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# NORTH BASE REHABILITATION STUDY



## EDWARDS A.F.B., CALIFORNIA

SEPTEMBER 1990


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**Air Force Flight  
Test Center**



**US Army Corps  
of Engineers -  
Omaha District**



**NORTH BASE REHABILITATION STUDY**  
**EDWARDS AIR FORCE BASE, CALIFORNIA**

**Prepared By U.S. Army Corps Of Engineers**  
**Omaha, Nebraska**

**SEPTEMBER 1990**

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TABLE OF CONTENTS

<u>SECTION:</u>	<u>PAGE:</u>
I. Introduction	1
II. Methodology	2
III. Airfield Pavements	4
IV. Roads & Parking	22
V. Utilities ( Water & Sewer )	28
VI. Utilities ( Electrical & Communications )	36
VII. Upgrade Buildings ( Hangars - Existing )	40
VIII. Upgrade Buildings ( Support Facilities - Existing )	63
IX. Buildings ( Support Facilities - New )	83
X. Physical Security	87
XI. Summary	92

APPENDICES:

Appendix A: Aerial Photograph Of North Base

Appendix B: Briefing Slides

Spot 99

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## LIST OF FIGURES

<u>FIGURE:</u>	<u>PAGE:</u>
Figure 1: Location Plan for Extend & Upgrade Runway	15
Figure 2: Location Plan for Upgrade Taxiways	18
Figure 3: Location Plan for Expand & Upgrade Aprons	20
Figure 4: Location Plan for Roads & Parking	26
Figure 5: Location Plan for Utilities (Water & Sewer)	32
Figure 6: Location Plan for Utilities (Elec. & Comm.)	38
Figure 7: Location Plan for Upgrade Bldgs. (Hangars)	50
Figure 8: Floor Plan for Building 4305	53
Figure 9: Floor Plan for Building 4401	56
Figure 10: Floor Plan for Building 4402	59
Figure 11: Floor Plan for Building 4505	62
Figure 12: Location Plan for Upgrade Bldgs. (Support Facilities)	68
Figure 13: Floor Plan for Building 4307	70
Figure 14: Floor Plan for Building 4318	72
Figure 15: Floor Plan for Building 4400	74
Figure 16: Floor Plan for Building 4493	76
Figure 17: Floor Plan for Building 4494	78
Figure 18: Floor Plan for Building 4496	80
Figure 19: Floor Plan for Building 4506	82
Figure 20: Location Plan for Buildings (Support Facilities-New)	84
Figure 21: Location Plan for Physical Security	90
Figure 22: Master Plan For The Rehabilitation Of North Base	93

**LIST OF TABLES**

**TABLE:**

**PAGE:**

Table 1:	Aircraft Pass Levels	5
Table 2:	Airfield Construction Time Durations	12
Table 3:	Summary Of Project Costs For Airfield Pavements	94
Table 4:	Summary Of Project Costs Excluding Airfield Pavements	95
Table 5:	Summary Of Total Project Costs	96
Table 6:	Sequencing Of Projects For Operational Milestones	98

## I. INTRODUCTION

The North Base at Edwards AFB, California consists of a mixture of facilities differing in their year of construction, functional use and physical condition. Many of these facilities were built in the 1940's when the base was initially constructed and have exceeded their 25-year life expectancy. A portion of the facilities are of a newer vintage, built in the 1960's, and are in relatively good condition.

The maintenance history of each building on North Base differs, some have been previously upgraded to support ongoing programs while others have been left to deteriorate to the point where demolition is a viable alternative. In the past, the hangars have been modified to meet the needs of specific programs, but over a period of time the facilities have continued to fall behind in terms of complying with Air Force criteria with respect to the two high cost areas of fire protection and electrical code compliance. Additionally, the infrastructure, consisting of airfield pavements, roads and utilities, has exceeded it's life expectancy and in some cases has deteriorated to the point where monthly repair projects are required to maintain it's functionality.

The purpose of this study is to assess the capabilities of the individual facilities and the associated elements of the infrastructure required to support future mission requirements

and to develop the associated costs of those improvements.

## II. METHODOLOGY

Since the North Base complex will be used to support relatively small classified programs, program requirements have been identified on the basis of a generic class of needs. The project scopes and associated estimates shown in this report have been based upon preliminary site visits and meetings with Air Force personnel. Using this background material as a basis for the study, along with as-built drawings and past experience with similar projects at other bases, a scope and estimate has been developed for those projects identified by the Air Force as necessary for meeting future mission requirements. As criteria becomes more definitive additional analysis and evaluation will be necessary to clarify specific project requirements.

The projects have been initially grouped into eight separate categories for the purpose of developing construction packages which are exclusive to themselves in order to minimizing construction conflicts and providing a complete functional facility. Due to funding and specific user requirements the categories may be separated and included with portions of other categories. The categories used are:

1. Airfield Pavements
2. Roads & Parking

3. Utilities ( Water & Sewer )
4. Utilities ( Electrical & Communications )
5. Upgrade Buildings ( Hangars - Existing )
6. Upgrade Buildings ( Support Facilities - Existing )
7. Buildings ( Support Facilities - New )
8. Physical Security

The format used in summarizing the information on the individual projects contained in each of the categories includes a brief text description of the identified deficiencies along with a project summary sheet which lists estimated cost and associated scope of work. The total program costs have then been summarized and preliminary project groupings made in the summary section of the report.

The support information contained in this document dealing with pavement cross sections, pipe sizes, etc. is meant only as background information for the estimated costs shown. During the design phase of the project, additional evaluation will be required to determine the specific design parameters as dictated by the individual project requirements.

### III. AIRFIELD PAVEMENTS

#### A. Upgrade Runway

The existing runway was constructed during the middle 1940's. The asphaltic cement concrete has had a surface treatment in recent years. The layout of the North Base airfield consists of a single runway (200' x 6000') with the runway also being used as the primary taxiway. The primary taxiway from the hangars and aprons intersect the runway at the midpoint forming a "T" configuration. The runway ends and midpoint areas are rigid pavement. The remainder of the runway is flexible pavement. Two airfield pavement evaluations were performed in 1989. The Air Force Engineering and Services Center, Tyndall AFB performed a modified Pavement Condition Index (PCI) in June 1989 which evaluated the pavement surface condition on visual observations. The PCI performed by Tyndall AFB does not meet the evaluation procedures set/forth in AFR 93-5, Chap. 2. Additionally, Tyndall AFB performed nondestructive testing using the Falling Weight Deflectometer. In August 1989, the Waterways Experiment Station (WES) performed a PCI. The evaluation performed by WES was in accordance with the requirements of AFR 93-5, Chap. 2. Both reports utilize destructive testing results performed in January 1983. This data will be updated with additional destructive testing for the pavement design. The two evaluations rated the North Base airfield from excellent to failed.

Information received from Edwards AFB at this time

requires the proposed mission to include the following aircraft and alternate pass levels:

Table 1: Aircraft Pass Levels

Aircraft	Alternate Pass Levels	
	<u>Runway</u>	<u>Taxiway/Apron</u>
C-130	2,400	1,200
C-141	200	100
F-15C	9,600	4,800
12,500 lb.	67,200	33,600

The alternate pass levels are based upon 25 years of service life and the fact that the runway is additionally used as the primary taxiway. All airfield features evaluated were determined from the procedures set forth in TM 5-827-3, TM 5-827-2, and the computer aided evaluation for airfield pavement, APEPCN, developed by WES. The evaluation indicates that each of the above listed aircraft, with the exception of the 12,500 pound aircraft, exceeds the Allowable Gross Loads (AGL) of the present runway pavement for the alternate pass levels listed above.

Four options are presented to increase the runway's AGL for medium load pavements:

**Option 1:** Remove the existing 4-6 inches of flexible pavement and replace the center 75 feet of runway with 11.5 inches of new Portland cement concrete on grade for Type A traffic. The outer edges of the runway shall be 3 inches of hot-

mix recycled asphalt cement concrete on a new 8.5 inch crushed aggregate base course.

**Option 2:** Overlay the existing flexible pavement with 5 inches of new asphaltic cement concrete and overlay the existing rigid pavement with 8.5 inches Portland cement concrete. The flexible overlay will incorporate a geotextile interlayer for the purpose of reducing reflective cracking. The rigid pavement at the east end of the runway will not require an overlay since the pavement in this area has sufficient thickness for the aircraft and pass levels previously listed. However, the replacement of the joint sealant in this area is recommended.

**Option 3:** Remove 4-6 inches of flexible pavement and replace with 11.5 inches of new Portland cement concrete in the center 75 feet of the runway on grade for Type A traffic, and 6.5 inches on grade of new Portland cement concrete on the outer edges for Type D traffic.

**Option 4:** Remove the existing flexible pavement and replace the center 75 foot width of the runway with 5 inches of recycled hot-mix asphalt cement concrete on a new 6 inch crushed aggregate base course for Type A traffic. The outer portion of the center 75 feet will consist of 3 inches of recycled hot-mix asphalt cement concrete on a new 8 inch crushed aggregate base course for Type D traffic. The existing asphalt cement concrete pavement will be utilized for the new recycled pavement subject to the existing pavement meeting acceptable



quality requirements. The existing runway rigid pavement at the intersection of the taxiway and the rigid pavement at the west end of the runway shall be removed and replaced with 11.5 inches of Portland cement concrete on grade. The east end of the runway shall be as previously described in Option 2.

All of the above described pavement options were designed for a service life of 25 years. However, the actual pavement service life is affected by several variables. One common cause in the reduction of pavement service life is poor construction. As the quality in construction procedures is reduced, the service life is reduced, and the pavement may require additional and costly repairs, and/or increased routine maintenance. Other variables leading to a reduction in service life include mission change, delayed or lack of maintenance to the pavement, environmental conditions, excessive overloading, or additional pass intensities which exceed that for which the pavement was designed. While the design life can be achieved and realistically exceeded, all options require some sort of maintenance, be it resealing of joints (Options 1 and 3), spall repair (Options 1 and 3), or surface treatment (Options 1, 2 and 4).

#### **B. Runway Extensions**

Due to the increase in aircraft size, a 1000 foot extension of pavement is needed on each end of the runway in order to conform with the requirements of AFM 86-2. The extensions may

utilize either Options 1 or 3 to conform to Air Force criteria. An all rigid pavement turnaround will be used at each end of the extensions. These areas are sized for C-141 aircraft. The overrun portion of the runway shall consist of flexible pavement. The first 150 feet will be a 2 inch thick bituminous surface course on a 6 inch base course. The remainder of the required 1000 foot overrun will be a double bituminous surface treatment on a 6 inch crushed aggregate base course.

An electrical switching station located at the west end of the runway is planned to be moved in FY 90 base electrical upgrade project, so no cost has been included for this item of work. Likewise a California utility substation located out from the west end of the proposed runway extension is currently being planned to be moved in approximately two years. This move will be performed by the power utility company, so no cost has been included in the estimate for this work. An initial concern as to the location of the substation within the glide slope of the runway extension has been check by the Base and was found to be unfounded since the substation at its present location meets airfield clearance requirements.

### C. Upgrade Taxiways

Evaluation of the taxiways was performed in accordance to the referenced AFM's as indicated in paragraph: Upgrade Runway. The flexible and rigid taxiways have the same deficiencies in AGL's as the runway for the proposed upgrade mission, with the

exception of the taxiway leading to and within the compound of Building 4505. This portion of the taxiway has sufficient thickness for the proposed upgrade mission. Replacement of the joint sealant and surface repairs to the transverse joints are recommended. The rigid pavement of the taxiway at the intersection of the runway will be removed and replaced with 11 inches of new Portland cement concrete on grade. The flexible pavement portion of the taxiway has had a surface treatment application applied in recent years and has cracking throughout. As with the runway category the four pavement options were evaluated for their applicability to the taxiways.

The taxiway leading to the dry lake bed will have a transition ramp extending beyond the security gate out into the dry lake bed. This transition section will consist of rigid pavement extending to a point outside of the security fencing. The final transition will be constructed of native soil.

**D. Upgrade and Expand Apron**

All aprons have deficient AGL's for the proposed upgrade mission with the exception of Building 4505. The aprons on each side of Building 4505 have sufficient thickness but will require joint sealant replacement. The apron transition slabs to the entrance of each side of the hangar will require removal and replacement. The apron running parallel to Buildings 4401, 4402, and 4305 has adequate thickness and will require only minor joint repair and joint sealant replacement. The remainder of the

aprons will be removed and replaced with 10.5 inches of Portland Cement Concrete.

The expanded apron area is within the compound of and to the south of Building 4505. Presently the apron consists of flexible pavement and has large block cracking and vegetation growing in the cracks throughout the entire area. The apron will be enlarged to accommodate parking for two C-141 aircraft. It is recommended to use 10.5 inches of rigid pavement for Type B traffic on this apron. All evaluations, with the exception of the expanded parking apron were performed in accordance with the referenced AFM's in paragraph: Upgrade Runway.

#### **E. Airfield Pavement Recommendations**

1. Upgrade And Extend Runway: The recommended option for the runway upgrade and runway extension is Option 3. This recommendation is based upon the following reasons:

- a. The North Base runway also functions as the primary taxiway.
- b. A rigid pavement will be more resistant to the effects of thermal stresses than a flexible pavement due to the temperature extremes experienced at the North Base.
- c. The size and repetitive use of the fire equipment serving North Base compound the stresses placed upon the pavements by aircraft movements.
- d. A rigid pavement would better serve the mission

requirements through reduced maintenance costs and runway down time. This can be seen in the performance of the existing rigid and flexible pavements.

**2. Upgrade Taxiways:** The recommended option for the primary taxiway is Option 1. Removal and replacement using Option 3 is recommended for the taxiway running parallel with Buildings 4401, 4402 and 4305. This recommendation is based upon the following reasons:

a. The flexible portion of the pavement on the outer edges will provide some cost savings.

b. Those reasons outlined above for "Upgrade And Extend Runway".

**3. Upgrade Aprons:** The recommended option for the aprons and apron extension areas is Option 3. This recommendation is based upon the following reasons:

a. Removal and replacement will allow for the correction of basic irregularities.

b. Rigid pavement will provide a surface material that will be more resistant to fuel, hydraulic fluid and oil spills from aircraft.

c. Provide adequate slopes and surface drainage away from the hangars.

d. Eliminate the need to remove adequate pavement for overlay transitions.

In addition to the reasons stated above, Options 2 and 4 do not conform to AFM 88-6, Chap. 3 criteria for Type A traffic. The use of a geotextile as an interlayer with the flexible overlay in Option 2 may provide only 3 to 5 years of service before reflective cracking propagates to the surface. As a result, an increase in maintenance can be expected on the runway from this option. Option 4 would eliminate the reflective cracking of Option 2 but in turn would require special attention during the production of the recycled hot-mix asphalt cement concrete if a uniform and high quality pavement is to be achieved.

**4. Construction Procedures:** Due to the size and cost of the proposed airfield pavement options, it is recommended that a full time outside professional quality assurance agent be procured for the life of the construction project. The agent should be experienced with the type of materials, testing and related construction practices required for the selected option.

The construction time for the different options are listed below:

Table 2: Airfield Construction Time Duration

	Approximate Construction Time (Days)			
	<u>Runway</u>	<u>Extensions</u>	<u>Taxiway</u>	<u>Apron</u>
Option 1	395	120	105	135
Option 2	240	120	85	135
Option 3	395	120	105	135
Option 4	240	120	85	135

## **F. Airfield Lighting**

The existing runway lighting system will be removed and replaced and new lights added for the runway extensions. An upgrade to the shoulder, which will include removal or overlay, will cause the existing lighting to be removed. Given the age and condition of the fixtures and wiring, it is very probable that damage to the runway lighting system will occur. In order to match the runway pavement upgrade in terms of life span, it is much more cost effective to replace the lights and wiring during the upgrade. Lighting and wiring will be provided in accordance with the latest Air Force and Federal Aviation Administration (FAA) standards and regulations for both the renovation and extension. The runway is for visual landing only, so no instrument landing type systems are included. Wiring will be placed in buried ducts with spare ducts provided under the runway for future expansion. The lighting vault (Building 4452) and associated equipment is currently inadequate to support the system renovation and extension and will be replaced.

The existing taxiway lighting will be removed and replaced and new lighting added where currently absent. The taxiway lighting system is presently in poor to fair condition and does not comply with the latest Air Force and FAA standards and regulations. The current taxiway lighting does not extend the full length of the taxiway to the hangar locations (Buildings 4305, 4401 4402 and 4505). In addition any upgrade to the

shoulder, which will include removal or overlay, will cause the existing lighting to be removed. Given the age and condition of the lighting and wiring, it is very probable that damage to taxiway lights or wiring will occur. In order to match the taxiway pavement upgrade in terms of life span, it is much more cost effective to replace the lights and wiring during the upgrade. The lighting and wiring will be provided in accordance with the latest Air Force and Federal Aviation Administration (FAA) standards and regulations. Spare ducts (minimum of eight) will be provided under the taxiway for future expansion. The lighting vault (Building 4452) and associated equipment is currently inadequate to support the system renovation and extension and will be replaced.

The current apron lighting system does not comply with the latest Air Force and FAA standards and regulations and will be replaced and/or upgraded. The current layout of static ground/tie down points are inadequately spaced and will be damaged during the pavement upgrade. Static ground/tie down points will be provided and/or replaced. The lighting vault (Building 4452) and associated equipment is currently inadequate to support the system upgrade and extension and will be replaced.



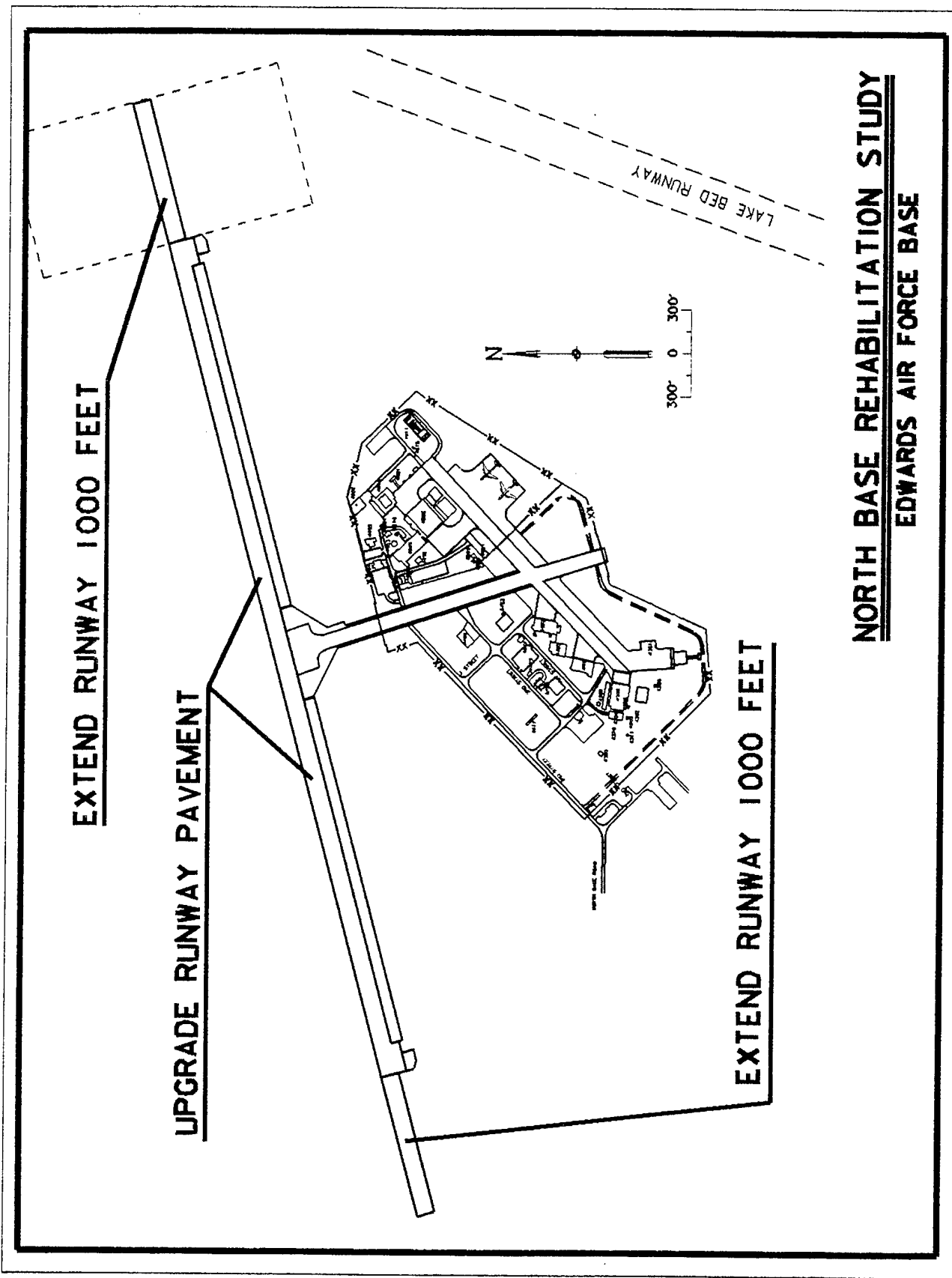


Figure 1 : Location Plan For Extend & Upgrade Runway

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Airfield Pavements

**Project Title:** Upgrade Runway

**Estimated Project Cost:** \$ 7,300,000 (Option No. 1)  
\$ 4,300,000 (Option No. 2)  
\$ 9,300,000 (Option No. 3)  
\$ 6,200,000 (Option No. 4)

**Scope Of Work:**

**Architectural:** Not Applicable

**Structural:**

- Provide airfield lighting vault.

**Mechanical:** Not Applicable

**Electrical:**

- Remove & replace runway lights.
- Remove & replace lighting vault, Building 4452.

**Sitework:**

- Upgrade runway with one of four options.

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Airfield Pavements

**Project Title:** Extend Runway

**Estimated Project Cost:** \$ 3,300,000

**Scope Of Work:**

**Architectural:** Not Applicable

**Structural:** Not Applicable

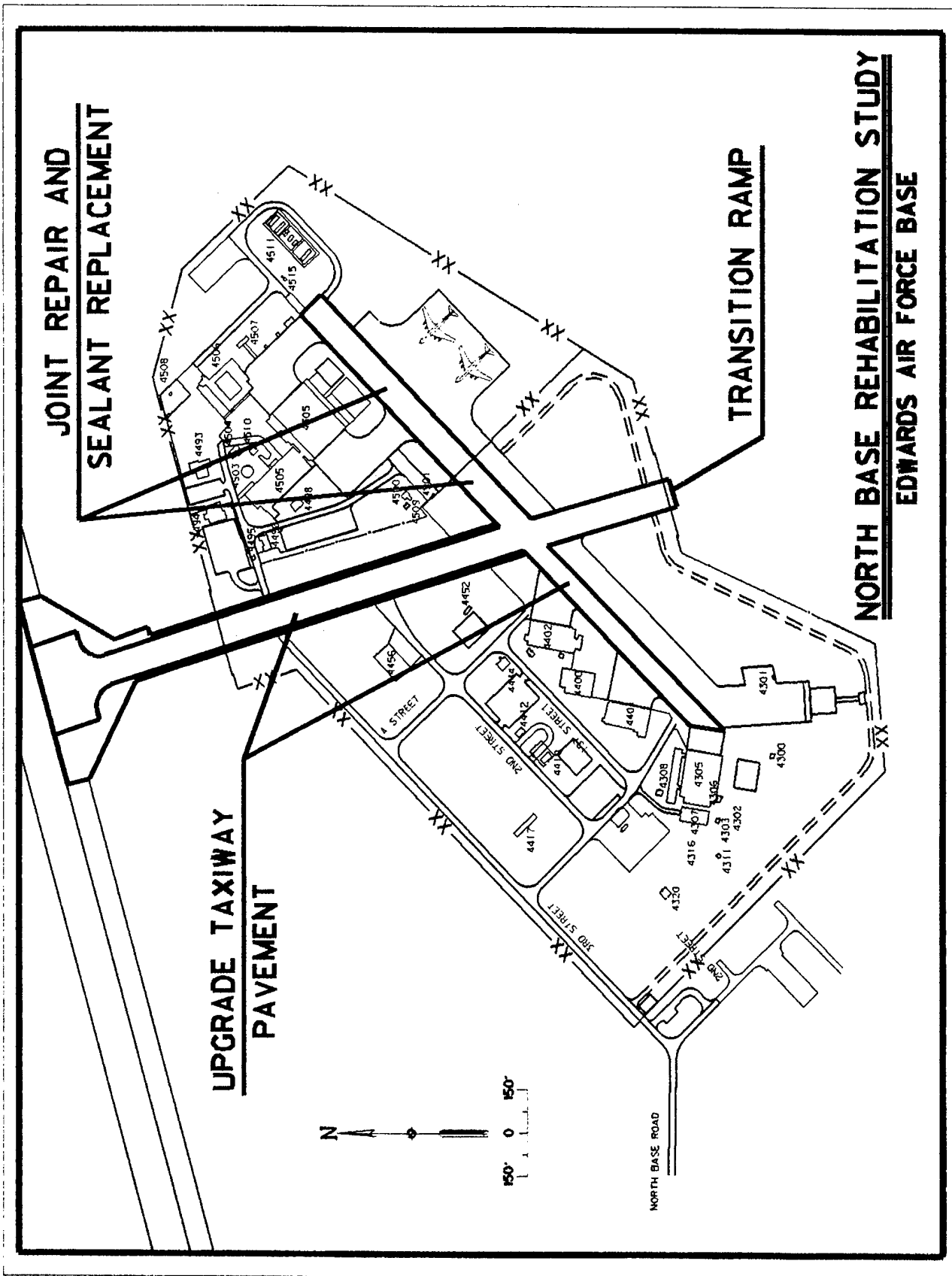
**Mechanical:** Not Applicable

**Electrical:**

- Extend runway lights.
- Relocate electrical substation ( By California Electric ).

**Sitework:**

- Extend runway 1000 feet on each end.



**NORTH BASE REHABILITATION STUDY**  
**EDWARDS AIR FORCE BASE**

Figure 2 : Location Plan For Upgrade Taxiways

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Airfield Pavements

**Project Title:** Upgrade Taxiways

**Estimated Project Cost:** \$ 3,700,000 (Option No. 1)  
\$ 2,600,000 (Option No. 2)  
\$ 3,700,000 (Option No. 3)  
\$ 3,200,000 (Option No. 4)

**Scope Of Work:**

**Architectural:** Not Applicable

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:**

- Remove & replace lights on main taxiway.
- Provide taxiway lights in front of Buildings 4305, 4401 & 4402.
- Provide taxiway lights in front of Building 4505.

**Sitework:**

- Upgrade main taxiway with one of four options:
- Upgrade taxiway in front of Buildings 4305, 4401 & 4402.
- Upgrade taxiway in front of Building 4505.
- Remove & replace drainage structures.

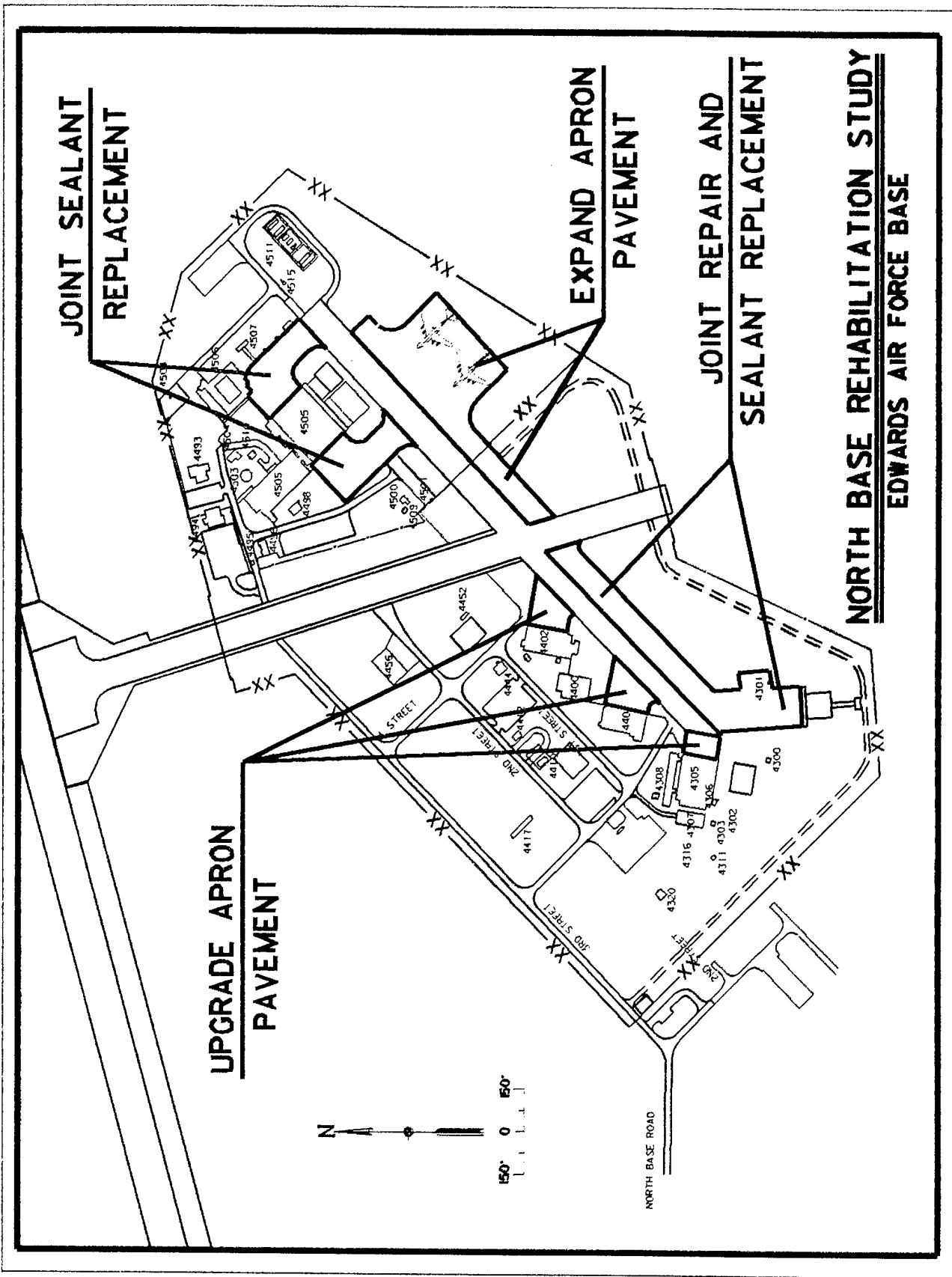


Figure 3 : Location Plan For Expand & Upgrade Apron

EDWARDS AIR FORCE BASE  
NORTH BASE REHABILITATION

PROJECT REQUIREMENTS

Category: Airfield Pavements

Project Title: Expand And Upgrade Apron

Estimated Project Cost: \$ 2,900,000 (Option No. 1)  
\$ 2,900,000 (Option No. 2)  
\$ 2,900,000 (Option No. 3)  
\$ 2,900,000 (Option No. 4)

Scope Of Work:

**Architectural:** Not Applicable

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:**

- Provide apron edge lighting.
- Provide tie down/grounding points.

**Sitework:**

- Upgrade apron in front of Buildings 4305, 4401 & 4402 with rigid pavement.
- Upgrade apron on both ends of Building 4505 with rigid pavement.
- Expand apron south of Building 4505.

#### IV. ROADS AND PARKING

##### A. Main Access Road

The main access road from Rosamond Avenue to the existing entry control point is in fair to good condition. No apparent subsurface failures were detected during the field investigation. Assuming that the existing base course structure is in good condition, rebuilding of this road will consist of placing a 2 inch bituminous overlay. The rebuilt road cross-section will consist of two eleven foot traffic lanes with four foot shoulders. Regrading of ditches will be required for improved drainage. New pavement markings will be provided.

##### B. Interior Road System

The interior road system is deteriorating due to age and lack of maintenance. Portions of the existing road network are no longer discernible. Most of the roads are not wide enough to accommodate two-way traffic. Removal and replacement of some of these roads will be required for the desired level of service. For the purpose of this evaluation, all roads to be removed and replaced have been assumed to be Class E - two lane roads with an Average Daily Traffic (ADT) of 170 to 1800 vehicles and a Design Hour Volume (DHV) of 21 to 220 vehicles. The proposed



road cross section will consist of two eleven foot traffic lanes with four foot shoulders. The removal of the existing pavement section will consist of removing 3 inches of bituminous surface course along with 8 inches of base course. The replacement pavement section will consist of 1-1/2 inches of bituminous surface course, 1-1/2 inches of bituminous intermediate course, 4 inches crushed aggregate base course and 4 inches granular filter course. Roads will be provided with pavement markings. New 24 inch reinforced concrete pipe culverts with headwalls will be provided to improve drainage along the length of the new roadway.

In addition to the reconstruction of existing roads, additional new roadway sections will be added to the interior road system. These new roads will follow the same design parameters as identified for the existing roads to be reconstructed.

During the upgrading of the interior road system additional work will be performed which will clean-up the complex of past building sites and construction. These removals will include existing building foundations, smokestacks, parking areas and small buildings and structures throughout the complex.

### **C. Parking Areas**

The existing parking area north of Building 4495 is in fair to good condition. Small areas of subsurface failure were encountered during the field investigation. These areas will be repaired prior to resurfacing the parking area with a 2 inch

bituminous overlay. New concrete curb stops will be provided for the perimeter parking stalls. New pavement markings will also be provided.

The existing parking area west of Building 4410 is in poor condition. Large areas of subsurface failure were encountered during the field investigation. Removal and replacement will be required for the desired level of service. The removal of the existing pavement section will consist of removing 3 inches of bituminous surface course along with 8 inches of base course material. The replacement pavement section will consist of 1-1/2 inches of bituminous surface course, 1-1/2 inches of bituminous intermediate course, 4 inches crushed aggregate base course, and 4 inches granular filter course. New concrete curb stops will be provided for the perimeter parking stalls and pavement markings will also be provided.

Additional parking areas will be provided to accommodate a total population of 500 people at a 70% usage level (350 parking stalls). Locations of additional lots were provided by the user. The new pavement section will consist of 1-1/2 inches of bituminous surface course, 1-1/2 inches of bituminous intermediate course, 4 inches crushed aggregate base course, and 4 inches granular filter course. New concrete curb stops will be provided for the perimeter parking stalls and new pavement markings will be provided.

A new parking area will be provided for aircraft ground

support equipment. The pavement section for this area will consist of 8 inches concrete, 4 inches rigid base course, and 4 inches granular filter course.

In keeping with standard Air Force practice the new and existing parking areas are to be provided with high pressure sodium lighting. This lighting provides an extra degree of security and safety for personnel.

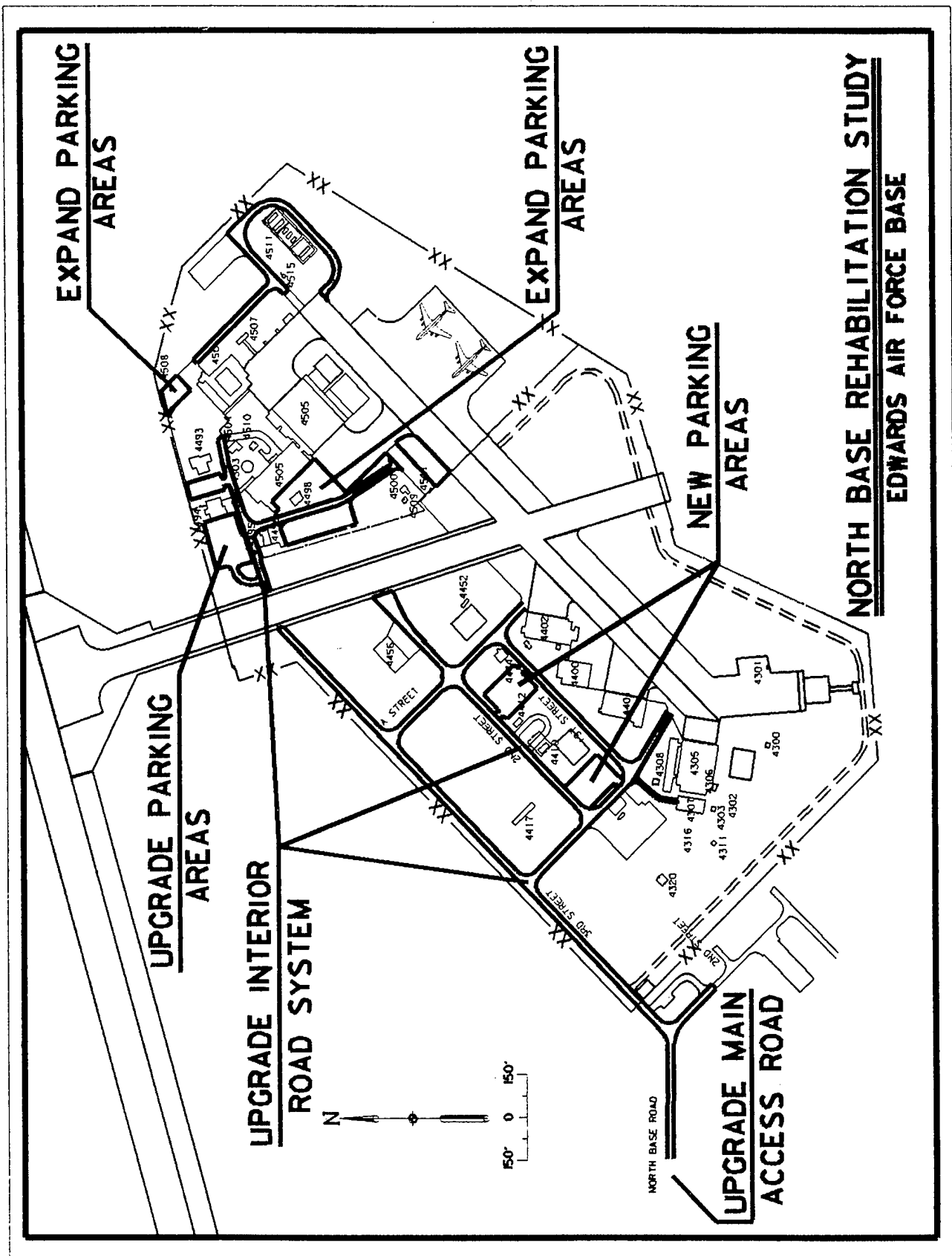


Figure 4 : Location Plan For Roads And Parking

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Roads & Parking

**Project Title:** Roads & Parking

**Estimated Project Cost:** \$ 4,500,000

**Scope Of Work:**

**Architectural:** Not Applicable

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:**

- Provide area lighting for parking areas.

**Sitework:**

- Rebuild main access road from Rosamond Avenue to existing entry control point, Bldg.4495.
- Remove and replace interior road system.
- Construct new access roads for interior road system.
- Rebuild existing parking area north of existing entry control point, Bldg. 4495.
- Remove and replace parking area west of Bldg. 4410.
- Construct additional parking areas for a total population of 500 people at 70% usage (350 parking stalls).
- Upgrade storm drainage system.
- Removal of existing building foundations, smokestacks and miscellaneous pavements.

**V. UTILITIES**  
**( WATER AND SEWER )**

**A. Domestic Water System**

The existing domestic water system in the North Base is approximately 30 to 40 years old. The majority of the water lines are unprotected steel pipe, that have exceed their useful life expectancy. Numerous leaks and failures have developed in recent years. The system supplies the North Base Area through one six inch supply line located along the North Base Road. The system is capable of providing only 400 gpm @ 20 psi, but has a static pressure of 105 psi. This system does not meet Air Force requirements as listed in Military Handbook 1008 which requires a minimum fire hydrant flow capacity for unsprinklered facilities of 750 gpm at 20 psi.

The existing system does not meet Air Force or NFPA criteria. As per Military Handbook 1008, a looped system is required for any major Air Force installation. The system also does not meet the requirements for fire protection for either sprinklered or unsprinklered facilities. A new loop system is proposed for the North Base. This new loop system will meet all the Air Force and NFPA requirements. The upgrades will increase the system capabilities to a static of 105 psi, with a residual pressure available of 20 psi at a flow rate of 2,500 gpm. All the main lines will also be replaced. The upgrades will ensure that the domestic water system is capable of supporting any type of

mission for the next 30 years.

Concurrent to the implementation of the proposed water system improvements will be the demolition and removal of Buildings 4316 & 4317 which are the existing water booster pump station and water storage reservoir.

#### **B. Fire Water System**

The existing fire protection system, for the North Base, relies on the domestic water system and a dedicated fire pump system. The dedicated system only provides interior fire protection for Building 4505 (Hangar). The fire pump system consists of three 2,000 gpm electric driven fire pumps located in Building 4504, a 500,000 gallons storage reservoir, and miscellaneous appurtenances.

The fire protection system that is supplied from the domestic water system is not capable of supplying the water for any of the North Base building's fire protection. The upgrade to the domestic water system will enable the domestic water system to supply all the exterior, and most of the interior fire protection requirements. The interior fire protection for the hangars (Buildings 4505, 4305, 4401 and 4402) requires a dedicated preaction AFFF (Aqueous Film Forming Foam) fire protection system as per AFR 88-15. The existing dedicated fire protection system does not meet the fire protection requirements. Therefore, three new diesel drive 3,000 gpm fire pumps and new

pipng to Buildings 4305, 4401 and 4402 are required. The new pumps and appurtenances will be installed in the existing Building 4504 (Fire Pumphouse). The existing fire water storage reservoir is adequate.

From an electrical perspective, the current pumphouse does not comply with current Air Force and National Fire Protection Association (NFPA) standards. Due to the amount of work required to remove the electric fire pump motors and the poor condition of the equipment, the entire electrical system (power & lighting) will be removed and replaced.

Likewise, the current pumphouse fire protection/suppression system does not comply with current Air Force and National Fire Protection Association (NFPA) standards and thus will require the removal of the fire alarm system and replacement with a heat detection system.

### **C. Sewage Collection And Treatment System**

The existing sewage collection and treatment consists of sewer lines, force mains, lift stations, an Imhoff Tank and evaporation ponds. All the components of this system are 30 to 40 years old. The existing system is in adequate condition, with the exception of the lift stations. However, at the present time the discharges from the system do not meet the current Kern County effluent standards for treatment.



As part of the proposed improvements all of the existing sewer lines will be cleaned and televised to ensure that they are adequate for anticipated flows. Should the televised inspection indicate problems, the lines will be repaired as necessary. For purposes of this study it has been assumed that 10% of the lines will require repair or replacement.

The lift station structures are all approximately 35 years old. During this time the pumps within the structures have been replaced. The actual capacities of the lift stations is unknown but it would be safe to assume that they do not meet current Air Force or Ten State's standards. Two new package lift stations will be installed to upgrade capabilities of the the current system.

Currently the existing Imhoff tank and evaporation ponds do not meet the Kern County regulatory requirements. The existing Imhoff tank is proposed to be removed and replaced with a mechanical primary and secondary treatment system. The existing evaporation ponds will be upgraded with concrete rubble, for rip-rap.

Electrical support for this project will include power and distribution for the sewage lift stations and other related equipment.

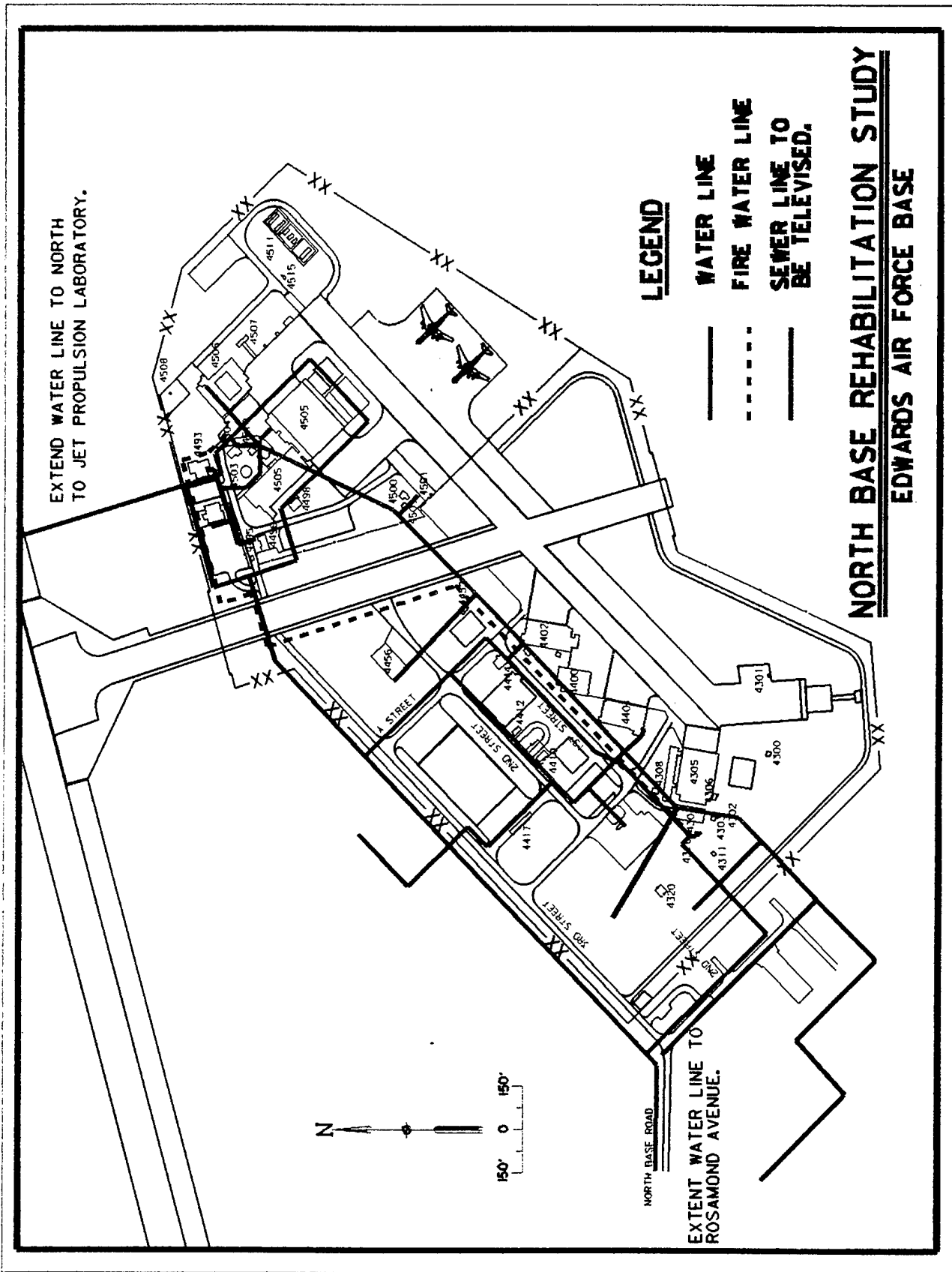


Figure 5 : Location Plan For Utilities ( Water And Sewer )

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Utilities (Water & Sewer)

**Project Title:** Utilities (Domestic Water)

**Estimated Project Cost:** \$ 1,900,000

**Scope Of Work:**

**Architectural:** Not Applicable

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:** Not Applicable

**Sitework:**

- Construct 10" water supply loop from Rosamond Blvd. thru the North Base to a point on the east side of of the Jet Propulsion Laboratory.
- Construct meter stations ( 2 required ).
- Remove Buildings 4316 & 4317.

EDWARDS AIR FORCE BASE  
NORTH BASE REHABILITATION

PROJECT REQUIREMENTS

Category: Utilities (Water & Sewer)

Project Title: Utilities (Fire Water)

Estimated Project Cost: \$ 2,100,000

Scope Of Work:

**Architectural:** Not Applicable

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:**

- Upgrade power in the water pumphouse.

**Sitework:**

- Remove & replace water line serving Buildings 4305, 4401 and 4402.
- Remove Buildings 4316 & 4317.
- Construct 14" fire water main behind Buildings 4305, 4401 and 4402.
- Remove & replace fire water pumps in Building 4504.

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Utilities (Water & Sewer)

**Project Title:** Utilities (Sewer)

**Estimated Project Cost:** \$ 800,000

**Scope Of Work:**

**Architectural:** Not Applicable

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:**

- Provide electrical support for the sewage lift stations and associated equipment.

**Sitework:**

- Clean & televise all sewer lines; Repair & replace as necessary.
- Remove & replace lift stations with package units.
- Remove Imhoff Tank and replace with package treatment plant.
- Rehabilitate existing evaporation lagoons.

**VI. UTILITIES**  
**( ELECTRICAL AND COMMUNICATIONS )**

**A. Electrical**

Preliminary information indicates that the primary electrical distribution to the area has been upgraded recently from the substation to the transformer location for each of the existing facilities. For purposes of this study it has been assumed that the in-place electrical distribution system is adequate for the additional loads placed on the system as a result of the proposed work included in this study. Should the existing electrical distribution system require to be upgraded then an additional cost of \$ 400,000 - \$ 800,000 would be anticipated. Any upgrade to building service transformers and associated wiring has been included as part of the facility line item.

**B. Communications**

The present communication distribution system is inadequate to support the upgrade to the complex. The present system represents a mixture of additions and minor upgrades, which makes the system difficult to maintain. In addition, the present distribution starts at a facility located in the heart of the complex, which presents an inconvenience to security personnel when maintenance is required. A completely new communication/security distribution system is required in the

complex. Both systems would start from the new entry control point and extend throughout the complex. The new system would consist of manholes and nonconcrete encased duct lines.

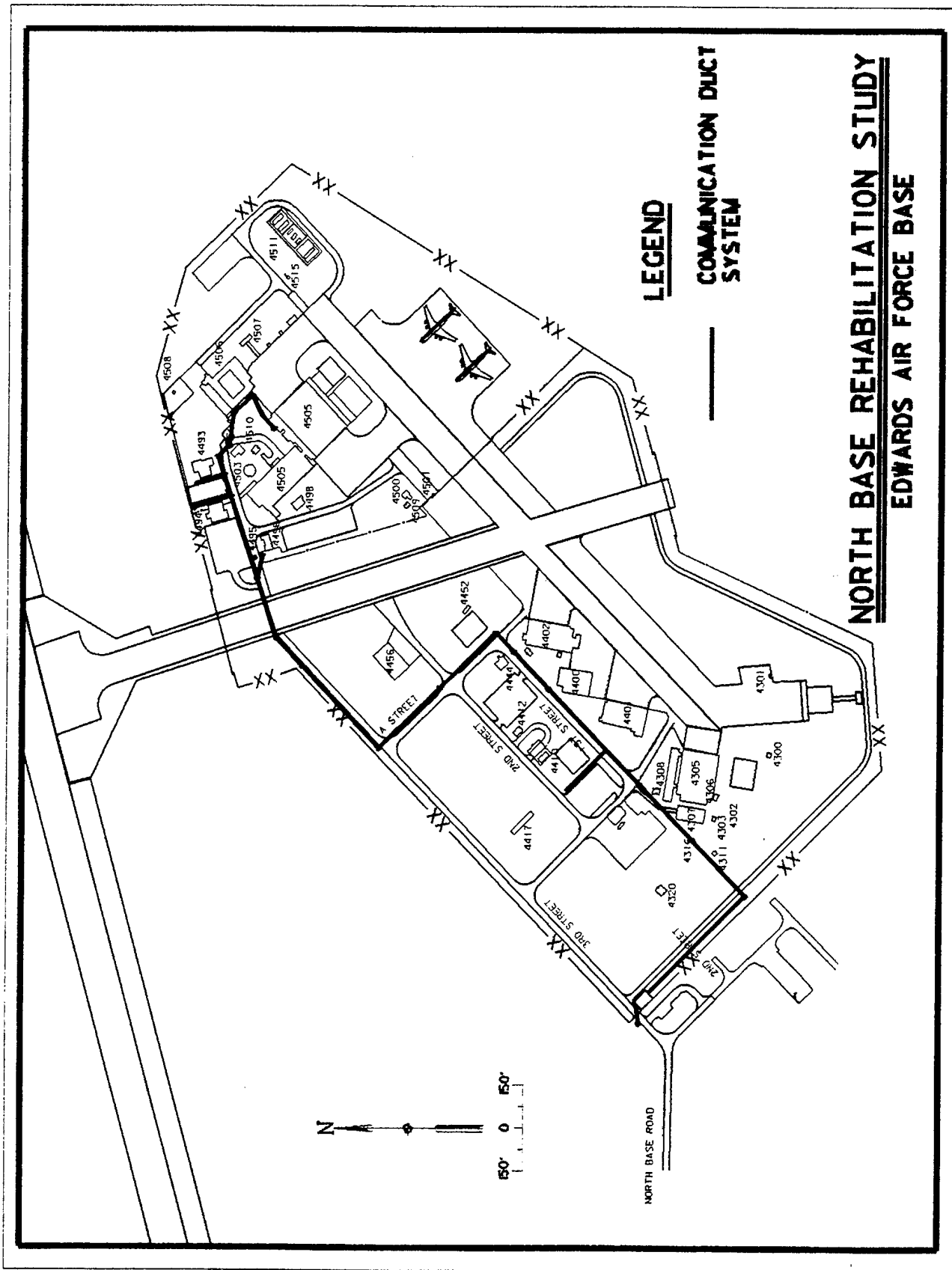


Figure 6 : Location Plan For Utilities  
( Electrical & Communications )



**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Utilities (Electrical And Communications)

**Project Title:** Utilities (Electrical & Communications)

**Estimated Project Cost:** \$ 500,000

**Scope Of Work:**

**Architectural:** Not Applicable

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:**

- Provide support for site related work with respect to distribution line realignments or relocations.
- Provide basewide communication system (conduits and manholes) for security system.

**Sitework:** Not Applicable

**VII. UPGRADE BUILDINGS**  
**( HANGARS - EXISTING )**

**A. Building 4305 (Hangar)**

Building 4305 originally was built as a hangar but since has been converted to administrative area. The intent now is to convert it back to its original use as a hangar. To accomplish this, the gypsum wallboard partitions and drop ceilings in the hangar area will be removed. The existing hangar door will be repaired or replaced and during the design process the cost of upgrading from manual to electrical operation will be considered. Interior walls will be painted and new reflective floor covering will be provided. If required to accommodate other work, the exterior siding finish, which is asbestos, will be removed. New roofing, siding and insulation are required to bring the facility up to current Air Force standards. In addition to the renovation of Building 4305, a Logistics Support Facility of 8,000 square feet to support approximately fifty (50) people will be provided.

Portions of the existing floor slab will be removed and replaced for new plumbing, fire protection piping and trench floor drains. The floor slab will be evaluated during design to determine if it will support the wheel loads of expected aircraft. Existing overhead door tracks and guides will be investigated further to insure proper door operation and to consider if electrically operated doors are required.

The existing heating, ventilating, plumbing and compressed

air systems do not meet the current AFR 88-15 and other Air Force criteria for this type of construction. The plumbing and compressed air systems are in need of repair and are well past their life expectancy. Continued use of the existing systems will result in frequent breakdowns and continued poor performance. The existing equipment in the hangar bay does not meet current hangar hazardous area requirements. Any existing equipment which has been recently installed in the facility will be reused whenever possible.

The existing fire protection/detection systems do not meet the current NFPA and AFR 88-15 requirements for protection of aircraft hangars and will be removed and replaced.

The majority of the electrical system does not comply with current National Electric Code (NEC) standards, Air Force regulations/standards, or personnel safety standards. In addition, most of the equipment is over 30 years old and is past its life expectancy and maintainability. The lighting does not comply with personnel safety standards and standard practice for energy conservation which will necessitate removal and replacement of the entire power and lighting systems. This is to include replacement of the current facility transformer. Existing electrical systems for the office/shop space currently attached will be removed and replaced to comply with current NEC and Air Force regulations and standards.

At present there is no 400 Hz power distribution in the

hangar. This will be provided in order to support aircraft/AGE power requirements.

The hangar does not comply with current Air Force and NFPA regulations/standards regarding lightning protection. A lightning protection system will be provided. The existing static grounding system has been assumed to be adequate.

The communication/security system will be removed and replaced as necessary in order to provide compatibility with the communication/ security system upgrade for the entire complex.

**B. Building 4401 (Hangar)**

The main hangar area of Building 4401 will be renovated by repairing or replacing the existing manually operated wood hangar doors, painting the interior walls and providing a new reflective floor covering. During design the cost and feasibility of providing electrical operation of the hangar doors will be considered.

The existing lean-to areas attached to the hangar cannot be easily upgraded to current Air Force criteria, Fire Protection standards or building and electrical codes. It is recommended that the existing lean-to areas be demolished and new areas complying with current codes be provided. Existing roofing will be replaced and a total insulation package of the building will be provided. Existing windows are old and leak, with some being painted over. New windows and translucent panels will be

provided for energy conservation and security. In addition to the renovation of Building 4401 and the lean-to areas, a single story Logistics Support Facility of 8,000 square feet to support approximately fifty (50) people will be provided.

Portions of the existing floor slab will be removed and replaced for new plumbing, fire protection, piping and trench floor drains. The floor slab will be evaluated during design to determine if it will support the wheel loads of the expected aircraft. Existing door tracks and overhead guides will be investigated further to insure proper door operation and to consider if electrically operated doors are feasible. The existing wood trusses have been evaluated, and specific recommendations for each truss have been made. Truss repair is required for hangar doors to operate and to insure that the structural integrity of each truss is maintained.

The existing ventilation, plumbing and compressed air systems do not meet the current AFR 88-15 and other Air Force criteria for this type of construction. The existing boilers were installed in 1982 and may need to be replaced or upgraded. The plumbing and compressed air systems are in need of repair and are well past their life expectancy. Continued use of the existing systems will result in frequent breakdowns and continued poor performance. The existing equipment in the hangar bay also does not meet current hangar hazardous area requirements. Any existing equipment which has been recently installed in the

facility will be reused whenever possible.

The existing fire protection/detection systems do not meet the current NFPA and AFR 88-15 requirements for protection of aircraft hangars and will be removed and replaced.

The majority of the electrical system does not comply with current National Electric Code (NEC) standards, Air Force regulations/standards, or personnel safety standards. In addition, most of the equipment is over 30 years old and is past its life expectancy and maintainability. The lighting does not comply with personnel safety standards and standard practice for energy conservation. The entire power and lighting system will be removed and replaced. This is to include replacement of the current facility transformer. Office space currently attached will be removed and replaced to comply with current NEC and Air Force regulations and standards.

At present there is no 400 Hz power distribution in the hangar. This will be provided to include a 60 Hz to 400 Hz converter to support aircraft/AGE power requirements.

The hangar does not comply with current Air Force and NFPA regulations/standards regarding lightning protection. A lightning protection system will be provided. The existing static grounding system has been assumed to be adequate.

The communication/security system will be removed and replaced as necessary in order to provide compatibility with the

communication/ security system upgrade for the entire complex.

**C. Building 4402 (Hangar)**

The main hangar area of Building 4402 will be renovated by repairing or replacing the existing manually operated wood hangar doors, painting the interior walls and providing a new reflective floor covering. The existing lean-to areas attached to the hangar cannot be easily upgraded to current Air Force criteria, Fire Protection standards or building and electrical codes. It is recommended that the existing lean-to areas be demolished and new areas complying with current codes be provided. Existing roofing will be replaced and a total insulation package of the building will be provided. Existing windows are old and leak, with some being painted over. New windows and translucent panels will be provided for energy conservation and security. In addition to the renovation of Building 4402 and the lean-to areas, a single-story Logistics Support Facility of 8,000 square feet to support approximately fifty (50) people will be provided.

Portions of the existing floor slab will be removed and replaced for new plumbing, fire protection piping and trench floor drains. The floor slab will be evaluated during design to determine if it will support the wheel loads of the expected aircraft. Existing door tracks and overhead guides will be investigated further to insure proper door operation and to determine if electrically operated doors are feasible. The existing wood trusses have been evaluated, and specific

recommendations for each truss have been made. Roof truss repair is required for hangar doors to operate and to insure that the structural integrity of each truss is maintained.

The existing ventilation, plumbing and compressed air systems do not meet the current AFR 88-15 and other Air Force criteria for this type of construction. The existing boilers were installed in 1982 and may need to be replaced or upgraded. The plumbing and compressed air systems are in need repair and are well past their life expectancy. Continued use of the existing systems will result in frequent breakdowns and continued poor performance. The existing equipment in the hangar bay also does not meet current hangar hazardous area requirements. Any existing equipment which has been recently installed in the facility will be reused whenever possible.

The existing fire protection/detection systems do not meet the current NFPA and AFR 88-15 requirements for protection of aircraft hangars and will be removed and replaced.

The majority of the electrical system does not comply with current National Electric Code (NEC) standards, Air Force regulations/standards, or personnel safety standards. In addition, most of the equipment is over 30 years old and is past its life expectancy and maintainability. The lighting does not comply with personnel safety standards and standard practice for energy conservation. The entire power and lighting system will be removed and replaced. This is to include replacement of the



current facility transformer. Office space currently attached will be removed and replaced to comply with current NEC and Air Force regulations and standards.

At present there is no 400 Hz power distribution in the hangar. This will be provided, including a 60 Hz to 400 Hz converter to support aircraft/AGE power requirements.

The hangar does not comply with current Air Force and NFPA regulations/standards regarding lightning protection. A lightning protection system will be provided. The existing static grounding system has been assumed to be adequate.

The communication/security system will be removed and replaced as necessary in order to be compatible with the communication/ security system upgrade for the entire complex.

**D. Building 4505 (Hangar)**

The existing hangar and adjacent areas of Building 4505 are in good condition. The interior work is limited to sealing cracks in the floor slab, providing a new reflective floor covering and painting the interior walls. The manually operated hangar doors and tail door will be repaired or replaced. The existing roofing will be removed and new insulation, roofing and flashing will be provided. Translucent panels for security purposes will be provided.

Structurally, the roof trusses will be repaired to maintain

their integrity. The floor trench drains and some of the concrete floor slabs will be removed and replaced for mechanical and electrical requirements. The hangar door tracks will be evaluated to insure proper door operation and if electrically operated doors are feasible.

The existing heating, ventilating, plumbing and compressed air systems do not meet the current AFR 88-15 and other Air Force criteria for this type of construction. The existing air conditioning system is two years old and may need to be replaced with a larger unit it required by new temperature requirements. The plumbing and compressed air systems are in need of repair and are well past their life expectancy. Continued use of the existing systems will result in frequent breakdowns and continued poor performance. The existing equipment in the hangar bay also does not meet current hangar hazardous area requirements. Any existing equipment which has been recently installed in the facility will be reused whenever possible.

The existing fire protection/detection systems do not meet the current NFPA and AFR 88-15 requirements for protection of aircraft hangars and will be removed and replaced.

The majority of the electrical system does not comply with current National Electric Code (NEC) standards, Air Force regulations/standards, or personnel safety standards. In addition, most of the equipment is over 30 years old and is past its life expectancy and maintainability. The lighting does not

comply with personnel safety standards. The entire power and lighting system will be removed and replaced. This is to include replacement of the current facility transformer.

At present there is no 400 Hz power distribution in the hangar. This will be provided, including a 60 Hz to 400 Hz converter to support aircraft/AGE power requirements.

The hangar does not comply with current Air Force and NFPA regulations/standards regarding lightning protection. A lightning protection system will be provided. The existing static grounding system is inadequate and will be upgraded with additional static ground/tie down points.

The communication/security system will be removed and replaced as necessary in order to be compatible with the communication/ security system upgrade for the entire complex.

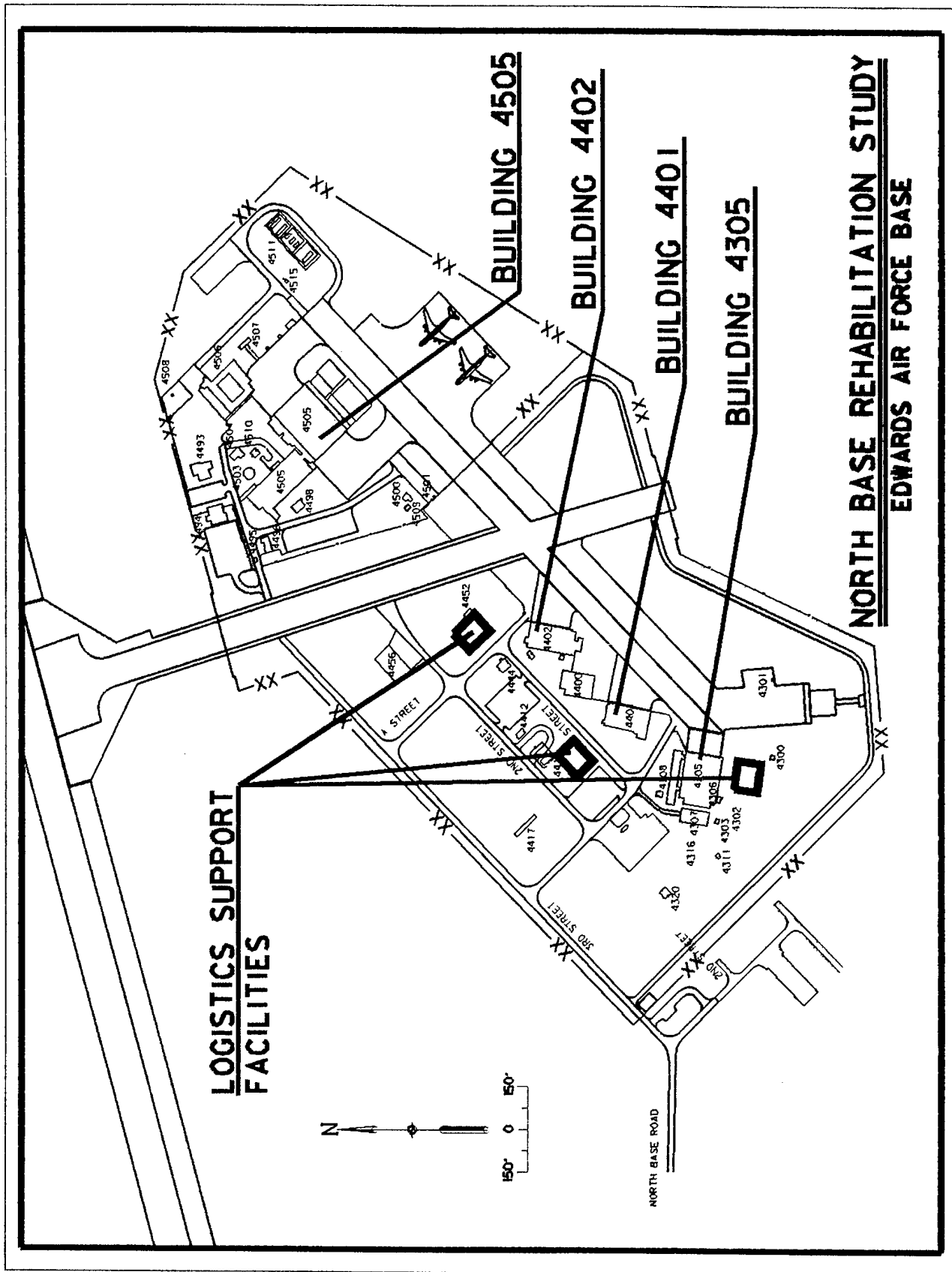


Figure 7 : Location Plan For Upgrade Buildings  
 ( Hangars-Existing)

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Hangars-Existing)

**Project Title:** Building 4305 (Hangar)

**Estimated Project Cost:** \$ 6,800,000

**Scope Of Work:**

**Architectural:**

- Demolish existing interior admin. areas.
- Remove & replace roofing and add insulation.
- Remove asbestos & install new exterior siding.
- Remove & replace windows.
- Repair exterior wall flashing.
- Renovate hangar doors.
- Construct engineering work areas.
- Paint all interior walls.
- Seal cracks & paint interior floor slabs.

**Structural:**

- Remove & replace 50% of interior floor slab.
- Remove & replace door tracks.
- Remove & replace trench drains

**Mechanical:**

- Remove & replace mechanical systems (HV, Plumbing, Compressed air)
- Remove & replace fire detection/suppression systems.
- Provide trench exhaust system.
- Provide trench drain vapor detection system.

**Electrical:**

- Add 400 Hz power.
- Remove & replace electrical system (Power & Lighting).
- Remove & replace communication system.
- Remove & replace security system.
- Install lightning protection.

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Hangars-Existing)

**Project Title:** Building 4305 (Hangar) (Cont'd.)

**Scope Of Work:**

**Sitework:**

- Construct exterior drives and sidewalks.
- Construct oil/water separator.
- Construct utility service lines from facility to distribution system (Max. 100 feet).

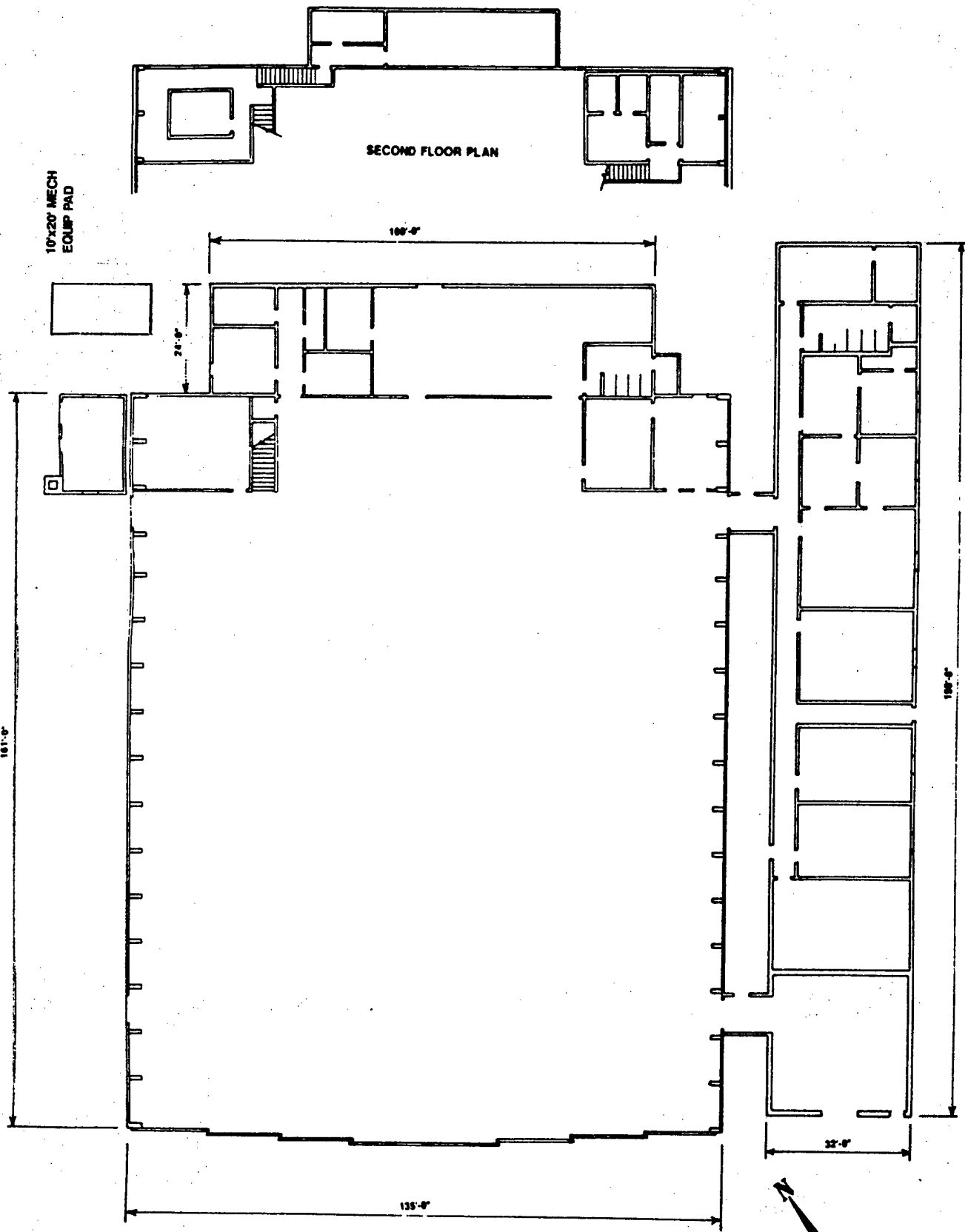


Figure 8 : Floor Plan For Building 4305

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Hangars-Existing)

**Project Title:** Building 4401 (Hangar)

**Estimated Project Cost:** \$ 4,400,000

**Scope Of Work:**

**Architectural:**

- Demolish existing add-on admin. areas.
- Remove & replace roofing.
- Insulate exterior walls and roof.
- Add translucent panels to exterior walls.
- Repair exterior wall flashing.
- Renovate hangar doors.
- Construct engineering work areas.
- Paint all interior walls.
- Seal cracks & paint interior floor slabs.

**Structural:**

- Repair roof trusses.
- Remove & replace 50% of interior floor slab.
- Remove & replace door tracks.
- Remove & replace trench drains

**Mechanical:**

- Remove & replace mechanical systems  
(Ventilation, Plumbing, Compressed air; Boilers, if necessary).
- Remove & replace fire detection/suppression systems.
- Provide trench drain exhaust system.
- Provide trench drain vapor detection system.

**Electrical:**

- Add 400 Hz power.
- Remove & replace electrical system (Power & Lighting).
- Remove & replace communication system.
- Remove & replace security system.
- Install lightning protection.



**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Hangars-Existing)

**Project Title:** Building 4401 (Hangar) (Cont'd.)

**Scope Of Work:**

**Sitework:**

- Construct exterior drives and sidewalks.
- Construct oil/water separator.
- Construct utility service lines from facility to distribution system (Max. 100 feet).

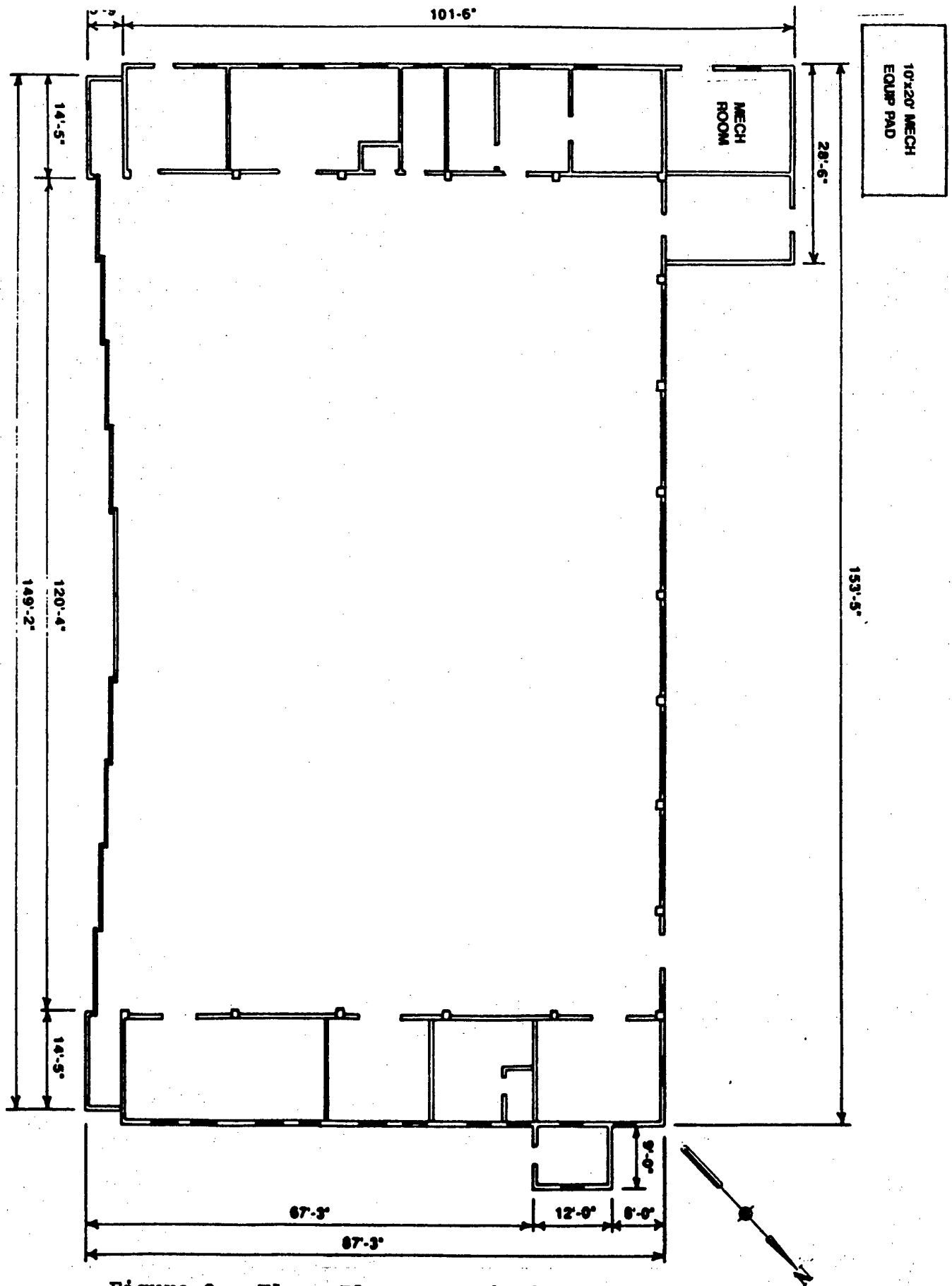


Figure 9 : Floor Plan For Building 4401

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Hangars-Existing)

**Project Title:** Building 4402 (Hangar)

**Estimated Project Cost:** \$ 4,400,000

**Scope Of Work:**

**Architectural:**

- Demolish existing add-on admin. areas.
- Remove & replace roofing.
- Insulate exterior walls and roof.
- Add translucent panels to exterior walls.
- Repair exterior wall flashing.
- Renovate hangar doors.
- Construct engineering work areas.
- Paint all interior walls.
- Seal cracks & paint interior floor slabs.

**Structural:**

- Repair roof trusses.
- Remove & replace 50% of interior floor slab.
- Remove & replace door tracks.
- Remove & replace trench drains

**Mechanical:**

- Remove & replace mechanical systems  
(Ventilation, Plumbing, Compressed air; Boilers, if necessary).
- Remove & replace fire detection/suppression systems.
- Provide trench drain exhaust system.
- Provide trench drain vapor detection system.

**Electrical:**

- Add 400 Hz power.
- Remove & replace electrical system (Power & Lighting).
- Remove & replace communication system.
- Remove & replace security system.
- Install lightning protection.

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Hangars-Existing)

**Project Title:** Building 4402 (Hangar) (Cont'd.)

**Scope Of Work:**

**Sitework:**

- Construct exterior drives and sidewalks.
- Construct oil/water separator.
- Construct utility service lines from facility to distribution system (Max. 100 feet).

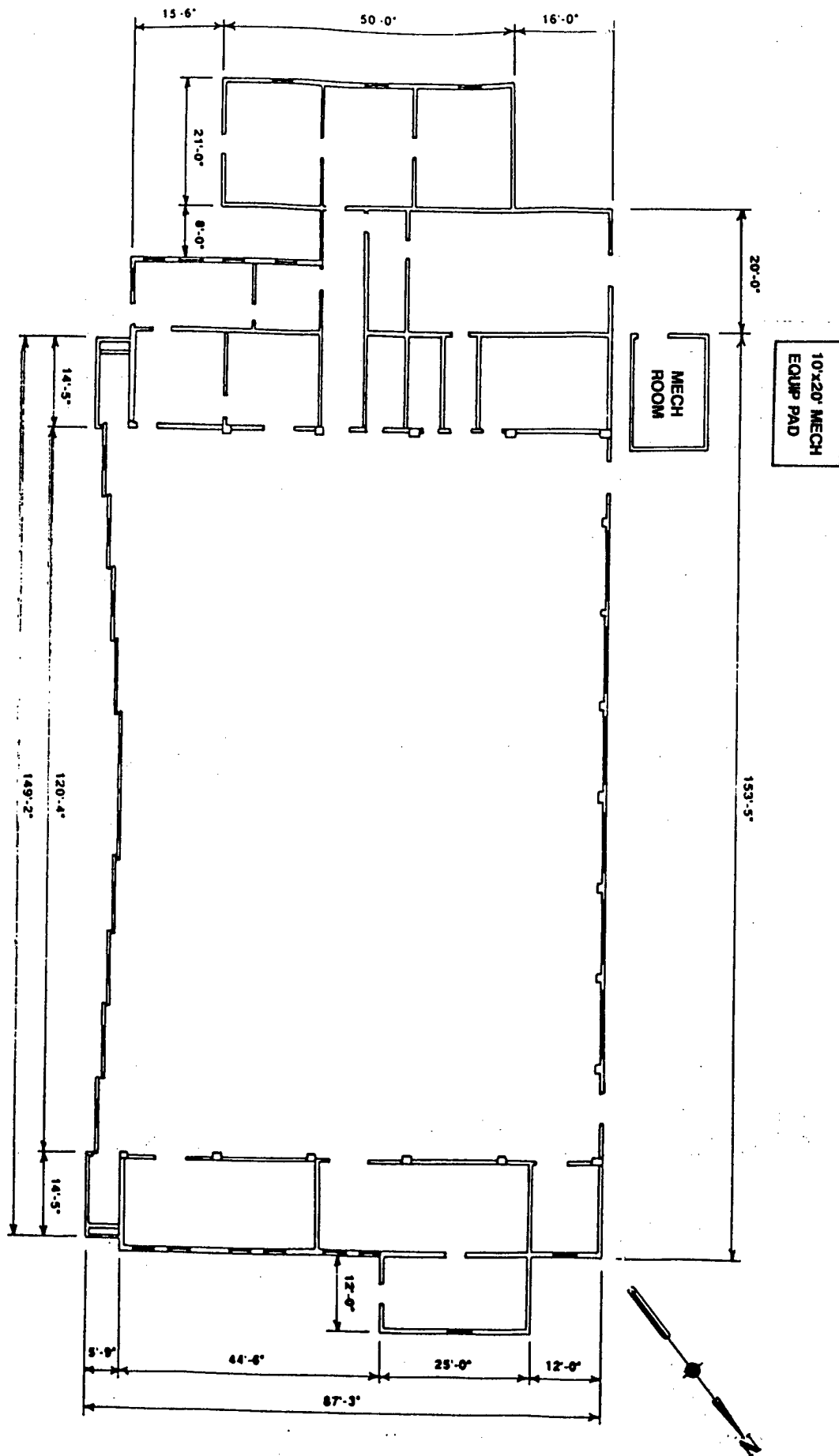


Figure 10 : Floor Plan For Building 4402

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Hangars-Existing)

**Project Title:** Building 4505 (Hangar)

**Estimated Project Cost:** \$ 7,100,000

**Scope Of Work:**

**Architectural:**

- Remove & replace roofing.
- Insulate roof.
- Repair translucent panels on exterior walls.
- Repair exterior wall flashing.
- Remove & replace tail door.
- Renovate hangar doors.
- Paint all interior walls.
- Seal cracks & paint interior floor slabs.

**Structural:**

- Repair roof trusses.
- Remove & replace door tracks.
- Remove & replace trench drains

**Mechanical:**

- Remove & replace mechanical systems (HV, Plumbing, Compressed air)
- Remove & replace fire detection/suppression systems.
- Repair roof vents.
- Provide trench drain exhaust system.
- Provide trench drain vapor detection system.

**Electrical:**

- Add 400 Hz power.
- Remove & replace electrical system (Power & Lighting).
- Remove & replace communication system.
- Remove & replace security system.
- Upgrade static grounding
- Install lightning protection.
- Remove & replace grounding system.

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Hangars-Existing)

**Project Title:** Building 4505 (Hangar) (Cont'd)

**Scope Of Work:**

**Sitework:**

- Construct exterior drives and sidewalks.
- Construct oil/water separator.
- Construct utility service lines from facility to distribution system (Max. 100 feet).

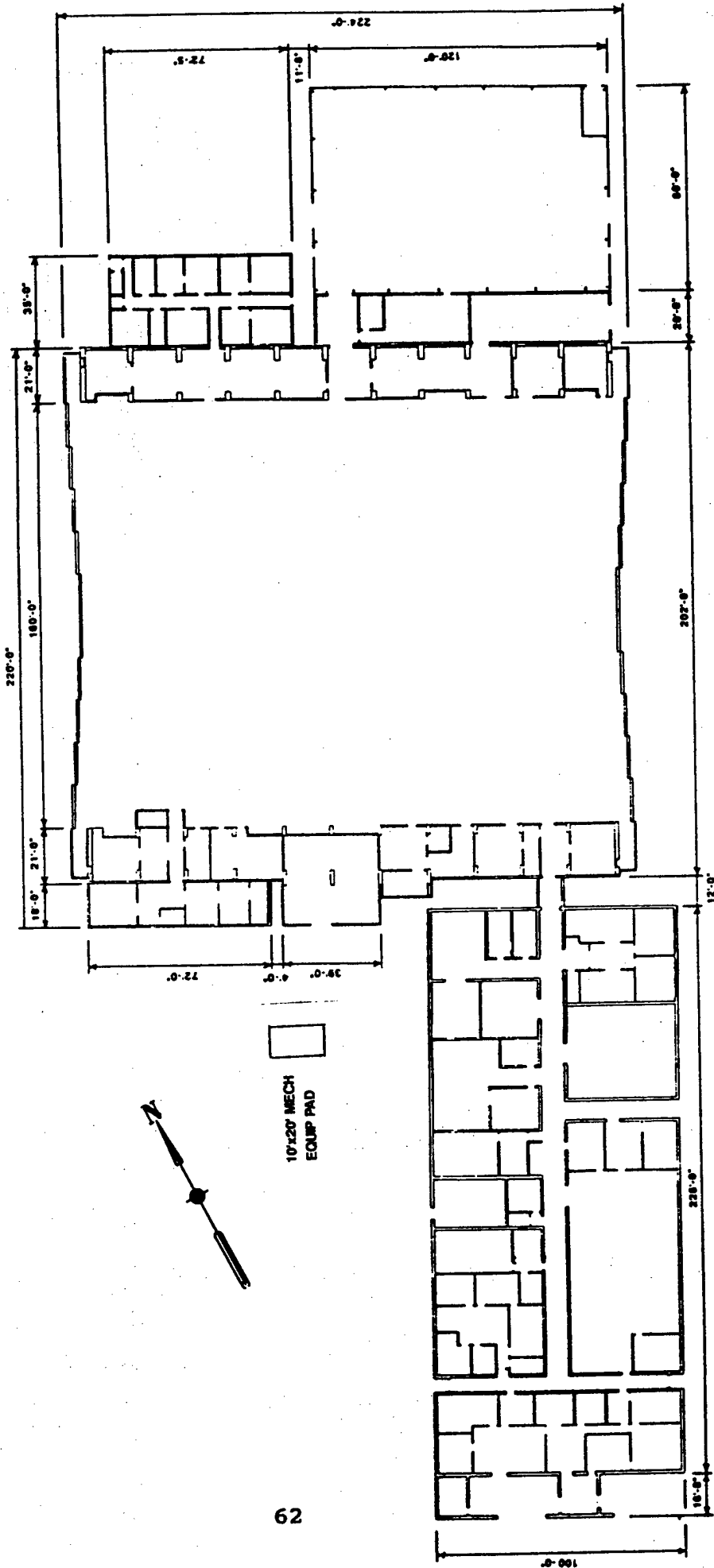


Figure 11 : Floor Plan For Building 4505



**VIII. UPGRADE BUILDINGS**  
**( SUPPORT FACILITIES - EXISTING )**

**A. Building 4307 (Storage)**

Building 4307 appears in good shape with the only identified work to be a base request to change an exterior manually operated 10 foot by 10 foot overhead sliding door to an internally mounted electrically operated overhead door.

**B. Building 4318 (Gas Station)**

Building 4318 is badly deteriorated. One underground storage tank has leaked in the past and subsequently has been drained and will be removed by the Base. The recommendation is to demolish the facility and construct a new fuel dispensing station.

The electrical work associated with the demolition of Building 4318 would be to remove facility transformer and associated wiring.

**C. Building 4400 (Storage)**

The electrical system Building 4400 does not comply with current National Electric Code (NEC) standards, Air Force regulations/standards, or personnel safety standards. Similarly the lighting system does not comply with personnel safety standards and standard practice for energy conservation. The power and lighting system will be upgraded to the current

standard used for a storage facility. A large portion of this work will involve the removal of the existing system.

The security system needs to be removed and replaced to be compatible with the security upgrade for the complex. The communications service entrance needs to be upgraded to support the new communication distribution project.

**D. Building 4493 (Gymnasium)**

Building 4493 is newer construction and is in very good condition with the exception of the roof. New work involves removal of existing built-up roofing and mechanical equipment and providing a new standing seam metal roof. Interior work will repair minor water damage to ceiling tiles and paint.

Structural work will involve supporting the new roof slopes required by the roof system and ground equipment pads for the mechanical equipment.

The existing heat pumps on the roof of the building do not meet the heating and cooling requirements of the building. The equipment is old and operating very inefficiently. The heating and air conditioning equipment will be removed from the roof of the building. A new heating and air conditioning system will be provided for the building.

The electrical work required would be to remove and replace power needed to support the heating and air conditioning system

upgrade. The communications service entrance needs to be upgraded to support the new communication distribution project.

**E. Building 4494 (Cafeteria)**

Building 4494 is newer construction and in good condition for a building currently not being used or fully maintained. New work involves the removal of a leaky built-up roof and replacement with a new standing seam metal roof. Interior work involves removal and replacement of damaged floor and ceiling tiles and minor repairs and painting of the interior walls. Additionally, the remaining out-dated kitchen equipment will be removed and new equipment for a cold sandwich serving line will be provided.

Structural work will include supporting the new roof system and equipment pads for relocated mechanical equipment.

The existing heat pumps on the roof of the building do not meet the heating and cooling requirements of the building. The equipment is old and operating very inefficiently. The heating and air conditioning equipment will be removed from the roof of the building. A new heating and air conditioning system will be provided for the building.

The electrical work required would be to remove and replace the power needed to support the heating and air conditioning system upgrade. The security system needs to be removed and

replaced to support the entire complex security upgrade. The communications service entrance for the communications needs to be upgraded to support the new communication distribution project. Also, since the cafeteria once served as office space, all extended telephone support for this function needs to be removed.

**F. Building 4496 (Administrative)**

Building 4496 is newer construction and is in good condition. New work involves the removal of a leaky built-up roof and replacement with a new standing seam metal roof. Interior work involves removal and replacement of damaged floor and ceiling tiles and minor repairs and painting of the interior walls.

The existing heat pump does not meet the heating and cooling requirements of the building. The equipment is old and operating very inefficiently. A new heating and air conditioning system will be provided for the building.

The electrical work required would be to remove and replace the power needed to support the heating and air conditioning system upgrade. The security system needs to be removed and replaced to support the entire complex security upgrade. The service entrance for the communications needs to be upgraded to support the new communication distribution upgrade.

**G. Building 4506 (Administrative)**

Building 4506 requires that it's security system be removed and replaced to support the security upgrade for the complex. The communications service entrance needs to be upgraded to support the new communication distribution project. The upgrade for the communications service entrance for this facility will be more extensive than the other facilities because it currently serves as the telephone distribution point for the complex.

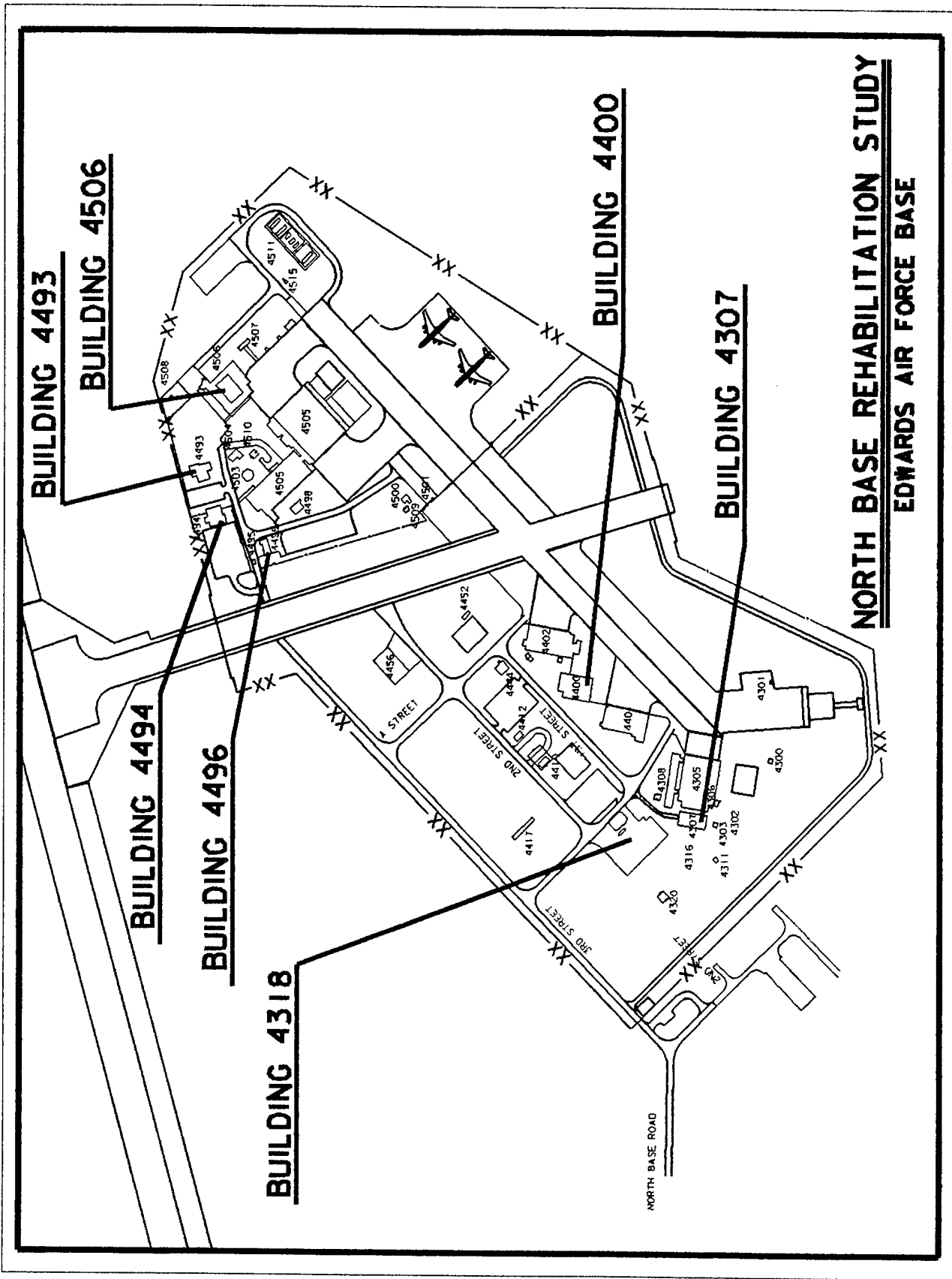


Figure 12 : Location Plan For Upgrade Buildings  
( Support Facilities - Existing )

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Support Facilities-Existing)

**Project Title:** Bldg. 4307 (Storage)

**Estimated Project Cost:** \$ 15,000

**Scope Of Work:**

**Architectural:**

- Install motor operated overhead doors.

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:**

- Upgrade electrical system to support motor operated overhead doors.

**Sitework:** Not Applicable

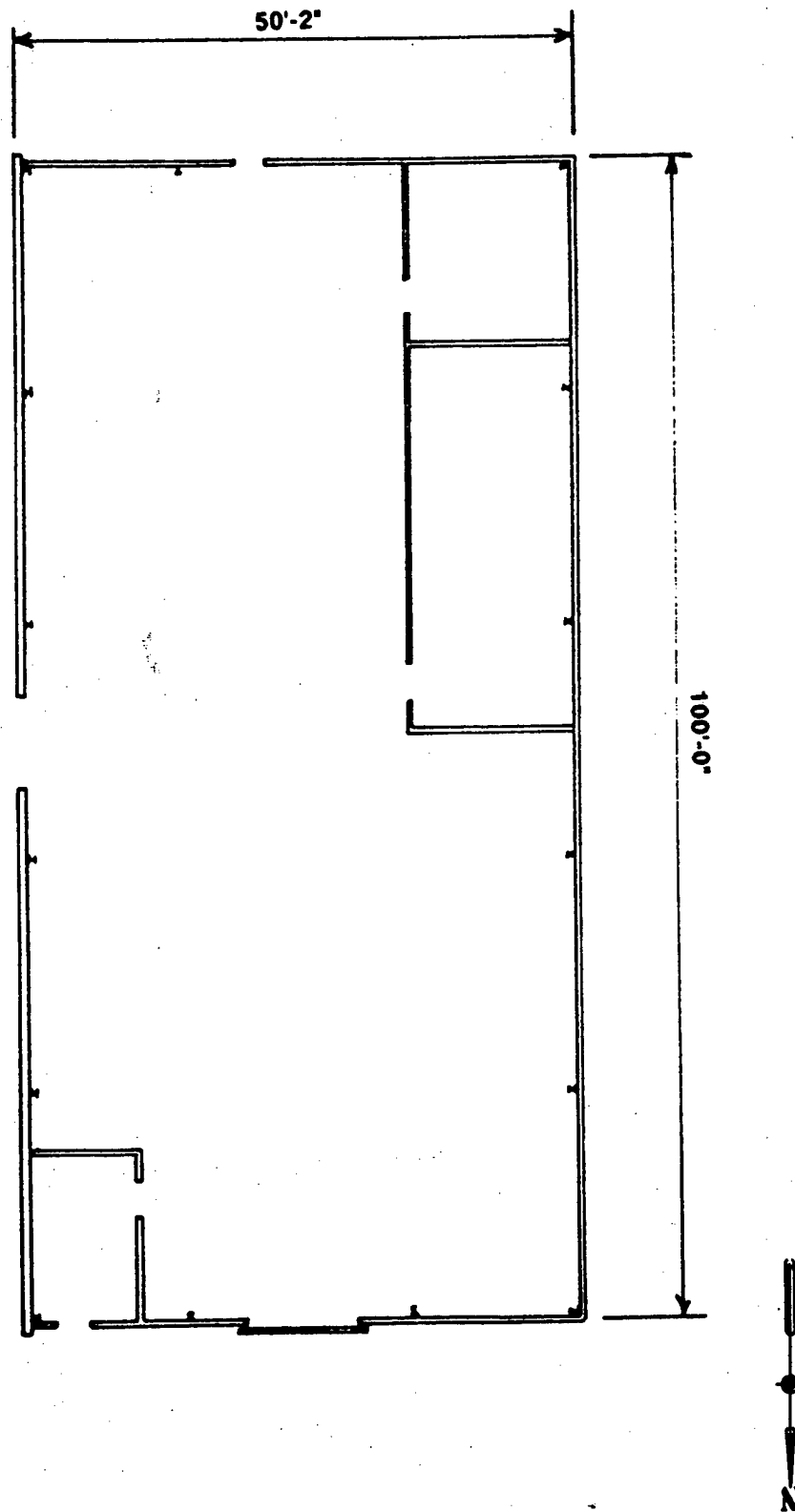


Figure 13 : Floor Plan For Building 4307



**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Support Facilities-Existing)

**Project Title:** Bldg. 4318 (Gas Station)

**Estimated Project Cost:** \$ 90,000

**Scope Of Work:**

**Architectural:**

- Demolish existing facility.

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:** Not Applicable

**Sitework:**

- Removal of pavement.
- Construct fuel dispensing station.

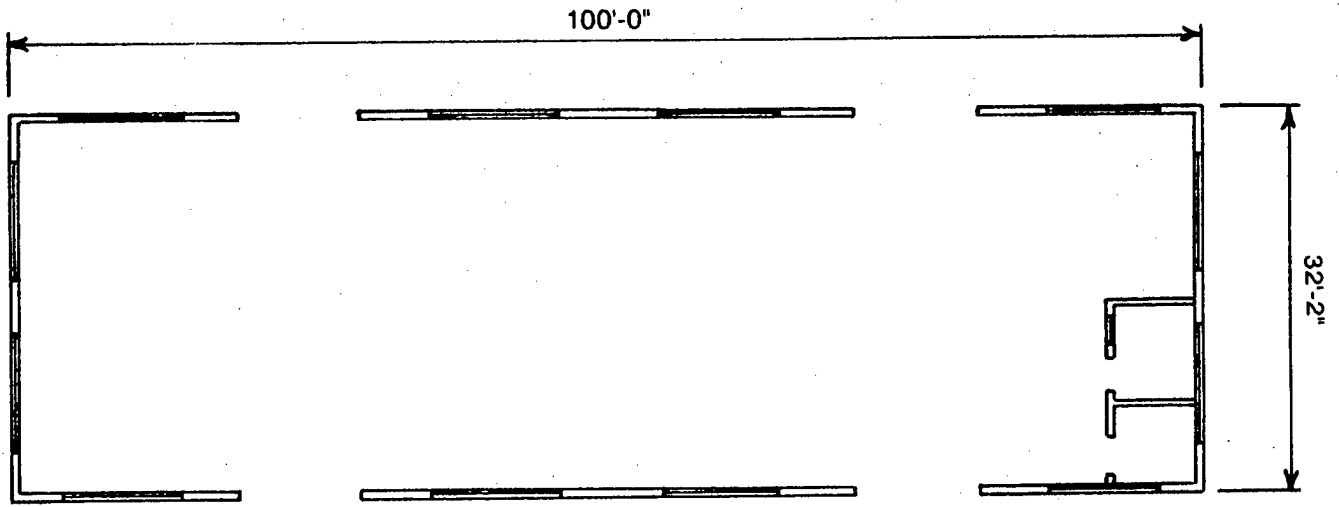


Figure 14 : .Floor Plan For Building 4318

EDWARDS AIR FORCE BASE  
NORTH BASE REHABILITATION

PROJECT REQUIREMENTS

Category: Upgrade Buildings (Support Facilities-Existing)

Project Title: Bldg. 4400 (Storage)

Estimated Project Cost: \$ 80,000

Scope Of Work:

**Architectural:** Not Applicable

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:**

- Upgrade electrical system (Power & Lighting).
- Remove & replace security system.
- Upgrade communications system.

**Sitework:** Not Applicable

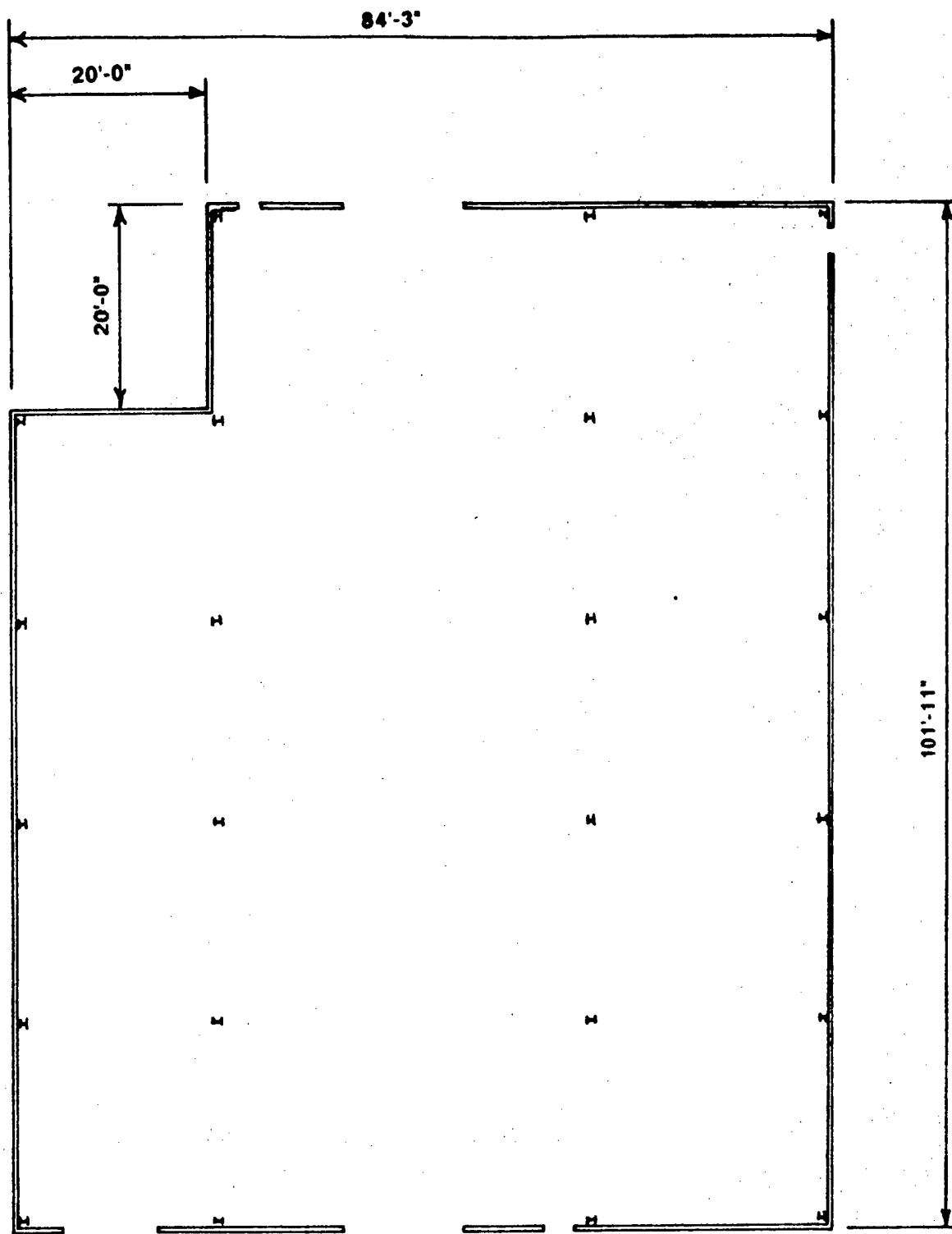


Figure 15 : Floor Plan For Building 4400

EDWARDS AIR FORCE BASE  
NORTH BASE REHABILITATION

PROJECT REQUIREMENTS

Category: Upgrade Buildings (Support Facilities-Existing)

Project Title: Bldg. 4493 (Gymnasium)

Estimated Project Cost: \$ 330,000

Scope Of Work:

**Architectural:**

- Remove roofing.
- Construct false roof system.
- Construct standing seam metal roof.
- Repair roof deck.
- Minor interior repair and painting.

**Structural:**

- Upgrade structural system to allow for additional weight of standing seam metal roof system.

**Mechanical:**

- Remove & replace mechanical system (HVAC).
- Move mechanical equipment off of roof onto ground equipment pads.
- Convert heating source from electrical heat pump to propane.
- Install propane tank.

**Electrical:**

- Upgrade electrical system to support mechanical upgrade.
- Upgrade communications system.

**Sitework:** Not Applicable

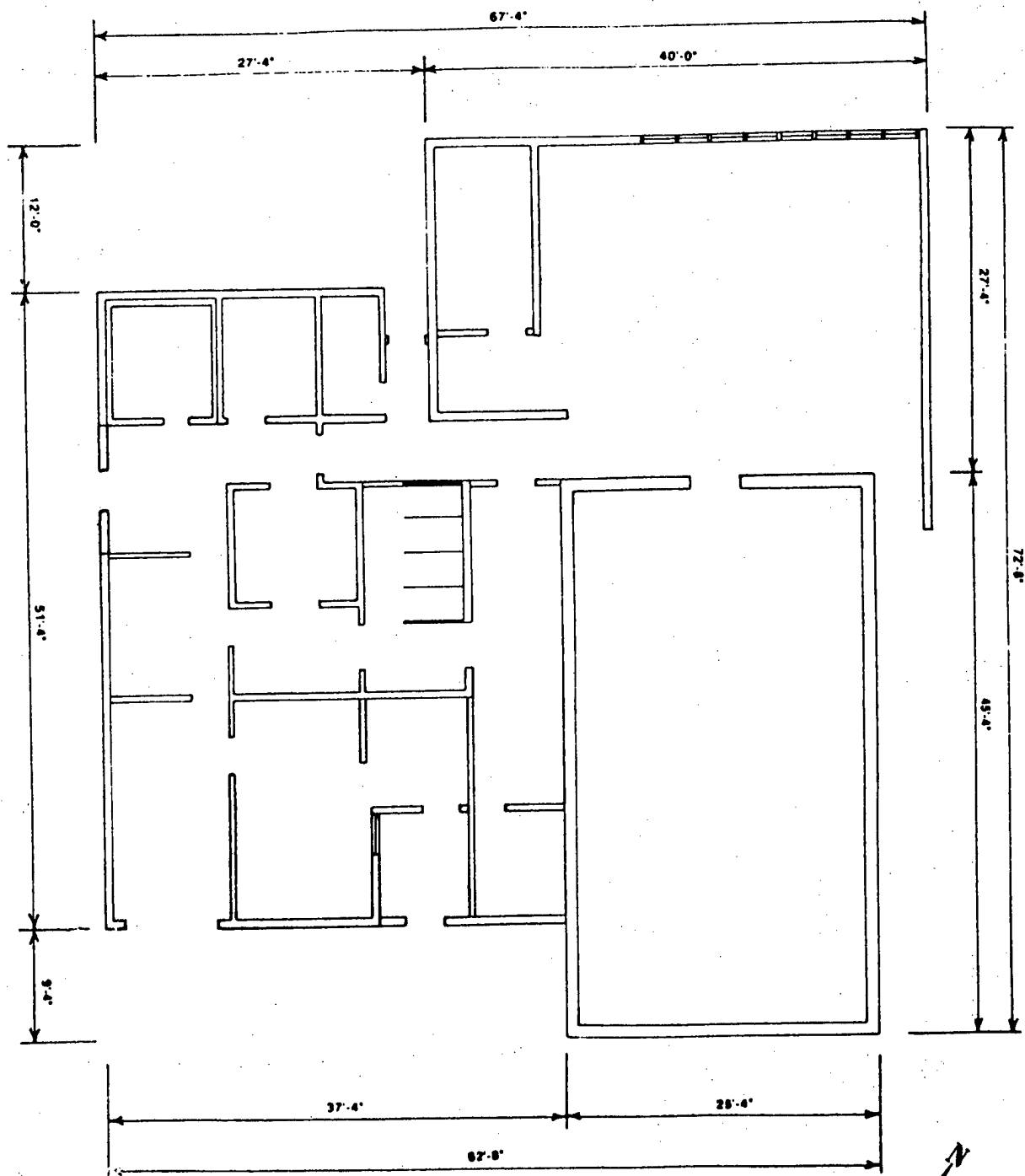


Figure 16 : Floor Plan For Building 4493

EDWARDS AIR FORCE BASE  
NORTH BASE REHABILITATION

PROJECT REQUIREMENTS

Category: Upgrade Buildings (Support Facilities-Existing)

Project Title: Bldg. 4494 (Cafeteria)

Estimated Project Cost: \$ 460,000

Scope Of Work:

**Architectural:**

- Remove roofing.
- Construct false roof system.
- Construct standing seam metal roof.
- Remove outdated kitchen equipment.
- Install cold sandwich serving line.
- Remove & replace floor tile.
- Remove & replace ceiling tile.
- Minor interior repair and painting.

**Structural:**

- Upgrade structural system to allow for additional weight of standing seam metal roof system.

**Mechanical:**

- Remove & replace mechanical system (HVAC).
- Move mechanical equipment off of roof onto ground equipment pads.
- Convert heating source from electrical heat pump to propane.
- Install propane tank.

**Electrical:**

- Upgrade electrical system to support mechanical upgrade.
- Remove & replace security system.
- Upgrade communications system.

**Sitework:** Not Applicable

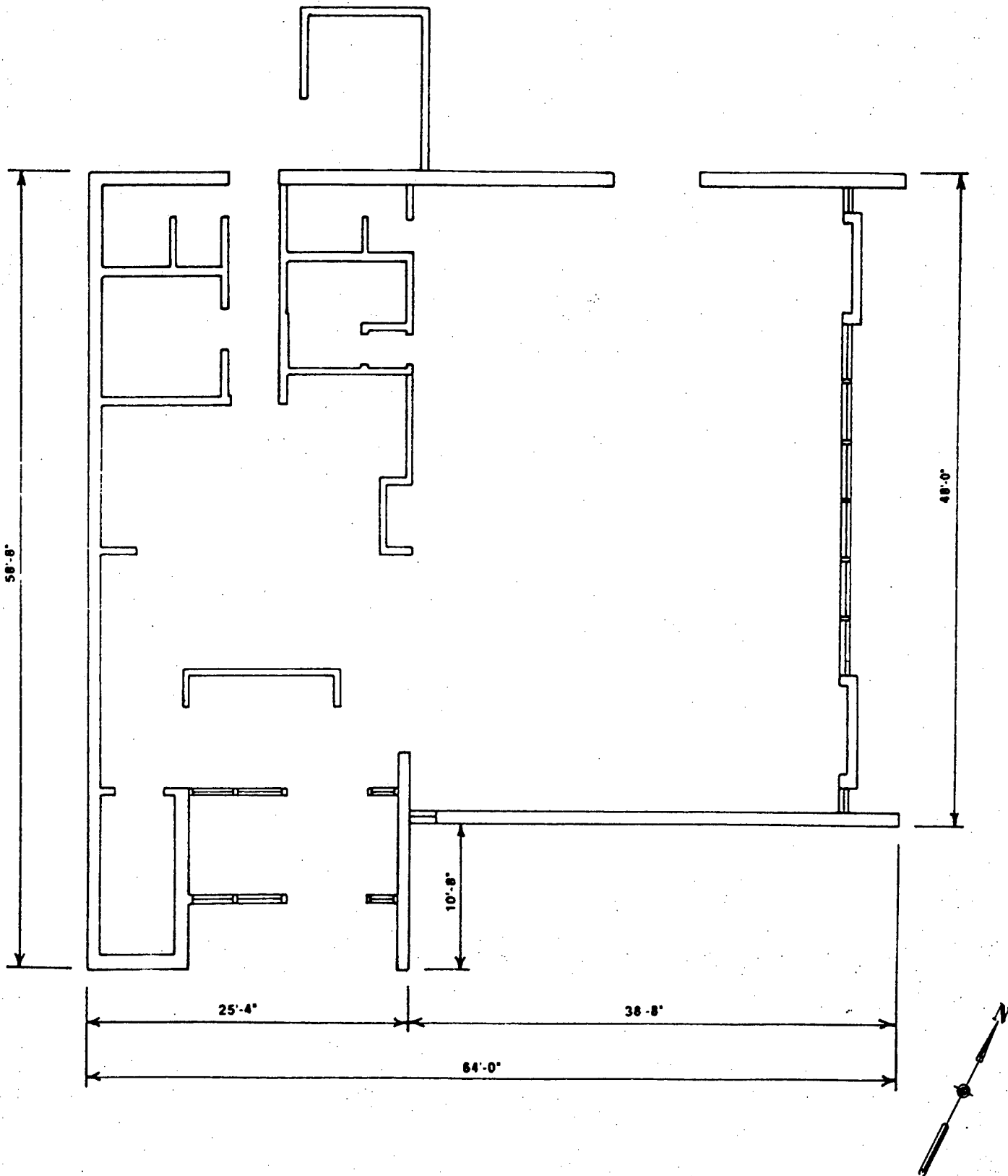


Figure 17 : Floor Plan For Building 4494



**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Support Facilities-Existing)

**Project Title:** Bldg. 4496 (Administrative)

**Estimated Project Cost:** \$ 160,000

**Scope Of Work:**

**Architectural:**

- Remove roofing.
- Construct false roof system.
- Construct standing seam metal roof.
- Minor interior repair and painting.

**Structural:**

- Upgrade structural system to allow for additional weight of standing seam metal roof system.

**Mechanical:**

- Remove & replace mechanical system (HVAC).
- Move mechanical equipment off of roof onto ground equipment pads.
- Convert heating source from electrical heat pump to propane.
- Install propane tank.

**Electrical:**

- Upgrade electrical system to support mechanical upgrade.
- Upgrade security system.
- Provide telephone entrance.

**Sitework:** Not Applicable

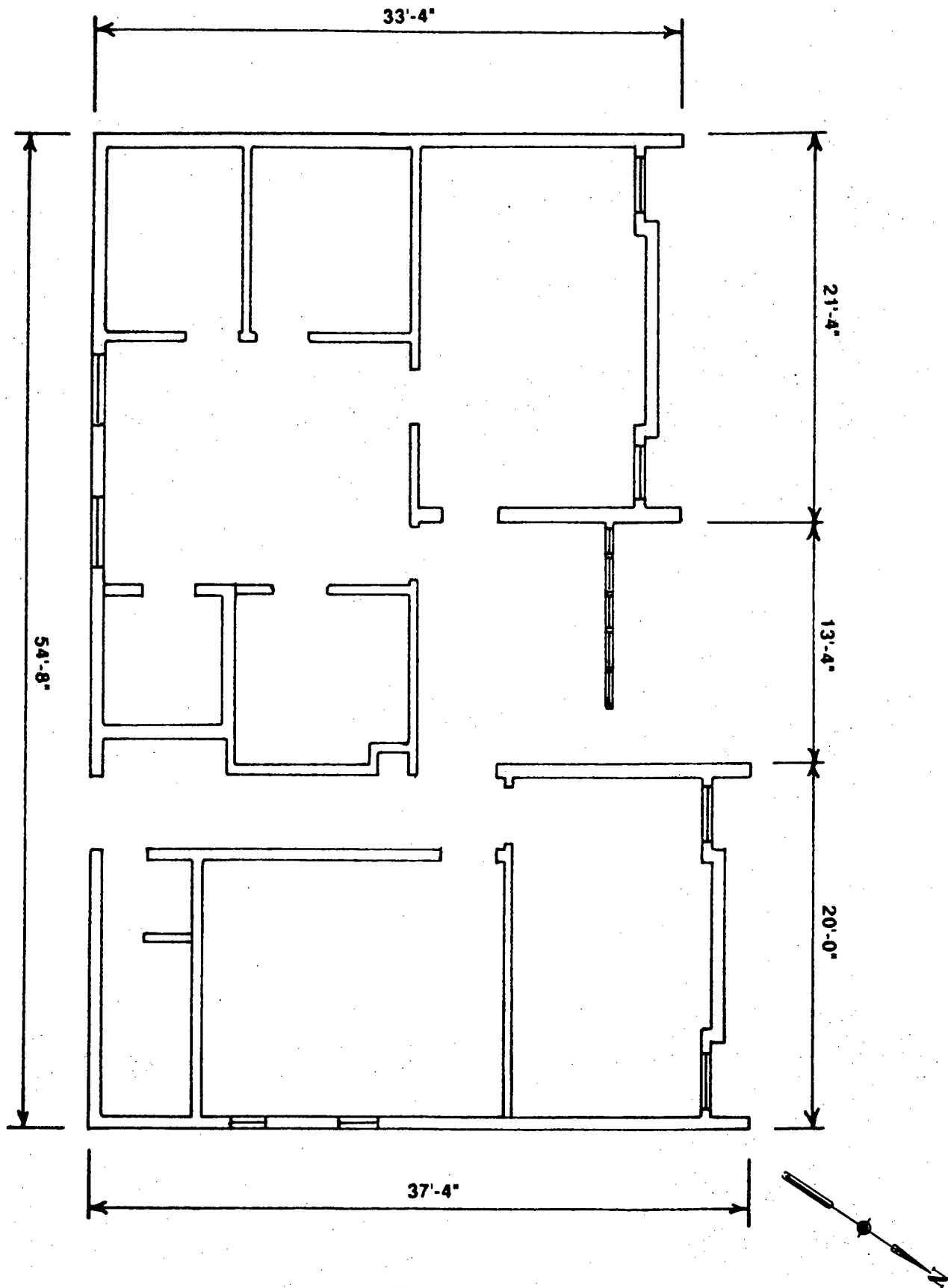


Figure 18 : Floor Plan For Building 4496

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Upgrade Buildings (Support Facilities-Existing)

**Project Title:** Bldg. 4506 (Administrative)

**Estimated Project Cost:** \$ 15,000

**Scope Of Work:**

**Architectural:** Not Applicable

**Structural:** Not Applicable

**Mechanical:** Not Applicable

**Electrical:**

- Remove & replace security system.
- Upgrade communications system.

**Sitework:** Not Applicable

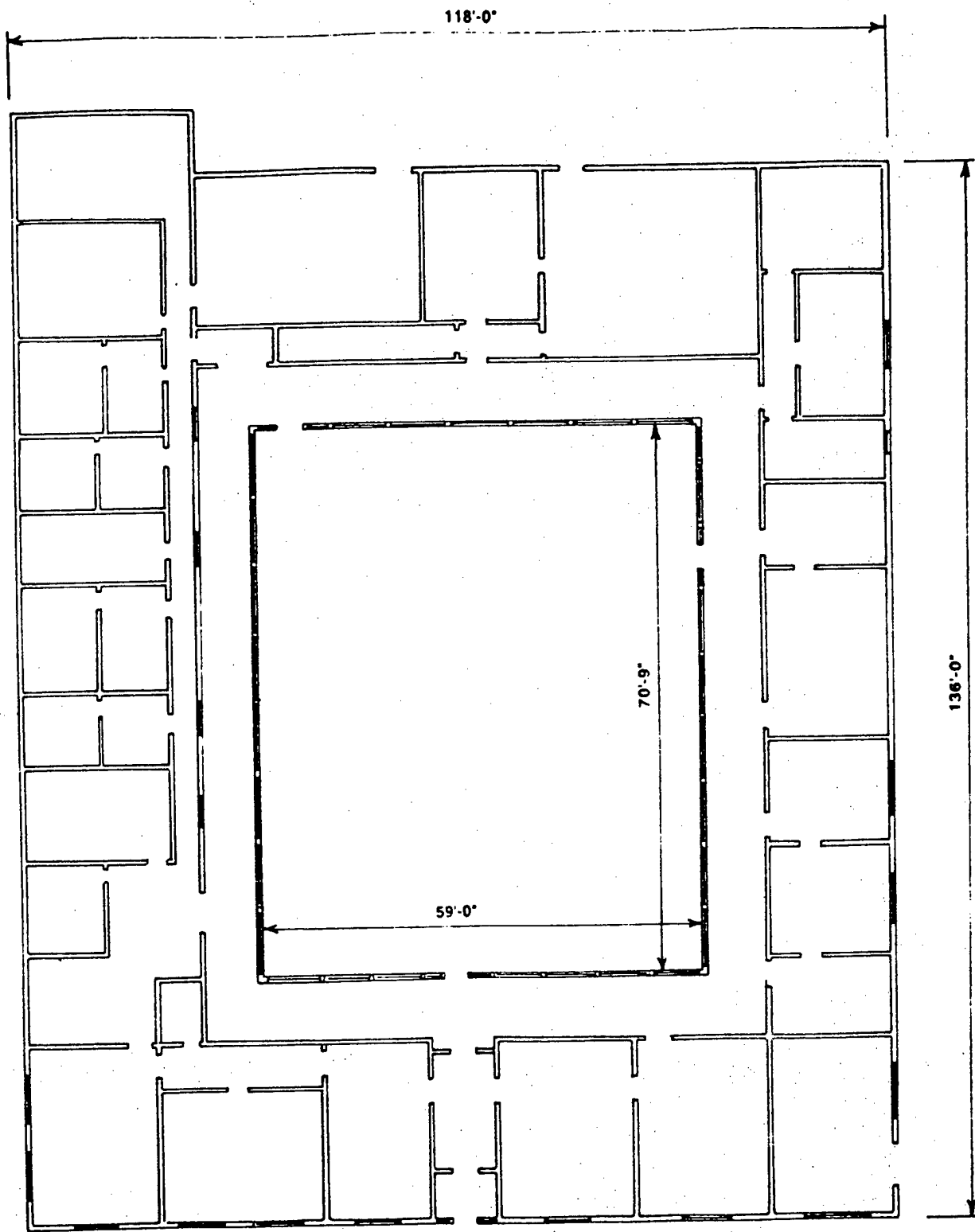


Figure 19 : Floor Plan For Building 4506

**IX. BUILDINGS**  
**( SUPPORT FACILITIES - NEW )**

**A. Engine Repair Shop & Storage Facility**

The existing engine repair shop located in an attached pre-engineered structure at Building 4505 will remain and a new 5200 The building addition will be a steel rigid frame with roof construction of steel joists and metal deck, rigid insulation and a standing seam metal roof. The walls will be constructed of metal panels and insulation. Ceiling will be exposed roof in storage areas.

**B. Hush House Noise Suppressor**

In conjunction with this category would be the construction of the foundation, site work and support utilities for a Hush House Noise Suppressor. The actual facility itself would be directly supplied and installed by the Air Force and not a part of this construction package. The facility would be located in the southwest corner of the complex adjacent to the existing aircraft apron.

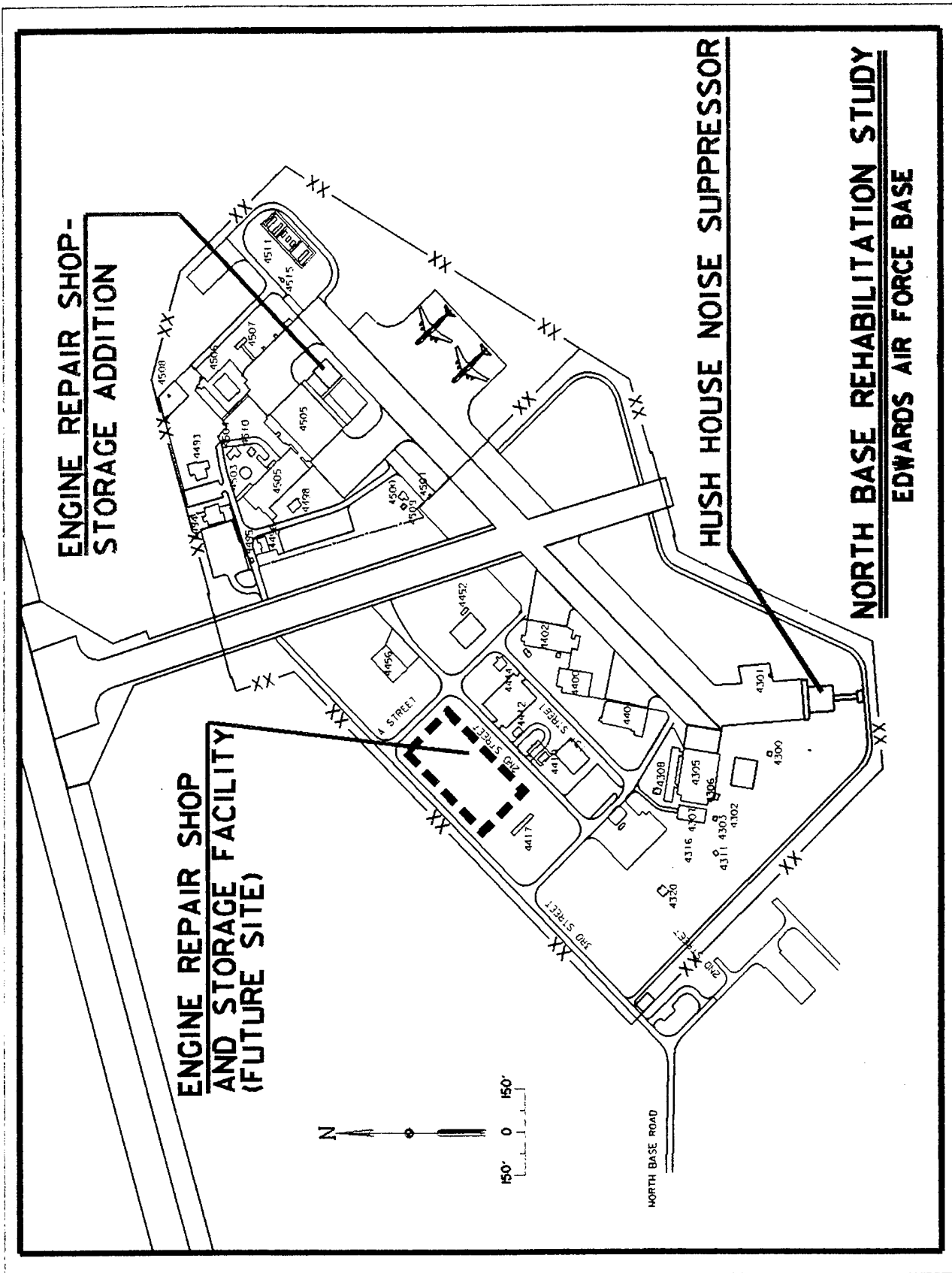


Figure 20 : Location Plan For Buildings ( Support Facilities - New )

EDWARDS AIR FORCE BASE  
NORTH BASE REHABILITATION

PROJECT REQUIREMENTS

Category: Buildings (Support Facilities-New)

Project Title: Engine Repair Shop - Storage Addition

Estimated Project Cost: \$ 600,000

Scope Of Work:

- Construct a 5200 sf Engine Repair Shop Storage Addition onto Building 4505.

**EDWARDS AIR FORCE BASE**  
**NORTH BASE REHABILITATION**

**PROJECT REQUIREMENTS**

**Category:** Buildings (Support Facilities-New)

**Project Title:** Hush House Noise Suppressor

**Estimated Project Cost:** \$ 650,000

**Scope Of Work:**

- Construct the foundation, site work and supporting utilities for a Hush House Noise Suppressor.



## X. PHYSICAL SECURITY

### A. Security Fencing

The existing perimeter security fence is a mixture of both six and eight foot high FE-6 chainlink fence. All eight foot high fence that matches the new alignment will be removed and replaced with six foot high FE-6 fence. The new six foot FE-6 fence will have top and bottom wires and a 6 inch by 6 inch concrete sill. All existing six foot high fence that matches the new alignment will remain intact but will have a 6 inch by 6 inch concrete sill added. New fence will be provided along the new alignment. The existing security fence around Building 4505 will remain creating a secure area within a secure area.

An existing motorized taxiway gate near Building 4505 will be removed and replaced with a gate capable of accommodating the proposed apron expansion. Two new motorized taxiway gates will be provided where the perimeter fence crosses the taxiway. Controls for the new gates will be located in the existing entry control facility, Building 4495. A new motorized slide gate will be provided at the new entry control facility.

New access pavement and parking area will be provided for the new entry control facility. The pavement section will consist of 1-1/2 inches of bituminous surface course, 1-1/2 inches of bituminous intermediate course, 4 inches crushed

aggregate base course, and 4 inches of granular filter course. The access road cross section will consist of two eleven foot traffic lanes with four foot shoulders. Pavement markings will be provided for both the access road and the parking area. Concrete curb stops will be provided for the perimeter parking stalls.

A new 16' wide interior patrol road will be provided paralleling the perimeter security fence. Pavement section will consist of 6 inches crushed rock surfacing over 12 inches compacted subgrade.

**B. Entry Control Facility / Generator / Communications Building**

The new Entry Control Facility will be a multi-purpose building. It will house the entry control function for the complex as well as containing the communication center and back-up generator for the security systems. The architecture of the facility will be compatible with other new facilities proposed in the area.

**C. Security Lighting & CCTV**

A security lighting system consisting of instant restrike high pressure sodium fixtures placed approximately every 60 feet will be placed around the inside perimeter fence. The lighting system supports a CCTV system. A CCTV system with monitors will be provided in the Entry Control Facility (ECF) for visual inspection of the perimeter of the complex. The Air Force

criteria followed will be for a priority type B area.

The ECF will also house the CCTV system console, the security system main console, control for the entrance gates, emergency generator for back-up power and the main communication distribution point for the complex. The emergency generator will provide standby power for the perimeter lighting, CCTV (cameras and console) and the security system console. A 60 kW emergency generator will be required to support this load.

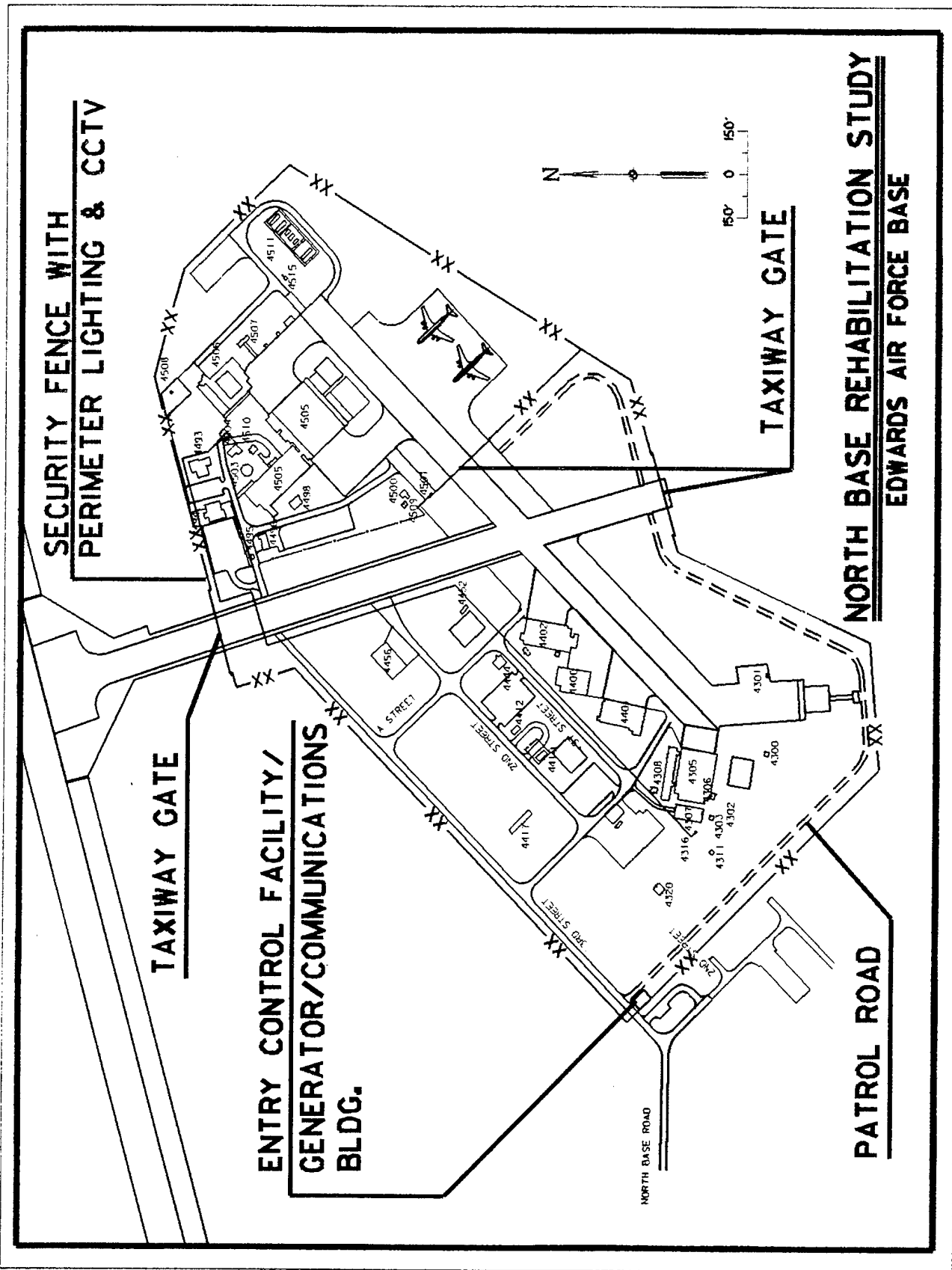


Figure 21 : Location Plan For Physical Security

EDWARDS AIR FORCE BASE  
NORTH BASE REHABILITATION

PROJECT REQUIREMENTS

Category: Physical Security

Project Title: Physical Security

Estimated Project Cost: \$ 2,900,000

Scope Of Work:

**Architectural:**

- Provide combination Entry Control Facility / Communications Center / Generator Bldg.

**Structural:**

**Mechanical:**

**Electrical:**

- Provide perimeter lighting.
- Provide CCTV system.
- Provide standby generator for security lighting.
- Distribution system for security wiring (Conduit system to be built by utility project.).

**Sitework:**

- Remove existing security fence and perimeter lights.
- Rehabilitate existing security fence.
- Provide security fence along new alignment.
- Remove existing taxiway gate.
- Provide taxiway gates (3-required).
- Provide slide gate at new entry control facility.
- Provide parking area for new entry control facility.
- Construct interior patrol road.

## XI. SUMMARY

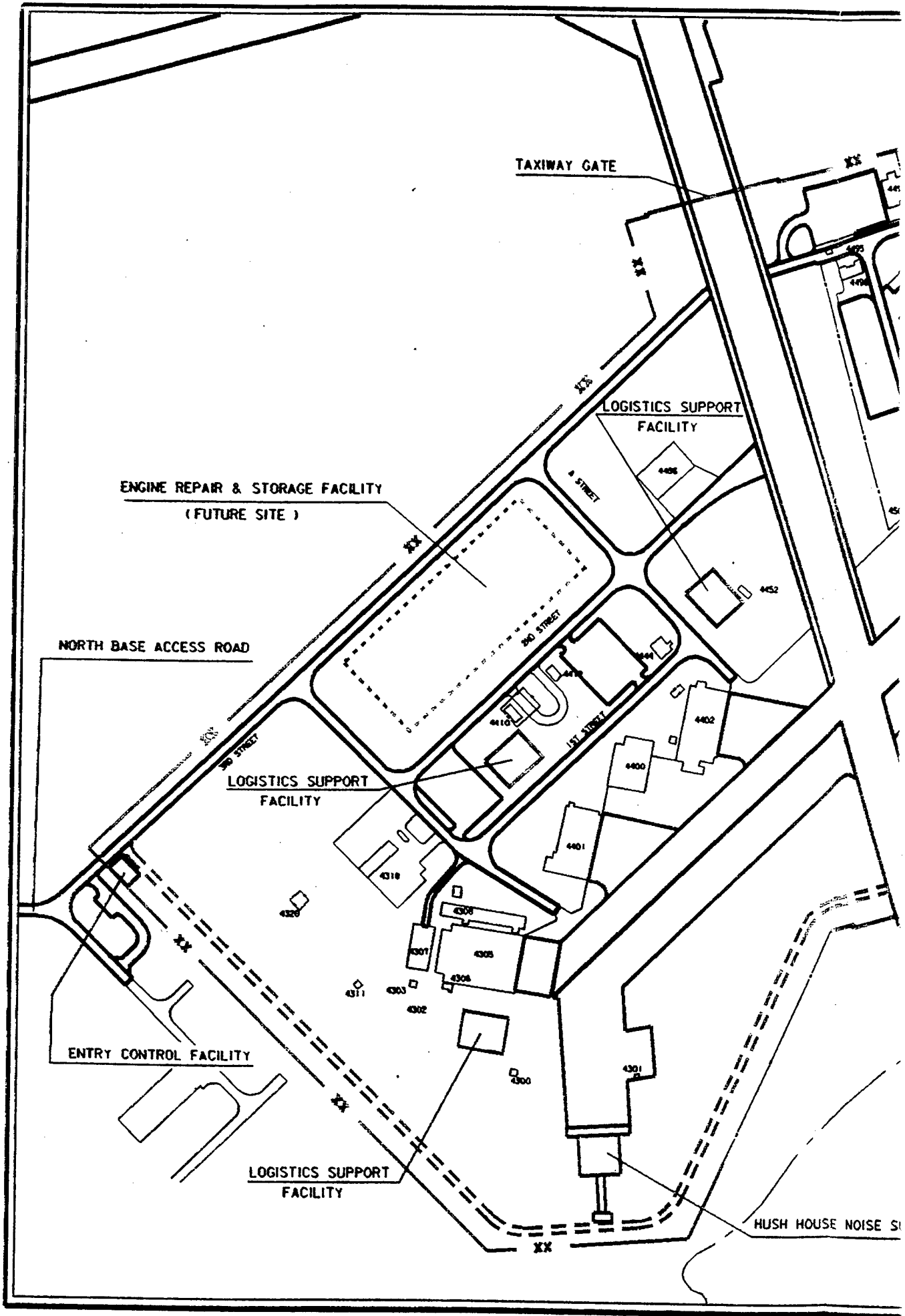
### A. Introduction

The general condition of facilities at the North Base are as would be expected for an installation which has seen very little maintenance work, both from the point of view of preventative maintenance and criteria compliance. However, the existing buildings and basic infrastructure of North Base are intact and offer a valuable resource to be used as a basis for the rehabilitation of North Base. By rehabilitating the existing hangars, use is made of in-place foundations and superstructures thus making the reuse of the existing facility a more favorable economic alternative when compared to a new facility.

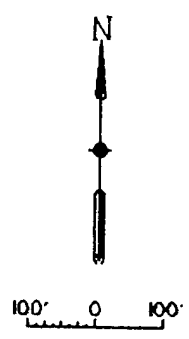
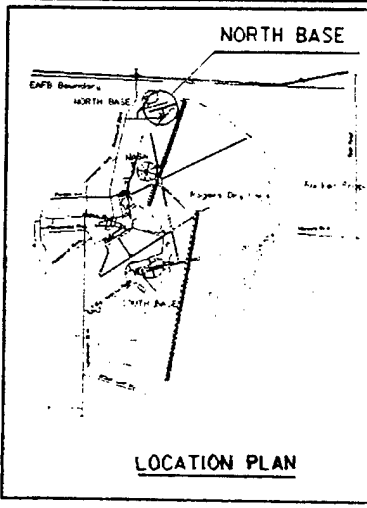
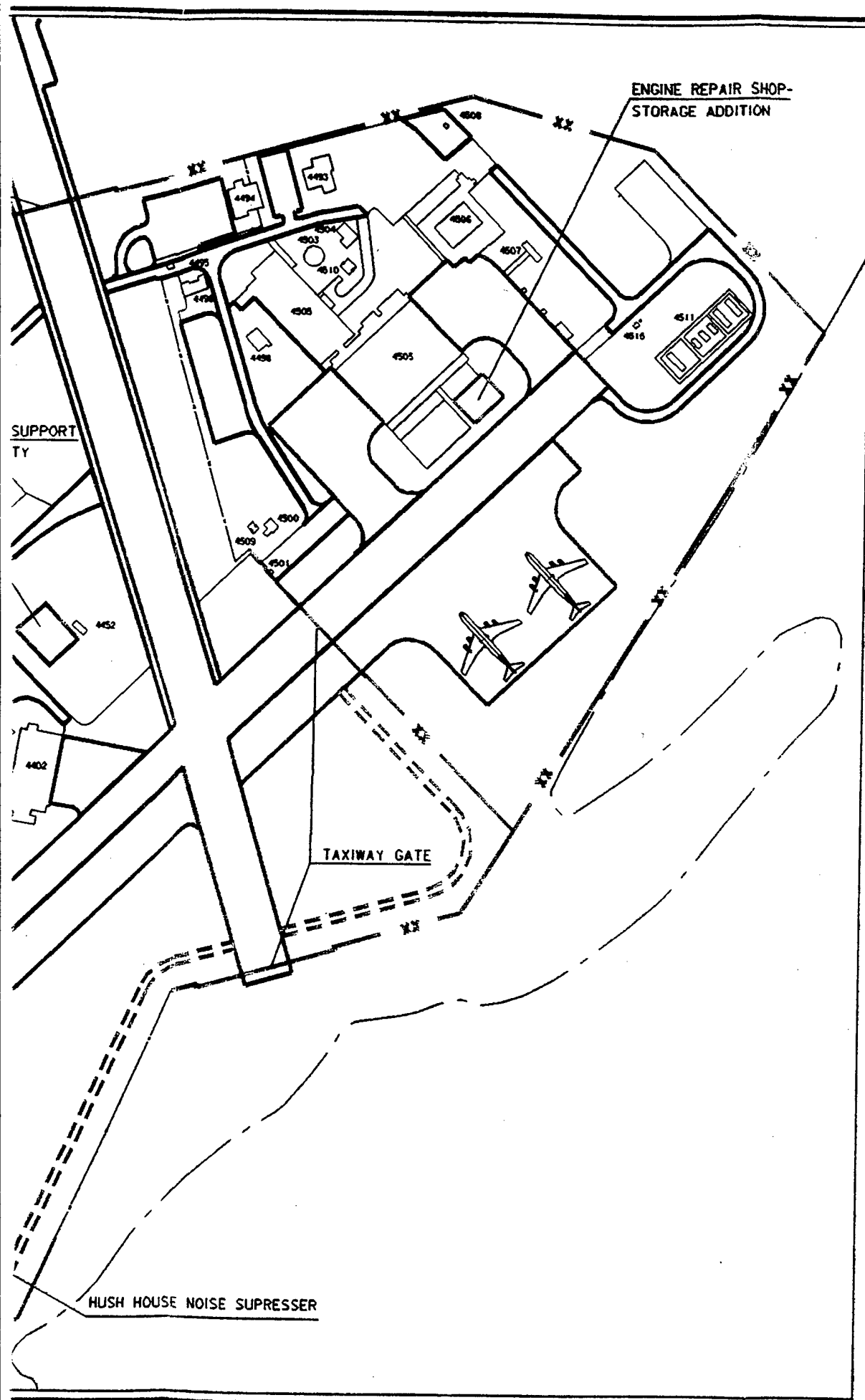
Contained in the following sections are summaries of the project categories, which include all of the identified projects, along with their associated costs. Figure 22 shows a comprehensive plan of all of the proposed improvements associated with the rehabilitation of North Base. A construction packaging sequence has been included in the final section of the report as an initial guideline in the development of a programming and acquisition strategy.

### B. Summary Of Project Costs

The following tables contain summaries of the estimated costs for each of the proposed projects. For purposes of clarification the projects have been grouped by their category.



①



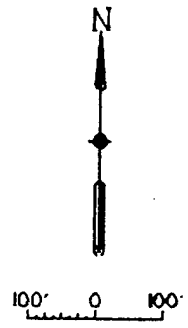
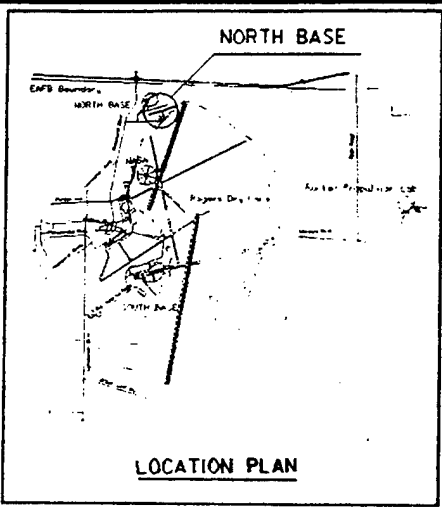
- LEGEND**
- EXISTING BLDGS., ROADS & FE
  - PROPOSED BUILDINGS
  - PROPOSED AIRFIELD PAVEMENT
  - PROPOSED ROADS & PARKING
  - PROPOSED SECURITY FENCE
  - - - - - PROPOSED SECURITY PATROL

**FIGURE 22**  
**MASTER PLAN**  
**FOR THE REHABILITAT**  
**OF NORTH BASE**

2



AIR SHOP-  
ADDITION



LEGEND

- EXISTING BLDGS., ROADS & FENCE
- PROPOSED BUILDINGS
- PROPOSED AIRFIELD PAVEMENTS
- PROPOSED ROADS & PARKING
- PROPOSED SECURITY FENCE
- - - - - PROPOSED SECURITY PATROL ROAD

FIGURE 22  
 MASTER PLAN  
 FOR THE REHABILITATION  
 OF NORTH BASE

3

Table 3: Summary Of Project Costs For Airfield Pavements

<u>PROJECT:</u>	<u>ESTIMATED COST:</u>
 Airfield Pavements	
Upgrade Runway	\$ 7,300,000 ( Option No. 1 ) 4,300,000 ( Option No. 2 ) 9,300,000 ( Option No. 3 ) 6,200,000 ( Option No. 4 )
Extend Runway	\$ 3,300,000
Upgrade Taxiways	\$ 3,700,000 ( Option No. 1 ) 2,600,000 ( Option No. 2 ) 3,700,000 ( Option No. 3 ) 3,200,000 ( Option No. 4 )
Expand & Upgrade Apron	\$ 2,900,000 ( Option Nos. 1,2,3 & 4 )
<hr style="width: 20%; margin-left: auto; margin-right: auto;"/>	
<b>TOTAL PROJECT COST</b>	<b>\$ 13,100,000 - 19,200,000</b>
<b>(Airfield Pavement Category)</b>	

Total Project Cost for this category depends upon the combination of pavement options selected.

Table 4: Summary Of Project Costs Excluding Airfield Pavements

<u>PROJECT:</u>	<u>ESTIMATED COST:</u>
Roads & Parking	\$ 4,500,000
Utilities ( Water & Sewer )	\$ 4,800,000
Utilities ( Electrical & Communications )	\$ 500,000
Upgrade Buildings ( Hangars - Existing )	
Building 4305	6,800,000
Building 4401	4,400,000
Building 4402	4,400,000
Building 4505	\$ 7,100,000
	\$ 22,700,000
Upgrade Buildings ( Support Facilities - Existing )	
Building 4307 (Storage)	\$ 15,000
Building 4318 (Gas Station)	90,000
Building 4400 (Storage)	80,000
Building 4493 (Gymnasium)	330,000
Building 4494 (Cafeteria)	460,000
Building 4496 (Administrative)	160,000
Building 4506 (Administrative)	15,000
	\$ 1,150,000
Buildings ( Support Facilities - New )	
Engine Repair Shop -	\$ 600,000
Storage Addition	
Hush House Noise Suppressor -	650,000
(Foundation)	\$ 1,250,000
Physical Security	\$ 2,900,000
<b>TOTAL PROJECT COST</b>	<b>\$ 37,800,000</b>
<b>(Excluding Airfield Pavement Category)</b>	

Table 5: Summary Of Total Project Costs

<u>PROJECT CATEGORY:</u>	<u>ESTIMATED COST:</u>
Airfield Pavements	\$ 13,100,000 - 19,200,000
Roads And Parking	4,500,000
Utilities (Water & Sewer)	4,800,000
Utilities (Electrical & Communications)	500,000
Buildings (Hangars - Existing)	22,710,000
Buildings (Support Facilities - Existing)	1,140,000
Buildings (Support Facilities - New)	1,250,000
Physical Security	2,900,000
	<hr/>
<b>TOTAL PROJECT COST</b>	<b>\$ 50,900,000 - 57,000,000</b>

### C. Construction Packaging

Recognizing the volatile nature of funding availability and operational need, the practical approach to the realization of the previously described projects calls for the prioritization of the projects based upon resource availability and anticipated need. The scheduled need dates are unknown at this time therefore it is impossible to be very specific as to the fiscal year packaging and the phasing of road and utility systems. Based upon an initial indications a sequencing of construction has been developed and is shown in Table 6.

The sequencing of work as shown in Table 6 is very generalized at best. Additional analysis would be required during the design stages such that the amount of new work damaged or disturbed by follow on projects would be minimized. This would be especially true for the road and utility work. Care will need to be taken such that new road work is not damaged by follow on construction and that the crossing of new utility and road system improvements are properly sequenced.

Table 6: Sequencing Of Projects For Operational Milestones

Project Description

**OPERATIONAL SEQUENCE NO. 1 - INFRASTRUCTURE OF COMPLEX:**

Utilities ( Water )  
Upgrade Runway  
Extend Runway  
Upgrade Main Taxiway  
Utilities ( Sewer )  
Utilities ( Elec. & Comm. )  
Physical Security  
Road System & Parking ( Interior )

**OPERATIONAL SEQUENCE NO. 2 - BUILDING 4402:**

Upgrade Apron For Bldg. 4402  
Building 4402 Rehab  
Engine Repair Shop Storage Addition  
Hush House Noise Suppressor

**OPERATIONAL SEQUENCE NO. 3 - BUILDING 4505:**

Upgrade & Expand Apron For Bldg. 4505  
Building 4505 Rehab

**OPERATIONAL SEQUENCE NO. 4 - BUILDING 4401:**

Upgrade & Expand Apron For Bldg. 4401  
Building 4401 Rehab

**OPERATIONAL SEQUENCE NO. 5 - BUILDING 4305:**

Upgrade & Expand Apron For Bldg. 4305  
Building 4305 Rehab

**OPERATIONAL SEQUENCE NO. 6 - COMPLETION OF COMPLEX REHABILITATION:**

Road System ( Exterior )  
Bldgs. 4307, 4318, 4400, 4493, 4494, 4496 & 4506

**APPENDICES**





# BRIEFING SLIDES

APPENDIX B

B-1

# NORTH BASE REHABILITATION STUDY

## EDWARDS AIR FORCE BASE

### Sequence of Briefing Slides

#### LEFT SCREEN

Slide  
LT-1

AERIAL PHOTO  
OF  
NORTH BASE

Slide  
LT-2

LOCATION PLAN  
FOR  
EXTEND & UPGRADE  
RUNWAY

Slide  
LT-3

LOCATION PLAN  
FOR  
UPGRADE TAXIWAY

Slide  
LT-4

LOCATION PLAN  
FOR  
UPGRADE & EXPAND  
APRON

#### RIGHT SCREEN

Slide  
RT-1

INTRODUCTORY  
SLIDE

Slide  
RT-2

PROJECT DATA  
FOR  
EXTEND & UPGRADE  
RUNWAY

Slide  
RT-3

PROJECT DATA  
FOR  
UPGRADE TAXIWAY

Slide  
RT-4

PROJECT DATA  
FOR  
UPGRADE & EXPAND  
APRON

# NORTH BASE REHABILITATION STUDY

## EDWARDS AIR FORCE BASE

### Sequence of Briefing Slides

#### LEFT SCREEN

Slide  
LT-5

LOCATION PLAN  
FOR  
UPGRADE ROADS  
& PARKING

Slide  
LT-6

LOCATION PLAN  
FOR  
UTILITIES -  
(WATER & SEWER)

Slide  
LT-7

LOCATION PLAN  
FOR  
UTILITIES -  
(ELEC. & COMM.)

Slide  
LT-8

LOCATION PLAN  
FOR  
UPGRADE BLDGS.  
(HANGARS)

#### RIGHT SCREEN

Slide  
RT-5

PROJECT DATA  
FOR  
UPGRADE ROADS  
& PARKING

Slide  
RT-6

PROJECT DATA  
FOR  
UTILITIES -  
(WATER & SEWER)

Slide  
RT-7

PROJECT DATA  
FOR  
UTILITIES -  
(ELEC. & COMM.)

Slide  
RT-8

PROJECT DATA  
FOR  
BUILDING 4305 -  
(HANGAR)

# NORTH BASE REHABILITATION STUDY

## EDWARDS AIR FORCE BASE

### Sequence of Briefing Slides

#### LEFT SCREEN

CONTINUE  
WITH  
SLIDE LT-8

CONTINUE  
WITH  
SLIDE LT-8

CONTINUE  
WITH  
SLIDE LT-8

LOCATION PLAN  
FOR  
UPGRADE BLDGS.  
(SUPPORT FAC.)

Slide  
LT-9

#### RIGHT SCREEN

PROJECT DATA  
FOR  
BUILDING 4401 -  
(HANGAR)

PROJECT DATA  
FOR  
BUILDING 4402 -  
(HANGAR)

PROJECT DATA  
FOR  
BUILDING 4505 -  
(HANGAR)

PROJECT DATA  
FOR  
BUILDING 4507 -  
(HANGAR)

Slide  
RT-9

Slide  
RT-10

Slide  
RT-11

Slide  
RT-12

# NORTH BASE REHABILITATION STUDY

## EDWARDS AIR FORCE BASE

### Sequence of Briefing Slides

#### LEFT SCREEN

CONTINUE  
WITH  
SLIDE LT-9

CONTINUE  
WITH  
SLIDE LT-9

CONTINUE  
WITH  
SLIDE LT-9

CONTINUE  
WITH  
SLIDE LT-9

#### RIGHT SCREEN

Slide  
RT-13

PROJECT DATA  
FOR  
BUILDING 4318 -  
(GAS STATION)

Slide  
RT-14

PROJECT DATA  
FOR  
BUILDING 4400 -  
(STORAGE)

Slide  
RT-15

PROJECT DATA  
FOR  
BUILDING 4493 -  
(GYMNASIUM)

Slide  
RT-16

PROJECT DATA  
FOR  
BUILDING 4494 -  
(CAFETERIA)

# NORTH BASE REHABILITATION STUDY

## EDWARDS AIR FORCE BASE

### Sequence of Briefing Slides

#### LEFT SCREEN

CONTINUE  
WITH  
SLIDE LT-9

CONTINUE  
WITH  
SLIDE LT-9

Slide  
LT-10

LOCATION PLAN  
FOR  
BUILDINGS (NEW)

Slide  
LT-11

LOCATION PLAN  
FOR  
PHYSICAL SECURITY

#### RIGHT SCREEN

Slide  
RT-17

PROJECT DATA  
FOR  
BUILDING 4496 -  
(ADMINISTRATION)

Slide  
RT-18

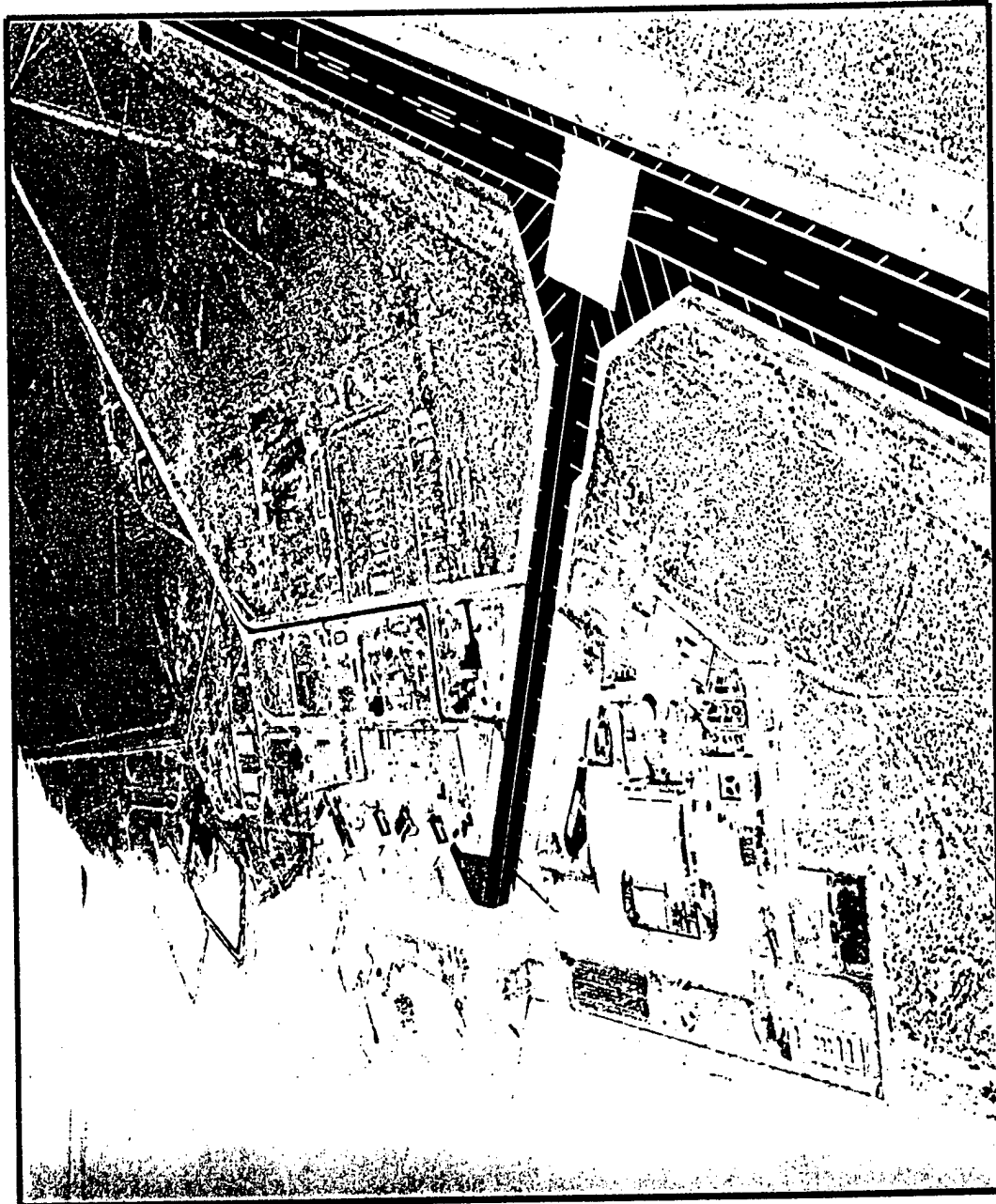
PROJECT DATA  
FOR  
BUILDING 4496 -  
(ADMINISTRATION)

Slide  
RT-19  
&  
RT-20

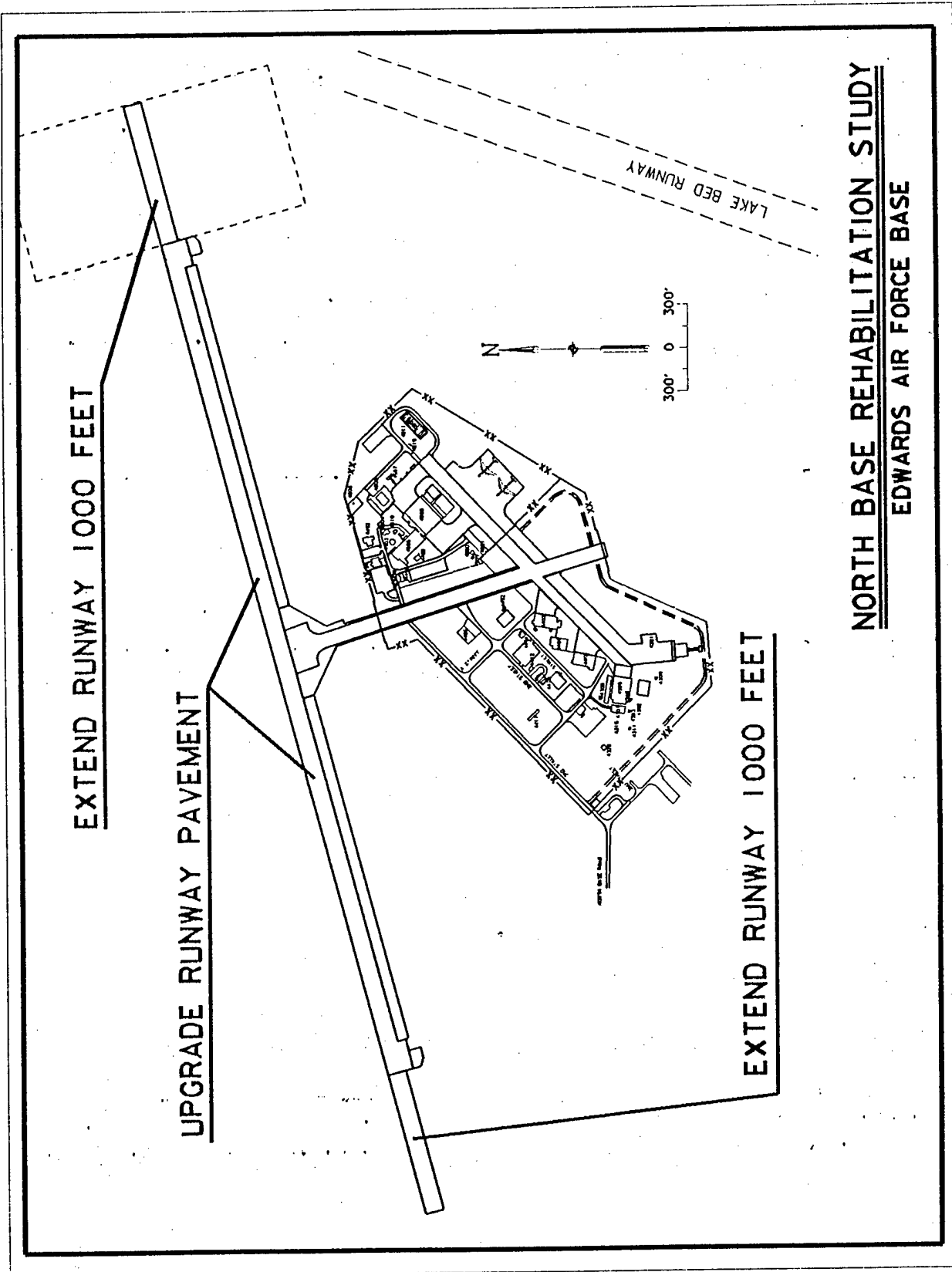
PROJECT DATA  
FOR  
ENG. SHOP/  
STORAGE ADDITION  
&  
HUSH HOUSE

Slide  
RT-21

PROJECT DATA  
FOR  
PHYSICAL SECURITY

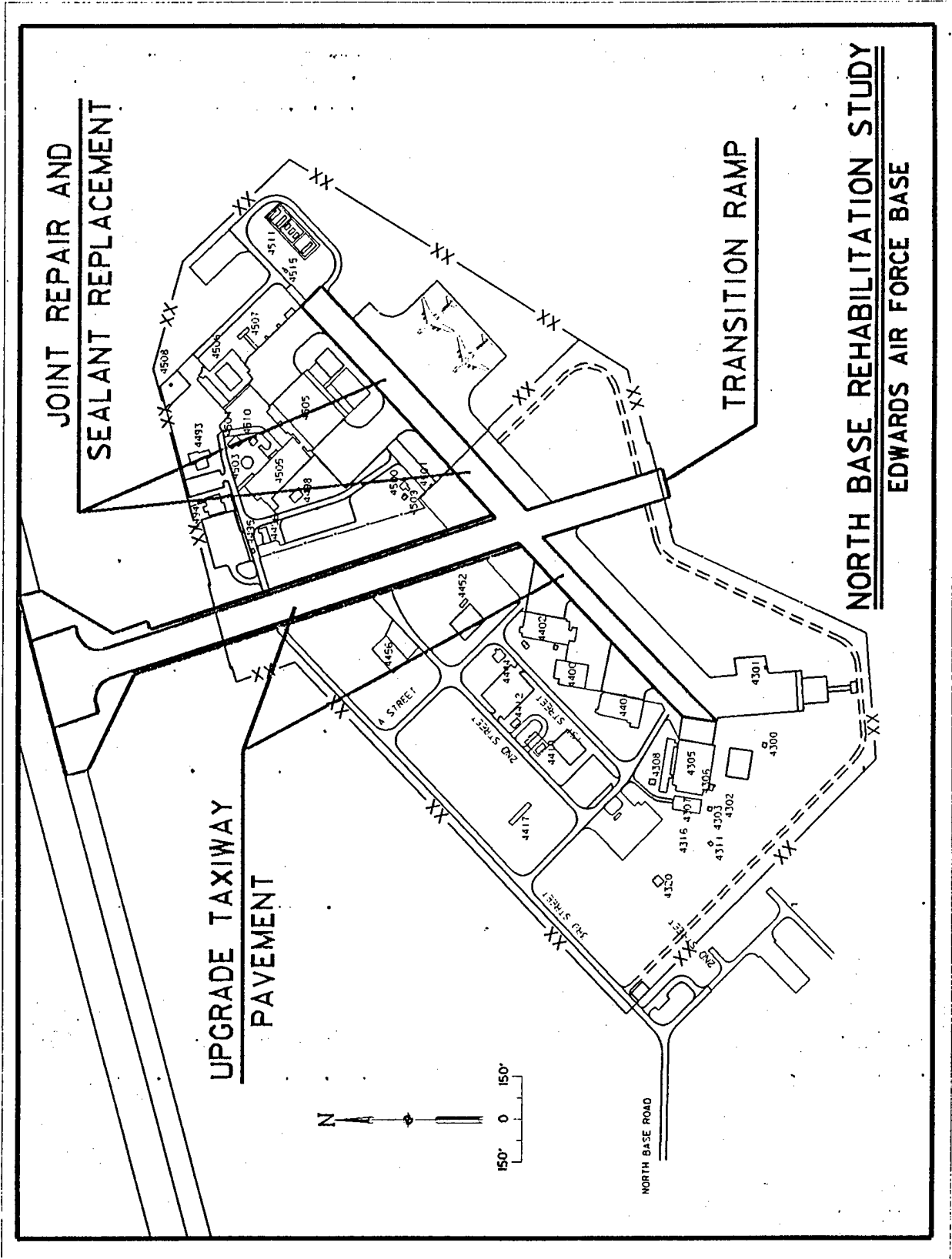


SLIDE LT-1

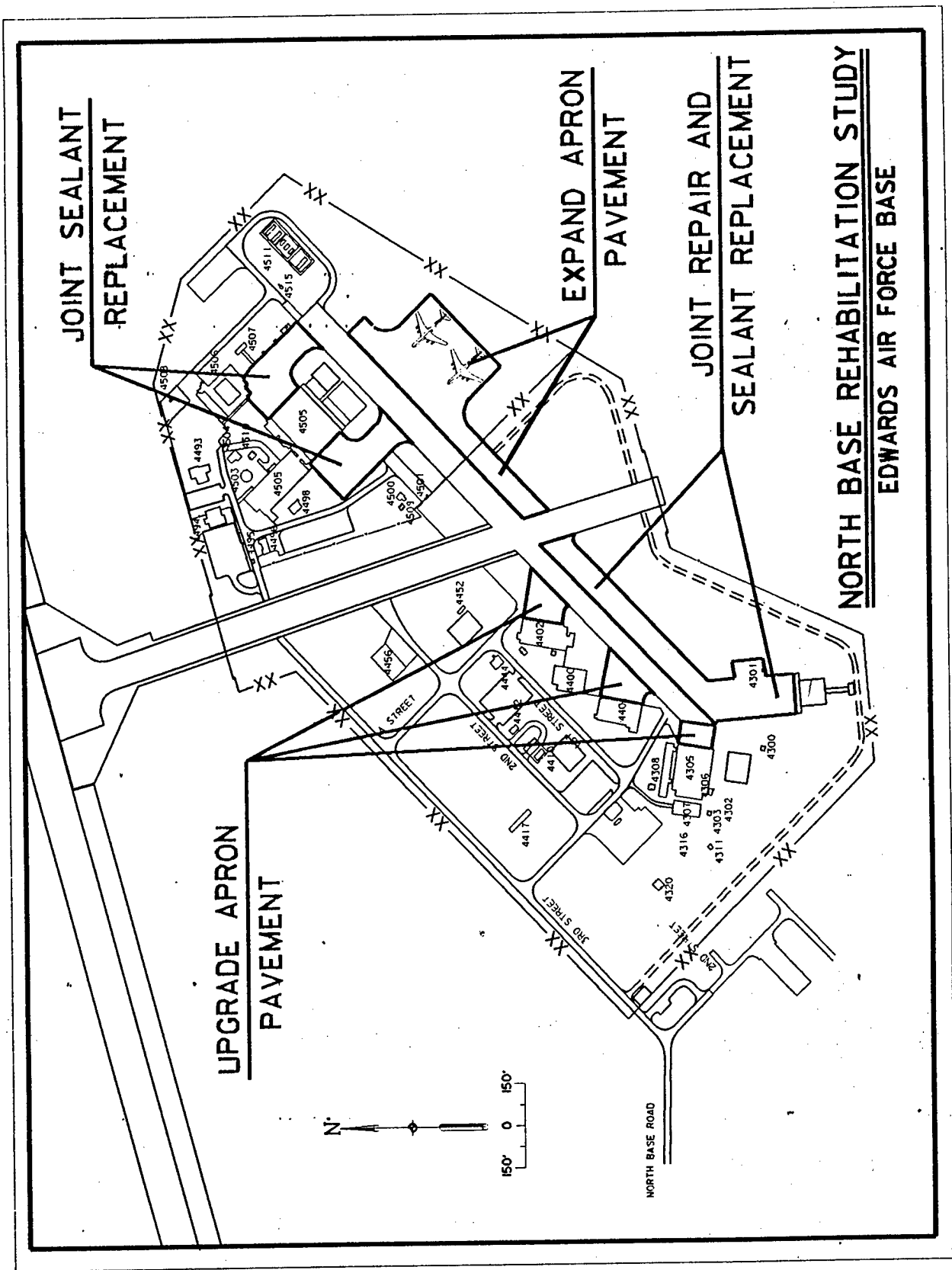


SLIDE LT-2

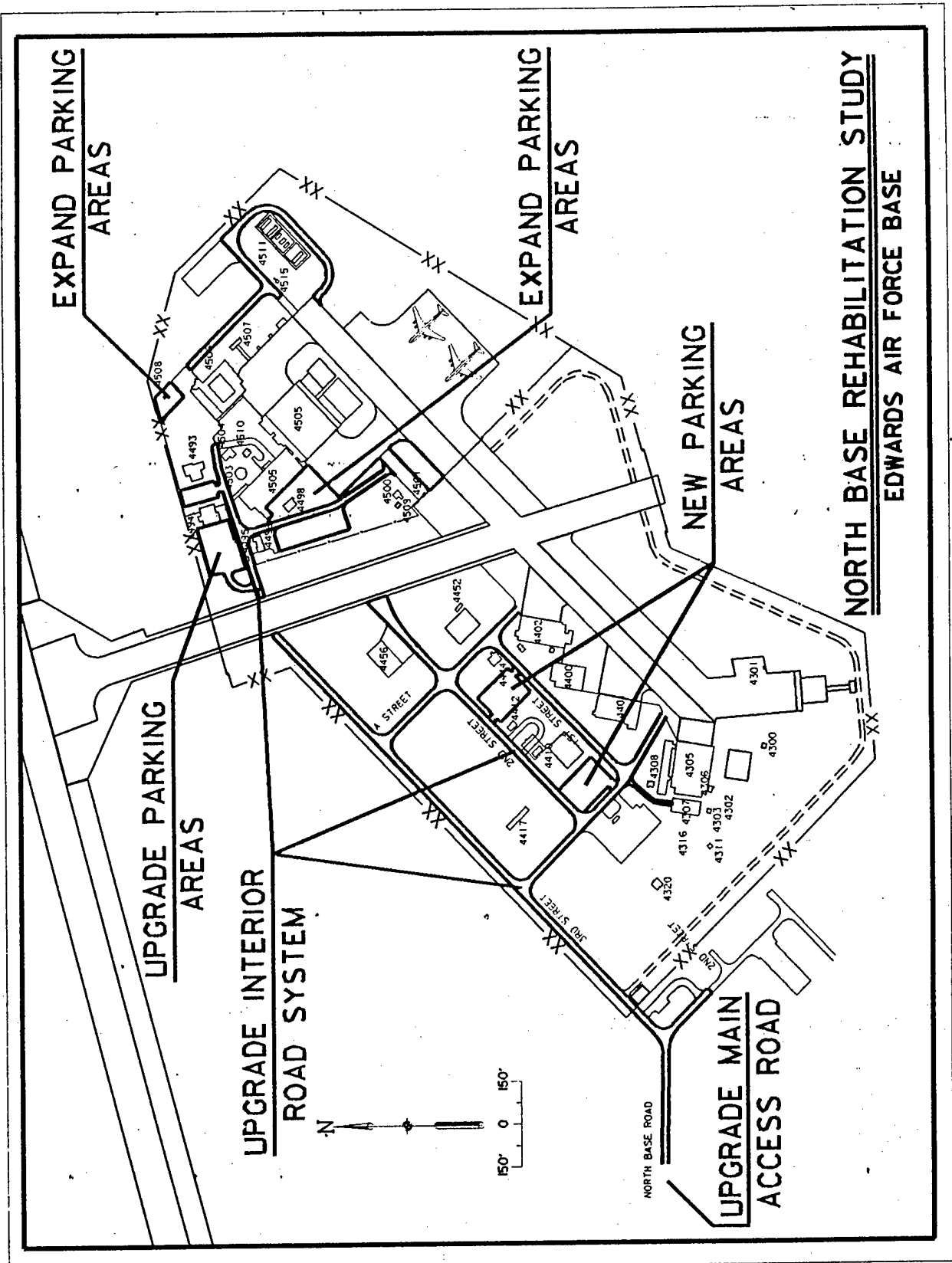




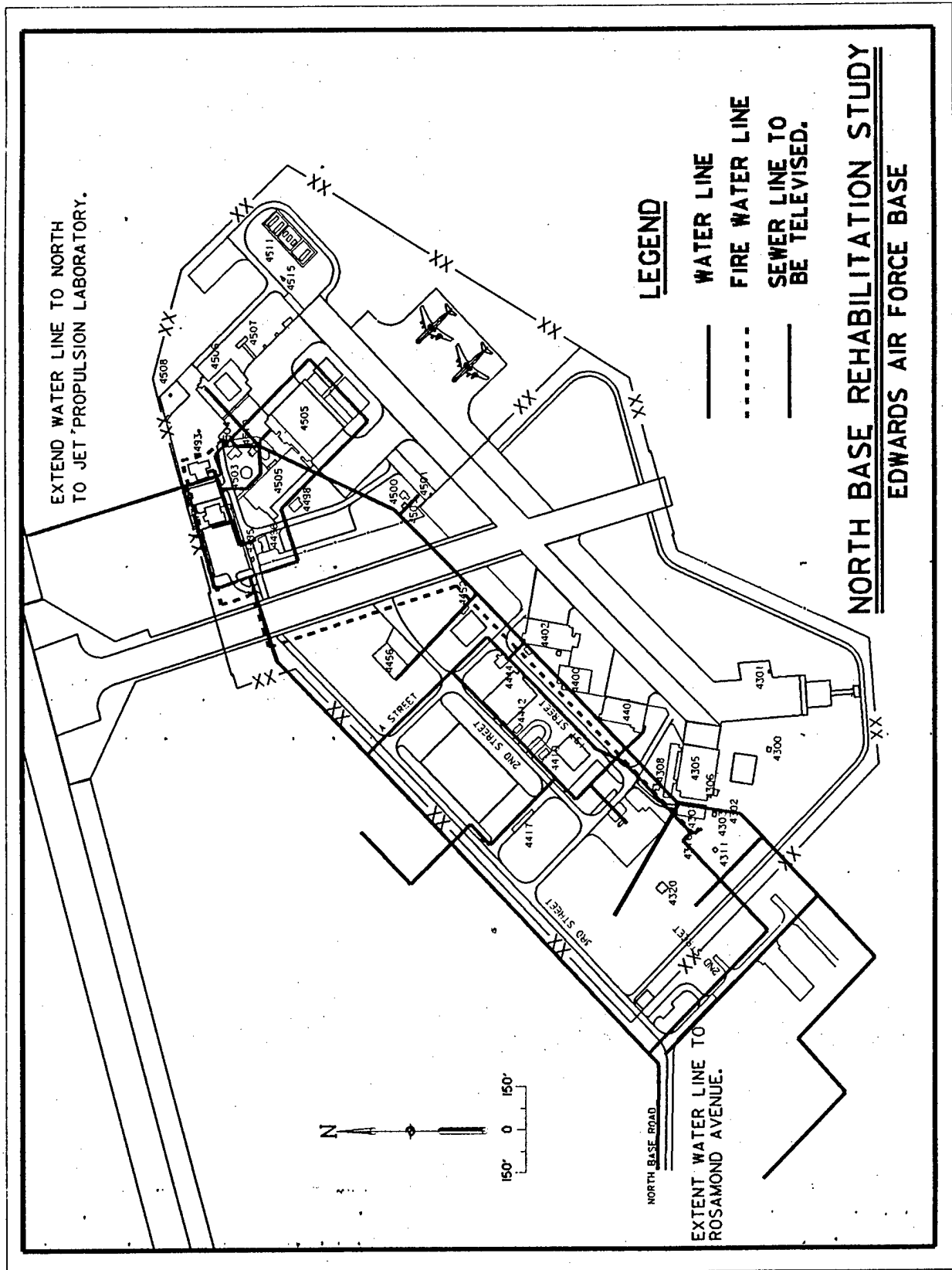
SLIDE LT-3



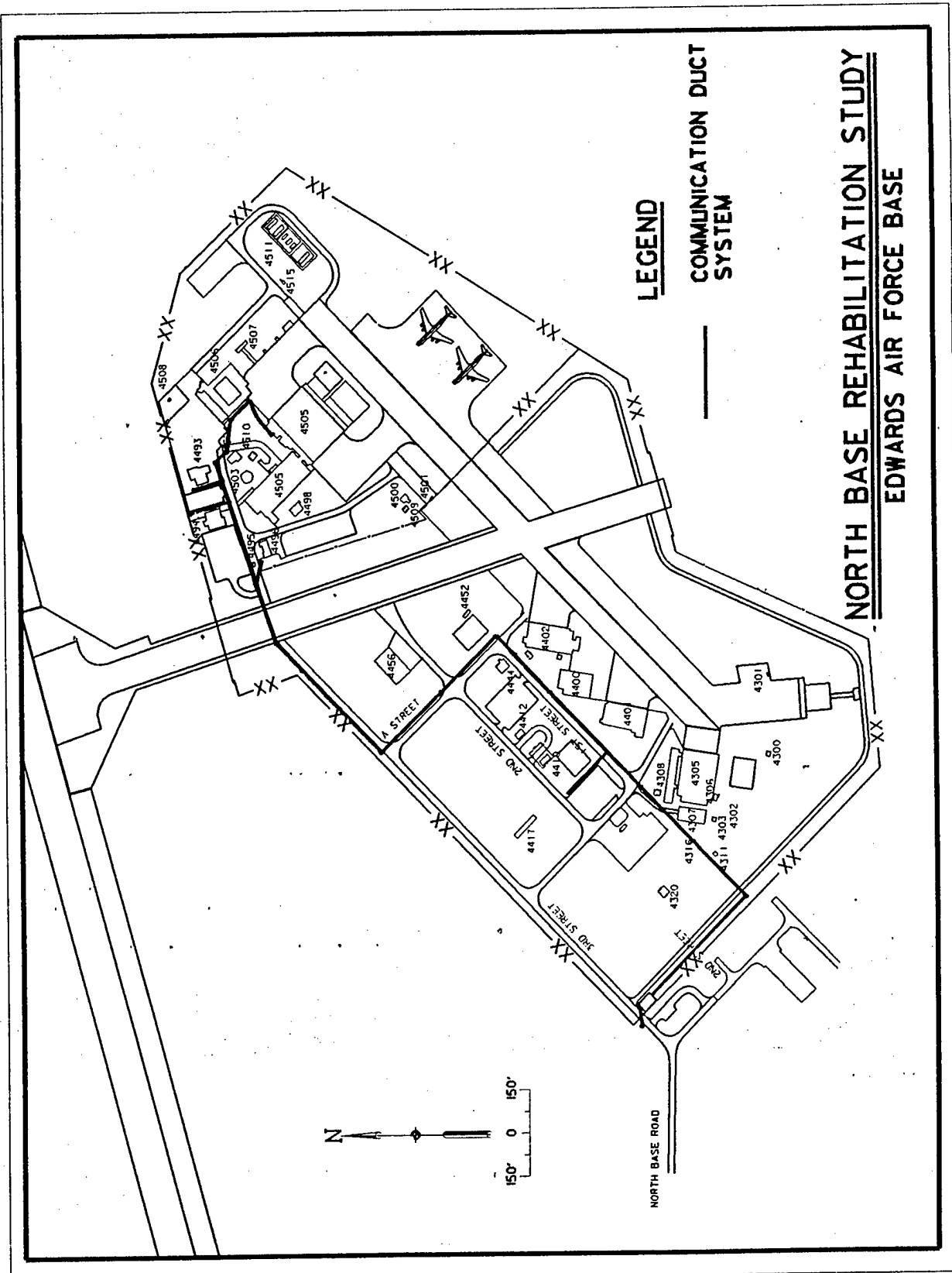
SLIDE LT-4



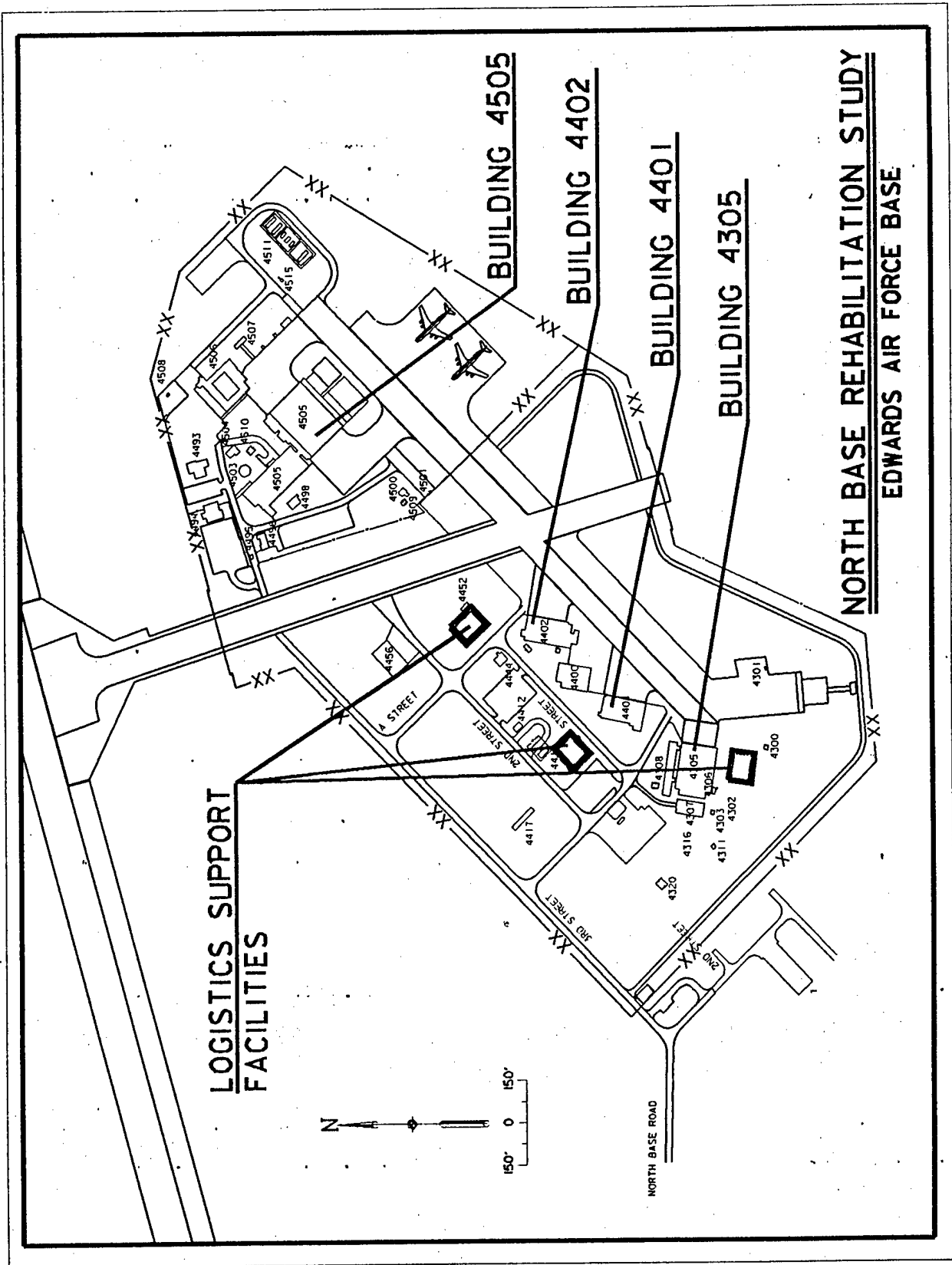
SLIDE LT-5



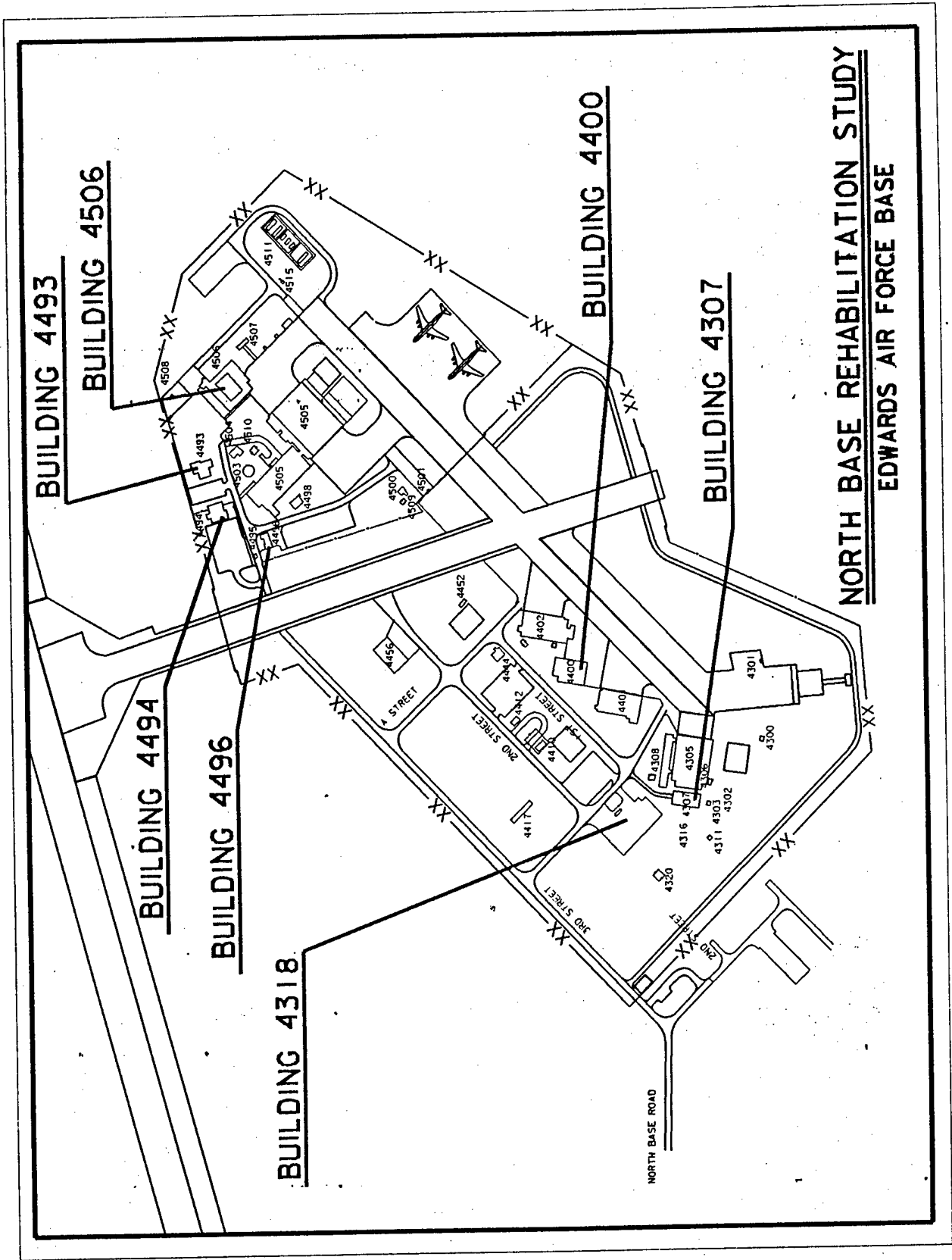
SLIDE LT-6



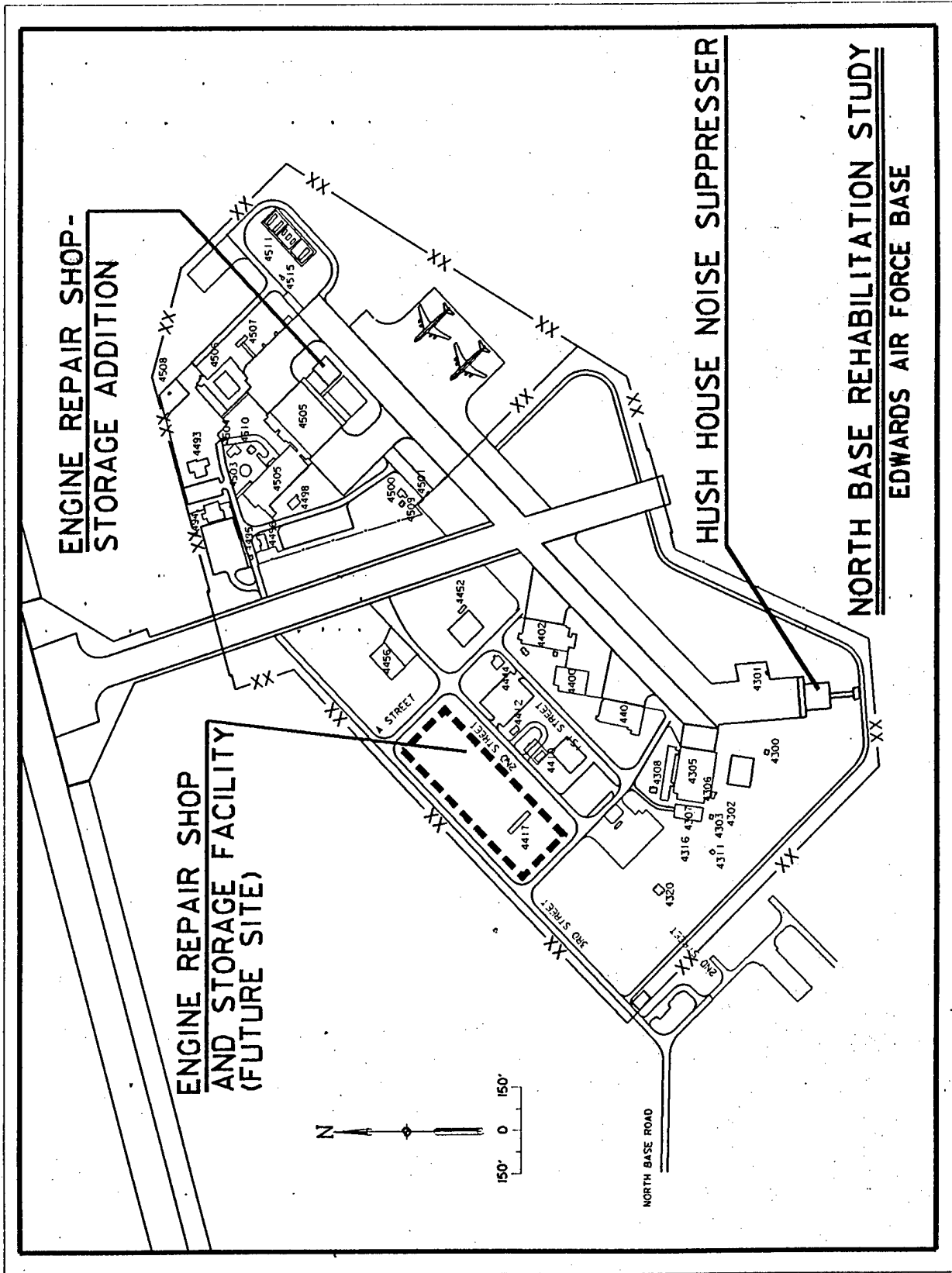
SLIDE LT-7



SLIDE LT-8



SLIDE LT-9







# NORTH BASE REHABILITATION STUDY

EDWARDS A.F.B. CALIFORNIA



Air Force Flight  
Test Center

SEPTEMBER 1990



US Army Corps  
of Engineers -  
Omaha District

NORTH BASE REHABILITATION STUDY

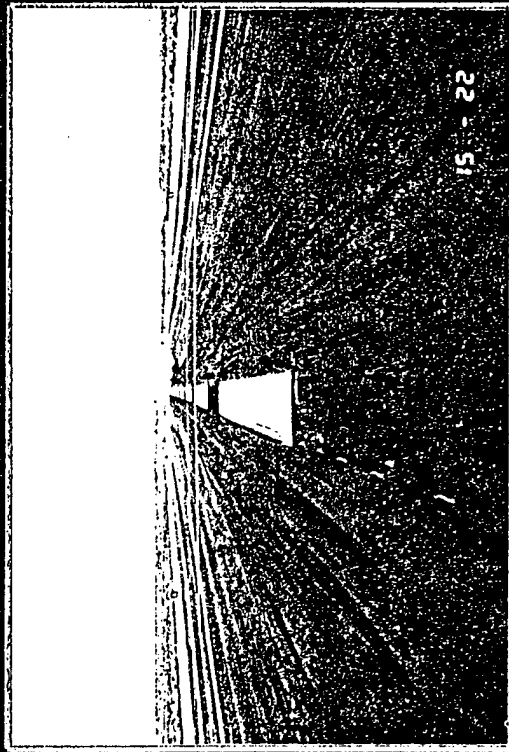
EDWARDS AIR FORCE BASE

PROJECT TITLE:

EXTEND & UPGRADE  
RUNWAY

ESTIMATED COST:

- \$ 10,600,000 (OPTION NO. 1)
- \$ 7,600,000 (OPTION NO. 2)
- \$ 12,600,000 (OPTION NO. 3)
- \$ 9,500,000 (OPTION NO. 4)



PROJECT DESCRIPTION:

EXTEND RUNWAY 1000 FEET ON EACH END;  
UPGRADE EXISTING RUNWAY PAVEMENT.

SLIDE RT-2

**NORTH BASE REHABILITATION STUDY**

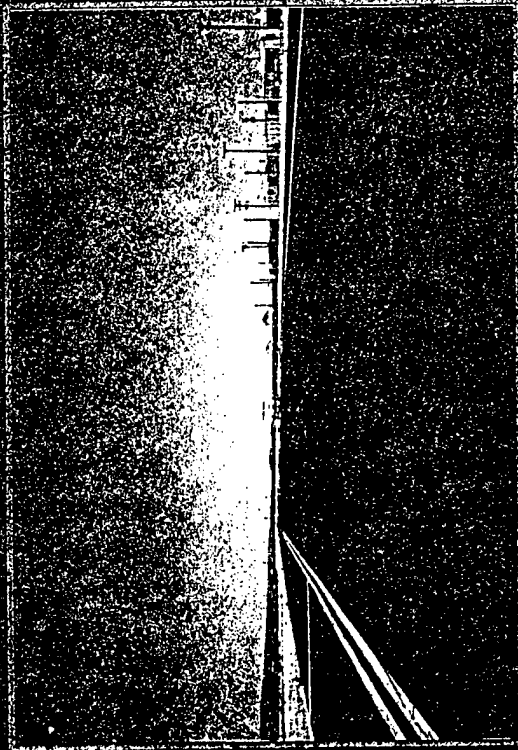
**EDWARDS AIR FORCE BASE**

**PROJECT TITLE:**

**UPGRADE TAXIWAY**

**ESTIMATED COST:**

- \$3,700,000 (OPTION NO. 1)**
- \$2,600,000 (OPTION NO. 2)**
- \$3,700,000 (OPTION NO. 3)**
- \$3,200,000 (OPTION NO. 4)**



**PROJECT DESCRIPTION:**

**UPGRADE EXISTING TAXIWAY PAVEMENT.**

**SLIDE RT-3**

**NORTH BASE REHABILITATION STUDY**

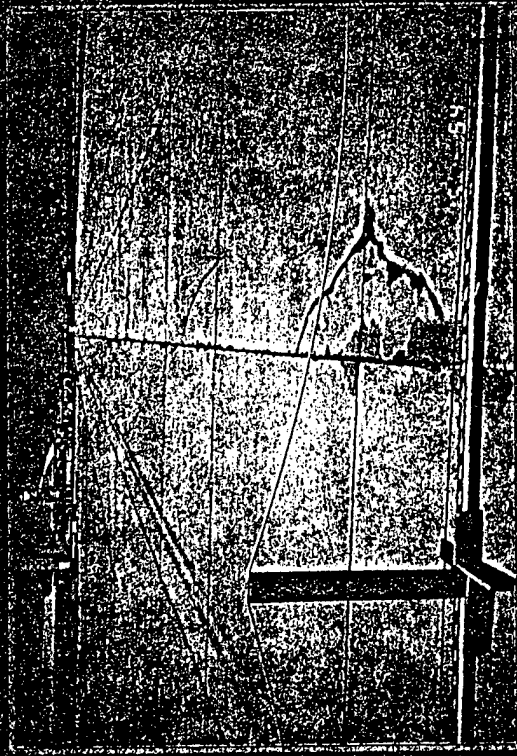
**EDWARDS AIR FORCE BASE**

**PROJECT TITLE:**

**UPGRADE & EXPAND  
APRON**

**ESTIMATED COST:**

**\$2,900,000  
(OPTION NOS. 1, 2, 3 & 4)**



**PROJECT DESCRIPTION:**

**UPGRADE EXISTING APRON PAVEMENT;  
EXPAND APRON FOR AIRCRAFT PARKING.**

**SLIDE RT - 4**

NORTH BASE REHABILITATION STUDY

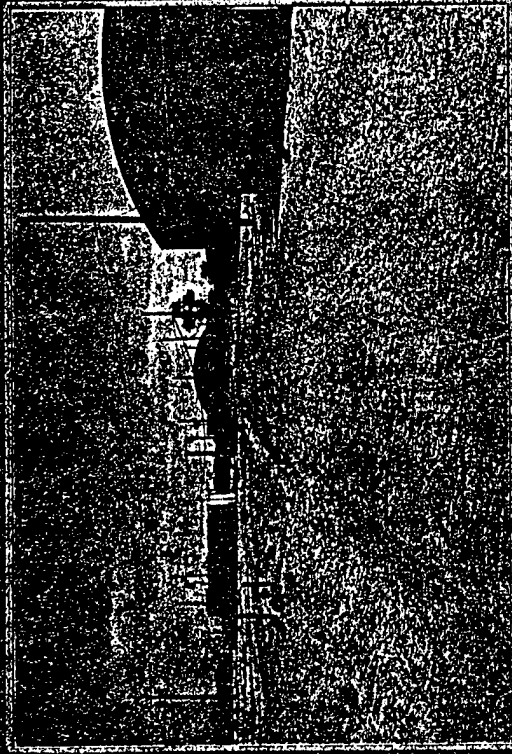
EDWARDS AIR FORCE BASE

PROJECT TITLE:

UPGRADE ROADS &  
PARKING

ESTIMATED COST:

\$4,500,000



PROJECT DESCRIPTION:

UPGRADE EXISTING ROAD SYSTEM AND PARKING LOTS;  
EXPAND PARKING AREAS.

SLIDE RT-5

NORTH BASE REHABILITATION STUDY

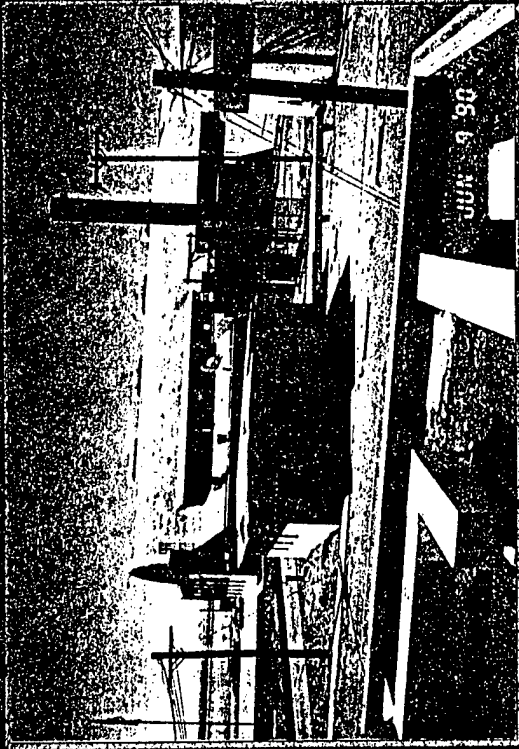
EDWARDS AIR FORCE BASE

PROJECT TITLE:

UTILITIES  
( WATER & SEWER )

ESTIMATED COST:

\$4,800,000



PROJECT DESCRIPTION:

CONSTRUCT NEW WATER SUPPLY LINE;  
CONSTRUCT NEW FIRE WATER LINE;  
UPGRADE SEWAGE COLLECTION AND TREATMENT SYSTEMS.

SLIDE RT-6



NORTH BASE REHABILITATION STUDY

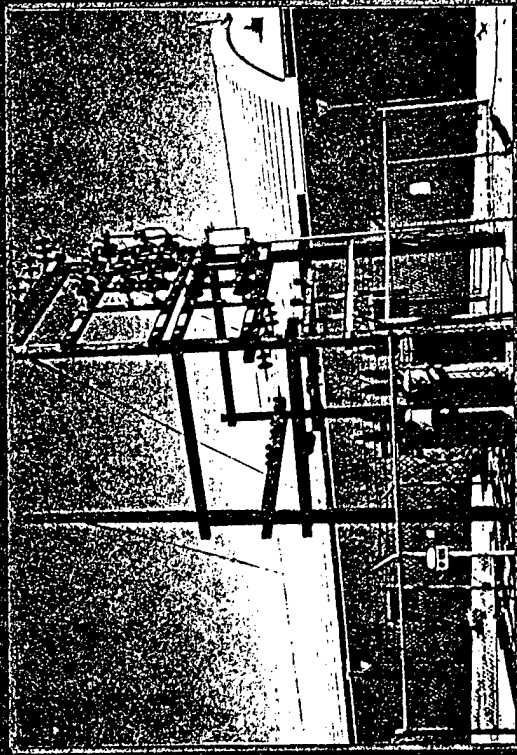
EDWARDS AIR FORCE BASE

PROJECT TITLE:

UTILITIES-  
( ELECTRICAL &  
COMMUNICATIONS )

ESTIMATED COST:

\$500,000



PROJECT DESCRIPTION:

PROVIDE ELECTRICAL SUPPORT FOR ROADS/UTILITIES  
PROJECTS; CONSTRUCT NEW COMMUNICATION  
DUCT BANK SYSTEM.

SLIDE RT-7



NORTH BASE REHABILITATION STUDY

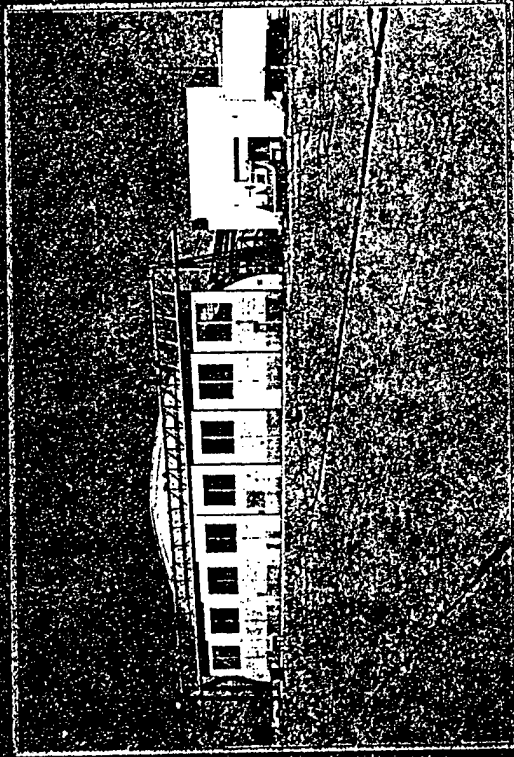
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4305 -  
( HANGAR )

ESTIMATED COST:

\$6,800,000



PROJECT DESCRIPTION:

UPGRADE STRUCTURAL, ELECTRICAL AND  
MECHANICAL BUILDING SYSTEMS AND  
PROVIDE LOGISTICS SUPPORT FACILITY.

SLIDE RT - 8

NORTH BASE REHABILITATION STUDY

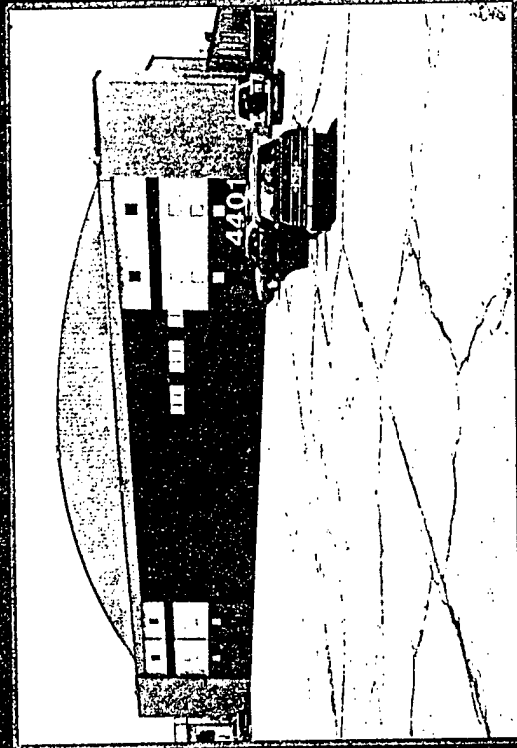
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4401 -  
( HANGAR )

ESTIMATED COST:

\$4,400,000



PROJECT DESCRIPTION:

UPGRADE STRUCTURAL, ELECTRICAL AND  
MECHANICAL BUILDING SYSTEMS AND  
PROVIDE LOGISTICS SUPPORT FACILITY.

SLIDE RT-9

NORTH BASE REHABILITATION STUDY

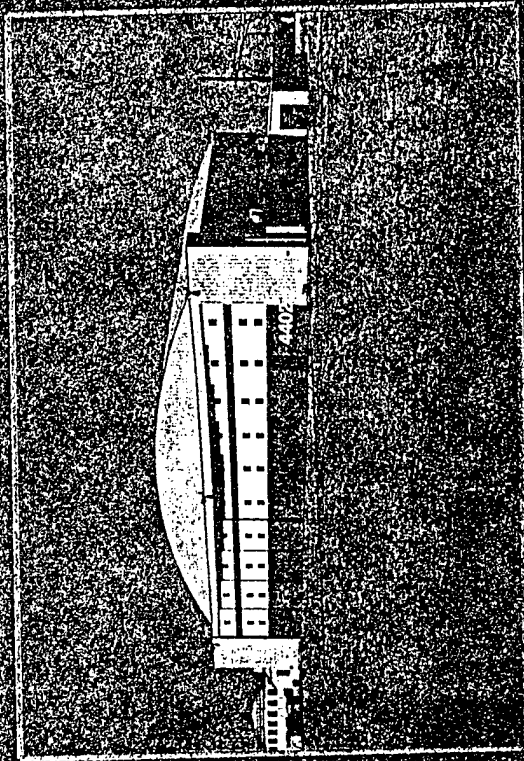
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4402 -  
( HANGAR )

ESTIMATED COST:

\$4,400,000



PROJECT DESCRIPTION:

UPGRADE STRUCTURAL, ELECTRICAL AND  
MECHANICAL BUILDING SYSTEMS AND  
PROVIDE LOGISTICS SUPPORT FACILITY.

SLIDE RT-10



NORTH BASE REHABILITATION STUDY

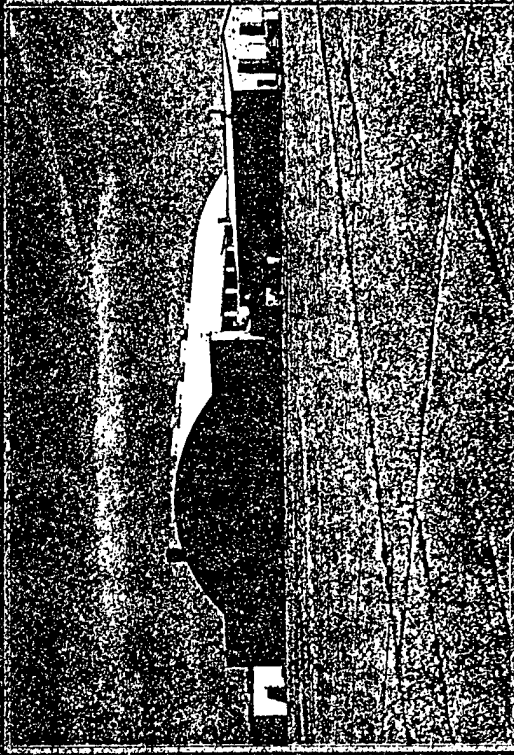
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4505 -  
( HANGAR )

ESTIMATED COST:

\$7,100,000



PROJECT DESCRIPTION:

UPGRADE STRUCTURAL, ELECTRICAL AND  
MECHANICAL BUILDING SYSTEMS.

SLIDE RT - 11

NORTH BASE REHABILITATION STUDY

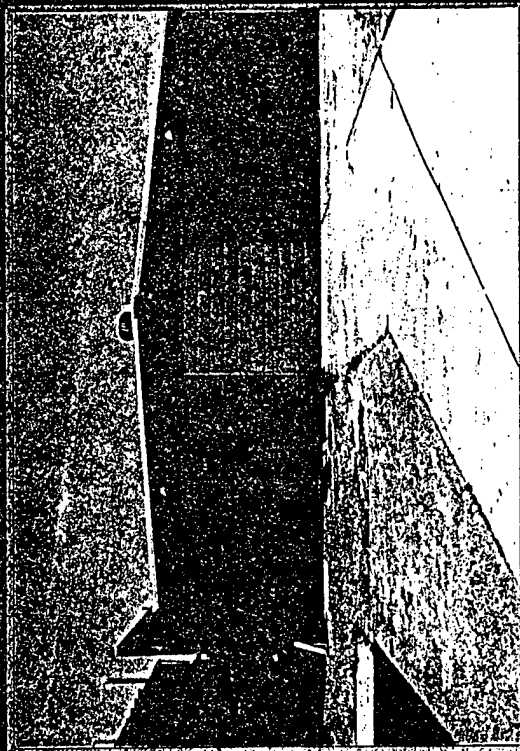
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4307 -  
( STORAGE )

ESTIMATED COST:

\$15,000



PROJECT DESCRIPTION:

PROVIDE NEW OVERHEAD DOOR AND  
ELECTRICAL OPERATOR.

SLIDE RT-12

NORTH BASE REHABILITATION STUDY

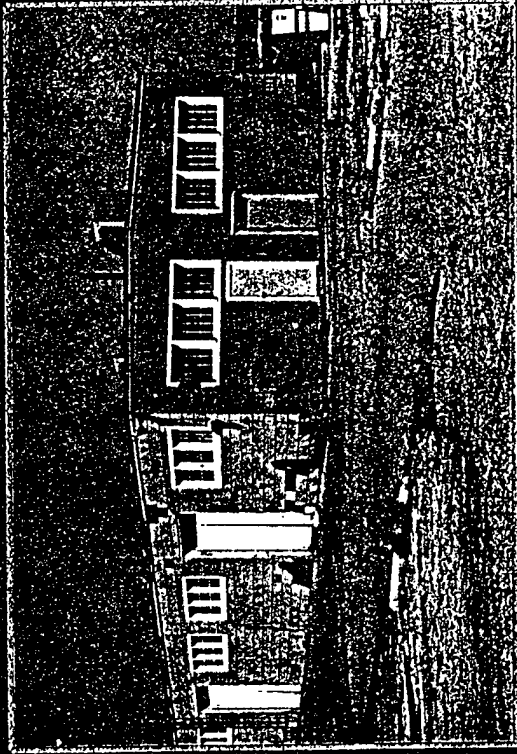
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4318 -  
( GAS STATION )

ESTIMATED COST:

\$90,000



PROJECT DESCRIPTION:

REMOVE EXISTING FACILITY AND CONSTRUCT  
FUEL DISPENSING STATION.

SLIDE RT-13

NORTH BASE REHABILITATION STUDY

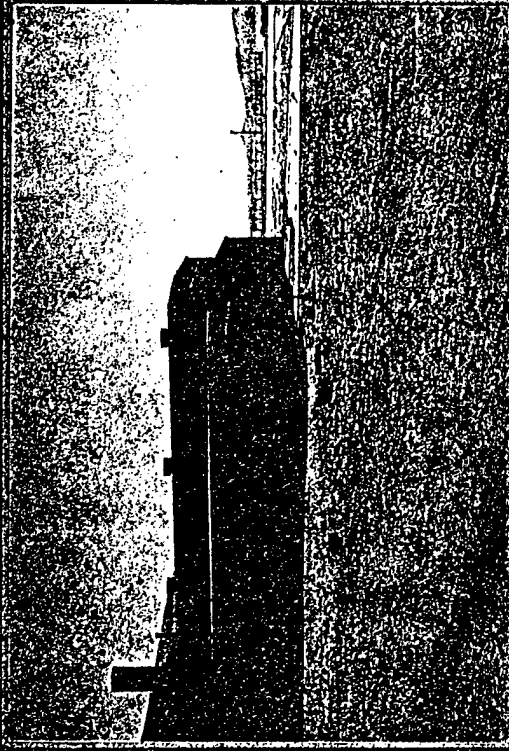
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4400 -  
( STORAGE )

ESTIMATED COST:

\$80,000



PROJECT DESCRIPTION:

UPGRADE ELECTRICAL AND  
COMMUNICATION SYSTEMS.

SLIDE RT - 14



NORTH BASE REHABILITATION STUDY

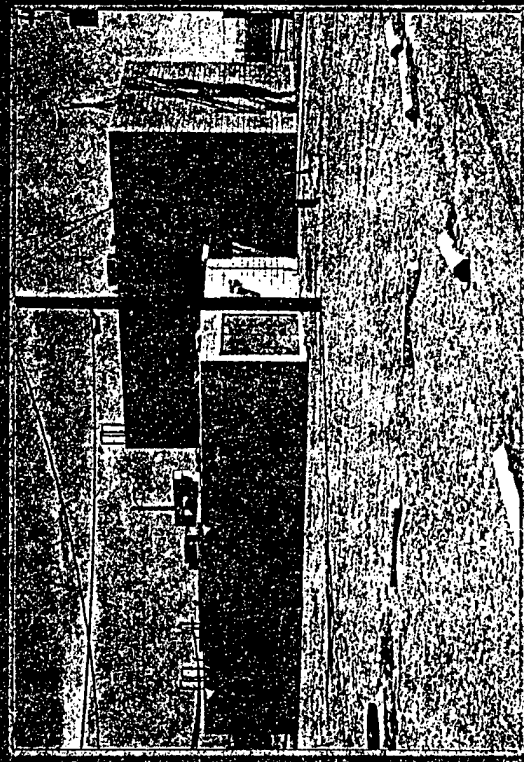
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4493 -  
( GYMNASIUM )

ESTIMATED COST:

\$330,000



PROJECT DESCRIPTION:

REPLACE ROOF AND UPGRADE  
MECHANICAL BUILDING SYSTEM.



NORTH BASE REHABILITATION STUDY

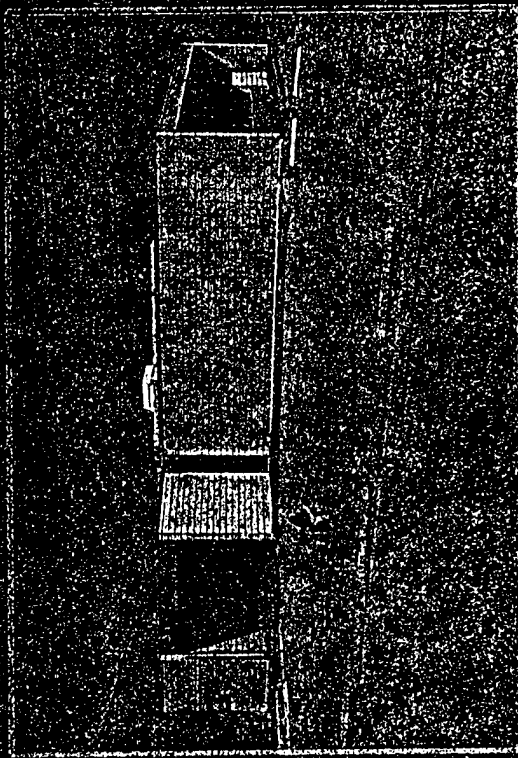
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4494 -  
( CAFETERIA )

ESTIMATED COST:

\$460,000



PROJECT DESCRIPTION:

REPLACE ROOF AND UPGRADE  
MECHANICAL BUILDING SYSTEM;  
RENOVATE FOOD SERVICE AREA.

SLIDE RT-16

NORTH BASE REHABILITATION STUDY

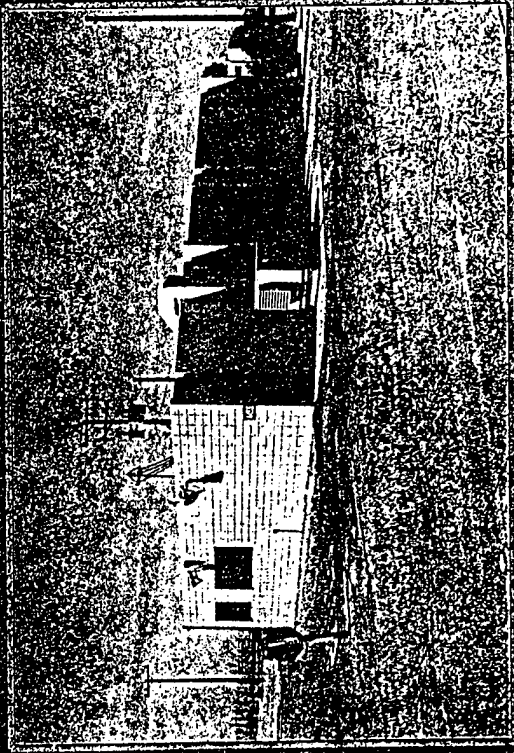
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4496 -  
( ADMINISTRATION )

ESTIMATED COST:

\$160,000



PROJECT DESCRIPTION:

REPLACE ROOF AND UPGRADE  
MECHANICAL BUILDING SYSTEM.

SLIDE RT-17

NORTH BASE REHABILITATION STUDY

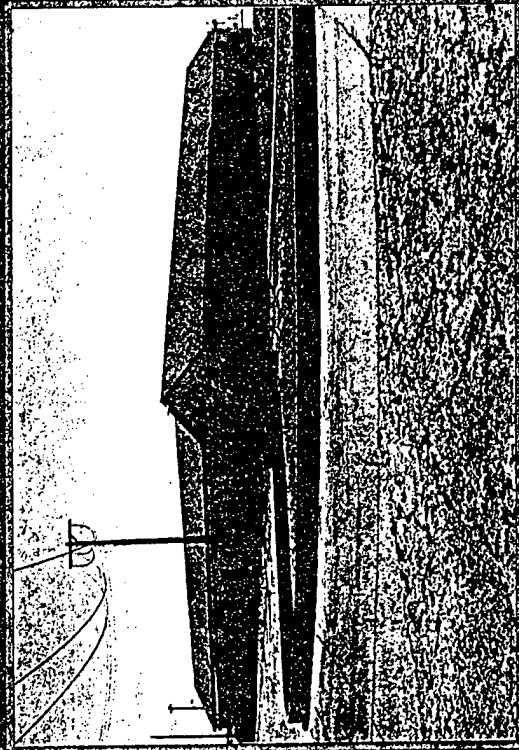
EDWARDS AIR FORCE BASE

PROJECT TITLE:

BUILDING 4506 -  
( ADMINISTRATION )

ESTIMATED COST:

\$15,000



PROJECT DESCRIPTION:

UPGRADE ELECTRICAL AND  
COMMUNICATION SYSTEMS.

SLIDE RT - 18

NORTH BASE REHABILITATION STUDY

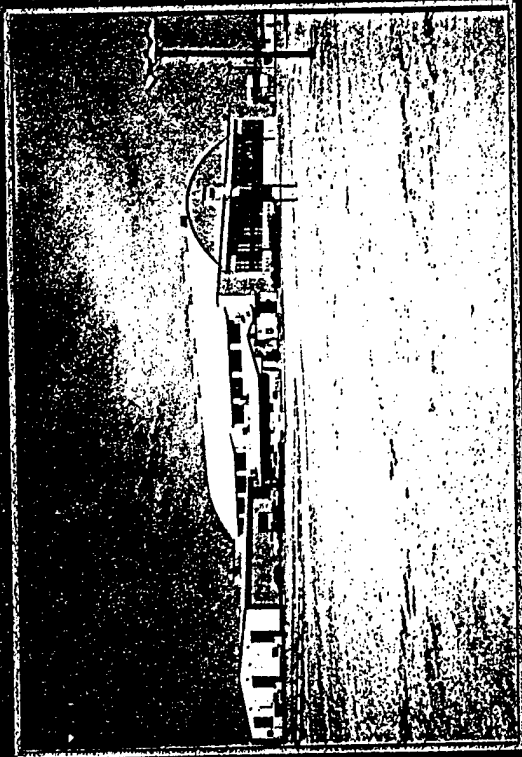
EDWARDS AIR FORCE BASE

PROJECT TITLE:

ENGINE REPAIR SHOP -  
STORAGE ADDITION  
(NEW)

ESTIMATED COST:

\$600,000



PROJECT DESCRIPTION:

PROVIDE NEW 5200 S.F. STORAGE ADDITION  
FOR EXISTING ENGINE REPAIR SHOP.

SLIDE RT-19

NORTH BASE REHABILITATION STUDY

EDWARDS AIR FORCE BASE

PROJECT TITLE:

HUSH HOUSE -  
NOISE SUPPRESSOR  
(NEW)

ESTIMATED COST:

\$650,000



PROJECT DESCRIPTION:

CONSTRUCT HUSH HOUSE NOISE SUPPRESSOR FOUNDATION.

SLIDE RT-20



NORTH BASE REHABILITATION STUDY

EDWARDS AIR FORCE BASE

PROJECT TITLE:  
PHYSICAL SECURITY

ESTIMATED COST:  
\$2,900,000



PROJECT DESCRIPTION:

SECURITY FENCING WITH PERIMETER LIGHTING & CCTV;  
CONSTRUCT NEW ENTRY CONTROL FACILITY /  
GENERATOR / COMMUNICATIONS BUILDING.

SLIDE RT-21