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REHABILITATION STUDY

Bachelor Enlisted Quarters

Marine Corps Air Station (H)

New River

Camp Lejeune, North Carolina

OCTOBER, 1977

Piedmont Engineers, Architects & Planners

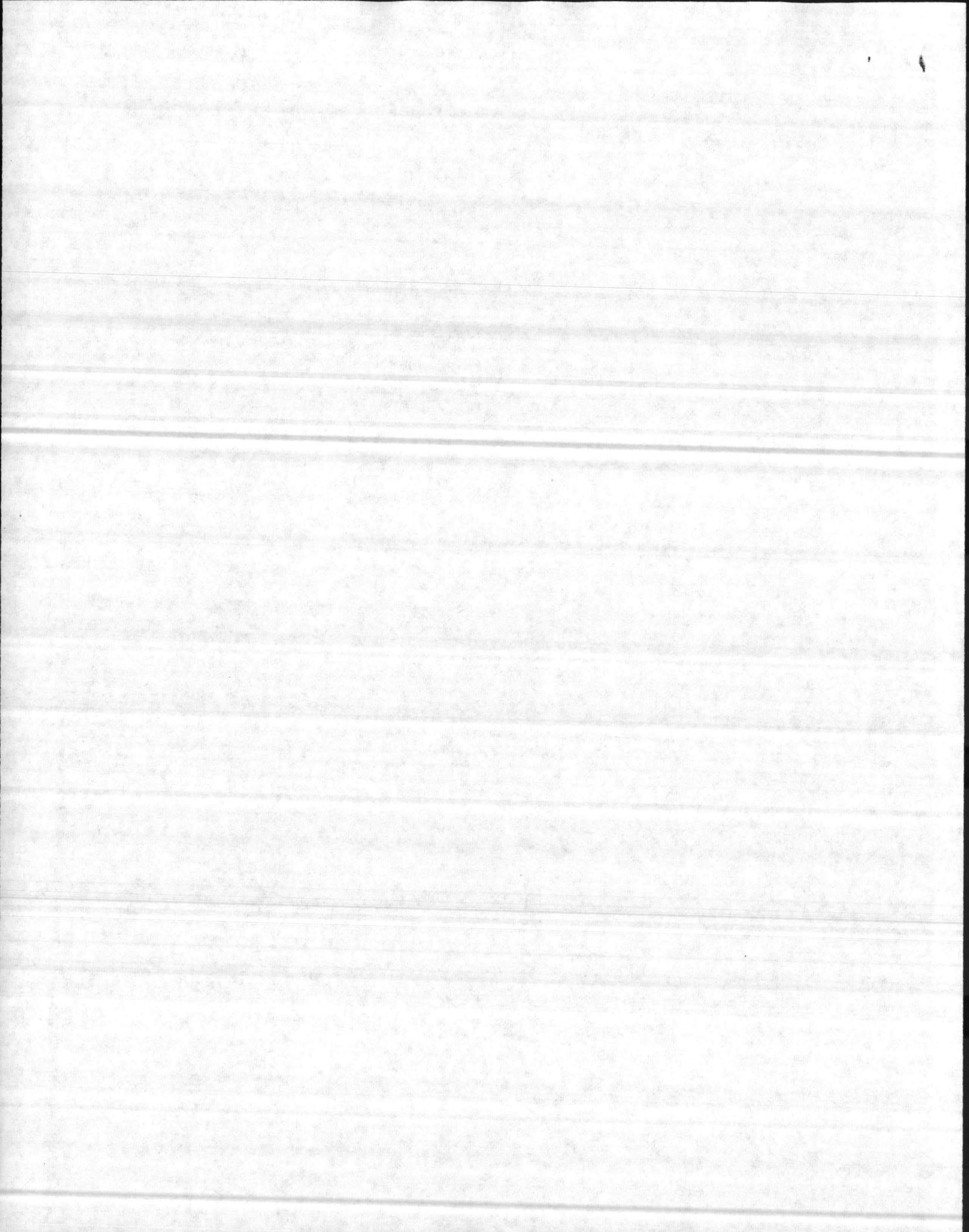
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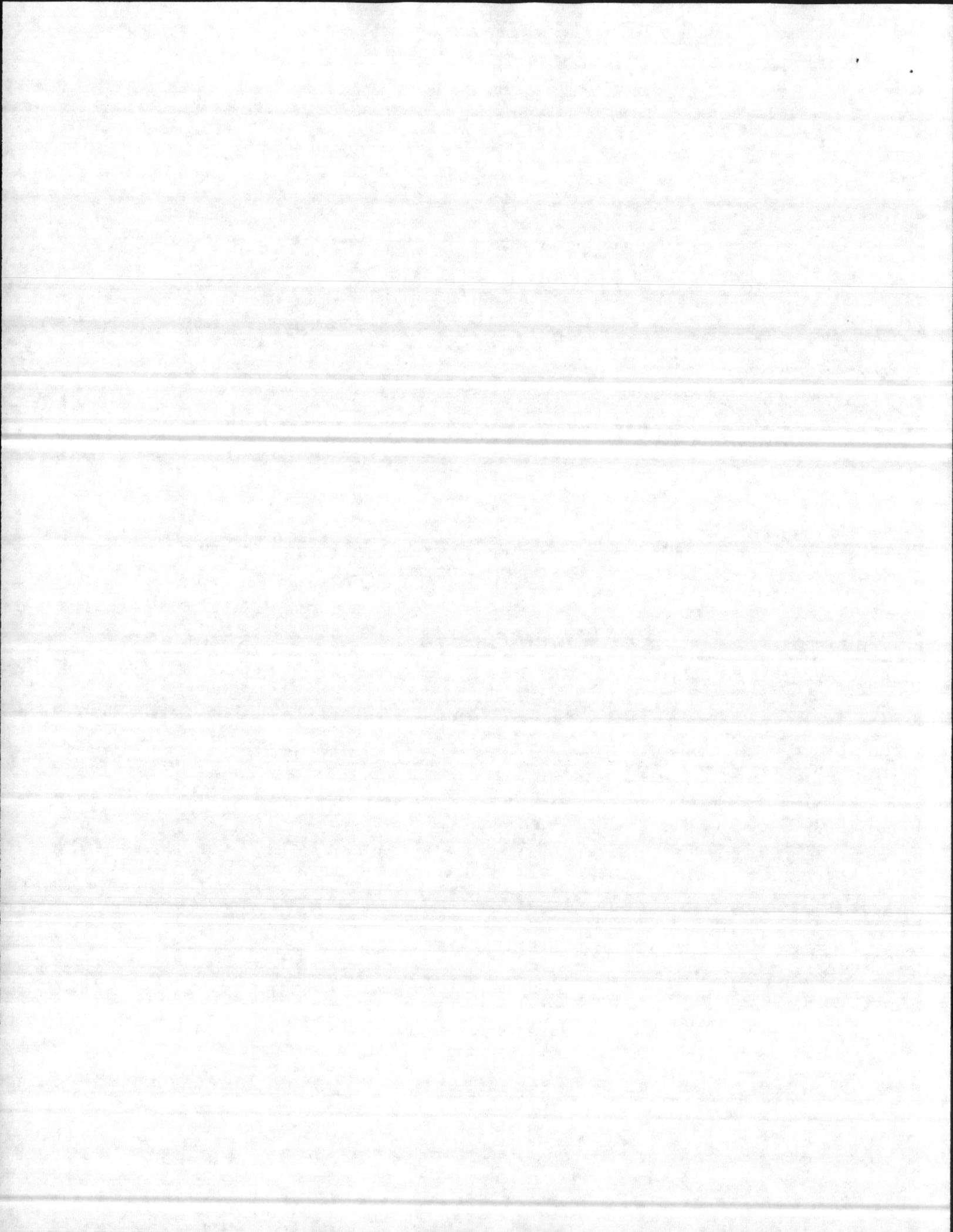


REHABILITATION STUDY

BACHELOR ENLISTED QUARTERS (P-226)
MARINE CORPS AIR STATION (H)
NEW RIVER, CAMP LEJEUNE, NC
CONTRACT N62470-77-C-4744

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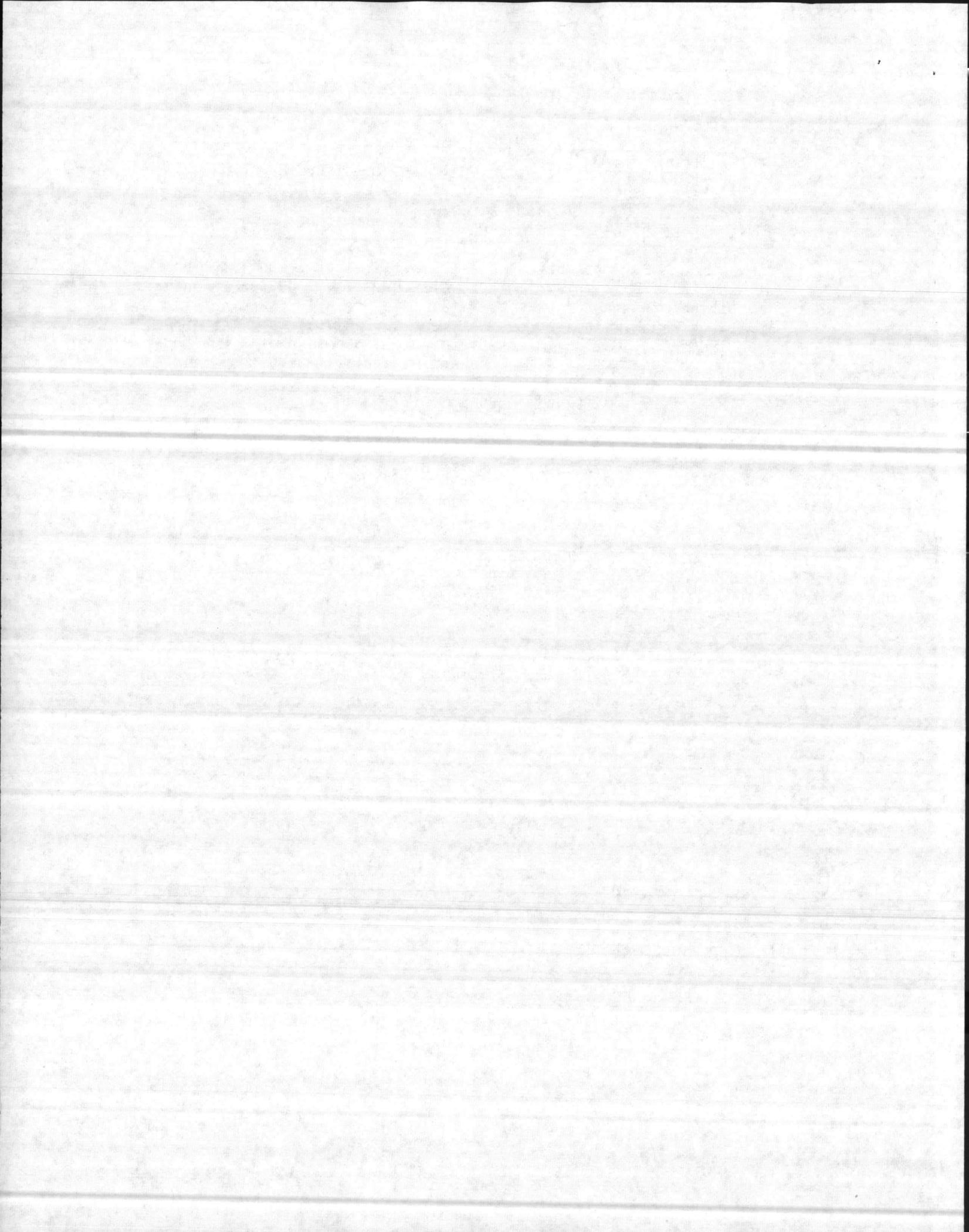


I. INTRODUCTION

This study was authorized to determine if it would be more economical to rehabilitate several existing squad-bay type barracks or construct new Bachelor Enlisted Quarters. The new construction would be a site adaptation of the standard Multi-Use Design B.E.Q. for 288 men.

Seven squad-bay type barracks are available for rehabilitation. Six of these existing buildings were built from the same plans but three of these were rehabilitated several years ago. This previous rehabilitation does not meet current DOD space criteria requirements. Of the three remaining buildings, one is abandoned and two are being used to house administrative functions. Minimum upgrading has been done by the Marines to make these facilities suitable for administrative use.

A field investigation was made by the design team to determine the extent and nature of deficiencies which must be corrected during the rehabilitation of these buildings.



ASSUMPTIONS

The seven existing barracks are each three stories high. Preliminary design studies revealed that two complete buildings and two floors of a third would be required to accommodate 288 men. A floor plan of the proposed renovation is included at the end of this section. The number of men per room is noted on the plan. Buildings # 215, 216 and 217 were designated for renovation since previous modifications to the other existing buildings would require more extensive rehabilitation.

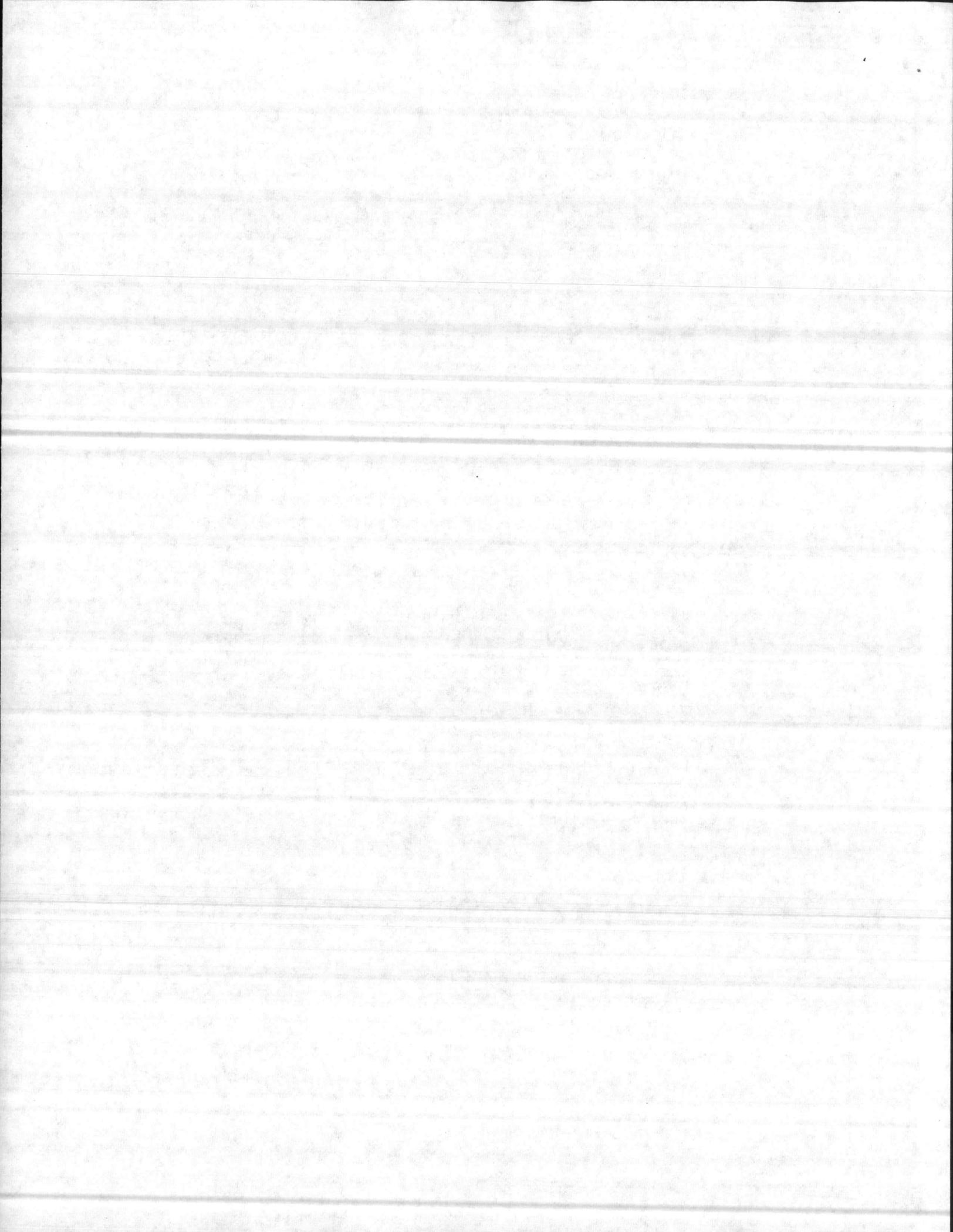
The rehabilitation includes all work necessary to make the existing buildings conform as closely as practical to new construction criteria. Assumptions on the extent of this work are as follows:

A. Architectural/Structural

1. The buildings will be re-roofed including insulation, trim, flashing, etc.
2. Exterior walls will be repaired and painted. Insulation will be veneered to the interior face of the exterior wall to comply with requirements for heat loss and sound reduction (due to location in the noise zone).
3. New interior walls will be 8" CMU.
4. All interior walls will be painted. Ceramic tile will be repaired and cleaned while vinyl tile will be replaced. Gypsum wallboard will be installed over the insulation on the inside face of the exterior walls. Suspended acoustical ceiling will be added to conceal new utilities and improve the sound transmission rating between floors.
5. Doors, frames and hardware will be replaced. Windows will be replaced with smaller units to comply with current criteria. Insulated glass will be provided to improve sound reduction and reduce heat loss - similar units are provided in the new facility.

B. Plumbing

1. All exposed plumbing fixtures and equipment will be replaced. The existing fixtures are at the end of their design life and are in poor condition.
2. All concealed plumbing lines will be left in place - see Section III Deficiencies.



C. Mechanical

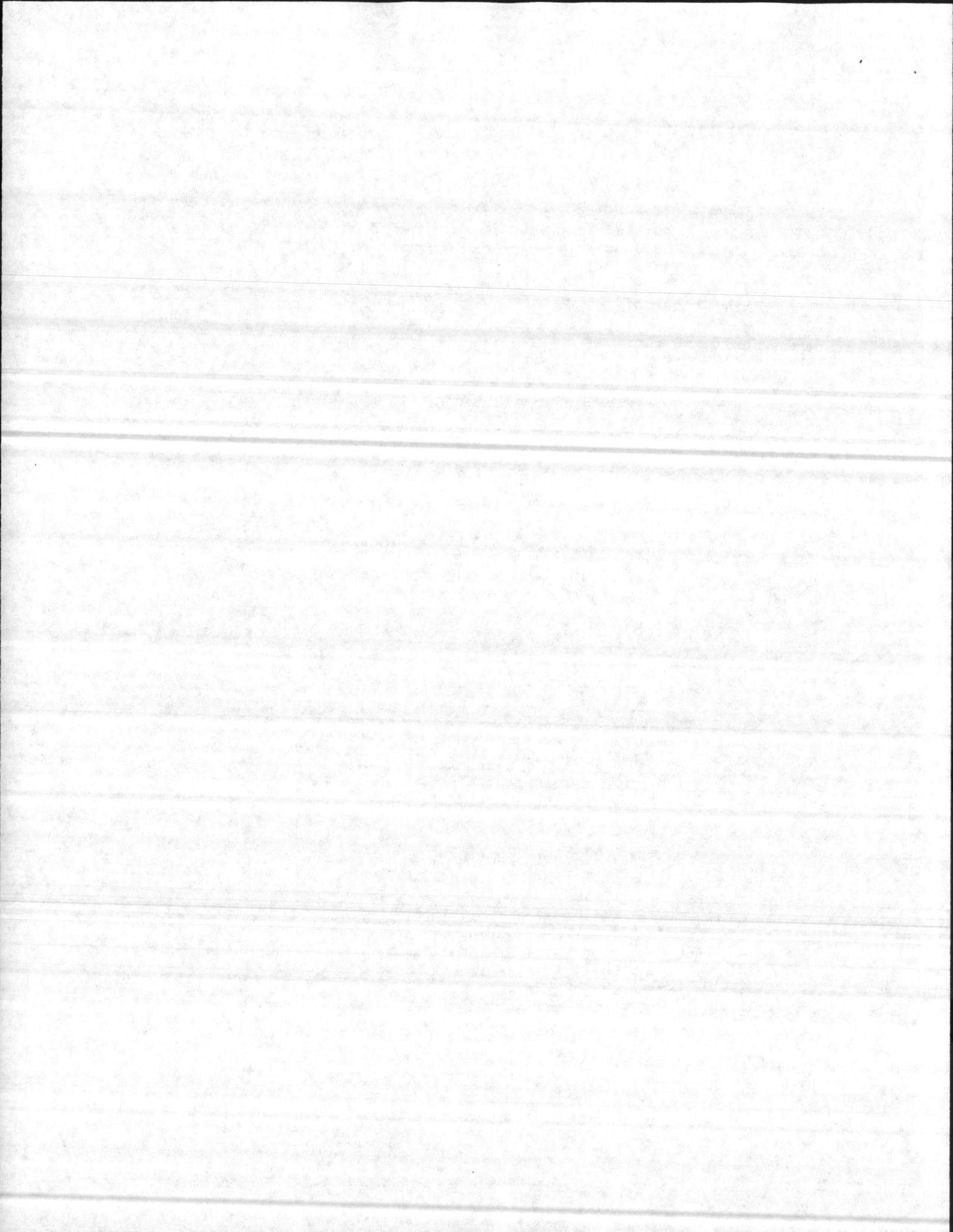
1. The existing heating system, in addition to being old, is not adaptable to the individual room concept. For this reason the entire system will be replaced.
2. Air conditioning will be added. This system will be tied into the central chilled water plant provided when the three adjacent barracks were rehabilitated several years ago.

D. Electrical.

1. Lighting is inadequate and will be redesigned for the new layout.
2. Due to use and age all receptacles and light switches will be replaced.
3. The telephone system will be reworked because of age and new design.
4. The fire alarm system is inadequate and inoperative and will be replaced completely.
5. Due to the new design and age of the existing system, the wire was judged unsuitable for use and will be replaced.
6. Due to redesign of the electrical system the capacity of the conduit is inadequate and will be replaced.
7. With the new electrical design the available short circuit interrupting rating of panels and breakers is inadequate and will be changed.
8. Due to additional electrical load it was judged necessary to replace and rework each substation.

E. Estimate

1. No Supervision Inspection and Overhead (SIOH) was included in the cost of either project for comparison purposes.
2. Since little or no work outside the "five foot line" will be required for the rehabilitation of existing buildings the cost of the new B.E.Q. was likewise limited to the "five foot line" but includes the mechanical equipment building and pile foundations.
3. Cost figures for the rehabilitation work include demolition as well as new work.



4. Fuel costs for the estimated operating cost were based on figures provided by LANTDIV, NAVFAC as follows:

#2 Fuel Oil - \$.41/gal.
Electric - \$26.35/MWH

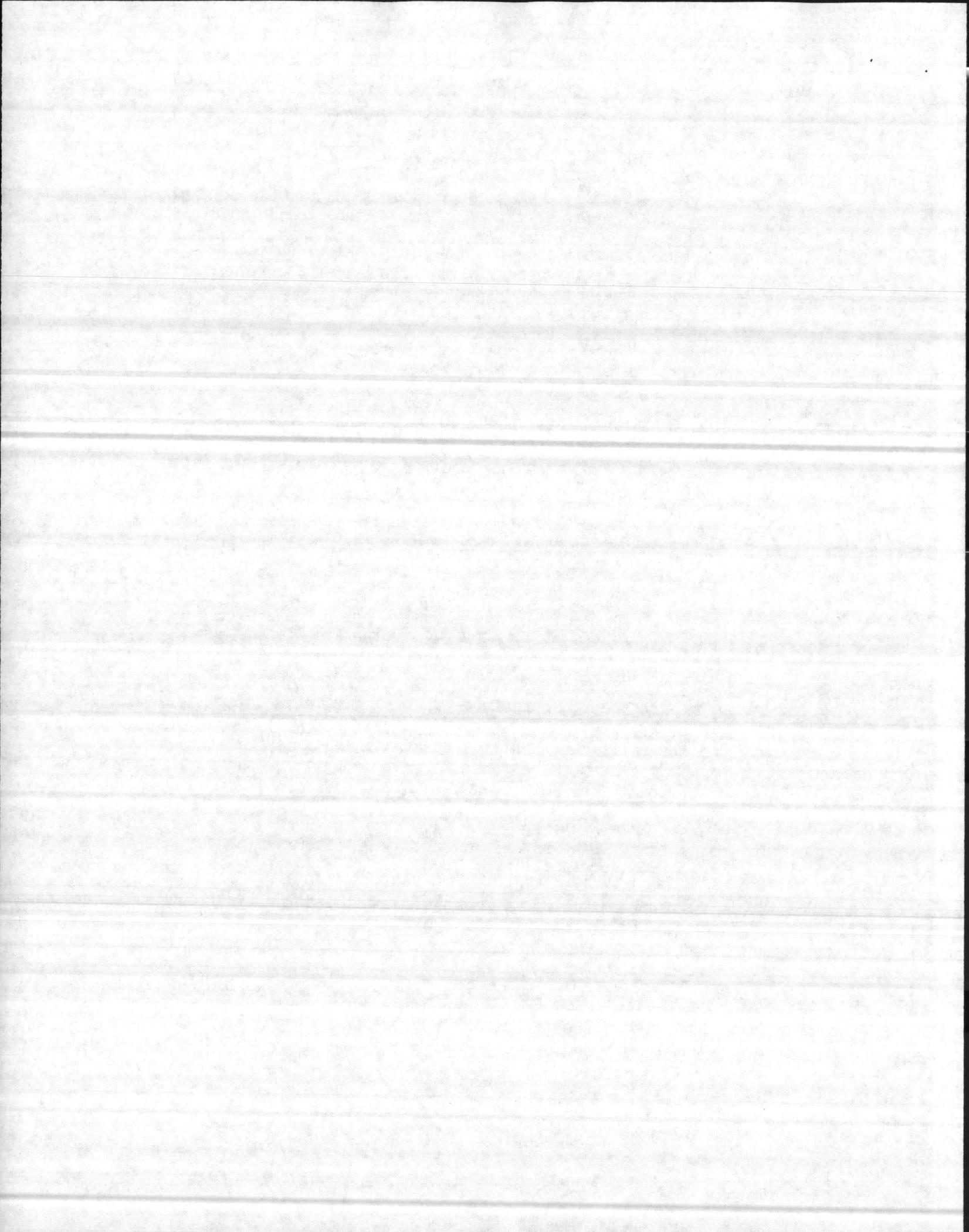
5. The estimate was made during the month of October, 1977 and the final submittal is due on 1 September 1978. A bid opening date in early October 1978 was assumed which will require escalation for 12 months. Since this coincides with FY 78 the prices were escalated at a straight 7% rate.

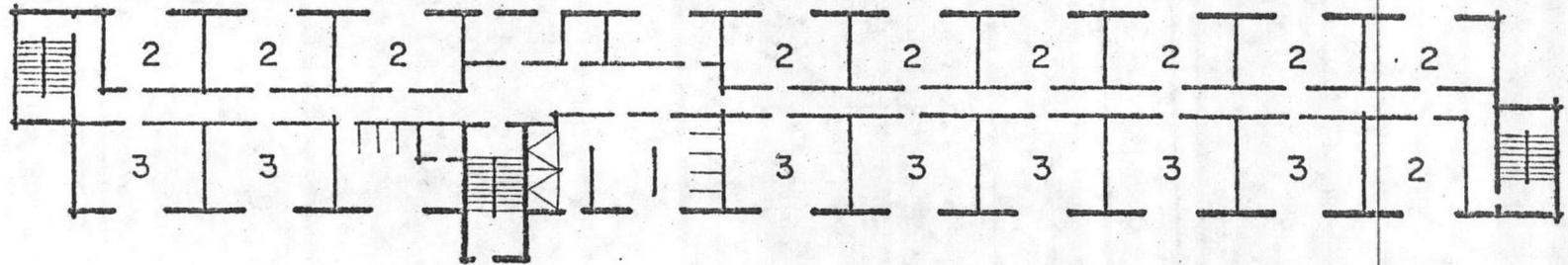
6. Contingencies were added to each system sub-total as follows:

M.U.D. Design - 3%
M.U.D. Design, New Work- 5%
Rehabilitation Work - 10%

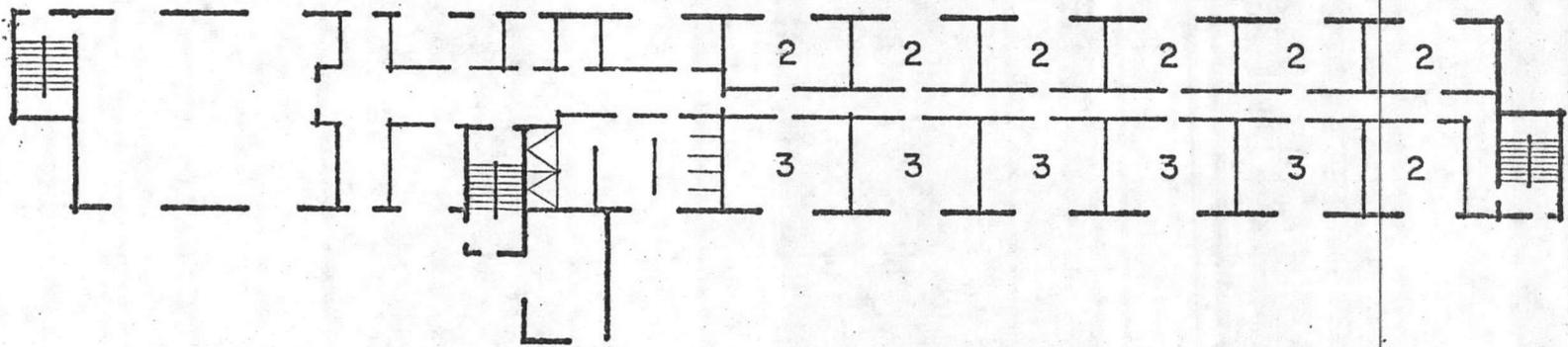
7. The interior electrical material take-off was made prior to the scope reduction to 288 men. Therefore, the subtotals in this section were reduced by one third - M.U.D. site adapt BEQ only.
8. The foundation design was based on the soils report for adjacent structures - Provided by LANTDIV, NAVFAC - MUD site adapt BEQ only.
9. At the direction of LANTDIV the labor rates were tailored to the Camp Lejeune area. Current wage rates provided by the Public Works Office at Camp Lejeune are listed below:

Heavy Equipment Operators	\$4.50/hr.
Electricians	6.00/hr.
Plumbers/Steamfitters	5.50/hr. and up
HVAC Mechanics	5.50/hr.
Reinforcing	4.25/hr.
Common Laborer	3.00-3.25/hr.
Mason	6.50/hr.
Painters	4.25/hr.
Concrete Finisher	4.50/hr.
Roofers	3.50/hr.
Soft Floor Installer	5.10/hr.
Hard Tile Installer	6.00/hr.
Carpenters	4.50-5.00/hr.
Pipe Layers	4.35/hr and up

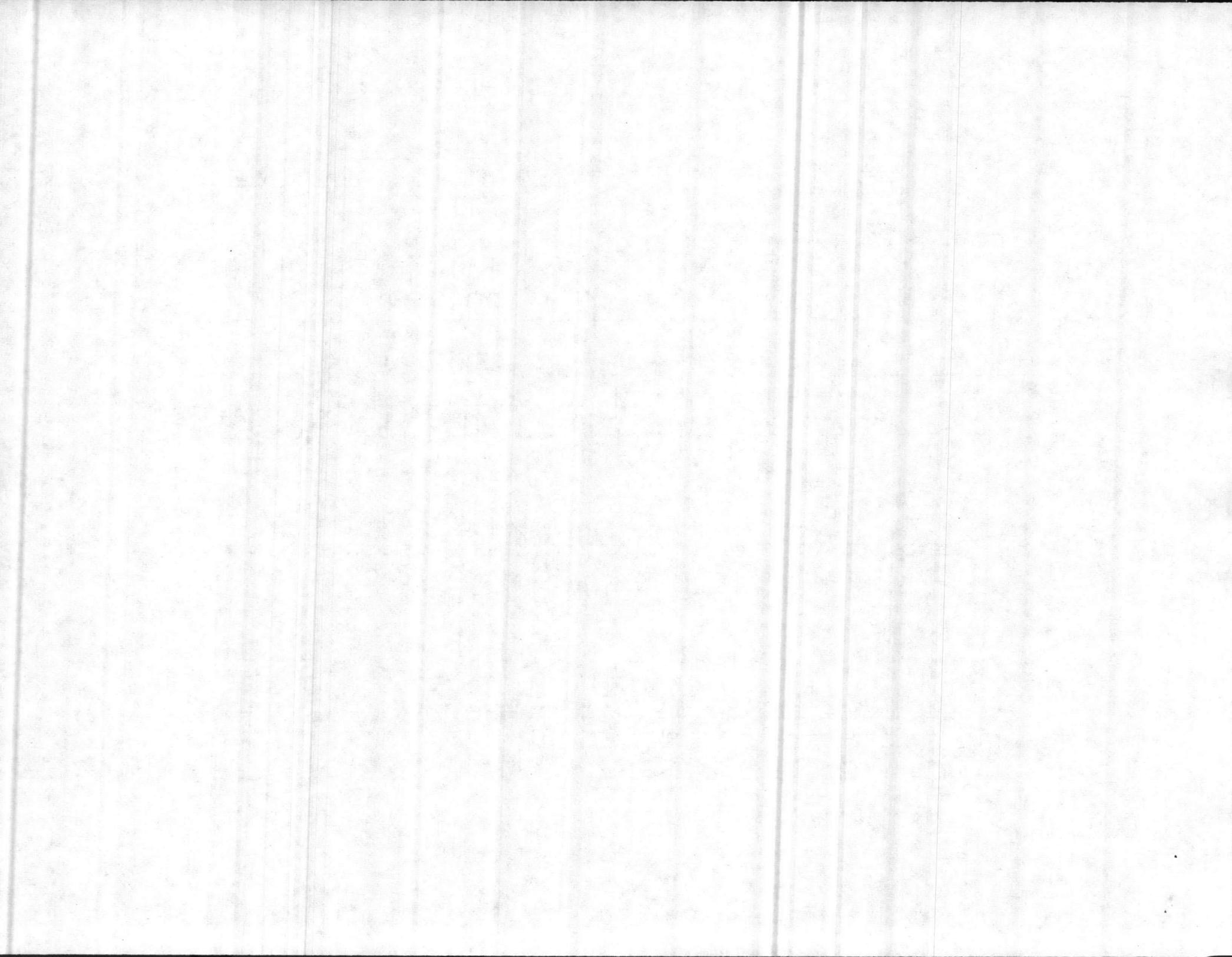




UPPER FLOOR PLANS (2)



GROUND FLOOR PLAN

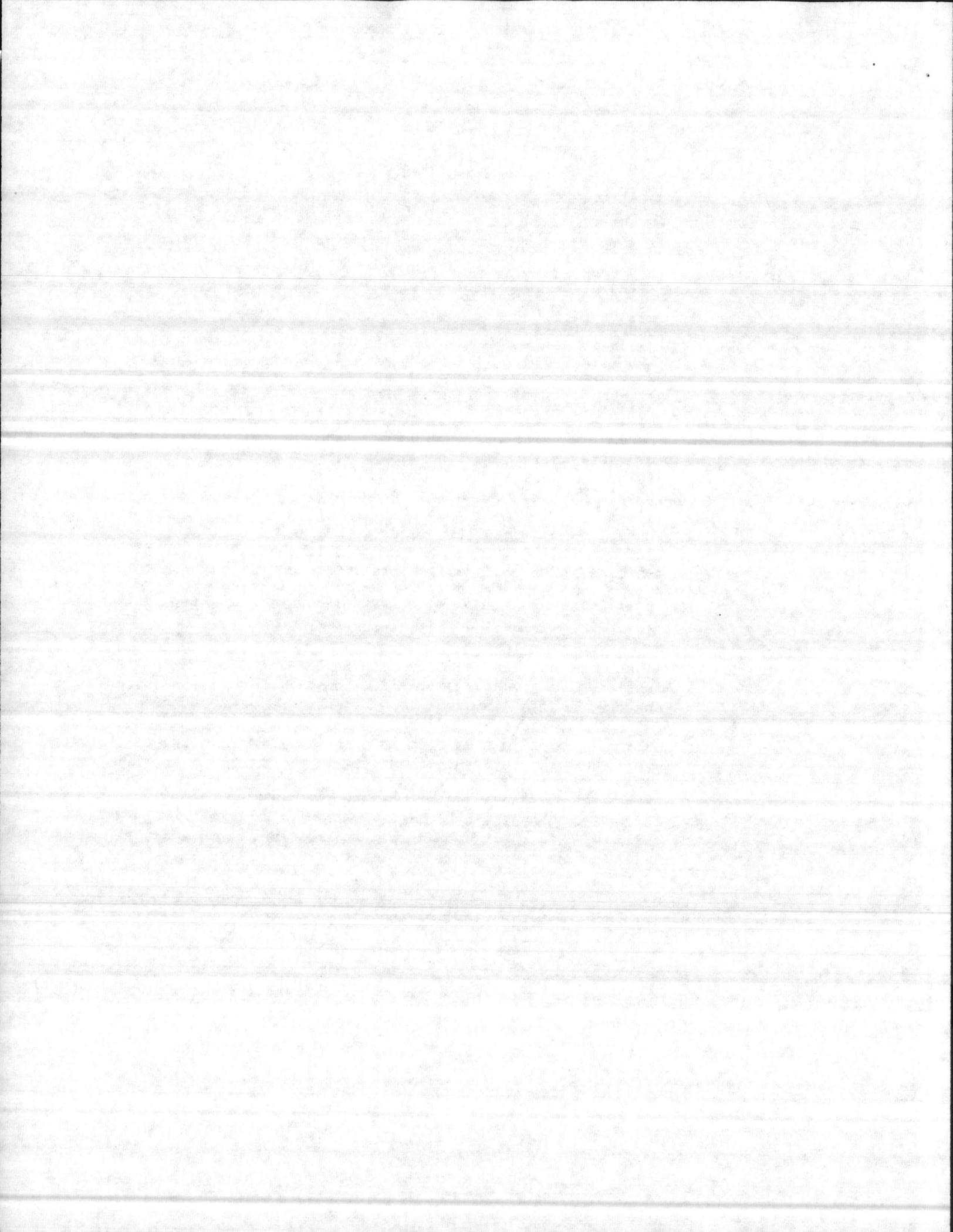


III. DEFICIENCIES

After all efforts have been made to upgrade the existing Bachelor Enlisted Quarters several deficiencies will still remain. ~~These are items which cannot feasibly be corrected~~ due to existing architectural and structural configurations. These items, plus several other less tangible deficiencies, are listed below:-

- A. Gang toilets must be utilized which will serve up to 29 personnel each. This is not in accordance with NAVFACINST 11012.114H, Paragraph 3a, which allows gang toilets to accommodate no more than 12 personnel (E.2-E.4).
- B. Minimum flexibility will be provided in the rehabilitation of these buildings. The gang toilet condition will preclude future changes in grade mix. This is not in accordance with NAVFACINST 11012.114H, Paragraph 5.
- C. Underground and concrete encased utilities (water, sanitary, and waste lines) were not modified in this study since there were no indications of failure in these systems. These items are, however, near the end of their original design life of 25 years. During the next 25 years the risk of failure will be significantly greater.
- D. The buildings have already been in existence close to the design life of many materials. These items will undoubtedly become constant maintenance problems. While the cost of this maintenance is included in the Economic Analysis the inconvenience to users and the work load on Maintenance Personnel should also be considered.
- E. The aesthetic qualities of these outdated structures, even after the "facelifting", is far short of that which would stimulate incentive and inspire higher morale in keeping with contemporary concepts of the modern Marine Corps.

The paragraphs referenced from NAVFACINST 11012.114H are contained in enclosure 2 of that instruction.

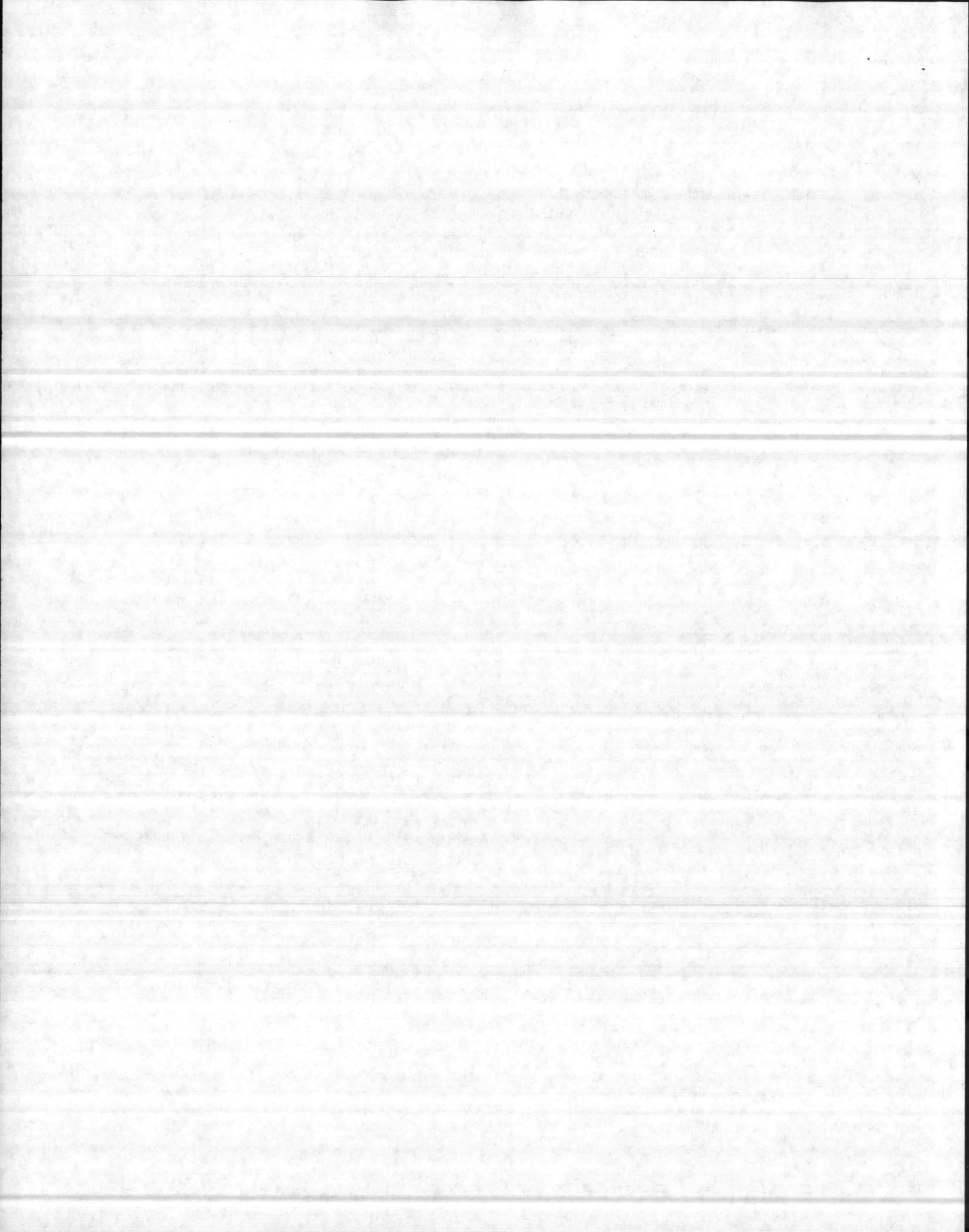


IV. CONCLUSIONS AND RECOMMENDATIONS

After reviewing the cost data and the list of deficiencies which cannot be rectified it is obvious that the best interest of the Government would be served by the construction of the new facility.

Even if the entire cost of supporting utilities and site work were to be included in the M. U. D. cost, it is doubtful that rehabilitation would be recommended due to maintenance and operating costs and remaining deficiencies.

In addition, if the Multi-Use Design Bachelor Enlisted Quarters are built then the existing barracks can continue to be utilized for administrative space. This additional advantage can be realized at no further cost since the minor renovations required for this usage have already been made.



PROGRAM COST ESTIMATES
ECONOMIC ANALYSIS OF SHORE FACILITY
NAVFAC 11010/1B (1-73)

DATE 31 Oct. 1977

1. ACTIVITY (Name and Location)
Marine Corps Air Station (H), New River, Camp LeJeune, NC

2. PROJECT TITLE
Bachelor Enlisted Quarters - Rehabilitation Study

P NO.
P-226

3. DESCRIPTION OF ALTERNATIVES
Alternate A - Rehabilitate existing three story squad-bay type barracks as required to house 288 men in accordance with latest bachelor housing criteria.
Alternate B - Construct a new 288 man Multi-Use Design (M.U.D.) Type bachelor enlisted quarters on a vacant site requiring no demolition of existing structures.

4. PROJECT COST PROJECTIONS BY ALTERNATIVES

ALTERNATIVE A Rehabilitate BEQ's #215, 216, 217

ECONOMIC LIFE 25 YRS.

DESCRIPTION AND YEAR	COSTS (\$)		DISCOUNT FACTOR	PRESENT VALUE (\$)
	ONE TIME	RECURRING		
INVESTMENT 1978	\$1,701,300	-	.954	\$1,623,040
OPERATIONS Annual	-	\$56,500	16.303	921,119
MAINTENANCE Annual	-	26,300	9.524	250,481
PERSONNEL -	-	-	-	-
TERMINAL VALUE -	-	-	-	-
OTHER: -	-	-	-	-

TOTAL PRESENT VALUE ALTERNATIVE A - \$ 2,794,640

ALTERNATIVE B Construct New BEQ

ECONOMIC LIFE 25 YRS.

DESCRIPTION AND YEAR	COSTS (\$)		DISCOUNT FACTOR	PRESENT VALUE (\$)
	ONE TIME	RECURRING		
INVESTMENT 1978	\$1,591,900	-	.954	\$1,518,673
OPERATIONS Annual	-	\$38,800	16.303	632,556
MAINTENANCE Annual	-	13,400	9.524	127,622
PERSONNEL -	-	-	-	-
TERMINAL VALUE -	-	-	-	-
OTHER: -	-	-	-	-

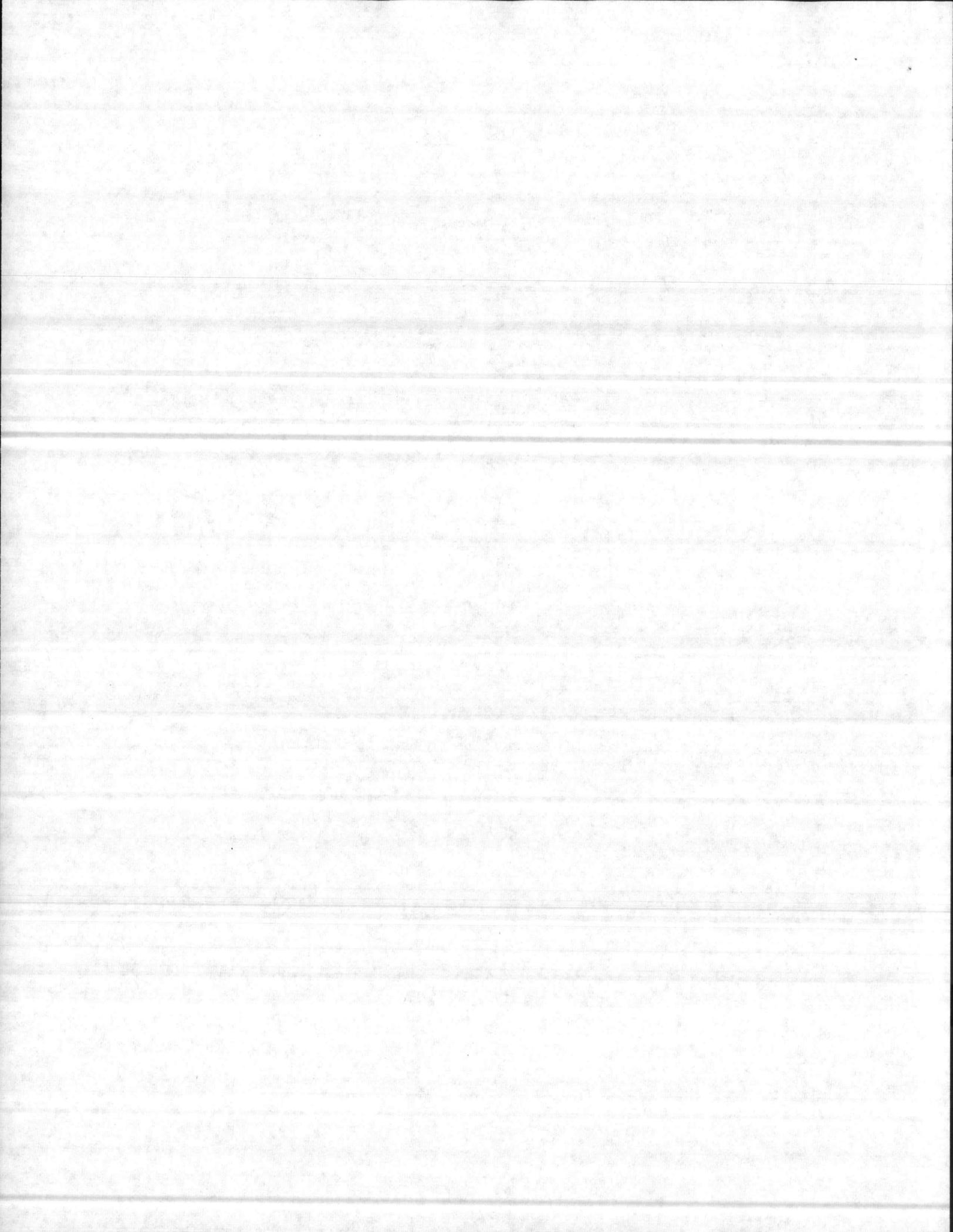
TOTAL PRESENT VALUE ALTERNATIVE B - \$ 2,278,851

5. UNIFORM ANNUAL COST (Present Value)

ALTERNATIVE A
\$ 46,864

ALTERNATIVE B
\$ 30,407

REMARKS Alternate "B" is the most favorable choice-see attached report.

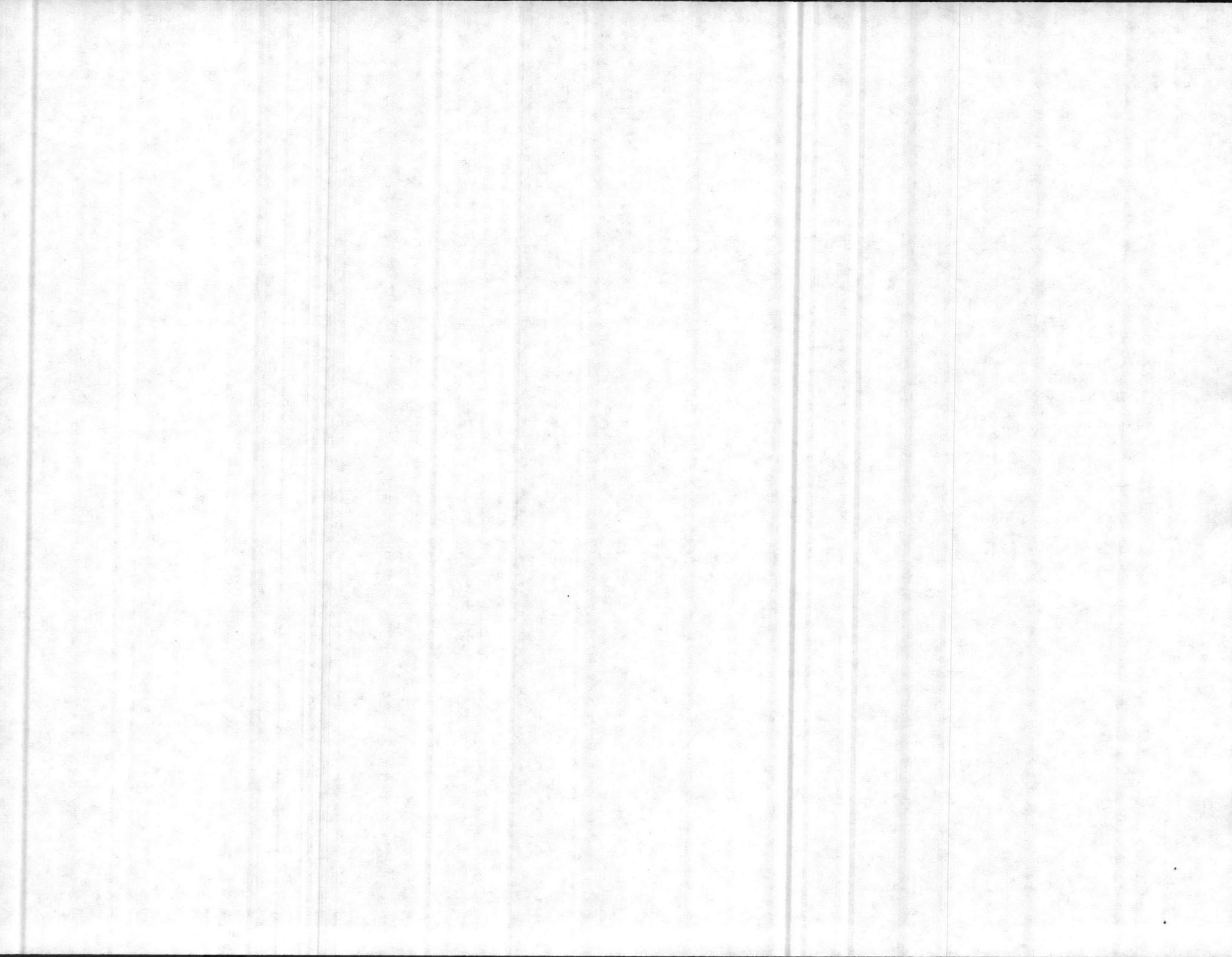


VI. ECONOMIC EVALUATION OF MILITARY CONSTRUCTION INVESTMENTS

GENERAL INFORMATION

1. Submitting DOD Component: NAVY
2. Name of Activity: Marine Corps Air Station (H), New River, Camp Lejeune, NC
3. Date of Submission: 31 October 1977
4. Project Title/Description of Project Objective:
Bachelor Enlisted Quarters (P-226). The objective of this project is to correct present bachelor enlisted housing deficiencies.
5. Alternatives Available:

<u>IDENTIFICATION</u>	<u>INVESTMENT YEAR</u>	<u>ECONOMIC LIFE (YRS)</u>	<u>DESCRIPTION</u>
A.	1978	25	Rehabilitate existing barracks as required to house 288 men in accordance with latest bachelor housing criteria.
B.	1978	25	Construct new 288 man BEQ (M.U.D. Design) on a vacant site - No demolition of existing barracks will be required.

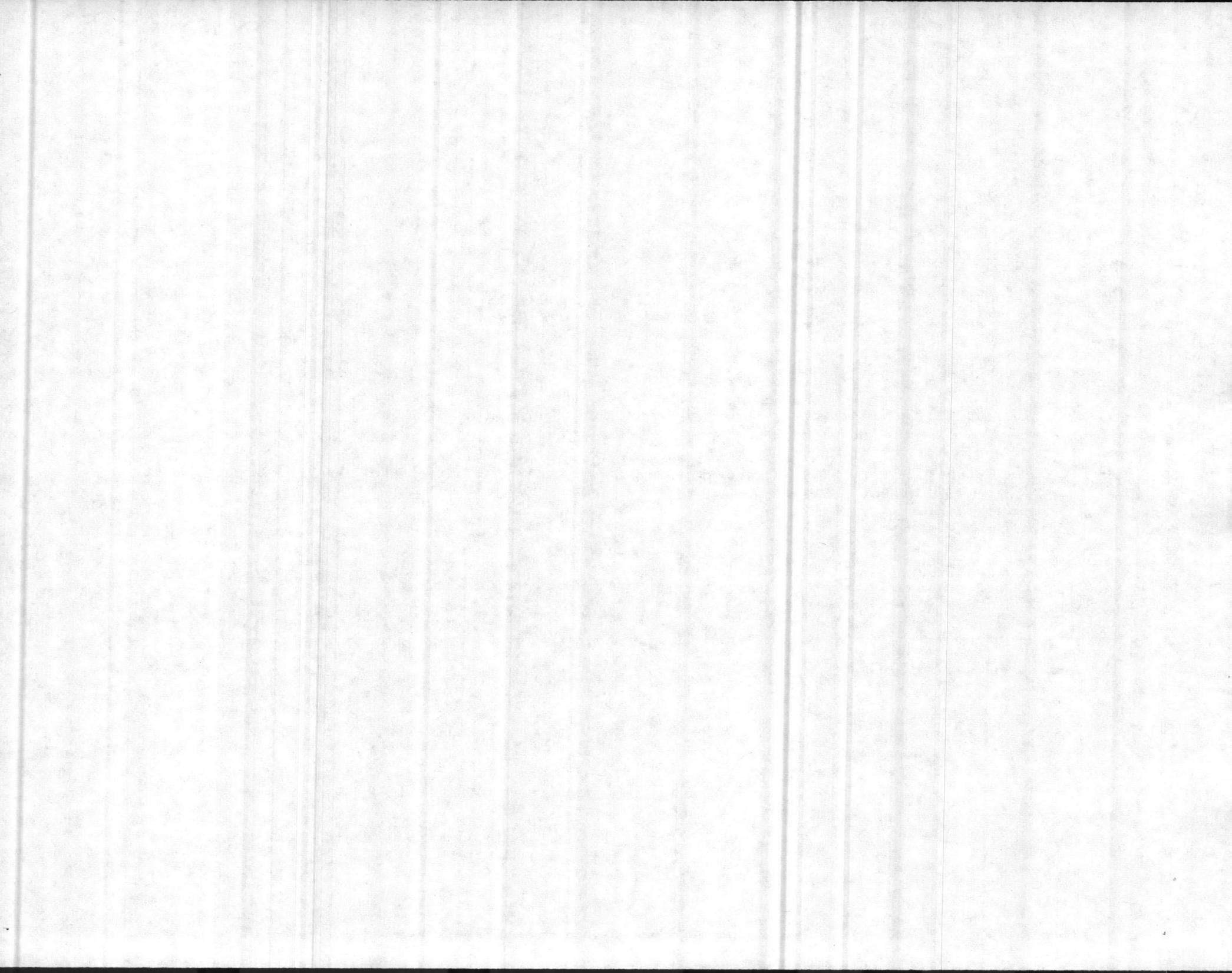


ECONOMIC EVALUATION OF MILITARY CONSTRUCTION INVESTMENTS

SUMMARY TABLE

<u>ALTERNATE</u>	<u>NET INVEST. COST</u>	<u>NET INV. COST/SF</u>	<u>NET INVEST. COST/MAN</u>	<u>(INVEST.+ ANNUAL) TOTAL COST</u>	<u>(INVEST. ANN TOTAL COST)/MA</u>
A	\$ 1,701,300	\$ 29.37	\$ 5,907	\$ 2,489,887	\$ 8,645
B.	\$ 1,186,400	\$ 25.83	\$ 4,119	\$ 1,683,553	\$ 5,846

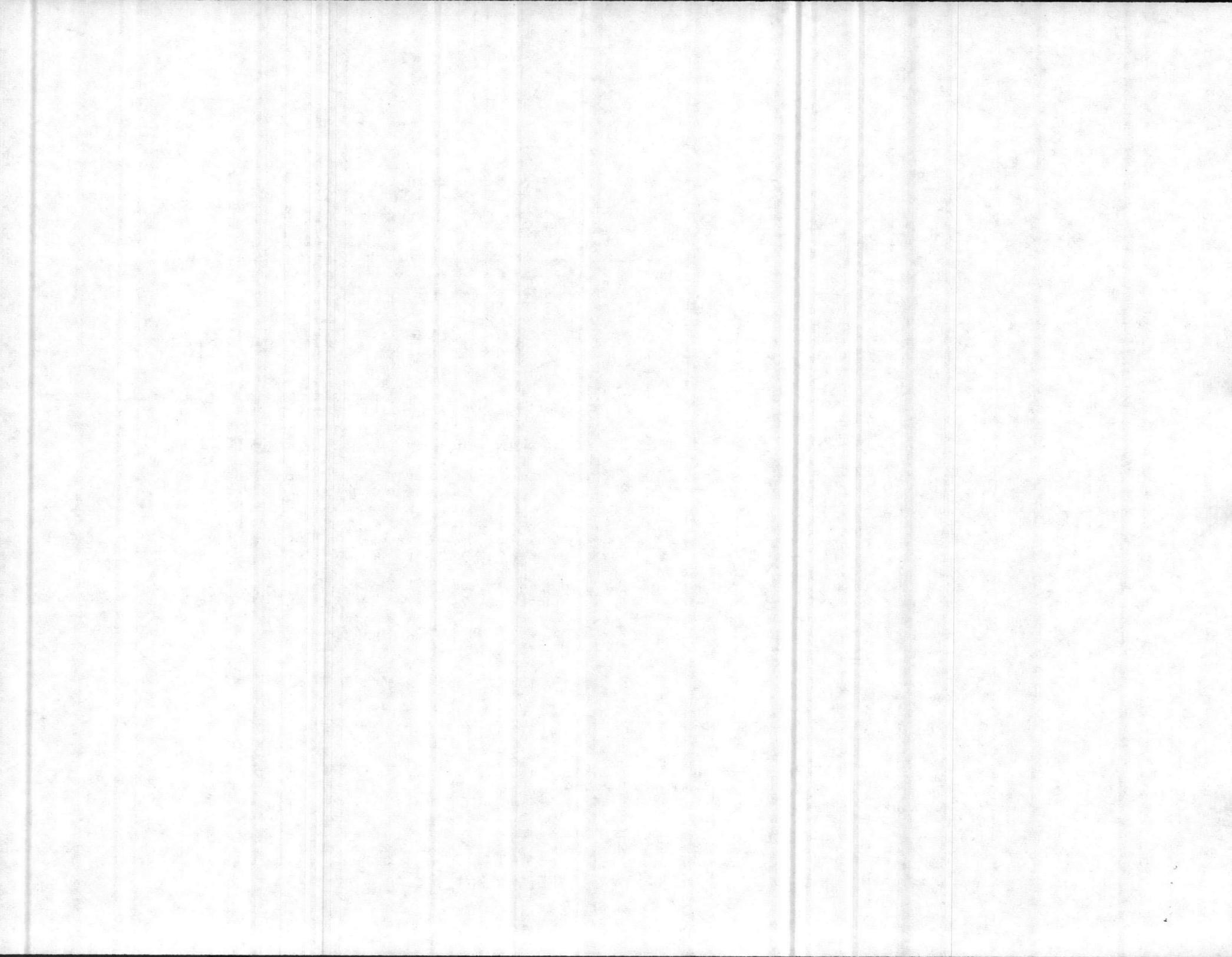
NOTE: Net figures shown above are Budget Cost Estimates including some Supporting Facilities beyond the "five foot line". These figures also reflect credits for existing Barracks to be re-used for other purposes and include costs for demolition of portions of the barracks to be rehabilitated. Therefore, statutory limits of cost per man cannot be applied to this table.



ECONOMIC EVALUATION OF MILITARY CONSTRUCTION INVESTMENTS

ONE-TIME COST DATA

1. Alternative Identification:	<u>A</u>	<u>B</u>	<u>A minus B</u>
2. Investment Cost			
a. Rehabilitate existing barracks	\$1,701,300	-0-	\$1,701,300
b. Construct new 288-man barracks	-0-	\$1,591,900	\$1,591,900
TOTAL			\$ 109,400
3. Working Capital Changes, plus or (minus):	-0-	-0-	-0-
4. Less: Value of Existing Assets Replaced, (plus) or minus:	-0-	-0	-0-
5. Plus: Value of Existing Assets to be Employed (Barracks to be retained for other uses)	-0-	(\$405,500)	\$ 405,500
6. Differential Net Investment:			\$ 514,900
7. Net Investment Cost/Sq. Ft: Differential	\$ 29.37	\$ 25.83	\$ 3.54
8. Net Investment Cost/Man: Differential	\$5,907	\$ 4,119	\$ 1,788



ECONOMIC EVALUATION OF MILITARY CONSTRUCTION INVESTMENTS

ANNUAL COSTS & SAVINGS/INVESTMENT RATIO

1. Alternate Identification:	<u>A</u>	<u>B</u>	<u>A minus B</u>
2. Annual Costs:			
a. Personnel: Included in Operating Maint. Costs			
b. Operating:			
1) Fuel/Utility Costs	\$56,500	\$38,800	\$ 17,700
2) Maintenance Costs	\$26,300	\$13,400	\$ 12,900
c. Overhead: NO CHANGE			
3. Total Annual Savings:			\$ 30,600
4. Present Value Factor:			9.524
5. Present Value of Annual Savings:			\$291,434
6. Differential Net Investment:			\$514,900
7. Savings/Investment Ratio:			-

Since Alt. A costs more in both investment and annual costs there is not savings/investment ratio and Alt. B is therefore the most favorable choice.

