. Community and commercial uses are planned near student housing. A common open space area separates troop and officer housing. The waterfront is designated for mostly passive recreation; however a small portion is retained for operational motor vehicle access by the Motor Transport School.

By increasing the density of the built environment at Montford Point, the Driver's Training Course nearly doubles in size. Circulation and traffic safety would be improved by constructing a separate entrance road to serve the Motor Transport and the Driver Training Schools. Construction of the Route 17 Bypass could reduce the isolation of these training facilities and quicken access to Verona Loop and other areas.

Because of the weaknesses associated with the existing land use pattern, development of a campus-like environment at Montford Point will require an extended timeframe for implementation. As existing facilities require replacement, the Land Use Plan should be used as a guide when new





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN

MONTFORD POINT AND VICINITY
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE IX-42

APPROVED / DATE

site locations are sought. Achievement of the land use arrangement set forth in the Plan can be undertaken in phases which coincide with the implementation schedule of the Capital Improvement Program.

SUPPORTING UTILITIES PLANS

The utilities serving the Marine Corps Base and incorporated into Supporting Utilities Plans include the water system, wastewater collection and treatment, electrical distribution system and central heating system. An analysis of existing facilities and deficiencies was presented in the Existing Utilities element of the Planning Analysis effort. The Supporting Utilities Plans indicate future improvements that will be required in order to alleviate existing system deficiencies and to support changing utility needs based upon land use and site development plans.

Most of the programmed CIP projects for the Marine Corps Base Activity are located near existing utility lines with adequate capacity, thus requiring only on-site utility improvements. More detailed information regarding required system improvements is provided in the CIP document and on Site Location Maps (Scale: 1" = 200'). It should be noted that system extensions and relocations were designed based upon appropriate NAVFAC design manuals. However, these should not be construed as final designs. Detailed utility design studies should be undertaken in conjunction with the individual project design.

Water Usage

Projected population over the planning period is not expected to change significantly from current levels (see Table III-1). Therefore, future water demand will continue to resemble present levels. As new facilities are constructed there will be some shifting of the population among the developed areas, especially in the Hadnot Point and French Creek areas where many of the Base activity's planned construction projects are located. However, no significant impacts on major components of the water system are expected.

Water Source

Government-owned water wells supply all water for the Camp Lejeune Complex. The State of North Carolina criteria requires that the combined yield of all well fields be sufficient to provide the average daily demand within a 12-hour pumping period. The Hadnot Point - French Creek and Tarawa Terrace fields fail this criteria by 1296 GPM.

A program to replace ten out-of-service wells, three operational wells, and to rescreen two wells is in progress. Additionally, ten new wells are being constructed for the Holcomb Boulevard Treatment Plant and ten new wells for the Hadnot Point - French Creek area. Implementation of these projects should allow the State criteria to be met. Additional recommendations include a new 3000 GPM well at Courthouse Bay and additional stages be placed in Wells BB-220 and BB-221. Upon completion of the above projects, water sources will be considered adequate for existing and planned facilities.

Water Treatment

Construction is presently underway to upgrade the Holcomb Boulevard plant from 2 MGD to 5 MGD. Under this project the Tarawa Terrace and Montford Point water treatment plants will be abandoned. Water for these areas will be supplied by the Holcomb Boulevard plant. The high service pumps at Montford Point will be removed, but the ones at Tarawa Terrace will remain in service. When the above upgrade is completed, all plants at Marine Corps Base will be adequate for existing and planned facilities (see Table IV-11).

Water Storage

There are no water storage deficiencies at the Marine Corps Base for existing and planned facilities. An indicated deficiency at Courthouse Bay (see Table IV-15) has been corrected by the recent construction of a new 325,000 gallon elevated tank in the Amphibian Area.

Water Distribution

Inadequate residual pressures under fire-flow conditions at three locations were noted in the EXISTING UTILITIES analysis. These locations include the Parachute Tower, the 200 area at Montford Point, and Building BA-115 at Onslow Beach. All of these facilities are served by long runs of six-inch mains. An economic analysis of the feasibility of line upgrade is recommended. Line extensions for critical CIP projects along with other siting considerations are addressed separately in the CIP document.

Wastewater Treatment

Since effective population is expected to remain fairly stable over the planning period, overall sewage flow to the six treatment plants at the Marine Corps Base will continue at present levels. The treatment plants are in good condition, and are considered adequate for existing and planned facilities.

Collection System

The majority of planned CIP projects will be sited in the Hadnot Point and French Creek areas, and will be served by the Hadnot Point wastewater system. The population distribution will shift somewhat in the wastewater service areas as new buildings are completed and occupied. Extensions to the collector sewers, new lift stations and service lines to new facilities will be required. Where planned buildings are sited over existing mains, those mains should be re-routed around the new building.

Peak wastewater flows are expected to increase by approximately 100 GPM in the French Creek area due to the programmed CIP construction. Therefore, it is recommended that three existing pumping stations in the area undergo further capacity evaluation for handling this additional load. These stations are SFC-315, SFC-203 and the station adjacent to FC-203.

The existing major gravity mains are adequate for existing and planned facilities. The existing major lift stations are adequate with the exception of LCH-4005. It is recommended that

the two-200 GPM pumps in the station be replaced with two-400 GPM pumps (see EXISTING UTILITIES).

CIP facilities to be sited in other areas of the Marine Corps Base will be served by the existing wastewater system within that area. Collection system improvements will be needed for these systems in the future, however they would be less extensive than those required to upgrade the Hadnot Point system.

ELECTRICAL DISTRIBUTION SYSTEM

Methodology

Electrical requirements for planned facilities were calculated on a watts per square foot basis for electrical air conditioning and ventilation, general power and lighting, electronic data processing, and kitchen facilities as required per facility. Information on square footage and, where possible, air conditioning tonnage was obtained from DOD 1391 forms as prepared for each project. The procedure used to obtain project electrical data was to obtain the total connected load for each project before applying a project demand factor. Demand factors were obtained from NAVFAC DM-4.1, Electrical Engineering based on the project function. The design criteria for calculating loads for planned facilities is illustrated in Table IV-27. It should be noted that this design criteria is used to arrive at estimated projected electrical demands for use in determining the impacts of future growth on the existing electrical system. Actual electric loads should be determined for each facility at the time of design.

Table IV-27
Electrical Design Criteria

Air Conditioning:	allow 1.35 KW/Ton
Admin. Bldg.	250-350 ft^2/Ton
Computer Rms.	80-150 ft^2/Ton
BEQ, BOQ	400-500 ft^2/Ton
Mess Halls	100-250 ft^2/Ton
Recreation	200-250 ft^2/Ton
EM, O Clubs	150-200 ft^2/Ton
Shops	250-300 ft^2/Ton
Medical	250-300 ft^2/Ton
Schools	225-275 ft^2/Ton
Ventilation:	1.40 VA/ft^2
General Power & Lighting:	2 w/ft^2 for BEQ, BOQ 3-5 w/ft^2 others
Kitchen:	Open Mess 15 w/ft^2 Cafeteria 20 w/ft^2 Dining Hall 25 w/ft^2
Electronic Data Processing:	50-60 VA/ft^2

1. Project Load = (A/C or Vent) + (GP+L) + (K) + (EDP)

2. Connected Load = Project Load ÷ power factor where p.f assumed to be .90.

3. Demand Load = Connected Load X Demand Factor where d.f. from NAVFAC DM 4.1

Power Supply

All future projects for the Marine Corps Base Activity will be provided electrical service by the existing Marine Corps Base Substation which currently serves the developed areas of the Camp Lejeune Complex. It is estimated that the total electrical demand for all projects sited at the Marine Corps Base is approximately 13,000 KVA. The Standard Handbook for Electrical Engineers allows for the application of a diversity factor of 2.24 to all loads on a substation. This diversity accounts for the varying times at which peak demands are reached by different facilities on several feeders. Based on a diversity factor of 2.24, an additional demand of 5,800 KVA will be loaded onto the Marine Corps Base Substation.

$$13{,}000 \text{ KVA} \div 2.24 = 5{,}803.5 \text{ KVA}$$

Billing Data for FY 83 indicates existing maximum demand on the substation is approximately 33,700 KVA. Application of the additional demand load will leave an excess capacity of over 20 percent.

$$\frac{50{,}000 \text{ KVA} - (33{,}700 + 5{,}800) \text{ KVA}}{50{,}000 \text{ KVA}} \times 100 = 21\%$$

It is assumed that Carolina Power & Light can supply the full capacity of the Marine Corps Base substation and, therefore, power supply is not seen as a deterrent to future growth.

Hadnot Point and French Creek Areas

Electrical service to Hadnot Point is provided by three Regimental feeders and the Industrial feeder and service to French Creek is provided by one feeder of the same name. The Regimental feeders will provide service to a large number of new barracks. Circuits should be limited to underground routings into the billeting areas to conform to present practices. Assuming feeder demand factors are not substantially increased with the addition of new loads, Regimental feeders 1 and 3 are adequate to serve planned facilities. Voltage drop on Regimental feeder 2 will be excessive with the addition of new loads. It is recommended that circuit conductors along Louis Road north of Main Service Road be upgraded. This critical length of circuit links the bulk of the feeder load to the substation. An increase in circuit size will reduce voltage drops at loads near the end of the feeder. All three regimental feeders should be monitored as new loads are added to assure adequate service.

Future facilities sited in the Industrial area include storage, maintenance shops and light industrial buildings. At present, the addition of these loads to the Industrial feeder will not adversely effect service to the area. However, should these new facilities increase the feeder demand factor, voltage drops in excess of the accepted two percent may be experienced. Upgrading the feeder conductors along Ash Street from Holcomb Boulevard to East Road will allow for adequate electrical service to these and any additional future projects.

The French Creek feeder will assume the largest percentage increase in demand of any feeder at Camp Lejeune. However, due to the strategic location of existing regulators and capacitor links, the French Creek feeder is adequate to supply future loads.

Paradise Point and Berkeley Manor

Service to Paradise Point is provided by one feeder of the same name routed from the substation along Main Service Road. Despite the existence of a 1,000 KVA regulator on Marine Service Road, voltage drops are estimated to exceed two percent, even assuming no increase in feeder demand. The automatic load tap changing mechanisms at the step down transformers serving the western Paradise Point area should be investigated to insure adequate source voltage. If deemed necessary, an additional regulator can be installed in the vicinity of oil circuit breaker 18 west of Dewey Street to correct voltage drops to that point.

Despite greater existing and future demand loads than the Paradise Point feeder, the Capehart feeder is adequate to support future development in the Berkeley Manor area. This is possible due to the location of voltage regulation closer to the majority of the load and the use of larger conductors for a greater length of the feeder. The benefits of reconducting the Paradise Point feeder should be examined to determine its feasibility.

Onslow Beach, Courthouse Bay and Rifle Range Areas

Service to Onslow Beach, Courthouse Bay and the Rifle Range is provided by the Rifle Range feeder. The existing length is approximately 13.25 miles routed along Sneads Ferry Road. Excessive voltage drop is estimated to exist from Lyman Road to the regulator at Marines Road, between the regulator at Marines Road and the regulator at Highway 172, and between the regulator at Beach Road and the regulator at Courthouse Bay. The latter two voltage drops are not considered critical

because the loads served by these segments are extremely light and few in number. Reconducting the Rifle Range feeder between Holcomb Boulevard and Marines Road would help to alleviate voltage drop in this area. It is recommended, however, that a study be conducted to determine the feasibility of a new feeder to serve existing and future facilities along Sneads Ferry Road as far south as Main Service Road.

This new feeder would not only assume some of the existing load on the Rifle Range feeder, but it would also provide service to the heavy concentration of new facilities planned for the area around the intersection of Sneads Ferry and Main Service Roads. It is also possible that this new feeder could assume some of the non-billeting load on the Regimental 2 feeder as well as provide adequate back-up capability to all feeders in the area. Service capability to future facilities at Onslow Beach and Courthouse Bay is seen as adequate. There are no Military Construction projects planned at the Rifle Range.

Camp Geiger

Two feeders from the MCAS New River Air Station are routed to Camp Geiger. These feeders are adequately sized to serve future facilities; excess capacity is available.

Montford Point and Midway Park

The Montford Point feeder extends north along Holcomb Boulevard to a regulator station at Brewster Boulevard and continues west across Northeast Creek along the leased section of Camp Lejeune Railroad to Knox and Montford Landing Roads. The feeder also supplies the Midway Park housing area which has had a substantial increase in load due to the installation of air conditioning.

Because feeders cover great distances, voltage drop is a problem between regulators. Of particular concern is the circuit segment between the intersection of Holcomb Boulevard and Sneads Ferry and the regulator at Brewster Boulevard. Most of the load on this segment consists of service to water wells along Holcomb Boulevard, as well as Piney Green Road, with some service to transportation areas. The existing conductor size of 4/0 copper is adequate to carry future current demand assuming no increase in the feeder demand factor. Voltage drop is also of concern in the Midway Park area as well as along the circuit segment between the main gate and Montford Landing Road.

Project P-851, Electrical Distribution Improvements (Montford Point), is programmed for Military Construction Program funding in FY 88 to address these problems. Project P-851 allows for reconducting approximately 3.9 miles of feeder with 4/0 copper conductor, installation of three voltage regulators with by-pass switching, and a switching station with three oil circuit breakers for the Montford Point area. It is anticipated that this project will alleviate current system shortfalls along the Montford Point feeder.

SUMMARY

Capacity is available at the Marine Corps Base Substation to serve planned facilities. Most distribution feeders have adequate capacity to provide service to individual projects and, in most instances, simple line extensions can provide needed service. However, several feeders will require reconducting or addition of circuit regulators to provide service at acceptable voltage levels. These include the Regimental 2, Paradise Point, Montford Point and Rifle Range feeders. It is recommended that a study be conducted to determine the feasibility of a new feeder in the area near the intersection of Sneads Ferry and Main Service Roads.

Several future projects will be served by Carolina Power & Light, including those facilities in Tarawa Terrace. It is recommended that service to project P-847, Regional Commissary, be provided by CP&L as well. Due to the remote location of P-847, extension of Marine Corps Base service lines should be delayed until further development in the area dictates extension.

HEATING SYSTEMS

Methodology

Heating requirements for typical CIP facilities were estimated on a Btu per hour per square foot basis using data from recent construction plans where they were available. Floor areas of planned facilities were obtained from DOD 1391 forms developed for the Capital Improvements Plan, FY 1987-1992. The general procedure was to obtain unit heating loads (Btuh/Ft^2) from construction plans for existing facilities and apply these unit loads to similar CIP facilities to obtain estimated peak-hour heat demand. When heating is to be supplied from an existing central plant an additional 20 percent was allowed for piping tax and pick-up to obtain the load at the plant. Typical estimated unit heat loads are shown in Table IV-28.

It should be noted that the above heat demands are estimated peak-hour demands and are considerably higher than average winter or summer demands would be. The estimated peak-hour demands are used as an overall planning guide and are not to be construed as detailed heating loss calculations for each facility. Actual heating load should be determined for each facility at the time of design.

Table IV-28
Estimated Unit Heat Loads

Type Facility	Unit Heat Demand (Btuh/Ft^2)	Unit Heat Load at Plant (Btuh/Ft^2)
Unaccompanied Personnel Housing	22.6	27
Administration	24.2	29
Electronics/Communication Shops	25	30
General Maintenance Shops	31.5	38
High Bay Maint. Shops	35	42
Mess Halls (inc. Kitchen Equip., Etc.)*	60	72
Warehouses**	20	24

*Based on NAVFAC MO-303 and 2-8 Hr. Shifts/Day.

**Source: Updated Feasibility Study, 22 Sept. 1982.

Hadnot Point and French Creek

It is expected that heating for all projects planned for the Hadnot Point and French Creek areas will be supplied by existing Plant 1700, except smaller projects remotely located from the existing distribution system (see Table IV-29 for listing). It is recommended that these projects have individual heating systems.

Estimated peak-hour steam requirements for programmed CIP facilities to be served by the Plant 1700 system is 134,000 pounds per hour (lb/hr). This value should be reduced by the heating load of existing facilities that will be demolished to clear the sites for new construction, which totals about 11,000 lb/hr. Net additional loading for CIP facilities is approximately:

$$134{,}000\text{-}11{,}000 = 123{,}000 \text{ lb/hr.}$$

A report titled Steam Distribution Study at Marine Corps Base, June 1984 recommended that the small oil-fired boiler plant at French Creek (FG-202), be taken off-line and the existing distribution system of that plant be connected to the Plant 1700 system. This would effect economies of operation by using coal instead of oil. Assuming this change-over would be accomplished during the planning period an additional heating load of approximately 2,900 lb/hr would be added to the Plant 1700 system for a net additional loading of:

$$123{,}000 + 2{,}900 = 125{,}900 \text{ say } 126{,}000 \text{ lb/hr.}$$

Table IV-29
Summary of Proposed Individual Heating Plant Locations

Project No. & Description		FY	Estimated Peak-Hour Heating Load (MBtuh)	Area of Location
P-857	TT Elem. School	86	0.123	TT
P-856	Multi-Purp. Rm. - School	86	0.132	AS, HP
P-816	Exchange	85	0.163	TT
P-824	Chapel	89	0.267	TT
P-827	Dep. High School	86	3.173	LCH
P-847	Reg. Commissary	89	2.825	LCH
P-866	Off. Open Mess	90	2.550	PP
P-813	Ordnance Ops	91	0.072	FC
P-607	Naval Clinic	88	0.761	BB
P-836	EM Club	88	0.142	BB
P-775	Lodge/Motel	90	0.770	BA
P-516	Storage	92	0.325	BA
P-568	Comb. Veh. Mtn. Shop	90	0.298	BA
P-569	Elec./Comm. Shop	90	0.158	BA

MBtuh = 1,000,000 Btu per hour.

Plant 1700 presently has a reserve capacity of 149,000 lb/hr (see Tables IV-23 and IV-24) with one boiler on standby. Therefore, Plant 1700 is considered adequate to meet future needs within its service area.

Paradise Point

New condensate return piping has recently been installed for the Plant PP-2615 central heating system. The plant has one 600 BHP boiler and one 200 BHP boiler. Planned improvements include the replacement of the 600 BHP boiler; however, plant capacity will not be increased by this project. With the 200 BHP boiler off-line there is a plant reserve capacity of about 1,800 lb/hr.

CIP projects recommended for inclusion on the PP-2615 system are P-124, P-849 and P-850 (BOQs). These three projects will have a total connected load of about 2,900 lb/hr and will require firing of both boilers during peak demand periods. No further upgrade is recommended.

Courthouse Bay

There is a planned project to replace the 600 BHP boiler in Plant BB-9 with a new boiler capable of burning used motor oil. No increase in plant capacity will be effected by this project. However, the previously mentioned 1984 Steam Distribution Study recommends that existing buildings BB-34, BB-37 and BB-48, which are now heated by individual plants, be connected to the central system for fuel economy. Should this be implemented, Plant BB-9 would have no reserve capacity that could be used for future CIP projects. Therefore, individual heating plants are recommended for future projects included in the CIP.

Steam Plant A-1 has approximately 1,900 lb/hr reserve capacity which is more than adequate to serve the planned storage facility (Project P-417) in the Amphibian Area.

Onslow Beach

As noted in the 1984 Steam Distribution Study, the efficiency of the Plant BA-106 system is very low due to low summertime loads and high distribution system losses. The report recommends the shut-down of Plant BA-106 and the utilization of heat pumps for heating/cooling and domestic hot water at each existing building. On the assumption that the 1984 report recommendations will be implemented, it is recommended that future CIP facilities have individual heating plants.

An alternate to the above recommendations would be the renovation of the existing central plant and system to provide heating for present and future facilities. This option should be adopted only after a comprehensive economic analysis has provided justification.

Camp Geiger

Central heating plant G-650 at Camp Geiger is in good condition and has a present reserve capacity of about 3,800 lb/hr. Expected steam requirement for CIP facilities at Camp Geiger is approximately 3,000 lb/hr. Therefore, Plant G-650 is considered adequate for the expected connected load for CIP facilities.

Montford Point

Plant M-625 has recently been upgraded by replacing the old boilers with three new 25,000 lb/hr boilers and ancillary equipment. The plant also has space available for an additional boiler of

somewhat smaller size. Assuming that one boiler is off-line the plant has a present reserve capacity of approximately 12,500 lb/hr. Net additional steam requirement for CIP facilities is about 7,000 lb/hr. Therefore Plant M-625 is considered adequate to meet planned requirements.

Individual Heating Plants

Individual heating plants are recommended for CIP facilities that will be remotely located from existing steam plant distribution systems, or placed in areas that have central plants with no reserve capacity. Such facilities programmed for Marine Corps Base are noted in Table IV-29.

Air Conditioning

Absorption air conditioning is recommended for CIP projects requiring large tonnages where those projects are located near a steam distribution system with adequate reserves. Mechanical compression systems are recommended for small tonnages and for those CIP projects not located near a steam distribution system (see Electrical Facilities).

Fuels Storage

Fuel storage requirements are based on a 30-day supply equal to the peak month usage, which occurred in January, 1982.

Coal

The coal storage facility at Marine Corps Base is located at the site of Plant 1700 which is the only coal-fired plant at Camp Lejeune. Estimated coal storage capacity is 11,000 tons. Peak

month coal usage for existing facilities was about 5,000 tons which leaves a reserve capacity of approximately 6,000 tons. Projected coal storage requirements for CIP facilities is based on a ratio of estimated peak steam demand for CIP facilities to recorded peak demand for existing facilities as follows:

$$\frac{123{,}000 \text{ lb/hr}}{264{,}600 \text{ lb/hr}} \times 5{,}000 \text{ tons} = 2{,}325 \text{ tons.}$$

Therefore coal storage is considered adequate for planned CIP facilities.

Fuel Oil

Fuel oil is the only fuel used for boiler-firing at nine of the major heating plants and is used as an alternate fuel at Plant 1700. Specifically, No. 6 oil is used at all plants except FC-202, M-230 and A-1, which use No. 2 oil. No additional heating for CIP facilities will be required from these three plants except for a small amount from Plant A-1. Therefore, since existing storage for No. 2 oil is more than adequate (see EXISTING UTILITIES) for present facilities, it is considered adequate for the planning period.

There is present storage shortfall for No. 6 oil for existing facilities of about 174,400 gallons (see EXISTING UTILITIES). Storage requirements for No. 6 oil for CIP facilities will be 230,700 gallons. Therefore, estimated total shortfall of No. 6 oil storage over the planning period is:

$$174{,}000 + 230{,}700 = 404{,}000 \text{ gallons.}$$

Recommended siting of the additional No. 6 oil storage is at the fuel farm in the Industrial Area if space is available.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

This assessment has been prepared for the Marine Corps Base, Camp Lejeune, North Carolina, in accordance with NAVFACINST 11010.63B of October 1982 and OPNAVINST 11000.16 of April 1983 in compliance with Section 102 (2) (c) of the National Environmental Policy Act of 1969.

Submitting DOD Component: Department of the Navy

Activity: Marine Corps Base, Camp Lejeune, North Carolina

Project Title: Camp Lejeune Complex Master Plan

Date of Submission: March 1987

SUMMARY

The Camp Lejeune Master Plan for the Marine Corps Base proposes that all programmed facilities delineated in the Capital Improvements Plan (CIP) be constructed subject to compliance with adopted environmental policies. As a result of undertaking this aggressive development program, potential exists for some significant adverse effects on the environment. In addition to the temporary construction impacts experienced from increased noise levels, implementation of the overall program includes some projects identified as having potential adverse impacts. Projects

involving sufficient environmental impact or controversy will require the preparation of a detailed Environmental Assessment which should be undertaken in conjunction with project planning activities and should identify any mitigation measures.

INTRODUCTION

The Master Plan provides a basis for the efficient and orderly development of real estate and facilities resources in order to meet mission requirements. It establishes an overall scheme for land and facilities resources use by all major tenants, and the optimum use of all property owned by the Department of the Navy. The Plan is based upon considerations of military requirements, planning criteria, economic and environmental factors.

Major proposals of the Plan are as follows:

1. Allocate additional land for training functions.

2. Allocate space for eventual replacement and construction phasing of facilities to maintain desired functional relationships and to maximize the efficient use of energy and natural resources.

3. Consider the immediate, short-range and long-range impacts on the natural and man-made environment relative to the expansion of training functions and all other potential construction on-base.

4. Consider construction of the proposed U.S. Route 17 Bypass and all other on-base roadway construction in terms of existing and planned land use patterns and access improvement.

5. Construct all programmed facilities delineated within the CIP in compliance with adopted environmental policies and accepted mitigation measures.

6. Preserve the overall quality of the natural and man-made environment and protect areas containing significant natural constraints for development such as: 100-year floodplains, wetlands, sensitive slopes, habitats of endangered species and archaeological/historic sites.

EXISTING ENVIRONMENT OF PROPOSED ACTIONS

The Camp Lejeune Military Complex is located within Onslow County in southeastern North Carolina, adjacent to the City of Jacksonville's southern boundary. The New River Inlet separates Camp Lejeune from the County's growing resort community of West Onslow Beach. The County's two forest preserves represent large areas of undeveloped land in close proximity to the Camp Lejeune Complex.

The topography of Camp Lejeune is a flat plain, sloping gently toward the New River. Elevation ranges from sea level to 72 feet with most of the land averaging from 20 to 40 feet above sea level. The 17 miles of Atlantic coastline are paralleled by a series of alluvium deposits and tidal marshes which are protected by relatively stable sand dunes (15 to 20 feet in height) forming a barrier strip along the coast. The Base is encompassed by vast areas of pocosins and swampland which evolved due to its topographic features.

A variety of 31 soil series are found throughout Camp Lejeune, ranging from sandy loam to fine sand and mud. Drainage is the most critical factor determining the suitability of the heterogeneous soil conditions. Approximately 3,000 acres of sensitive estuarine areas are dispersed widely throughout the Complex. These wetland ecosystems, extremely important to the food chain, should not be used for future development. A significant amount of flood-prone areas exist throughout the Camp Lejeune Complex and must be considered in development plans. Projects planned at Onslow Beach must comply with the North Carolina Coastal Zone Management Program.

Vegetation is typical of the southeastern coastal plain. Extensive tracts of both pure pine and pine-hardwood mixtures dominate the landscape. Areas on the periphery of the forests contain several species of shrubs, vines and herbs. The upland swamps, or pocosins, are overgrown with fetterbush, cyrilla, pond pine and greenbrier, and uneconomically harvested species of pine.

Endangered species having an impact on carrying out the mission of the Military Complex include the Red-Cockaded Woodpecker, Atlantic Loggerhead Sea Turtle, Green Sea Turtle, Eastern Brown Pelican and American Alligator. Protection of habitat and foraging areas is essential to the survival of these species.

The Camp Lejeune area is located in a region of warm, humid and temperate climate. The average annual temperature is 63^{0} and the average annual rainfall is 57.9 inches, with the heaviest rains occurring during June, July and August.

The Military Complex encompasses some of Onslow County's earliest settled areas and some of its most historic sites. At present, only one archaeological site has been studied in detail. It was found to contain Indian artifacts.

Only four percent of Onslow County is developed with urban uses mostly concentrated inside the corporate limits of Jacksonville. Surrounding civilian land uses are predominately agricultural and forestal in character.

PROJECT DESCRIPTIONS AND POTENTIAL ENVIRONMENTAL CONSEQUENCES

This section addresses the projects contained in the Capital Improvements Plan. Each Military Construction (MCON) and special fund project scheduled for construction during the 5-year period of this plan should be evaluated for potential impacts as a part of project planning. During this evaluation, impacts which would interfere unreasonably with the living conditions of man, wildlife or marine life on an immediate, short-range or long-range basis were identified.

The projects listed in Table IV-30 have been evaluated, as a part of the project planning process, for potential impacts on air quality, earth resources, general ecology, groundwater, historic and archaeological resources, and development character.

In general these projects do not appear to have significant long-term adverse impacts. However, those projects which do appear to have long-term adverse impacts include P-869 (Expand Range/Maneuver Area) and projects located at Onslow Beach (P-516, P-568, and P-569). Project 869, recently programmed by the Marine Corps, consists of the acquisition of additional acreage west of the existing Complex boundaries and will significantly expand training area acreage. A separate Environmental Assessment will be conducted for P-869. The projects planned at Onslow Beach (P-516, P-568 and P-569) must also be evaluated for compliance with the North Carolina Coastal Zone Management Program requirements.

TABLE IV-30
SUMMARY OF PROGRAMMED CIP PROJECTS
MARINE CORPS BASE ACTIVITY
CAMP LEJEUNE, NORTH CAROLINA

PROJECT NUMBER	PROJECT DESCRIPTION
	TRAINING AREA
P-846	MOUT TRAINING COMPLEX
P-869	EXPAND RANGE/MANEUVER AREA
	HADNOT POINT
P-124	BACHELOR OFFICER QUARTERS
P-196	COMBAT VEHICLE MAINTENANCE SHOP
P-229	ELECTRONICS/COMM MNT SHOP
P-298	PHYSICAL FITNESS FACILITY
P-410	PINEY GREEN RD. ALT ACCESS
P-445	COMBAT VEHICLE MAINTENANCE SHOP
P-507	STORAGE/OUT OF STORES
P-510	STORAGE/OUT OF STORES
P-511	STORAGE/OUT OF STORES/ARMORY
P-525	COMBAT VEHICLE MAINTENANCE SHOP
P-527	ELECTRONICS/COMM MNT SHOP
P-567	STORAGE/OUT OF STORES
P-624	UNACCOMPANIED ENL PN HOUSING
P-626	BACHELOR ENL QTRS, HADNOT PT
P-627	BACHELOR ENL QTRS
P-629	BACHELOR ENL QTRS
P-630	BACHELOR ENL QTRS
P-631	UNACCOMPANIED ENL PN HOUSING
P-643	ELECTRONICS/COMM MNT SHOP

TABLE IV-30 (Continued)

PROJECT NUMBER	PROJECT DESCRIPTION
P-644	ELECTRONICS/COMM MNT SHOP
P-678	COMBAT VEHICLE MNT SHOP
P-773	HOBBY SHOP COMPLEX
P-778	EXCHANGE SELF-SERVICE CAR WASH
P-785	WATER TREATMENT FAC. IMPROVEMENT
P-786	COLD STORAGE PLANT
P-790	SEWERAGE SYSTEM IMPROVEMENTS
P-794	REHABILITATION-HANDBALL COURTS
P-797	EXCHANGE COMPLEX
P-802	DIVISION HEADQUARTERS
P-806	LIGHT ARMORED VEHICLE MNT SHOP
P-821	REHABILITATION-NCO CLUB
P-837	HANDBALL/RACQUETBALL COURTS
P-837	HANDBALL/RACQUETBALL COURTS
P-838	REHABILITATION-TENNIS COURTS
P-842	REGIONAL AUTOMATED SERVICE CTR
P-843	RD IMPROVEMENTS-MAIN SERVICE RD
P-849	BACHELOR OFFICER QUARTERS
P-850	BACHELOR OFFICER QUARTERS
P-853	VEHICLE READY FUEL STORAGE
P-856	MULTIPURPOSE ROOM-STONE ST ELEM
P-858	EXPAND ELEM LIBRARY - STONE ST
P-859	STORAGE/OUT OF STORES
P-868	COMMISSARY ADDITION

TABLE IV-30 (Continued)

PROJECT NUMBER	PROJECT DESCRIPTION
	FRENCH CREEK
P-027	COMBAT VEHICLE MAINTENANCE SHOP
P-031	BATTALION HEADQUARTERS
P-054	COMBAT VEHICLE MAINTENANCE SHOP
P-055	STORAGE/OUT OF STORES
P-057	DIVISION OPERATIONS CENTER
P-065	GYMNASIUM
P-118	STORAGE/OUT OF STORES
P-121	STORAGE/OUT OF STORES
P-167	ELECTRONICS/COMM MNT SHOP
P-227	ARMORY
P-256	FIELD MAINTENANCE SHOP
P-257	FIELD MAINTENANCE COMPLEX
P-259	BOWLING ALLEY
P-266	COMBAT VEHICLE MAINTENANCE SHOP
P-512	STORAGE/OUT OF STORES
P-513	STORAGE/OUT OF STORES
P-517	COMBAT VEHICLE MAINTENANCE SHOP
P-527	ELECTRONICS/COMM MNT SHOP
P-533	STORAGE/OUT OF STORES
P-541	ELECTRONICS/COMM MNT SHOP
P-542	ELECTRONICS/COMM MNT SHOP
P-548	STORAGE/2ND BULK FUEL STORAGE

TABLE IV-30 (Continued)

PROJECT NUMBER	PROJECT DESCRIPTION
P-549	STORAGE/OUT OF STORES
P-550	STORAGE/OUT OF STORES
P-551	STORAGE/OUT OF STORES/ARMORY
P-552	STORAGE/OUT OF STORES/FLOAT-OPS
P-553	STORAGE/OUT OF STORES
P-554	STORAGE/OUT OF STORES
P-564	ELECTRONICS/COMM MNT SHOP
P-571	STORAGE/OUT OF STORES
P-679	ELECTRONICS/COMM FIELD MNT SHOP
P-790	SEWERAGE SYSTEM IMPROVEMENTS
P-803	FIELD MAINTENANCE COMPLEX
P-804	COMBAT/AUTOMOTIVE FIELD MNT SHOP
P-805	FIELD MAINTENANCE COMPLEX
P-813	ORDANCE OPERATIONS BUILDING
P-837	HANDBALL/RACQUETBALL COURTS
P-840	SELF SERVICE GAS STA/CAR WASH
P-841	MESS HALL ADDITION
P-843	RD IMPROVEMENTS-MAIN SERVICE RD
P-844	COMBAT TRAINING POOL/TANK
	COURTHOUSE BAY
P-417	STORAGE/OUT OF STORES/ARMORY
P-823	HANDBALL/RACQUETBALL COURTS

TABLE IV-30 (Continued)

PROJECT NUMBER	PROJECT DESCRIPTION
	BEACH AREA
P-516	STORAGE/OUT OF STORES
P-568	COMBAT VEHICLE MAINTENANCE SHOP
P-569	ELECTRONICS/COMM MNT SHOP
	CAMP GEIGER
P-794	REHABILITATION-HANDBALL COURTS
P-828	FIELD MEDICAL SERVICE SCHOOL FAC
P-870	USMC SCHOOL OF INFANTRY
P-871	BACHELOR ENLISTED QUARTERS
	MONTFORD POINT
P-663	MESS HALL
P-807	OF-35 DRIVER TRAINING FACILITY
P-808	APPLIED INSTRUCTION BUILDING
P-809	MECHANICS TRAINING BUILDING
P-810	MECHANICS TRAINING BUILDING
P-815	ENLISTED CLUB
P-823	HANDBALL/RACQUETBALL COURTS
P-851	ELECTRICAL DISTRIBUTION
P-852	CHILD CARE CENTER

TABLE IV-30 (Continued)

PROJECT NUMBER	PROJECT DESCRIPTION
	MIDWAY PARK/NAVAL HOSPITAL
P-410	PINEY GREEN RD. ALT ACCESS
P-672	RD. IMPROVEMENTS-BREWSTER BLVD.
P-816	LOCATION EXCHANGE
P-824	CHAPEL
P-827	DEPENDENT HIGH SCHOOL
P-847	EAST COAST COMM COMPLEX WAREHSE
P-848	RENOVATION-LOCATION EXCHANGE
P-852	CHILD CARE CENTER
P-854	REHAB-BREWSTER JR HS TO ADM FAC
P-855	REHABILITATION-HIGH SCHOOL
P-857	MODULE TO TARAWA TERRACE 1 ELEM
P-858	EXPAND ELEM LIBRARY - TT #1
P-858	EXPAND ELEM LIBRARY - BERK MANOR

Source: Camp Lejeune Military Construction Project Data, 1986.

All MCON projects are anticipated to have short-term construction impacts on the surrounding environment, however these impacts are not expected to exist after project completion. All construction contracts should include, to the extent possible, mitigation measures which are designed to limit the adverse impacts resulting from construction.

POSSIBLE CONFLICT BETWEEN PLAN RECOMMENDATIONS AND OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The master planning process for the Camp Lejeune Complex considered current and future mission requirements and produced recommendations for the land use plan and capital improvement projects which met these requirements. The recommendations include changes to existing land use patterns as well as changes to the future land use plan. The changes resulting from mission requirements considered objectives of Federal, Regional, State and local land use plans, policies and controls. Potential conflicts were resolved during the planning effort which must take into consideration all of the appropriate legislation identified above.

MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS

This section discusses the extent to which countervailing benefits could be realized by following reasonable alternatives to the proposed action that would avoid some or all of the adverse environmental effects. In addition, separate consideration must be given to any probable adverse environmental effects which cannot be avoided should the project be implemented.

The following projects resulting from master plan recommendations have been identified as having potential adverse impacts:

- o P-869 Expand Range/Maneuver Area
- o P-516 Storage/Out of Stores - Onslow Beach
- o P-568 Combat Vehicle Maintenance Shop - Onslow Beach
- o P-569 Electronics/Communications Maintenance Shop - Onslow Beach

The means for mitigating the adverse impacts resulting from the training area project are to be addressed in the Environmental Impact Statement (EIS) recommended to be completed prior to implementation of this project. Mitigating adverse impacts resulting from the Onslow Beach projects should be incorporated into the individual project planning process and should comply with the North Carolina Coastal Zone Management Program requirements.

Other impacts on the environment, resulting from planned projects, are considered to be temporary and the result of construction activity. In order to insure that every effort is made to mitigate these impacts, measures for mitigation should be specified in each project construction contract. Such measures as erosion control (installing siltation screens, etc.), air quality maintenance (spraying dust covered roads) and construction noise abatement (designating assigned travel routes, specifying working hours, etc.) need to be included to the extent possible so that these temporary impacts are made minimal.

Additional adverse impacts on the environment have not been identified in conjunction with implementation of the recommended land use plan. The master plan gives careful consideration to the environment and has resulted in a recommended land use plan which addresses impacts on the environment.

APPEARANCE GUIDELINES

This section describes various guidelines for improving and maintaining the aesthetic quality of the Marine Corps Base activity. The guidelines are intended to provide a link between the planning process and construction of specific CIP Projects.

The Camp Lejeune Complex is composed of diverse functions and facilities whose massing and exterior facades reflect this diversity. Coordination of the design of facilities, plantings, and streetscape elements establishes an overall base character. Accomplishment of this goal should be undertaken with sensitivity toward the uniqueness of each sub-area.

The elements addressed below include architectural considerations, streetscaping, landscaping, and visual communications.

ARCHITECTURAL

As part of the Master Plan process, site development plans have been established for each critical CIP project in order to effectively implement the Land Use Plan. Compatibility of land uses and buildings is enhanced by a site design that sensitively interrelates the building forms and massing, the open space between buildings, and coordinates circulation and parking areas. Buildings sited in groups should have strong functional and visual relationships. New construction projects can benefit from an established site development concept, regardless of the length of the implementation schedule or extent of existing development.

The Master Plan proposes changes in the existing land use patterns in several sub-areas to more functionally accommodate replacement of existing training, personnel support, administrative and operational facilities. Inadequate and substandard buildings are found throughout the Complex with major concentrations located primarily in the oldest sub-areas such as Montford Point. Included are buildings which no longer meet safety criteria and are unattractive. Some of the old maintenance and supply buildings currently in use do not adequately serve their required function.

Development of a compatible architectural character between new facilities and older development can be accomplished through design by means of a consistent scale, massing and building form, color, building materials, spatial relationship, and supporting site components.

An important factor in relating a building to its setting is scale. Scale is conveyed by the arrangement and proportioning of windows and door openings, and by the strength of architectural details.

Architectural materials should also provide a cohesive and consistent character, expressive of southeast building technologies. The use of compatible and complimentary colors is closely linked to appropriate selection of exterior building materials. In general, colors should be integral rather than applied to exterior building materials to avoid costly periodic painting. At Camp Lejeune, building materials such as the red brick veneer, as well as architectural design, type of roof line, and style of window grouping can form the nucleus for architectural continuity.

In addition, the design of new facilities should incorporate consideration of climatic conditions. Proper building orientation, building design, and landscape planning can conserve energy as well as provide pedestrian protection and comfort from inclement weather, temperature extremes, wind tunnel effects and sun glare.

STREETSCAPING

In addition to promoting architectural continuity, consideration should be given to other elements of the built environment which contribute to the overall visual impact of the Base. The Land Use Plan initiates this effort by designating appropriate locations for operational and personnel support uses which preserve the appearance of important roadways. For example, industrial uses, such as maintenance facilities and warehouses are generally located in areas away from public view. The arrangement of community and administrative uses along major corridors promotes a buffer from unattractive and noisy work areas.

Image improvement may be further enhanced by acting on the following items which reinforce the Land Use Plan:

1. Coordinating the siting and design of all streetscape elements to minimize clutter.

2. Maintaining a coordinated and consistent system of street signs that provides directions and other information in a clear and concise manner. As funds become available, traffic and regulatory signs should be upgraded to conform to the latest edition of the Manual on Uniform Traffic Control Devices, published by the Federal Highway Administration (FHWA). Pavement markings should also be brought into conformance with FHWA standards.

3. Establishing a coordinated design for street furniture. Removing unnecessary furniture, trash receptacles, signing, etc.

4. Burying existing overhead utilities along streets and in community facility areas to alleviate cluttered and unsightly streetscape appearance.

5. Burying steam lines where possible to alleviate visual clutter. If this is infeasible, they should be painted a complementary earth tone to blend with the background color of existing facilities and/or plant material.

6. Considering street landscaping improvements as funds can be made available. Installation of street trees and other plant materials along major visitor routes, such as Holcomb Boulevard, would convey the importance of adjacent buildings while softening their appearance from the street.

7. Establishing guidelines for upgrading the outdoor lighting system to provide for continuity of design, and improvement of appearance and effectiveness.

The actual design of site components should complement the surroundings, especially architectural features of nearby buildings. In addition, site components should satisfy an actual need such as rest, visual relief, or vista enhancement along a heavily traveled pedestrian route. A final consideration is the integral relationship of the site component to its setting. The use of street furniture, paving patterns and materials, landscape materials/design and lighting, in accordance with established streetscape design guidelines, should produce a unifying image and identity for the Base.

LANDSCAPING

Landscape planning is an integral part of the overall goal of improving the visual and unctional elements of the Base. Preparation of a landscape plan will create a framework for future levelopment while simultaneously enhancing the existing environment. It should emphasize the use of existing landscape features and vegetation wherever possible, and include specific sub-area plans locating plant materials and site furnishings.

Existing trees, forested areas and detail planting features are important resources and visual assets that should be carefully preserved and enhanced for functional as well as aesthetic uses. Consideration should be given to harmoniously blending the built with the natural environment, providing scale and comfort to pedestrian routes, screening unsightly views, and buffering more intense land uses.

Formal or informal landscaping should serve as a means of integrating buildings into the environment. Specifically, plantings should be used to highlight entrances, screen service areas, define parking areas and circulation, and serve as windbreaks when necessary. Plant material, in most cases, should be of local varieties including deciduous trees which provide seasonal color and interest. Existing trees in developed areas should be retained as much as possible, to highlight the natural environment and accent new structures. This would reduce the need for an extensive planting program which would be uneconomical and require excessive maintenance.

Implementation of the Land Use Plan calls for phased utilization of previously disturbed sites. In addition to retaining existing trees, the landscape plan should emphasize the installation of pine trees and other native species to provide a relatively quick visual impact. A few ornamental trees

planted at entrances to Base housing areas would highlight and enhance them. Principal roadways, such as Holcomb Boulevard, should be emphasized by properly scaled and sited street trees. The trees would not only enhance the importance of the road, but would also relieve the monotony of the straight, wide roadway.

VISUAL COMMUNICATIONS

A well coordinated sign system can contribute to the overall visual quality of the Base. In order to be effective however, signs must be consciously designed as part of an attractive, consistent, simple and uncluttered information system used throughout the Base.

The sign system should incorporate all types of visual message forms including identification of street names, building numbers, organization, and facility. Coordination of the sign system with the design of other site furnishings would minimize the number of streetscape elements and reduce clutter.

In order to develop visual communications that will be clear and consistent, a sign system should be designed to accommodate additions or deletions over time without being visibly obtrusive. Consistent regulations should be adopted setting policies for removing, locating and maintaining signs as well as establishing design criteria.

In certain areas the streetscape at Camp Lejeune tends to be cluttered with directional/information signs which, because of variations in height, area, materials, and color, do not create a harmonious and unifying visual element. This is especially noticeable on entrance roads such as Holcomb Boulevard, Montford Landing Road, etc., where community and administrative uses are concentrated.

The following guidelines should be incorporated into a visual communication system to address these concerns:

1. Provide signs only where there is a demonstrated need.

2. Remove unnecessary or conflicting signs. Directional information should be combined on a single sign where possible.

3. Provide an economical system for installation, maintenance and replacement.

4. Insure the consistency of signs performing a similar function.

5. Provide signs that are visible and designed to attract the viewer's attention.

6. Insure that the wording of all signs is understandable, concise and correct.

Sign design, as suggested by these guidelines, should use simple wording. Heights should be controlled, and materials and color selection should complement the setting and be consistent. Standards should be established at Camp Lejeune as to sign area, color, illumination and lettering style for directional/informational signs to develop consistency and continuity throughout the Base.

TABLE OF CONTENTS

INTRODUCTION

The purpose of this Activity Plan is to provide a basis for logical and efficient use of Marine Corps Air Station, New River real estate and facilities to accomplish assigned mission requirements through the 1980s. This Activity Plan is one of four Activity Plans which form the basis for the Camp Lejeune Master Plan document. The intent of the Master Plan is to provide an integrated framework for the use of resources Complex wide. This section of the Plan document expands upon general Complex-wide issues presented in the Complex section of the Master Plan and discusses specifically those issues relevant to the Marine Corps Air Station Activity. The Activity Plan is structured to comply with and incorporate all requirements stipulated by NAVFACINST 11010.63B and MCO P11000.12C.

Preparation of this Plan began in November 1983 at a meeting with Air Station personnel to review and discuss the process involved and the assistance required in preparation of a Master Plan. Following this initial conference, interviews were undertaken with commanding officers and key personnel at MCAS, New River. Data was collected and field investigations were undertaken for the purpose of identifying problems and deficiencies.

After the initial data collection activities were completed, a detailed planning analysis was initiated. Current and immediate future requirements were determined from the Basic Facilities Requirements List (BFR), field surveys, interviews with Complex personnel and analysis of other data. Physical constraints, both natural and man-made, were identified and then were related to functional and operational requirements.

The above procedure established the physical facility and land requirements necessary to accomplish the Activity mission. These requirements were then used as the basis for determining future development goals and objectives. Alternative concept plans which support the goals and objectives were then derived. Informal concept presentations were made to Air Station personnel in order to receive comments and suggestions and to refine further concept alternatives. Final alternative concept plans were presented at a formal meeting in March 1985 and a Land Use Plan for the activity was selected at that time.

REQUIREMENTS ANALYSIS

The requirements analysis evaluates the current physical resources at Marine Corps Air Station (MCAS), New River as they relate to the operational needs of the principle Second Marine Aircraft Wing tenants, MAG 26 and MAG 29. Facility requirements were then related directly to missions and personnel loadings, and compared to existing assets. This comparison identifies facility deficiencies which form the basis of the Military Construction Project list. Results of the requirements analysis are addressed in the alternative concepts for future development to yield the proposed Land Use Plan and, subsequently, the Capital Improvements Program.

Prior to a specific discussion of facility requirements, Marine Corps Air Station mission, organization and personnel loadings are discussed below.

MISSION

The Air Station is primarily a helicopter base with an increasing contingent of fixed-wing aircraft. Its present mission is to maintain and operate facilities and provide services and material

to support operations of Marine Air Groups (MAG) 26 and 29, the two tenant commands which have similar missions and tasks. MCAS also supports other activities and units as designated by the Commandant of the Marine Corps in coordination with the Chief of Naval Operations.

MAGs 26 and 29 provide helicopter support to Fleet Marine Force and such other air operations as may be directed. They also perform logistical and administrative support for other miscellaneous units which are attached to the Marine Air Group. They perform specialized helicopter training for pilots and aircrewmen in the practice of vertical envelopment warfare and provide other technical training for aviation personnel. Finally, they conduct other such training and air operations as may be directed by higher authority.

The four other units which are tenants of the Marine Corps Air Station, New River are listed below along with their respective missions:

Naval Air Maintenance Training Group - Detachment 1027 provides academic classroom and laboratory type technical training for the CH-46 helicopter.

The Marine Air Traffic Control Squadron - 28 directs and controls air traffic including take-offs and landings within a traffic control area or zone around expeditionary airfields under all weather conditions.

Marine Wing Communication Squadron 28 - Detachment "A" provides communications for the Aviation Combat Element (ACE) of each Marine Amphibious Force (MAF) or for each ACE of two Marine Amphibious Brigades (MABs) deployed simultaneously.

Marine Wing Support Squadron 272 provides essential aviation ground support including security, internal airfield communications, weather services, emergency services, essential engineer services, lighting, motor transport and refueling.

ORGANIZATION

The Marine Corps Air Station (MCAS), New River is an entirely separate command operating under the directives of the Marine Corps Air Bases Eastern area, Cherry Point, North Carolina. As described earlier in Section II of the Master Plan, the training functions of this command interrelate with those of the three other commands, the 2nd Marine Division, 2nd FSSG and the Marine Corps Base organization.

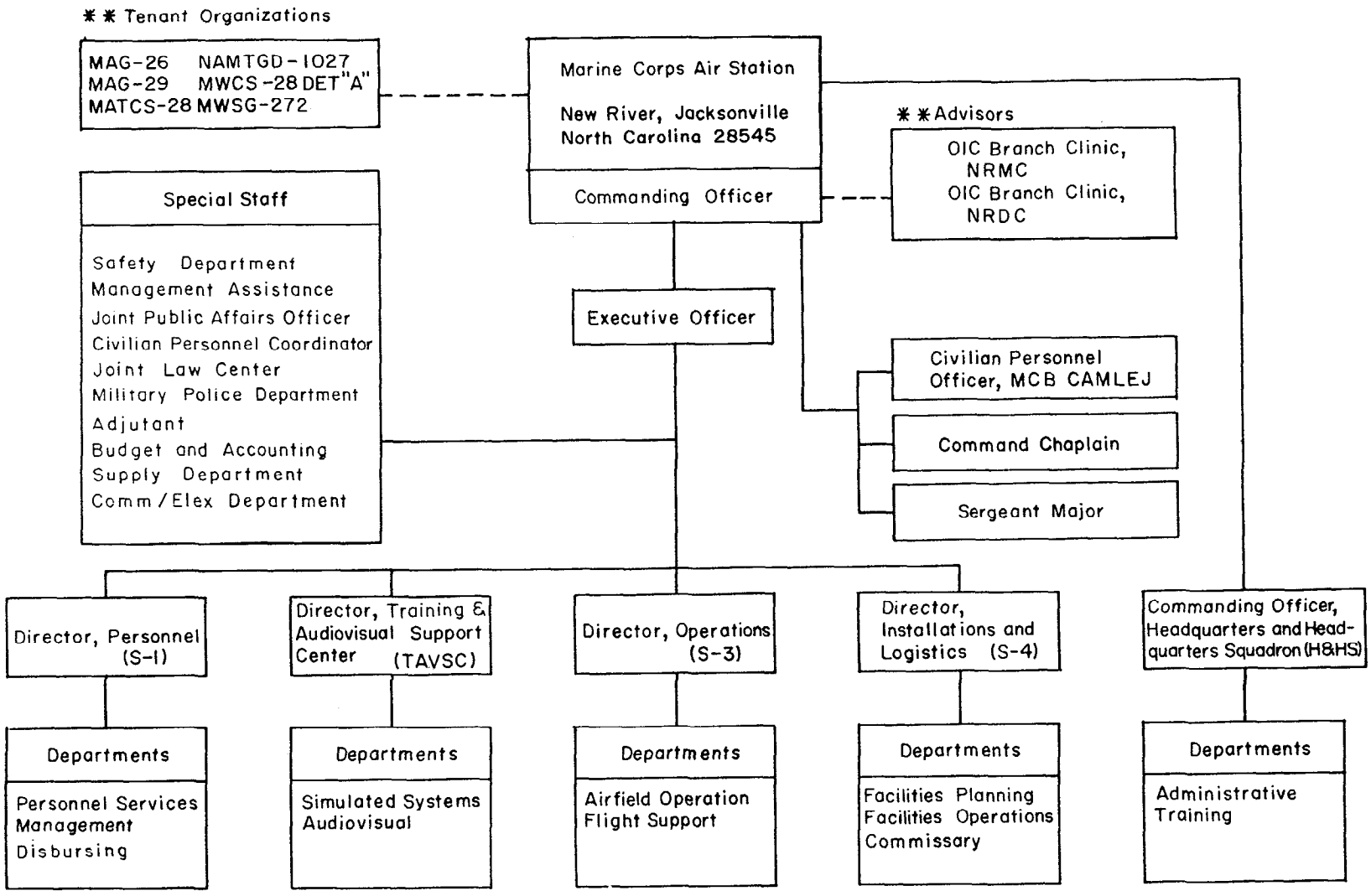
Land, utilities and housing are provided to MCAS, New River by the MCB organization. The Air Station receives its supplies from the Base and, although most of its supplies are consolidated at Air Station warehouses, some supplies are stored in Marine Corps Base facilities.

MCAS, New River serves as the host organization for six tenant activities. Two tenant activities, MAGs 26 and 29, are under the command of the commanding general of the Second Marine Aircraft Wing (Figure V-1). MAGs 26 and 29 provide helicopter air-fire support and troop transport for the 2nd Division forces. The groups function in direct support of the 2nd Division and serve as an integral component to the mission of that division.

Figure V-1

ORGANIZATIONAL CHART

MARINE CORPS AIR STATION, NEW RIVER
CAMP LEJEUNE, NORTH CAROLINA



** NOT UNDER OPERATIONAL CONTROL OF THE COMMANDING OFFICER MCAS (H) NR

Source: Manual Of Organization, MCAS (H), New River, January 1983

PERSONNEL LOADING/PROGRAMMED STRENGTH

No significant change in the number of military or civilian personnel assigned to MCAS, New River is anticipated to occur during the next five years (Table V-1). An estimated 5,037 persons were assigned to the Air Station on an average each month during 1983 and roughly the same number are projected in program strength records. Slight declines in officers and enlisted personnel levels are expected to be offset by a large increase in civilian workers employed at the Air Station.

FACILITY REQUIREMENTS

Basic Facilities Requirements is the listing of quantities by category code, of those facilities required to perform the mission of a shore activity. It includes only those facilities necessary to support the assigned mission. The requirement for each category code is derived by applying base-loading/quantitative workload data to the planning factors/criteria included in NAVFAC P-80, "Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations."

The following section examines the adequacy of existing structural facilities which fall under Marine Corps Air Station, New River jurisdiction. The facilities existing on the Basic Facilities Requirements List (BFR) are arranged by category code. For the purposes of the Master Plan, the category codes have been aggregated into 16 land use categories, based upon planning criteria contained in NAVFAC P-80. It is these 16 land uses which form the basis of the subsequent existing assets and deficiencies analyses.

Table V-1

Personnel Loading and Programmed Strength
FY 1983 to FY 1988
MCAS, New River

Personnel	Officer		Enlisted		Civilian		Total	
	FY83	FY84-88	FY83	FY84-88	FY83	FY84-88	FY83	FY84-88
Permanent Units	---	45	---	309	---	107	---	461
Students/Trainees	---	95	---	20	---	---	---	115
Supported Units	---	535	---	3,826	---	103	---	4,464
Total	704	675	4,218	4,155	115	210	5,037	5,040

Source: Monthly Quad Command Reports, Average for 1983;
Facilities Support Requirements Planning Document, MCAS, New River, February 1983.

Existing Assets

Based upon the ratings contained in the Activity Facilities Plan dated September 23, 1983, Marine Corps Air Station facilities are grouped according to land use categories and rated as either adequate, substandard or inadequate. These ratings are expressed as relative percentages to facilities in that land use category as a whole and appear on Table V-2. Findings shown on Table V-2 will be used subsequently to identify problem areas and to develop Concept Plans.

The ratings of existing assets by land use category are described below.

Operational Facilities

Because airfield operations is the primary activity at MCAS, New River, operational facilities account for the largest facility area. Runway, taxiway, land support buildings (such as the various air traffic control facilities), and liquid fueling and dispensing facilities fall into this category. One-hundred percent of the airfield area is rated adequate, while of the fueling and dispensing facilities, 86 percent of existing facilities are adequate, eight percent substandard and six percent inadequate.

Maintenance Facilities

The second largest category of existing facilities are those used for helicopter and aircraft maintenance activities. Over one-third of these facilities have been deemed substandard, but none are inadequate. Facility obsolescence, due to the advent of new aircraft and helicopters and related equipment, can account for the more than 213,000 square feet of substandard maintenance buildings.

Table V-2

Facility Requirement: Existing Assets Rating
MCAS, New River

Location	Land Use	Percent of Total Existing Facilities		
		Adequate	Substandard	Inadequate
MCAS - New River	Operational (SY)	100.0%	---	---
	Operational (GA)	86.4	7.9	5.7
	Classroom Training	86.4	13.6	---
	Maintenance	62.6	37.4	---
	Supply/Storage	87.2	12.4	0.4
	Dental	50.0	50.0	---
	Medical	100	---	---
	Administrative	78.6	21.4	---
	Troop Housing[1/]	86.6	13.4	
	Community (PN)	---	34.8	65.2
	Community (SF)	57.0	41.8	1.2
	Commercial	76.0	24.0	---
	Recreational (SF)	98.8	---	1.2
	Recreational (EA)	100	---	---

1/ MCAS, New River, September 1984.

Source: Activity Facilities Plan, September 23, 1983

Supply/Storage Facilities

These account for the third largest amount of existing facility area. Twelve percent, or 26,000 square feet, of supply/storage space is rated substandard. This can be attributed to changes in aircraft and equipment stored at the Air Station. None of the existing space is considered inadequate.

Administrative Facilities

Over 20 percent (21,000 square feet) of existing administrative space is rated substandard for reasons related mostly to age and physical condition. The Group Headquarters located in a small section of Building AS-504 accounts for a majority of the substandard administrative space, with the remainder in various squadron headquarters and general MCAS Headquarters facilities.

Classroom Training Facilities

This facility category includes all buildings used for academic instructional purposes. Buildings AS-217 and AS-216 are the only classroom facilities which are substandard; all other classrooms have been rated adequate.

Troop Housing

A majority of troop housing is adequate due to the new facilities constructed in the early 1970s west of the railroad tracks. Thirteen percent of existing troop housing is substandard due to age and building configuration in the old squad-bay formation.

Family Housing

(See Section IV, Facility Requirements, Family Housing)

Community Facilities

Inadequate facility assets appearing on Table V-2 are comprised of the dining facility for 1,500 personnel in AS-226 (which was scheduled for replacement at the time this Plan was written) and the Drug/Alcohol Rehabilitation Center in Building AS-216. Substandard assets include the theater, library, Family Service Center and Child Care Center.

Commercial Facilities

No commercial facilities are inadequate. Of the nearly one-quarter (21,000 square feet) of existing assets that are substandard, the largest is the Commissary located in Building AS-414. This facility does not meet the BFR size and condition requirements. Other substandard facilities are the Exchange Service Station and two Hobby Shop Arts and Crafts buildings.

Recreational Facilities

All facilities are adequate, except for one boathouse building which has been scheduled for demolition.

Deficiencies

The following analysis is directed toward the amount of additional new construction that needs to be undertaken in order to satisfy BFR. The analysis is based upon available information and focuses upon the relative deficiencies in each of the 16 land use categories for each of the geographic areas (Table V-3).

Recreational uses comprise the single largest category of deficient facilities. Although existing recreational assets are adequate (see Table V-2), they fall 35 percent short of the BFR. Most of this deficiency is comprised of a gymnasium, which is scheduled for construction in Fiscal Year 1986.

A 25 percent deficiency exists in supply/storage space at MCAS, New River, where over 90,000 square feet of space is needed to be newly constructed in order to satisfy the BFR. Most of this additional need is for warehouse facilities which average 30,000 square feet in size and store ammunition. New equipment and supplies expected in the next few years will compound this problem. In addition, on site storage requirements have risen dramatically as a result of Seaboard Coastline Railroad's abandonment of service between New Bern and Wilmington, North Carolina which forced MCAS to revert to fuel delivery by truck. The disparity in hauling capability (20,000 gallons per tank car versus 7,000 gallons per truck) as well as processing problems have changed New River's position regarding fuel requirements. Military construction scheduled for FY 86 will raise storage capacity approximately 45 percent. Another project under development is the replacement of existing fuel storage tanks with advanced corrosion based on internal inspections. That replacement, coupled with new construction, will provide New River with a modern state-of-the-art fuel facility.

Table V-3

Facility Requirement: New Construction Deficiency Corrections
MCAS, New River

Land Use	Required New Construction [1/]	Percent New Construction to meet BFR
Operational	N/A	N/A
Maintenance	38,244 (s.f.)	4.9%
Supply/Storage	90,000 (s.f.)[1/]	25.2
Administrative	12,000 (s.f.)	11.7
Troop Housing	360 (PN)	15.0
Family Housing		
Community	27,858 (s.f.)	16.9
Commercial	3,800 (s.f.)	3.2
Recreational	30,500 (s.f.)	35.0

[1/] Based upon information received from MCAS, New River

Source: Activity Facilities Plan, September 23, 1983.

In the community facilities land use category, roughly a 17 percent deficiency exists. Not included in this amount is the deficiency of one enlisted mess facility which, at the time this Master Plan was written, was being corrected. Lacking are various entertainment facilities, such as a movie theater and a youth center.

Troop housing deficiencies are created by the inadequacy of older, open-squad bay buildings. These older buildings are steadily being converted to administrative uses as new barracks are constructed.

A relatively small deficiency in administrative space exists. As recorded in the September 1983 BFR, one Group Headquarters (12,000 square feet) facility was lacking. Other deficiencies in administrative space are being met by the ongoing conversion and rehabilitation of existing barracks, as mentioned in the preceding paragraph.

Deficiencies in maintenance facilities can be attributed to the age and condition of existing buildings, as well as by an overall shortfall in the number of maintenance work areas, due to the advent of new aircraft and equipment.

Deficient commercial space is in scattered support facilities. Most of the deficient substandard commercial uses listed in the Activity Facilities Plan have been replaced by the new facilities located at Curtis Road Triangle.

FUTURE MISSION CHANGES

No basic mission changes are anticipated for the MCAS, New River for the remainder of the decade. While changes in the number of assigned personnel and in the number and type of weapons and equipment are anticipated, the Air Station will remain a tactical support facility.

PLANNING ANALYSIS

This section will examine the relationship between existing land uses at MCAS, New River and will evaluate the influence of surrounding regional and Complex land uses. All acreages discussed pertain solely to those areas which are developed. The final component of this analysis will be the identification of various "Planning Factors," such as natural constraints, circulation considerations and land which has been contaminated by hazardous wastes.

EXISTING LAND USE

The present land use configuration is arranged around the airfield operations area, which quite naturally has served as the focal point for Air Station development (Figure V-2). One problem resulting from the existing land use patterns, however, has been the conflict between housing and community uses situated in Noise and Accident Potential Zones. This conflict has been compounded with the increase in size and number of fixed-wing aircraft.

Operational land uses account for over 45 percent, or 578 acres, of the total developed land area at the Air Station (Table V-4). Most of the land in this category is comprised of runways and taxiways although the main fuel storage area sits directly east of the Seaboard Coastline Railroad

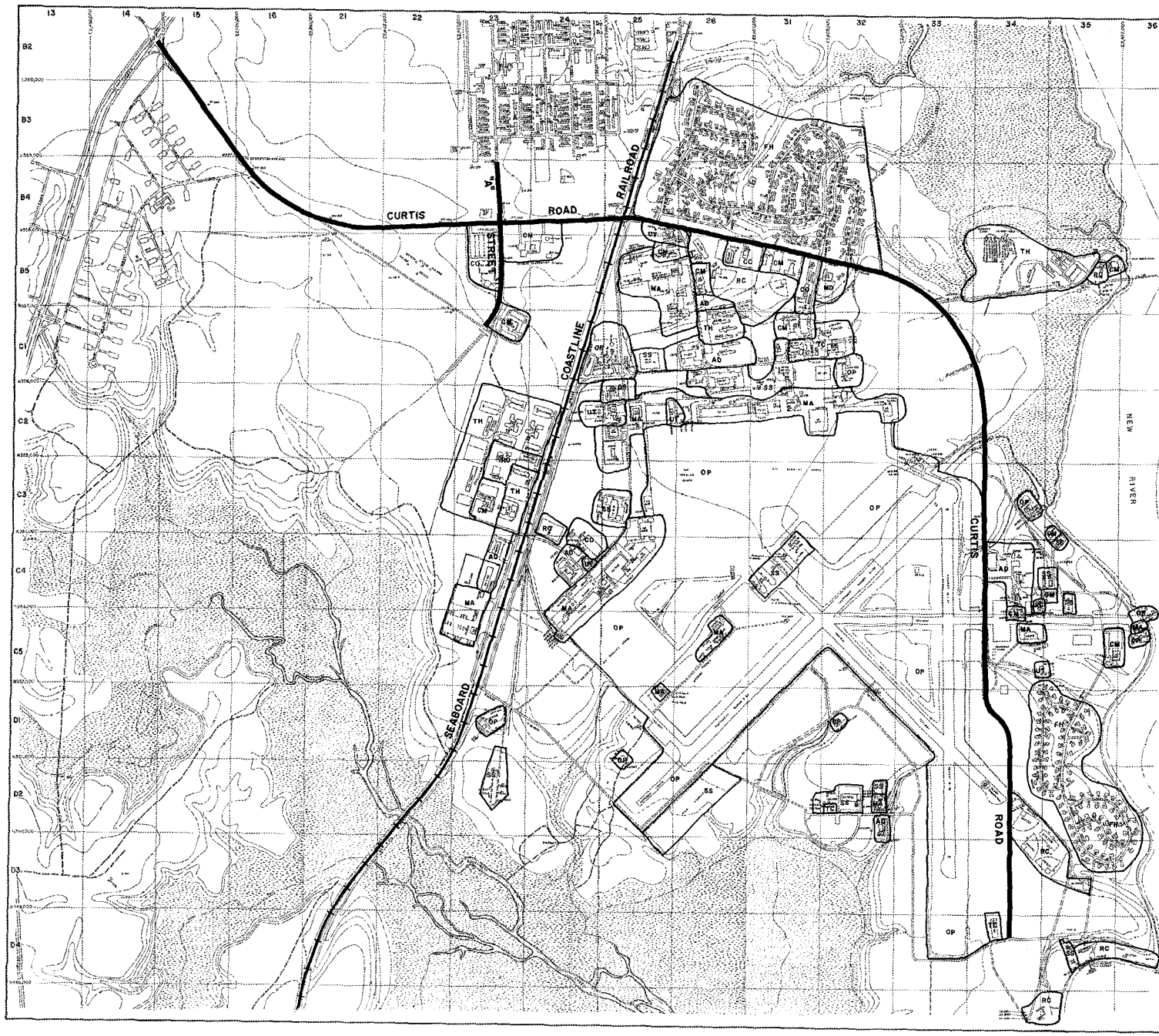

CURTIS ROAD
STREET
RAILROAD
COASTLINE
SEABOARD
CURTIS ROAD
NEW RIVER
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (unpaved)
FENCE
5' CONTOUR (Source - USGS Maps)
RESERVATION BOUNDARY
AIR STATION BOUNDARY
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MD MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
RAILROAD
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAND USE
MCAS NEW RIVER
EXISTING CONDITIONS
DATE 31 JULY 84
SCALE: GRAPHIC
FIGURE V-2
APPROVED / DATE

Table V-4

Land Utilization: Developed Areas
MCAS, New River

Land Use	Acres	Percent
Operational	518	45.4%
Training Classroom	10	.9
Maintenance	97	8.5
Research	--	--
Supply/Storage	70	6.1
Medical	--	--
Administrative	34	3.1
Family Housing	188	16.5
Troop Housing	74	6.5
Community	50	4.4
Commercial	24	2.1
Recreational	57	5.0
Utility	17	1.5
Total	1,139	100.0%

tracks and a small operational area located adjacent to the New River is set aside for deployment purposes.

Maintenance (97 acres) and supply/storage (70 acres) land uses are arranged adjacent to the airfield, as well as accessible to one another. Hangars and warehouses account for a large portion of this space. Together, these land uses comprise 15 percent of the total developed land area controlled by the Air Station.

Less than one percent of the developed area is used for classroom training. Classrooms are consolidated in an area easily accessible from both the airfield and other work areas.

Administrative uses are located directly behind the maintenance and supply areas. The only exception to this is the group of main administration buildings which are located east of the airfield. In one sense, these administrative offices are convenient due to proximity to the airfield; in another sense, vehicular travel between the Main Gate and the housing areas must take Curtis Road which transverses the Clearance Zone. A total of 34 acres are used for administrative uses at the present time, which is three percent of the total developed area.

Medical/Dental uses are consolidated in one building which is situated on Curtis Road, adjacent to older community and commercial uses and directly south of the enlisted family housing area.

As stated earlier, family housing is located in two large areas fronting on Curtis Road. While the Officer Family Housing sits in a particularly convenient (to the airfield) and attractive setting, this area is relatively isolated and inaccessible to related community and commercial uses as is

located in a Noise Zone 2 area. Furthermore, the present location of family housing at the Air Station constrains the potential for expansion of air operation uses.

Troop housing exists in two areas: In a newer complex located directly west of the railroad tracks and in several older buildings located in the developed area. These older, squad-bay barracks are in the process of being converted entirely to administrative uses. Gradually, MCAS troop housing is being consolidated west of the Seaboard Coastline Railroad tracks.

EXISTING UTILITIES

The utilities serving the MCAS, New River, which will be developed in the activity master plan, include water supply, wastewater collection and treatment, electrical system and central heating systems. The existing facilities have been analyzed and known deficiencies have been noted.

Water Supply

Water Usage

Table V-5 presents data on the average and maximum amounts of water used in the MCAS and Camp Geiger areas. Data on water usage and population served were developed as described in the Section IV narrative for Water Usage. Table V-6 indicates water usage data for the MCAS and Camp Geiger areas.

TABLE V-5
WATER USAGE

NEW RIVER AIR STATION

WATER SUPPLY SYSTEM	AVERAGE DAILY RAW WATER USED		AVERAGE DAILY TREATED WATER DELIVERED		MAXIMUM DAILY TREATED WATER DELIVERED		EFFECTIVE SERVICE POPULATION	AVERAGE PER CAPITA USAGE
	CY 1982	FY 1983	CY 1982	FY 1983	FY 1982	FY 1983		CY 1982
MCAS /Camp Geiger	1,025	1,014	945	914	2,122	2,103	11,642	81

NOTE: Quantities shown in Thousands of Gallons.

TABLE V-6
WATER SOURCE

MARINE CORPS AIR STATION

WATER SUPPLY SYSTEM	NUMBER OF WELLS IN SERVICE	NUMBER OF WELLS OUT OF SERVICE	NO. OF WELLS WITH EMERGENCY POWER	AVERAGE WELL SPACING	AVERAGE WELL DEPTH	WELL CAPACITY RANGE ORIGINAL	WELL CAPACITY RANGE CURRENT	COMBINED WELL CAPACITY ORIGINAL	COMBINED WELL CAPACITY CURRENT	EXISTING DAILY DEMAND-CY 1982 AVERAGE	EXISTING DAILY DEMAND-CY 1982 MAXIMUM	NORTH CAROLINA STANDARDS MGD	WELL DEFICIENCY OR SURPLUS MGD
MCAS / Camp Geiger	24	2	6	1,100'	167'	50-300 GPM	30-400 GPM	4,375 GPM 6.3 MGD	3,497 GPM 5.0 MGD	0.9 MGD	2.3 MGD	1.8	+3.2

NOTE: Data are for Wells in Service.

Water Source

The source of water for the MCAS water treatment plant at Building MCAS-110 are wells in the geographic areas of the MCAS and Camp Geiger areas. Originally, there were separate water treatment plants for the MCAS and Camp Geiger, so that the present field is composed of two well fields. The Camp Geiger water treatment plant was abandoned some years ago and Camp Geiger is now served by the MCAS water treatment plant. Ten wells are from the old Camp Geiger system and 16 wells are from the MCAS well field system. Two wells of the Camp Geiger system are out of service, leaving 24 wells in service from both systems. The Camp Geiger system wells represent the older system and have average depths of 113 feet, as compared to average depths of 208 feet for the MCAS wells. For both systems the average depth is 167 feet. Current average yield of the MCAS well is 150 GPM and 139 GPM of the Camp Geiger wells. Average well spacing for the two well fields is 1,100 feet. Table V-6 indicates data for the MCAS and Camp Geiger areas. The data indicates that the water wells provide a surplus amount of water.

Original well capacities range from 50 GPM to 300 GPM, and current well capacities reportedly range from 30 GPM to 400 GPM. The original combined well capacity was 6.3 MGD and current capacity is 5.0 MGD. Well capacities exceed usage and the North Carolina Standards for well fields.

Raw Water Transmission

The water well field land raw water transmission lines for the MCAS water treatment plant are a combination of the raw water system built to serve the now abandoned Camp Geiger water treatment plant and the MCAS water treatment plant at Building AS-110. The Camp Geiger system

consists of water wells and lines near A Street to water well TC-700 in Camp Geiger, along with a number of wells paralleling U.S. Highway 17 west of Camp Geiger. The MCAS system connects with the Camp Geiger system at Curtis Road near well TC-1001 and at A Street north of well STC 1253. The MCAS system includes wells and lines south and east of the Camp Geiger system. The system consists mostly of 8- to 12-inch lines with several transmission lines which are looped. Pump station STC 1252 near the intersection of A Street and Curtis Road boosts pressure and flow into the water treatment plant.

Water Treatment Plant

Raw Water Storage and Delivery. The third largest plant at Camp Lejeune is MCAS with a capacity of 3.5 MGD. The MCAS plant has a raw water booster station, Building STC 1252, with two (1400 GPM) pumps, as well as two raw water pumps at 2,400 GPM capacity each at the treatment plant. The plant does not have raw water storage facilities. Data are shown on Table V-7.

Water Treatment. Data for the water treatment plants are shown on Table V-8. The plant capacity exceeds the existing average and maximum demand by an acceptable margin. The maximum surface loading rate of the filters would slightly exceed the filtration rate maximum criteria at design capacity, but due to the excess capacity at the plant this is not considered a major problem. Treated water reservoir capacity is deficient for the requirement of having 12 hours of maximum daily consumption.

TABLE V-7
RAW WATER STORAGE AND DELIVERY

MARINE CORPS AIR STATION

WATER SUPPLY SYSTEM	RESERVOIR	RAW WATER PUMPS	APPROXIMATE FIRM CAPACITY	EXISTING DAILY DEMAND MGD		PLANT CAPACITY	EMERGENCY POWER CAPACITY	ONE-HALF PUMP CAPACITY
				CY 1982 AVG	CY 1982 MAX			
MCAS Camp Geiger	-	2-1,400 gpm[1] 2-2,400 gpm	7,600 gpm 10,944 MGD	.945	2.122	3.5 MGD	0	5.472 MGD

(1) Booster Station Pumps - Bldg STL 1252.

TABLE V-8
WATER TREATMENT

MARINE CORPS AIR STATION

WATER SUPPLY SYSTEM	TYPE PLANT	CAPACITY	EXISTING DAILY DEMAND MGD CY 1982 AVG	EXISTING DAILY DEMAND MGD CY 1982 MAX	NUMBER	SURFACE AREA	MAX. SURFACE LOADING RATE	FILTRATION RATE MAXIMUM CRITERIA	TREATED WATER RESERVOIR	MINIMUM TREATED WATER RESERVOIR CRITERIA GAL.
MCAS /Camp Geiger	Lime Softening variable declining rate filtration	3.5 MGD	0.945	2.122	3	1,152 SF	2,110 gpm/sf	2 gpm/sf	200,000 gal 225,000 gal 425,000 gal	1,061,000 gal(1) 970,000 gal(2)

(1) Twelve Hours of Maximum Daily Consumption.

(2) Capacity Required with 1/2 of Filters Out of Service.

High Lift Distribution Pumping

High lift distribution pumps are provided for Camp Geiger and the MCAS as shown on Table V-9. The approximate firm capacity shown in Column 2 is derived by assuming that the largest pump is inoperable at the time of a fire. The existing peak hour demand for the two systems is derived by use of the formula on page 5-9-3 of the NAVFAC Design Manual DM-5. Emergency pump capacities are for those pumps with an auxiliary engine to operate the pump in case of a power outage. Data from this table are used in the evaluation of storage capacity requirements in the event of a fire. Based upon the investigations described below for elevated storage, the high lift distribution pumping system is satisfactory.

Elevated Storage

The existing elevated storage tanks for the Marine Corps Air Station (and Camp Geiger) are shown on Table V-10. Elevated storage tank 4130 is the only elevated tank with an altitude valve.

The basic criteria for determining storage requirements are given in NAVFAC DM-5 (Design Manual) on page 5-9-5 and in the NAVFAC DM-8 (Fire Protection Engineering) on page 8-7-6. Required fire flows were obtained by reviewing the types of buildings in each area and comparing those buildings with those included for the various hazard groups in NAVFAC DM-8. Comparisons were also made with the fire flows used in the Fire Protection Engineering Survey Reports obtained in the initial data collection phase of the project.

Storage capacity criteria require that the total storage be sufficient to supply the peak fire flow demand plus 50 percent of the average daily demand. Calculations for these requirements are

TABLE V-9
HIGH LIFT DISTRIBUTION PUMPING

MARINE CORPS AIR STATION

WATER SUPPLY SYSTEM	HIGH LIFT PUMPS	APPROXIMATE FIRM CAPACITY	EXISTING PEAK HOUR DEMAND	EMERGENCY PUMP CAPACITY	ONE-HALF TOTAL PUMPING CAPACITY
MCAS (H)/Camp Geiger					
1. Building MCAS-110	2-1,000 GPM 1- 500 GPM	2,900 GPM	2,297 GPM	1-1,000 GPM	2,300 GPM
2. Camp Geiger Pumping Station, Building TC-501	2- 700 GPM 1- 900 GPM			1- 700 GPM	
Subtotals	4,800 GPM 6.9 MGD	2,900 GPM 4.2 MGD	2,297 GPM 3.3 MGD	1,700 GPM 2.4 MGD	2,300 GPM 3.3 MGD

TABLE V-10
ELEVATED STORAGE

MARINE CORPS AIR STATION

WATER SUPPLY SYSTEM	ELEVATED STORAGE TANKS	COMBINED STORAGE CAPACITY
MCAS /Camp Geiger	S-1070 - 100,000 Gal[1]	200,000 Gal[1]
	S-606 - 100,000 Gal[1]	
	4130 - 300,000 Gal[2]	650,000 Gal[2]
	310 - 350,000 Gal[2]	

1 Camp Geiger

2 MCAS

shown on Table V-11, Maximum Fire Demand. The calculations for this table were based upon use of those high lift distribution pumps having an auxiliary engine in operation at the time of a fire. The fire demand exceeding the capacity of the standby pumps was defined as Total Storage Requirements, Column 6, which would come from elevated storage tanks. In addition, the elevated storage tanks should provide storage for fluctuations in demand for a four-hour peak period as shown on Table V-12, Storage Requirements. This table compares the flows with all high lift pumps in operation, except the largest pump is assumed to be out of service. The capacity of those pumps is shown in Column 2 of Table V-9. From Column 3 of that table it is shown that the high lift distribution pump capacities exceed the peak hour demand for the Camp Geiger and MCAS areas. Those systems are shown as having a negative storage requirement in Column 5. The first storage requirements are shown in Column 6 and, when added to the amounts shown in Column 5, indicate the total elevated storage requirement. By comparing Column 7 with Column 8 (Existing Elevated Storage), it can be seen that Camp Geiger has a slight deficiency. Since the Camp Geiger system is connected to the MCAS system, this small amount causes no problem.

A Fire Department representative has stated that an elevated storage tank is needed in the Family Quarters area of the MCAS to correct low pressures in that area. Due to the proximity of runways in that area, siting an elevated tank in that area could be a problem.

Water Distribution

The present water system for MCAS and Camp Geiger resulted from the abandonment of the Camp Geiger water treatment plant and modification of the system to connect the MCAS and Camp Geiger water distribution systems.

TABLE V-11
MAXIMUM FIRE DEMAND

MARINE CORPS AIR STATION

WATER SUPPLY SYSTEM	(1) FIRE FLOW GPM	(2) 1/2 AVERAGE DAILY DEMAND GPM	(3) STANDBY PUMPING GPM	(4) FIRE DEMAND RATE GPM	(5) DURATION MINUTES	(6) TOTAL STORAGE REQUIRED
Camp Geiger (Exchange Store Warehouse TC-611)	2,500	$\frac{0.5 \times 426,000}{1,440} = 148$	700	1,948	150	292,200
MCAS (Hangars)	5,000	$\frac{0.5 \times 522,874}{1,440} = 181$	1,000	4,181	45	188,145

Column (1) + Column (2) - Column (3) = Column (4); Column (4) x Column (5) = Column (6)

TABLE V-12
STORAGE REQUIREMENTS

MARINE CORPS AIR STATION

WATER SUPPLY SYSTEM	(1) PEAK HOUR DEMAND GPM	(2) FIRM PUMPING CAPACITY GPM	(3) DEMAND FROM STORAGE GPM	(4) DURATION MINUTES	(5) STORAGE REQUIRED GALS.	(6) FIRE STORAGE REQUIRED GALS.	(7) TOTAL STORAGE REQUIRED GALS.	(8) EXISTING ELEVATED STORAGE GALS.
Camp Geiger	1,036	1,400	- 364	240	- 87,360	292,200	204,840	200,000
MCAS	1,271	1,500	- 229	240	- 54,960	188,145	133,185	650,000

Column (1) - Column (2) = Column (3); Column (3) x Column (4) = Column (5); Column (5) + Column (6) = Column (7)

The Camp Geiger distribution system serves an area providing infantry training and having approximately 200 well-separated buildings. Most buildings are one-story frame construction built in the early 1940s. The system is well-looped with six-inch and eight-inch lines, as well as a minor amount of 10-inch lines. There are numerous valves to isolate a line or lines for repair. The area is served by a single eight-inch main from the MCAS water treatment plant. This line ties into the Camp Geiger distribution system at the intersection of Eleventh and F Streets some 2,200 feet from the MCAS water treatment plant. A further unfavorable situation is that lines serving the quarters are in the MCAS area north of the treatment plant and facilities south of Curtis Road and west of the Seaboard Coast Line Railroad also tie into the line serving Camp Geiger. Water from the MCAS treatment plant is delivered to the 600,000-gallon and 272,000-gallon reservoirs at Camp Geiger. From these two reservoirs, two 700 GPM automatic electric pumps and one 900 GPM manual start pump take suction and deliver to the distribution system and two 100,000-gallon elevated tanks. The Fire Protection Engineering Survey Report entitled Camp Geiger dated 22 February 1982 indicated that the water supply and distribution system were adequate, as substantiated by water flow test data for four building locations. However, Camp Lejeune personnel indicated a problem caused by manual filling of the reservoirs. It was suggested by Camp Lejeune personnel that a new single main from MCAS water treatment plant to the Camp Geiger reservoirs would correct the Camp Geiger water system problems.

The MCAS distribution system serves a large geographic area with scattered development. The industrial area of the Air Station and the quarters areas north and west of the industrial area are reasonably well-looped with lines ranging in size from six inches to 12 inches. These lines are connected to lines fronting the Maintenance Hangars (such as AS 515 and AS 4108) which are large sizes ranging from 14 to 18 inches to serve the sprinklered facilities from the two nearby elevated storage tanks.

Due to the configuration of development around the runways, taxiways and A/C parking areas, there are large areas served by dead-end lines. Examples of dead-end line situations are the facilities along Flounder Road, the Air Station facilities in the vicinity of Longstaff Street and Curtis Road (including Hangar Building AS 840), the MOQ housing area along Longstaff Road, the Marina near Building AS 2800, the area in the vicinity of Warehouse 3525 and the staff NCO Club (Building AS 901). All of these areas are served by an eight-inch line connected to the looped distribution system at the intersection of Curtis Road and McAvoy Street, approximately 2,200 feet from the water treatment plant. A booster pump station, Building AS 2003 with two 750 GPM and two 125 GPM pumps, and a 300,000-gallon reservoir are located just south of Hangar AS 840 but do not serve AS 840. The pump station and reservoir provide capacity and pressure to the MOQ area and to the area near Warehouse 3525. An eight-inch dead-end line serves the helicopter fueling area, AS 511. The Fire Protection Engineering Survey Report titled Marine Corps Air Station (Helicopter) dated 15 September 1983 indicated 1600 GPM available at 20 psi at the New Exchange (1100 GPM and 20 psi required) and 6000 GPM available at 20 psi at the Vehicle Shop, Building 4157 (1250 GPM at 20 psi required). Deficiencies indicated in the study were at the MOQ Area (180 GPM at 20 psi versus 500 GPM at 20 psi required); Warehouse 3525 (1135 GPM available at 20 psi versus 1800 GPM at 20 psi required); Hangar 840 (340 GPM available at 20 psi versus 2500 GPM at 20 psi required); and the Officers Club (630 GPM available at 20 psi versus 1000 GPM at 20 psi required). Personnel at Camp Lejeune stated that looped system and additional elevated storage tanks are needed to correct the numerous deficiencies in the area.

Water lines at the MCAS have been constructed at various times, beginning in 1952 with lines along segments of Curtis Road, Bancroft Street, Flounder Road and McAvoy Street. The quarters areas north of Curtis Road and east of the Seaboard Coast Line Railroad were installed in 1957, as were the quarters area along Longstaff Street. Water lines in the hangar areas along White Street

and Campbell Street were mostly installed in the mid-1960s. Other segments of lines have been constructed intermittently over the years, with some lines being constructed in the 1980s, such as those near Building AS 4158 west of the hangar area.

Wastewater

Wastewater Flows

Table V-13 indicates data regarding flow of wastewater at the Camp Geiger/MCAS wastewater treatment plant. Basic flow data were obtained from Camp Lejeune personnel. From these data certain other data were derived using information also obtained from the records of the base. Effective service population data were developed from information obtained at the base. Population data as developed takes into account where military personnel work and reside, where dependents reside and where civilians work. To assist in evaluating wastewater flow data, the average per capita water use for the service area is also shown. The average per capita flow was the lowest on the base. The average water used from the water treatment plant equalled the flow of wastewater through the wastewater treatment plant. The ratio of maximum to average flow was not excessive.

Wastewater Treatment

Table V-14 indicates data for the treatment plant. Average and maximum daily flows, as well as plant capacity, are shown on the table. Flows are within the design capacity of the plant. The plant operates under an NPDES permit where the permit flow equals design capacity. At the time of the inspection several needed items were mentioned. The existing sludge drying beds are

TABLE V-13
WASTEWATER FLOWS

MARINE CORPS AIR STATION

Wastewater System	Average[1] Daily Flow	Maximum[1] Daily Flow	Effective Service Population	Average Per Capita Flow	Ratio Maximum To Average Flow	Average Per Capita Water Flow	% Wastewater Over Water Use
Camp Geiger-MCAS	949	1,481	8,681	109	1.56	109	0

[1] In Thousands of Gallons.

[2] Flows for Calendar Year 1982.

TABLE V-14
WASTEWATER TREATMENT PLANT

MARINE CORPS AIR STATION
(At Camp Geiger)

Wastewater System	Type Plant	Level of Treatment	Plant Capacity MGD	Existing Daily Flow CY 1982	
				Average MGD	Maximum MGD
MCAS and Camp Geiger	Trickling Filter	Secondary			
	Chemical Precipitation and Filtration	Tertiary	1.6	0.949	1.481

undersized and four additional beds have been requested. Flow is restricted leading from the secondary clarifiers by an eight-inch diameter main between the distribution box and the alum flash mixers. The main cannot easily be replaced because it runs under the concrete floor slab of Building 645. It was indicated that a relief main parallel to the effluent line from the tertiary tanks could be constructed. Again, the need for chlorine and methane gas detectors was indicated.

Collection System

One wastewater treatment plant located in Camp Geiger serves the Camp Geiger and MCAS areas. The sewage treatment plant that formerly served the MCAS area has been abandoned. The collection system for the Camp Geiger Wastewater Treatment Plant can be considered as two systems, i.e. the system for Camp Geiger and the system for the MCAS. A listing of lift stations is shown in Table V-15. The listing indicates pump capacities for each pump in the lift station and the mapping area where the lift station is located. There are 16 lift stations in the system, two of which are in the treatment plant.

There are two sewerage subsystems in the Camp Geiger area; one for the northerly portion of the area and one for the southerly portion. Both are gravity systems, with no lift stations required. The northerly area is served mostly by eight-inch to 12-inch sewers draining to an 18-inch outfall sewer. That sewer joins an 18-inch outfall sewer from the southerly area at manhole 6L, from which point a 21-inch sewer drains to the treatment plant. The southerly area is served by sewers ranging from eight inches to 15 inches in diameter, draining to an 18-inch outfall sewer. This sewer joins the outfall sewer for the northerly area as described above. Most of the Camp Geiger sewerage facilities were installed in the early 1940s.

TABLE V-15

LIFT STATIONS
MARINE CORPS AIR STATION

BUILDING NUMBER	PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4	TOTAL PUMPING CAPACITY - GPM	MAPPING AREA NUMBER	REMARKS
NEW RIVER AIR STATION - MCAS (H)/CAMP GEIGER							
AS-1001	200	200			400	B-3	
AS-230	500	500			1,000	B-3	
AS-206	500	500			1,000	B-2	
AS-850	275	275			550	C-3	
AS-606	200	200			400	B-3	
AS-426	75	75			150	C-3	
AS-517	150	150			300	C-2	
AS-629	700	700	700		2,100	B-3	Was AS-1003
AS-4125	500	500			1,000	C-2	
AS-2001	125	125			250	D-3	
AS-2808	100	100			200	D-3	
AS-902	125	125			250	C-3	
AS-3502						D-3	
S-TC-565	1,000	1,500			2,500	A-3	@ Treatment Plant
S-TC-641	1,800	1,800			3,600	A-3	@ Treatment Plant
Delalio Elem. School No Number						B-2	

The sewerage system for the Marine Corps Air Station is a complex system of gravity sewers, lift stations and force mains. All sewage from the MCAS area is pumped to the Camp Geiger Wastewater Treatment Plant by Lift Station AS-629 through a 12-inch diameter force main. Sewer facilities are provided through six sewerage collection subsystems, most of which have a major lift station to connect with a seventh subsystem in the vicinity of Curtis Road. The major features of these various subsystems are described below, proceeding in a counterclockwise direction around Lift Station AS-629. Most of the quarters' area north of Curtis Road and east of the Seaboard Coastline Railroad drains to Lift Station AS-1001. Sewers are six-inch to 10-inch in diameter. Lift Station AS-1001 pumps sewage to a manhole and eight-inch sewer near the intersection of McAvoy and Newell Streets. The easterly portion of this area drains by gravity to a 10-inch outfall line leading to Lift Station AS-629. Sewers in the easterly area drain to the 10-inch outfall sewer. A sewer along Sumner Street discharges to the 12-inch outfall line leading to Lift Station AS-629. These sewer facilities were installed in the middle to late 1950s. The second subsystem consists of the Barracks Area 4000 and the Hangar Area along White Street, which have collection systems of mostly eight-inch to 12-inch diameter pipe that drain to Lift Station AS-4125. From there sewage is pumped through an eight-inch force main to a manhole along Bancroft Street near Curtis Road. These sewers were installed in the late 1960s and mid-1970s.

A third subsystems at MCAS, New River provides sewers to facilities along Bancroft Street, from Campbell Street to Lift Station AS-206. The lift station discharges to a manhole and gravity sewer south of Curtis Road. The lines are mostly eight inches to 12 inches and were constructed in the mid-1950s. The fourth subsystem serves the hangar area south of Campbell Street and facilities along McAvoy Street to Lift Station AS-230 south of Curtis Road. The sewer lines are eight-inch to 12-inch in diameter and were constructed in the mid-1950s and mid-1960s. The fifth subsystem consists of gravity lines, lift stations and force mains south of the Curtis Road-Longstaff Street

intersection. On the south a lift station pumps sewage to the collection system for the Quarters Area 2000. The collection system for the quarters area are mostly eight-inch and 10-inch lines leading to Lift Station AS-2001. From that lift station sewage is pumped through a six-inch force main to Lift Station AS-850. A collection system of six-inch and eight-inch lines in the vicinity of Longstaff and Gooden Streets to a manhole and a 10-inch sewer line near the intersection of Curtis Road and Agan Street. A four-inch force main from AS-3526 west of Runway 1-19 also connects to the quarters area collection system. That line was constructed in 1979. The quarters area sewers were constructed in the late 1950s.

The sixth subsystem at MCAS, New River provides sewerage facilities for the area along Flounder Road off Curtis Road. The eight-inch sewer line leads to Lift Station AS-606 from which it is pumped through a four-inch force main to a manhole near the intersection of Curtis Road and Agan Street. Facilities were constructed in the mid-1950s and early 1970s. The seventh subsystem consists of those gravity sewers along and near Curtis Road from the Seaboard Coastline Railroad to Agan Street which collect sewage from force main described above, as well as from facilities in that area. These lines lead to a 12-inch outfall sewer between McAvoy and Sumner Street which discharges to an 18-inch line near Lift Station AS-629. Most of these lines are eight-inch to 12-inch in diameter, constructed in the mid-1950s. The 12-inch force main from Lift Station AS-629 to the wastewater treatment plant was installed in 1979.

Existing Electrical System

The Camp Geiger/Air Station, MCAS substation rated at 25MVA (Thousand kilovolt amperes) is located along Curtis Road at the Air Station entrance from Camp Geiger. Carolina Power and Light Company (CP&L) owns the substation and secondary to the main vacuum frame breaker. The

main breaker and underground crossing to the distribution circuit structure at 12.47 KV wye/7.s KV (kilovolts) located across the Camp Geiger connecting road (A Street) are owned by the government. The substation reserve capacity based on 1983 demands is about 11 MVA and could be increased with power factor improvement. Metering for billing is at the substation.

Electricity consumption for the past two years for MCAS is summarized as follows:

	FY-82	FY-83
Consumption (KWH)	45,980,000	48,375,000
Month Peak Demand	August	August
Peak Demand KW*	10,601	10,886
Peak Month Power Factor	0.85	0.83**
Annual Load Factor	0.50	0.51
Total Cost	$2,068,375	$2,278,975

Load Factor = Consumption/Peak Demand (KW)* Annual Hours

Annual Hours = 8,760

*Demand is purchased power during 15-minute intervals.

**Recorded on August billing.

Power factor penalties occur when there are periods during a month that power factor draw is less than 85 percent. An inspection of recent billings indicates the following:

FY-82	2 penalty periods
FY-83	6 penalty periods

MCAS Distribution

The distribution feeders are 12.47 KV-wye/7.2 KV, 3 phase, 4 wire configuration. Three circuits protected by breakers at the distribution circuit structure are routed to the air station and two circuits are routed to Camp Geiger and are analyzed in Section IV narrative. An additional circuit for underground feed of water wells to the west along Curtis Road is protected by a fused disconnect and riser at the distribution circuit structure. Feeder #1 is routed south along the extension of A Street to the BFQ area and along Schmidt Street east of the Seaboard Coastline Right-of-Way and extends along White Street north to Campbell Street and south to the airfield lighting vault, Building 3620. Feeder #2 is routed east and parallel to Curtis Road along with Feeder #3 and one of the feeders serving Camp Geiger. Feeder #2 is routed south at White Street to Campbell Street and then east to Buildings AS-504 and AS-505. The feeder extends underground in a duct bank routed to the south across the airfield apron to the AS-3500 area. Feeder #3 is routed on Curtis Road east of the Seaboard Coastline and continues east and south to Longstaff Street. It serves two family quarters areas and the operations area along the North-South Runway.

Distribution System Improvements

The electrical distribution structure and distribution feeders were improved under utility expansion contracts in FY78 (78-3096), FY75 (75-5308) and FY73 (73-1155). Airfield lighting improvements were made under a contract in FY80 (80-0400).

Analysis of Feeders

Analysis of the three distribution feeders serving air station facilities is based on 60 percent demand factor and is shown in Table V-16. The voltage drop is above two percent for each feeder, but if adjustments are made based on metered demands, all feeders are below two percent voltage drop under existing conditions. The demand factors for feeders No. 1 and No. 2, however, are low. Increased air conditioning and utilization of present facilities is expected to increase demands.

Standby Power

Standby power for the airfield is supplied by a 150 kw Diesel Generator at Building 3620. Other electric power generators are installed at buildings requiring standby service. There is approximately 1,600 kw installed capacity from 32 units.

TABLE V-16
FEEDER ANALYSIS MCAS SUBSTATION

MARINE CORPS AIR STATION

FEEDER IDENTIFICATION	(SYMBOL)	METERED DEMAND CURRENT (A)	CONNECTED TRANSF. LOAD (KVA)	DEMAND FACTOR	LENGTH (FT)	INITIAL CONDUCTOR SEGMENT	% VOLTAGE DROP @ 0.6 DF
Station Feeder No. 1	(1)	115	12,947.0	.19	8,375	336.4 MCM	2.75
Station Feeder No. 2	(2)	100	10,955.0	.20	7,800	336.4 MCM	3.23
Station Feeder No. 3	(3)	140	7,065.0	.43	17,675	336.4 MCM	2.15

Steam and Central Heating

Energy Sources

The primary heating fuel used at MCAS is fuel oil. Grade No. 6 is used at the central plant in Building AS-4151. Grade No. 2 oil is used at several individual plants as shown in Table V-17 and in buildings that have warm air furnaces. Heating in the family housing is by electric heat pumps.

Central Heating and Steam Production

There is one central heating plant at MCAS located at Building AS-4151 near White and Campbell Streets that provides steam for heating, cooking, domestic hot water, chillers and equipment cleaning. The plant supplies steam to the hangars, support facilities and BFQ complex south of Curtis Road by way of a distribution system of overhead and underground lines. The following summarizes the plant characteristics:

BOILERS					STEAM		
Plant Capacity* (lb/hr)	No/Size (BHP)	Type of Fuel	MFR	Year	Max Pressure (psig)	Opr. Pressure (psig)	Opr. Pressure (F^o)
80,000	3-116	No. 6 Oil	Trane-Murray	1976	250	150	366

*Based on one boiler not operating and on standby. Rating is from and at 212F^o.

BHP = Boiler Horsepower.

Source: Base Maintenance Department.

TABLE V-17
SUMMARY OF INDIVIDUAL BOILER PLANTS

MARINE CORPS AIR STATION

BLDG. NO.	NO. BOILERS	BOILER HORSEPOWER	STEAM OR HOT WATER	TYPE OF FUEL	MANUFACTURER
AS-710	1	36	Steam	No. 2 Oil	National Steel
AS-833	1	174	Steam	No. 6 Oil	Kewanee
AS-704	1	38	Hot Water	No. 2 Oil	National Steel
AS-702	1	26	Hot Water	No. 2 Oil	Kewanee
AS-3502	1	13.9	Hot Water	No. 2 Oil	American Standard
AS-3504	1	9.6	Hot Water	No. 2 Oil	Crane
AS-705	1	200	Steam	No. 2 Oil	Crane

Source: Base Maintenance Department.

A summary of steam production and fuel storage for Plant AS-4151 during calendar year 1982 is as follows:*

Steam Production for Year (KLB)	185,675
Peak Month Steam (KLB)	28,084
Peak Day Steam (KLB)	1,245
Month	January
Fuel Consumption for Year (MBTU)	239,333
BTU to Produce 1 Lb. Steam	1,289

Source: Harland Bartholomew & Associates, Inc.

Plant AS-4151 was put in service about eight years ago and is in good condition. It is adequate for present requirements and has a reserve capacity of about 11,600 pounds per hour.

Steam Distribution

Steam distribution is by two main feeder systems. The first, consisting of overhead 10- and six-inch steam and condensate mains, leaves the east side of the plant and crosses White Street then splits into two branches. One branch, a six- and four-inch steam and condensate pair, runs south along White and feeds a network of service lines ranging in size from $1\frac{1}{4}$ to 4 inches which serve facilities along the west side of the airfield aprons. The other branch, consisting of overhead eight- and five-inch steam and condensate mains, runs eastwardly past hangar AS-515, then north to Campbell Street and connects to a secondary main and service system ranging in size from $1\frac{1}{4}$ to six inches serving Areas 100, 200, 300, 400 and 500. The west feeder system leaves the plant as

overhead six- and three-inch steam and condensate mains and drops underground at a pit near the canal, then continues underground to the Campbell Street BFQ Complex. Here it connects to a system of secondary mains and service lines ranging in size from $1\frac{1}{2}$ to four inches which serves the buildings in the area.

A recent report of a field survey of the distribution system indicates it is in generally good condition.[1] Insulation is two-inch fiberglass on steam lines and one-inch fiberglass on condensate lines.

Fuel Storage

Bulk storage of No. 6 fuel oil at MCAS consists of three 100,000-gallon tanks located near plant AS-4151. Allowing for heat expansion, the effective storage is:

300,000 gals. x 085 = 255,000 gallons

Peak month usage occurred in January 1982 when 240,630 gallons of No. 6 oil were used; so storage is adequate for the 30-day requirement.

There is no bulk storage for No. 2 fuel oil at MCAS, but each of the individual plants as listed in Table V-17 has on-site day tanks which are supplied from the bulk facility at Hadnot Point (see

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[1] Steam Distribution Study at Camp Lejeune, December 9, 1983.

Section IV, UTILITIES). On this basis, storage for No. 2 fuel oil is adequate for the 30-day requirement.

REGIONAL INFLUENCES

MCAS, New River has one outlying field (OLF) under its control, OLF Camp Davis, located 10 miles to the southeast. The main command headquarters for the Air Station is MCAS, Cherry Point which is located approximately 46 miles from Camp Lejeune via NC Route 24 and Route 40.

As described in detail in Section II, encroachment is a problem at the Air Station, but much less than that encountered by the Marine Corps organization. Increased numbers of property owners will result in a higher noise impact; increased fixed-wing aircraft of a larger size will increase the potential for noise and accident problems.

The alignment for the proposed Highway 17 Bypass would impact positively MCAS, New River. Vehicular access to the Hadnot Point Marine Corps Base and 2nd Marine Division headquarters would be improved, as would access to training areas Complex-wide. Abandonment of the Seaboard Coastline Railroad will necessitate increased use of external roadways for fuel delivery. Fuel delivery to the Campbell Street Extension Storage Area would be enhanced greatly by the Bypass.

COMPLEX INFLUENCES

Due to the interrelationship between air and ground training by the Marine Corps, training activities undertaken by the Marine Corps Base (MCB) Activity greatly influence the activities and

facility and equipment requirements of the Air Station Activity. This relationship has been explored specifically in the Special Training Analysis, Camp Lejeune, North Carolina.

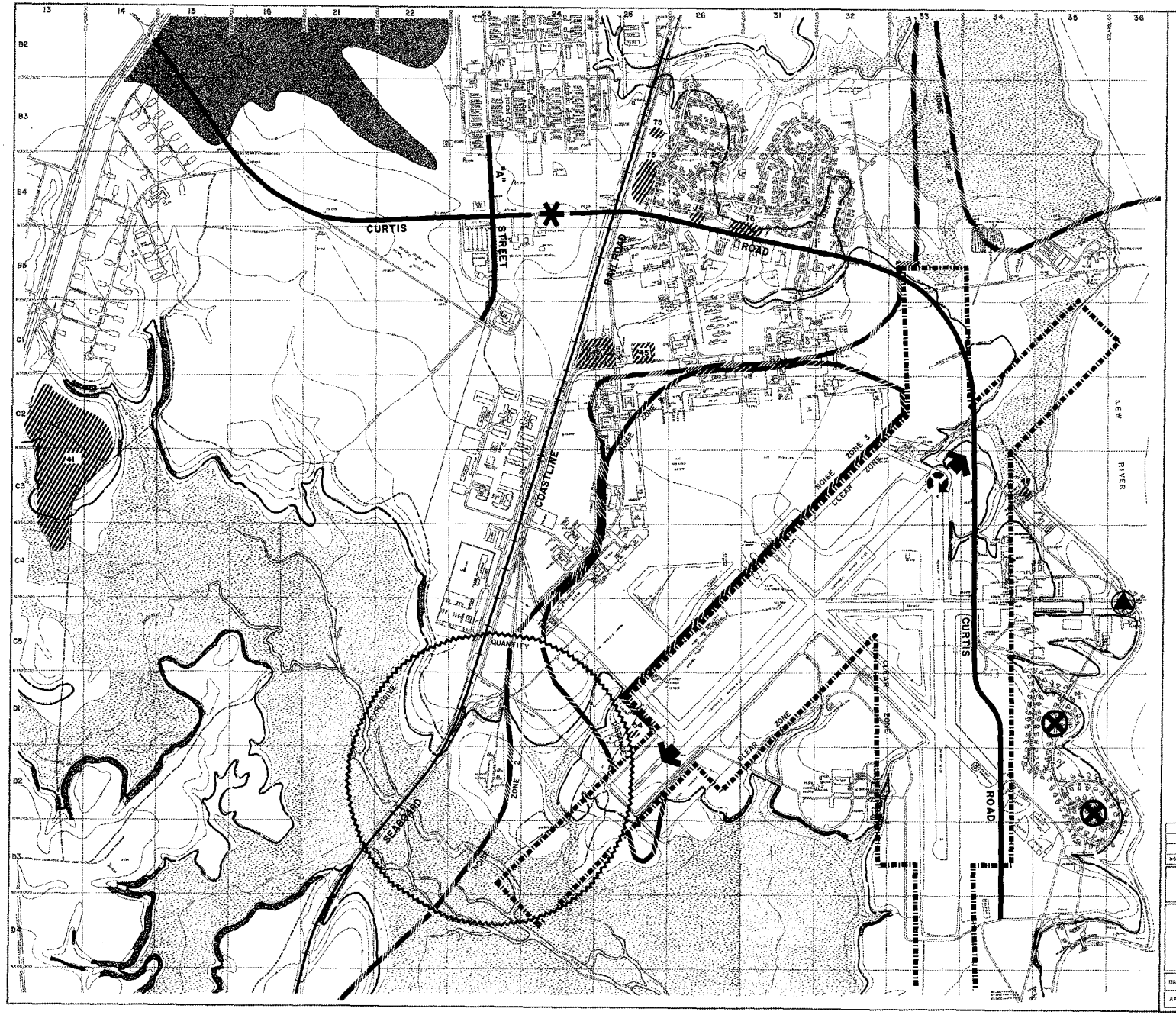
Secondly, MCAS, New River stores some of its supplies in MCB warehouses at Camp Geiger. Support facilities, such as commercial, community and housing services, also are programmed in conjunction with the Marine Corps Base host organization.

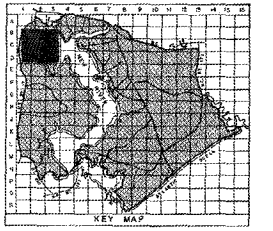
PLANNING FACTORS

Listed below are factors which should be considered in planning any future development at MCAS, New River. These factors include problem areas as well as specific natural and man-made constraints which have been identified in the preceding analysis.

Planning factors that can be depicted graphically are shown in Figure V-3. It should be noted that areas labeled as "Contaminated Site" do not pose an immediate threat to human health or the environment. In its 1983 study entitled "Initial Assessment of Marine Corps Base, Camp Lejeune, North Carolina," the Naval Energy and Environmental Support Activity identified 76 potentially contaminated sites. Twenty-two of these sites were described in detail and were recommended for further study. Five contaminated areas exist at MCAS, New River.

Flood plains, sloped areas and poor soils are not considered problems unless they occur in developed areas. However, these three characteristics are considered as constraints to development. For the most part, poor soils/slopes are located in flood plain areas. The only poor soils/slopes shown on the Planning Factors Maps are those that are not in the flood plain.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE
- FLOOD LINE
- POOR SOILS / SLOPES
- CONTAMINATED SITE
- TRAFFIC PROBLEM AREAS
- INCOMPATABLE LAND USE
- ROADS
- RAILROAD
- INADEQUATE DISEMBARKATION AREA
- INADEQUATE RUNWAY FOR LARGE FIXED-WING AIRCRAFT
- LIMITED TURN-AROUND AREA

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

PLANNING FACTORS

MCAS NEW RIVER
EXISTING CONDITIONS

DATE 31 JULY 86	SCALE: GRAPHIC	FIGURE V-3
APPROVED / DATE		

The following lists factors which should be considered in planning areas for future development:

1. Contaminated Site No. 75, Basketball Court Site: In the early 1950s, 75 to 100 55-gallon drums of material simply called "gas" were burned at this site. It is believed to be CN tear compound in solution as well as one or more solvents.

2. Contaminated Site No. 76, Curtis Road Site: In 1949, 25, and possibly as many as 75, 55-gallon drums were burned at this site. The contents are believed to be the same as the previous site (MCAS Basketball Court Site).

3. Contaminated Site No. 45, Campbell Street Underground Avgas Storage and Adjacent JP Fuel Farm: About 200 to 300 gallons of Avgas leaked in 1978 from underground storage tank(s). In 1981 it was discovered that more than 100,000 gallons of JP fuel had leaked from underground tanks.

4. Contaminated Site No. 48, New River Mercury Dump Site: Between 1956 and 1966 a total of more than 1,000 pounds of mercury were dumped in this area.

5. Contaminated Site No. 54, Crash Crew Fire Training Burn Pit: Contains an estimated 3,000 to 4,000 gallons of waste oil and solvents which were dumped at the site since the mid-1950s (lining added in 1975).

6. The Explosive Safety Quantity Distance Arc surrounding Ordnance Magazine limits the area available for future development.

7. Noise and Accident Potential Zones also pose restrictions on development areas, especially in the categories of housing and personnel support uses.

8. Officer family housing, located southeast of the airfield, sits in Noise Zone 2, according to the 1978 AICUZ.

9. Limited airfield turn-around area for C-5, C-130 and C-141 fixed-wing aircraft presently exists.

10. Projected need to extend Runway 5 in order to accommodate new heavier and larger aircraft.

11. Taxiways need to be widened and resurfaced.

12. Inadequate MAT area on which to store larger aircraft and cargo.

13. Conflict between operationally-related traffic and general community traffic on Curtis Road. At the present time, Curtis Road provides the only access to the fuel storage area and to the MAG 26 and MAG 29 industrial areas.

14. Need to expand the "embarkation area" in the vicinity of the present MCAS headquarters buildings.

CONCEPTUAL DEVELOPMENT

GENERAL

Alternative concept plans represent conceptual solutions for directing growth and change at MCAS, New River. The purpose of this analysis is to compare alternative land use schemes and to select the most logical and efficient land use plan, given assigned missions, available resources, and various physical and operational constraints.

Defined below are a set of broad goals to serve as a guide for future physical development at MCAS, New River. Selection of these goals was based upon the preceding planning analysis. Following each goal is a series of measurable objectives which can be used to achieve each goal.

GOALS AND OBJECTIVES

Goal 1: ENCOURAGE COMPATIBLE LAND USE RELATIONSHIPS

Objective 1A: Site physically and functionally related facilities adjacent to one another.

Objective 1B: Maintain unit integrity.

Goal 2: CONCENTRATE DEVELOPMENT TO MAXIMIZE LAND POTENTIAL

Objective 2A: Site new facilities in locations occupied currently by temporary, sub-standard or inadequate facilities.

Objective 2B: Prevent encroachment of development into training and maneuver areas.

Goal 3: IMPROVE THE CIRCULATION SYSTEM TO FULLY SERVE AND SUPPORT LAND USE, TO CONSERVE TIME AND ENERGY AND TO PROMOTE SAFETY

Objective 3A: Minimize conflicts between pedestrian and vehicular traffic.

Objective 3B: Relieve traffic congestion along major arterials and at major intersections.

Objective 3C: Reduce travel times between developed areas.

Objective 3D: Improve access to personnel support areas.

Goal 4: CONSERVE EXISTING ASSETS

Objective 4A: To the extent economically feasible, repair and/or renovate substandard facilities prior to planning new replacement facilities.

Objective 4B: Relocate tenants from facilities that, although in good structural condition, are deficient in configuration or size for their needs.

Goal 5: PRESERVE AND PROTECT THE NATURAL ENVIRONMENT

Objective 5A: Maintain the integrity of all endangered species' habitats.

Objective 5B: Construct facilities outside the 100-year flood plain.

Objective 5C: Construct facilities in areas with less than 10 percent slope.

Objective 5D: Prevent contamination or destruction of soils, vegetation and wetlands.

Goal 6: ENHANCE THE OVERALL ATTRACTIVENESS OF DEVELOPED AREAS

Objective 6A: Use plant materials or fencing to buffer incompatible uses.

Objective 6B: Improve main entryways into MCAS, New River.

Objective 6C: Plan facilities which are well-integrated in terms of scale, materials and design.

Goal 7: IMPROVE ACCESS TO AND VISIBILITY OF THE NEW RIVER SHORELINE

Objective 7A: Establish passive recreational corridors that interconnect the waterfront with active recreational and housing areas.

Objective 7B: Improve embarkation areas.

Objective 7C: Emphasize the unique natural setting as an important physical attribute.

Goal 8: RESERVE UNDEVELOPED LAND AREAS TO ACCOMMODATE FUTURE FACILITY NEEDS

Objective 8A: Identify potential facility requirements beyond the time frame of this plan.

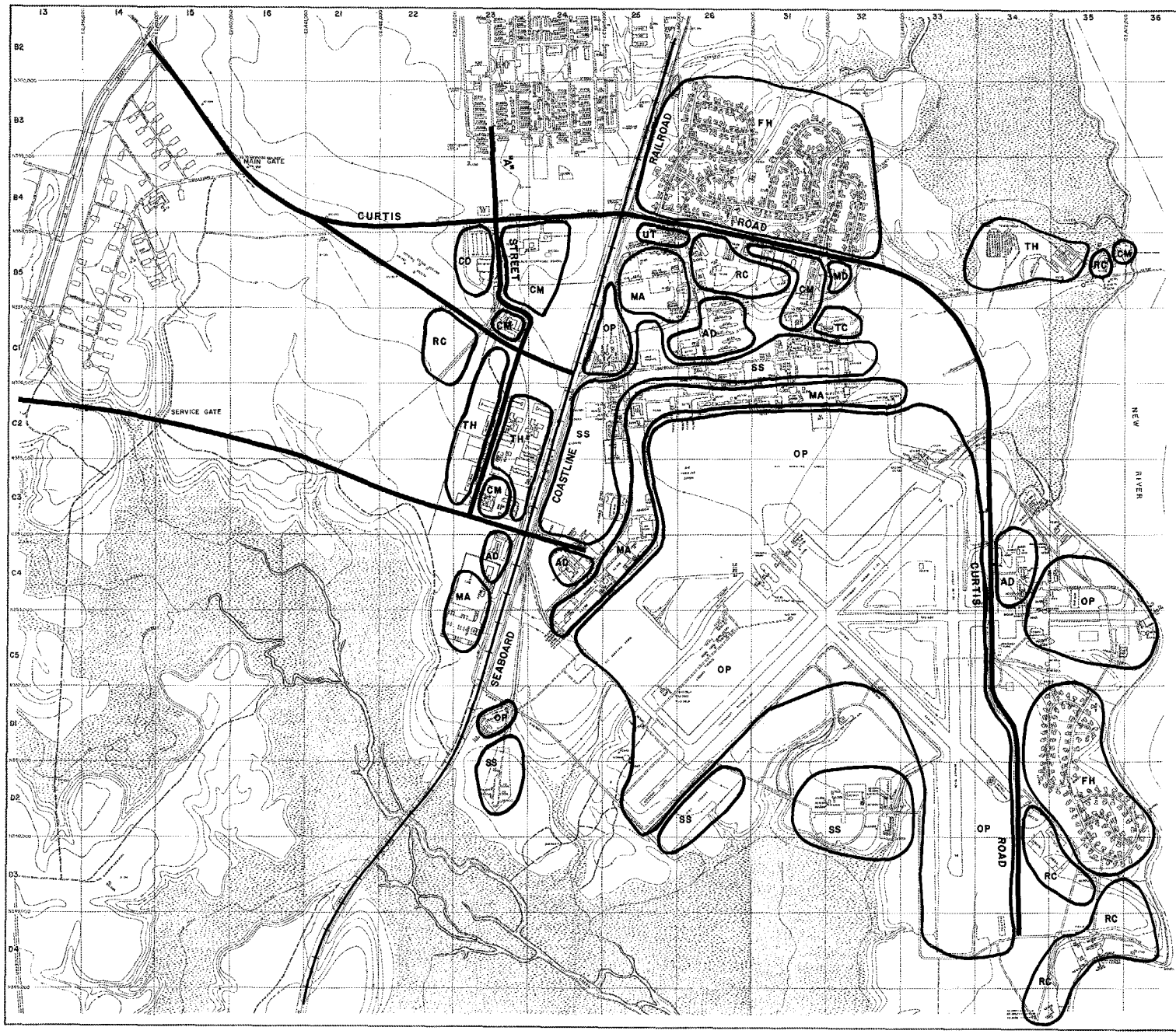
Objective 8B: Identify specific areas for construction of facilities designed to meet requirements beyond the time frame of this plan.

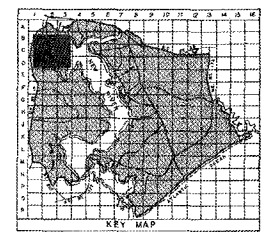
CONCEPT PLANS

Presented below are three alternative concepts for future development at MCAS, New River. Each concept is depicted or analyzed as it relates to the goals and objectives. Following this analysis, is a Land Use Plan which most closely satisfies all goals and objectives.

Concept Plan A

Concept Plan A generally reflects the existing pattern of development and programmed MILCON projects (Figure V-4). This concept does not meet several important goals. For example, while existing assets are largely conserved, incompatible land use relationships are preserved, heightening the potential for noise and accident conflicts. The most adverse impact occurs on the Married Officers' Housing which is located within Noise Zone 2. Secondarily, personnel assigned to the administrative areas directly north of the airfield, and families and personnel using community facilities in that same area, also are subjected to higher than recommended noise levels. Furthermore, the present pattern of development around the north and east sides of the airfield greatly constrains the expansion potential of operationally-related uses, such as runways, taxiways





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Improved)
- FENCE
- 5' CONTOUR (Source—USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS
	RAILROAD

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INIT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN A

MCAS NEW RIVER
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE V-4

APPROVED / DATE

and maintenance hangars. Conflicts between operational and residential traffic will be reduced with construction of a new Service Gate and entrance road loading directly from Highway 17 to the fuel storage area.

Concept Plan B

This concept depicts most of the land use proposals made in the previous Master Plan. Essentially the same land use pattern is shown for both Concepts A and B (Figure V-5). More dense multi-use development is retained in the operational area east of the Seaboard Coastline Railroad tracks, creating similar conflicts as discussed under Concept A. Any northward expansion of the flight-path operational area would present an even greater conflict in terms of noise and accident potential, especially to the Enlisted Married Housing and Reservist housing areas located on either side. In this concept, the Officers' Married Housing is retained; however, noise insulation, vegetative buffers and certain revisions in air operation procedures, as stipulated in the 1978 AICUZ, would need to be undertaken. As in Concept A, a segregated roadway exists for operationally-related traffic.

Concept Plan C

In Concept Plan C, operationally-related land uses are limited to the eastern side of the Seaboard Coastline Railroad tracks and personnel support uses limited to the western side of the tracks (Figure V-6). Noise and accident conflicts are virtually eliminated in this land use scheme. Airfield operation expansion is no longer limited and a large embarkation area is opened up on the New River shoreline. A new Service Gate is shown which allows direct access to the storage area and the southern part of the operations area. Also shown is the recommended site for the Army Reserve Training Center.

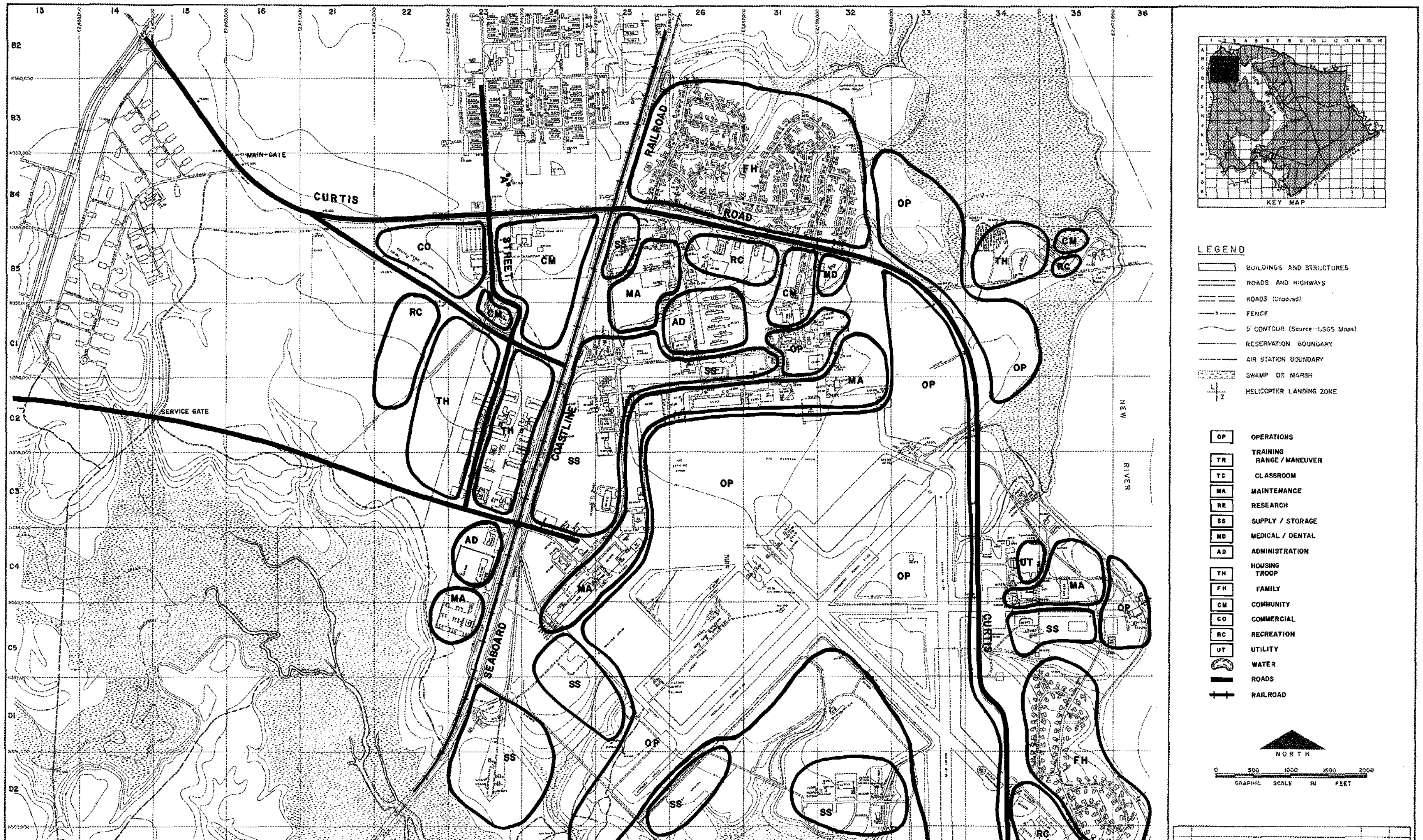
The major disadvantage to Concept Plan C is the limitations it would present to access and visibility of the New River and the long-term capital investment required to construct new facilities as old facilities deteriorate. This disadvantage would be far outweighed by the air operations expansion potential and land use compatibilities created by this Concept.

LAND USE PLAN

The Land Use Plan for future physical development at the Marine Corps Air Station, New River is described below and is shown on Figure V-7. The Land Use Plan is the result of the analysis of facility requirements, planning factors, and comments provided by the activity as a result of its review of alternate Concept Plans. Therefore, it represents the most logical and efficient use of activity assets given the assigned mission, available resources, and physical and operational constraints. The Land Use Plan provides a sound basis for directing growth and change, and has been used to site Capital Improvements Program projects.

The present land use pattern encircles the Airfield Operations Area, which traditionally has served as the focal point for Air Station development. Resolution of the resulting conflicts between incompatible land use relationships is a major emphasis of the Land Use Plan. This is accomplished by limiting operationally-related land uses to the eastern side of the Seaboard Coastline Railroad tracks and by assigning personnel support uses to the western side (Figure V-7).

Conflicts between housing and community uses situated in the Noise and Accident Zones are virtually eliminated. In addition, accessibility of support facilities is improved. For example, the relocation of the medical clinic westward on Curtis Road will bring these services much closer to family and troop housing areas, and the elementary school. Administrative functions are centralized



NO	DESCRIPTION OF REVISION	DATE	INT.

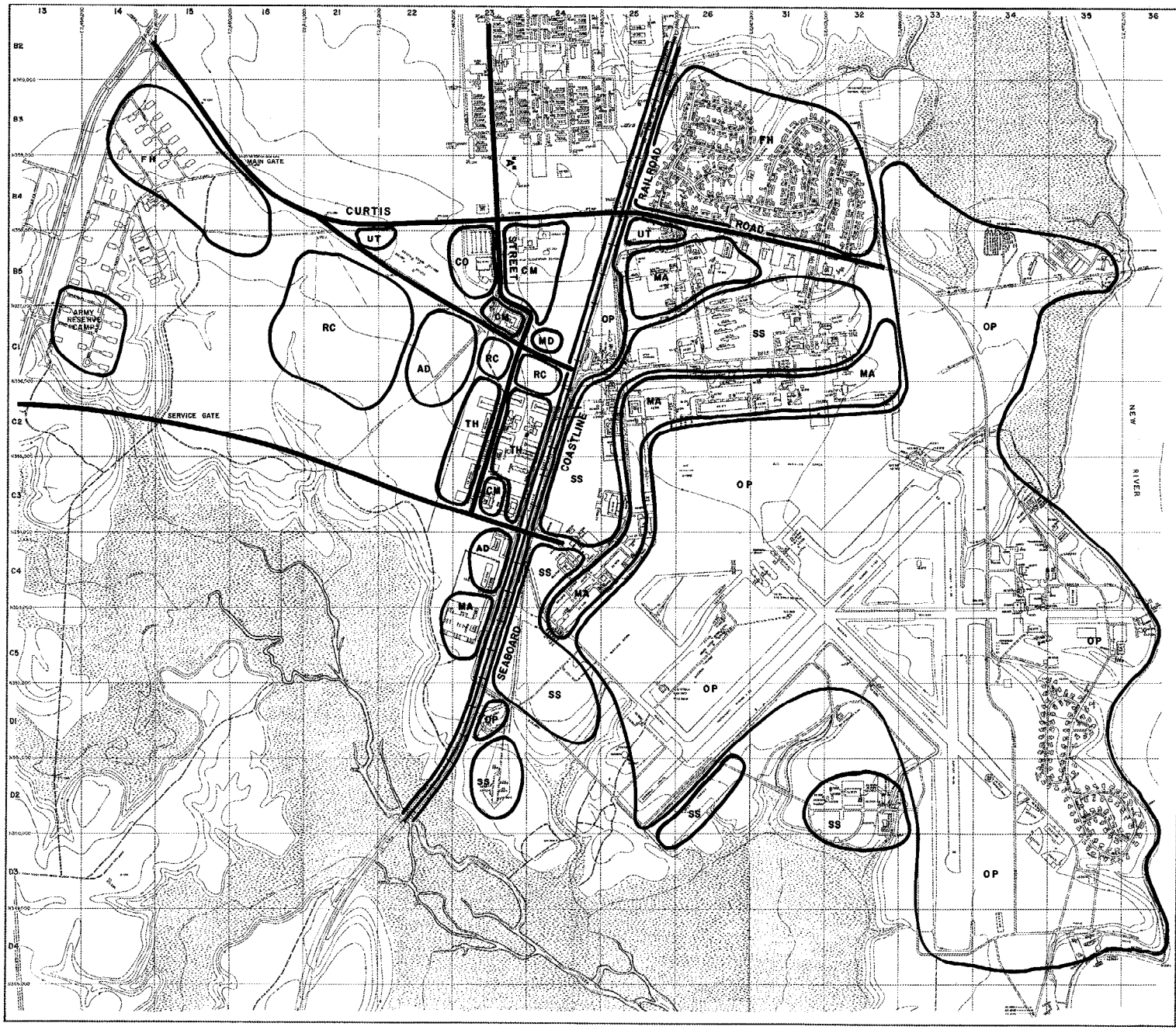
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

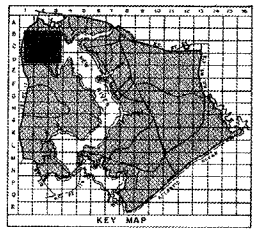
CONCEPT PLAN B

MCAS NEW RIVER
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | **FIGURE V-5**

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS
	RAILROAD

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INIT

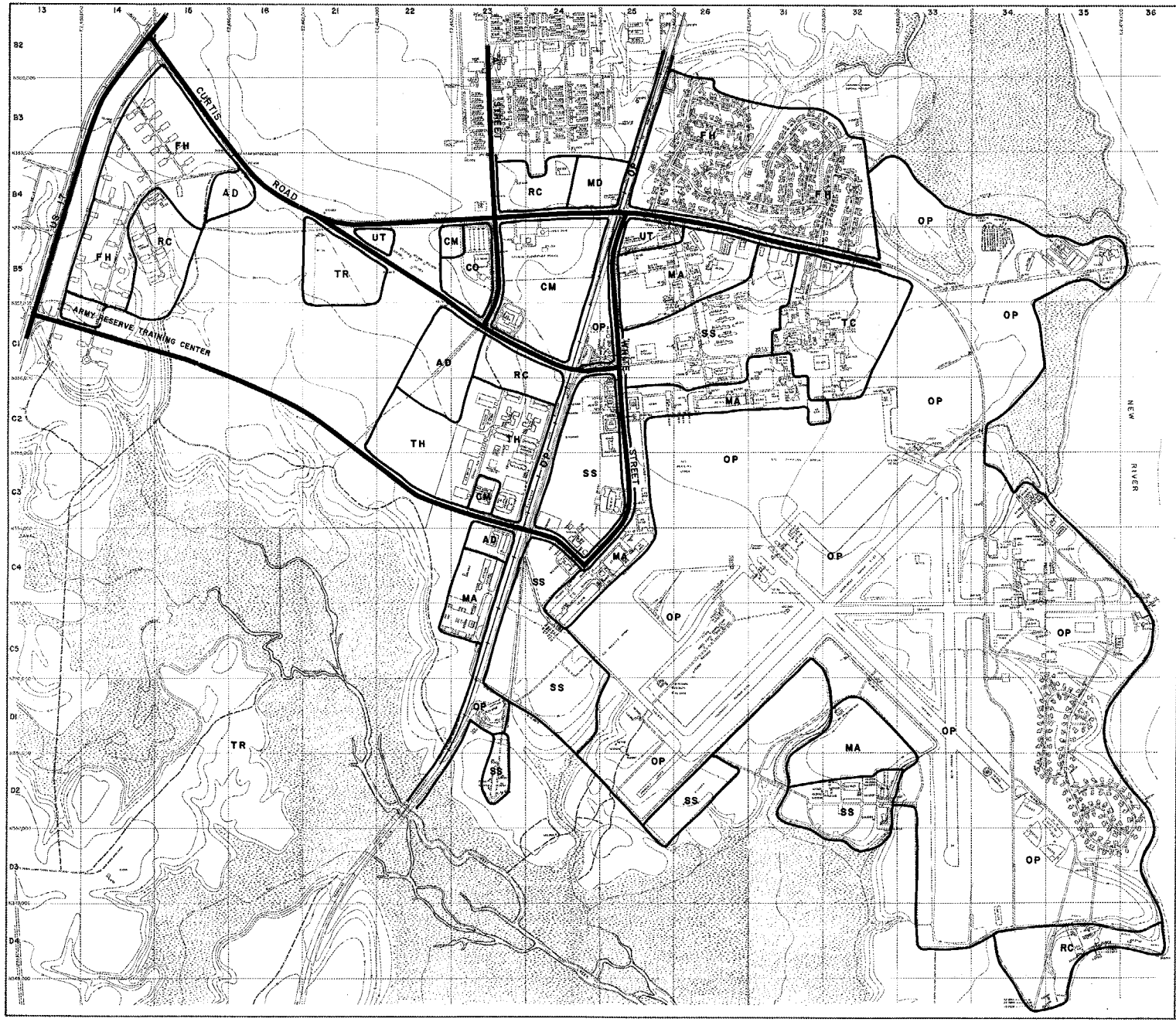
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN C

MCAS NEW RIVER
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | **FIGURE V-6**

APPROVED / DATE


CURTIS
ROAD
ARMY RESERVE TRAINING CENTER
STREET
WHITE
STREET
NEW
RIVER
FH
AD
RC
MD
UT
CM
CO
TR
MA
SS
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KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source-USGS Maps)
RESERVATION BOUNDARY
AIR STATION BOUNDARY
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MD MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2200
GRAPHIC SCALE IN FEET
NO DESCRIPTION OF REVISION DATE INT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAND USE PLAN
MCAS(H) NEW RIVER
EXISTING CONDITIONS
DATE: MAY 1986
SCALE: GRAPHIC
FIGURE V-7
APPROVED / DATE

nearby in a highly accessible location which offers increased visibility. With the movement of personnel support uses west of the railroad tracks, the Airfield Operations Area is expanded and a large embarkation area is made available on the New River shoreline. Recreation/open space uses are retained where they presently exist to preserve access and visibility of the New River.

A new Service Gate, allowing direct access from U.S. Route 17 to the fuel storage and maintenance areas, will reduce conflicts between operational and residential traffic and thus the risk for potentially serious accidents.

The western boundary of the Air Station Area is more firmly defined by the designation of the Army Reserve Training Center on Hawkins Boulevard near the new Service Gate. This location provides a separate identity for the Center, and also insures the establishment of a transitional zone adjacent to the Air Station.

Opportunities created by the Land Use Plan are substantial in terms of air operations expansion potential and land use compatibility. Achievement of the land use arrangement set forth in the Plan, while requiring long-term investment, can be undertaken in phases which coincide with the implementation schedule of the CIP. As existing facilities require replacement, the Land Use Plan should be used as a guide when new site locations are sought.

SUPPORTING UTILITIES PLAN

The utilities serving the Marine Corps Air Station and incorporated into the Supporting Utilities Plan include the water system, wastewater collection and treatment, the electrical system and central heating system. An analysis of existing facilities and deficiencies was presented in the

EXISTING UTILITIES element of the Planning Analysis effort. The Supporting Utilities Plan indicates future improvements that will be required in order to alleviate existing system deficiencies and to support changing utility needs based upon land use and site development plans.

Most of the programmed CIP projects for the Marine Corps Air Station Activity are located near existing utility lines with adequate capacity, thus requiring only on-site utility improvements. More detailed information regarding required system improvements is provided in the CIP document and on Site Location Maps (scale: 1" = 200'). It should be noted that system extensions and relocations were designed based upon appropriate NAVFAC design manuals. However, these should not be construed as final designs. Detailed utility design studies should be undertaken in conjunction with the individual project design.

WATER SERVICE

Water Usage

Personnel strength is expected to remain at present levels over the planning period (see Table V-1). Therefore, future water usage will resemble present rates (see Table V-5).

Major System Components

The MCAS water system serves both Camp Geiger as well as the Air Station.

Major system components adequate for existing and planned facilities include the water source (well fields), water treatment plant, high lift pumps, and storage. Pressure deficiencies exist

in the distribution system under fire flow conditions at five locations. System looping and/or additional elevated storage tanks are recommended. Line extensions for critical CIP projects are addressed along with other siting considerations in the separate CIP document.

WASTEWATER TREATMENT SYSTEM

Wastewater Treatment

The Camp Geiger Wastewater Treatment Plant serves both MCAS and Camp Geiger. As previously noted, the population at MCAS and Camp Geiger is expected to remain relatively stable over the planning period. Therefore, daily sewage flows to the plant are not expected to change. Present flows are within the hydraulic capacity of the plant (see Table V-14). Specific needs at the plant, as indicated under EXISTING UTILITIES, include additional sludge drying beds, a relief main between the distribution box and the alum flash mixers, and chlorine and methane gas detectors. Following installation of these improvements, the treatment plant would be considered adequate for existing and planned facilities.

Collection System

Much of the existing collection system is 30 to 45 years old. However, the system appears adequate since average per capita sewage flow is about the same as average per capita water usage (see Table V-13). The ratio of maximum to average sewage flows is 1.56 while the ratio for water usage is 2.23 (see Tables V-5 and V-13). This indicates that inflow and infiltration into the system is not excessive. Since no additional sewage flow is expected, the major collectors are considered adequate for existing and planned facilities. There are no known deficiencies at the major lift

stations and force mains. Therefore no required upgrading of existing lift stations is anticipated over the planning period.

New service extensions, mains and pumping stations, required to serve critical CIP projects, will be addressed along with other siting considerations in the separate CIP document.

ELECTRICAL DISTRIBUTION SYSTEM

Methodology

Electrical requirements for programmed CIP projects were calculated on a watts per square foot basis similar to the method used for the Marine Corps Base. The Requirements Analysis section of the Marine Corps Base Activity Plan can be consulted for a complete description of applicable design criteria. It should be noted that the design criteria is used to arrive at estimated electrical demands for use in determining the impacts of future growth on the electrical system. Actual electric loads should be determined for each facility at the time of project design.

Power Supply

All future development at the Marine Corps Air Station and at Camp Geiger will be served by the existing MCAS Substation. It is estimated that the total electrical demand for all projects sited at MCAS and Camp Geiger is approximately 2,600 KVA. The Standard Handbook for Electrical Engineers allows for the application of a diversity factor of 2.24 to all loads on a substation. This

diversity accounts for the varying times at which peak demands are reached by different facilities on several feeders. Based on a diversity factor of 2.24, an additional demand of 1,160 KVA will be loaded onto the MCAS Substation.

$$2{,}600 \text{ KVA} \div 2.24 = 1{,}160.7 \text{ KVA}$$

Billing data for FY 83 indicates existing maximum demand on the substation is approximately 13,100 KVA. Application of the additional load will result in an excess capacity of over 40 percent.

$$\frac{25{,}000 \text{ KVA} - (13{,}100 + 1{,}160) \text{ KVA}}{25{,}000 \text{ KVA}} \times 100 = 42.9\%$$

It is assumed that Carolina Power & Light can supply the full capacity of the MCAS Substation and, therefore, power supply is not seen as a deterrent to future growth.

Electrical Distribution

Electrical service to MCAS is provided by three aerial feeders. New facilities planned for the area include maintenance and equipment shops, hangar modernization and storage facilities. Assuming feeder demand factors remain constant or are only slightly elevated, all three feeders in the Air Station have adequate capacity to supply anticipated future loads. Feeder 1, known as the "Loop Feeder," will assume the majority of the new load and will require reconfiguration to avoid several CIP project sites. Electrical service provision to most of the projects, however will require only simply line extensions.

Methodology

Heating requirements for CIP facilities at MCAS were estimated on a Btuh/square foot basis similar to that for the Marine Corps Base. It is expected that the majority of CIP projects will be furnished heat by the central heating plant in building AS-4151. CIP projects remotely located from the AS-4151 distribution system should have individual heating plants.

Central Heating Distributing Systems

Additional peak steam demands on Plant AS-4151 for programmed CIP facilities is estimated at approximately 22,200 pounds per hour. The reserve plant capacity of 11,600 lbs/hr assumes that one boiler is off-line; however with all boilers operating, reserve capacity is increased to approximately 38,270 lb/hr which is more than adequate for planned CIP facilities. No further upgrade of the plant is recommended.

Individual Heating Plants

Individual heating plants are recommended for the following CIP facilities planned at MCAS for FY 87-92 (Table V-18).

Table V-18
Summary of Programmed CIP Projects Requiring Individual Heating Plants
Marine Corps Air Station Activity

Project No. & Description		FY	Estimated Peak-Hour Heating Load (MBtuh)
P-856	Multi-Purp. Rm. - School	86	0.132
P-489	H.Q. Building	89	0.363
P-133	Phys. Ftns. Ctr.	89	0.475
P-497	Ordnance Ops. Bldg.	89	0.097
P-505	Elec/Comm. Mtn. Shop	89	0.125
P-450	Library	90	0.189

Air Conditioning

Absorption air conditioning is recommended for those CIP projects requiring large tonnages if they are located near the steam distribution system. Mechanical compression systems are recommended for other locations (see Electrical Facilities).

Fuels Storage

Net effective bulk storage of No. 6 fuel oil at MCAS is 255,000 gallons (see Table IV-26). Requirements for existing facilities is 240,630 gallons which leaves a reserve capacity of 14,370 gallons.

The projected requirement for programmed CIP projects was computed based upon the same methodology used for the Marine Corps Base. The peak month steam requirement for MCAS was estimated to be 9,124,200 lb.

A one month supply of No. 6 oil was estimated to require approximately 78,570 gallons of storage. This indicates a storage shortfall of

78,570 - 14,730 (Reserve) = 63,840 gallons

for No. 6 oil to be located at the present fuel storage area near Plant AS-4151.

Planned CIP facilities with oil-fired individual plants are expected to use No. 2 fuel oil. It is recommended that these facilities have on-site day tanks equivalent to about a one-week supply.

The day tanks can be supplied from the 600,000 gallon storage facility for No. 2 oil located at Hadnot Point. Therefore storage for No. 2 oil at MCAS is considered adequate.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

This assessment has been prepared for the Marine Corps Air Station, New River at Camp Lejeune, North Carolina, in accordance with NAVFACINST 11010.63B of October 1982 and OPNAVINST 11000.16 of April 1983 in compliance with Section 102 (2) (c) of the National Environmental Policy Act of 1969.

Submitting DOD Component: Department of the Navy

Activity: Marine Corps Air Station, New River, Camp Lejeune, North Carolina

Project Title: Camp Lejeune Complex Master Plan

Date of Submission: March 1987

SUMMARY

The Camp Lejeune Complex Master Plan component for the Marine Corps Air Station, New River proposes that all programmed facilities delineated in the Capital Improvements Plan (CIP) be constructed subject to compliance with adopted environmental policies. As a result of undertaking this aggressive development program, potential exists for some significant adverse effects on the environment. Although temporary construction impacts will be experienced from increased noise

levels, these will subside following completion of the overall program. No additional adverse impacts are anticipated.

INTRODUCTION

The Master Plan provides a basis for the efficient and orderly development of real estate and facilities resources in order to meet mission requirements. It establishes an overall scheme for land and facilities resources use and the optimum use of all property owned by the Department of the Navy. The Plan is based upon considerations of military requirements, planning criteria, economic and environmental factors.

Major proposals of the Plan for MCAS, New River are as follows:

1. Allocate space for eventual replacement and construction phasing of facilities to maintain desired functional relationships and to maximize the efficient use of energy and natural resources.

2. Consider the immediate, short-range and long-range impacts on the natural and man-made environment relative to the expansion of training functions and all other potential construction on-base.

3. Consider construction of the proposed U.S. Route 17 Bypass and all other on-base roadway construction in terms of existing and planned land use patterns and access improvement.

4. Construct all programmed facilities delineated within the CIP in compliance with adopted environmental policies and accepted mitigation measures.

5. Preserve the overall quality of the natural and man-made environment and protect areas containing significant natural constraints for development such as: 100-year floodplains, wetlands, sensitive slopes, habitats of endangered species and archaeological/historical sites.

EXISTING ENVIRONMENT OF PROPOSED ACTIONS

MCAS, New River is located within the western portion of the Camp Lejeune Military Complex. Situated within Onslow County in southeastern North Carolina, the Complex is adjacent to the City of Jacksonville's southern boundary. The New River Inlet separates Camp Lejeune from the County's growing resort community of West Onslow Beach. The County's two forest preserves represent large areas of undeveloped land in close proximity to the Camp Lejeune Complex.

The topography of Camp Lejeune is basically flat, sloping gently toward the New River. Elevation ranges from sea level to 72 feet with most of the land averaging from 20 to 40 feet above sea level. The Base is encompassed by vast areas of swampland which evolved due to its shallow topographic features.

A variety of 31 soil series are found throughout Camp Lejeune, ranging from sandy loam to fine sand and mud. Drainage is the most critical factor determining the suitability of the heterogenous soil conditions. Approximately 3,000 acres of sensitive estuarine areas are dispersed widely throughout the Complex. Wetland areas near the Air Station, like other sensitive areas

within the Military Complex, should not be used for future development because of their importance to the food chain.

Vegetation is typical of the southeastern coastal plain. Extensive tracts of both pure pine and pine-hardwood mixtures dominate the landscape. Much of the area within the Air Station is open grassland which is well suited to its mission.

Endangered species with habitats on-base include the Red-Cockaded Woodpecker and the Atlantic Loggerheaded Sea Turtle. Neither of these species have an impact on the mission at MCAS.

The Camp Lejeune area is located in a region of warm, humid and temperate climate. The average annual temperature is 63° and the average annual rainfall is 57.9 inches, with the heaviest rains occurring during the summer months.

The Military Complex encompasses some of Onslow County's earliest settled areas and some of its most historic sites. At present, only one archaeological site has been studied in detail. It was found to contain Indian artifacts.

Only four percent of Onslow County is developed, with urban uses mostly concentrated within the corporate limits of Jacksonville. Surrounding civilian land uses are predominately agricultural and forestal in character.

PROJECT DESCRIPTIONS AND POTENTIAL ENVIRONMENTAL CONSEQUENCES

This section addresses the projects contained in the Capital Improvements Plan. Each Military Construction (MCON) and special fund project scheduled for construction during the 5-year period of this Plan should be evaluated for potential impacts as a part of project planning. During this evaluation, impacts which would interfere unreasonably with the living conditions of man, wildlife or marine life on an immediate, short-range or long-range basis were identified.

The projects listed in Table V-19 have been evaluated for potential impacts, as part of the project planning process, and are not anticipated to have significant impact on air quality, earth resources, general ecology, groundwater, historic and archaeological resources, and development character. In general these projects do not appear to have significant long-term adverse impacts.

All MCON projects are anticipated to have short-term construction impacts on the surrounding environment, however these impacts are not expected to exist after project completion. All construction contracts should include, to the extent possible, mitigation measures which are designed to limit the adverse impacts resulting from construction.

POSSIBLE CONFLICT BETWEEN PLAN RECOMMENDATIONS AND OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The master planning process for the Camp Lejeune Complex considered current and future mission requirements and produced recommendations for the land use plan and capital improvement projects which met these requirements. The recommendations include changes to existing land use

TABLE V-19
SUMMARY OF PROGRAMMED CIP PROJECTS
MARINE CORPS AIR STATION ACTIVITY
CAMP LEJEUNE, NORTH CAROLINA

PROJECT NUMBER	PROJECT DESCRIPTION
P-133	PHYSICAL FITNESS CENTER
P-185	GENERAL PURPOSE WAREHOUSE
P-188	PARACHUTE & SURVIVAL EQUIP SHOP
P-211	GROUND SUPPORT EQUIP FACILITY
P-300	ROAD AND STREET IMPROVEMENTS
P-305	GROUP OPERATIONS FACILITY
P-339	PHOTOGRAPHIC BUILDING
P-357	GENERAL PURPOSE WAREHOUSE
P-389	GROUP HEADQUARTERS
P-404	MAINTENANCE HANGAR
P-410	BACHELOR ENLISTED QUARTERS
P-430	OPERATIONAL TRAINER FACILITY
P-433	CORROSION CONTROL HANGAR
P-450	LIBRARY
P-451	MAINTENANCE HANGAR MODERNIZATION

TABLE V-19 (Continued)

PROJECT NUMBER	PROJECT DESCRIPTION
P-465	COMBAT AIRCRAFT LOADING AREA
P-476	AVIATION READY FUEL STORAGE
P-489	HEADQUARTERS BUILDING
P-496	FLIGHT LINE SECURITY IMPROVEMENT
P-497	ORDANCE OPERATIONS BUILDING
P-500	GENERAL WAREHOUSE
P-506	AVIATION ARMAMENT SHOP
P-507	MAINTENANCE HANGAR MODERNIZATION
P-514	GENERAL WAREHOUSE
P-515	GENERAL WAREHOUSE
P-517	ARMORY
P-520	OPERATIONAL TRAINER FACILITY
P-525	APPLIED INSTRUCTION BUILDING
P-856	MULTIPURPOSE ROOM-DELALIO ELEM
P-858	EXPAND ELEM LIBRARIES - DELALIO

Source: Camp Lejeune Military Construction Project Data, 1986.

patterns as well as changes to the future land use plan. The changes resulting from mission requirements considered objectives of Federal, Regional, State and local land use plans, policies and controls. Potential conflicts were avoided by virtue of the planning effort which removed family housing and community uses from the Noise and Accident Zones and expanded the Airfield Operations Area to provide for sufficient buffer. Thus this Master Plan takes into consideration all of the appropriate legislation identified above.

MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS

This section discusses the extent to which countervailing benefits could be realized by following reasonable alternatives to the proposed action that would avoid some or all adverse environmental effects. In addition, separate consideration must be given to any probable adverse environmental effects which cannot be avoided should the project be implemented.

Environmental impacts resulting from planned projects are expected to be temporary and the result of construction activity. In order to insure that every effort is made to mitigate these impacts, measures for mitigation should be specified in each project construction contract. Such measures as erosion control (installing siltation screens, etc.), air quality maintenance (spraying dust covered roads, etc.), and construction noise abatement (designating assigned travel routes, specifying work hours, etc.) need to be included to the extent possible so that these temporary impacts are made minimal.

Additional adverse impacts on the environment have not been identified in conjunction with implementation of the recommended land use plan. The master plan gives careful consideration to

the environment and has resulted in a recommended land use plan which addresses impacts on the environment.

APPEARANCE GUIDELINES

This section describes various guidelines for improving and maintaining the aesthetic quality of the Marine Corps Air Station, New River. The guidelines are intended to provide a link between the planning process and construction of specific CIP Projects.

The Air Station is composed of diverse facility types whose massing and exterior facades reflect this diversity. Coordination of the design of facilities, plantings, and streetscape elements will contribute toward establishment of a unified appearance character.

The elements addressed below include architectural considerations, streetscaping, landscaping, and visual communications.

ARCHITECTURAL

As part of the Master Plan process, site development plans have been established for each critical CIP project in order to effectively implement the Land Use Plan. Compatibility of land uses and buildings is enhanced by a site design that sensitively interrelates the building forms and massing, the open space between buildings, and coordinates circulation and parking areas. Buildings sited in groups should have strong functional and visual relationships. New construction projects can benefit from an established site development concept, regardless of the length of the implementation schedule or extent of existing development.

The Master Plan proposes changes in the existing land use patterns at MCAS to more functionally accommodate replacement of existing training, personnel support, administrative and operational facilities. Although currently in use, some operations-related buildings are rated substandard or inadequate because they do not adequately serve their required function. Other substandard buildings include four community facilities. Family housing, currently located just east of the airfield, is removed from the Noise and Accident Zone to an area more suited to personnel support uses.

Development of a compatible architectural character between new facilities and older development can be accomplished through design by means of a consistent scale, massing and building form, color, building materials, spatial relationship, and supporting site components. Used thoughtfully, these elements can form the nucleus for architectural continuity at MCAS.

Architectural materials should provide a cohesive and consistent character, expressive of southeast building technologies. Appropriate selection of exterior building materials is closely linked with the use of compatible and complimentary colors. In general, colors should be integral rather than applied to exterior building materials to avoid costly periodic painting.

In addition, the design of new facilities should incorporate consideration of climatic conditions. Proper building orientation, building design, and landscape planning can conserve energy as well as provide pedestrian protection and comfort from inclement weather, temperature extremes, wind tunnel effects and sun glare.

STREETSCAPING

In addition to promoting architectural continuity, consideration should be given to other elements of the built environment which contribute to the overall visual impact of the Air Station. The Land Use Plan initiates this effort by designating appropriate locations for operational and personnel support uses which preserve the appearance of important roadways. For example, facilities associated with airfield operations are generally concentrated away from public areas. The arrangement of community and administrative uses along major corridors promotes a buffer from unattractive and noisy work areas.

Image improvement may be further enhanced by acting on the following items which reinforce the Land Use Plan:

1. Coordinating the siting and design of all streetscape elements to minimize clutter.

2. Maintaining a coordinated and consistent system of street signs that provides directions and other information in a clear and concise manner. As funds become available, traffic and regulatory signs should be upgraded to conform to the latest edition of the Manual on Uniform Traffic Control Devices, published by the Federal Highway Administration (FHWA). Pavement markings should also be brought into conformance with FHWA standards.

3. Establishing a coordinated design for street furniture. Removing unnecessary furniture, trash receptacles, signing, etc.

4. Burying existing overhead utilities along streets and in community facility areas to alleviate cluttered and unsightly streetscape appearance.

5. Burying steam lines where possible to alleviate visual clutter. If this is infeasible, they should be painted a complementary earth tone to blend with the background color of existing facilities and/or plant material.

6. Considering street landscaping improvements as funds can be made available. Installation of street trees and other plant materials along major visitor routes, such as Curtis Road, would convey the importance of adjacent buildings while softening their appearance from the street.

7. Establishing guidelines for upgrading the outdoor lighting system to provide for continuity of design, and improvement of appearance and effectiveness.

The actual design of site components should complement the surroundings, especially architectural features of nearby buildings. In addition, site components should satisfy an actual need such as rest, visual relief, or vista enhancement along a heavily traveled pedestrian route. A final consideration is the integral relationship of the site component to its setting. The use of street furniture, paving patterns and materials, landscape materials/design and lighting, in accordance with established streetscape design guidelines, should produce a unifying image and identity for the Air Station.

LANDSCAPING

Landscape planning is an integral part of the overall goal of improving the visual and functional elements at MCAS. Preparation of a landscape plan will create a framework for future development while simultaneously enhancing the existing environment. It should emphasize the use of existing landscape features and vegetation wherever possible, and include a specific plan which locates plant materials and site furnishings.

Existing trees, forested areas and detail planting features are important resources and visual assets that should be carefully preserved and enhanced for functional as well as aesthetic uses. Consideration should be given to harmoniously blending the built with the natural environment, providing scale and comfort to pedestrian routes, screening unsightly views, and buffering more intense land uses.

Formal or informal landscaping should serve as a means of integrating buildings into the environment. Specifically, plantings should be used to highlight entrances, screen service areas, define parking areas and circulation, and serve as windbreaks when necessary. Plant material, in most cases, should be of local varieties including deciduous trees which provide seasonal color and interest. Existing trees in developed areas should be retained as much as possible, to highlight the natural environment and accent new structures. This would reduce the need for an extensive planting program. In addition to cost and maintenance concerns, the planting program for MCAS must take airfield safety into consideration.

Implementation of the Land Use Plan calls for phased utilization of previously disturbed sites. In addition to retaining existing trees, the landscape plan should emphasize where feasible the

installation of pine trees and other native species to provide a relatively quick visual impact. A few ornamental trees planted at entrances to housing areas would highlight and enhance them. Principal roadways, such as Curtis Road, should be emphasized by properly scaled and sited street trees.

VISUAL COMMUNICATIONS

A well coordinated sign system can contribute to the overall visual quality of MCAS. In order to be effective however, signs must be consciously designed as part of an attractive, consistent, simple and uncluttered information system used throughout the Base.

The sign system should incorporate all types of visual message forms including identification of street names, building numbers, organization, and facility. Coordination of the sign system with the design of other site furnishings would minimize the number of streetscape elements and reduce clutter.

In order to develop visual communications that will be clear and consistent, a sign system should be designed to accommodate additions or deletions over time without being visibly obtrusive. Consistent basewide regulations should be adopted setting policies for removing, locating and maintaining signs as well as establishing design criteria.

In certain areas the streetscape at MCAS exhibits a variety of directional/information signs which, because of variations in height, area, materials, and color, do not create a harmonious and unifying visual element. This is especially noticeable on major corridors such as Curtis Road where community and administrative uses are concentrated.

The following guidelines should be incorporated into a visual communication system to address these concerns:

1. Provide signs only where there is a demonstrated need.

2. Remove unnecessary or conflicting signs. Directional information should be combined on a single sign where possible.

3. Provide an economical system for installation, maintenance and replacement.

4. Insure the consistency of signs performing a similar function.

5. Provide signs that are visible and designed to attract the viewer's attention.

6. Insure that the wording of all signs is understandable, concise and correct.

Sign design, as suggested by these guidelines, should use simple wording. Heights should be controlled, and materials and color selection should complement the setting and be consistent. Standards should be established as to sign area, color, illumination and lettering style for directional/informational signs to develop consistency and continuity throughout the Base.

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INTRODUCTION

The purpose of the Activity Plan for the Naval Hospital, Camp Lejeune, North Carolina is to provide a basis for logical and efficient use of the real estate and facilities to accomplish assigned mission requirements through the 1980s. The intent of the Plan is to provide an integrated framework for the use of all resources, both within the Activity, as well as to provide for optimum functional effectiveness of existing and planned facilities Complex-wide.

The Activity Plan is structured to comply with and incorporate all requirements stipulated by NAVFACINST 11010.63B. This section of the Plan document expands upon general Complex-wide issues presented in Section III and discusses specifically those issues relevant to the Naval Hospital.

A pre-planning conference was held on November 8, 1983, at which personnel from LANTDIV and each of the Complex activities reviewed and discussed the process involved and the assistance required in the preparation of a Master Plan. Following the conference, interviews were undertaken with the Naval Hospital Commanding Officer, Executive Officer, Public Works Officer and key personnel in Public Works and in the Branch facilities. Data was collected and field investigations were initiated for the purpose of identifying problem areas and deficiencies. Next, a detailed planning analysis was initiated. As the analysis progressed, additional interviews were conducted and more detailed data was collected.

Current and immediate requirements were determined from the Basic Facilities Requirements (BFR). Field surveys and interviews with Naval Hospital personnel were also used to determine requirements. Constraints and problems were identified to devise a list of "Planning Factors" affecting future development alternatives.

Goals and objectives for future development were developed based upon conclusions drawn from the "Facilities Requirements" and "Planning" Analyses. Alternative concept plans supporting the established goals and objectives were then developed. Alternative concept plans were presented at a formal meeting in March 1984, after which a Land Use Plan was selected by the Activity Command.

REQUIREMENTS ANALYSIS

The requirements analysis evaluates the current physical resources controlled by the Naval Hospital Activity at Camp Lejeune. Facility requirements are related directly to the Naval Hospital's mission and personnel loadings and are compared to existing assets. This comparison identifies facility deficiencies and forms the basis of the Military Construction Project list.

Prior to a specific discussion of facility requirements, the Naval Hospital Activity mission, organization and personnel loadings are discussed below.

MISSION

The official mission of the Naval Hospital Activity at Camp Lejeune is comprised of the following responsibilities: To provide health care services for active duty Navy and Marine Corps personnel, active duty members of the other armed services, dependents of active duty personnel and other persons as authorized by current codes and directives; to support Mobile Medical Augmentation Readiness System; direct and coordinate the operation of subordinate health care commands; to participate in the Navy and Tri-Service Regional Health Care System; to provide training and educational programs for assigned personnel; ensure that medical materials and

equipment are maintained; and to cooperate with military and civilian authorities in matters pertaining to public health, local disasters and other emergencies.

ORGANIZATION

The organization of the Naval Hospital Activity is shown in Figure VI-1. The Commanding and Executive Officers preside over six directorates; all but one of these is located at the new Naval Hospital. The exception is the Branch Clinic headquarters facility which is located in Building 15 at Hadnot Point. Proximity to the population it serves is the reason this directorate sits in the main regimental area.

PERSONNEL LOADING/PROGRAMMED STRENGTH

As of December 1984, 196 officers, 553 enlisted personnel and 301 civilians, or a total of 1,050 personnel, were assigned to the Naval Hospital Activity, according to the "Monthly Camp Lejeune Area Population Report." This number is anticipated to remain at about the same level over the next five years, according to programmed strength estimates (Table VI-1).

Staffing at the 10 Branch Clinic facilities is divided between "permanent" and "rotational" personnel. The largest number of staff is found at the headquarters, while the second largest exists at MCAS, New River (Table VI-2). The Rifle Range and the Correctional Facility Clinics have the smallest number of staff.

An even more important statistic is the population served by the Naval Hospital Activity. According to Department of Defense criteria, the beneficiary population for the Naval Hospital is

Table VI-1

Programmed Strength
FY 85-89
Naval Hospital, Camp Lejeune

	Officer	Enlisted	Total
FY 85	185	472	657
FY 86	206	502	708
FY 87	216	513	729
FY 88	216	513	729
FY 89	224	513	737

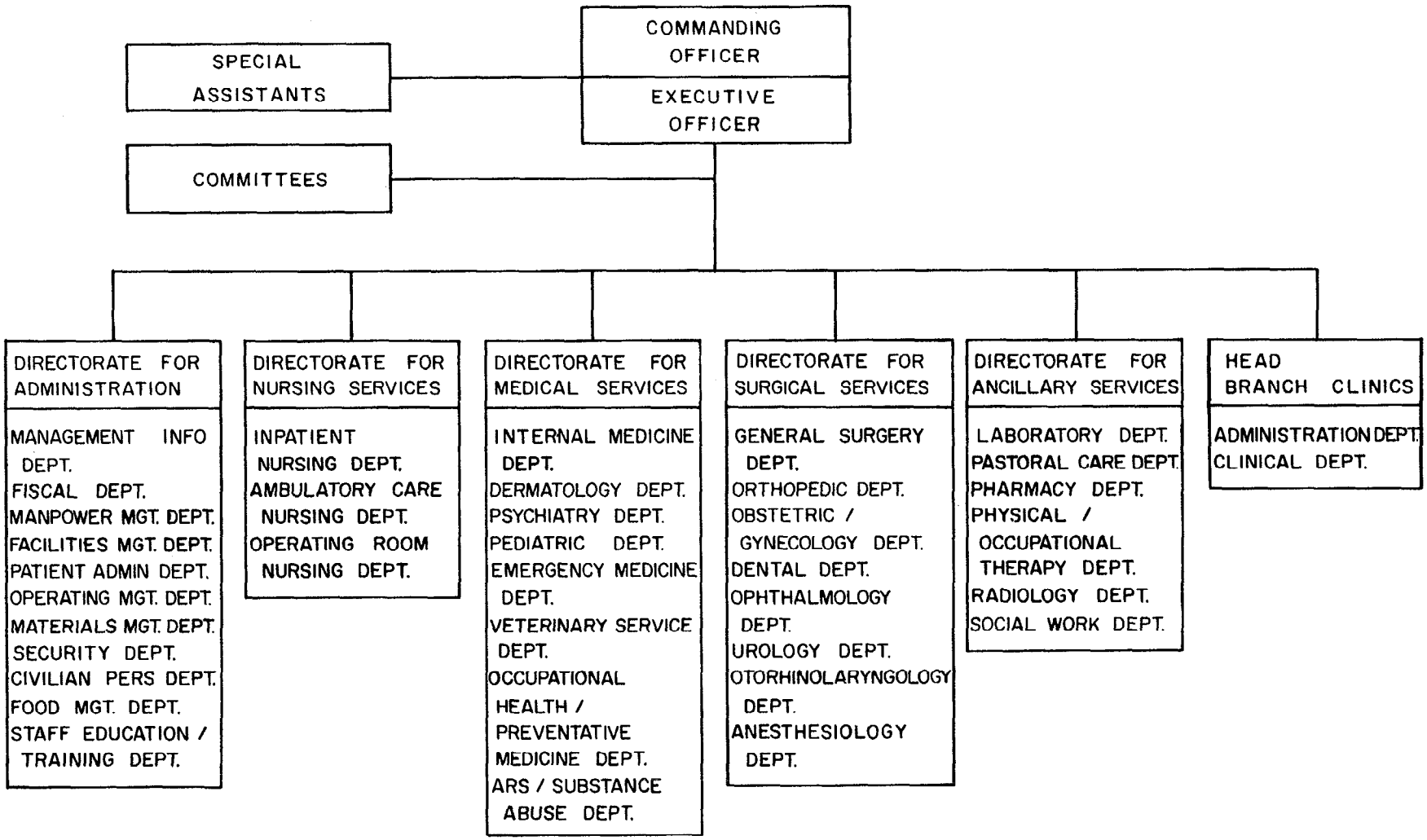
Source: Manpower Authorization, 1984.

Figure VI-1

ORGANIZATIONAL CHART

NAVAL HOSPITAL

CAMP LEJEUNE, NORTH CAROLINA



Source: NHCLNCINST 5450.2C, NOVEMBER 10, 1983

Table VI-2

Branch Clinic Staffing
FY 1984
Naval Hospital

Clinic	Officer		Enlisted		Civilian		Total
	Permanent	Rotational	Permanent	Rotational	Permanent	Rotational	
Building 15	2	11	14	36	4	3	70
River Road	0	1	0	11	0	0	12
Physical Exam Ctr.	1	0	6	12	1	0	20
Correctional Fac.	0	0	5	0	0	0	5
Montford Point	1	0	10	2	0	0	13
Camp Geiger	1	1	13	1	1	0	17
Courthouse Bay	0	1	6	11	0	0	18
French Creek	0	2	0	16	0	0	18
Rifle Range	0	0	2	0	0	0	2
MCAS	0	13	4	30	0	0	47
Total	5	29	65	119	6	3	222

Source: Annual Report of Component Health Care Treatment Facilities, December 27, 1984.

defined as those eligible individuals who reside within a 40-mile radius of Camp Lejeune. This area is commonly referred to as the Activity "catchment area." Eligible individuals are comprised of the following: Active duty military personnel (regardless of service affiliation) and their dependents; retired military personnel and their dependents; dependents of deceased active duty and retired personnel ("survivors"); and civil service employees (seen at Branch Clinic facilities only on a limited basis). Dependents are seen only at the Naval Hospital, the MCAS, New River Branch Clinic and the Camp Geiger Branch Clinic.

The total population served by the Naval Hospital Activity was 128,133 in Fiscal Year 1983. This number is expected to increase six percent to 136,140 patients in Fiscal Year 1988. The largest increase in patient demand is expected in the category of retired personnel and their dependents. Patient demand in this category is expected to increase 15 percent between fiscal years 1983 and 1988 (Table VI-3).

Branch Clinic facilities support over 84,521 military personnel (Table VI-4). This number represents a cumulative total of the target population served and includes some overlap. For example, the Physical Exam Center serves the same military personnel that are served by the Building 15 Clinic, but because they provide different services, these individuals are listed twice in target population estimates.

Records indicate that, on an average, 13,286 outpatient visits were made to the 10 Branch Clinics each month during 1984 (Table VI-4). By far the largest use occurred at the Building 15 Clinic, with the second largest at the Montford Point Clinic. When a comparison is made between outpatient visits relative to the support population, the Correctional Facility Clinic is seen to

Table VI-3

Catchment Area Population
Existing and Projected
Naval Hospital

	Inpatient	Ambulatory	Total
Active Duty			
FY 83	32,574	27,559	60,133
FY 88	34,230	28,985	63,215
Percent Increase	5.0%	5.2%	5.1%
Dependents Active Duty			
FY 83	29,363	23,590	52,953
FY 88	30,831	24,805	55,636
Percent Increase	5.0%	5.2%	5.1%
Retired			
FY 83	3,736	959	4,695
FY 88	4,311	1,103	5,414
Percent Increase	15.4%	15.0%	15.3%
Dependents Retired			
FY 83	7,598	1,930	9,528
FY 88	8,760	2,219	10,979
Percent Increase	15.3%	15.0%	15.2%
Survivors			
FY 83	584	240	824
FY 88	636	260	896
Percent Increase	8.9%	8.3%	8.7%
Total			
FY 83	73,855	54,278	128,133
FY 88	78,768	57,372	136,140
Percent Increase	6.7%	5.7%	6.2%

Source: Planning and Programming Branch, MEDCOM

Table VI-4

Military Personnel Supported and Average Monthly Outpatient Visits
Branch Clinic Facilities
1984
Naval Hospital

Location	Military Personnel Supported			Average Monthly Out-Patient Visits		
	Operational	Non-Operational	Total	Operational	Non-Operational	Total
Building 15 Clinic	17,019	6,204	23,223	1,191	2,446	3,637
Physical Exam Center	26,438	5,819	32,257	1,050	426	1,476
River Road Clinic	6,174	---	6,174	296	---	296
Correctional Clinic	---	385	385	701	---	701
French Creek Clinic	9,241	---	9,241	1,215	---	1,215
Courthouse Bay Clinic	1,640	916	2,556	389	422	811
Rifle Range Clinic	NA[1/]	173	173+	48	18	66
Camp Geiger Clinic	2,345	1,263	3,608	476	991	1,467
Montford Point Clinic	---	1,549	1,549	1,998	---	1,998
MCAS, New River Clinic	4,729	626	5,355	1,193	426	1,619
Total	67,586	16,935	84,521+	8,557	4,729	13,286

1/Segments of all units served periodically.

Source: Memorandum from NAVHOSP, Camp Lejeune to COMNAVMEDCOM, October 1984.

sustain the highest ratio of visits per support population, followed closely by the Montford Point Clinic.

FACILITY REQUIREMENTS

Basic Facilities Requirements is the title given to the listing of quantities by category code, of those facilities required to perform the mission of a shore activity. It includes only those facilities necessary to support the assigned mission. The requirements for each category code is derived by applying base-loading/quantitative workload data to the planning factors/criteria included in NAVFAC P-80, "Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations."

The following section examines the adequacy of existing facilities which fall under Naval Hospital Activity jurisdiction. Included in this Analysis are the Branch Clinic facilities, the Preventive Medicine Clinic, the Veterinary Clinic and a small number of ancillary facilities which support the medical function. All other Marine Corps medical facilities, such as the numerous Battalion Aid Stations, have been discussed and analyzed in Section IV, the Marine Corps Base Activity Plan. Naval Dental Clinics facilities, which in most cases share Naval Hospital Branch Clinic facilities, will be discussed separately in Section VII, the Naval Dental Clinic Activity Plan. For planning purposes, category codes have been aggregated into 16 land use categories based upon planning criteria contained in NAVFAC P-80. Only five of these land use categories are applicable directly to the following Naval Hospital "Existing Assets" and "Deficiencies" analyses.

Existing Assets

The following evaluation of existing facilities is based upon the Facilities Planning Document dated November 21, 1983. This document states Basic Facility Requirements (the BFR) and rates each structure as being either adequate, substandard or inadequate. It should be noted that ratings are based not only upon the physical condition of facilities, but also upon the ability of a facility to sustain the Activity mission. Table VI-5 summarizes the these ratings.

Naval Hospital

At about the same time the "Facilities Planning Document" was prepared, the Naval Hospital was in the process of transferring into new facilities at a new site. As a result, a surplus appeared in several facility categories. The old Naval Hospital facility is being reassigned to use as the 2nd Marine Division Headquarters. If a wartime mobilization were to occur, this facility would be converted back into a 400-bed hospital.

Operational Facilities. Assets in this category include an inadequate helicopter landing pad (location at the old hospital site), adequate filling station and fuel storage facilities, and adequate emergency vehicle garage space. There is a surplus of adequate garage space which is scheduled for reassignment.

Maintenance Facilities. All of the existing space is considered inadequate due to its location at the old Hospital. New maintenance facilities are programmed to be built at the new Hospital site.

Table VI-5

Facility Requirement: Existing Assets Rating
Naval Hospital and Branch Clinics

Location	Land Use	Percent of Total Existing Facilities Adequate	Substandard	Inadequate
Naval Hospital	Operational (SF)	100%	---	---
	Operational (SY)	---	---	100%
	Maintenance	---	---	100%
	Medical	54.0%	---	46.0%
	Administrative	.6%	92.0%	7.3%
	Commercial	100%	---	---
Hadnot Point	Medical	---	100%	---
French Creek	Medical	100%	---	---
Courthouse Bay	Medical	---	---	100%
Rifle Range	Medical	100%	---	---
Camp Geiger	Medical	100%	---	---
Montford Point	Medical	---	100%	---
MCAS, New River	Medical	---	100%	---

Source: Facilities Planning Document, November 21, 1983.

Medical Facilities. The existing adequate hospital space more than meets the required need. The large amount of surplus space is being reassigned to the 2nd Marine Division.

Administrative Facilities. Ninety-two percent of the existing facilities are considered substandard, while seven percent are inadequate and only one percent are adequate. All of the existing administrative space is scheduled for reassignment to the 2nd Marine Division, and new administrative space to be constructed at the new Naval Hospital site.

Commercial Facilities. The small amount of existing commercial space has been rated entirely adequate.

Branch Clinics

Hadnot Point Clinic. All buildings, which were built in 1943, have been classified as substandard. Deficiencies are generally centered around Table VI-2 improper interior configuration. The physical condition of buildings and the environmental control systems were also cited as problems.

French Creek Clinic. Building FC-313, built in 1968, houses the medical clinic and is adequate.

Courthouse Bay Clinic. The existing building, which was built in 1942, has been programmed for demolition in FY 88 due to physical deterioration. A replacement facility had not been programmed at the time this plan was written.

Rifle Range Clinic. This 40-year-old, relatively small facility (652 square feet) houses the medical clinic and is in inadequate condition due to age.

Camp Geiger Clinic. The medical clinic at this location is adequate in terms of accomplishing the assigned mission.

Montford Point Clinic. The existing facility has been rated substandard due to the physical deterioration and inadequate design of the building.

MCAS, New River Clinic. The existing 1956 structure was deemed to be substandard. Deficiencies cited included: location subject to excessive noise and the general condition of the building, especially the roof/ceiling/trusses.

Deficiencies

The ensuing analysis is directed toward the amount of additional new construction that needs to be undertaken in order to satisfy Basic Facility Requirements (BFR). The analysis will focus upon the relative deficiencies in each relevant land use category. The "Facilities Planning Document" dated November 21, 1983, provided the source of this information (Table VI-6).

Naval Hospital

The only deficiencies found at the Naval Hospital site are in smaller, subordinate facilities that have yet to be constructed to support the new facility. Maintenance and community-type facilities comprise the largest areas of need.

Table VI-6

Facility Requirement: New Construction Deficiency Corrections
Naval Hospital and Branch Clinics

Location	Land Use	Required New Construction (sq. ft., except where noted)	Percent New Construction to meet BFR
Naval Hospital	Operational (SY)	1,100	100
	Maintenance	16,140	100
	Medical	0	---
	Administrative	750	100
	Comm. Facilities	18,000	100
	Commercial	0	---
Hadnot Point	Medical	24,697	44.0
French Creek	Medical	4,605	54.3
Courthouse Bay	Operational	350	100
	Medical	10,786	100
Rifle Range	Operational	350	100
	Medical	1,506	69.8
Camp Geiger	Operational	700	100
	Medical	4,985	29.3
Montford Point	Operational	350	100
	Medical	3,269	32.1
MCAS, New River	Operational	700	100
	Medical	11,949	57.4

Branch Clinics

Hadnot Point. According to BFR criteria, there is a 100 percent total deficiency. Forty-four percent of the deficiency will require new construction (24,497 square feet), while the remaining 56 percent can be made up through renovation of existing buildings.

French Creek. In order to meet the BFR, 4,605 square feet of clinic space must be constructed. This amount represents 54 percent of the BFR.

Courthouse Bay. One-hundred percent of the BFR is deficient. In order to meet the BFR, 10,786 square feet of clinic space and 350 square feet of emergency vehicle garage space must be constructed.

Rifle Range. Nearly 70 percent of the BFR for clinic space must be newly constructed in order to meet stated requirement. One-hundred percent of the BFR for emergency vehicle garage space must be built. In terms of square footage, the clinic requirement is 1,506 square feet and the garage requirement is 350 square feet.

Camp Geiger. In order to meet the BFR, almost 5,000 square feet of newly-constructed clinic and 700 square feet of newly-constructed emergency vehicle garage space is required. This represents about 29 percent of the required clinic space and 100 percent of the required garage space.

Montford Point. In order to meet the BFR, over 10,000 square feet of medical space must be constructed. In order to meet the requirement, the existing 6,915 square foot substandard

facility can be renovated and 3,269 square feet must be newly constructed. A 350-square foot emergency vehicle garage is also required.

MCAS, New River. One-hundred percent of the stated BFR (20,798 square feet) for clinic space has been rated deficient. In order to meet the requirement, 11,949 square feet of new space needs to be constructed. The remaining 8,849 square foot requirement can be met through partial renovation of the existing clinic. Seven-hundred square feet, or 100 percent of the BFR, of emergency vehicle garage space is deficient.

FUTURE MISSION CHANGES

No changes in mission are anticipated for the Naval Hospital Activity during the time frame of this Plan.

PLANNING ANALYSIS

This section examines the relationship between existing land uses as they relate specifically to the Naval Hospital facility and each of the Branch Clinics. The influence of the surrounding region and of the other Activities at Camp Lejeune will be evaluated at the end of this section. This analysis will be used to identify planning factors which are likely to affect future physical development of Naval Hospital facilities.

Included in this section is a narrative description and graphic depiction of the existing development pattern of Base areas which contain Naval Hospital facilities.

Naval Hospital

Land Use. The new 205-bed hospital is located on a relatively level site which slopes gently downward to Northeast Creek to the north (Figure VI-2). Brewster Boulevard, an east-west collector road, borders the 153-acre tract on the south and forms a major intersection with Holcomb Boulevard and Stone Street. The site is both accessible and attractive. The hospital is surrounded by open areas on both the east and west sides, and the Berkeley Manor family housing area to the south.

Within the Naval Hospital tract only three land uses have been completed at the present time: the Medical Center building and associated parking areas; a small recreational area directly northwest of the hospital building; and a helicopter landing pad adjacent to Northeast Creek. The new hospital building itself was sited in a linear, east-west axis to provide an opportunity to relate adjacent parking areas to individual outpatient clinics inside the facility and to gain maximum benefits from the sun.

Circulation. Incoming vehicular traffic enters the site from Brewster Boulevard on the Main Entrance Road. Informational signs are located along the road to direct traffic to appropriate locations.

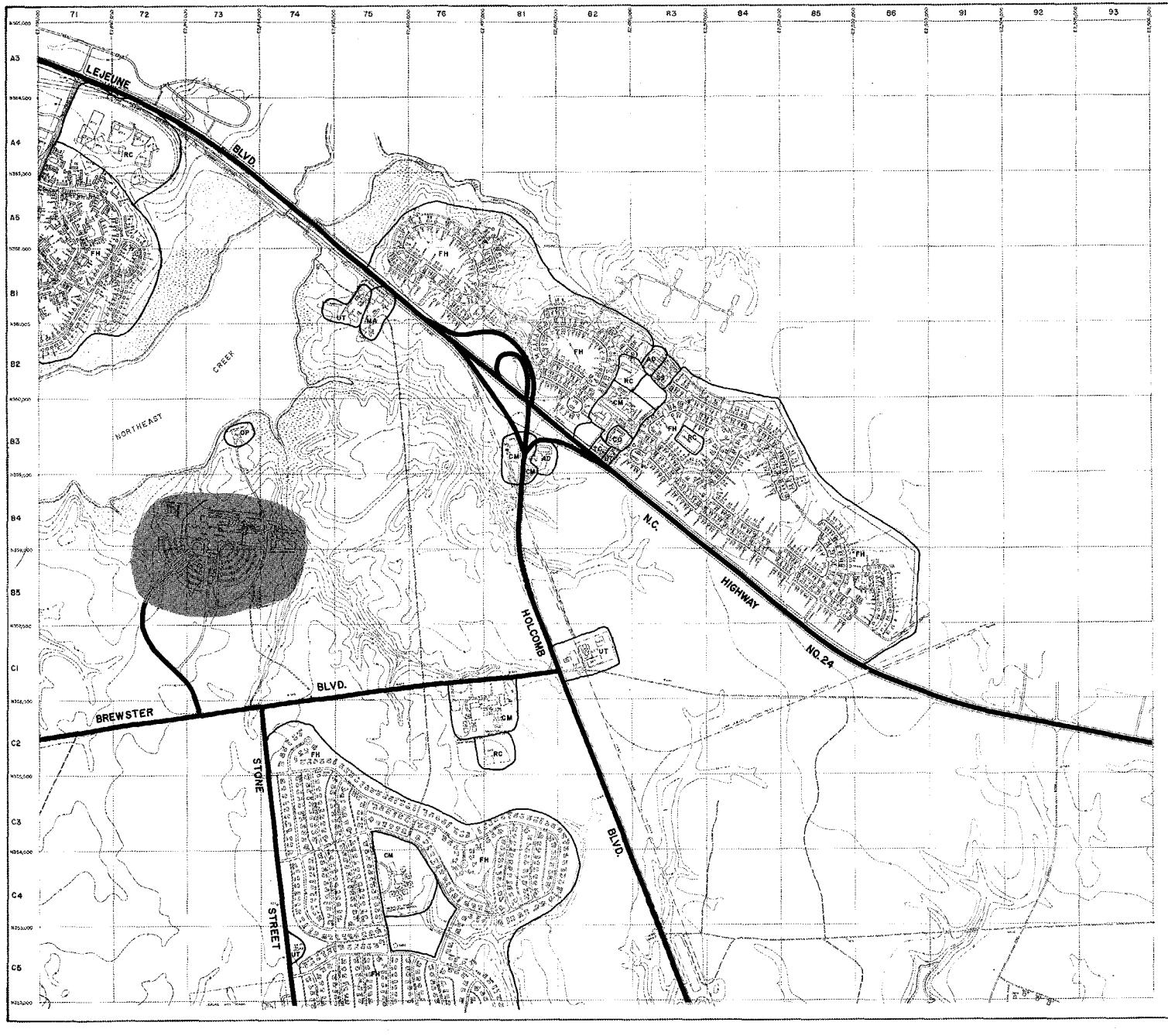
Approximately at the mid-point between Brewster Boulevard and the Medical Center, the Main Entrance Road is intersected by a service road which veers to the right. The service road leads to the Emergency Room at the second level of the South Wing and continues to the staff parking area, Main Service Dock, Service Courtyard, Public Works, the tank farm and the Helipad. Supplies and food are delivered via this road and it serves as a service exit.

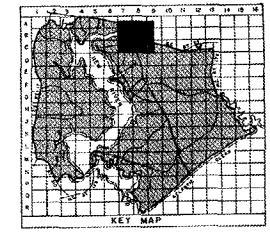
Beyond the service road intersection the Main Entrance road continues to the public parking areas and terminates with a one-way traffic circle serving the Visitor Entrance (portal "C") and covered loading areas. Portions of the interior of the traffic circle are paved for ceremonial activities and the official flag poles are located in the center. As the Main Entrance road nears the public parking areas, the road becomes divided. In the median, informational signs direct the patients and visitors to the appropriate section of the parking areas. There are four separate entrances to the first level from the adjacent parking areas and the traffic circle.

The portals and the Outpatient Clinics in the West Wing are directly served by the parking area located on the left-hand side of the incoming main road. Likewise the parking area on the left side of this road is designated for outpatients going to clinics in the South Wing and for visitors using the Main Entrance.

The service road to the right at the first intersection has been located so that it can be joined by future road systems to serve the southeast quadrant of the site and future structures in the area.

This same intersection leads directly to the covered Emergency Room loading area which is located at the end of the South Wing at the Second Level. Exterior signage is strategically located along the road to direct traffic to the Emergency Room.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE
NAVAL HOSPITAL
MIDWAY PARK HOUSING AREA
AND NAVAL HOSPITAL
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE GRAPHIC | FIGURE VI-2

APPROVED / DATE

Fire and emergency vehicles can reach every side of the Medical Center by paved roads except on the west and north sides of the Nursing Tower. Between the paved roads, a landscaped, all-weather road provides perimeter access to reach the west and north sides.

In order to locate designated parking areas adjacent to related entrances to the building and to reduce congestion, three major areas are provided. Parking areas for patients, visitors and the general public are located at the termination of the main entrance road. Here patients are directed by entrance signs to various sections located nearest the portals serving the desired Outpatient Clinic or Visitor Entrance.

The main entrance to the Medical Center is located in this area and covered canopies with seats have been provided for those waiting to load or unload. The circular drive serving the main entrance forms a landscaped and paved plaza for ceremonies and official flags. Parking spaces for visitors, general public and handicapped are identified by signs.

Parking for emergency patients and staff is located adjacent to a covered driveway at the Emergency Entrance. Covered parking area for emergency vehicles is located nearby. This area is near the first intersection on the main road and is quickly reached from Brewster Boulevard.

The third major parking area is entered from the service road just beyond the emergency drive. Spaces for staff, employees, sales people, service representatives and Base personnel are provided in this area.

The main parking area is designed for expansion to the west and to the south. The staff/employee parking can be expanded to the south.

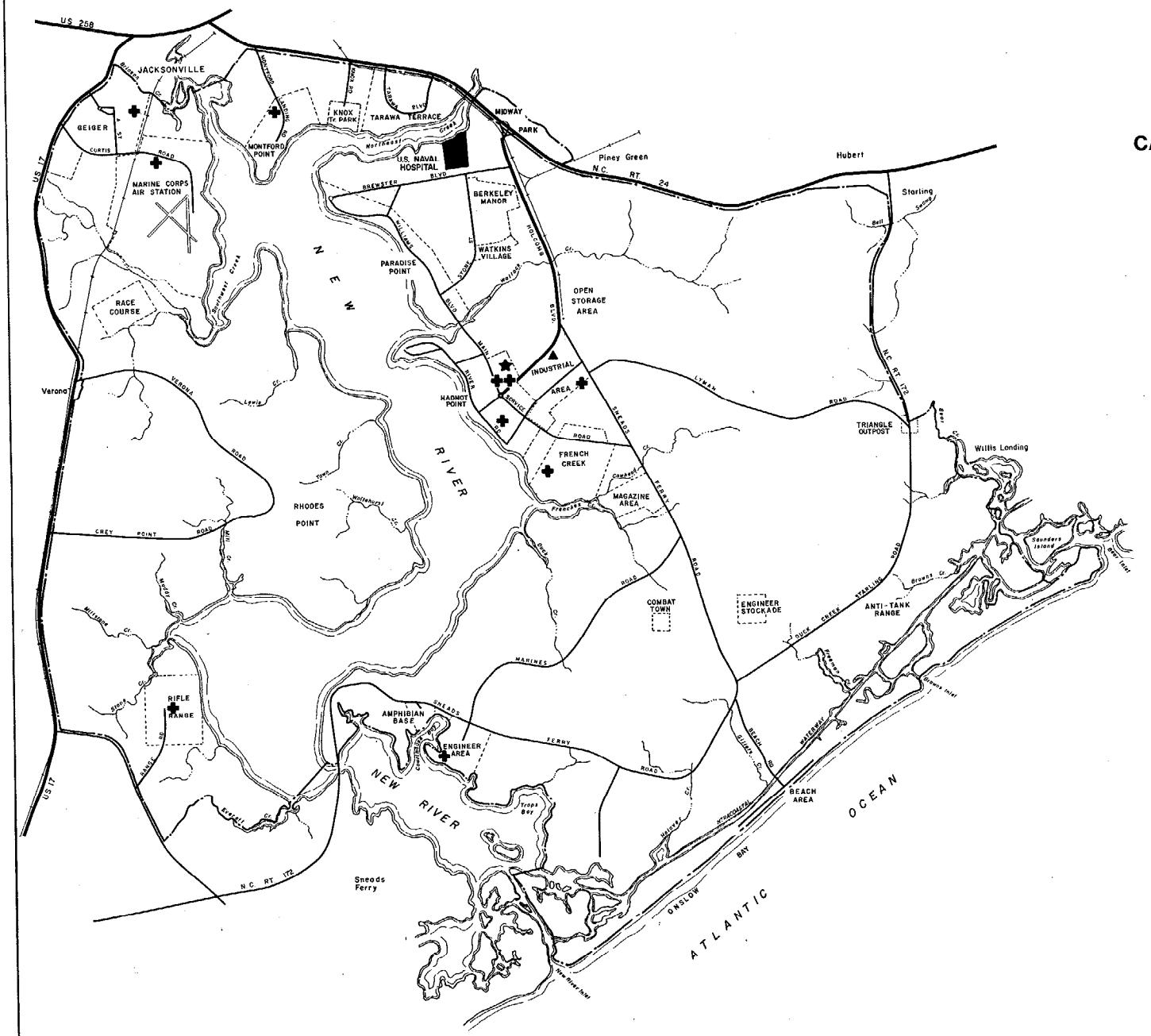
Patients and visitors enter the Medical Center from the main parking area through one of four portals. Three portals are located near the Outpatient Clinics which they serve. The fourth portal, the Main Entrance, is for patients and visitors and open into the Main Lobby and public areas of the Medical Center.

Branch Clinics

Twelve Naval Hospital Activity facilities are scattered throughout Camp Lejeune (Figure VI-3). Of these facilities, there are 10 "Branch Clinics," a Physical Exam Center and a Veterinary Clinic. In many cases Branch Clinics share facilities with Naval Dental Clinics, which will be discussed in Section VII.

Six Naval Hospital facilities presently exist at Hadnot Point (Figure VI-4). The (Building 15) Headquarters is located centrally next to Building 1, the main Marine Corps Base administration building, just north of Holcomb Traffic Circle. This locale is accessible, both to the large number of troops assigned to the Hadnot Point regimental area as well as to the concentration of family housing areas to the northwest. In addition to housing the Branch Clinic headquarters, this facility provides routine health care, pharmacy and laboratory services to the following individuals: Marine Corps Base units assigned to Hadnot Point; Naval Dental Clinic; and all operating forces located within the Hadnot Point area that would be referred from the River Road, French Creek or Courthouse Bay Clinics.

Behind Building 15 is the Physical Exam Center (Building 36). This facility serves the entire Complex and, therefore, supports the largest number of military personnel (as shown earlier on Table VI-4). The following personnel are supported by the Physical Exam Center: Marine Corps



EXISTING LAND USE
NAVAL HOSPITAL

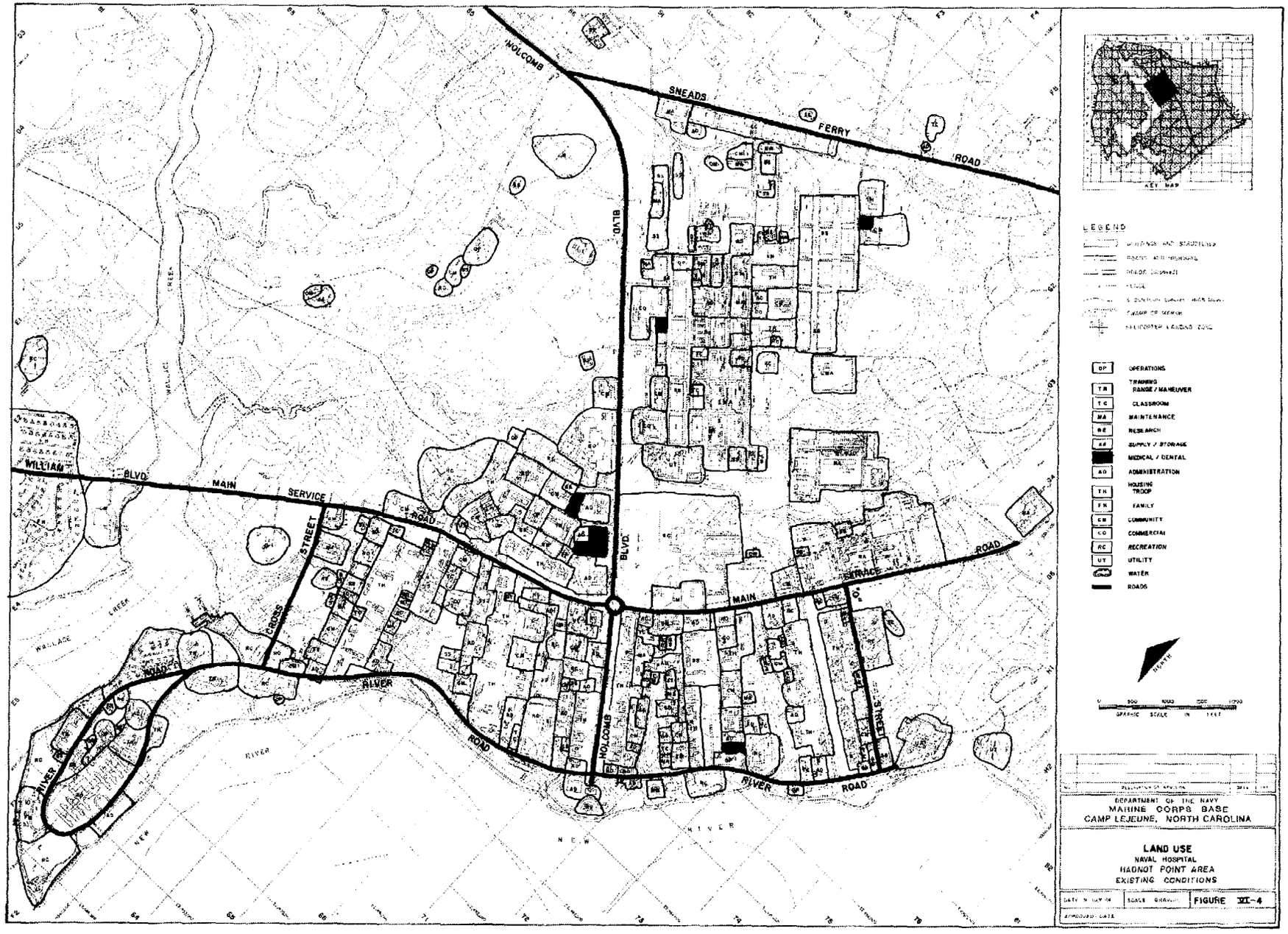
MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

LEGEND

- ✚ BRANCH CLINIC
- ★ OCCUPATIONAL HEALTH AND PREVENTIVE MEDICINE
- ▲ VETERINARY CLINIC

FIGURE VI-3



DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE
NAVAL HOSPITAL
HADNOT POINT AREA
EXISTING CONDITIONS

FIGURE XII-4

Base units; Naval Hospital and Naval Dental units; 2nd Marine Division personnel, 2nd FSSG personnel; and 6th MAB units. This central location within close proximity to the Building 15 Headquarters facility is both logical and efficient. The Preventive Medicine Clinic is located north of Lucy Brewer Avenue in Building 65.

The fourth Naval Hospital facility at Hadnot Point is the River Road Clinic. Located near the intersection of "L" Street and River Road, this clinic provides routine health care and limited laboratory services to the 6th and 10th Marines, 2nd Combat Eng., LAV Battalion and "A" Company 2nd Medical Battalion. This site is easily accessible from both the Hadnot Point and French Creek troop housing areas.

The fifth facility at Hadnot Point is the small clinic located inside the Correctional Facility. This clinic serves correctional staff and inmates only.

The sixth and final Naval Hospital Activity facility at Hadnot Point is the Veterinary facility which is used mostly for research activities. The Veterinary Clinic is accessibly located near the intersection of "A" Street and Holcomb Boulevard in Building 1300.

The French Creek Branch Clinic (Building 313) serves the H&S Battalion, 8th Engineers, 2nd LSB, 8th Communications Battalion, 2nd Rad. Battalion, 2nd Maintenance Battalion, 8th M.T. Battalion, 2nd Force Reconnaissance Battalion, 2nd ANGLICO and BSSG-4. This facility is centrally located between two troop housing areas (Figure VI-5).

At Courthouse Bay, Building BB10 houses the Branch Clinic. Routine health care, limited laboratory, X-ray and pharmacy services are provided. This building is located on the bay front,

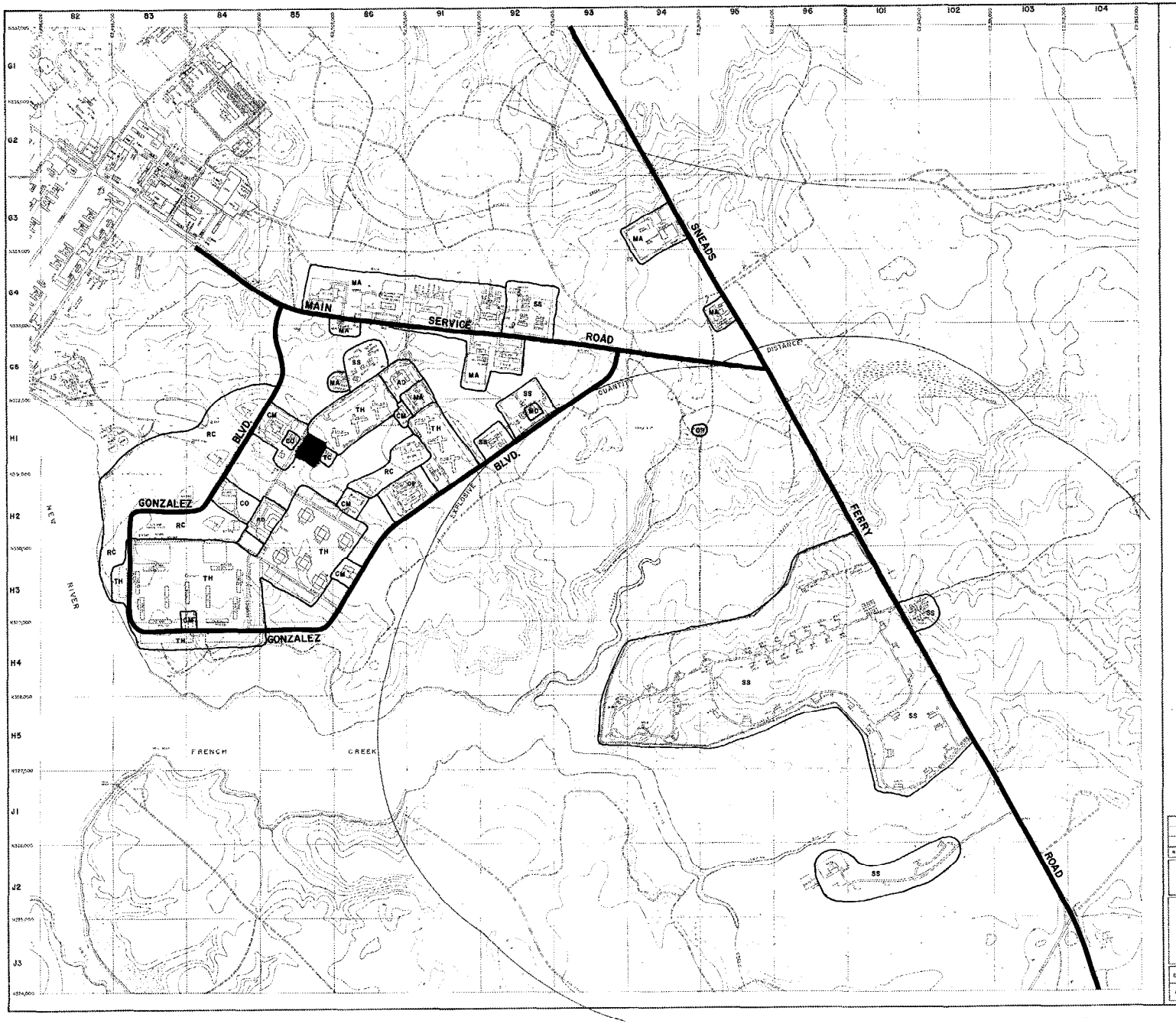
between the family housing area and the old barracks that are presently being converted into classroom training facilities (Figure VI-6).

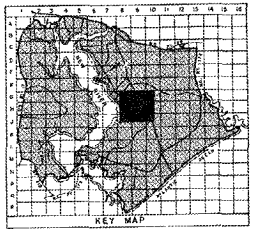
The small Rifle Range Branch Clinic (Building RR11) is located within a general purpose building which also houses classroom training and community uses. The building sits across from the Range facility near community and troop housing land uses (Figure VI-7). This clinic serves the Rifle Range Detachment and all units as they rotate through range training.

The Camp Geiger Branch Clinic occupies Building G770, which is located near the intersection of "E" and Seventh Streets (Figure VI-8). This clinic offers comprehensive services to the Infantry Training School, Communications School, NBC School, the 8th Marines, the 5th FASC and "C" Company of the 2nd Medical Battalion.

The Montford Point Branch Clinic occupies a small portion of the M-128 troop housing facility (Figure VI-9). This facility is located conveniently along Montford Landing Road. The clinic is less than 7,000 square feet in size and serves two non-operational units: the Marine Corps Service Support Schools and the Field Medical Service School. Routine health care, pharmacy and x-ray services are available at this clinic.

The MCAS, New River Clinic serves active duty (MAG 26 and MAG 29, as well as headquarters personnel), retired military and all dependents. It has the second largest number of assigned staff, after Building 15. The clinic is located on McAvoy Street, just south of Curtis Road, in Building AS-302 (Figure VI-10). This location is accessible to the airfield and family housing. Due to the large number of off-Base retired military and dependents seen at this clinic, however, the location is relatively inaccessible. Comprehensive clinic services are provided at this facility.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

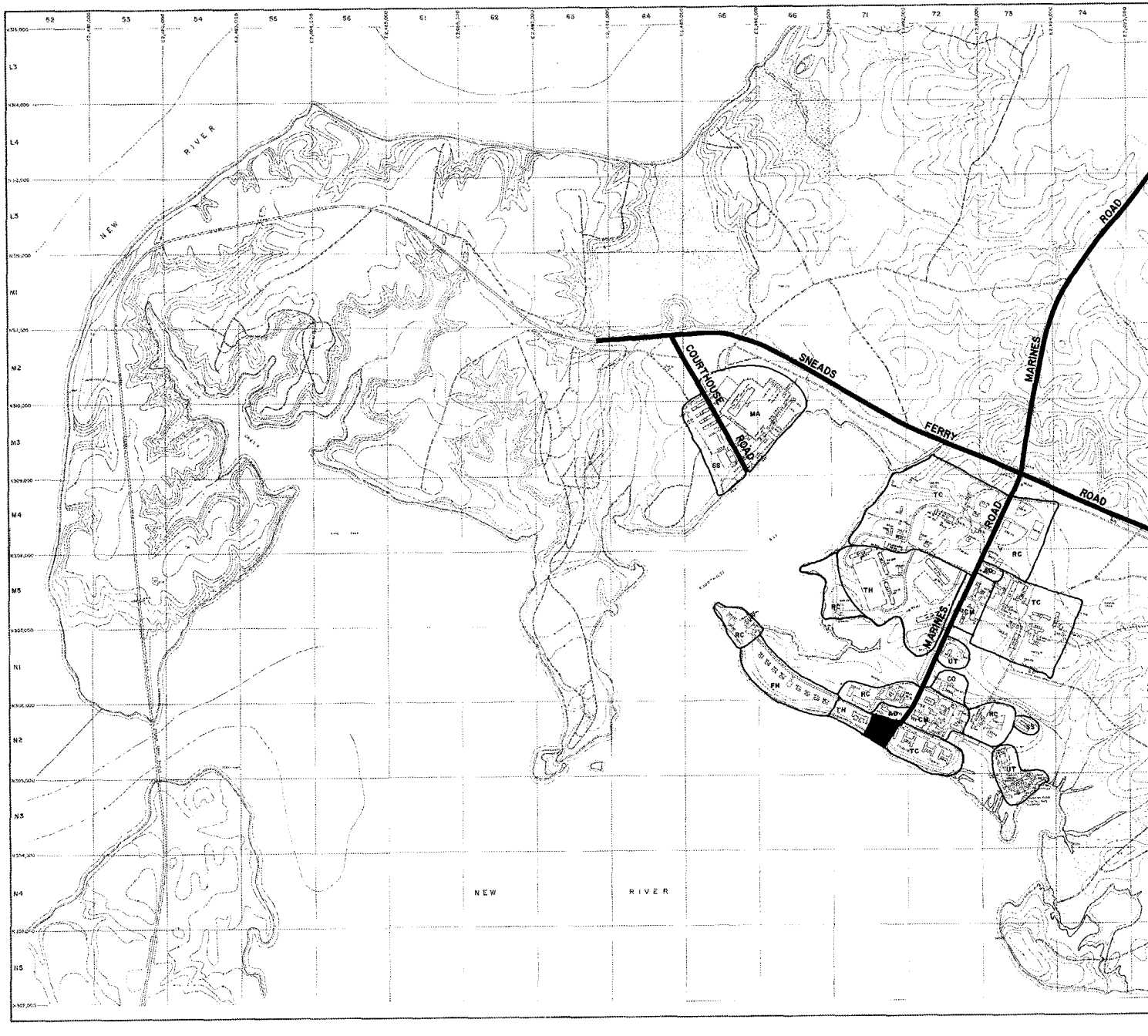
NO	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE
NAVAL HOSPITAL
FRENCH CREEK AND MAGAZINE AREAS
EXISTING CONDITIONS

DATE 24 JULY 84 | SCALE GRAPHIC | **FIGURE VI-5**

APPROVED / DATE



LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

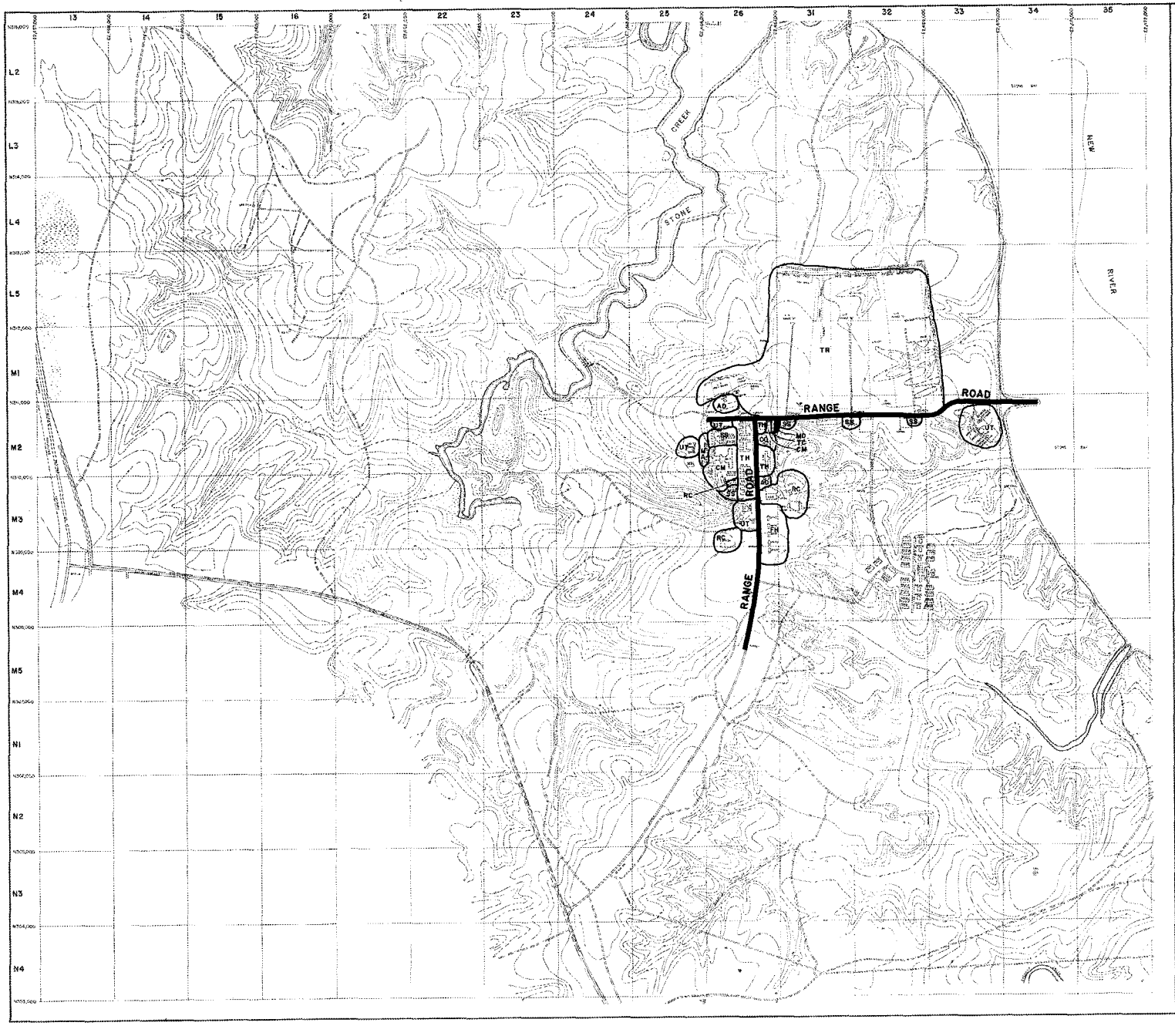
NO.	DESCRIPTION OF REVISION	DATE

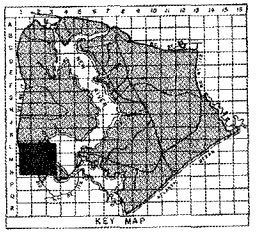
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE
NAVAL HOSPITAL
ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE: 31 JULY 84 | SCALE: GRAPHIC | FIGURE VI-6

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

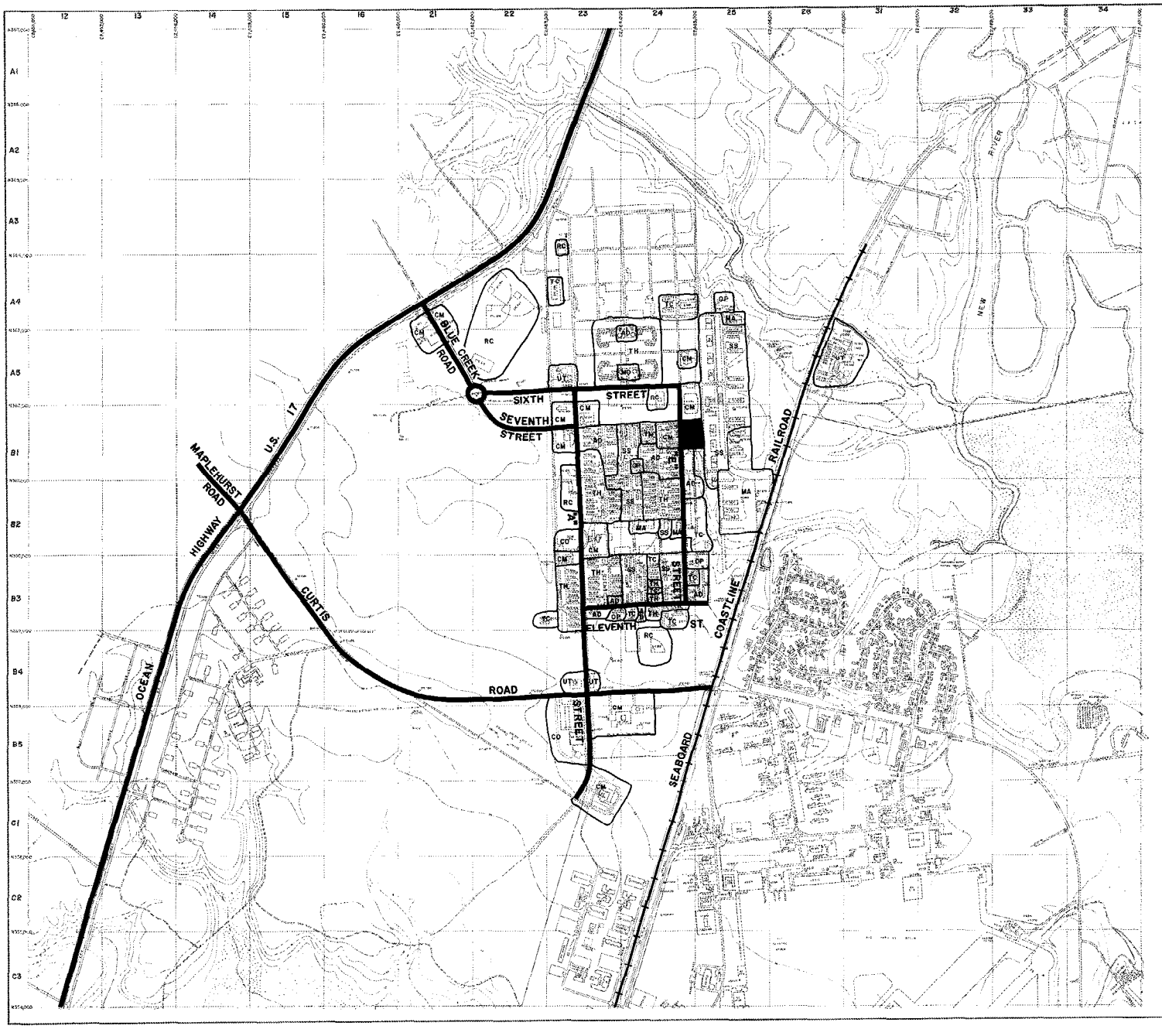
NO	DESCRIPTION OF REVISION	DATE	INT

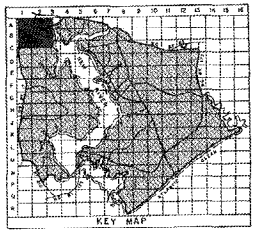
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE
NAVAL HOSPITAL
RIFLE RANGE AREA
EXISTING CONDITIONS

DATE 31 JULY 64 | SCALE: GRAPHIC | FIGURE VI-7

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUS (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS
	RAILROAD

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

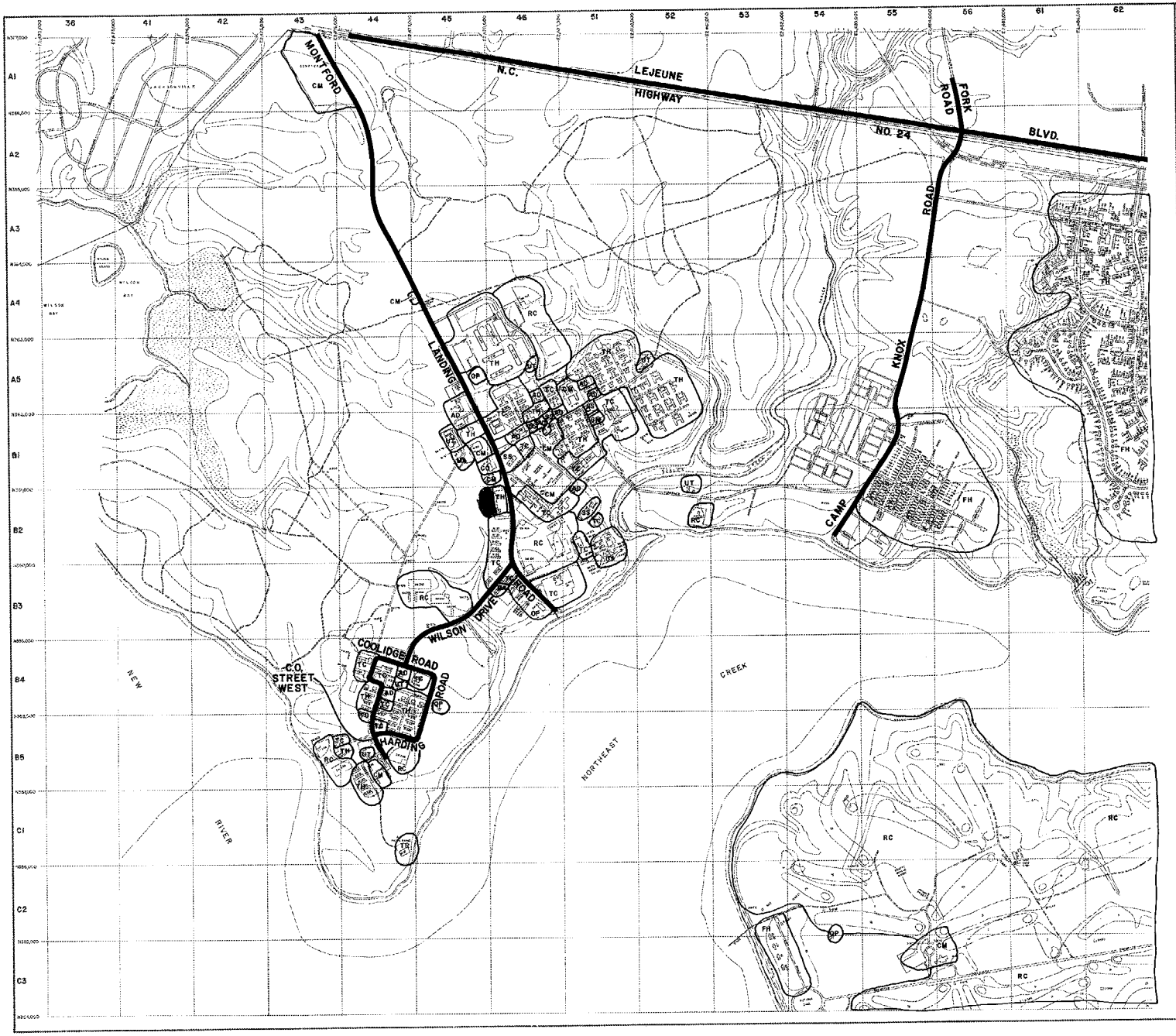
NO.	DESCRIPTION OF REVISION	DATE	INIT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE
NAVAL HOSPITAL
GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS

DATE 5 JULY 84 | SCALE: GRAPHIC | FIGURE VI-8

APPROVED / DATE

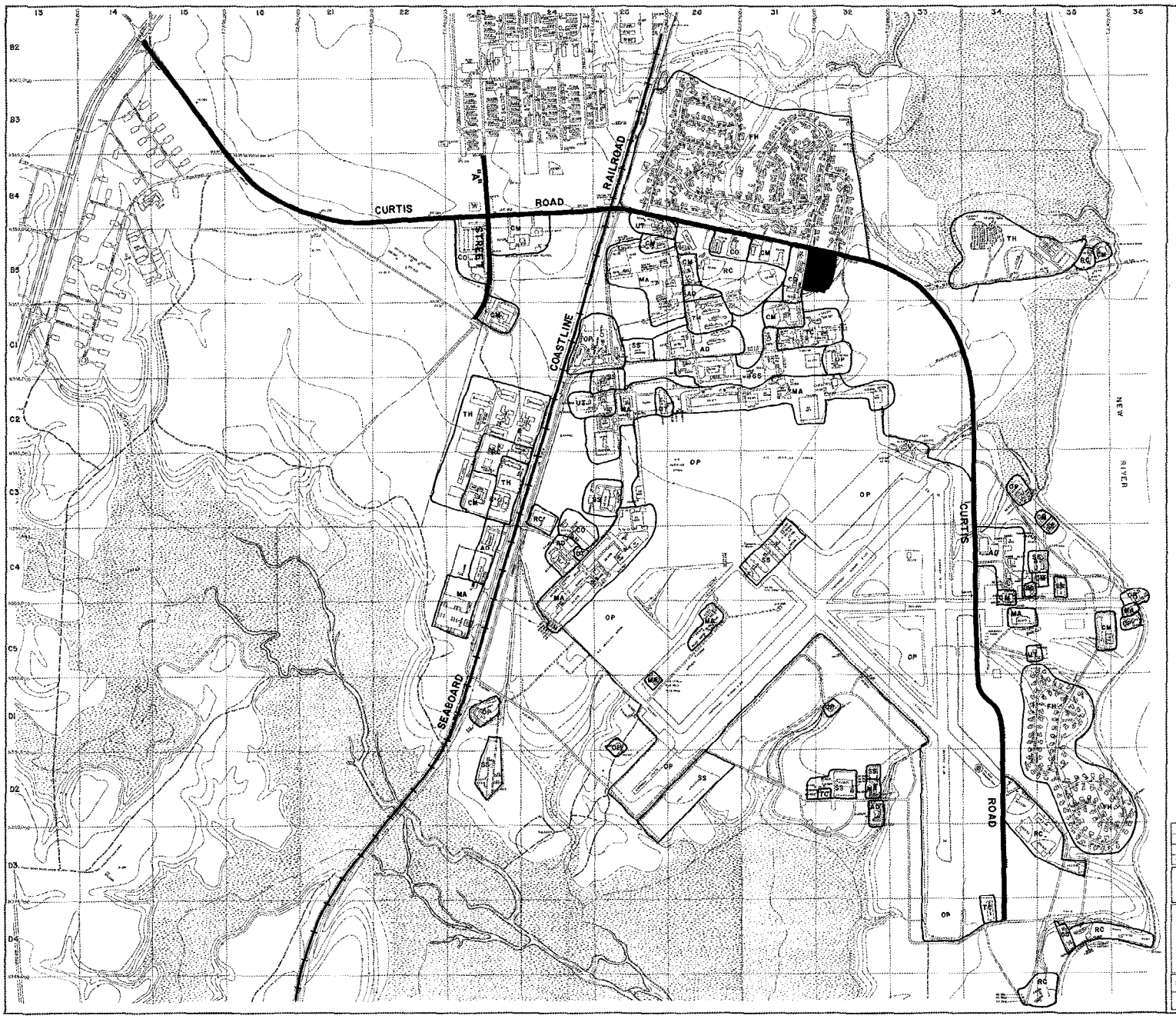


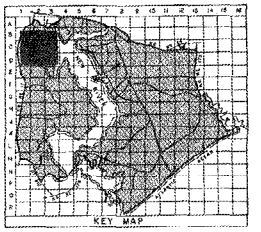
NO	DESCRIPTION OF REVISION	DATE	INIT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE
NAVAL HOSPITAL
MONTFORD POINT AND VICINITY
EXISTING CONDITIONS

DATE: 31 JULY 84	SCALE: GRAPHIC	FIGURE VI-9
APPROVED / DATE		





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS
	RAILROAD

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE
NAVAL HOSPITAL
MCAS NEW RIVER
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE VI-10

APPROVED / DATE

EXISTING UTILITIES

The source of the following information is the Public Works Department, U.S. Naval Hospital, Camp Lejeune. Water is provided by a distribution system from the Holcomb Boulevard Water Treatment Plant. Wastewater is pumped to an existing sanitary sewer manhole on the Hadnot Point System. The Marine Corps Base Substation is the source of electric power. The hospital has its own steam plant.

Water

Water source for the hospital is the Holcomb Boulevard Water Treatment Plant which is located approximately 4,500 feet east of the hospital. The Holcomb Boulevard Water Treatment Plant has a present capacity of 2 MGD, which is more than adequate for its present area of service. The plant will be expanded to 5 MGD capacity in the near future and will serve an expanded area, as well as provide additional water to the Hadnot Point Water Treatment Plant service area. Water supply lines to the Naval Hospital consist of a looped 10-inch line around the hospital. The looped line ties into an existing main which parallels Brewster Boulevard on the south. The easternmost line to the hospital connects to the Brewster Boulevard existing 16-inch line about 200 feet east of the Stone Street-Brewster Boulevard intersection. The westernmost line to the hospital ties into the existing 12-inch line paralleling Brewster Boulevard about 900 feet south of the Stone Street-Brewster Boulevard intersection. There are no known water pressure problems in this part of the water system.

Wastewater

The sewer lines in the hospital area are eight-inch and 10-inch lines leading to a lift station north of the hospital. A 10-inch force main 3,200 feet in length carries sewage to a manhole near the Stone Street-Brewster Boulevard intersection. A gravity sewer leads to the 15-inch diameter sewer carrying sewage from Midway Park, Brewster Junior High School and the Holcomb Boulevard Water Treatment Plant. The 15-inch sewer extends southerly to serve Berkeley Manor and join the 21-inch outfall sewer leading to Lift Station SHP-47A. Sewage then flows through gravity sewers in the Hadnot Point area to the Hadnot Point Wastewater Treatment Plant. From the report entitled Study of Water and Sewerage Systems, Hadnot Point, Camp Lejeune, North Carolina dated June 1980, the additional load from the U.S. Naval Hospital (0.2 MGD) was expected to bring the peak flow in the 15-inch diameter sewer to very near the line capacity.

Electrical System

The new U.S. Naval Hospital activity is served by two government-owned feeders from the Marine Corps Base Substation. Within the hospital building, two substations rated at 5 MVA are on one side of the load interrupting switchgear lineup for primary power with the other side supplied from backup capacity at 5 MVA having high voltage ratings of 12.47 KV. The hospital equipment was installed in 1982 (Contract 77-7526).

The primary feeder is a direct overhead 3 phase circuit with conductors sized at 394.5 MCM AAC. The backup feeder if from the regulating station at Holcomb Boulevard near Brewster Boulevard and is 3 phase 394.5 MCM AAC. Demands on the New Hospital (NH) feeder are metered but usage billing is not available. The present demand is about 2,600 KVA providing a demand factor

based on the total 10 MVA transformer load at approximately 0.26. The voltage drop is calculated to be 3.3 percent, which requires that tap settings on the building transformers compensate for line losses. During periods of light demand the voltage in the area will be six to eight volts higher than the nominal secondary 480 wye/277 volts. Since the feeder is an express routing from the substation, a regulator should be installed to provide compensation for variable load conditions.

Standby power for the hospital is at 480 wye/277 volts supplied by three diesel generators in the area with a total capacity of 3,075 KW.

Central Heating System

There is one steam plant at the U.S. Naval Hospital that supplies steam for the hospital only. The plant has two No. 6 oil fired boilers of 350 horsepower each, manufactured by Cleaver-Brooks, and installed in 1982. Each boiler has a capacity of 12,400 pounds of steam per hour. Boiler start-up is on No. 2 fuel oil and then switched over to No. 6 for running. The plant is new and is adequate for present requirements.

Fuel storage at the site consists of two 20,000-gallon underground tanks for No. 2 oil and two 20,000-gallon underground tanks for No. 6 oil and is adequate for a 30-day supply.

REGIONAL INFLUENCES

The Naval Hospital does not routinely share facilities or equipment with other area hospitals, nor does the Naval Hospital use civilian hospitals to meet facility requirements. On occasion, Naval

Hospital patients are referred to civilian hospitals under the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) when equipment is not available at the Naval Hospital.

The Naval Hospital cooperates with both military and civilian authorities in instances involving public health, local disasters and other emergencies. The Hospital also keeps standards at a level so as to ensure accreditation and recognition by appropriate government and civilian agencies and commissions, including the Joint Commission on Accreditation of Hospitals. The Naval Hospital also participates in the Navy and Tri-Service Regional Health Care System.

Also, the number of retired military and their dependents who choose to reside in the Naval Hospital "Catchment" area influences the demand for services.

COMPLEX INFLUENCES

Changes in personnel assigned to the Marine Corps Base, 2nd Marine Division, 2nd Force Service Support Group or MCAS, New River directly influence the demand for Naval Hospital services and, in turn, staff, facilities and equipment.

As stated earlier, some staff rotates between Naval Hospital Branch Clinics and the Battalion Aid Stations (BAS) operated by the Marine Corps. Patient referrals are made from the BASs to the Naval Hospital and the Branch Clinics.

Both the Naval Hospital and Naval Dental Activities at Camp Lejeune report to Naval Medical Command, Mid-Atlantic Region. The five Naval Dental Clinics are collated in the following Branch Clinic facilities: Headquarters Building 15; Preventive Medicine Building 65;

Courthouse Bay Branch Clinic; Camp Geiger Branch Clinic; Montford Point Branch Clinic; and MCAS, New River Branch Clinic. A new French Creek Clinic, P-701 planned for fiscal year 1987, will house both medical and dental services.

In addition, the Naval Hospital Activity is involved in equipment purchasing and storage for both the Marine Corps medical activities, as well as for the Naval Dental Clinic. The Naval Hospital also provides security, environmental and chaplain staff persons to the Naval Dental Clinic.

PLANNING FACTORS

Listed below are several factors that should be considered in planning future physical development at the Naval Hospital and Branch Clinic facilities. Included as planning factors are general problems and specific natural and man-made constraints which have been identified in the preceding analysis.

1. Peak-hour traffic congestion at the Brewster/Holcomb Boulevard intersection.

2. Hospital Point barracks in deteriorating physical condition.

3. Hospital Point barracks five miles away from new Naval Hospital.

4. Branch Clinic Headquarters (Building 15) is cramped and in poor physical condition. Limited room for future expansion of this facility.

5. Co-location of Branch Clinics and Naval Dental Clinics should be addressed in any facility relocation decision.

6. Additional development at the Naval Hospital site should be designed to segregate work and personnel support areas to provide a logical and efficient land use configuration.

CONCEPTUAL DEVELOPMENT

GENERAL

Alternative concept plans represent conceptual solutions for directing growth and change at the Naval Hospital Activity. The purpose of this analysis is to compare alternative land use schemes and to select the most logical and efficient land use plan, given assigned missions, available resources, and physical and operational constraints.

Defined below are a set of general goals which are intended to serve as an implementing guide for future physical development. These goals were derived from the preceding planning analysis. Accompanying each goal is a series of measurable objectives which, if followed, can produce achievement of each goal.

GOALS AND OBJECTIVES

Goal 1: ENCOURAGE COMPATIBLE LAND USE RELATIONSHIPS

Objective 1A: Site physically and functionally related facilities adjacent to one another.

Objective 1B: Maintain unit integrity.

Goal 2: CONCENTRATE DEVELOPMENT TO MAXIMIZE LAND POTENTIAL

Objective 2A: Site new facilities in locations occupied currently by temporary, sub-standard or inadequate facilities.

Objective 2B: Prevent encroachment of development into training and maneuver areas.

Goal 3: IMPROVE THE CIRCULATION SYSTEM TO FULLY SERVE AND SUPPORT LAND USE, TO CONSERVE TIME AND ENERGY AND TO PROMOTE SAFETY

Objective 3A: Minimize conflicts between pedestrian and vehicular traffic.

Objective 3B: Relieve traffic congestion along major arterials and at major intersections.

Objective 3C: Reduce travel times between developed areas.

Objective 3D: Improve access from personnel support areas.

Goal 4: CONSERVE EXISTING ASSETS

Objective 4A: To the extent economically feasible, repair and/or renovate substandard facilities prior to planning new replacement facilities.

Objective 4B: Relocate tenants from facilities that, although in good structural condition, are deficient in configuration or size for their needs.

Goal 5: PRESERVE AND PROTECT THE NATURAL ENVIRONMENT

Objective 5A: Maintain the integrity of all endangered species' habitats.

Objective 5B: Construct facilities outside the 100-year flood plain.

Objective 5C: Construct facilities in areas with less than 10 percent slope.

Objective 5D: Prevent contamination or destruction of soils, vegetation and wetlands.

Goal 6: ENHANCE THE OVERALL ATTRACTIVENESS OF DEVELOPED AREAS

Objective 6A: Use plant materials or fencing to buffer incompatible uses.

Objective 6B: Plan facilities which are well-integrated in terms of scale, materials and design.

Goal 7: RESERVE UNDEVELOPED LAND AREAS TO ACCOMMODATE FUTURE FACILITY NEEDS

Objective 7A: Identify potential facility requirements beyond the time frame of this plan.

Objective 7B: Identify specific areas for construction of facilities designed to meet requirements beyond the time frame of this plan.

The subsequent analysis is organized by the various geographic areas where Naval Hospital facilities are located. Each alternative concept is depicted on a map and analyzed in narrative form in terms of the goals and objectives presented above. Culminating this process is a "Land Use Plan" which most closely satisfies all these goals and objectives.

NAVAL HOSPITAL

Concept Plan A

This concept (Figure VI-11) is the future development plan contained in the Naval Hospital Concept Manual. The following description is taken directly from that manual.

A secondary road, entering the site from Brewster Boulevard, is proposed as a direct access to Public Works, the service docks and the future helipad. This new road would eliminate truck traffic from the main entrance road and could provide additional access to projected facilities to be located in the Southeastern Quadrant of the site.

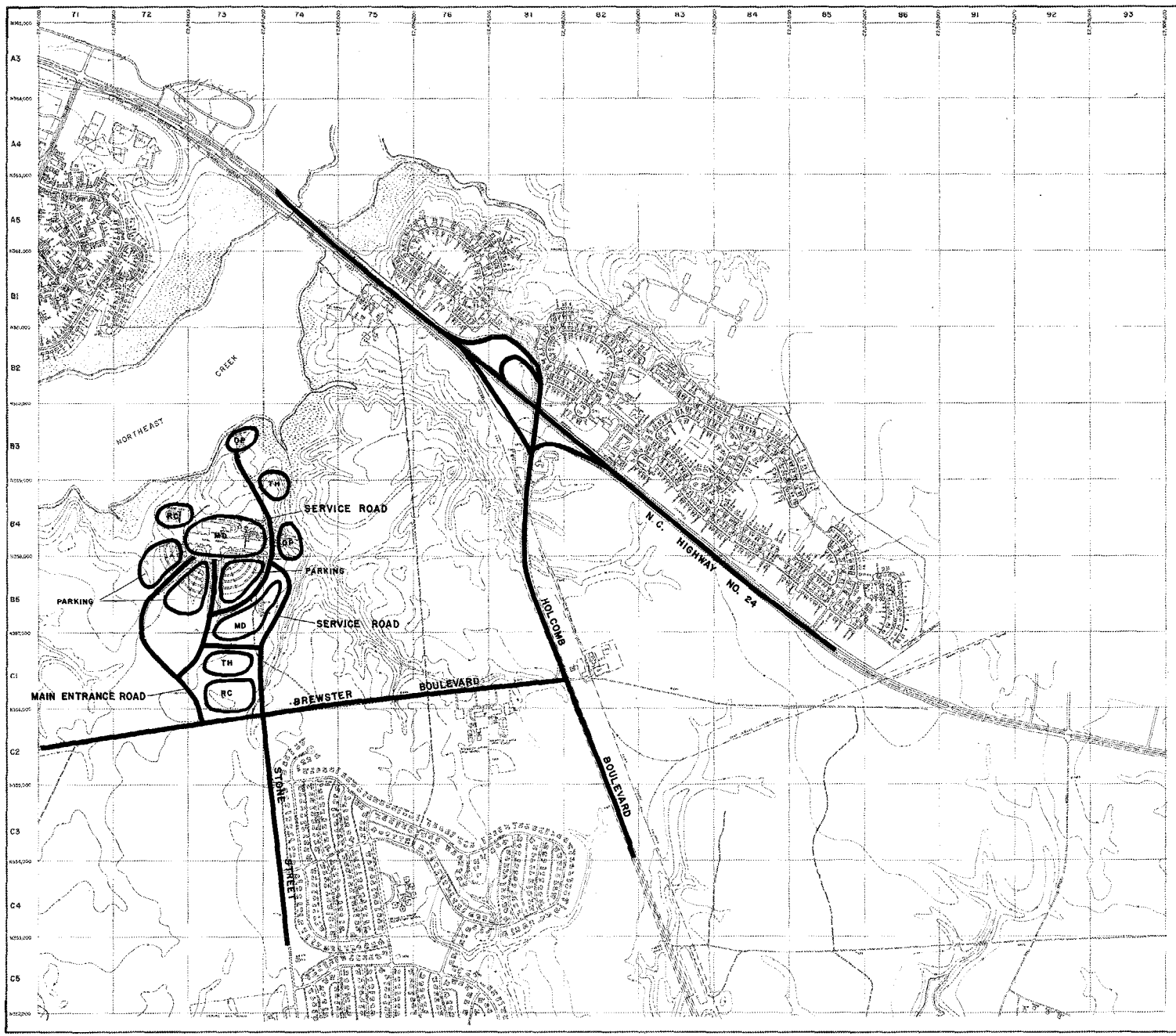
Recommended areas for future facility development include areas in the southeast and northeast quadrants of the site. The major considerations in designating these areas include the amount of area available for construction, parking and expansion; the nature and medical relationship to the Main Hospital, the natural environment, and isolation for on-site housing units and a near-the-shore location for the permanent helipad constructed as originally planned.

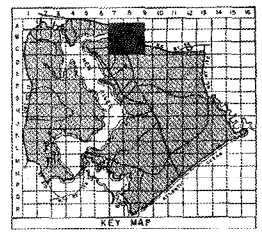
The area between the main entrance and emergency roads should be developed as an open, unencumbered space for large type field games and recreation. This area is adjacent to the area proposed for troop housing development. Recreational areas are shown in the northwest quadrant, close to the North Wing of the Medical Center building.

It is proposed that the area in the southeast quadrant be divided by a new east-west street which connects the original roads with the projected new service road. The area to the south of this connector street is recommended for development of Unaccompanied Enlisted Personnel Housing Units.

The space between the proposed connector street and the main employee/staff parking area is projected for development as sites for medically-related structures. This area is surrounded by the road system on all four sides and is situated near the emergency, staff and service entrances serving the Medical Center building. Freestanding medical functions such as Alcohol Rehabilitation, Light Care Center, Day Care Center, Hospice and other related disciplines can be accommodated efficiently in this zone.

In the northeast quadrant, an area of high ground borders the road leading from the Medical Center to the Helipad on Northeast Creek shoreline. This area is reserved for the future Unaccompanied Officer Housing.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	BY

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN A

MIDWAY PARK HOUSING AREA
AND NAVAL HOSPITAL
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE - GRAPHIC | FIGURE VI-11

APPROVED / DATE

Concept Plan B

In this modification of the first concept, the Unaccompanied Officer Housing (UOH) is relocated from the sites northeast quadrant to its southwest quadrant (Figure VI-12). This is proposed for several reasons: This site is more accessible to the main circulation system; the UOH site alternative shown in Concept Plan A would permit clear views of the unattractive backside of the Hospital; the Concept Plan A UOH site would be in close proximity to the helicopter landing zone which could result in noise conflicts from helicopters and ambulances transporting patients from the pad to the emergency entrance.

Concept Plan C

Concept Plan C present an entirely different pattern for future development at the Hospital tract. For the most part, personnel support uses are consolidated on the eastern side of the entrance road and planned outpatient uses on the western side (Figure VI-13). Unaccompanied Officer Housing is shown north of Unaccompanied Enlisted Personnel Housing, with a recreational buffer separating the two housing areas. Omitted in this plan is an east-west connector road between the main entrance and service road; complete segregation of service traffic is desirable. The Alcoholic Rehabilitation Unit and the Preventive Medicine Unit are sited on the western side of the site, close to the parking area.

BRANCH CLINICS

Hadnot Point

Concept Plan A

In this alternative, medical facilities are relocated to a large undeveloped area behind the Main Street Post Office (Figure VI-14). Relocation would better provide for continued use of old facilities during new construction and permit large-scale expansion, if necessary, over the long-term. This is one of the few centrally-located undeveloped sites remaining at Hadnot Point. The site would be equally accessible from work areas and living areas and would be a small distance closer to the large service population at French Creek.

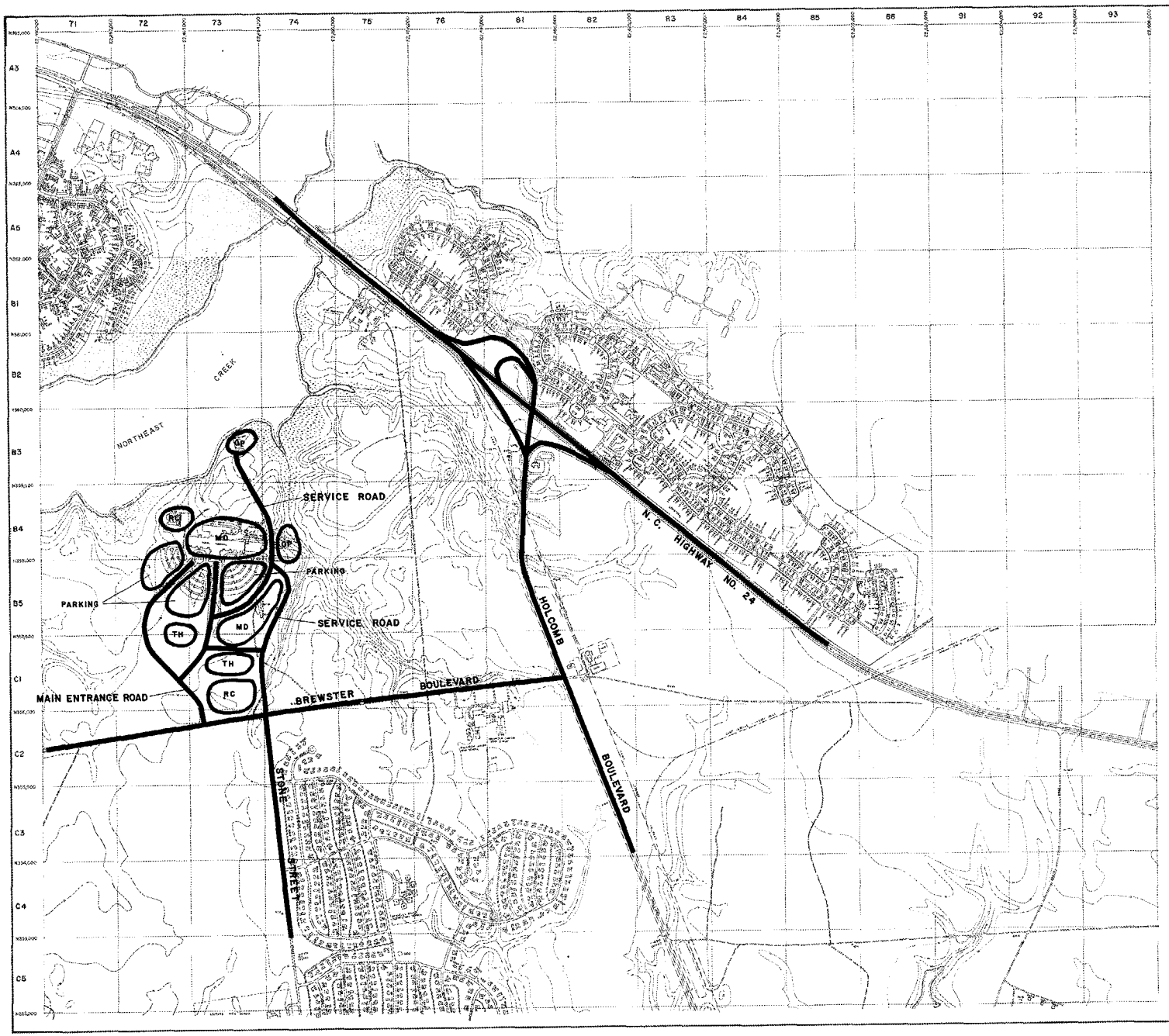
Concept Plan B

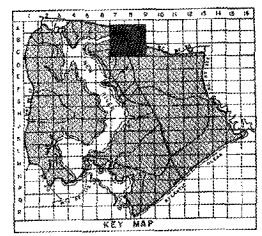
This concept reflects land use relationships as they exist presently (Figure VI-15). Branch facilities located in Buildings 15, 36 and 65 are centrally located to 2nd Marine Division regimental housing areas, as well as to main administrative and community/commercial facilities. Another major advantage is the close proximity of these clinics to one another.

Courthouse Bay

Concept Plan A

Existing land use patterns are retained in this concept (Figure VI-16). The clinic would be replaced at the same waterfront location at which it currently exists. A disadvantage of this site is





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TG	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT

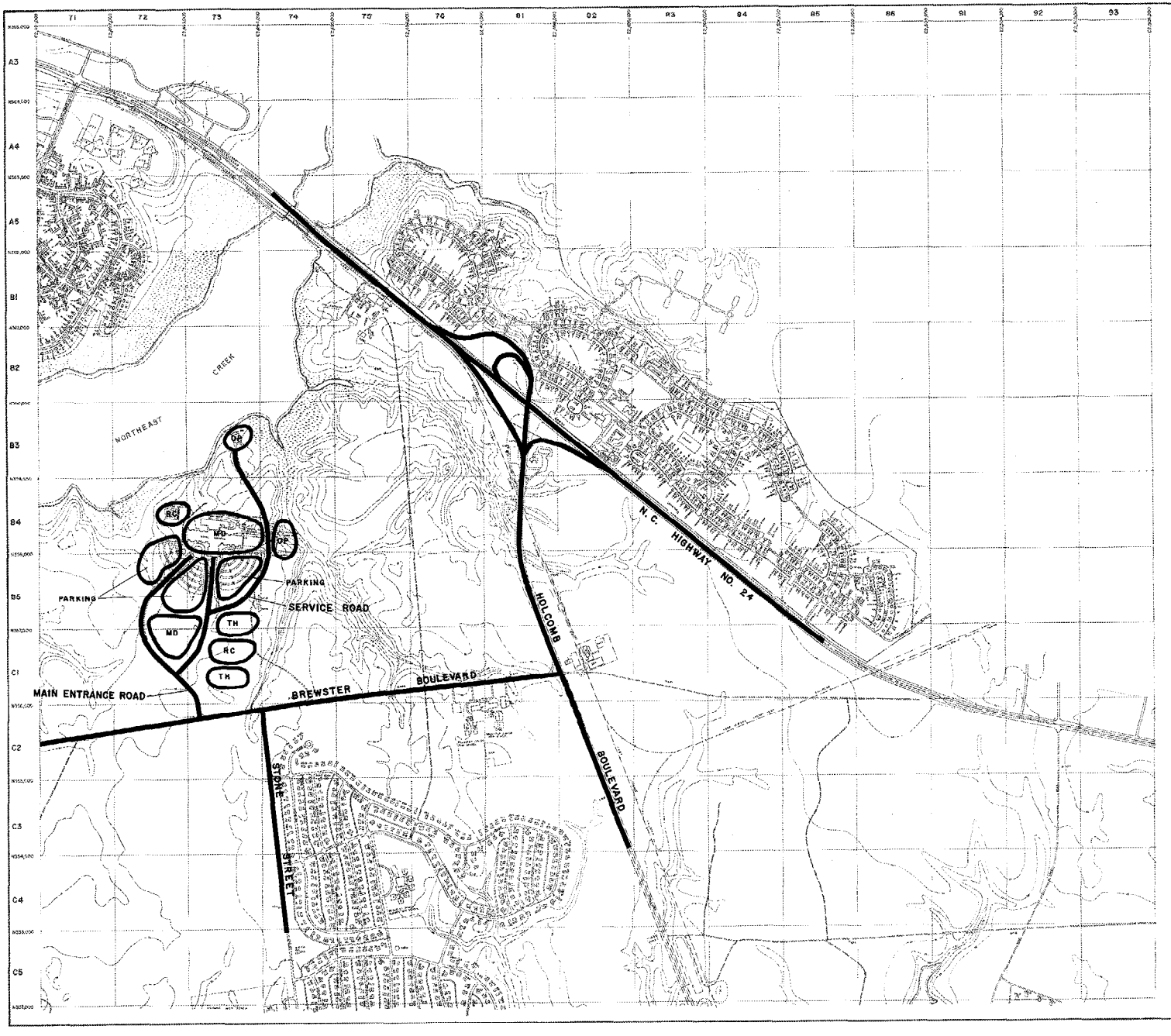
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

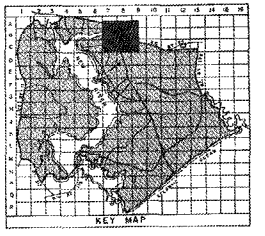
CONCEPT PLAN B

MIDWAY PARK HOUSING AREA
AND NAVAL HOSPITAL
EXISTING CONDITIONS

DATE 01 JULY 84 | SCALE: GRAPHIC | FIGURE VI-12

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source—USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INIT.

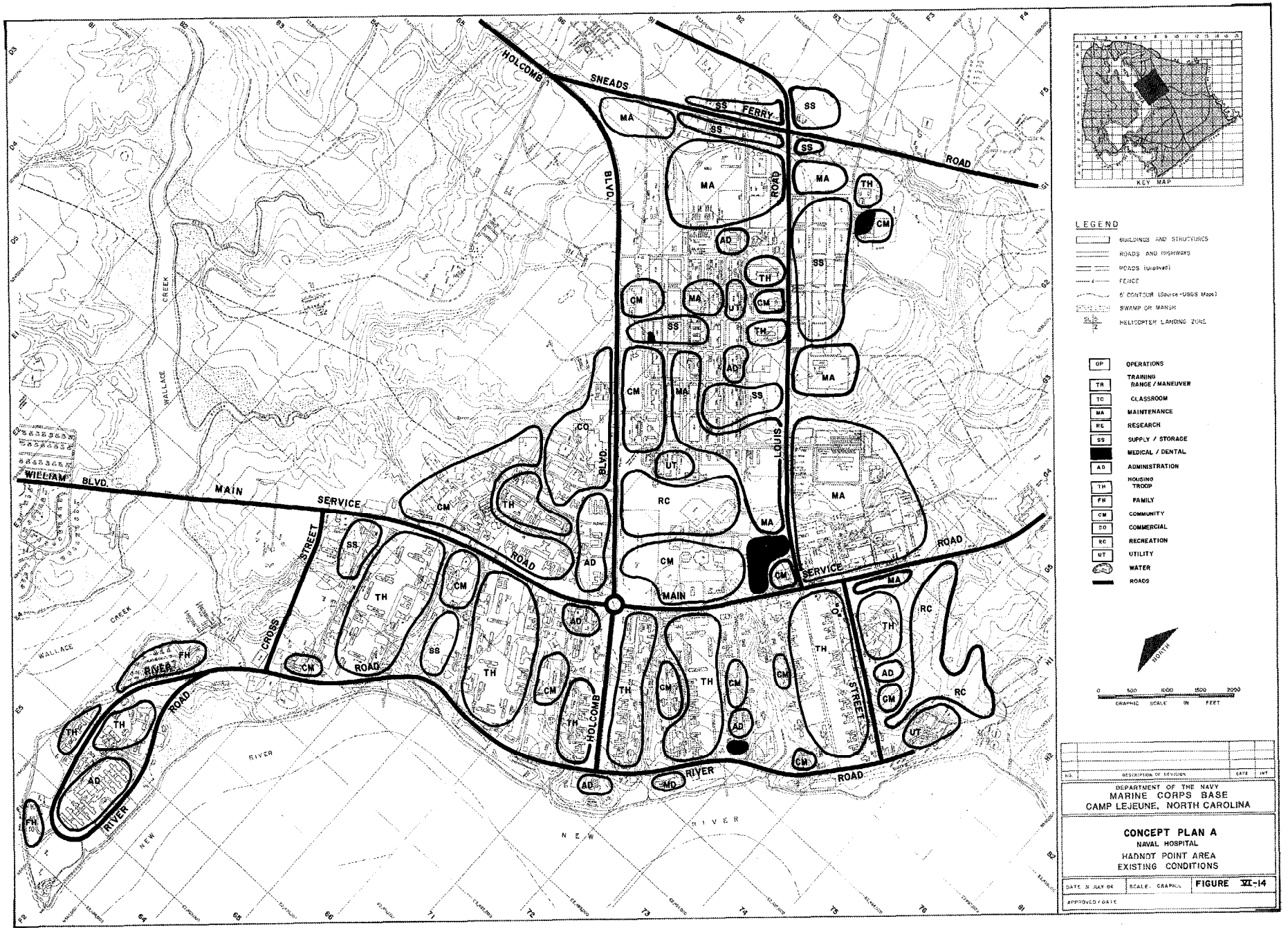
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN C

MIDWAY PARK HOUSING AREA
AND NAVAL HOSPITAL
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE VI-13

APPROVED / DATE



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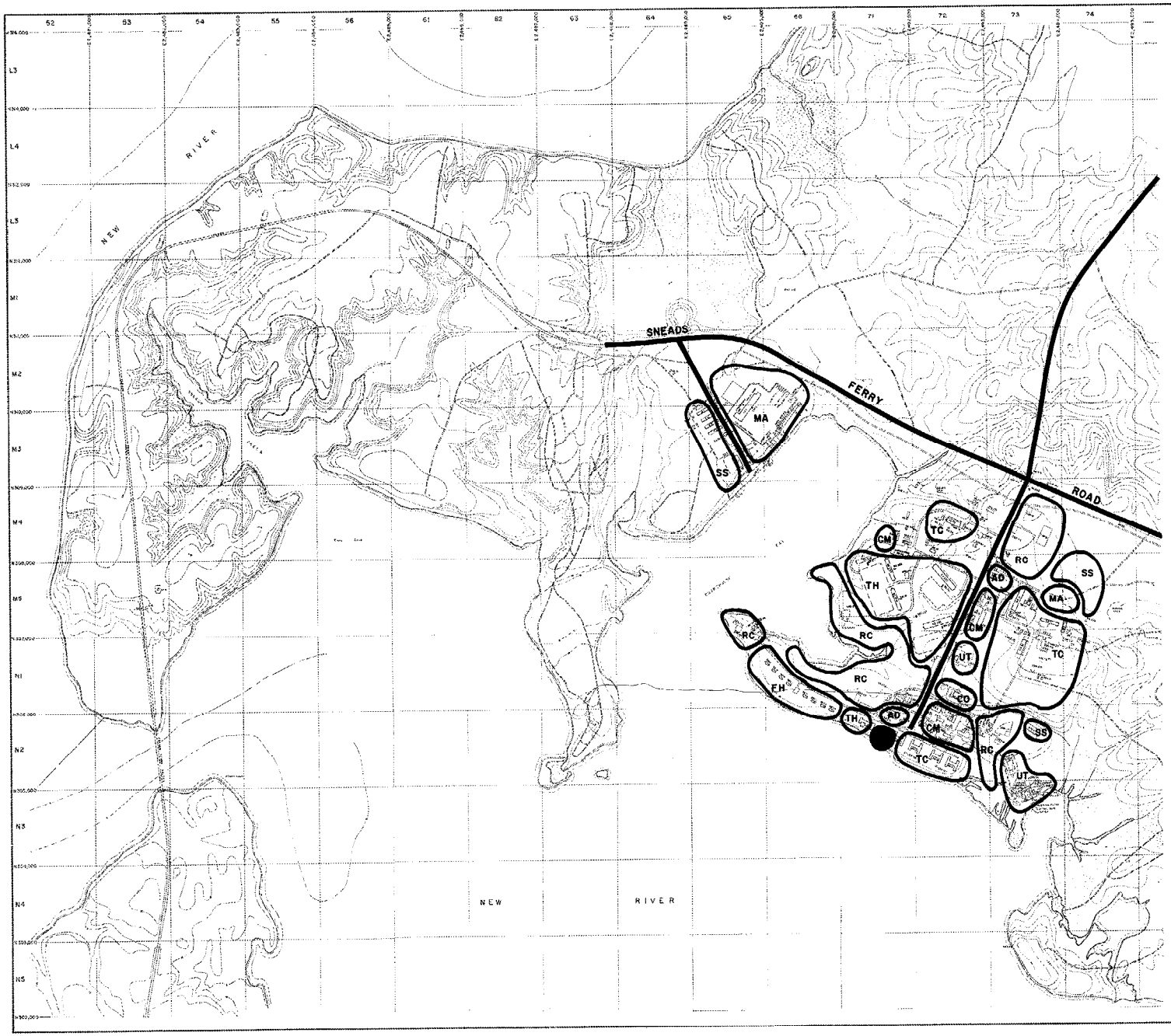
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

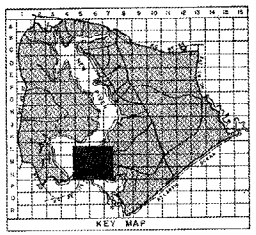
CONCEPT PLAN A
NAVAL HOSPITAL
HADNOT POINT AREA
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE XI-14

APPROVED / DATE


SNEADS FERRY ROAD
WILLIAM BLVD.
MAIN SERVICE ROAD
CROSS STREET
HOLCOMB BLVD.
LOUIS ROAD
MAIN SERVICE ROAD
CROSS STREET
WALLACE CREEK
RIVER ROAD
NEW RIVER
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source-USGS Maps)
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE BY
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
CONCEPT PLAN B
NAVAL HOSPITAL
HADNOT POINT AREA
EXISTING CONDITIONS
DATE 31 MAY 84
SCALE GRAPHIC
FIGURE VI-15
APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INIT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN A
NAVAL HOSPITAL
ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE GRAPHIC | FIGURE VI-16

APPROVED / DATE

that it is removed from the large troop housing and community support area to the north. Rebuilding so close to the 100-year flood plain is seen as a second major disadvantage.

Concept Plan B

The Branch Clinic is relocated northward along Marines Road next to the community use area (Figure VI-17). This provides a more centralized location closer to relocated administrative headquarters and to AMTRAC supply/maintenance areas and avoids entirely the threat of flooding.

MCAS, New River

Concept Plan A

The clinic is retained in its present location across from the Enlisted Personnel Family Housing Area (Figure VI-18). Access is good both to work areas and to family housing areas.

Concept Plan B

In this concept, medical uses have been moved west of the Seaboard Coastline Railroad tracks, as have all other non-operational land uses at MCAS, New River (Figure VI-19). This site is adjacent to the Curtis Road Triangle area, and directly accessible via the Campbell Street Extension to the airfield operations area. Access from off-Base to this clinic would be improved, in terms of distance and reduced vehicle conflicts.

LAND USE PLANS

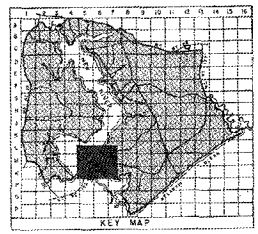
The Land Use Plans for future physical development of the Base areas containing Naval Hospital facilities are described below and are shown on Figures VI-20 through VI-28. Each Land Use Plan is the result of the analysis of facility requirements, planning factors, and comments provided by the activity as a result of their review of alternate Concept Plans. The Land Use Plans represent the most logical and efficient use of activity assets given assigned missions, available resources, and physical and operational constraints. They provide a sound basis for directing growth and change, and have been used to site Capital Improvements Program projects.

NAVAL HOSPITAL

The pattern of future development shown in the Land Use Plan for the Naval Hospital area is quite different from that previously presented in the Naval Hospital Concept Manual. Although the Hospital remains the focal point, land use relationships and expansion potential are improved by separating personnel support uses and medically-related activities (Figure VI-20).

The space west of the entrance road is designated for development as sites for freestanding medical functions such as the Preventive Medicine Clinic, Alcohol Rehabilitation Unit, Light Care Center, Day Care Center, Hospice and other related disciplines. This area is well served by the road system and adjacent parking lots.

Located Northeast of the Medical Center are operational facilities including the Helipad which is shown on the Northeast Creek shoreline near the emergency entrance. The Public Works



LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

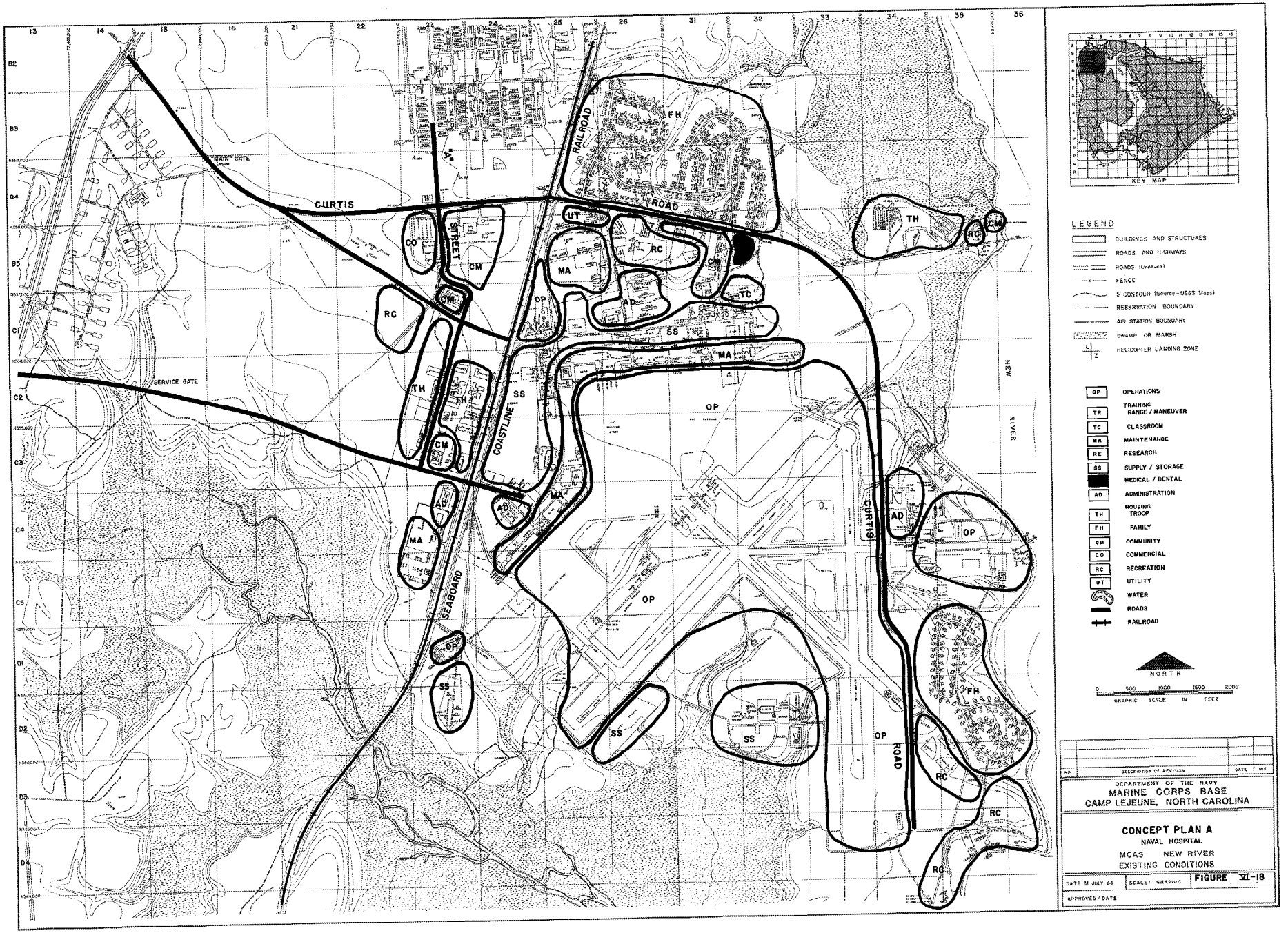
NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN B
NAVAL HOSPITAL
ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE VI-17

APPROVED / DATE


MAIN GATE
CURTIS
STREET
ROAD
RAILROAD
SERVICE GATE
COASTLINE
SEABOARD
CURTIS
ROAD
NEW
RIVER
CO
CM
UT
RC
MA
OP
AD
SS
TC
TH
FH
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source - USGS Maps)
RESERVATION BOUNDARY
AIR STATION BOUNDARY
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
RAILROAD
NORTH
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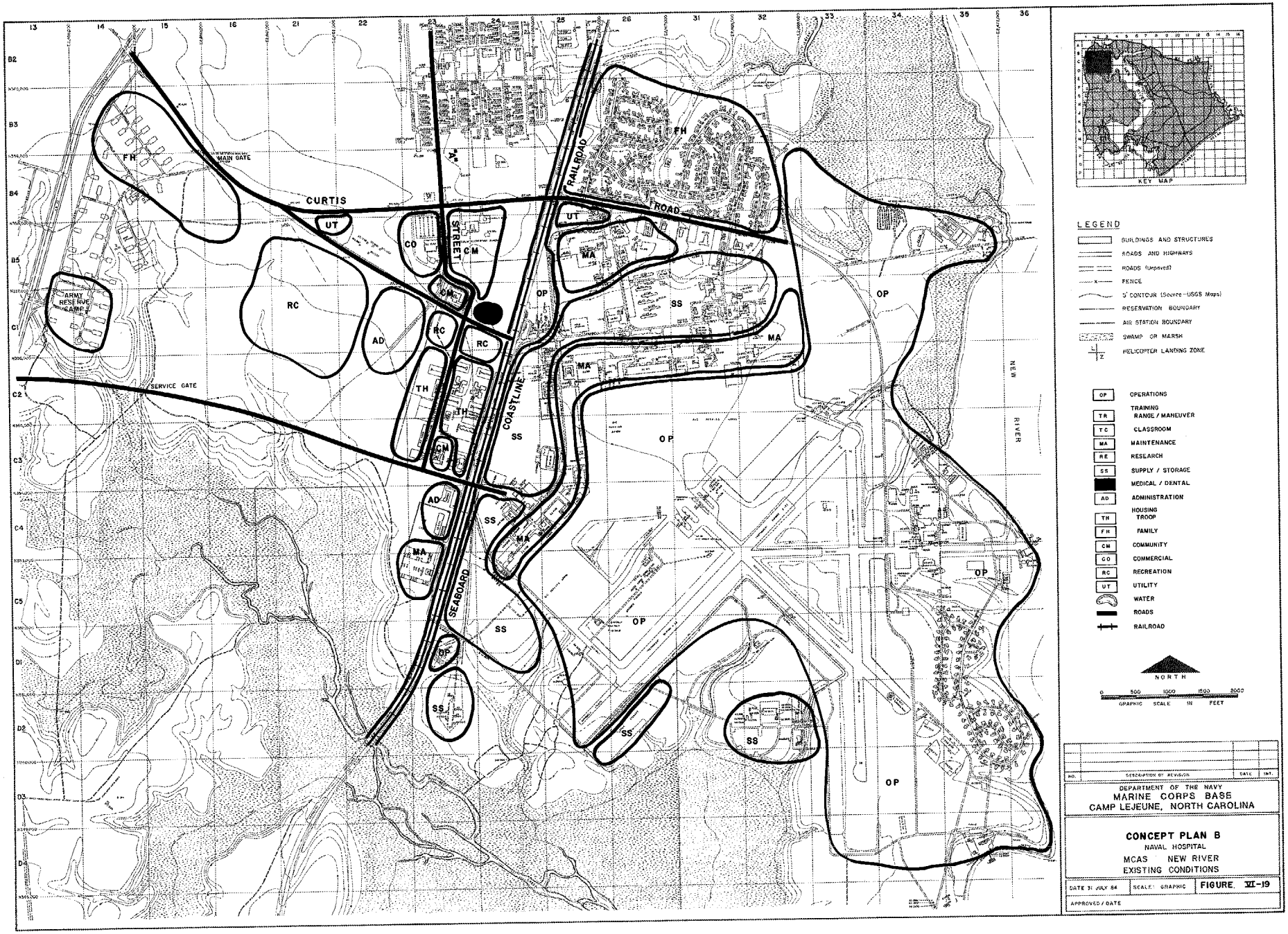
GRAPHIC SCALE IN FEET
NO DESCRIPTION OF REVISION DATE INIT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
CONCEPT PLAN A
NAVAL HOSPITAL
MCAS NEW RIVER
EXISTING CONDITIONS
DATE 31 JULY 84
SCALE: GRAPHIC
FIGURE VI-18
APPROVED / DATE



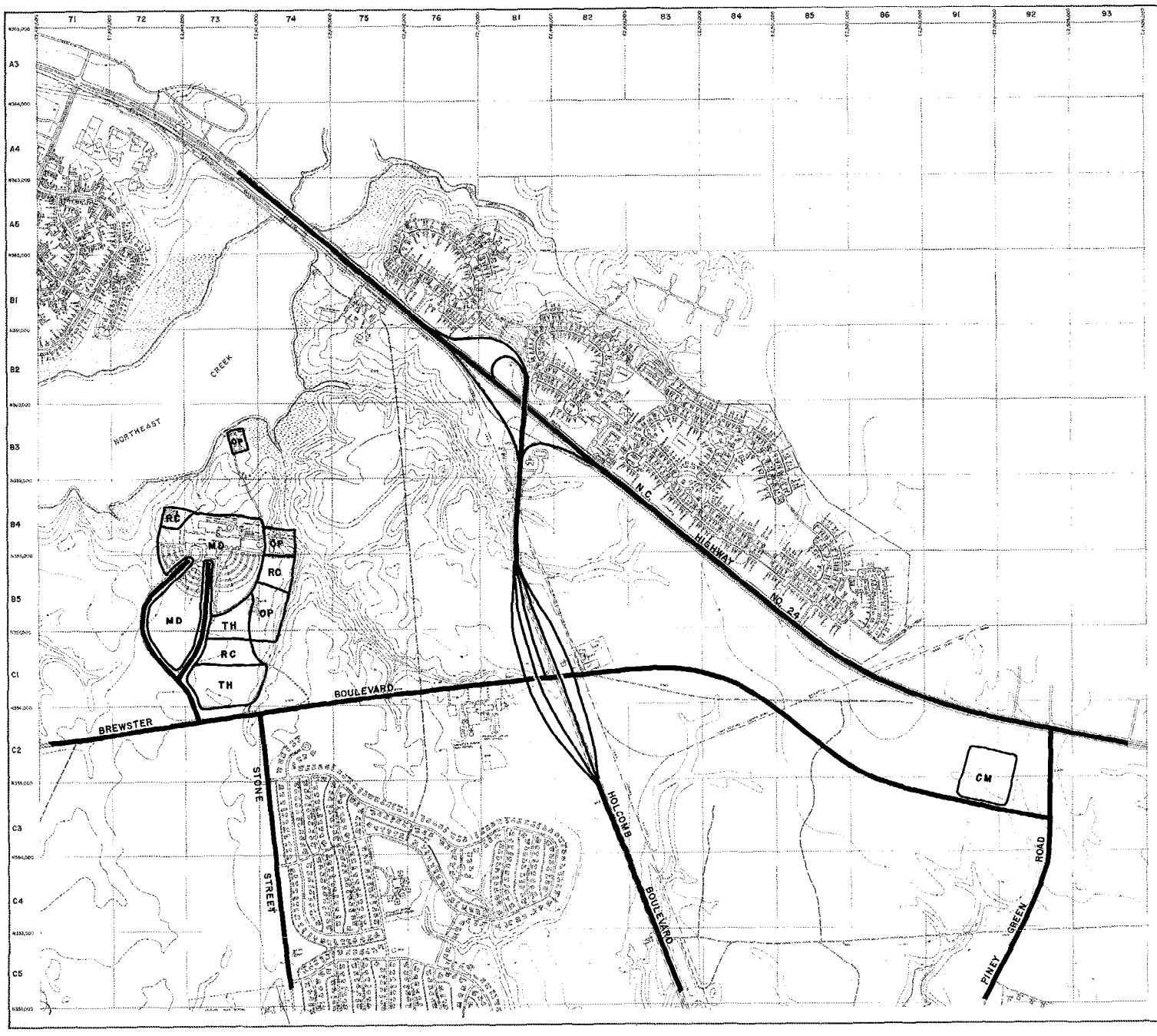
NO.	DESCRIPTION OF REVISION	DATE	INT.

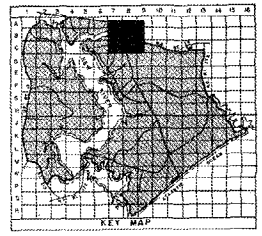
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN B
NAVAL HOSPITAL
MCAS NEW RIVER
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE VI-19

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 600 1000 1600 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	OAT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN

MIDWAY PARK HOUSING AREA
AND NAVAL HOSPITAL
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE VI-20

APPROVED / DATE

building, service docks and staff entrance border a service road which eliminates truck traffic from the main entrance road.

Unaccompanied Officer Housing is shown north of Unaccompanied Enlisted Personnel Housing, separated by a recreational/open space buffer. The site's accessibility to the main circulation system and its relative distance from hospital service areas provides desirable advantages for residential use.

BRANCH CLINICS

Included in this section is a description of the future land use pattern of Base areas, each of which are served by Naval Hospital Clinics. Branch Clinics are sited to promote the sharing of facilities with Naval Dental Clinics, which will be discussed in Section VII.

At Hadnot Point, the Land Use Plan consolidates several existing Naval Hospital facilities into one central location on the north side of the Main Service Road, adjacent to the Post Office and other community facilities. This site is accessible to the large number of troops assigned to the Hadnot Point regimental area as well as to work areas and family housing (Figure VI-21).

The new Branch Clinic site will combine routine health and dental care, pharmacy and laboratory services currently provided at Building 15 and at the Physical Exam Center, and eliminate the need for separate facilities. The Preventive Medicine Clinic is relocated to the Naval Hospital area with other outpatient services. The small clinic inside the Correctional Facility which serves correctional staff and inmates, would remain in its present location.

Concentration of medical/dental activities into a larger area provides increased visibility and improved exposure from two major arterials, the Main Service Road and Louis Road. More importantly, facility consolidation will reduce operational costs and duplication of services while improving patient service delivery. Expansion potential within this tract is also enhanced by efficient use of land resources.

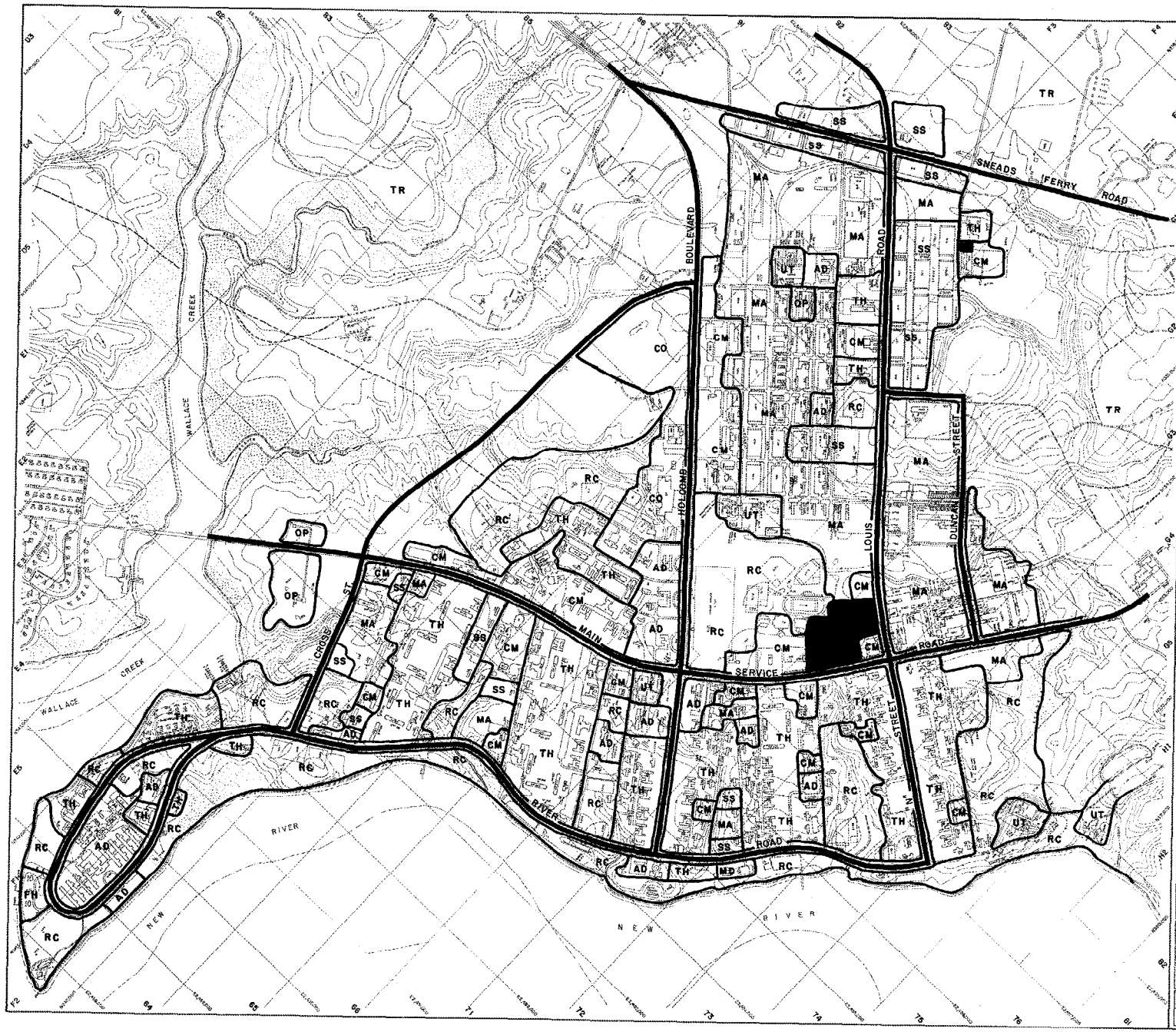
The Land Use Plan for the French Creek area calls for the Branch Clinic to remain in its present location which is centrally located with respect to troop housing, training and work areas (Figure VI-22).

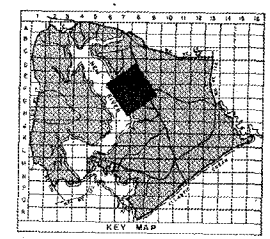
At Courthouse Bay, the Land Use Plan relocates the Branch Medical Clinic further north along Marine's Road away from the flood hazard area to a more central and visible location (Figure, VI-23).

The Land Use Plan for Onslow Beach moves the Branch Clinic to a larger site with direct access to Ocean Drive. The Clinic and adjacent community facility uses serve as a transitional zone between public areas to the east and troop activity areas (Figure VI-24).

The Rifle Range Branch Clinic is shown on the Land Use Plan in its same general location but on an expanded site which takes advantage of its close proximity to all troop activity areas (Figure VI-25).

At Camp Geiger, the Land Use Plan indicates that the Branch Clinic should remain in its present location near the intersection of Seventh and "E" Streets. This site logically incorporates medical/dental services into an area where other personnel support uses are located (Figure VI-26).





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

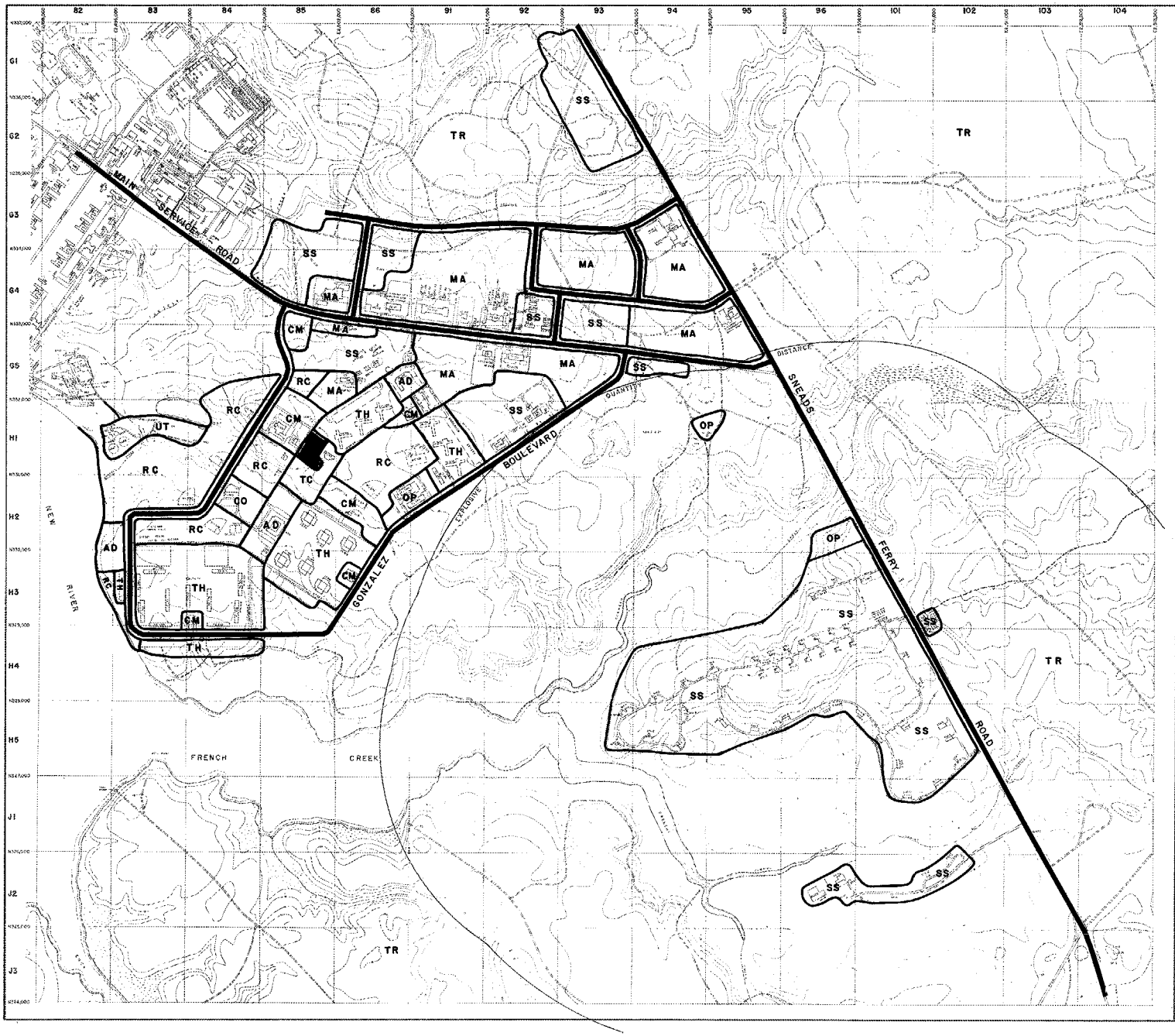
NO.	DESCRIPTION OF REVISION	DATE	INT.

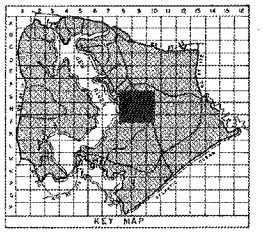
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN
NAVAL HOSPITAL
HADNOT POINT AREA
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE III-21

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

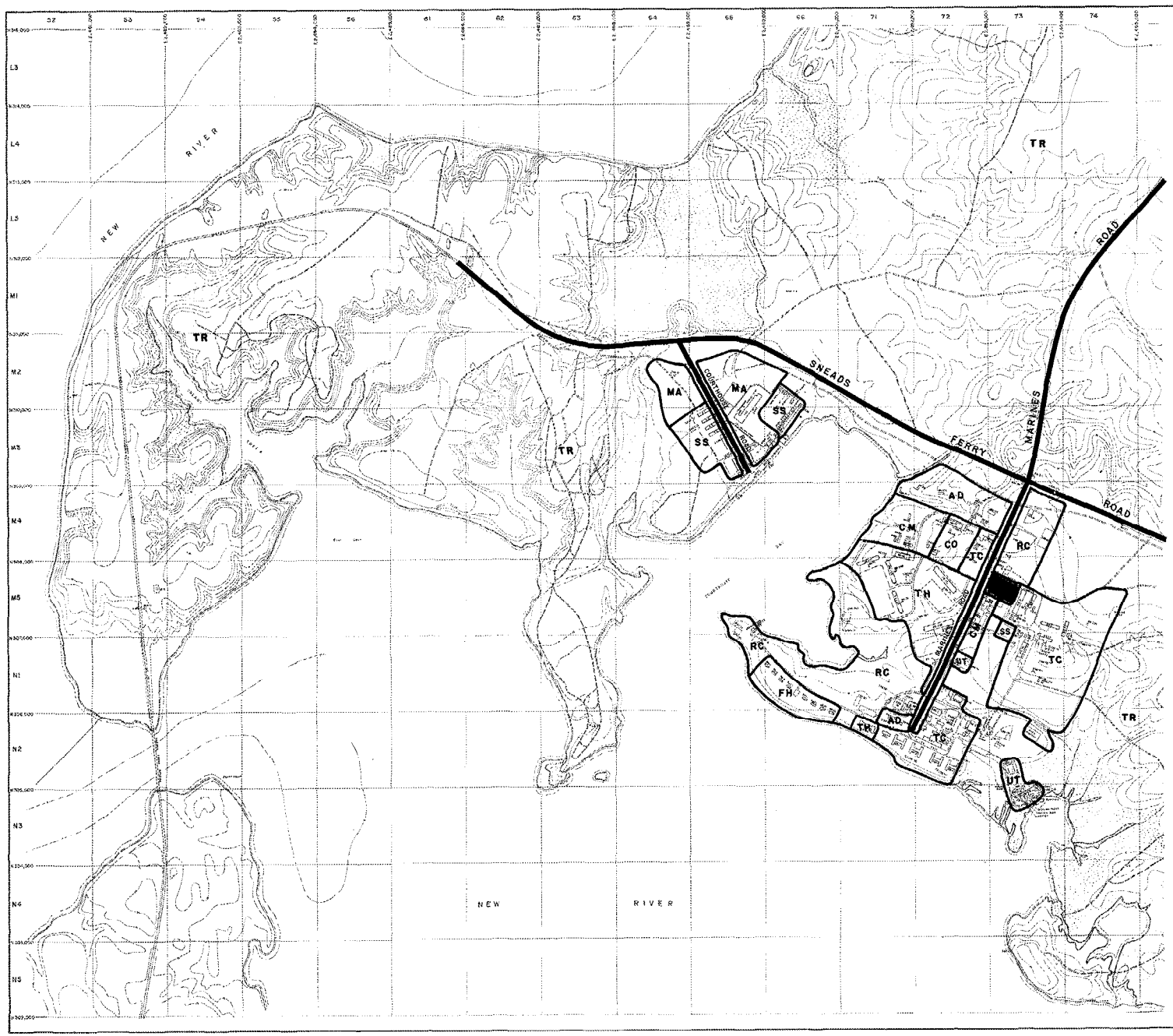
LAND USE PLAN

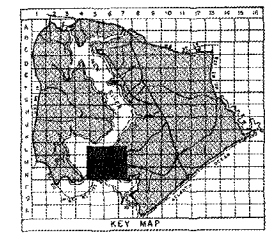
NAVAL HOSPITAL

FRENCH CREEK AND MAGAZINE AREAS
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE VI-22

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source -USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE/MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL/DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

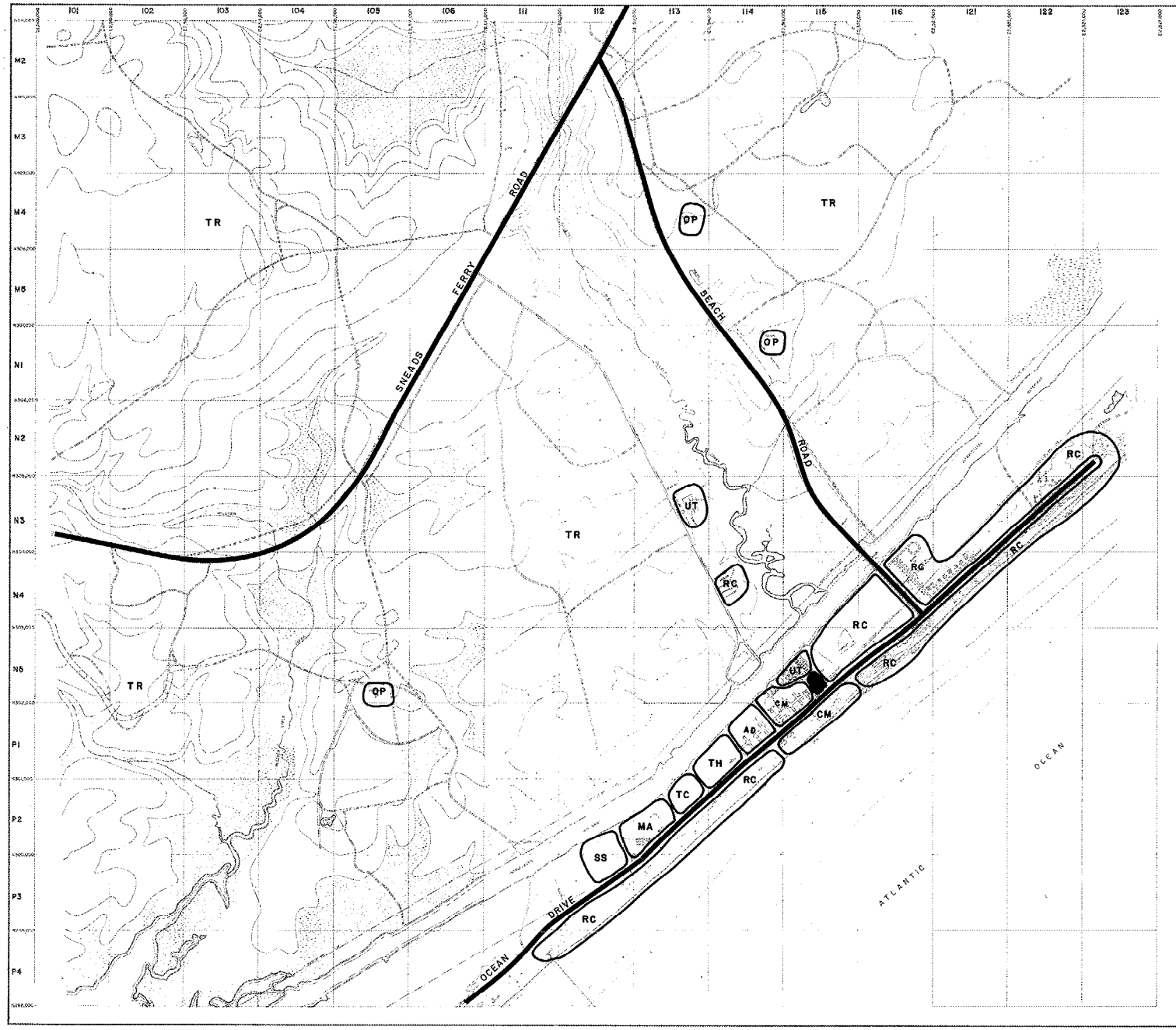
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

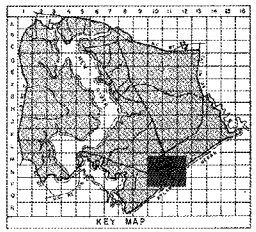
LAND USE PLAN

NAVAL HOSPITAL
ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE III-23

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RL	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

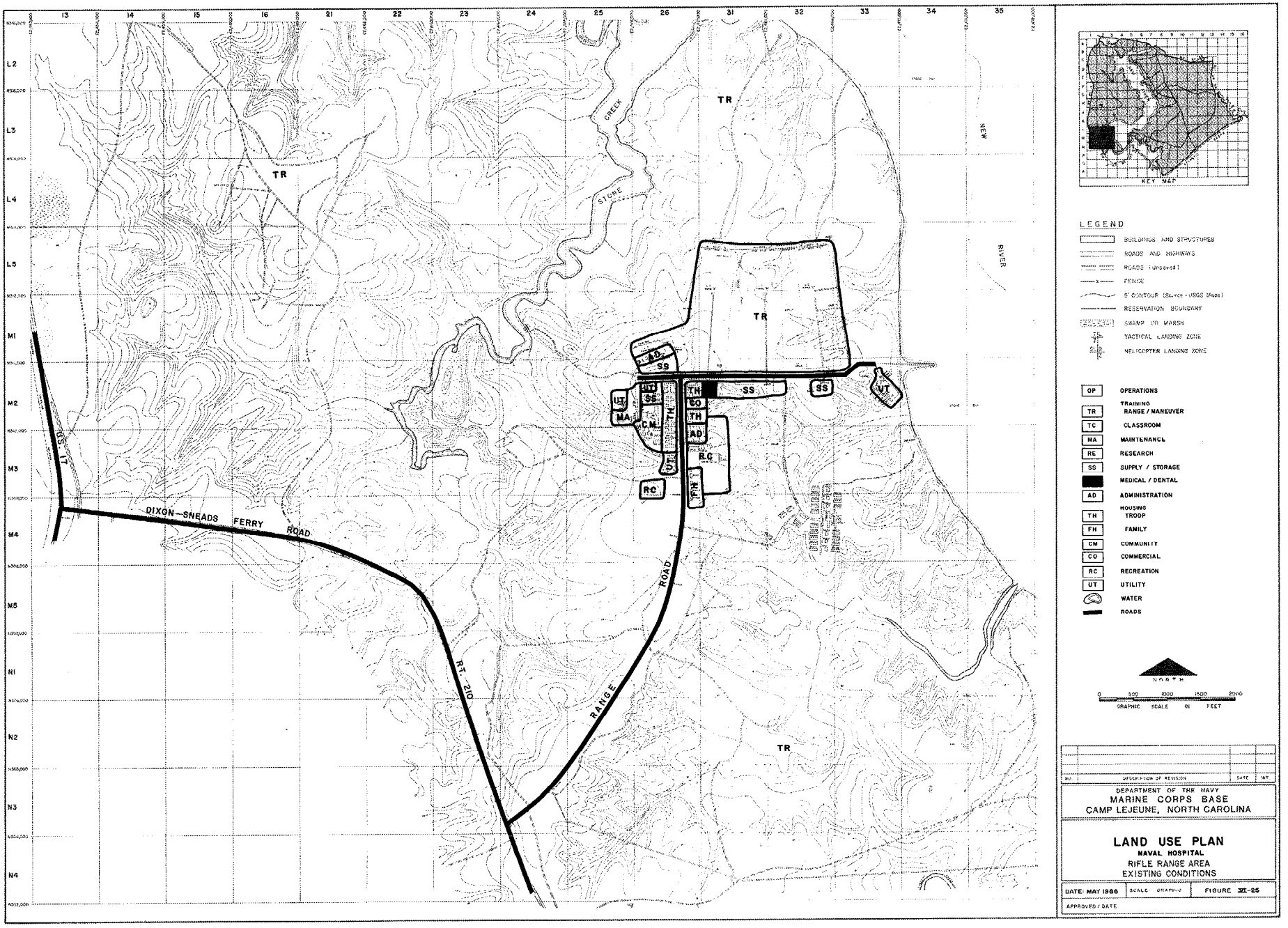
LAND USE PLAN

NAVAL HOSPITAL

BEACH AREA AND VICINITY
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE VI-24

APPROVED / DATE



NO	DESCRIPTION OF REVISION	DATE	INIT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

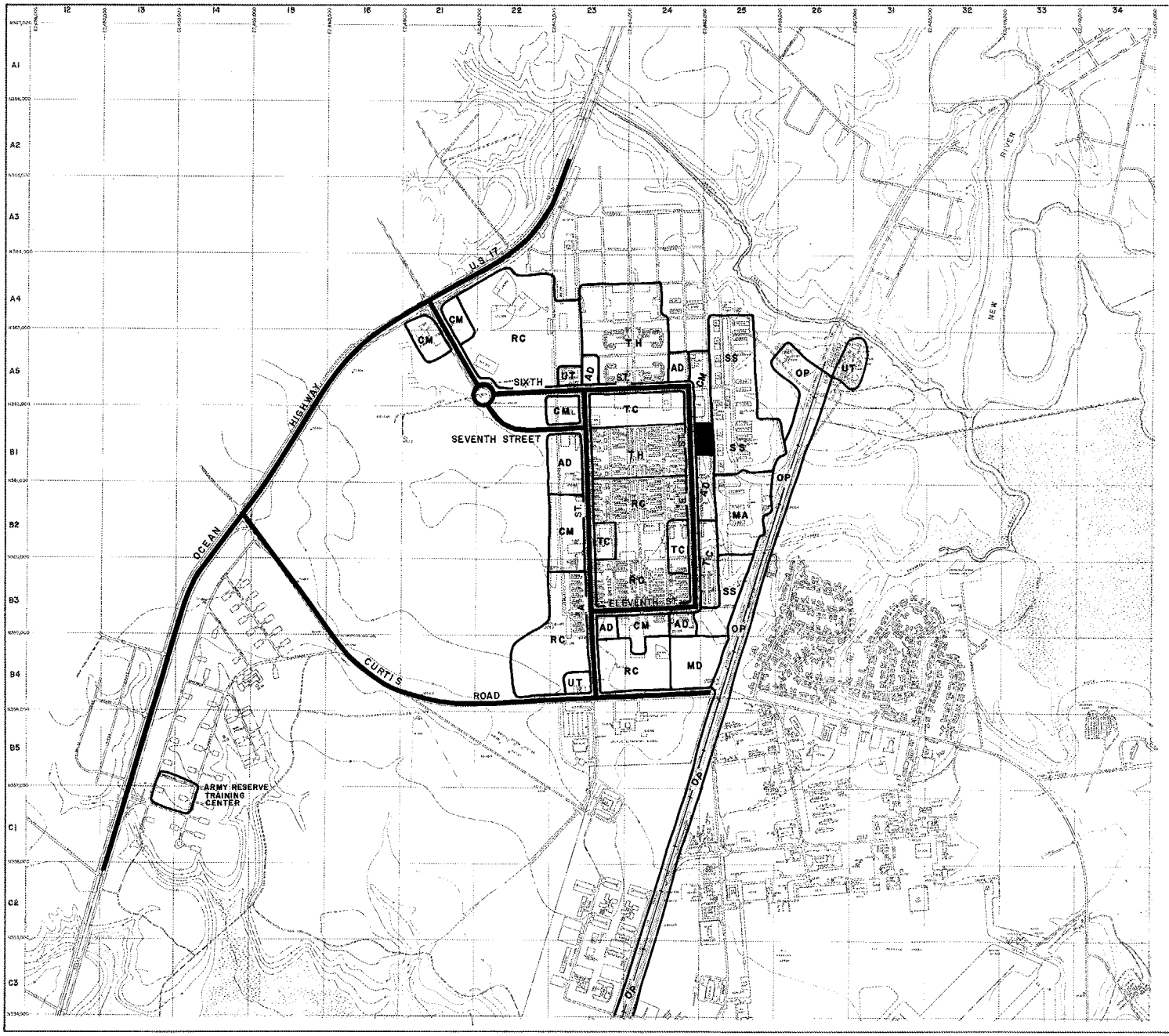
LAND USE PLAN

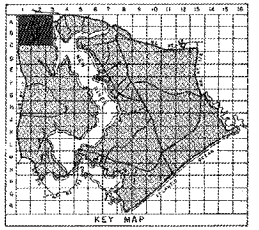
NAVAL HOSPITAL

RIFLE RANGE AREA
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE XII-25

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- 1/17 HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN

NAVAL HOSPITAL

GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS

DATE: MAY 1986 SCALE: GRAPHIC FIGURE XII-26

APPROVED / DATE

The Land Use Plan for the Montford Point area expands the present Branch Clinic site providing direct access and visibility from Montford Landing Road. This facility is centrally located near community, administrative and training classroom uses (Figure VI-27).

Medical uses at MCAS, New River are shown in a new location on the Land Use Plan west of the Seaboard Coastline Railroad tracks, as are all other non-operational land uses. This site, also having direct access to Curtis Road, promotes greater land use compatibility because of its location near family and troop housing as well as community and commercial uses (Figure VI-28).

SUPPORTING UTILITIES PLAN

The Supporting Utilities Plan for the Naval Hospital Activity includes the water system, wastewater collection and treatment, the electrical system and central heating system requirements for all naval medical facilities. An analysis of existing facilities and deficiencies for each of the developed areas within the Camp Lejeune Complex was presented as part of the Planning Analysis. With Branch Medical Clinics located throughout the Complex, the availability of utilities to serve these facilities is directly related to the requirements of the Marine Corps Base Activity. The Supporting Utilities Plan for the Naval Hospital Activity analyzes existing and planned systems needed to support proposed land use and site development plans in terms of their specific locations within Marine Corps Base Activity areas. Section IV contains a more thorough discussion of utility requirements related to implementation of Land Use and Capital Improvements for the Marine Corps Base.

Programmed CIP projects for the Naval Hospital Activity are generally located near existing utility lines with adequate capacity, thus requiring only on-site utility improvements. More detailed

information regarding required system improvements is provided in the CIP document and on Site Location Maps (scale: 1" = 200'). It should be noted that system extensions were designed based upon appropriate NAVFAC design manuals. However, these should not be construed as final designs. Detailed utility studies should be undertaken in conjunction with individual project design.

WATER SERVICE

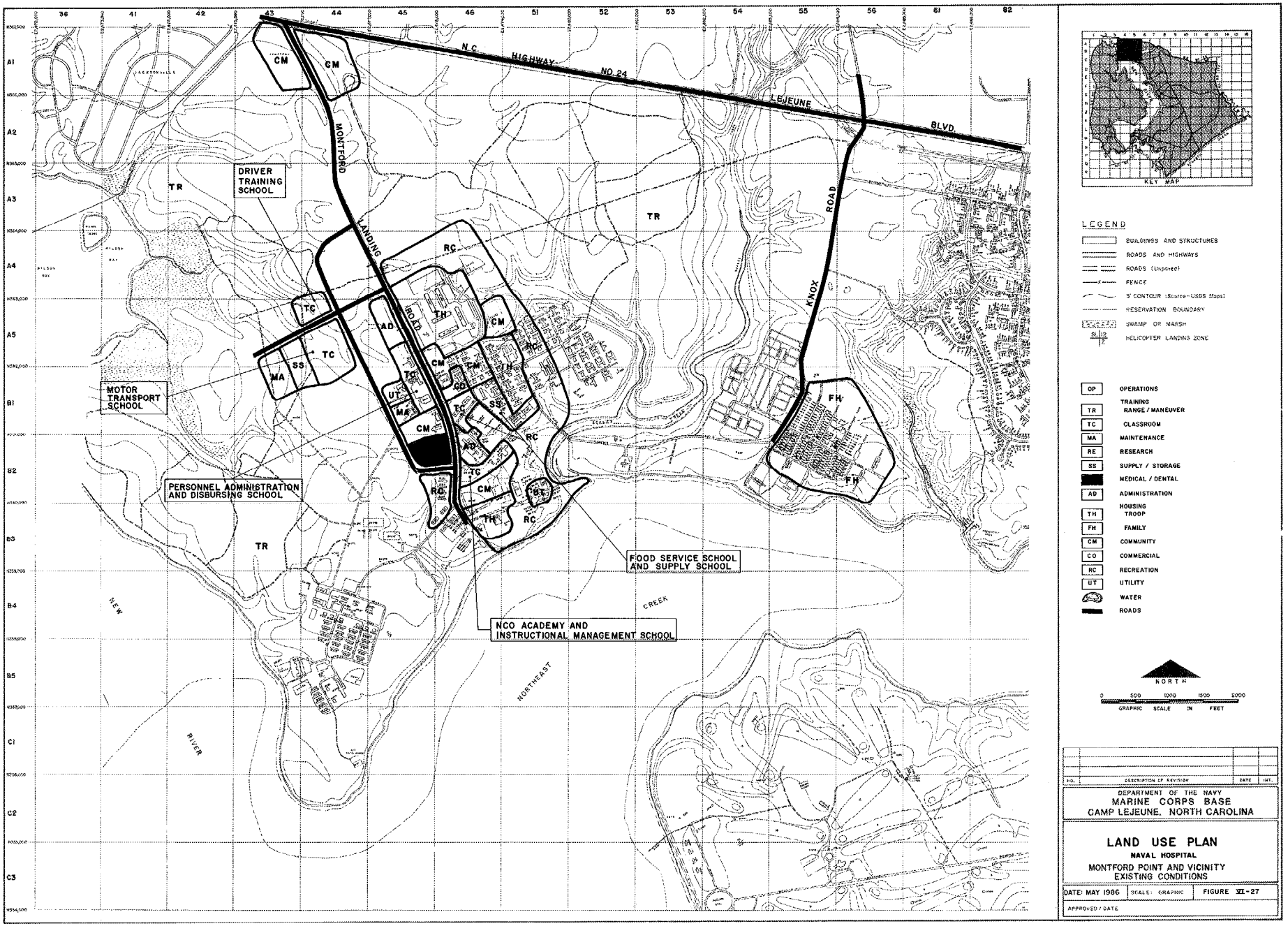
Water is supplied by the Holcomb Boulevard plant and is considered an adequate source to meet present and future needs at the Naval Hospital. The population increase of 80 persons anticipated over the planning period will have no significant impact on the water system. The Naval Hospital distribution system has no known deficiencies.

WASTEWATER SYSTEM

Wastewater from the Naval Hospital is conveyed to the Hadnot Point Wastewater Terminal Plant by way of gravity mains and a lift station and force main. Collection and treatment facilities for the Hadnot Point System are considered to be adequate.

ELECTRICAL DISTRIBUTION SYSTEM

Electric power to the Naval Hospital is supplied by the Marine Corps Base Substation. Service to planned clinics will be supplied by feeders which have adequate capacity to supply the estimated medical/dental facility loads. An analysis of individual feeders is contained in Section IV as part of the Marine Corps Base Supporting Utilities Plan.



NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

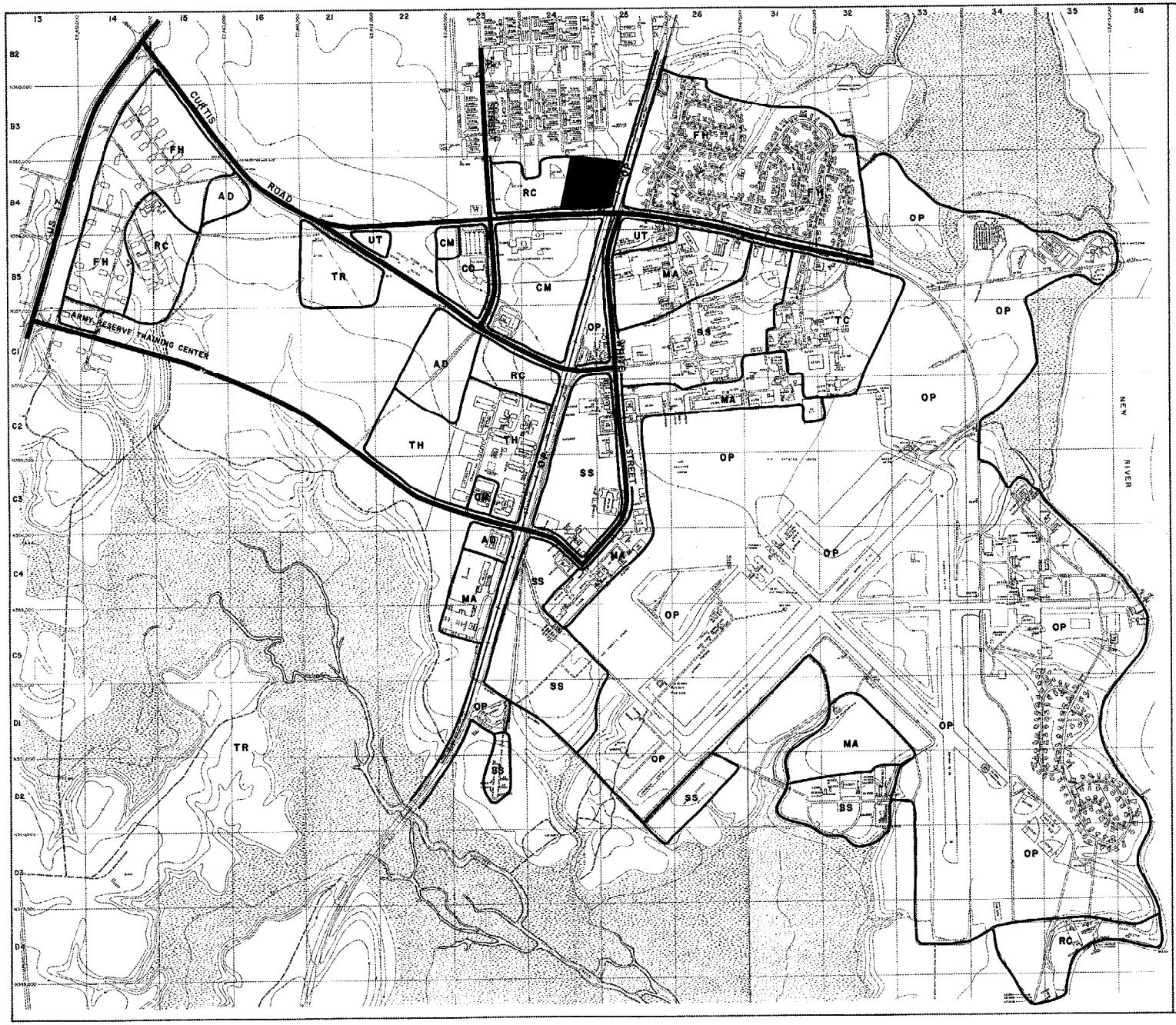
LAND USE PLAN

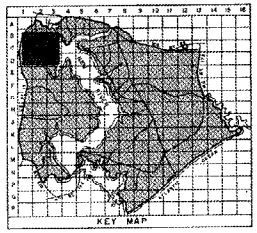
NAVAL HOSPITAL

MONTFORD POINT AND VICINITY
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE XII-27

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- H/Z HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NO. DESCRIPTION OF REVISION DATE INIT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN
NAVAL HOSPITAL
MCAS(H) NEW RIVER
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE XI-28

APPROVED / DATE

HEATING SYSTEMS

Programmed CIP Projects for the Naval Hospital Activity include branch medical clinics located at Hadnot Point, French Creek and Courthouse Bay. Heating for the new facilities at Hadnot Point and French Creek will be supplied by the Plant 1700 central system. An individual heating plant is recommended for the planned clinic at Courthouse Bay since no excess steam capacity will be available from Plant BB-9.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

This assessment has been prepared for the Naval Hospital, Camp Lejeune, North Carolina, in accordance with NAVFACINST 11010.63B of October 1982 and OPNAVINST 11000.16 of April 1983 in compliance with Section 102 (2) (c) of the National Environmental Policy Act of 1969.

Submitting DOD Component: Department of the Navy

Activity: Naval Hospital, Camp Lejeune, North Carolina

Project Title: Camp Lejeune Complex Master Plan

Date of Submission: March 1987

SUMMARY

The Camp Lejeune Master Plan component for the Naval Hospital proposes that all programmed projects delineated in the Capital Improvements Plan (CIP) be constructed subject to compliance with adopted environmental policies. As a result of undertaking this aggressive development program, potential exists for some significant adverse effects on the environment. Although temporary construction impacts will be experienced from increased noise levels, these will subside following completion of the overall program. No additional adverse impacts are anticipated with any project.

INTRODUCTION

The Master Plan provides a basis for the efficient and orderly development of real estate and facilities resources in order to meet mission requirements. It establishes an overall scheme for land and facilities resources use and the optimum use of all property owned by the Department of the Navy. The Plan is based upon considerations of military requirements, planning criteria, economic and environmental factors.

Major proposals of the Plan are as follows:

1. Allocate space for eventual replacement and construction phasing of facilities to maintain desired functional relationships and to maximize the efficient use of energy and natural resources.

2. Consider the immediate, short-term or long-range impacts on the natural and man-made environment relative to the expansion of training functions and all other potential construction on-base.

3. Consider construction of the proposed U.S. Route 17 Bypass and all other on-base roadway construction in terms of existing and planned land use patterns and access improvement.

4. Construct all programmed facilities delineated within the CIP in compliance with adopted environmental policies and accepted mitigation measures.

5. Preserve the overall quality of the natural and man-made environment and protect areas containing significant natural constraints for development such as: 100-year floodplains, wetlands, sensitive slopes, habitats of endangered species and archaeological/historic sites.

EXISTING ENVIRONMENT OF PROPOSED ACTIONS

The Naval Hospital and Branch Clinics are located within the Camp Lejeune Military Complex. Situated within Onslow County in southeastern North Carolina, the Complex is adjacent to the City of Jacksonville's southern boundary. The New River Inlet separates Camp Lejeune from the County's growing resort community of West Onslow Beach. The County's two forest preserves represent large areas of undeveloped land in close proximity to the Camp Lejeune Complex.

The topography of Camp Lejeune is a flat plain, sloping gently toward the New River. Elevation ranges from sea level to 72 feet with most of the land averaging from 20 to 40 feet above sea level. The 17 miles of Atlantic coastline are paralleled by a series of alluvium deposits and tidal marshes which are protected by relatively stable sand dunes (15 to 20 feet in height) forming a barrier strip along the coast. The Base is encompassed by vast areas of pocosins and swampland which evolved due to its shallow topographic features.

A variety of 31 soil series are found throughout Camp Lejeune, ranging from sandy loam to fine sand and mud. Drainage is the most critical factor determining the suitability of the heterogeneous soil conditions. Approximately 3,000 acres of sensitive estuarine areas are dispersed widely throughout the Complex. These wetland ecosystems, extremely important to the food chain, should not be used for future development. A significant amount of flood-prone areas exist throughout the Camp Lejeune Complex and must be considered in development plans. Projects planned at Onslow Beach must comply with the North Carolina Coastal Zone Management Program.

Vegetation is typical of the southeastern coastal plain. Extensive tracts of both pure pine and pine-hardwood mixtures dominate the landscape. Areas on the periphery of the forests contain several species of shrubs, vines and herbs. The upland swamps, or pocosins, are overgrown with fetterbush, cyrilla, pond pine and greenbrier, and uneconomically harvested species of pine.

Endangered species having an impact on carrying out the mission of the Military Complex include the Red-Cockaded Woodpecker, Atlantic Loggerhead Sea Turtle, Green Sea Turtle, Eastern Brown Pelican and American Alligator. Protection of habitat and foraging areas is essential to the survival of these species.

The Camp Lejeune area is located in a region of warm, humid and temperate climate. The average annual temperature is 63° and the average annual rainfall is 57.9 inches, with the heaviest rains occurring during June, July and August.

The Military Complex encompasses some of Onslow County's earliest settled areas and some of its most historic sites. At present, only one archaeological site has been studied in detail. It was found to contain Indian artifacts.

Only four percent of Onslow County is developed, with urban uses mostly concentrated inside the corporate limits of Jacksonville. Surrounding civilian land uses are predominately agricultural and forestal in character.

PROJECT DESCRIPTIONS AND POTENTIAL ENVIRONMENTAL CONSEQUENCES

This section addresses the projects contained in the Capital Improvements Plan. Each Military Construction (MCON) and special fund project scheduled for construction during the 5-year period of this Plan should be evaluated for potential impacts as a part of project planning. During this evaluation, impacts which would interfere unreasonably with the living conditions of man, wildlife or marine life on an immediate, short-range or long-range basis were identified.

The projects listed in Table VI-7 have been evaluated for potential impacts, as a part of the project planning process, and are not anticipated to have significant impact on air quality, earth resources, general ecology, groundwater, historic and archaeological resources, and development character. In general these projects do not appear to have significant long-term adverse impacts.

TABLE VI-7
SUMMARY OF PROGRAMMED CIP PROJECTS
NAVAL HOSPITAL ACTIVITY
CAMP LEJEUNE, NORTH CAROLINA

PROJECT NUMBER	PROJECT DESCRIPTION
P-605	MEDICAL CLINIC
P-607	MEDICAL CLINIC
P-701	MEDICAL CLINIC
P-721	BACHELOR ENLISTED QUARTERS

Source: Camp Lejeune Military Construction Project Data, 1986.

All MCON projects are anticipated to have short-term construction impacts on the surrounding environment, however these impacts are not expected to exist after project completion. All construction contracts should include, to the extent possible, mitigation measures which are designed to limit the adverse impacts resulting from construction.

POSSIBLE CONFLICT BETWEEN PLAN RECOMMENDATIONS AND OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The master planning process for the Camp Lejeune Complex considered current and future mission requirements and produced recommendations for the land use plan and capital improvement projects which met these requirements. The recommendations include changes to existing land use patterns as well as changes to the future land use plan. The changes resulting from mission requirements considered objectives of Federal, Regional, State and local land use plans, policies and controls. Potential conflicts were resolved by virtue of the planning effort which must take into consideration all of the appropriate legislation identified above.

MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS

This section discusses the extent to which countervailing benefits could be realized by following reasonable alternatives to the proposed action that would avoid some or all adverse environmental effects. In addition, separate consideration must be given to any probable adverse environmental effects which cannot be avoided should the project be implemented.

Environmental impacts resulting from planned projects are expected to be temporary and the result of construction activity. In order to insure that every effort is made to mitigate these impacts, measures for mitigation should be specified in each project construction contract. Such measures as erosion control (installing siltation screens, etc.), air quality maintenance (spraying dust covered roads, etc.), and construction noise abatement (designating assigned travel routes, specifying work hours, etc.) need to be included to the extent possible so that these temporary impacts are made minimal.

Additional adverse impacts on the environment have not been identified in conjunction with implementation of the recommended land use plan. The master plan gives careful consideration to the environment and has resulted in a recommended land use plan which addresses impacts on the environment.

APPEARANCE GUIDELINES

This section discusses the aesthetic quality of the Naval Hospital as part of the overall visual environment of the Camp Lejeune Complex. Integral to the improvement and maintenance of aesthetic quality are considerations of architectural features, streetscaping, landscaping, and visual communications. Appearance guidelines would provide an ongoing link between the planning process and construction of specific CIP projects to insure visual continuity throughout the Base. Thus, coordination of facility design, planting, and streetscape components would unify diverse functions and facility requirements.

Development at the new Naval Hospital area represents effective visual linkage of site elements. More importantly, it provides an excellent basis upon which to begin creating a pleasing

overall character for the Base. The use of compatible building designs and materials, complementary landscaping, and uniform lighting and signage demonstrates the strong positive impacts which could result from the establishment of basewide aesthetic guidelines.

With Branch Medical Clinics scattered throughout the Camp Lejeune Complex, the image of these facilities is directly related to future development of areas outside the Hospital tract. Therefore, aesthetic considerations of these facilities must be made in terms of their specific locations within Marine Corps Base activity areas. Section IV contains a discussion of aesthetic guidelines related to implementation of the Land Use Plan for the Marine Corps Base.

TABLE OF CONTENTS

INTRODUCTION

The purpose of the Activity Plan for the Naval Dental Clinic, Camp Lejeune, North Carolina is to provide a basis for logical and efficient use of the real estate and facilities to accomplish assigned mission requirements through the 1980s. The intent of the Plan is to provide an integrated framework for the use of all resources, both within the Activity, as well as to provide for optimum functional effectiveness of existing and planned facilities Complex-wide.

The Activity Plan is structured to comply with and incorporate all requirements stipulated by NAVFACINST 11010.63B. This section of the Plan document expands upon general Complex-wide issues presented in Section III and discusses specifically those issues relevant to the Naval Hospital.

A pre-planning conference was held on November 8, 1983, at which personnel from LANTDIV and each of the Complex activities reviewed and discussed the process involved and the assistance required in the preparation of a Master Plan. Following the conference, interviews were undertaken with the Naval Dental Clinic Commanding Officer, Executive Officer, Public Works Officer and key personnel at the Branch facilities. Data was collected and field investigations were initiated for the purpose of identifying problem areas and deficiencies. Next, a detailed planning analysis was initiated. As the analysis progressed, additional interviews were conducted and more detailed data was collected.

Current and immediate requirements were determined from the Basic Facilities Requirements (BFR). Field surveys and interviews with Naval Dental personnel were also used to determine requirements. Constraints and problems were identified in order to derive a list of "Planning Factors" to be used in delineating future development alternatives.

Goals and objectives for future development were identified based upon conclusions drawn from the "Facilities Requirements" and "Planning" Analyses. These goals and objectives are much the same as those identified for the other three Activities. Alternative concept plans supporting the established goals and objectives were then developed. Alternative concept plans were presented at a formal meeting in March 1984, after which a Land Use Plan was selected by the Activity Command.

REQUIREMENTS ANALYSIS

The following analysis evaluates the current facility resources at the Naval Dental Clinic (NDC), Camp Lejeune as they relate to the operational needs of the Activity. Facility requirements are related directly to the mission and personnel loading and are compared to existing assets. This comparison identifies facility deficiencies and forms the basis of the Military Construction Project list. The requirements analysis is then combined with alternative concepts for future development to yield the proposed Land Use Plan and, subsequently, the Capital Improvements Program.

Prior to a specific discussion of facility requirements, the Naval Dental Clinic mission, organization and personnel loadings are presented below.

MISSION

The official mission of the Naval Dental Clinic Activity at Camp Lejeune is comprised of the following responsibilities: To provide comprehensive dental service to Navy and Marine Corps units of the operating forces, shore activities and other authorized personnel in the assigned geographic area as prescribed by title 10 U.S. Code and other applicable directives; to manage and operate

assigned component dental care facilities; to ensure that all assigned military personnel are cognizant of and properly trained in their performance of their contingency and wartime duties; to ensure that the Naval Dental Clinic and its component facilities are maintained in a proper state of material and personnel readiness to fulfill wartime and contingency mission plans; to provide, as directed, dental care services in support of the Navy and Marine Corps units of the operating forces and shore activities to ensure the highest possible degree of operational readiness of these forces and activities; to maintain appropriate educational programs for assigned personnel to ensure the highest standards of achievement in both military conduct and dental health care delivery; to participate as an integral element of the Navy and Tri-Service Regional Health Care System; and to cooperate with military and civilian authorities in matters pertaining to public health, local disasters and other emergencies.

ORGANIZATION

The Naval Dental Clinic, Camp Lejeune, North Carolina, previously the Naval Regional Dental Center, has served the Camp Lejeune complex as a tenant command since 1975. The Naval Dental Clinic is a subordinate command of the Naval Medical Command, Mid-Atlantic Region in Norfolk, Virginia. Internal organization of the Activity is shown on Figure VII-1. There are seven Branch Dental Clinics under the jurisdiction of the Commanding Officer and, with the exception of the MCAS Cherry Point Branch Clinic, six are located at Camp Lejeune.

It should be noted at this point that the Naval Dental Clinic, Camp Lejeune is one of the three Activities which provide dental services at Camp Lejeune. The 2nd Dental Battalion of the 2nd Force Service Support Group (2nd FSSG) is responsible for the provision of dental services for deploying forces. The Naval Hospital Activity, Camp Lejeune provides dental services to that

Activity's assigned military personnel. The relationships of these organizations to the Naval Dental Clinic is addressed further in the "Complex Influences."

PERSONNEL LOADING

Military personnel assigned to the Naval Dental Clinic rotate between the various commands stationed at Camp Lejeune, serving all operating units.

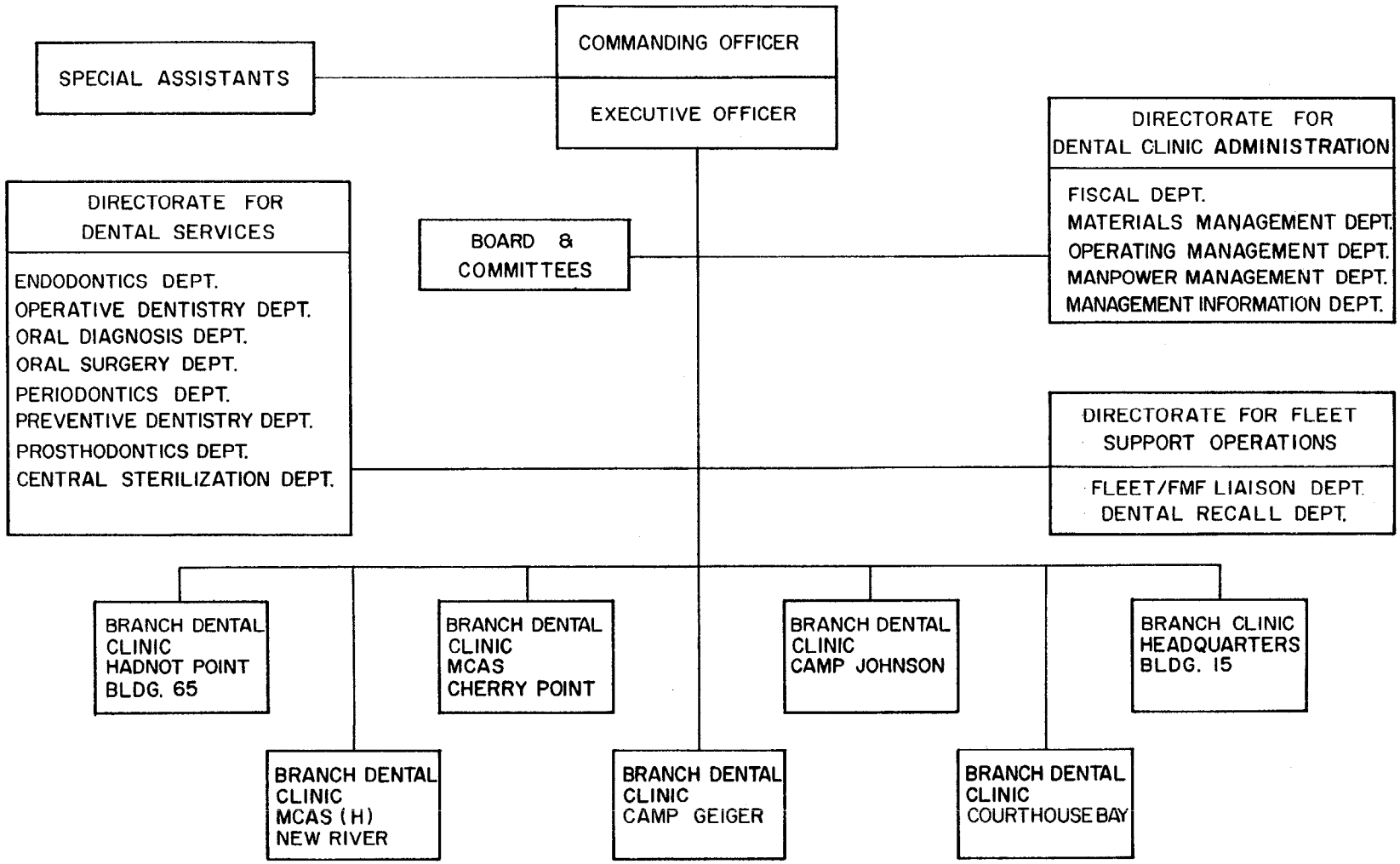
The Dental Officer Allowance at Camp Lejeune totals 81, which is broken down amongst the following units: Naval Dental Clinic, 24 officers; Naval Hospital, Camp Lejeune, three officers, Naval Hospital Cherry Point, one officer; 2nd Dental Company, 24 officers; 12th Dental Company, 15 officers; 22nd Dental Company, 13 officers; and H&S Company, one officer.

The Naval Dental Clinic has the specific responsibility for patient care delivery for 11,746 active duty military personnel (Table VII-1). There is, however, a great deal of joint staff support among the various dental commands at Camp Lejeune. The active duty military population at Camp Lejeune (including the New River and Cherry Point Air Stations) provides a better indication of the number of patients supported by the Naval Dental Clinic Activity staff. According to September 1983 data, 50,625 troops and 8,215 retired military comprise the patient population (Table VII-2). Authorized government employees and retired military are seen on a space-available basis. Beginning July 1, 1985, military dependents will be treated on a space-available basis. However, at the present time, dependents are seen on an emergency basis only.

The ratio of Dental Officer allowance to total military population served is one per 726 personnel. When Dental Officers are compared to the total active duty personnel served, the ratio declines to one per 625 personnel.

Figure VII-1

ORGANIZATIONAL CHART
NAVAL DENTAL CLINIC
CAMP LEJEUNE, NORTH CAROLINA



Source: NAVDENCLINICINST 5450.1, MAY 1984

Table VII-1

Active Duty Military Population Served
Naval Dental Clinic
Camp Lejeune, North Carolina

Marine Corps Base	4,524
Naval Dental Clinic	78
MCAS New River	587
MCAS Cherry Point	2,318
2nd Assault Amphibious Battalion	1,000
8th Marine Regiment	3,239
	11,746

Source: HB&A Questionnaire for Naval Dental Clinic Command, September 7, 1983.

Table VII-2

Patient Population
Naval Dental Clinic
Camp Lejeune, North Carolina

Marine Corps Base	4,524
(Permanent)	(2,511)
(Students)	(2,013)
Naval Dental Clinic	78
Naval Hospital	612
MCAS New River	4,869
(Station)	(587)
(2nd MAW)	(4,282)
MCAS Cherry Point	11,666
(Station)	(2,318)
(2nd MAW)	(9,348)
2nd Marine Division	19,379
2nd FSSG	9,497
Total Active Duty	50,625
Total Retired	8,215
TOTAL	58,840

Source: HB&A Questionnaire for Naval Dental Clinic Command, September 7, 1983.

In FY 1984, 131,258 patients were treated in Naval Dental Clinic facilities (Table VII-3). Treatments were administered to 85,000 patients by Naval Dental Clinic personnel. An estimated 46,258 patients were treated by 2nd Dental Battalion personnel colocated in Naval Dental Clinic branch clinics.

FACILITY REQUIREMENTS

Basic Facility Requirements is the title given to the listing of quantities by category code, of those facilities required to perform the mission of a shore activity. It includes only those facilities necessary to support the assigned mission. The requirement for each category code is derived by applying base-loading/quantitative workload data to the planning factors/criteria included in the NAVFAC P-80, "Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations."

The following section examines the adequacy of existing facilities which fall under Naval Dental Clinic jurisdiction. Available data was used as the source of this analysis. The facilities listed on the Basic Facilities Requirements (BFR) are arranged by category code. For the purposes of the Master Plan, the category codes have been aggregated into 16 land use categories based upon planning criteria contained in NAVFAC P-80. Only facilities which relate directly to the dental function form the basis of the assets and deficiencies analyses.

Existing Assets

Naval Dental Clinic facilities are grouped according to land use categories and are rated as either adequate, substandard or inadequate, as determined by the Facilities Planning Document dated November 1, 1983. These ratings are expressed as relative percentages to facilities in that

Table VII-3

Patients Treated
Fiscal Year 1984
Naval Dental Clinic
Camp Lejeune, North Carolina

By NDC Personnel	85,000
(Camp Lejeune)	(77,100)
(MCAS, Cherry Point)	(7,900)
By 2nd Dental Battalion Personnel	46,258
(MCAS, New River)	(10,294)
(Camp Geiger)	(4,800)
(MCAS Cherry Point)	(31,164)
TOTAL	131,258

Source: Letter to Harland Bartholomew & Associates from Naval Dental Clinic, February 7, 1985.

land use category as a whole and appear on Table VII-4. Findings shown on Table VII-5 will be used subsequently to identify problem areas and to develop conceptual plans.

The ratings of existing assets are described below in narrative form and are arranged by the five geographic areas at the Camp Lejeune Complex which are the site of Dental Clinic facilities. In all cases, Dental Branch Clinics are colocated with Naval Hospital Branch Clinics.

Camp Geiger and Montford Point facilities are entirely adequate in terms of existing requirements. Dental facilities located at Courthouse Bay have been deemed entirely inadequate due to age and configuration of space. This clinic has been programmed for demolition in FY 1987.

The MCAS, New River Clinic is in the second worst condition with a 100 percent substandard facility rating, and has been given priority for refurbishment or replacement. A majority of the space existing at the two Hadnot Point clinics (Building 15 Headquarters and the Building 65 Preventive Dentistry Clinic) is also rated substandard. Physical condition and size account for the high substandard ratings.

Deficiencies

The following deficiency analysis focuses upon the amount of additional space that needs to be newly constructed in order to meet the BFR (Table VII-5). Existing substandard and inadequate space that can be made adequate through renovation or rehabilitation is not addressed in this analysis.

Table VII-4

Facilities Requirements: Existing Assets Rating
Naval Dental Clinic

Clinic Location	Unit of Measure	Percent of Total Existing Facilities			
		Adequate	Substandard	Inadequate	Total
Hadnot Point	SF	37.8%	62.2%	---	100%
	OU	11.1%	88.8%	---	100%
Courthouse Bay	SF	---	---	100%	100%
	OU	---	---	100%	100%
Camp Geiger	SF	100%	---	---	100%
	OU	100%	---	---	100%
Montford Point	SF	100%	---	---	100%
	OU	100%	---	---	100%
MCAS, New River	SF	---	100%	---	100%
	OU	---	100%	---	100%

Source: Facilities Planning Document, November 1, 1983.

Table VII-5

New Construction Deficiency Corrections
Naval Dental Clinic

Location	Unit of Measure	Required New Construction	Percent New Construction to BFR
Hadnot Point	SF	4,675	29.8%
	OU	6	27.0%
Courthouse Bay	SF	3,200	100.0%
	OU	5	100.0%
Camp Geiger	SF	3,981	58.5%
	OU	5	54.5%
Montford Point	SF	2,957	67.2%
	OU	3	42.8%
MCAS, New River	SF	1,800	32.3%
	OU	---	---

Source: Facilities Planning Document, November 1, 1983.

The largest deficiency is found at French Creek where a formal dental clinic is programmed for FY 1988. A trailer will be sited at French Creek in Spring 1985 to provide preliminary dental service. A 3,200-square foot dental clinic is needed to be newly constructed at Courthouse Bay. This accounts for the largest deficiency relative to the total facility requirement. In terms of the absolute number of square feet needed to be constructed, the greatest deficiency occurs at Hadnot Point where Building 15 is deteriorating and small in size. This amount of space accounts for only one-third of the BFR, however.

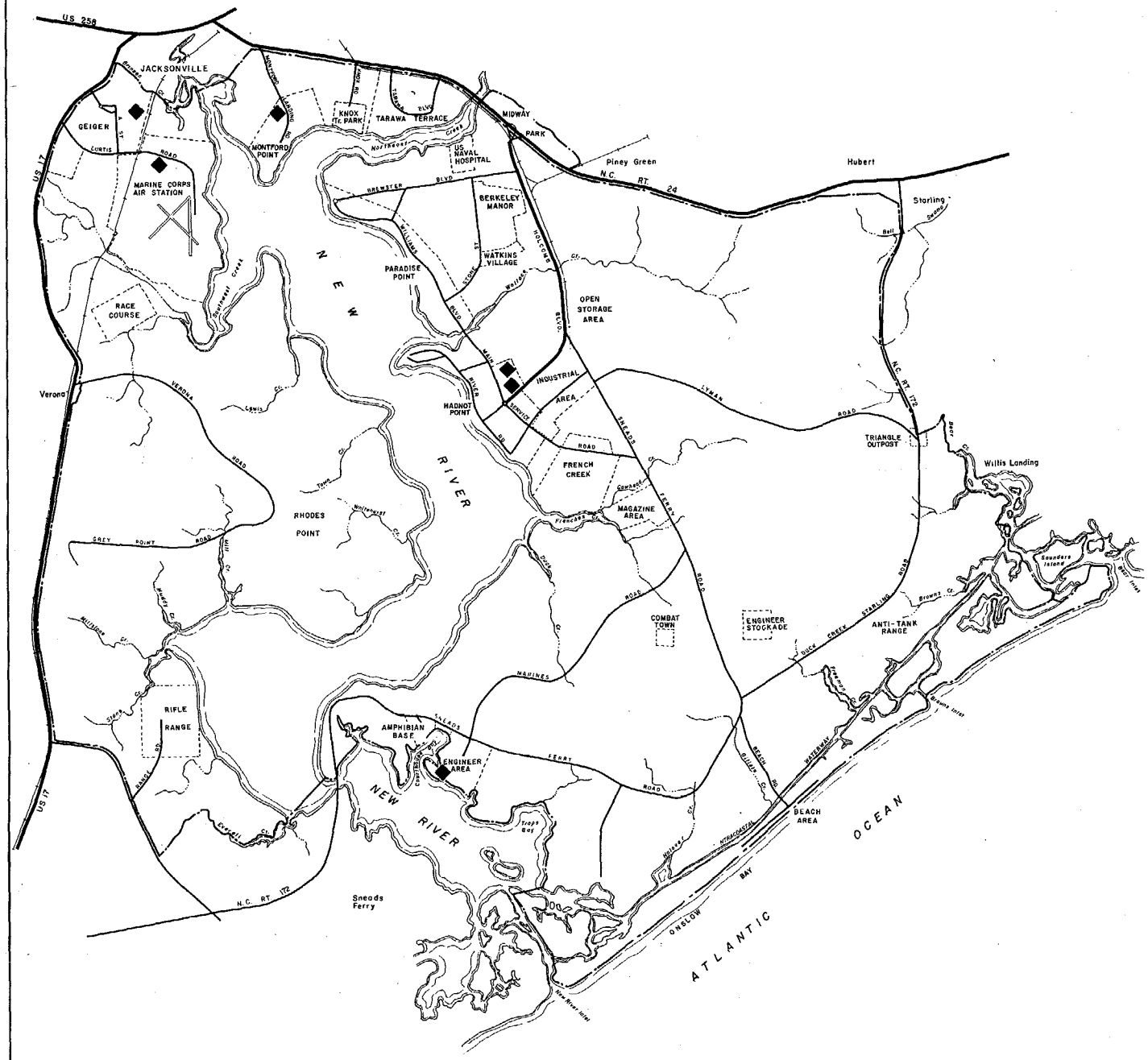
At the Camp Geiger and Montford Point Dental Clinics, over 4,000 and 3,000 square feet, respectively, of new dental facilities need to be constructed in order to meet the Basic Facility Requirements. MCAS, New River requires the smallest amount of additional space (1,800 square feet), but this accounts for nearly one-third of the total facility requirement at that branch clinic.

FUTURE MISSION CHANGES

While no change in the primary mission is planned, there will be an expansion of responsibility after July 1, 1985, to serve dependents on a space-available basis.

PLANNING ANALYSIS

The subsequent analysis examines the relationship between existing land uses as they relate specifically to the six Naval Dental Clinic branch clinics (Figure VII-2). The influence of the surrounding region and of the other Camp Lejeune commands will be evaluated also. This analysis will then be used to identify planning factors which are likely to affect future physical development of Naval Dental Clinic facilities.



EXISTING LAND USE
NAVAL DENTAL CLINIC

MASTER PLAN

CAMP LEJEUNE, NORTH CAROLINA

LEGEND

◆ DENTAL CLINIC

FIGURE VII-2

The six branch clinics are scattered throughout the Camp Lejeune complex. Two clinics presently exist at Hadnot Point (Figure VII-3). The Building 15 Headquarters is collated with a medical clinic (as are all the dental clinics) and is centrally located next to the main Marine Corps Base administration building, just north of Holcomb Traffic Circle. This location is accessible, both to the large number of troops assigned to the Hadnot Point regimental area as well as to the large family housing areas to the northwest. In addition to housing Branch Clinic administrative offices, this facility provides comprehensive dentistry services. Building 65 is the site of the Preventive Dentistry Clinic, which not only provides preventive dentistry services but also provides operative dentistry services.

At Courthouse Bay, Building BB10 houses the Dental Branch Clinic. This clinic offers general dentistry services only to AMTRAC and Engineer School personnel. This facility is sited on the bay front between the family housing area and the old barracks under conversion to classroom training facilities (Figure VII-4).

The Camp Geiger Branch Clinic occupies Building G770, which is located near the intersection of Seventh and "E" Streets (Figure VII-5). This clinic only offers general dentistry treatments to the Infantry Training School, Communications School, NBC School, 8th Marines, the 5th FASC and "C" Company of the 2nd Medical Battalion.

The Montford Point Branch Clinic occupies a small portion of the M-128 troop housing facility (Figure VII-6). The facility is located conveniently along Montford Landing Road and classroom training uses. The clinic is less than 7,000 square feet in size and serves two

non-operational units: the Marine Corps Service Support Schools and the Field Medical Service School.

The MCAS, New River Branch Clinic serves MAG 26 and MAG 29, as well as headquarters personnel. The clinic is located on McAvoy Street just south of Curtis Road in Building AS302 (Figure VII-7). This facility is convenient to work areas and family housing but is removed from troop housing and the central commercial/community use area at Curtis Road Triangle.

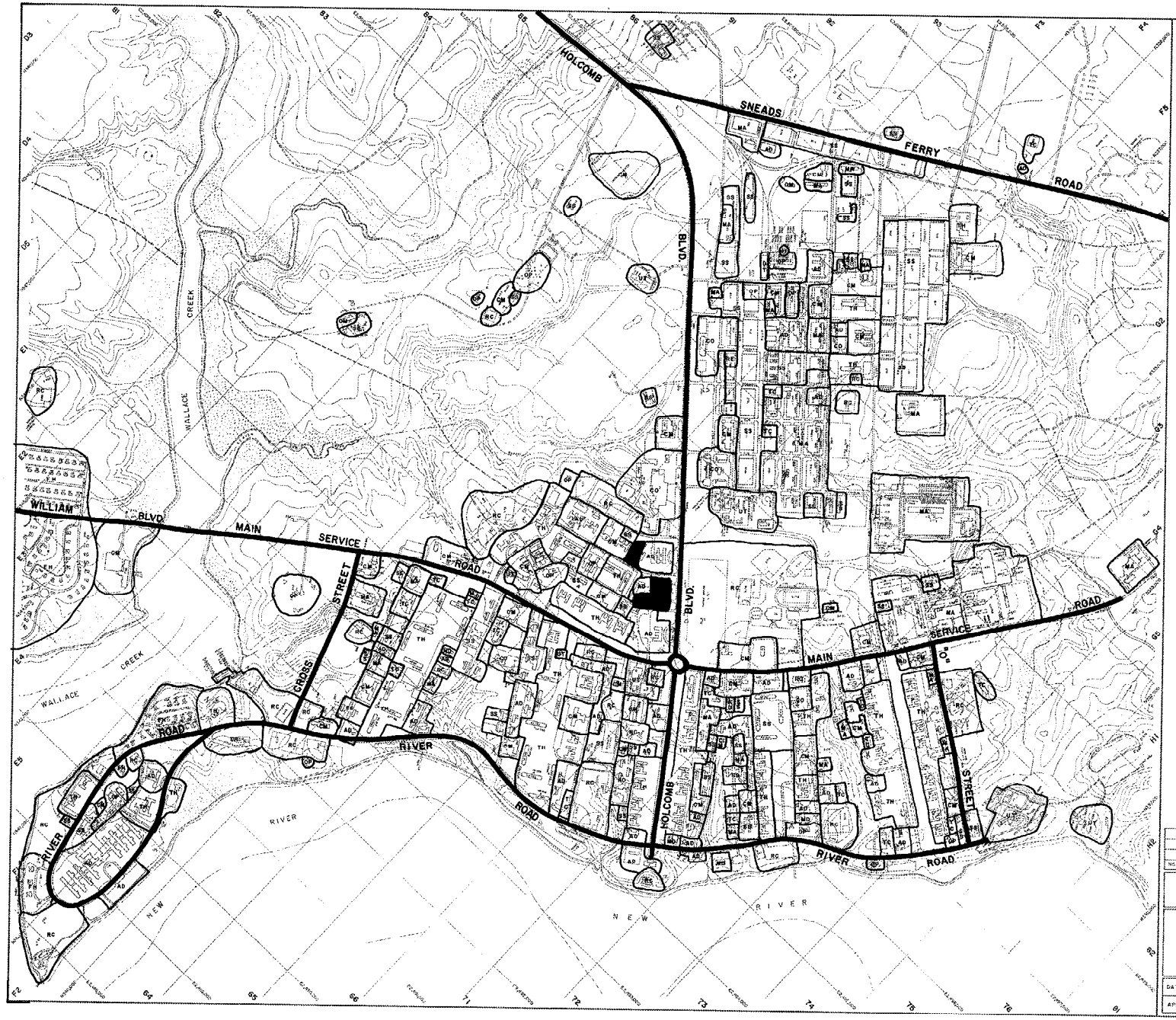
EXISTING UTILITIES

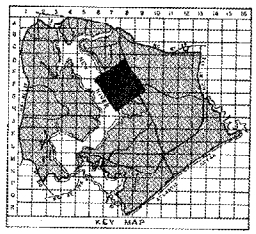
Naval Dental Clinics are located at several buildings in Camp Lejeune and usually share building space with a dispensary. Buildings where Dental Clinic facilities are located are as follows:

Building 15	Hadnot Point - Regional Dental Facility
Building 460	Hadnot Point
Building HP65	Hadnot Point (Dental Equipment Maintenance)
Building M128	Montford Point
Building G770	Camp Geiger
Building AS302	Marine Corps Air Station
Building BB10	Courthouse Bay

Water

Water source for Building 15 facility is the Hadnot Point Water Treatment Plant approximately 1,200 feet to the southwest. The building is served by a three-inch line from an eight-inch





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000
GRAPHIC SCALE IN FEET

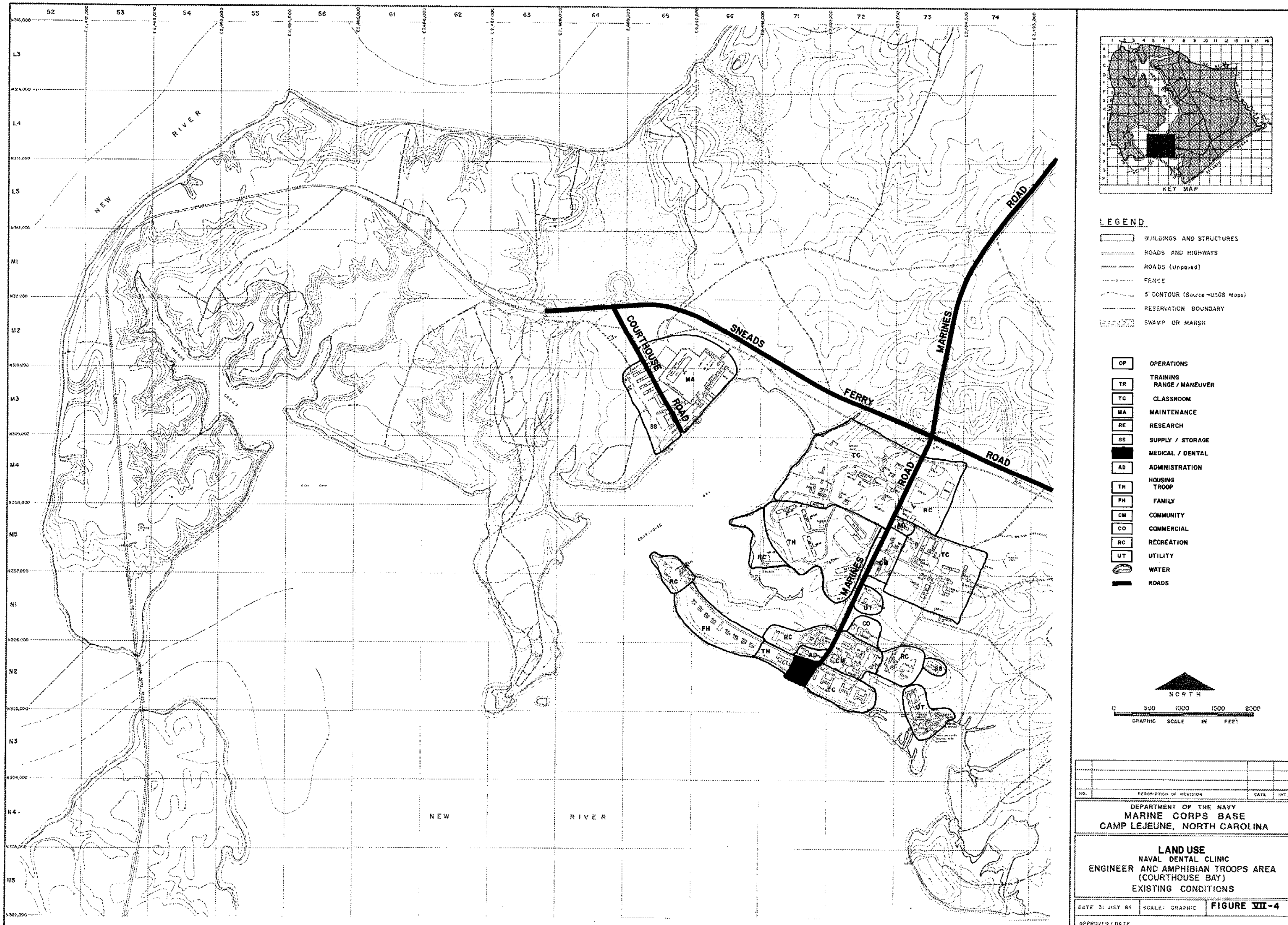
NO.	DESCRIPTION OF REVISION	DATE	INT.

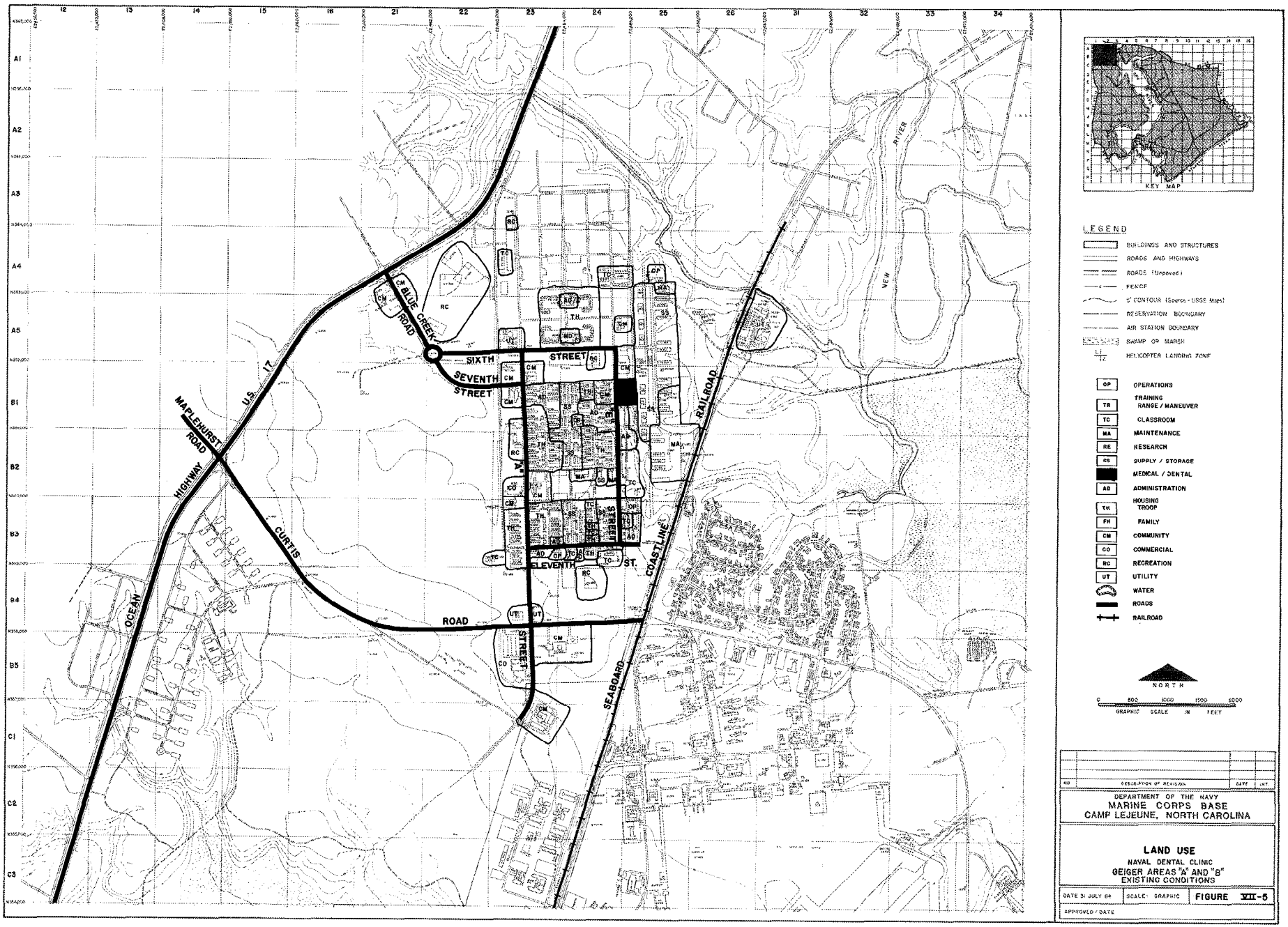
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

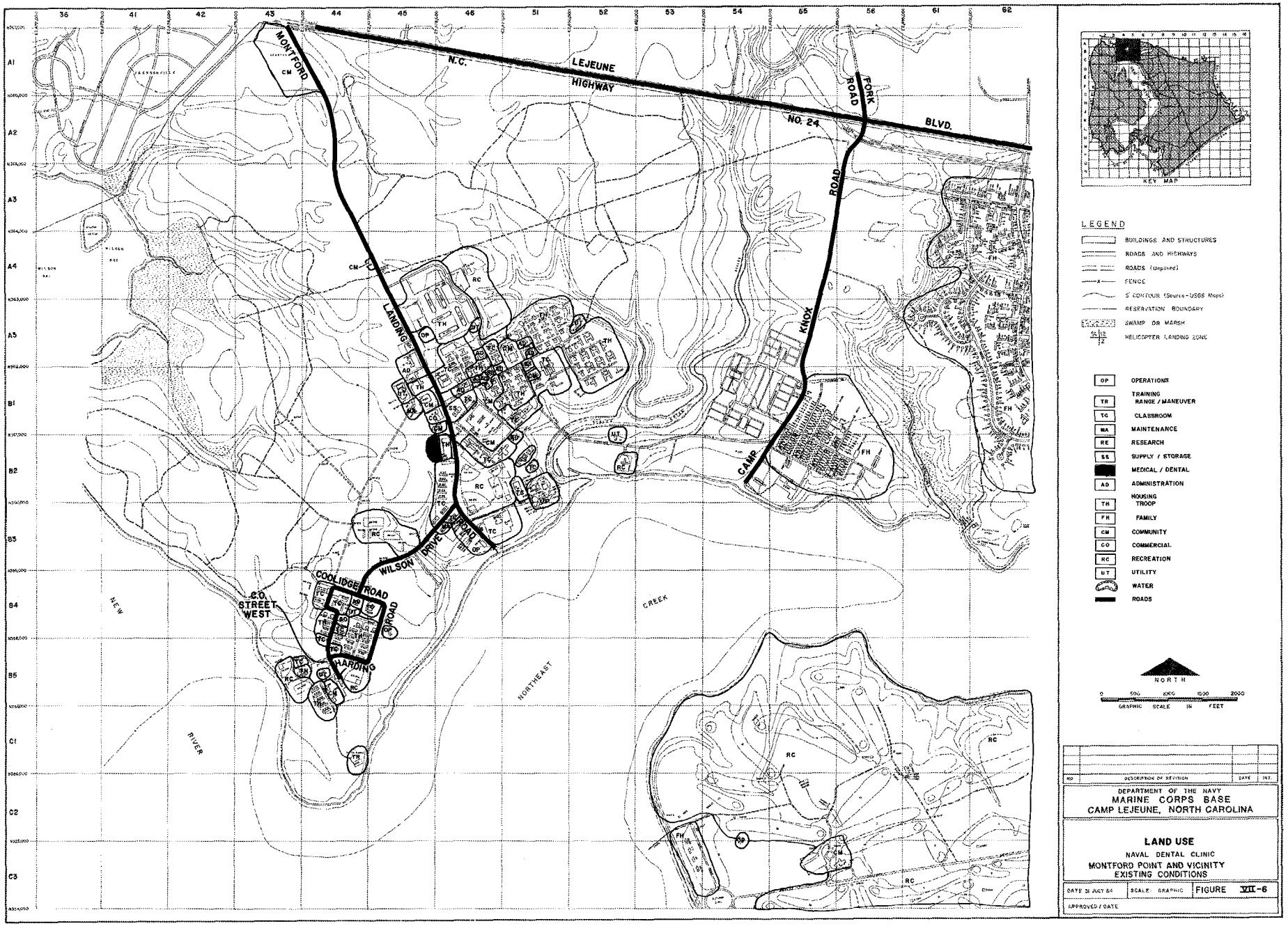
LAND USE
NAVAL DENTAL CLINIC
HADNOT POINT AREA
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE VII-3

APPROVED / DATE


NEW RIVER
SNEADS FERRY ROAD
COURTHOUSE ROAD
MARINES ROAD
NEW RIVER
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source – USGS Maps)
RESERVATION BOUNDARY
SWAMP OR MARSH
OP OPERATIONS
TRAINING
TR RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MEDICAL / DENTAL
AD ADMINISTRATION
HOUSING
TH TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAND USE
NAVAL DENTAL CLINIC
ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS
DATE 31 JULY 84
SCALE: GRAPHIC
FIGURE VII-4
APPROVED / DATE


SIXTH STREET
SEVENTH STREET
ELEVENTH ST.
BLUE CREEK ROAD
MAPLEHURST ROAD
U.S. 17
HIGHWAY
CURTIS
ROAD
OCEAN
COASTLINE RAILROAD
SEABOARD
RAILROAD
NEW RIVER
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source - USGS Maps)
RESERVATION BOUNDARY
AIR STATION BOUNDARY
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
RAILROAD
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO DESCRIPTION OF REVISION DATE INIT
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAND USE
NAVAL DENTAL CLINIC
GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS
DATE 31 JULY 68
SCALE: GRAPHIC
FIGURE VII-5
APPROVED / DATE



LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

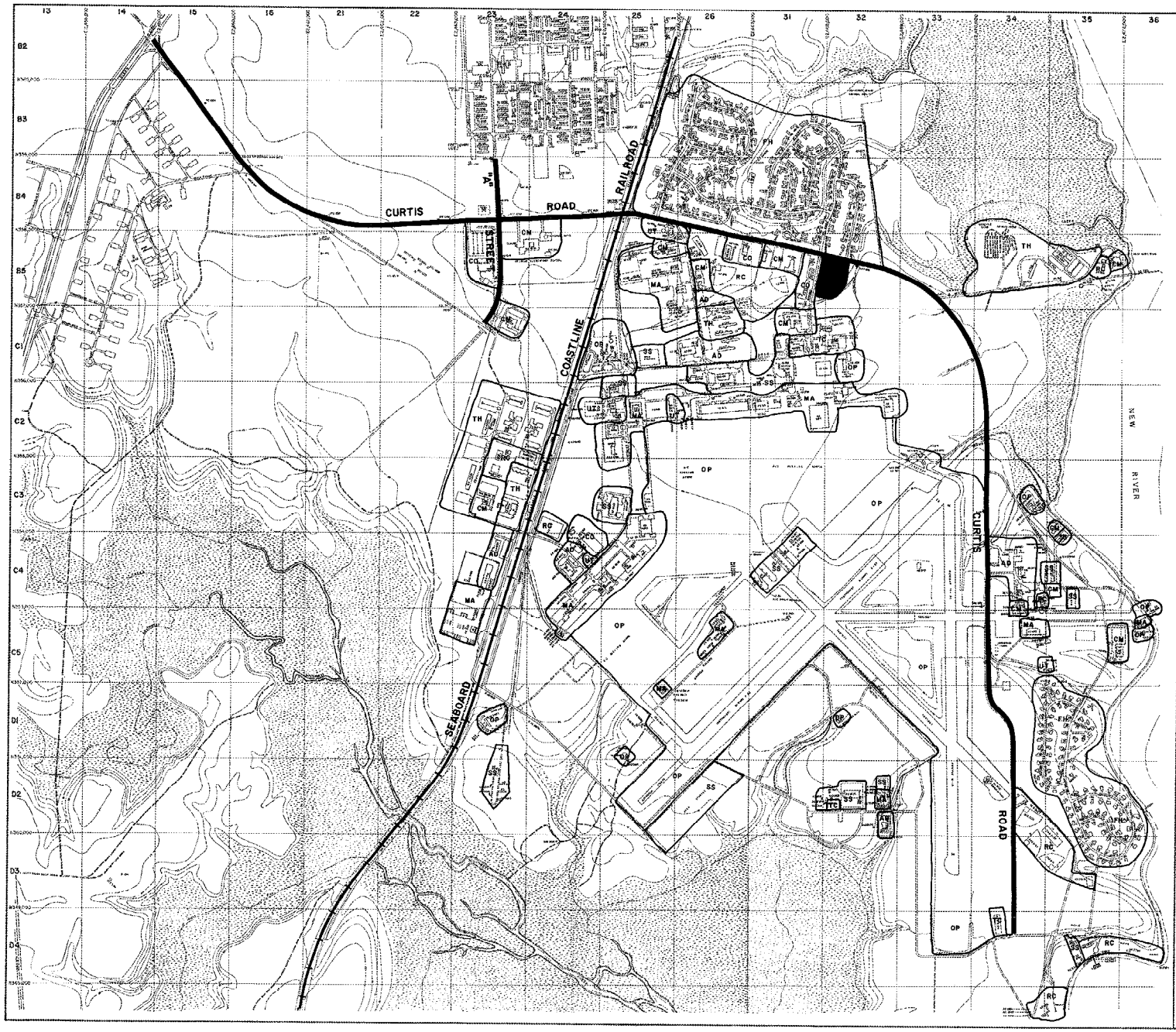
NO	DESCRIPTION OF REVISION	DATE	INT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE

NAVAL DENTAL CLINIC
MONTFORD POINT AND VICINITY
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE: GRAPHIC	FIGURE VII-6
APPROVED / DATE		



LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS
	RAILROAD

NORTH

0 500 1000 1500 2000
GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE
NAVAL DENTAL CLINIC
MCAS NEW RIVER
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE GRAPHIC | FIGURE VII-7

APPROVED / DATE

main along Post Lane. The main connects on the southwest with a 12-inch main along Holcomb Boulevard on the northwest with a 12-inch main along the Main Service Road. Facilities in Building 460 and HP65 are also served by the Hadnot Point Water System. Building M125 is served by the Montford Point water system, Building G770 and AS302 are served by the MCAS system, and Building BB10 is served by the Courthouse Bay system.

Wastewater

The Building 15 facility is served by an eight-inch gravity sewer which extends southwesterly through the Hadnot Point 300 area as an eight-inch and 10-inch line. The line connects to the 30-inch intercepting sewer at manhole 53L. That sewer continues southeasterly to the Hadnot Point Wastewater Treatment Plant which has a capacity of 8 MGD and operates within capacity. Building M128 is served by the Montford Point Wastewater system. Building G770 and Building AS302 are served by the MCAS and Camp Geiger wastewater system, and Building BB10 is served by the Courthouse Bay system.

Electrical Distribution

Electricity for dental needs is furnished from the Marine Corps Base Substation or Camp Geiger/New River Marine Corps Air Station Substation, depending upon facility location.

The Building HP-15 and HP-460 facilities are served by risers and underground laterals from Regimental No. 3 Feeder but are minor demands on the feeder. The M-128 facility is served by the Midway Montford Point Feeder. The BB-10 facility is served by the Rifle Range Feeder. The Camp Geiger and MCAS clinics are served by feeders in the vicinity. Electrical power is adequate for present dental needs.

Heating

Heating requirements for dental clinics are supplied by the central heating systems within the area of their location.

REGIONAL INFLUENCES

No formal relationship has been established with area civilian dentistry services.

As stated earlier, the Naval Dental Clinic at Camp Lejeune is responsible for patient treatment at MCAS Cherry Point. No other regional military ties exist.

COMPLEX INFLUENCES

Changes in personnel assigned to the Marine Corps Base, 2nd Marine Division, 2nd Force Service Support Group or MCAS, New River directly influence the demand for Naval Dental Clinic services and, in turn, staff, facilities and equipment.

As stated earlier, officer and enlisted staff rotate between Naval Dental Clinics and the 2nd Dental Battalion Clinics operated by the 2nd FSSG. Patient referrals are made between the Naval Dental Clinic and the 2nd Dental Battalion.

No chain of command exists between the Naval Dental Clinic and the 2nd Dental Battalion. Instead, an interservice support agreement exists between the two commands. Naval Dental Clinic procures all minor and investment garrison dental equipment utilized by 2nd Dental Battalion at

Camp Lejeune and MCAS, Cherry Point. This equipment is maintained on Naval Dental Clinic plant account. Naval Dental Clinic provides preventive maintenance and all repair services to 2nd Dental Battalion operatories at Camp Lejeune, but not at MCAS, Cherry Point. 2nd Dental Battalion's three clinics at Camp Lejeune have 44 dental operatories separate from Naval Dental Clinic. In addition, the 2nd Dental Battalion utilizes 13 out of the 16 operatories located at MCAS, Cherry Point.

The Naval Hospital facility at Camp Lejeune is outside the Naval Dental Clinic chain of command. However, the Naval Hospital is responsible for procurement and storage of Naval Dental Clinic equipment and supplies. On occasion, the Naval Dental Clinic assigns a rotating dental officer to the Dental Services Department at the Naval Hospital to provide oral surgery training or general dental support. The Naval Hospital provides Safety Officer consultations and assigns a Chaplain to the Naval Dental Clinic for additional duty. Marine Corps Base provides purchasing and contracting support, automated data processing support and printing capabilities. The Commanding Officer, Naval Dental Clinic has additional duty as Marine Corps Base Staff Dental Officer.

PLANNING FACTORS

Listed below are several factors that should be considered in planning future physical development of Naval Dental Clinic facilities. Included as planning factors are general problems and specific natural and man-made constraints which have been identified in the preceding analyses.

1. Co-location of Naval Hospital Branch Clinics and Naval Dental Clinics should be considered in any facility relocation decision.

2. The Building 15 headquarters facility is deficient in size and in poor physical condition. Limited room exists for future expansion of this facility.

3. Plan for increased facility requirements at Camp Geiger and Montford Point and for a site for replacement facility at Courthouse Bay.

4. Plan a new French Creek Branch Clinic.

CONCEPTUAL DEVELOPMENT

GENERAL

Alternative concept plans represent conceptual solutions for directing growth and change at the Naval Dental Clinic Activity. The purpose of this analysis is to compare alternative land use schemes and to select the most logical and efficient land use plan, given assigned missions, available resources, and physical and operational constraints.

Defined below are a set of general goals which are intended to serve as an implementing guide for future physical development. These goals were derived from the preceding planning analysis. Accompanying each goal is a series of measurable objectives which, if followed, can result in the achievement of each goal.

GOALS AND OBJECTIVES

Goal 1: ENCOURAGE COMPATIBLE LAND USE RELATIONSHIPS

Objective 1A: Site physically and functionally related facilities adjacent to one another.

Objective 1B: Maintain unit integrity.

Goal 2: CONCENTRATE DEVELOPMENT TO MAXIMIZE LAND POTENTIAL

Objective 2A: Site new facilities in locations occupied currently by temporary, sub-standard or inadequate facilities.

Objective 2B: Prevent encroachment of development into training and maneuver areas.

Goal 3: IMPROVE THE CIRCULATION SYSTEM TO FULLY SERVE AND SUPPORT LAND USE, TO CONSERVE TIME AND ENERGY AND TO PROMOTE SAFETY

Objective 3A: Minimize conflicts between pedestrian and vehicular traffic.

Objective 3B: Relieve traffic congestion along major arterials and at major intersections.

Objective 3C: Reduce travel times between developed areas.

Objective 3D: Improve access from personnel support areas.

Goal 4: CONSERVE EXISTING ASSETS

Objective 4A: To the extent economically feasible, repair and/or renovate substandard facilities prior to planning new replacement facilities.

Objective 4B: Relocate tenants from facilities that, although in good structural condition, are deficient in configuration or size for their needs.

Goal 5: PRESERVE AND PROTECT THE NATURAL ENVIRONMENT

Objective 5A: Maintain the integrity of all endangered species' habitats.

Objective 5B: Construct facilities outside the 100-year flood plain.

Objective 5C: Construct facilities in areas with less than 10 percent slope.

Objective 5D: Prevent contamination or destruction of soils, vegetation and wetlands.

Goal 6: ENHANCE THE OVERALL ATTRACTIVENESS OF DEVELOPED AREAS

Objective 6A: Use plant materials or fencing to buffer incompatible uses.

Objective 6B: Plan facilities which are well-integrated in terms of scale, materials and design.

Goal 7: RESERVE UNDEVELOPED LAND AREAS TO ACCOMMODATE FUTURE FACILITY NEEDS

Objective 7A: Identify potential facility requirements beyond the time frame of this plan.

Objective 7B: Identify specific areas for construction of facilities designed to meet requirements beyond the time frame of this plan.

The subsequent analysis is organized by the various geographic areas where there are Naval Dental Clinic facilities. Each alternative concept is depicted on a map and analyzed in narrative form in terms of the goals and objectives presented above. Culminating this process is selection of a Land Use Plan which satisfies all the stated goals and objectives.

HADNOT POINT

Concept Plan A

In this alternative, Branch facilities are relocated to a large undeveloped area behind the Main Street Post Office (Figure VII-8). Relocation would better provide for continued use of old facilities during new construction and permit extensive expansion over the long-term. This is one of the few centrally-located undeveloped sites available at Hadnot Point. The site would be equally accessible from work areas and living areas and would be a short distance closer to the large service population at French Creek.

Concept Plan B

This concept reflects land use relationships as they exist presently (Figure VII-9). Branch facilities located in Buildings 15 and 65 are centrally located to 2nd Marine Division regimental housing areas, as well as to main administrative and community/commercial facilities. Another major advantage is the close proximity of these clinics to one another.

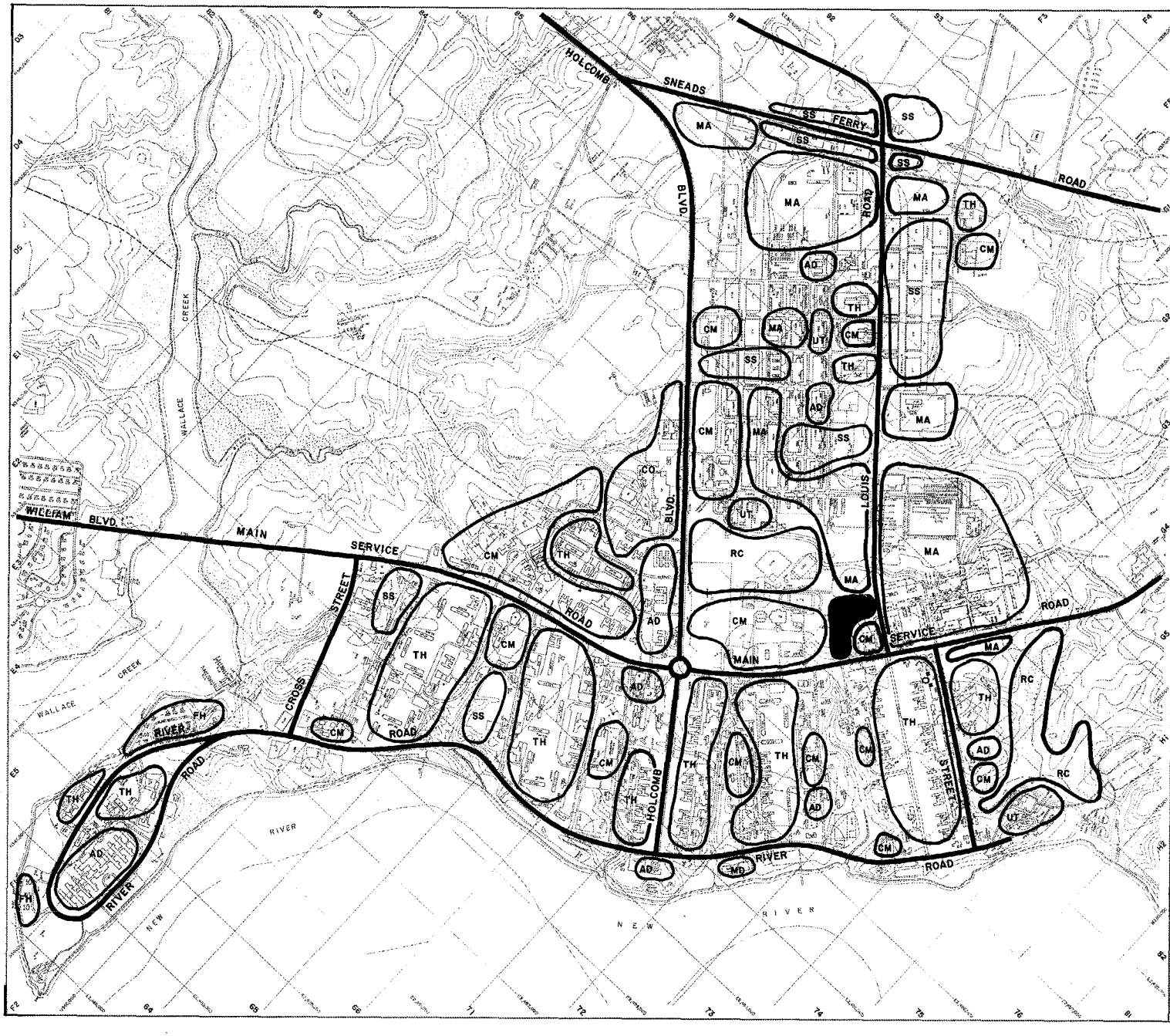
COURTHOUSE BAY

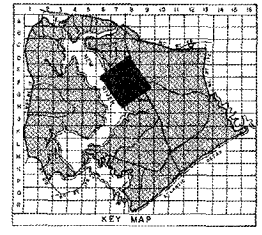
Concept Plan A

Existing land use patterns are retained in this concept (Figure VII-10). The Branch Clinic would be replaced at the same waterfront location at which it currently exists. A disadvantage of this site is that it is removed from the large troop housing and community support area to the north. Rebuilding so close to the 100-year flood plain is seen as a second major disadvantage.

Concept Plan B

The Branch Clinic is relocated northward along Marines Road next to the community use area (Figure VII-11). This constitutes a more centralized location that would be closer to administrative headquarters and to AMTRAC supply/maintenance areas and avoids entirely the threat of flooding.





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
MD	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000
GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT

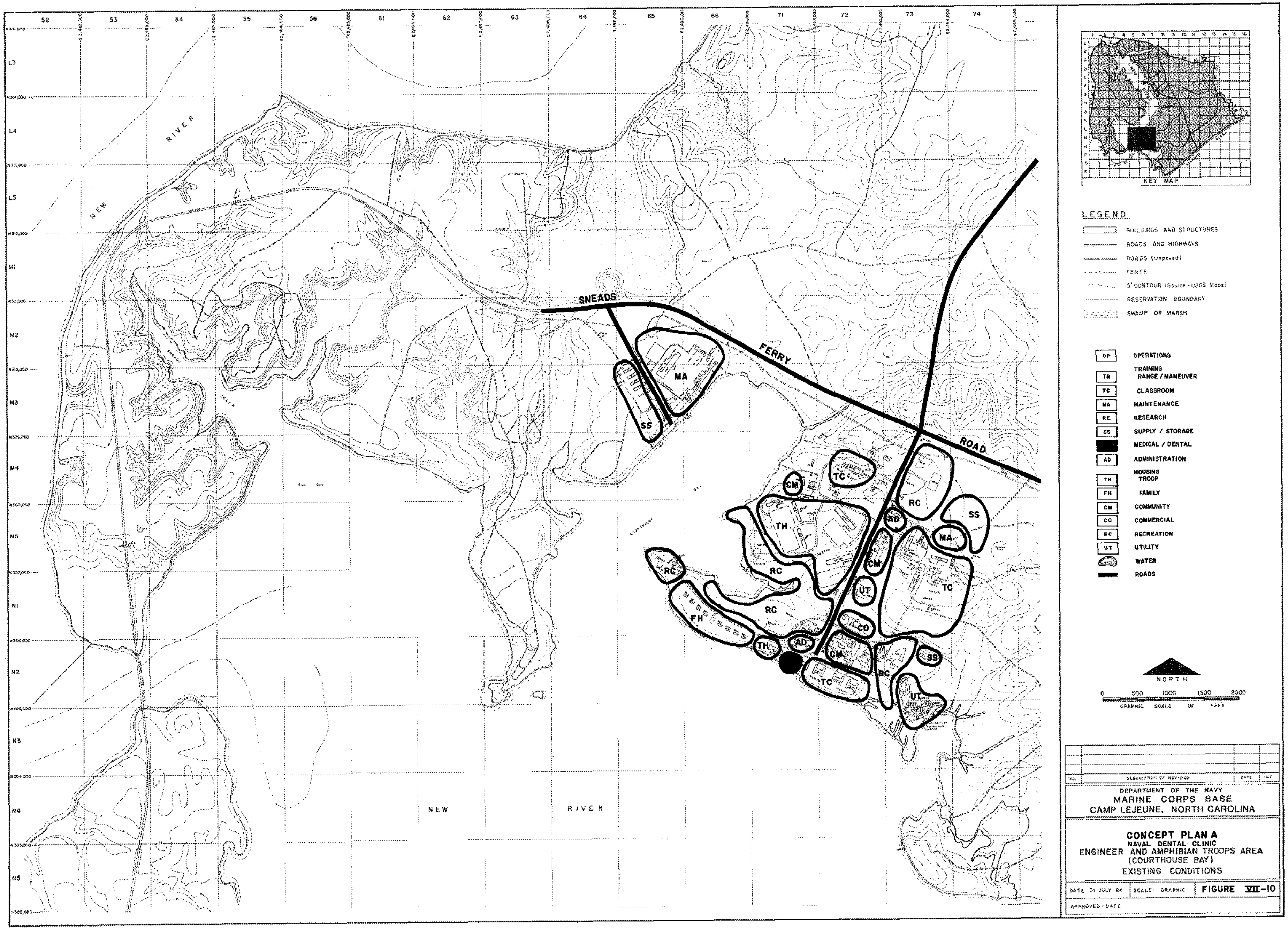
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

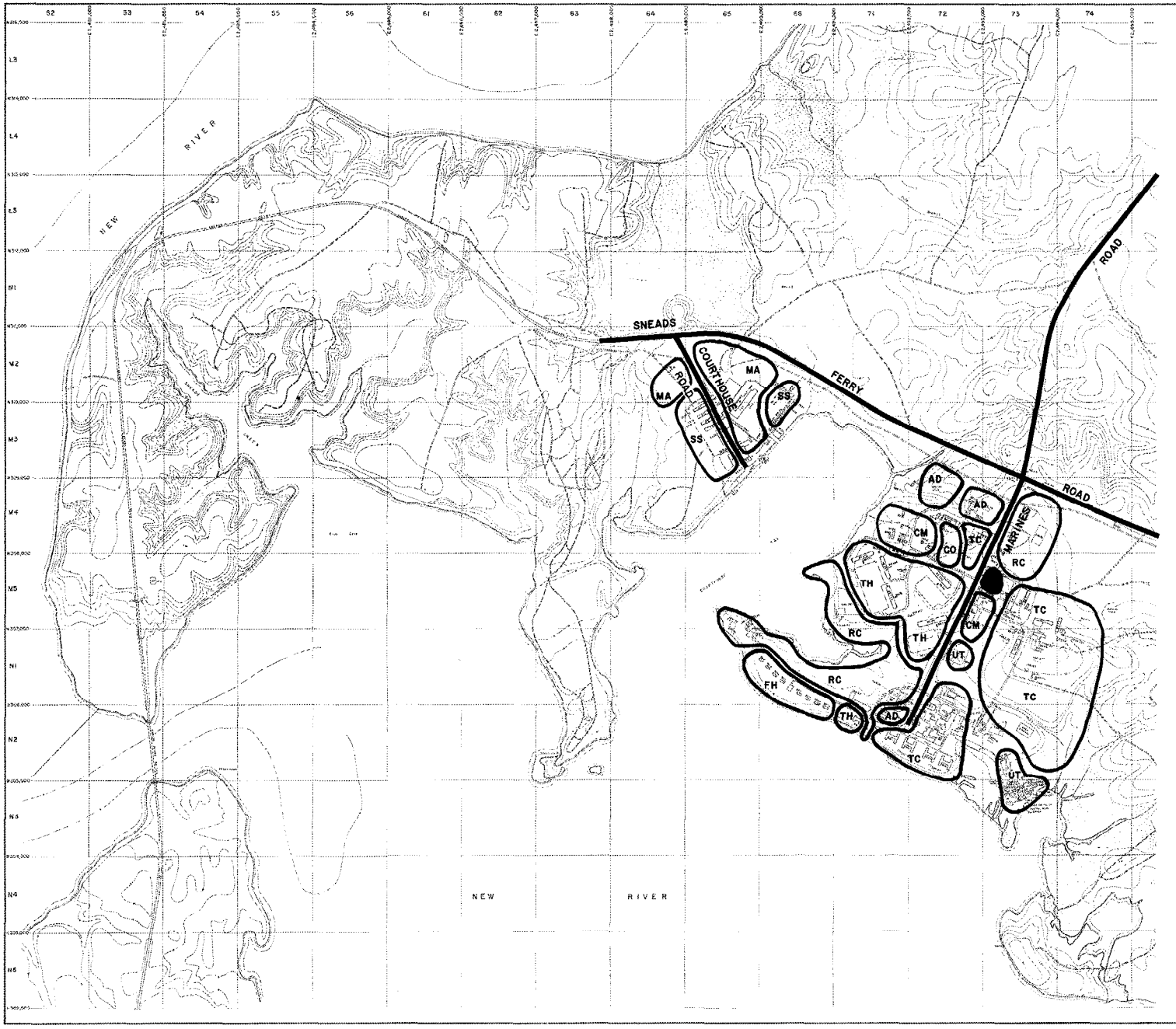
CONCEPT PLAN A
NAVAL DENTAL CLINIC
HADNOT POINT AREA
EXISTING CONDITIONS

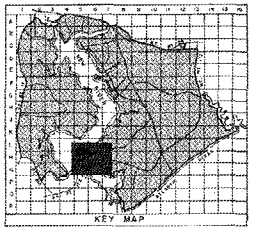
DATE 31 JULY 64 | SCALE: GRAPHIC | **FIGURE VII-8**

APPROVED / DATE


KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source - USGS Maps)
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATIONS
TRAINING
TR RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MEDICAL / DENTAL
AD ADMINISTRATION
HOUSING
TH TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INT
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
CONCEPT PLAN B
NAVAL DENTAL CLINIC
HADNOT POINT AREA
EXISTING CONDITIONS
DATE 31 JULY 94
SCALE: GRAPHIC
FIGURE VII-9
APPROVED / DATE
SNEADS FERRY ROAD
WILLIAM BLVD
MAIN SERVICE ROAD
HOLCOMB BLVD
LOUIS ROAD
CROSS STREET
"O" STREET
RIVER ROAD
NEW RIVER
WALLACE CREEK


NEW RIVER
SNEADS FERRY ROAD
MA
SS
TC
CM
RC
AD
TH
MA
RC
CM
UT
TC
RC
FH
RC
CO
TH
AD
CM
RC
SS
TC
UT
NEW RIVER
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source - USGS Maps)
RESERVATION BOUNDARY
SWAMP OR MARSH
OP OPERATIONS
TRAINING
TR RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MEDICAL / DENTAL
AD ADMINISTRATION
HOUSING
TH TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
CONCEPT PLAN A
NAVAL DENTAL CLINIC
ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS
DATE 31 JULY 84
SCALE: GRAPHIC
FIGURE VII-10
APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RS	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INIT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN B
NAVAL DENTAL CLINIC
ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE 31 JULY 84	SCALE GRAPHIC	FIGURE XII-11

APPROVED / DATE

Concept Plan A

The clinic is retained in its present location across from the Enlisted Personnel Family Housing Area (Figure VII-12). Access is good both to work areas and to family housing areas but somewhat less convenient to troop housing and community support areas.

Concept Plan B

In this concept, medical uses have been moved west of the Seaboard Coastline Railroad tracks, as have all other non-operational land uses at MCAS, New River (Figure VII-13). This site is adjacent to the Curtis Road Triangle area, and directly accessible via the Campbell Street Extension to the airfield operations area. Access from off-Base to this clinic would be improved in terms of distance and reduced vehicle conflicts.

LAND USE PLANS

The Land Use Plans for future physical development of the Base areas containing Naval Dental Clinic facilities are described below and are shown on Figures VII-14 through VII-21. Each Land Use Plan is the result of the analysis of facility requirements, planning factors, and comments provided by the activity as a result of their review of alternate Concept Plans. The Land Use Plans represent the most logical and efficient use of activity assets given assigned missions, available resources, and physical and operational constraints. They provide a sound basis for directing growth and change, and have been used to site Capital Improvements Program projects.

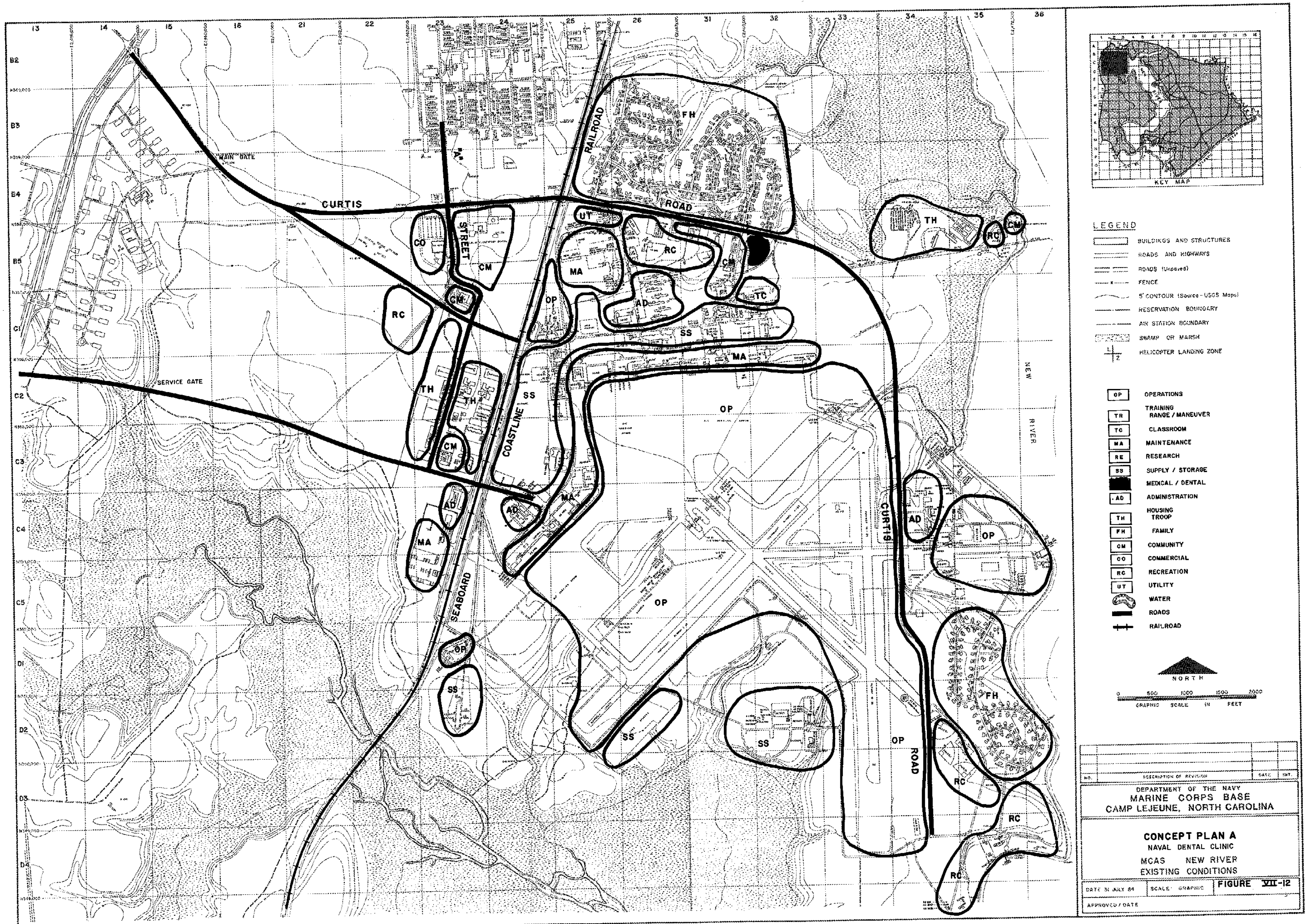
At Hadnot Point, the Land Use Plan shows Branch facilities, including those at Building 15 and the Preventive Dentistry Clinic, relocated to the undeveloped area on the north side of the Main Service Road, beside the Post Office (Figure VII-14). Relocation would consolidate medical and dental-related uses, permitting extensive expansion over the long-term. This central location, equally accessible from work and living areas, has improved visibility and access from Louis Road as well.

At French Creek, the Land Use Plan calls for the Branch Clinic to remain in its present location which is centrally located with respect to troop housing, training and work areas (Figure VII-15).

The Land Use Plan for the Courthouse Bay area also consolidates medical and dental uses into one Branch Clinic facility, which is relocated northward along Marine's Road next to community uses. This site provides a more centralized location, closer to administrative headquarters and entirely avoiding the threat of flooding (Figure VII-16).

At Onslow Beach, the Land Use Plan shows an expanded site for medical/dental facilities with direct access to Ocean Drive. These and other adjacent community facility uses serve as a transitional zone between public areas to the east and troop activity areas (Figure VII-17).

A branch clinic at the Rifle Range is shown on the Land Use Plan in conjunction with existing medical facilities. This site provides for expanded medical/dental uses in close proximity to all troop activity areas (Figure VII-18).

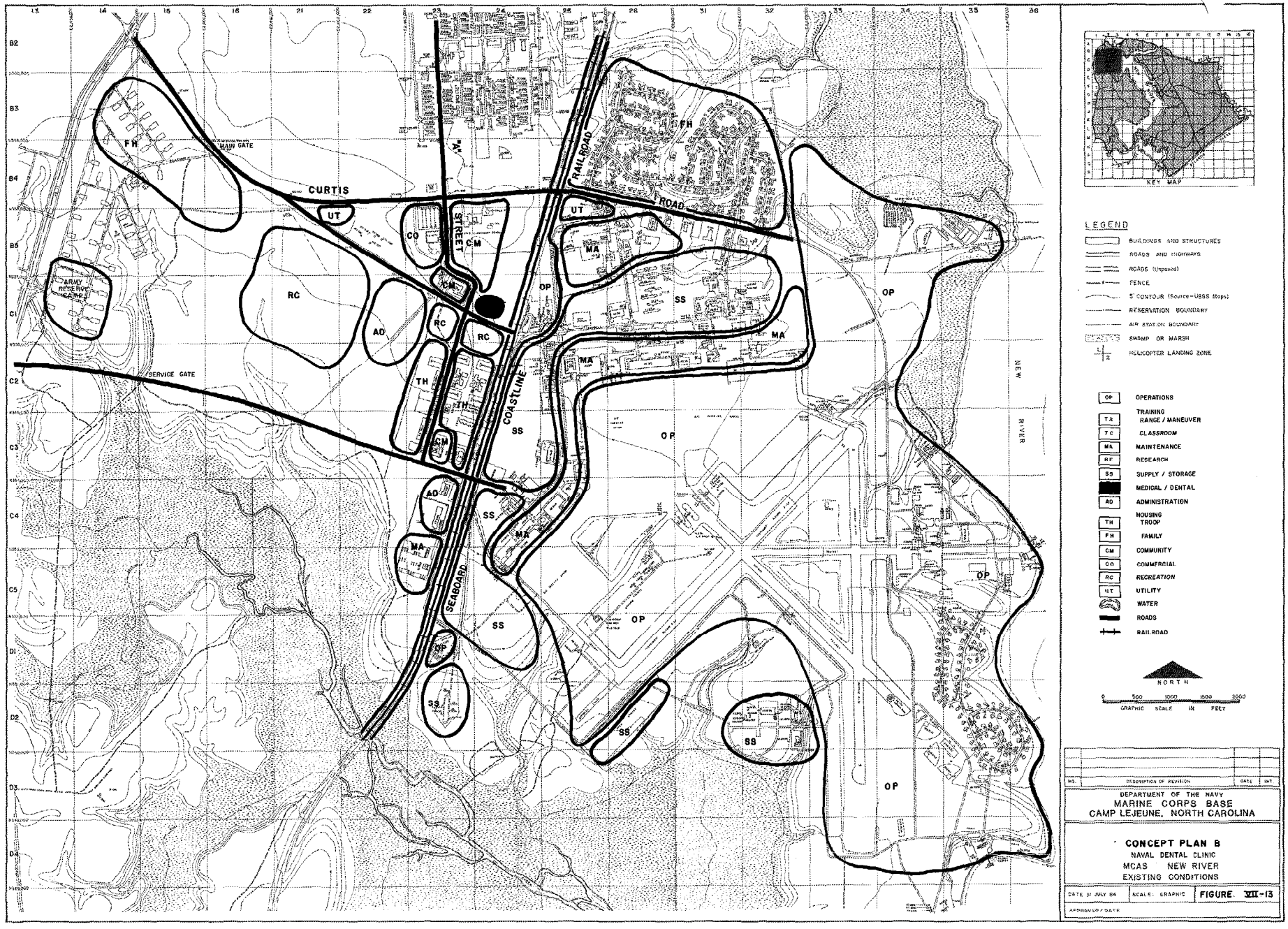


DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONCEPT PLAN A
NAVAL DENTAL CLINIC
MCAS NEW RIVER
EXISTING CONDITIONS

DATE 31 JULY 84 | SCALE: GRAPHIC | FIGURE VII-12

APPROVED / DATE



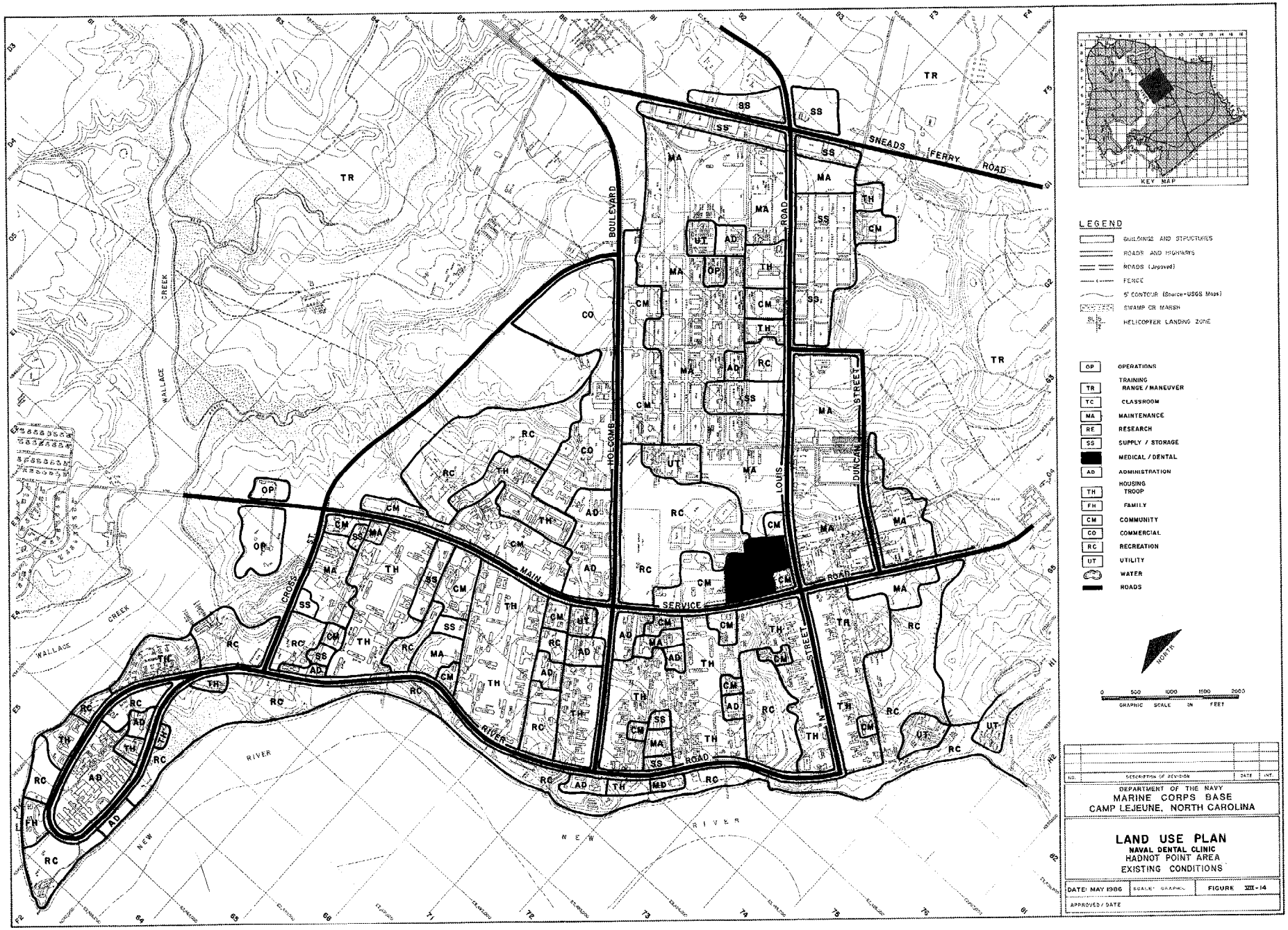
NO.	DESCRIPTION OF REVISION	DATE	INT

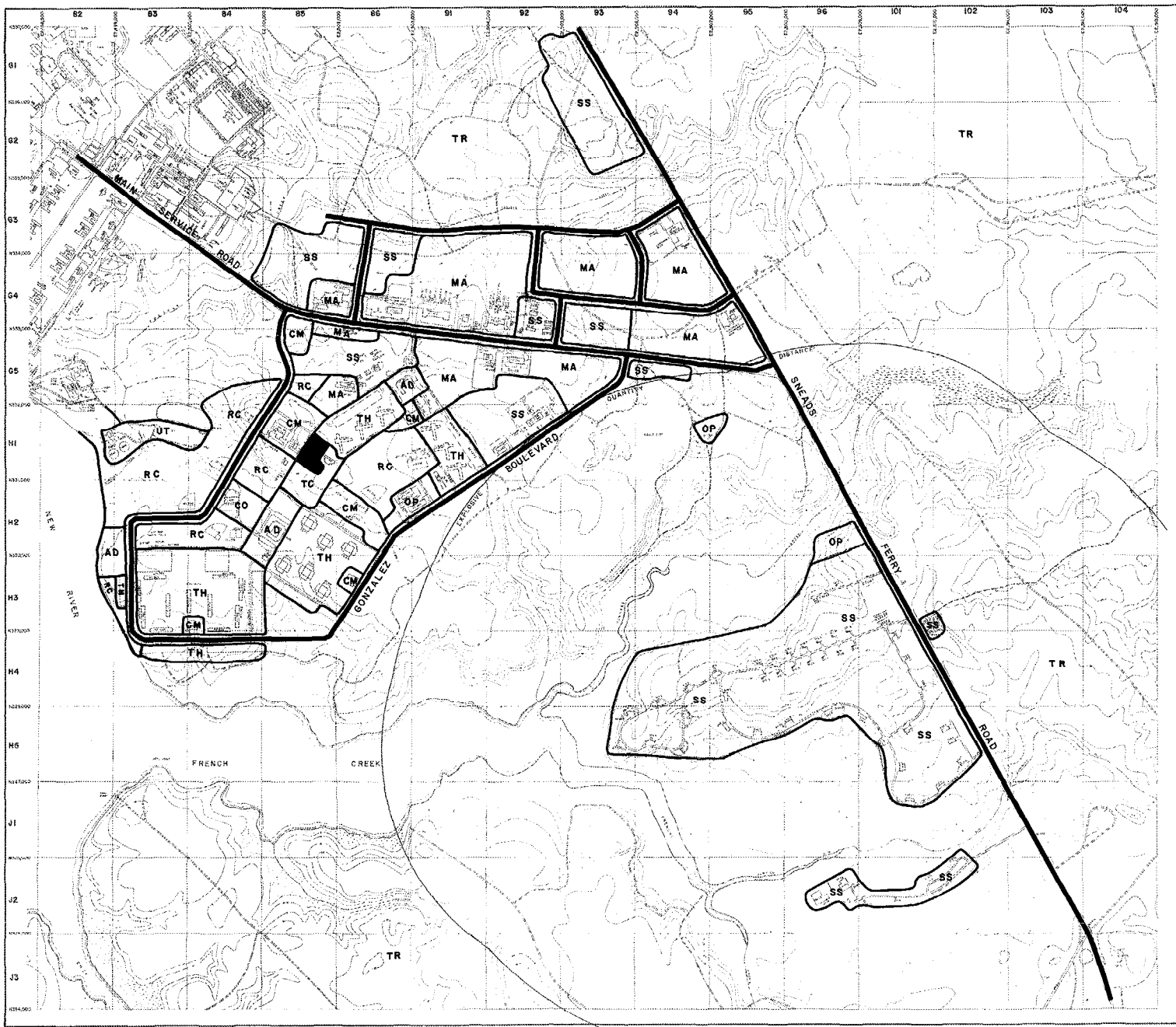
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

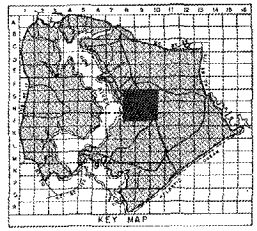
CONCEPT PLAN B
NAVAL DENTAL CLINIC
MCAS NEW RIVER
EXISTING CONDITIONS

DATE: 31 JULY 84 | SCALE: GRAPHIC | FIGURE VII-13

APPROVED / DATE


SNEADS FERRY ROAD
HOLCOMB BOULEVARD
LOUIS ROAD
DUNCAN STREET
MAIN SERVICE ROAD
CROSS ST
N STREET
WALLACE CREEK
NEW RIVER
KEY MAP
LEGEND
BUILDINGS AND STRUCTURES
ROADS AND HIGHWAYS
ROADS (Unpaved)
FENCE
5' CONTOUR (Source-USGS Maps)
SWAMP OR MARSH
HELICOPTER LANDING ZONE
OP OPERATIONS
TR TRAINING RANGE / MANEUVER
TC CLASSROOM
MA MAINTENANCE
RE RESEARCH
SS SUPPLY / STORAGE
MEDICAL / DENTAL
AD ADMINISTRATION
TH HOUSING TROOP
FH FAMILY
CM COMMUNITY
CO COMMERCIAL
RC RECREATION
UT UTILITY
WATER
ROADS
NORTH
0 500 1000 1500 2000
GRAPHIC SCALE IN FEET
NO. DESCRIPTION OF REVISION DATE INIT.
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAND USE PLAN
NAVAL DENTAL CLINIC
HADNOT POINT AREA
EXISTING CONDITIONS
DATE: MAY 1986
SCALE: GRAPHIC
FIGURE VIII - 14
APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (unpaved)
- FENCE
- 5' CONTOUR (Source-USGS Maps)
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
	HOUSING
TH	TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	INT

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

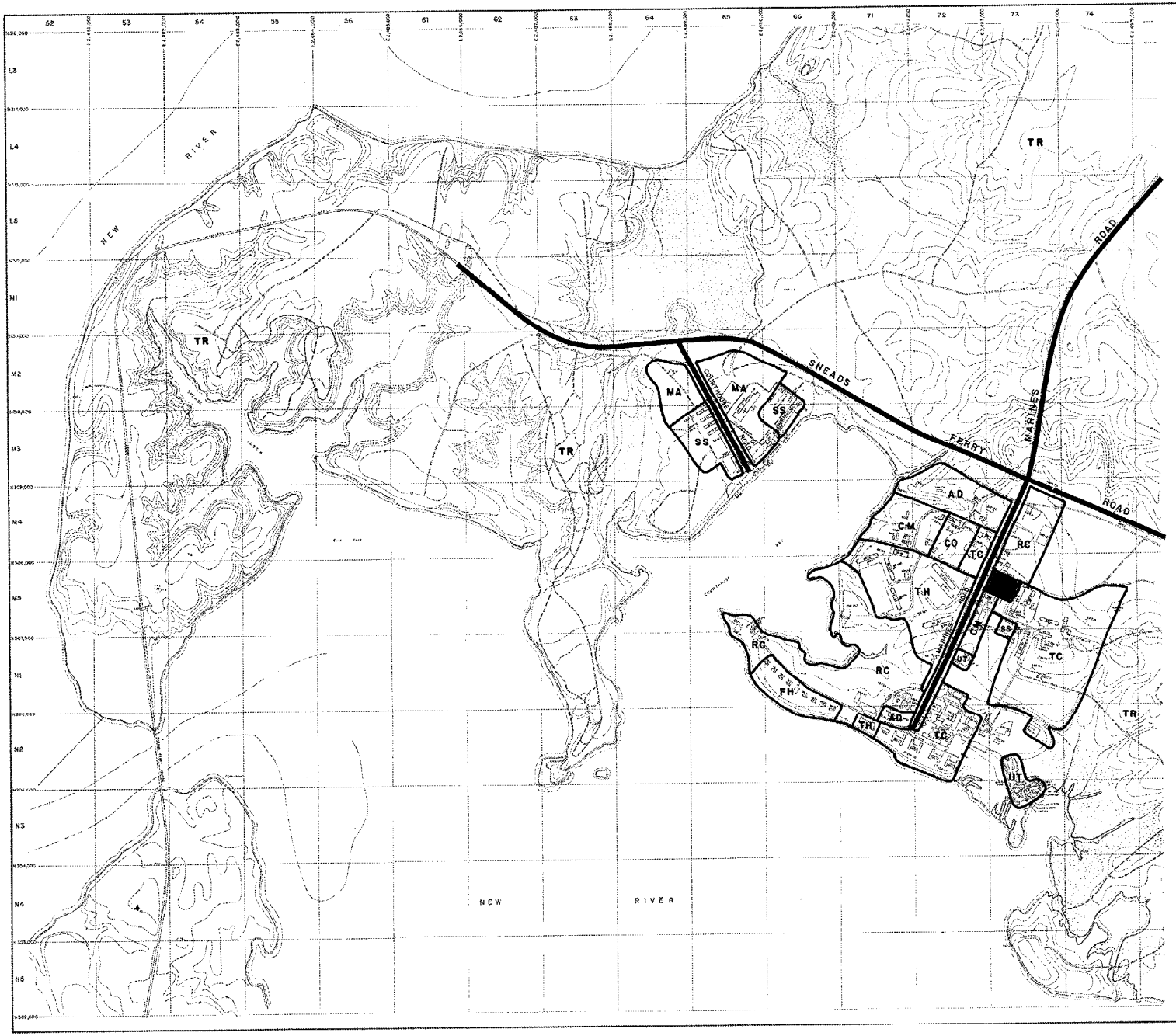
LAND USE PLAN

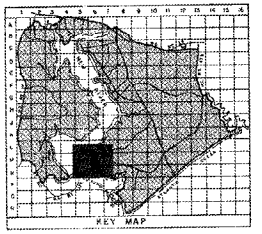
NAVAL DENTAL CLINIC

FRENCH CREEK AND MAGAZINE AREAS
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE VII-15

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source -USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH

OP	OPERATIONS
TR	TRAINING RANGE/MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

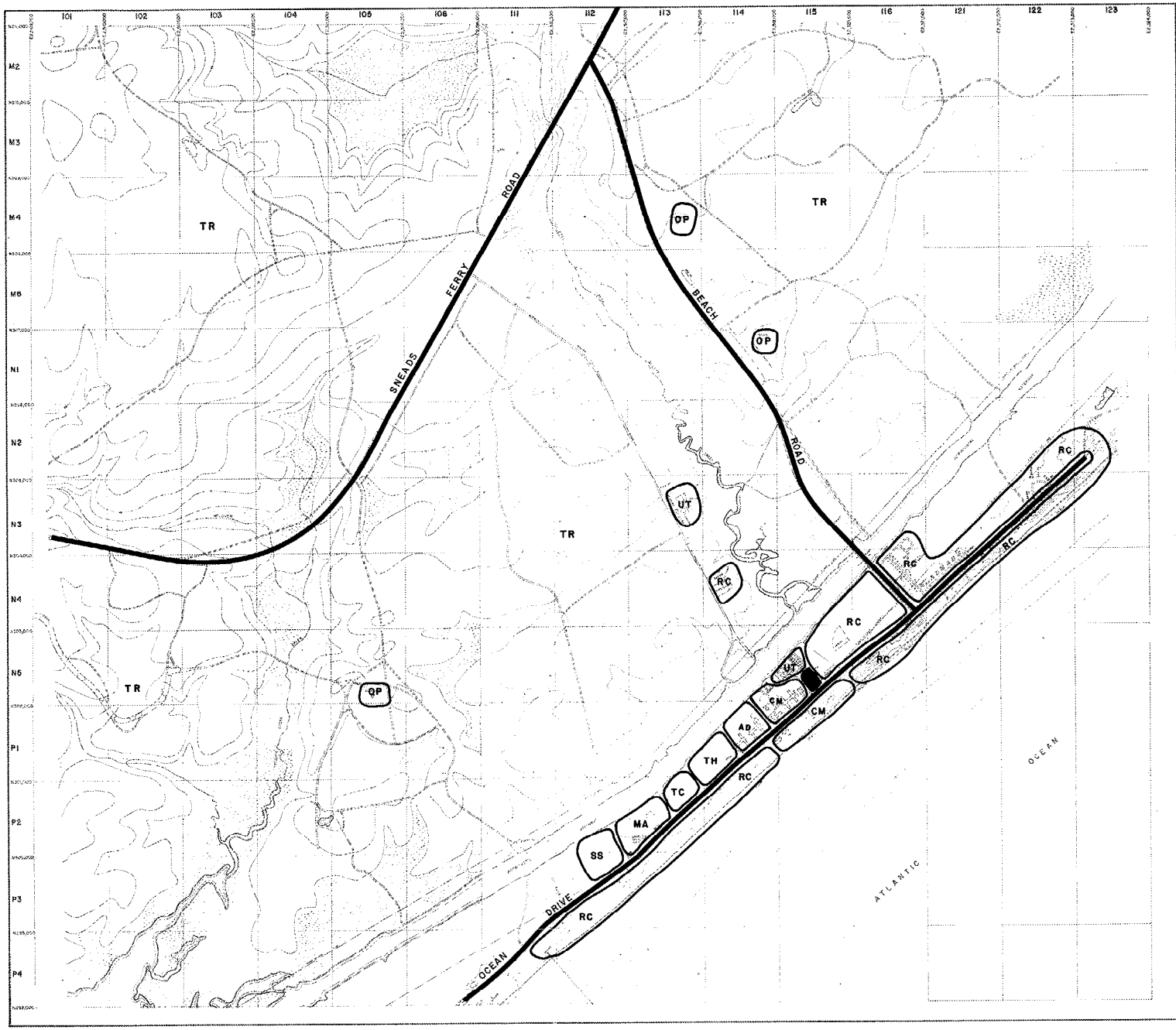
DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

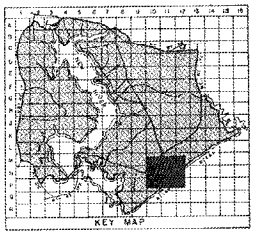
LAND USE PLAN

NAVAL DENTAL CLINIC
ENGINEER AND AMPHIBIAN TROOPS AREA
(COURTHOUSE BAY)
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE VII-J6

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

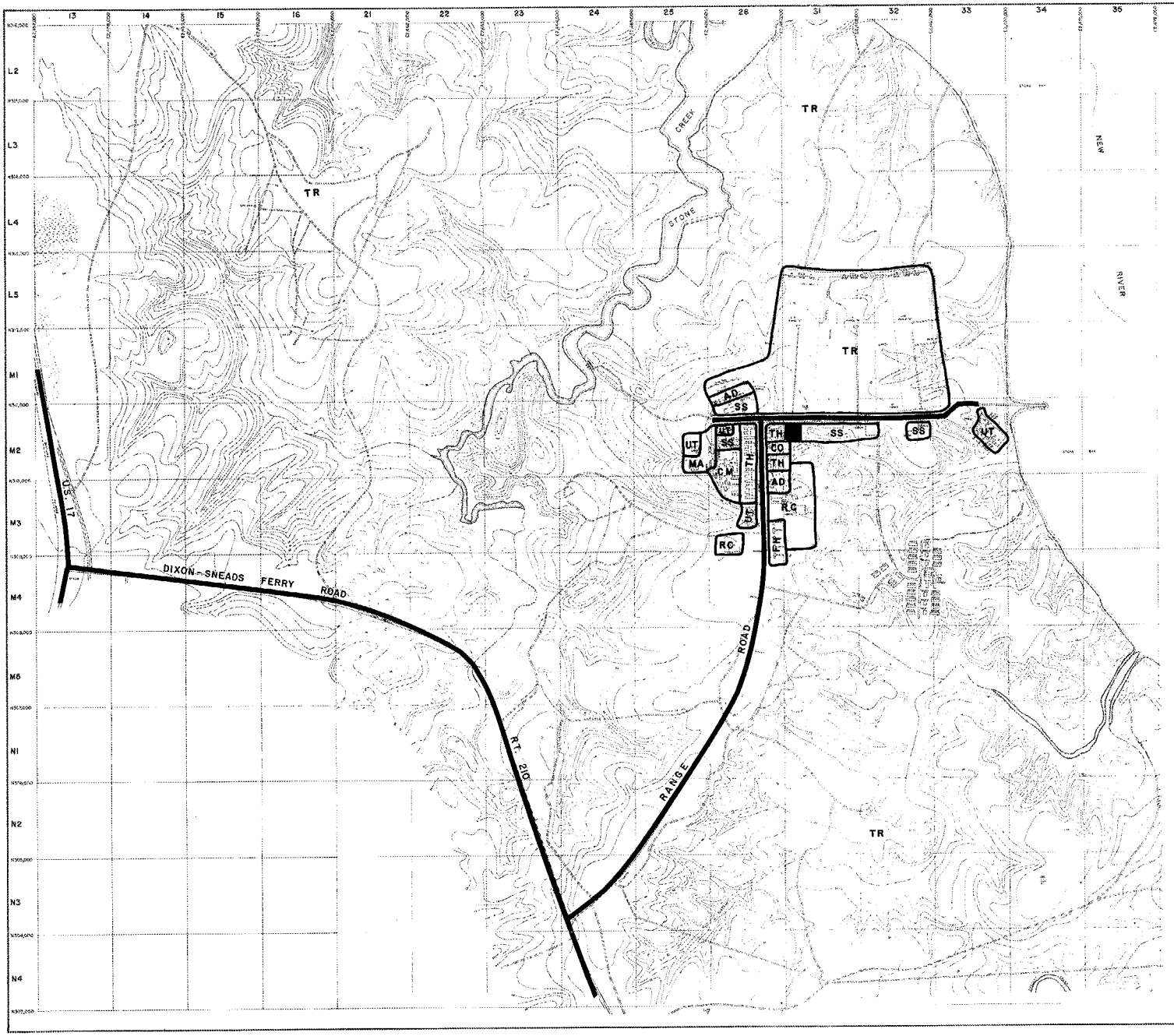
LAND USE PLAN

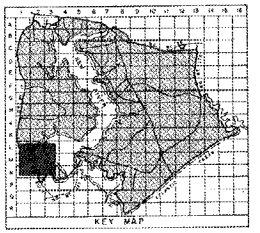
NAVAL DENTAL CLINIC

BEACH AREA AND VICINITY
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE VII-17

APPROVED / DATE





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- SWAMP OR MARSH
- TACTICAL LANDING ZONE
- HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO	DESCRIPTION OF REVISION	DATE	BY

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN

NAVAL DENTAL CLINIC

RIFLE RANGE AREA
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE GRAPHIC | FIGURE III-18

APPROVED / DATE

The Camp Geiger Land Use Plan indicates that the Branch Clinic should remain in its present location near the intersection of Seventh and "E" Streets. This site logically incorporates medical and dental facilities into an area where other personnel support uses are located (Figure VII-19).

The Land Use Plan for Montford Point shows an expanded area for medical and dental uses which extends to Montford Landing Road, and thus provides direct access and visibility. Locational advantages include the site's proximity to community, administrative and training classroom uses (Figure VII-20).

Medical and dental uses at MCAS, New River are shown on the Land Use Plan in a new location west of the Seaboard Coastline Railroad tracks, where all other non-operational land uses are concentrated. This new site promotes greater land use compatibility because of its location near family and troop housing as well as community and commercial uses (Figure VII-21).

SUPPORTING UTILITIES PLAN

The Supporting Utilities Plan for the Naval Dental Clinic Activity includes the water system, wastewater collection and treatment, the electrical system and central heating system requirements for all Naval dental facilities. An analysis of existing facilities and deficiencies for each of the developed areas within the Camp Lejeune Complex was presented as part of the Planning Analysis.

With Branch Dental Clinics located throughout the Complex, generally in conjunction with medical facilities, the availability of utilities is therefore directly related to the requirements of the Marine Corps Base Activity Plan. Section IV indicates future utility improvements that will be required to alleviate existing system deficiencies and to support changing utility needs based upon land use and site development plans for the Marine Corps Base.

Programmed CIP projects for the Naval Dental Clinic Activity are generally located near existing utility lines with adequate capacity, thus requiring only on-site utility improvements. More detailed information regarding required system improvements is provided in the CIP document and on Site Location Maps (scale: 1" = 200'). It should be noted that system extensions were designed based upon appropriate NAVFAC design manuals. However, these should not be construed as final designs. Detailed utility studies should be undertaken in conjunction with individual project design.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

This assessment has been prepared for the Naval Dental Clinic, Camp Lejeune, North Carolina, in accordance with NAVFACINST 11010.63B of October 1982 and OPNAVINST 11000.16 of April 1983 in compliance with Section 102 (2) (c) of the National Environmental Policy Act of 1969.

Submitting DOD Component: Department of the Navy

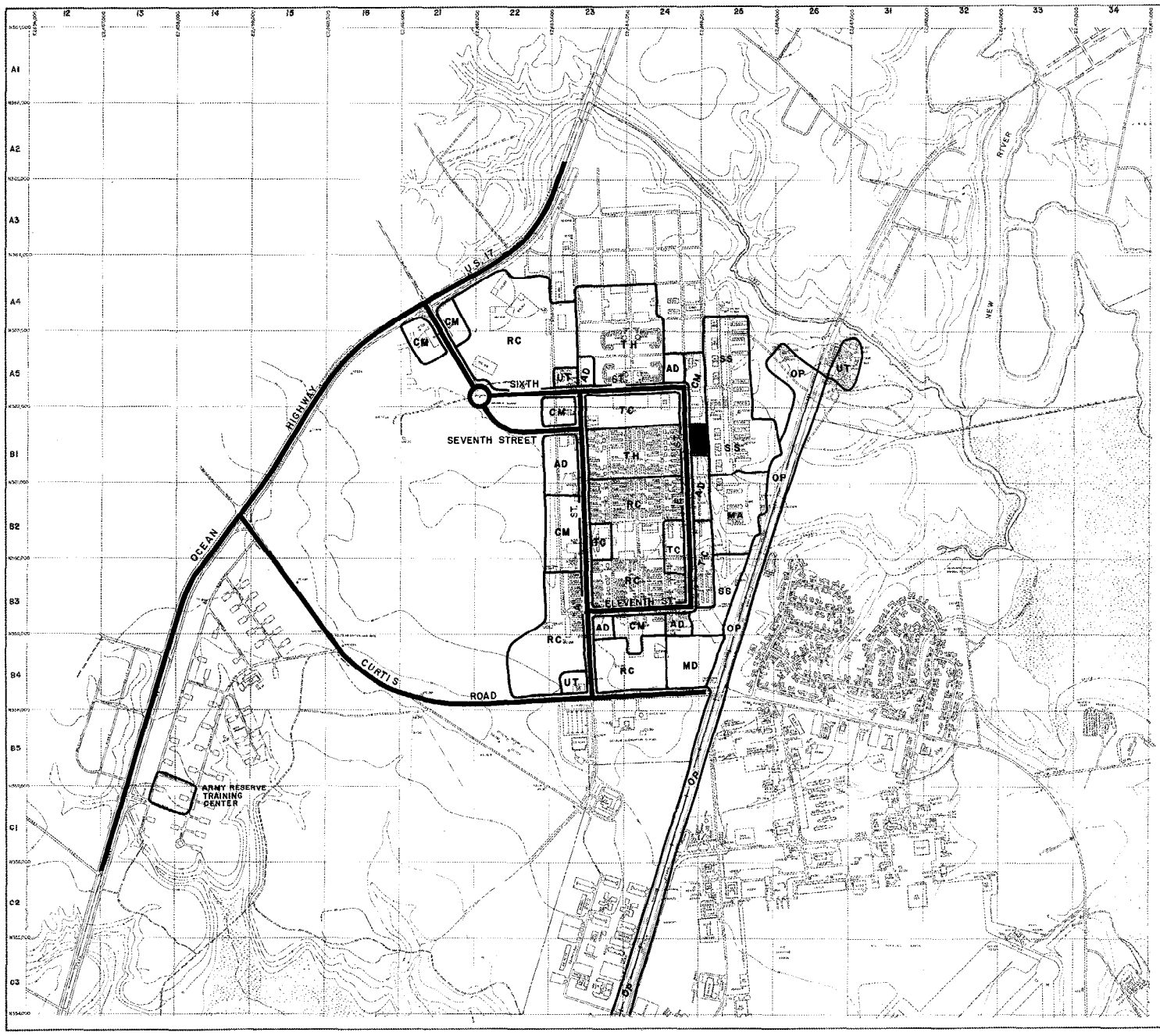
Activity: Naval Dental Clinic, Camp Lejeune, North Carolina

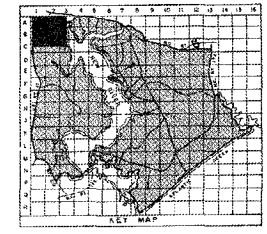
Project Title: Camp Lejeune Complex Master Plan

Date of Submission: March 1987

SUMMARY

The Camp Lejeune Master Plan component for the Naval Dental Clinic proposes that all programmed projects delineated in the Capital Improvements Plan (CIP) be constructed subject to





LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source - USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- 1/12 HELICOPTER LANDING ZONE

OP	OPERATIONS
TR	TRAINING RANGE / MANEUVER
TC	CLASSROOM
MA	MAINTENANCE
RE	RESEARCH
SS	SUPPLY / STORAGE
	MEDICAL / DENTAL
AD	ADMINISTRATION
TH	HOUSING TROOP
FH	FAMILY
CM	COMMUNITY
CO	COMMERCIAL
RC	RECREATION
UT	UTILITY
	WATER
	ROADS

NORTH

0 500 1000 1500 2000

GRAPHIC SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

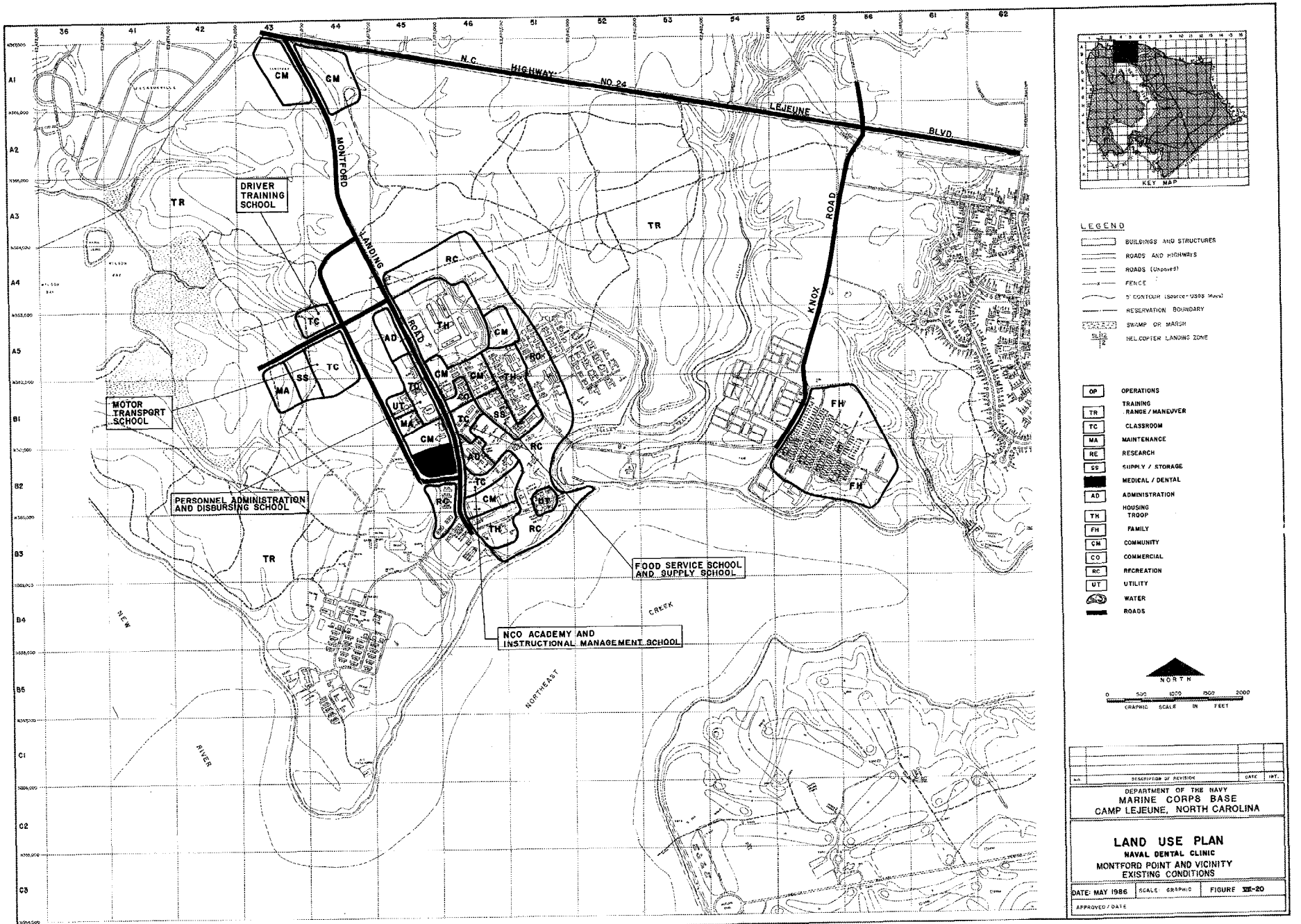
LAND USE PLAN

NAVAL DENTAL CLINIC

GEIGER AREAS "A" AND "B"
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE XIII-19

APPROVED / DATE



NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

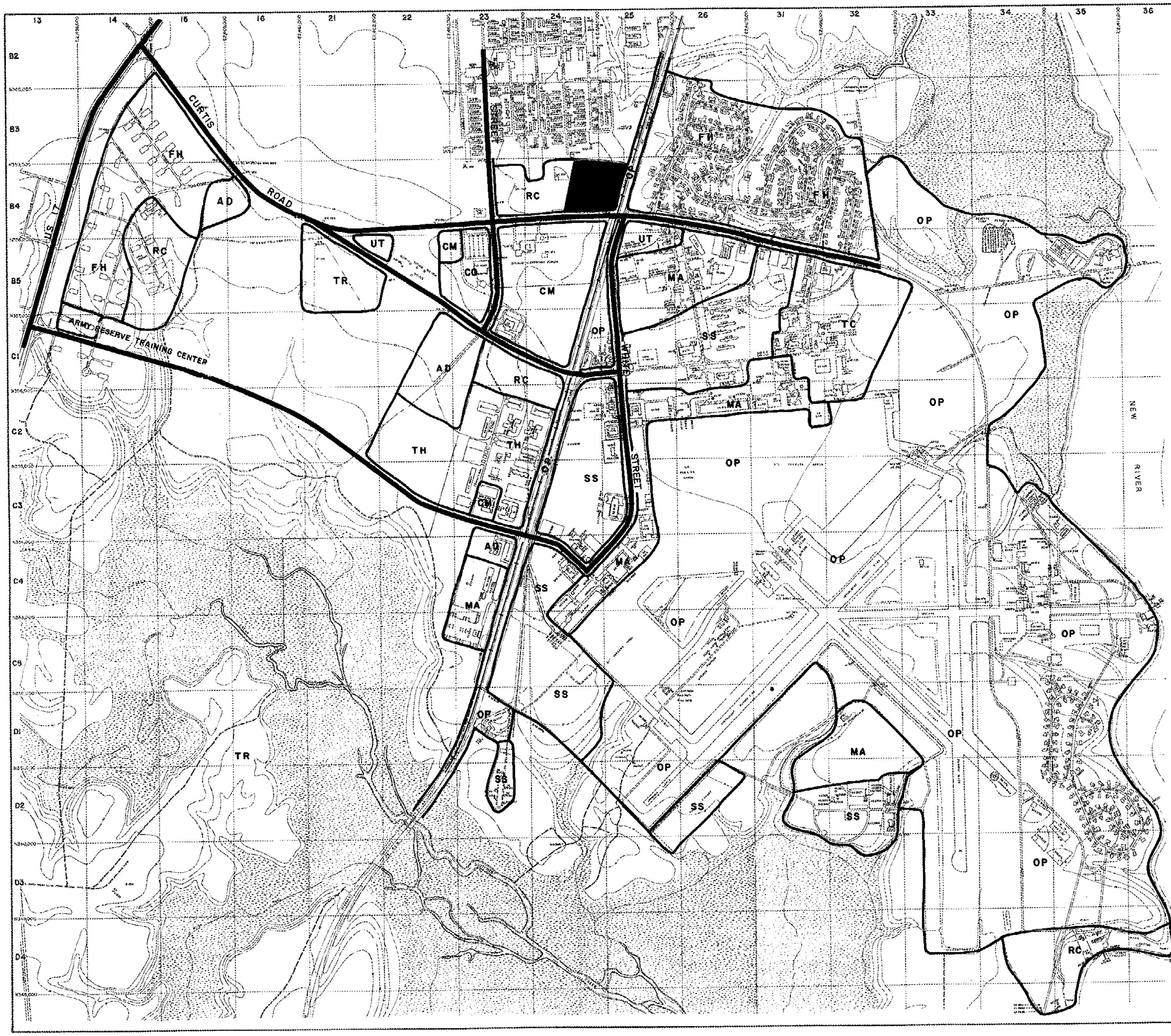
LAND USE PLAN

NAVAL DENTAL CLINIC

MONTFORD POINT AND VICINITY
EXISTING CONDITIONS

DATE: MAY 1986	SCALE: GRAPHIC	FIGURE VII-20

APPROVED / DATE



LEGEND

- BUILDINGS AND STRUCTURES
- ROADS AND HIGHWAYS
- ROADS (Unpaved)
- FENCE
- 5' CONTOUR (Source—USGS Maps)
- RESERVATION BOUNDARY
- AIR STATION BOUNDARY
- SWAMP OR MARSH
- HELICOPTER LANDING ZONE

- OP OPERATIONS
- TRAINING
  - TR RANGE / MANEUVER
  - TC CLASSROOM
- MA MAINTENANCE
- RE RESEARCH
- SS SUPPLY / STORAGE
- MEDICAL / DENTAL
- AD ADMINISTRATION
- HOUSING
  - TH TROOP
  - FH FAMILY
- CM COMMUNITY
- CO COMMERCIAL
- RC RECREATION
- UT UTILITY
- WATER
- ROADS

NO.	DESCRIPTION OF REVISION	DATE	INT.

DEPARTMENT OF THE NAVY
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

LAND USE PLAN
NAVAL DENTAL CLINIC
MCAS: NEW RIVER
EXISTING CONDITIONS

DATE: MAY 1986 | SCALE: GRAPHIC | FIGURE XII-21

APPROVED / DATE

compliance with adopted environmental policies. As a result of undertaking this aggressive development program, potential exists for some significant adverse effects on the environment. Although temporary construction impacts will be experienced from increased noise levels, these will subside following completion of the overall program. No additional adverse impacts are anticipated with any project.

INTRODUCTION

The Master Plan provides a basis for the efficient and orderly development of real estate and facilities resources in order to meet mission requirements. It establishes an overall scheme for land and facilities resources use and the optimum use of all property owned by the Department of the Navy. The Plan is based upon considerations of military requirements, planning criteria, economic and environmental factors.

Major proposals of the Plan are as follows:

1. Allocate space for eventual replacement and construction phasing of facilities to maintain desired functional relationships and to maximize the efficient use of energy and natural resources.

2. Consider the immediate, short-range or long-range impacts on the natural and man-made environment relative to the expansion of training functions and all other potential construction on-base.

3. Consider construction of the proposed U.S. Route 17 Bypass and all other on-base roadway construction in terms of existing and planned land use patterns and access improvement.

4. Construct all programmed facilities delineated within the five-year CIP in compliance with adopted environmental policies and accepted mitigation measures.

5. Preserve the overall quality of the natural and man-made environment and protect areas containing significant natural constraints for development such as: 100-year floodplain, wetland, sensitive slopes, habitats of endangered species and archaeological/historic sites.

EXISTING ENVIRONMENT OF PROPOSED ACTIONS

Naval Dental Clinics are located throughout the Camp Lejeune Military Complex. Situated within Onslow County in southeastern North Carolina, the Complex is adjacent to the City of Jacksonville's southern boundary. The New River Inlet separates Camp Lejeune from the County's growing resort community of West Onslow Beach. The County's two forest preserves represent large areas of undeveloped land in close proximity to the Camp Lejeune Complex.

The topography of Camp Lejeune is a flat plain, sloping gently toward the New River. Elevation ranges from sea level to 72 feet with most of the land averaging from 20 to 40 feet above sea level. The 17 miles of Atlantic coastline are paralleled by a series of alluvium deposits and tidal marshes which are protected by relatively stable sand dunes (15 to 20 feet in height) forming a barrier strip along the coast. The Base is encompassed by vast areas of pocosins and swampland which evolved due to its shallow topographic features.

A variety of 31 soil series are found throughout Camp Lejeune, ranging from sandy loam to fine sand and mud. Drainage is the most critical factor determining the suitability of the heterogeneous soil conditions. Approximately 3,000 acres of sensitive estuarine areas are dispersed widely throughout the Complex. These wetland ecosystems, extremely important to the food chain, should not be used for future development. A significant amount of flood-prone areas exist throughout the Camp Lejeune Complex and must be considered in development plans. Projects planned at Onslow Beach must comply with the North Carolina Coastal Zone Management Program.

Vegetation is typical of the southeastern coastal plain. Extensive tracts of both pure pine and pine-hardwood mixtures dominate the landscape. Areas on the periphery of the forests contain several species of shrubs, vines and herbs. The upland swamps, or pocosins, are overgrown with fetterbush, cyrilla, pond pine and greenbrier, and uneconomically harvested species of pine.

Endangered species having an impact on carrying out the mission of the Military Complex include the Red-Cockaded Woodpecker, Atlantic Loggerhead Sea Turtle, Green Sea Turtle, Eastern Brown Pelican and American Alligator. Protection of habitat and foraging areas is essential to the survival of these species.

The Camp Lejeune area is located in a region of warm, humid and temperate climate. The average annual temperature is 63^{0} and the average annual rainfall is 57.9 inches, with the heaviest rains occurring during June, July and August.

The Military Complex encompasses some of Onslow County's earliest settled areas and some of its most historic sites. At present, only one archaeological site has been studied in detail. It was found to contain Indian artifacts.

Only four percent of Onslow County is developed with urban uses mostly concentrated inside the corporate limits of Jacksonville. Surrounding civilian land uses are predominately agricultural and forestal in character.

PROJECT DESCRIPTIONS AND POTENTIAL ENVIRONMENTAL CONSEQUENCES

This section addresses the projects contained in the Capital Improvements Plan. Each Military Construction (MCON) and special fund project scheduled for construction during the 5-year period of this Plan should be evaluated for potential impacts as a part of project planning. During this evaluation, impacts which would interfere unreasonably with the living conditions of man, wildlife or marine life on an immediate, short-range or long-range basis were identified.

The projects listed in Table VII-6 have been evaluated for potential impacts, as part of the project planning process, and are not anticipated to have significant impact on air quality, earth resources, general ecology, groundwater, historic and archaeological resources, and development character. In general these projects do not appear to have significant long-term adverse impacts.

All MCON projects are anticipated to have short-term construction impacts on the surrounding environment, however these impacts are not expected to exist after project completion. All construction contracts should include, to the extent possible, mitigation measures which are designed to limit the adverse impacts resulting from construction.

TABLE VII-6
SUMMARY OF PROGRAMMED CIP PROJECTS
NAVAL DENTAL CLINIC ACTIVITY
CAMP LEJEUNE, NORTH CAROLINA

PROJECT NUMBER	PROJECT DESCRIPTION
P-605	DENTAL CLINIC
P-607	DENTAL CLINIC
P-701	DENTAL CLINIC

Source: Camp Lejeune Military Construction Project Data, 1986.

POSSIBLE CONFLICT BETWEEN PLAN RECOMMENDATIONS AND OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The master planning process for the Camp Lejeune Complex considered current and future mission requirements and produced recommendations for the land use plan and capital improvement projects which met these requirements. The recommendations include changes to existing land use patterns as well as changes to the future land use plan. The changes resulting from mission requirements considered objectives of Federal, Regional, State and local land use controls. Potential conflicts were resolved by virtue of the planning effort which must take into consideration all of the appropriate legislation identified above.

MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS

This section discusses the extent to which countervailing benefits could be realized by following reasonable alternatives to the proposed action that would avoid some or all adverse environmental effects. In addition, separate consideration must be given to any probable adverse environmental effects which cannot be avoided should the project be implemented.

Environmental impacts resulting from planned projects are expected to be temporary and the result of construction activity. In order to insure that every effort is made to mitigate these impacts, measures for mitigation should be specified in each project construction contract. Such measures as erosion control (installing siltation screens, etc.), air quality maintenance (spraying dust covered roads, etc.), and construction noise abatement (designating assigned travel routes, specifying work hours, etc.) need to be included to the extent possible so that these temporary impacts are made minimal.

Additional adverse impacts on the environment have not been identified in conjunction with implementation of the recommended land use plan. The master plan gives careful consideration to the environment and has resulted in a recommended land use plan which addresses impacts on the environment.

APPEARANCE GUIDELINES

This section discusses the aesthetic quality of the Naval Dental Clinic as part of the overall visual environment of the Camp Lejeune Complex. Integral to the improvement and maintenance of aesthetic quality are considerations of architectural features, streetscaping, landscaping, and visual communications. Appearance guidelines would provide an ongoing link between the planning process and construction of specific CIP projects to insure visual continuity throughout the Base. Thus, coordination of facility design, planting, and streetscape components would unify diverse functions and facility requirements.

With Branch Dental Clinics scattered throughout the Camp Lejeune Complex, the image of these facilities is directly related to future development of areas where they are located. Therefore, aesthetic considerations of these facilities must be made in terms of their specific locations within Marine Corps Base activity areas. Section IV contains a discussion of aesthetic guidelines related to implementation of the Land Use Plan for the Marine Corps Base.

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