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IN REPLY REFER TO

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 18 DEC 1986

From: Commander, Naval Air Systems Command

Subj: REQUEST FOR REVIEW OF DRAFT BELL-BOEING SITE EVALUATION REPORT FOR MCAS
 NEW RIVER, N.C.

Encl: (1) Subject Report

1. The draft of the subject report is forwarded as enclosure (1) for review and comment. It is requested that review comments be forwarded to reach NAVAIRHQ, Attn: Code 4223E by 23 January 1987.
2. The NAVAIRHQ POC is Mr. L. Lussier, Code 4223E, at AV 224-9546/7, Comm (202) 694-9546/7.

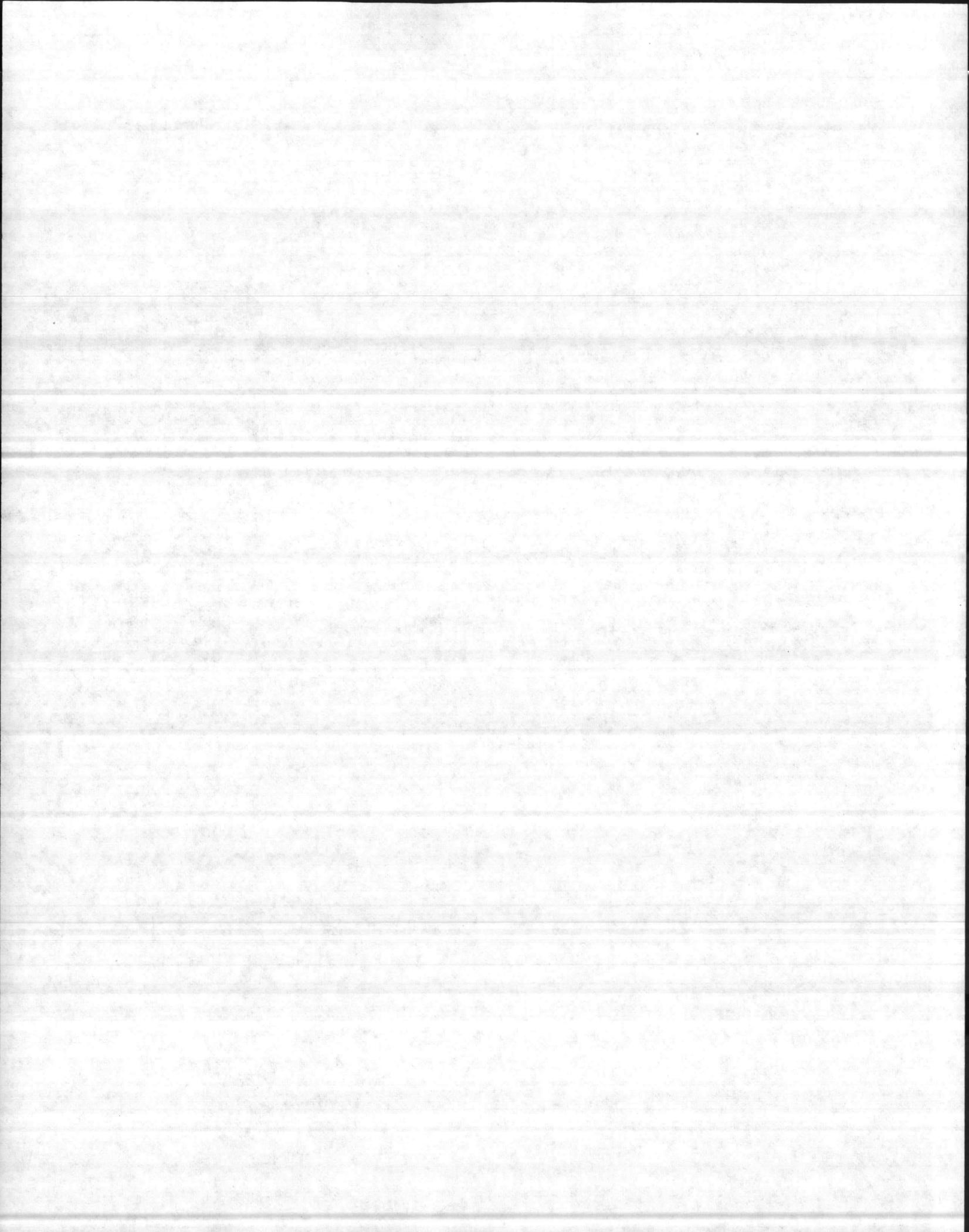
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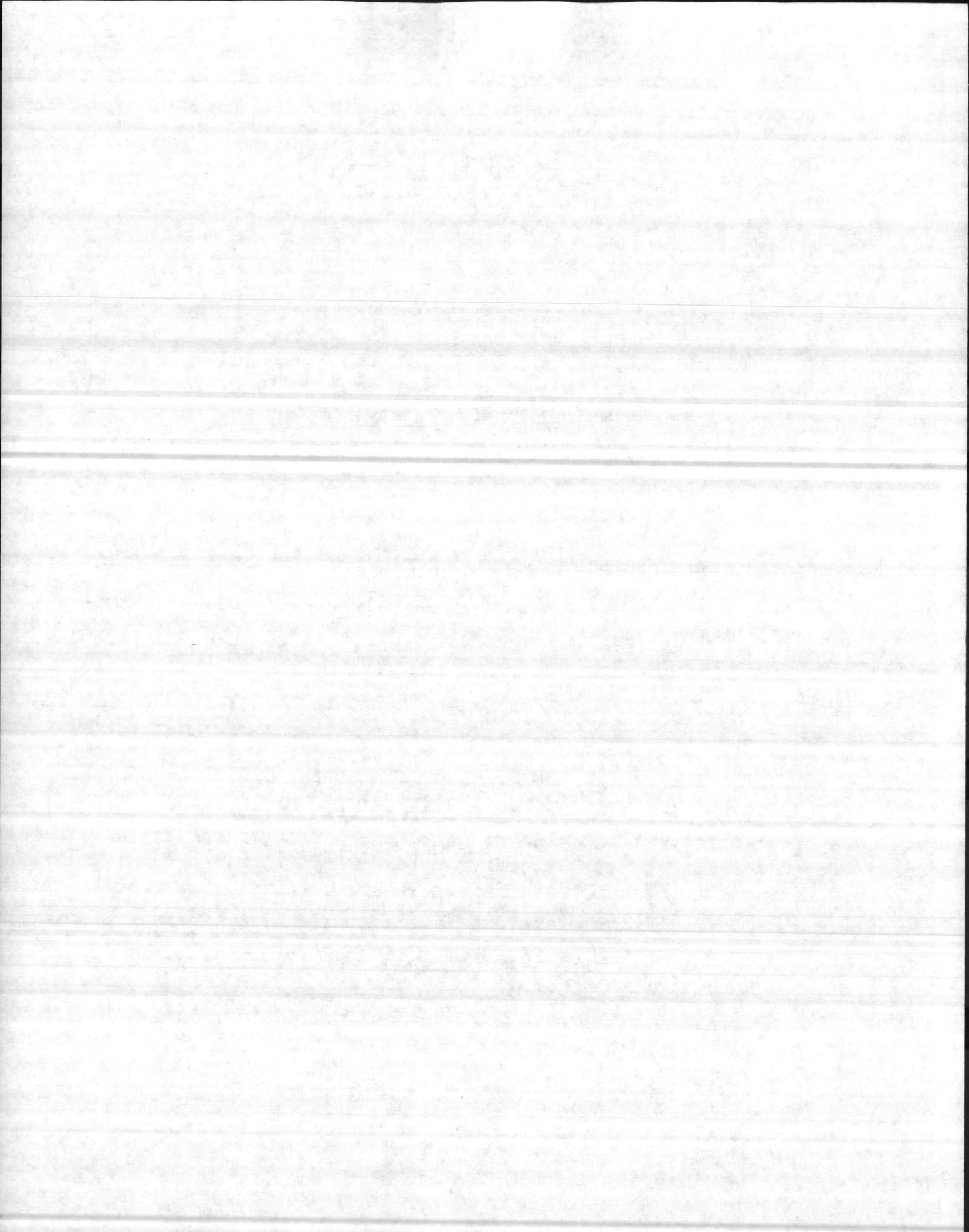
TITLE SITE EVALUATION REPORT - MCAS(H) NEW RIVER, N.C.

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MODEL 901 CONTRACT N00019-85-C-0145

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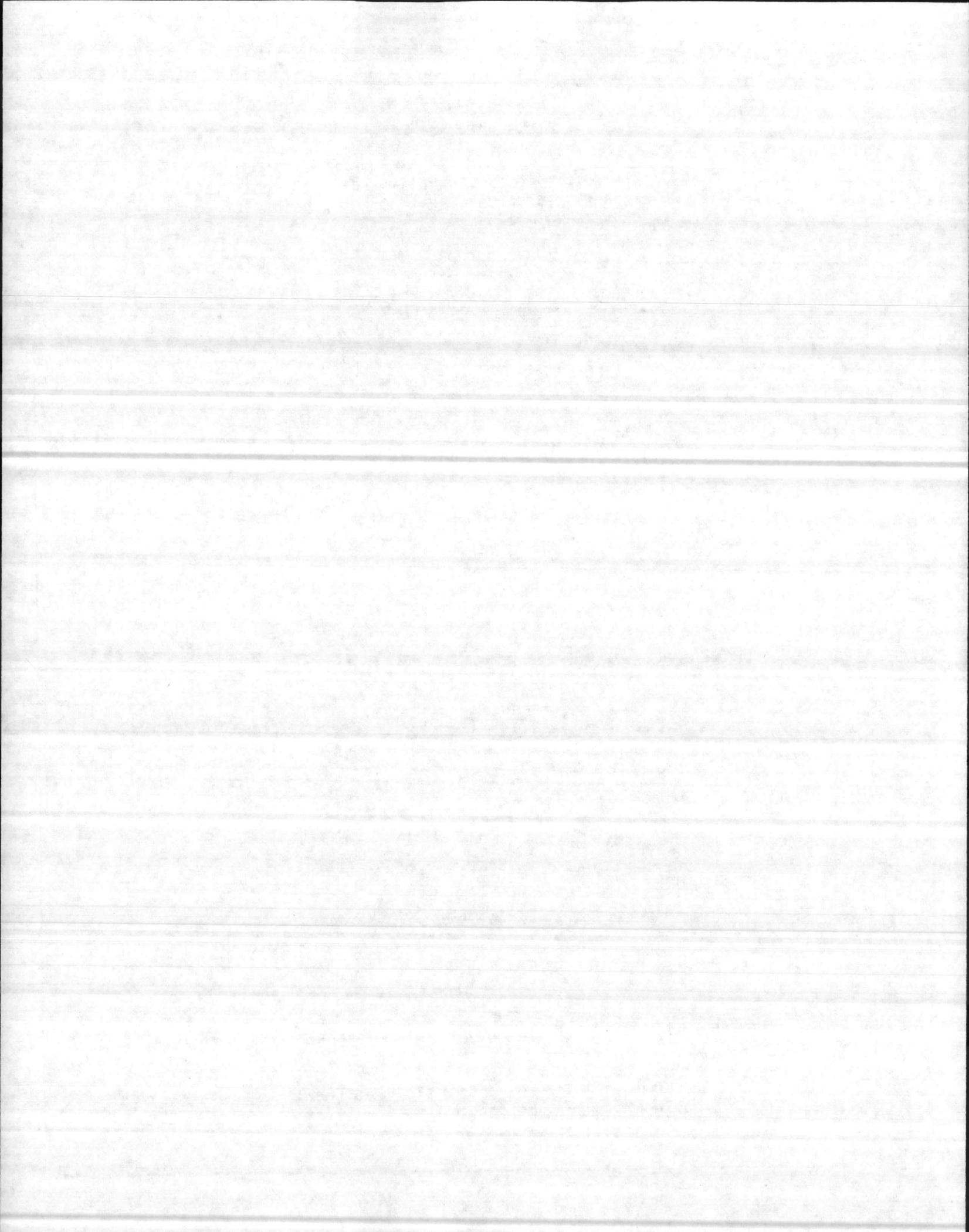


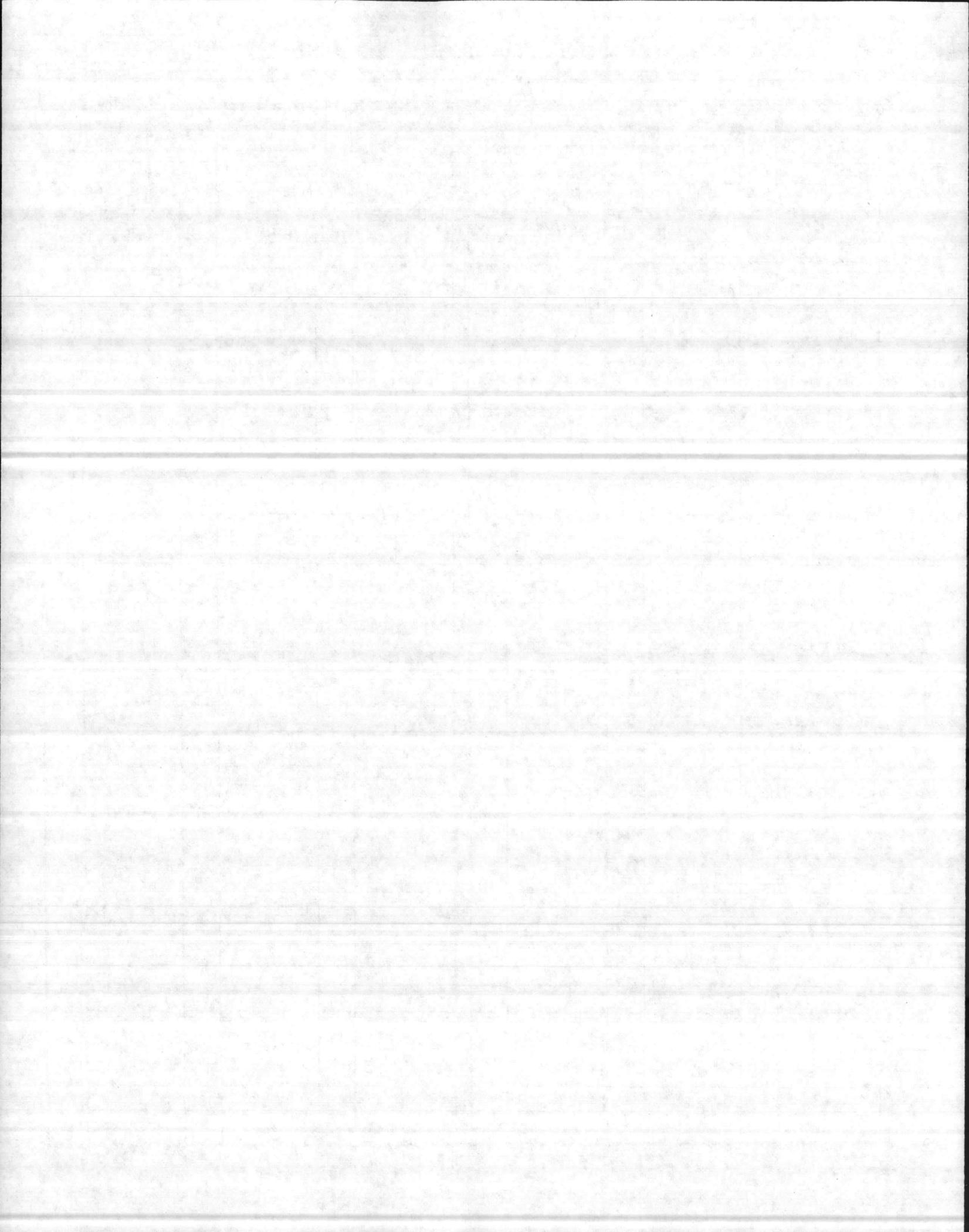
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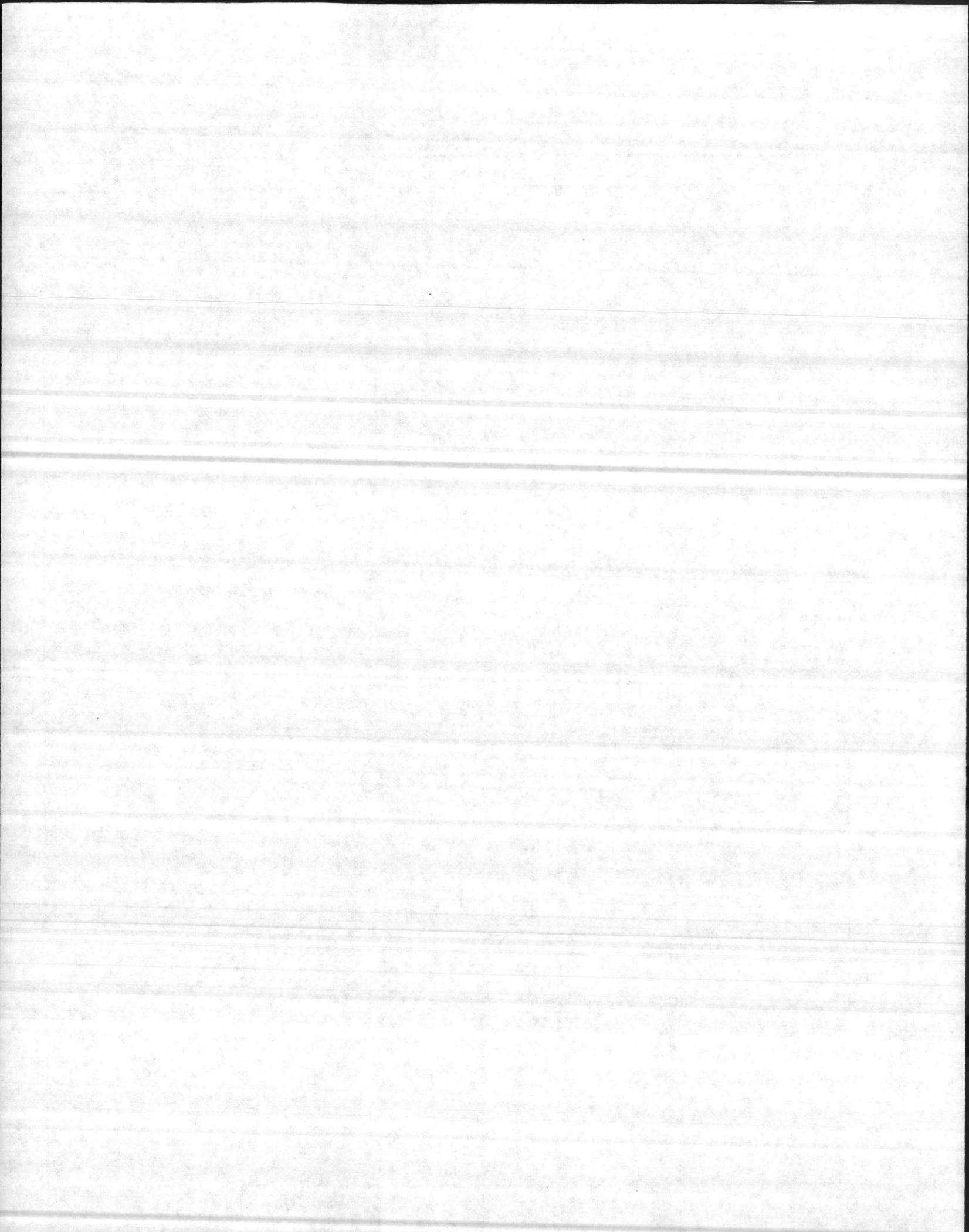
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REVISIONS

LTR	DESCRIPTION	DATE	APPROVAL
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ABSTRACT

This site evaluation report has been prepared in accordance with the V-22 Full Scale Development Contract N00019-85-C-0145, CDRL Sequence Number L004, Data Item Description UDI-P-21038. This report is narrative in nature and includes analysis and recommendations for modification/alteration of existing facilities and construction of new facilities for support of the V-22 Operational Program at MCAS (H) New River, N.C. as defined by the MV-22A Weapon System Planning Document (WSPD). This MCAS(H) New River Preliminary Site Survey conducted 22-26 September 1986 constitutes the first of a maximum ten (10) site surveys to be performed by the Bell-Boeing Team.

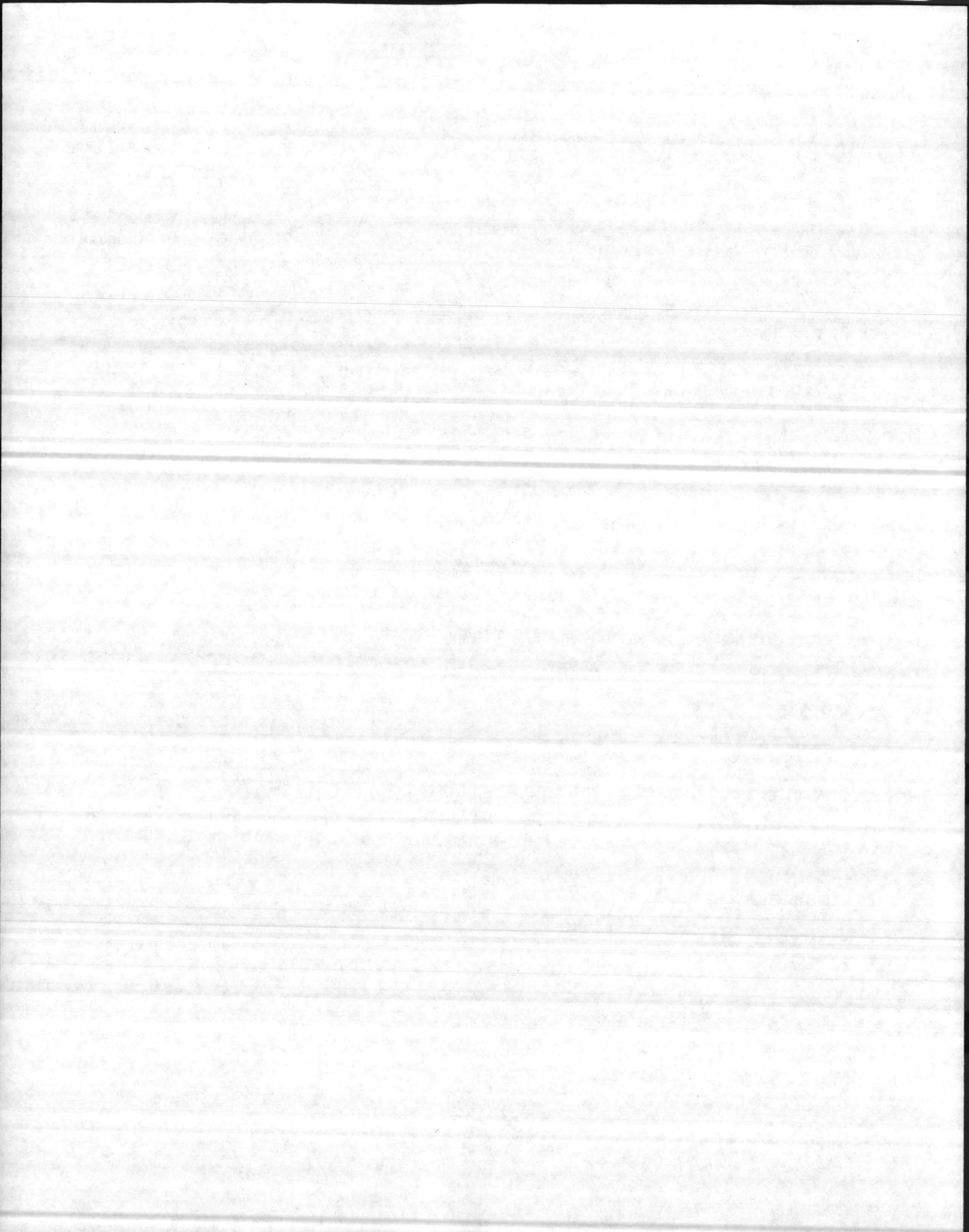
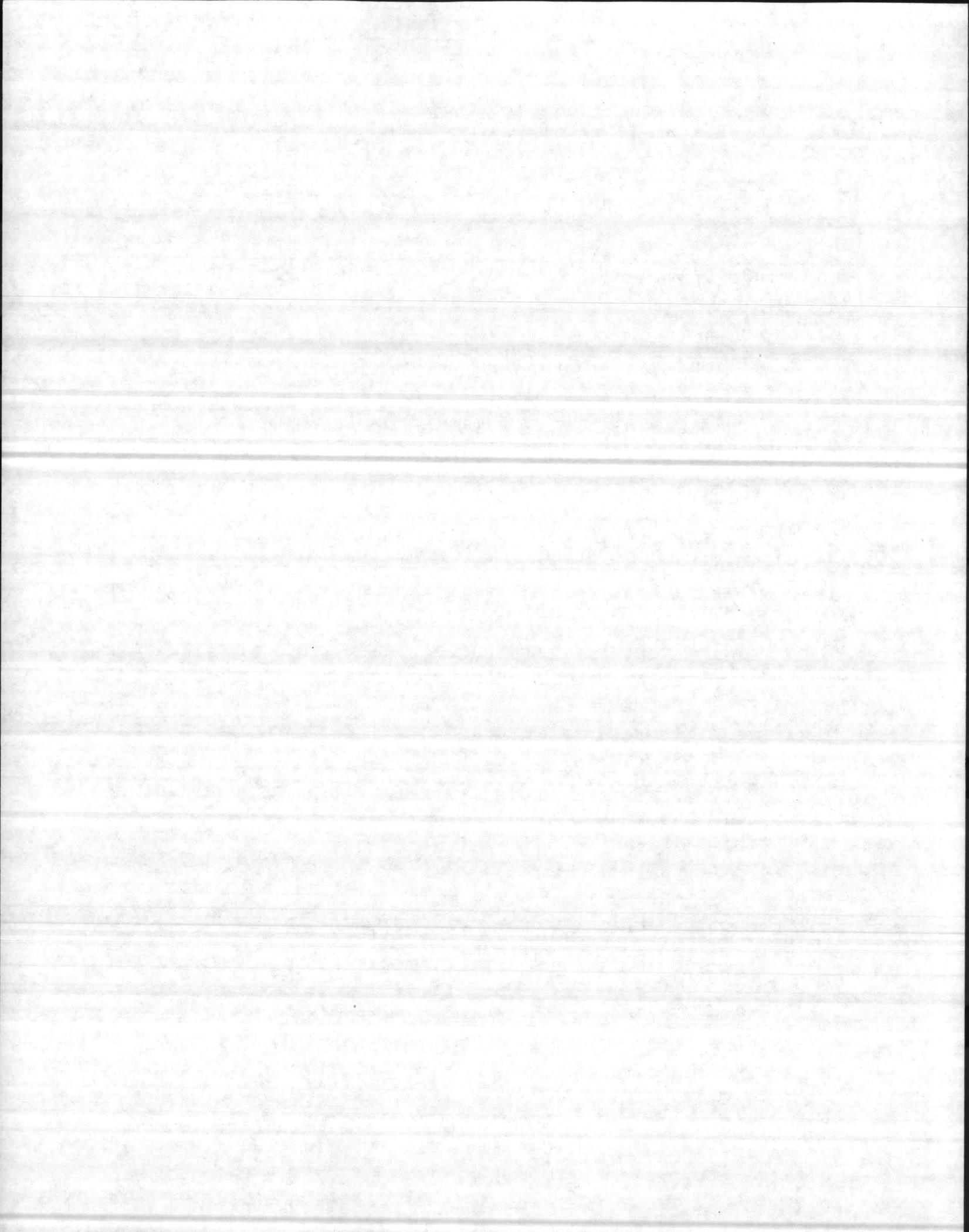
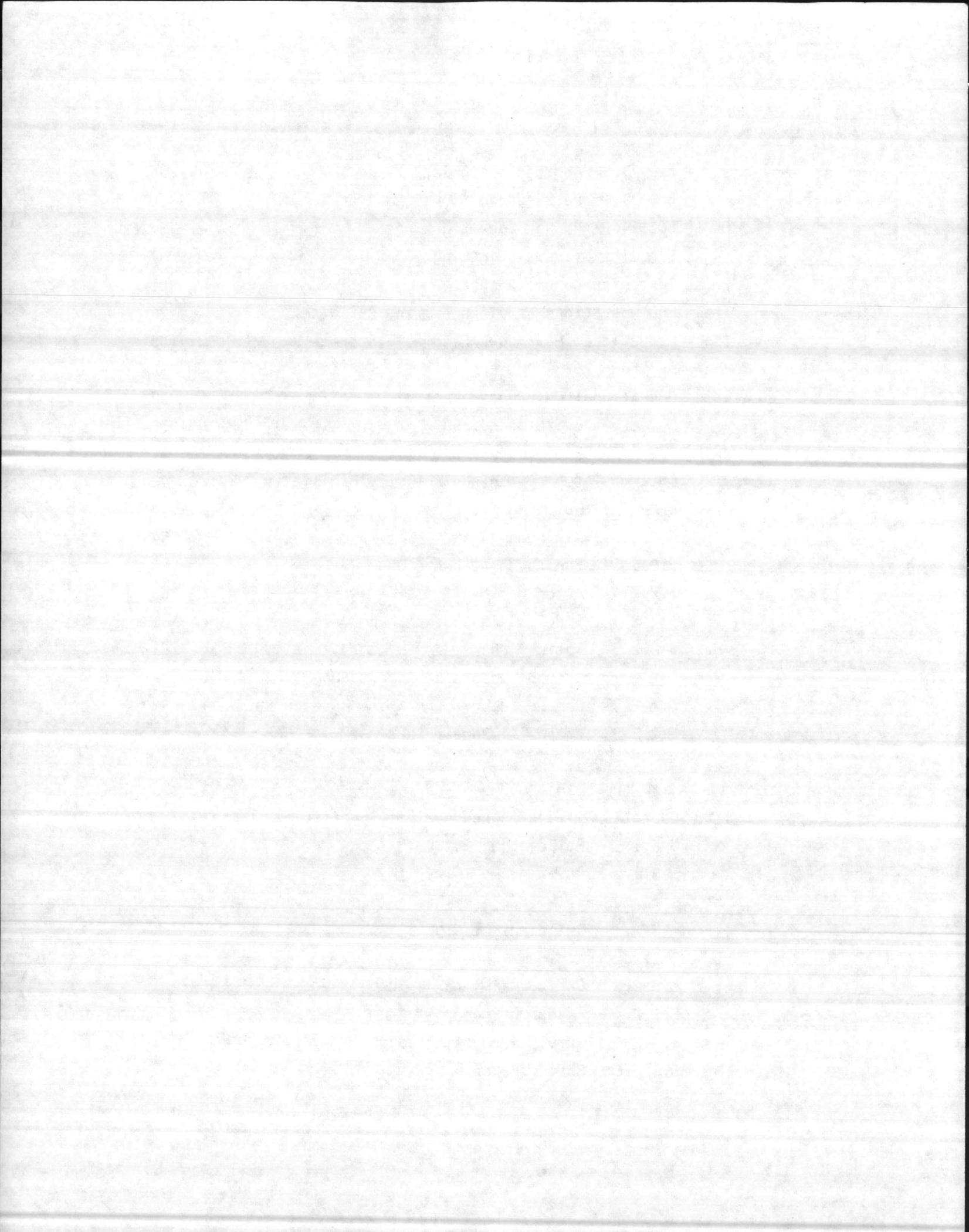


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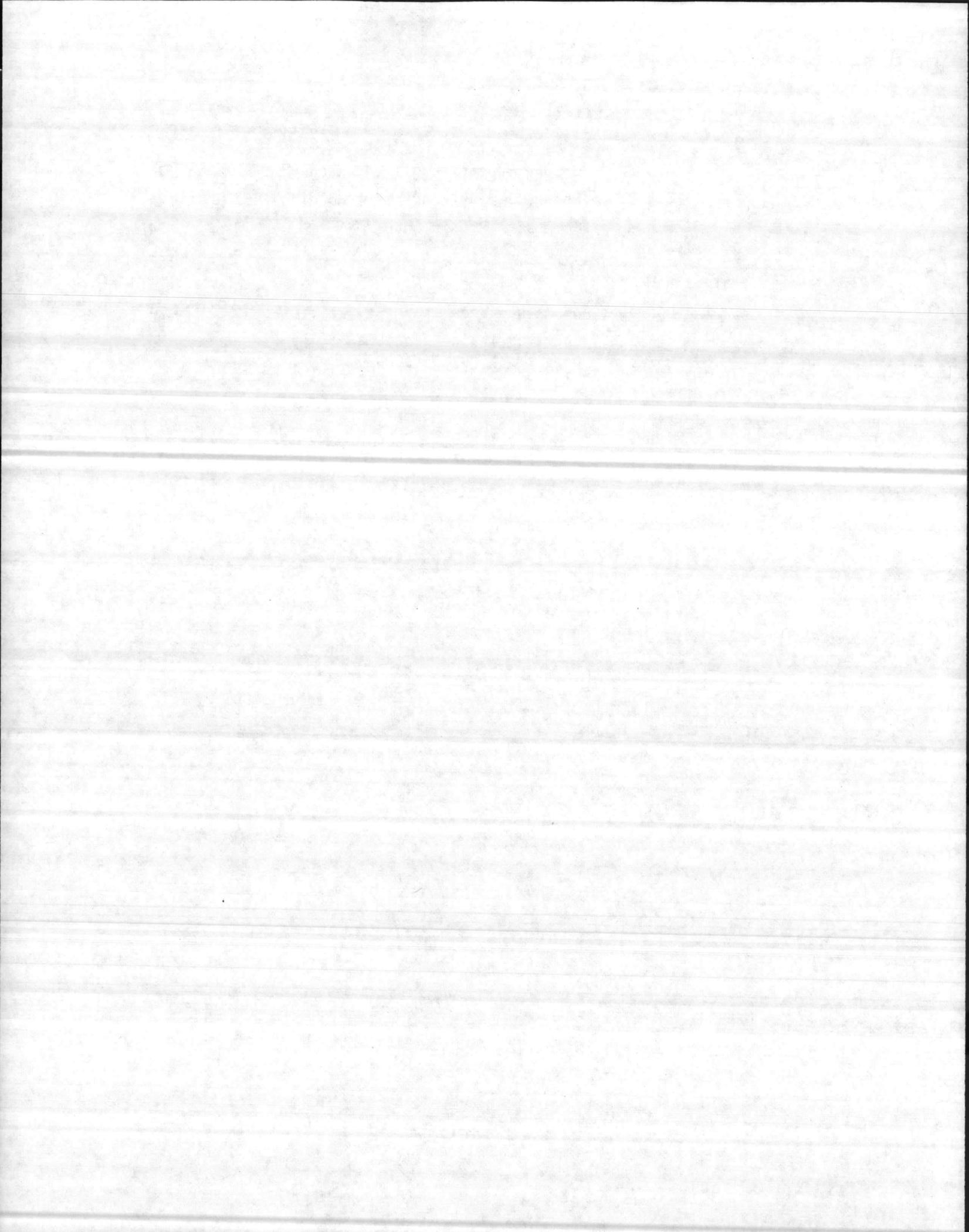
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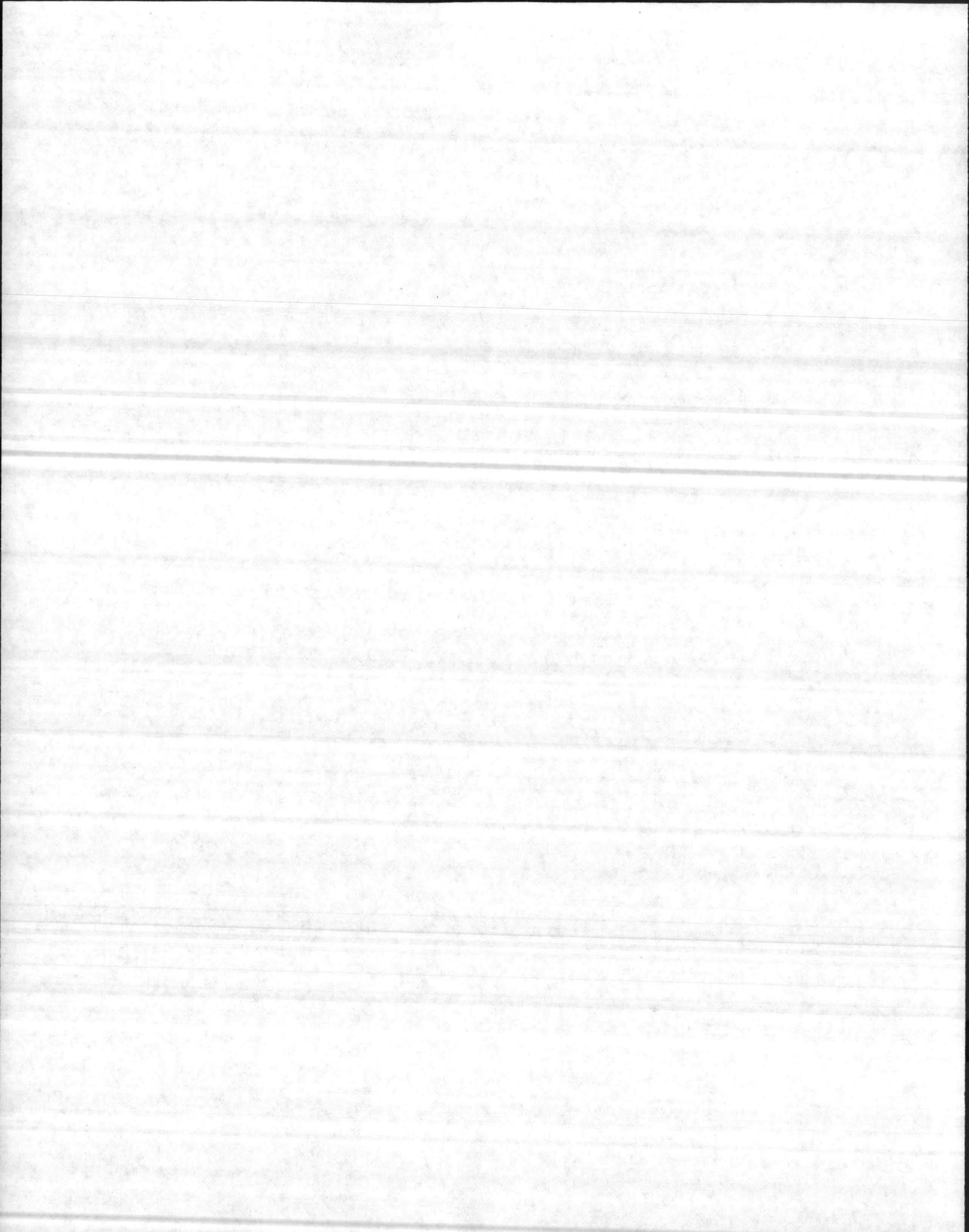


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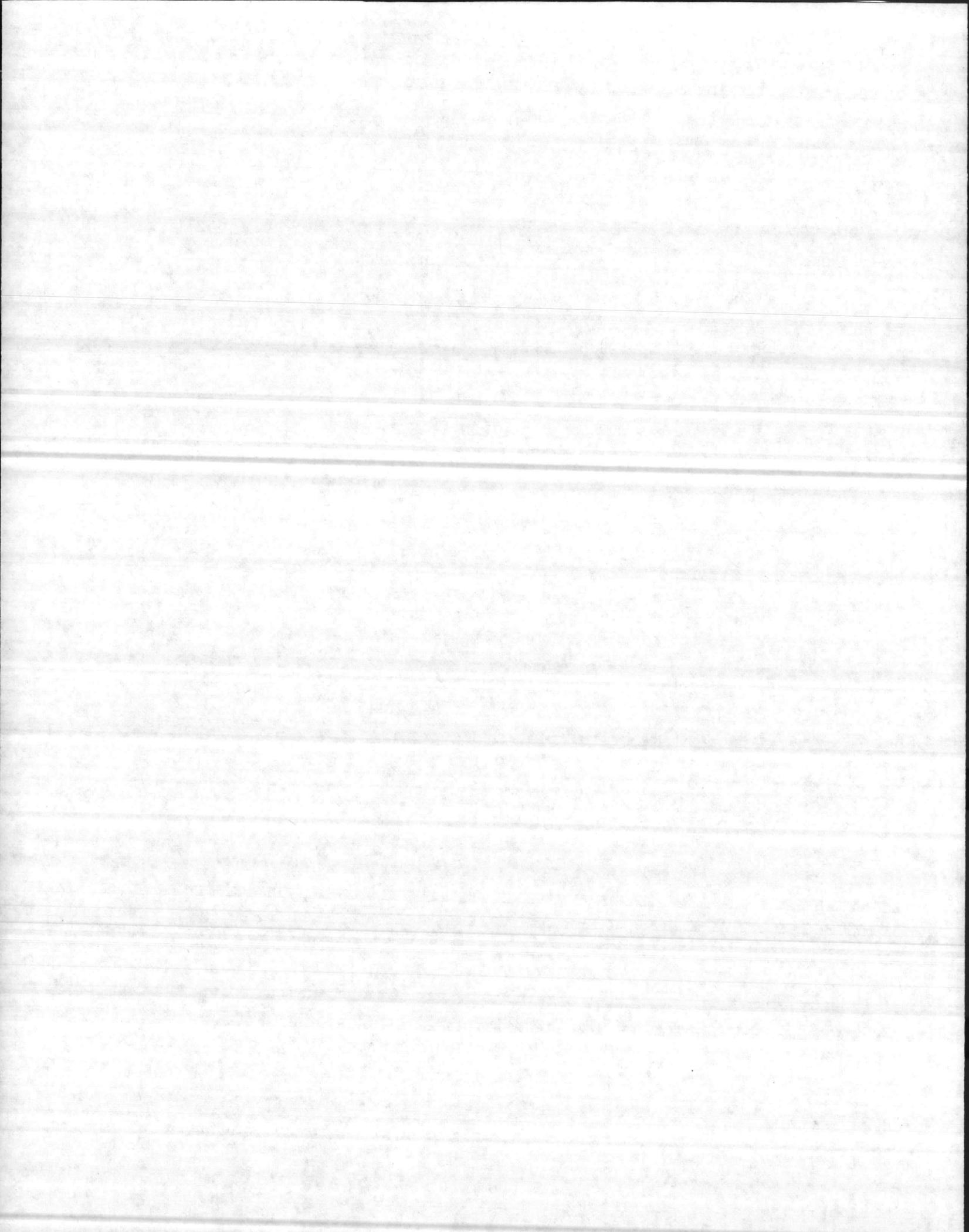
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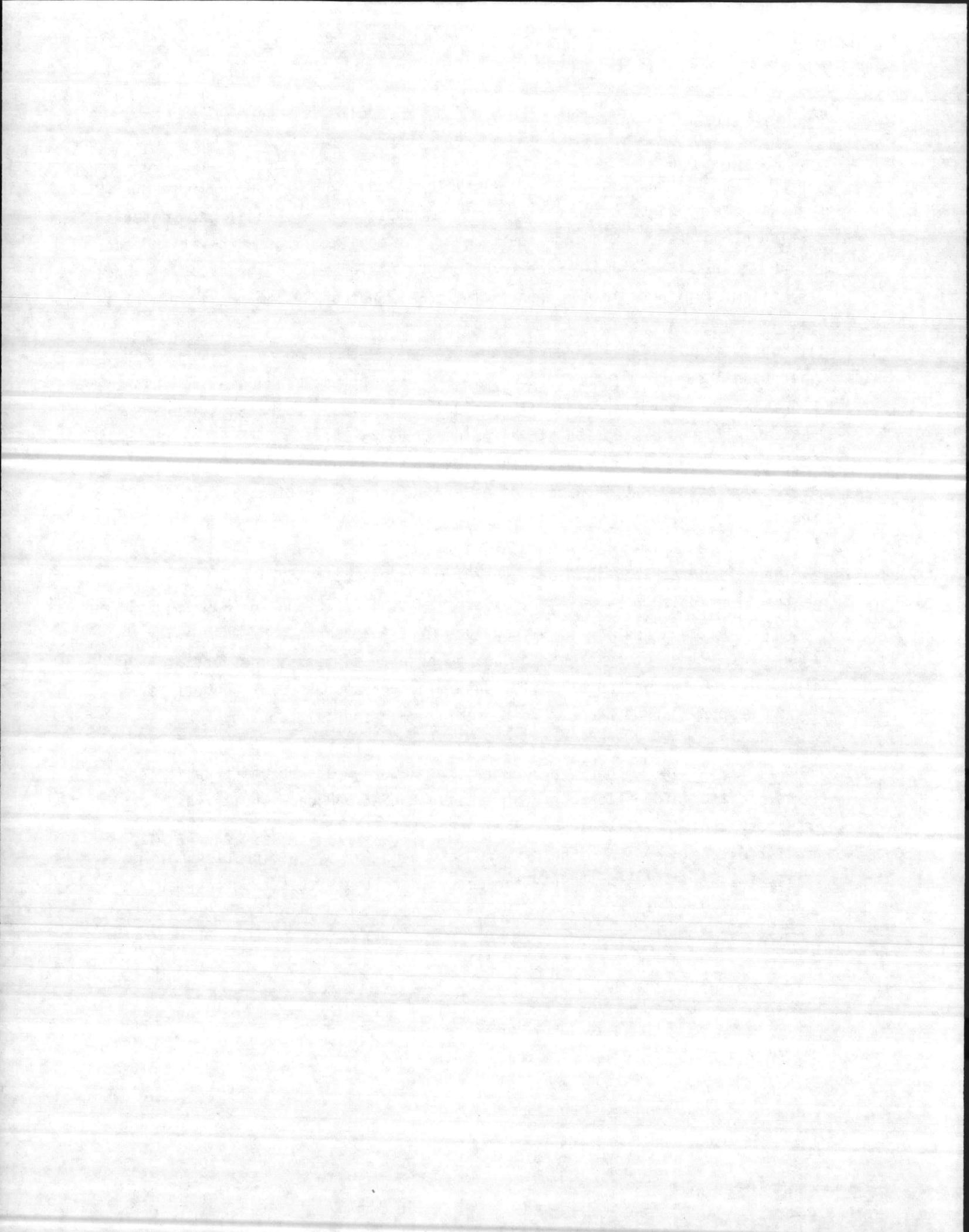
1.0 BACKGROUND

The primary purpose of the New River, N.C. site survey was to evaluate MCAS(H) New River's ability to support the V-22 aircraft so as to facilitate determination of budgetary planning requirements for modifications, alterations and/or new facilities in ample time to allow for design and construction of long lead items for operational support of the V-22 Weapon System.

Although specific facilities were analyzed and determined to be suitable for operational support of the V-22 Weapon System, it must be recognized that the LSA/LSAR approved data which will include facilities requirements is not available for determination of WRA maintenance as related to organizational, intermediate and depot levels. The data contained herein is subject to change as the approved LSA/LSAR data becomes available and additional facilities analyses are performed.

Marine Helicopter Training Squadron 204 (HMT-204) at MCAS(H) New River will be the first unit to receive the MV-22A. Marine Air Group 26 (MAG-26) will be parent to HMT-204 and the first tactical MV-22A squadron (HMM-261). The New River, N.C. site survey provided the opportunity to assess the current and planned facility configurations to determine the adequacy for support of the MV-22A Weapon System in order to identify new resources required.

A draft of the preliminary V-22 Facilities Requirements Document (which contains limited information based on available LSA/LSAR data and released design drawings) and a Facilities Site Survey Checklist provided by the Government facilities engineers were the primary data used for evaluation of existing facilities at MCAS(H) New River for determining the site's adequacy for supporting the V-22 Weapon System.

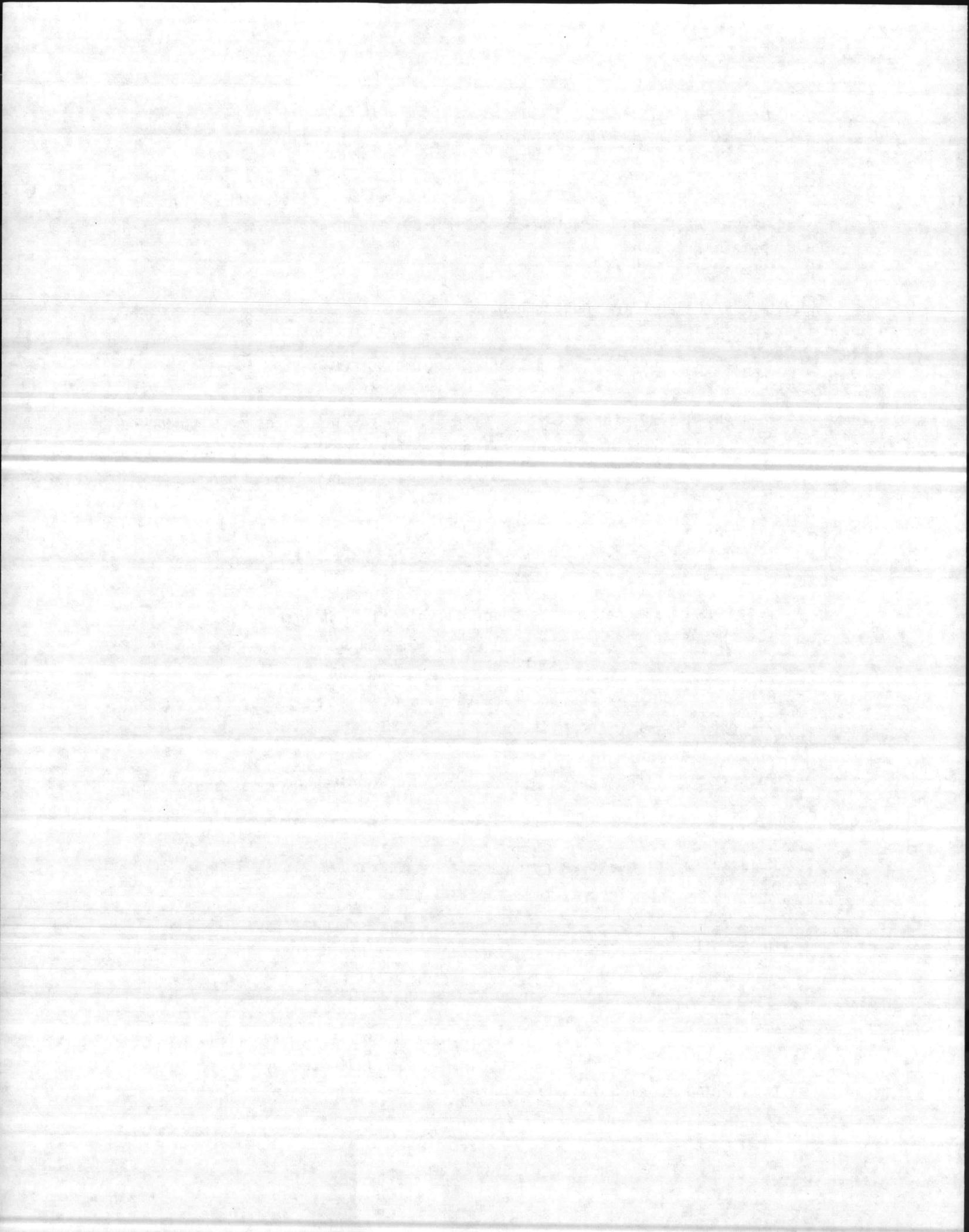


2.0 PROJECT DATA/LOCATION

Military Construction Project Data, Marine Corps Air Station (Helicopter) (MCAS(H)), North Carolina, MAG-26 and MAG-29. Figure 1 shows key buildings and operational areas.

Brief Description of Proposed Changes:

- Major modifications/alterations to buildings 504, 515, and 518.
 - Construction of three (3) new Type 1 hangars in accordance with NAVFAC P-80 and P-272 definitive drawing no. 1291710 or an equivalent three (3) module hangar facility for MAG-26 and one (1) new Type 1 hangar at MAG-29. ? (apparently referring to P. 526 - this is also mag 26) *P-404/R 543
This is a Type 1 hangar & A
Type 1 - modify
Not in current plans*
 - Construction of IMA composite repair work centers for, MAG-26 and MAG-29. *CAN we do in existing facilities?*
 - Redesign of planned aircraft corrosion control hangar to be in accordance with NAVFAC P-272 definitive Drawing No. 1403809. *Do not have drawing*
 - Consideration of V-22 requirements in construction of four (4) currently planned hot refueling pits.
 - Major alterations and/or new construction of IMA GSE shops and holding sheds.
 - Major alterations to existing and construction of new parking aprons and interior and peripheral taxi-lanes.
 - Major alterations to existing and construction of a new rinse facility in accordance with NAVFAC P-272 definitive Drawing No. 1291728 modified.
-
- Modifications/alterations to existing IMA facilities to provide a dedicated tire and wheel work center and a dedicated hydraulic tubing repair and fabrication work center.



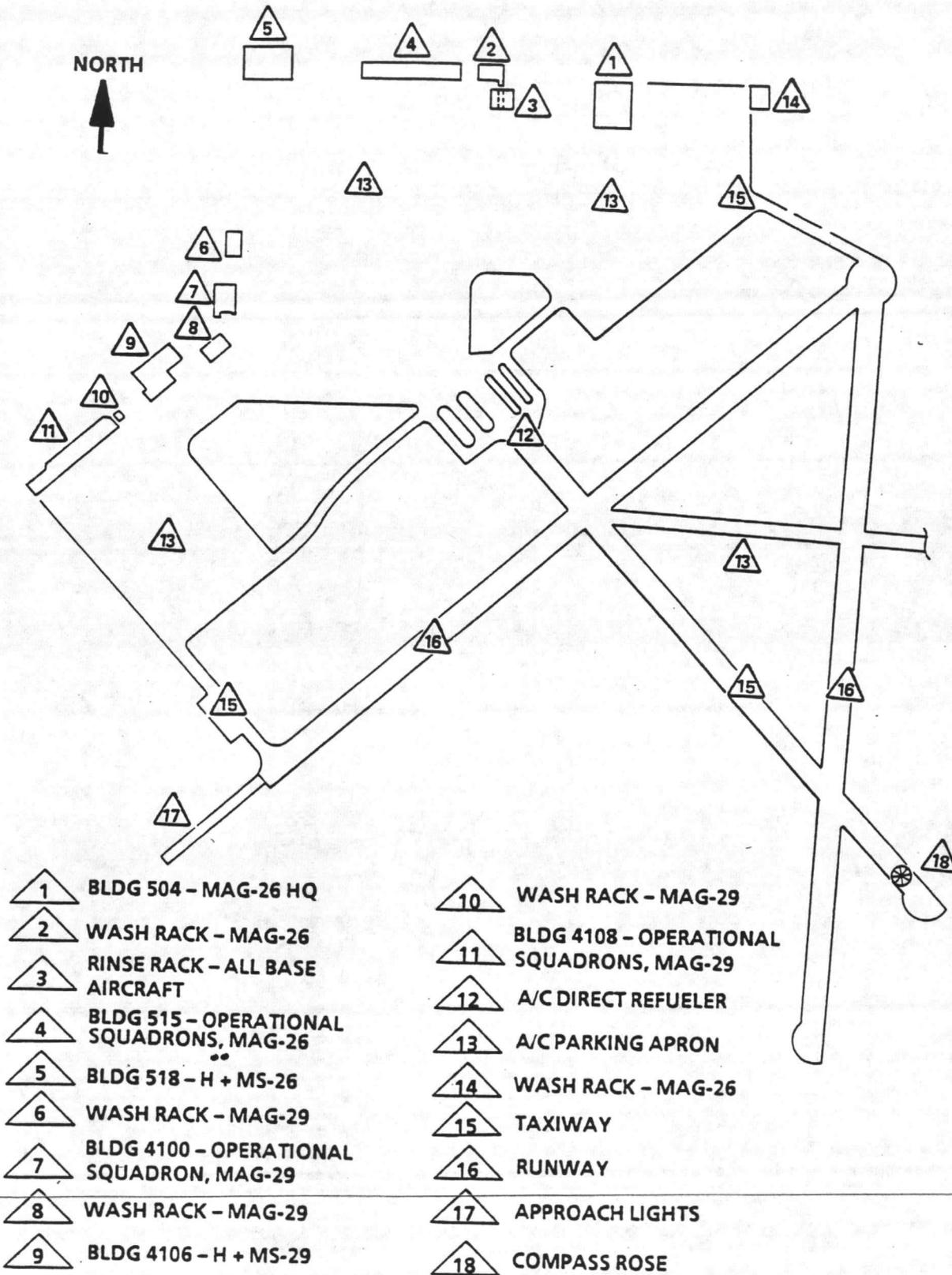
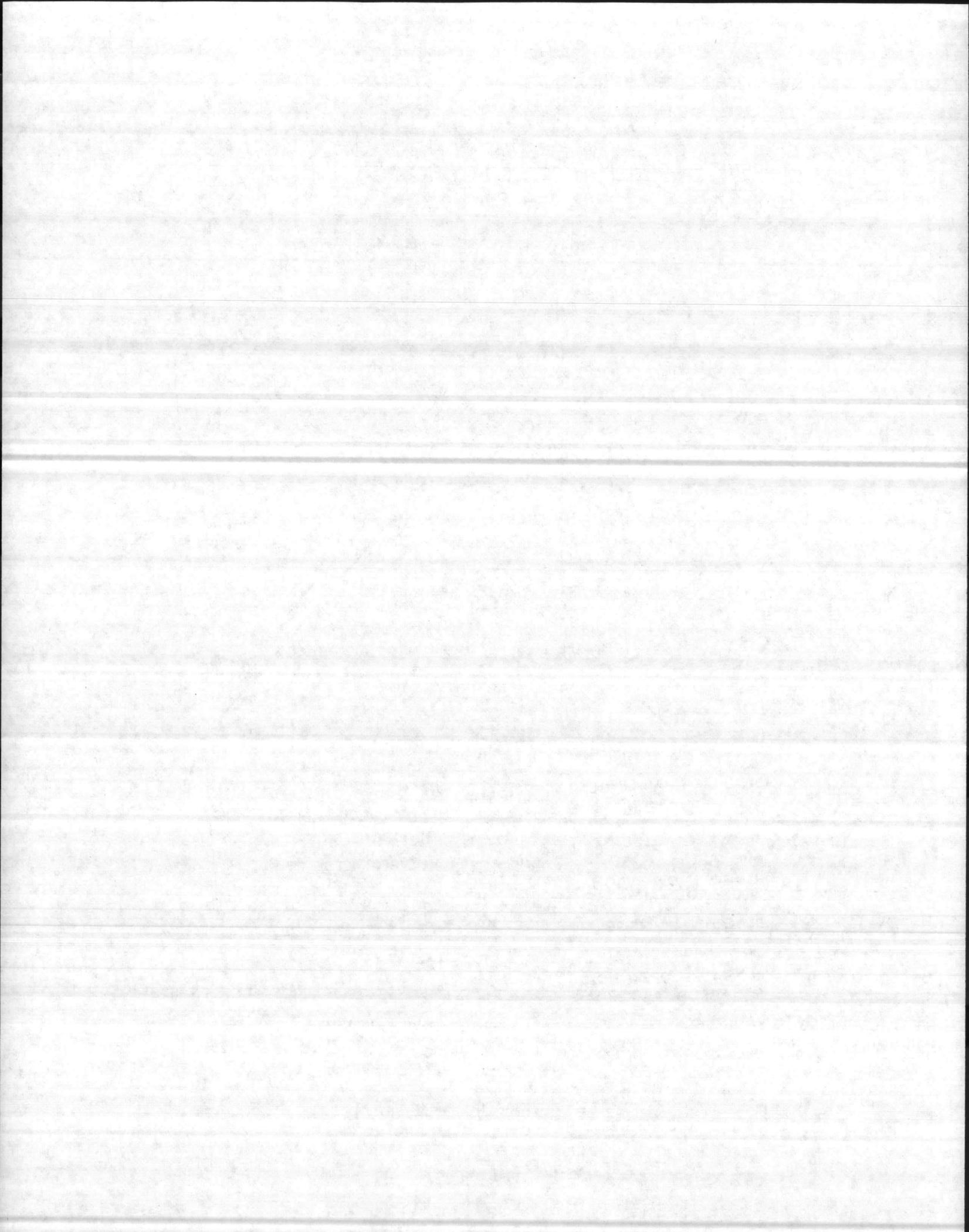


FIGURE 1. MCAS(H) NEW RIVER, NC - OPERATIONAL FACILITIES LAYOUT

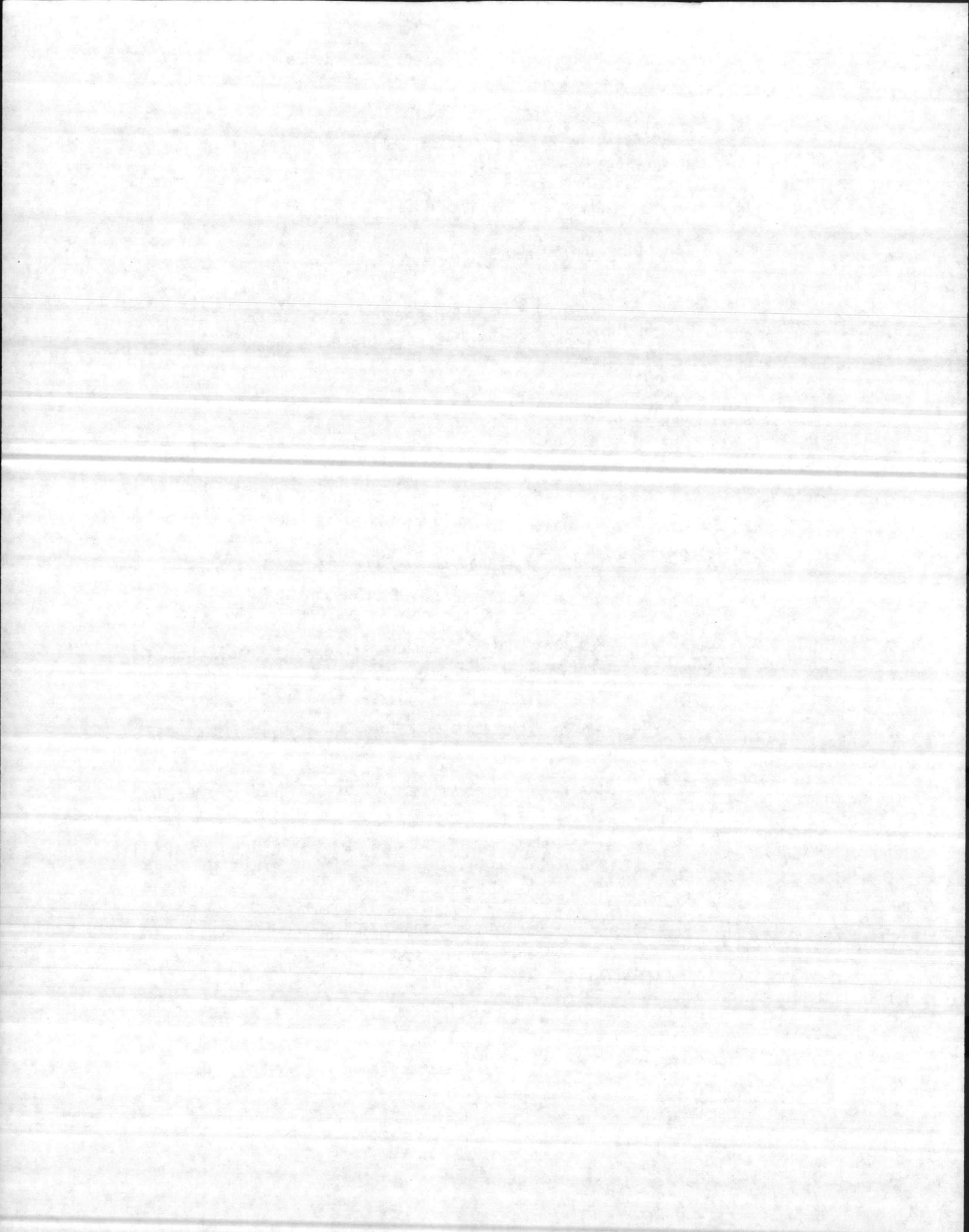


- Modifications/alterations to existing OMA facilities to provide a dedicated survival equipment storage and repair work center for, MAG-26 and MAG-29.
- Major alterations and/or new avionics facility for, MAG-26 and MAG-29.
- Modifications to building 4108 and 4106 for installation of electrical power distribution system and wall type enclosures/receptacles, 440V, 60Hz, 3 Ph, 100 AMPS.

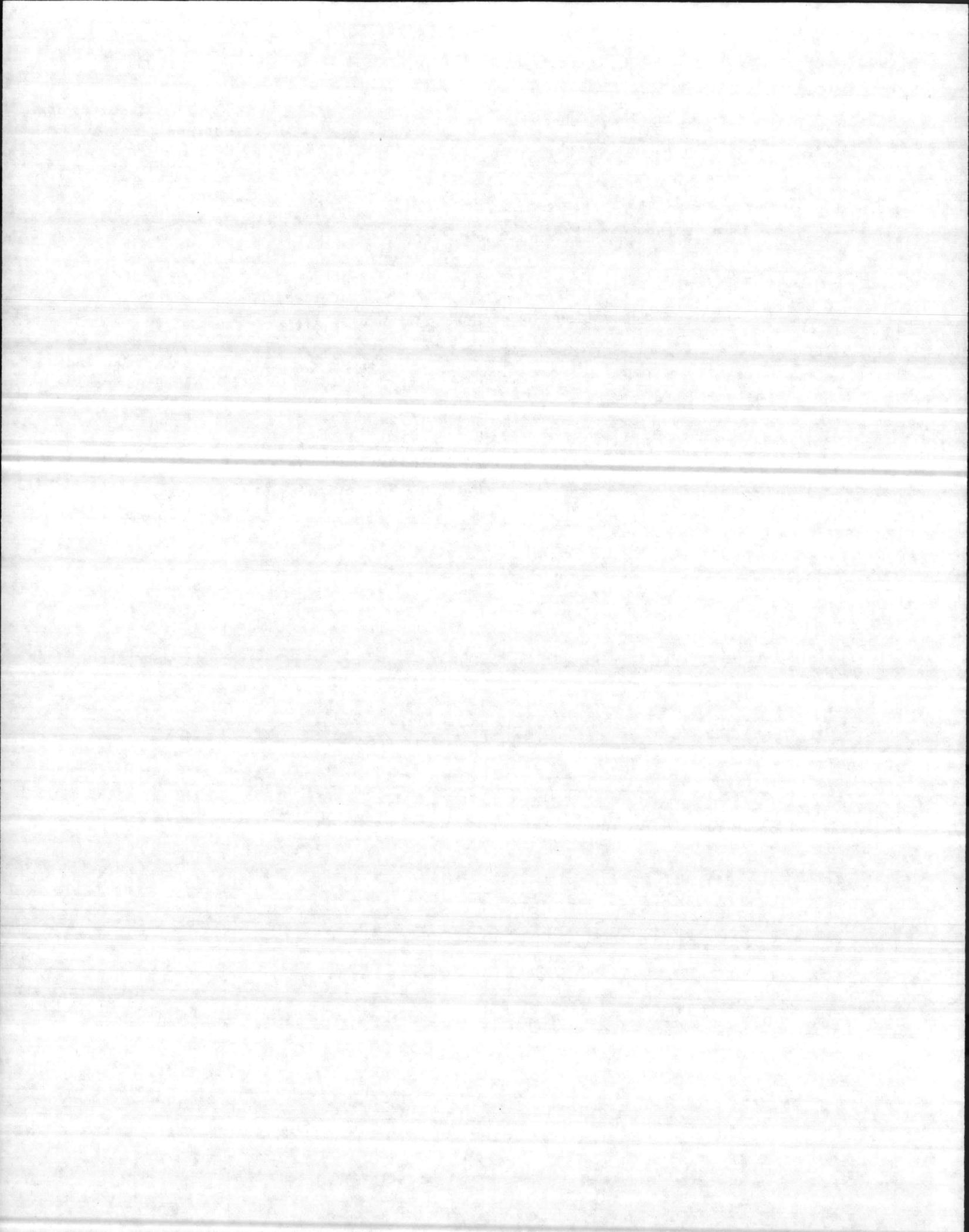
Baseline Considerations:

The following baseline considerations were used in the preparation of this report:

- MAG-26 and MAG-29 will be assigned three (3) V-22 Aircraft operational squadrons each; fifteen (15) aircraft per squadron.
 - MAG-26 will also include a training squadron (HMT-204) consisting of twenty-seven (27) V-22 Aircraft.
 - A total of seventy-two (72) V-22 Aircraft will be assigned to MAG-26.
 - A total of forty-five (45) V-22 Aircraft will be assigned to MAG-29.
 - The first nine (9) V-22 Aircraft will be delivered in GFY 1992 and will be assigned to HMT-204.
 - The seventy-two (72) V-22 Aircraft assigned to MAG-26 will replace the existing forty-six (46) CH-46 Aircraft assigned to HMT-204, HMM-261, HMM-264, and HMM-266.
-
- The forty-five (45) V-22 Aircraft assigned to MAG-29 will replace the existing thirty-six (36) CH-46 Aircraft assigned to HMM-162, HMM-263, and HMM-365.



- The existing CH-53, UH-1N, AH-1J/T, and OV-10 aircraft squadrons will be retained at MAG-26 and MAG-29.
- Existing Aircraft Intermediate Maintenance Activities (IMA) will be available for support of V-22 Aircraft.
- All existing facilities at MAG-26 and MAG-29 are candidates for modification/renovation for support of the V-22 Aircraft.
- H&MS will accomplish first degree IMA (I1) repair of the T406-AD-400 Engine. *what does first degree mean?*
- NAVFAC P-80, Facility Planning Criteria for Navy and Marine Corps Shore Installations, was used for evaluation of existing assets and the determination of specific facility requirements.



3.0 OPERATIONAL CONCEPT

The Marine Corps MV-22 will replace all medium-lift CH-46 helicopters beginning in 1992. The Marine Corps medium-assault troop transport is required to be mission-configured to internal/external cargo equipment, medevac, and search and rescue roles. MAG-26 and MAG-29 are aviation units organized for relatively independent operations without outside assistance except for supply support. Each Marine Air Group (MAG) is task organized for the mission assigned and the facilities from which it will operate. The primary mission of each MAG is to conduct assault support operations. The MAG provides helicopter support for helicopter-borne operations in support of the Fleet Marine Forces and such other air operations as may be directed.

3.1 Marine Corps Air Station (MCAS)(H) New River, North Carolina

MCAS(H) New River is the home of MAG-26 and MAG-29 which are organized and supported similarly except for a training squadron (HMT-204) assigned to MAG-26. HMT-204 serves as a Fleet Readiness Squadron (FRS) to train fleet-ready CH-46 and CH-53 pilots. MAG-26 and MAG-29 are organized and supported as follows:

MAG-26

HMT-204 in Bldg. 504 houses 10 CH-46 and 10 CH-53 FRS aircraft and will be the FRS on the East Coast for the V-22.

HMH-362, Bldg. 504, 15 CH-53 aircraft

HMH-461, Bldg. 504, 15 CH-53 aircraft

HMM-266, Bldg. 515, 12 CH-46 aircraft

HMM-261, Bldg. 515, 12 CH-46 aircraft

HMM-264, Bldg. 515, 12 CH-46 aircraft

HML/A-167, Bldg. 515, 9 UH-1N and 9 AH-1J/T aircraft - ?

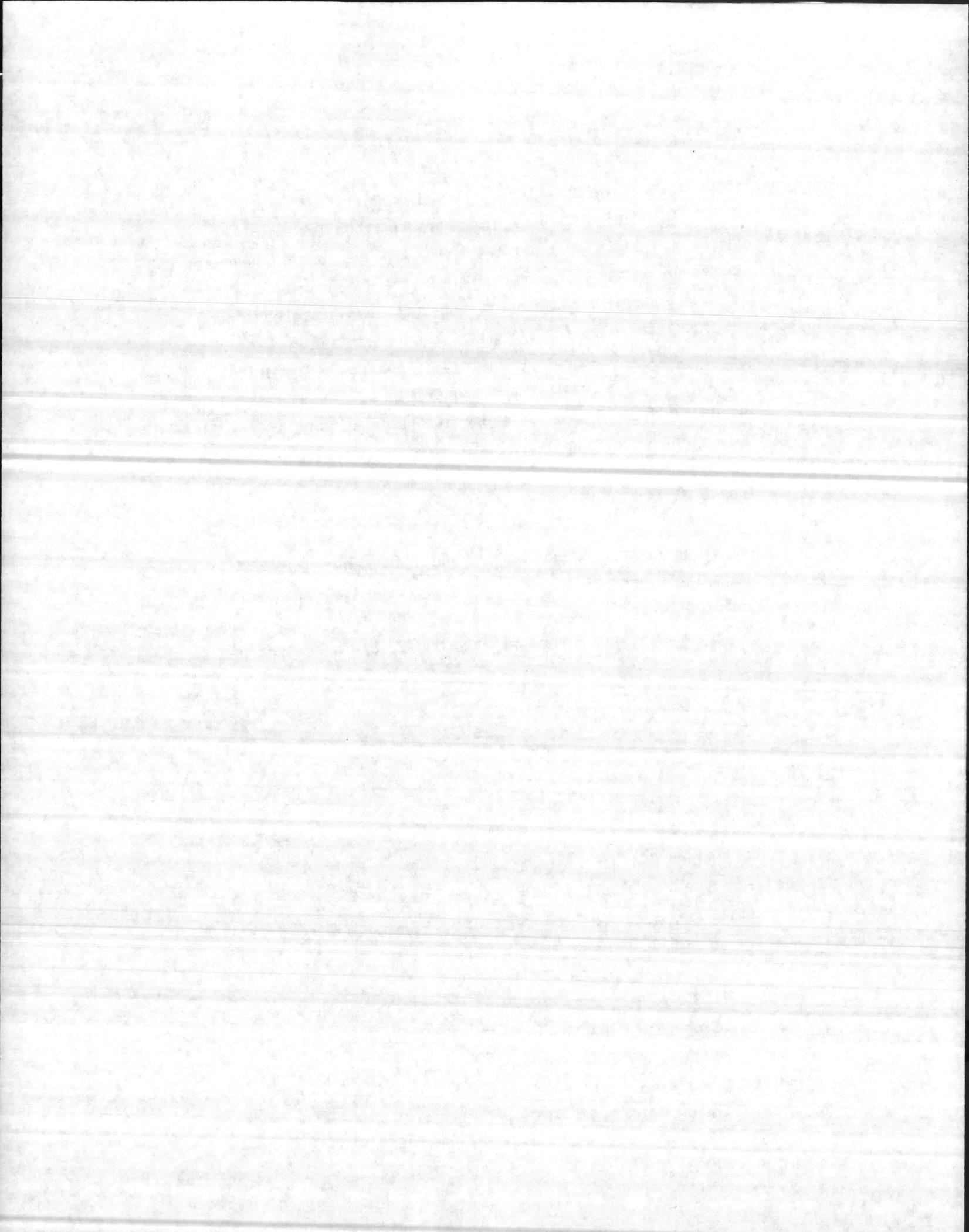
H&MS-26, Bldg. 518, IMA Support all aircraft

Supply, Bldg. 424/425, all aircraft support

GSE, Bldg. 4146, all aircraft support

Avionics, Bldg. 4144, all aircraft support

*This info is
classified*



MAG-29*Classified*

MMH-464, Bldg. 4100, 15 CH-53E aircraft -?
 HMM-365, Bldg. 4108, 12 CH-46 aircraft
 HMM-263, Bldg. 4108, 12 CH-46 aircraft
 HMM-162, Bldg. 4108, 12 CH-46 aircraft
 HML/A-269, Bldg. 4108, 9 UH-1N/9 AH-1J/T aircraft -?
 VMO-1, Bldg. 4108, 10 OV-10 aircraft
 H&MS-29, Bldg. 4106, IMA Support of all aircraft
 Supply, Bldg. 4110, all aircraft support
 Avionics, P/O Bldg. 4106, all aircraft support

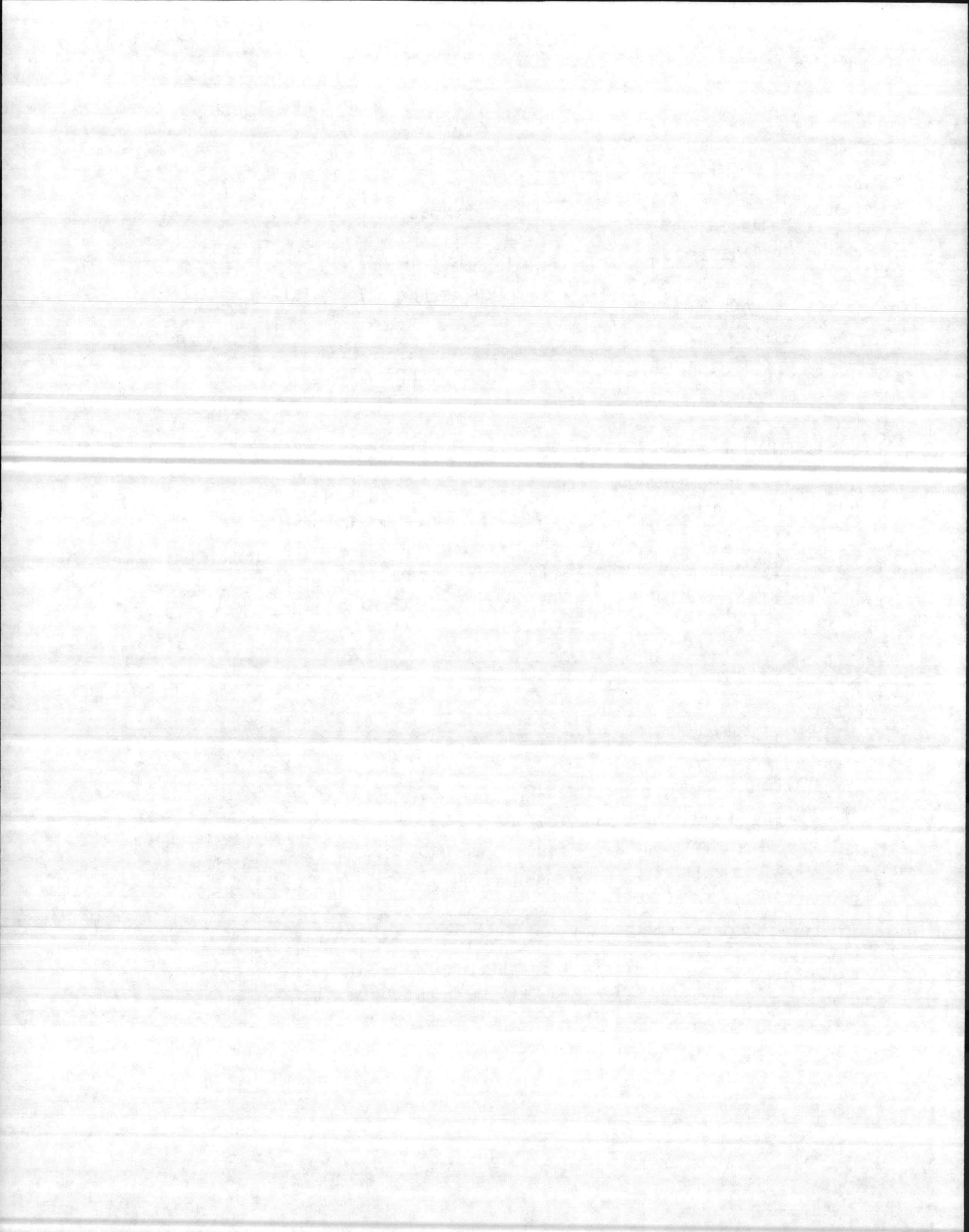
MCAS(H) New River is in the coastal region of North Carolina. The operational environment is of moderate temperature, high humidity, loose soil (sand), with frequent flights over salt water, making corrosion control a significant effort. All airfield runways at MAG-26 and MAG-29 are asphalt-concrete; all parking aprons are Portland concrete. The minimum spacing of CH-46 aircraft with rotor blades extended is approximately 25 feet between blade tips.

3.1.1 Aircraft Squadrons

Aircraft squadrons within MAG-26 and MAG-29 are comprised of the following:

HMM (Helicopter Marine Medium) - Mission of the HMM is to provide helicopter transport of personnel, supplies, and equipment for the landing force during ship-to-shore movement and within an objective area. The MV-22A will be fielded to these tactical HMM Squadrons currently equipped with CH-46s.

MMH (Helicopter Marine Heavy) - Mission of the MMH is to provide helicopter transport of heavy supplies, equipment, and personnel for the landing force during ship-to-shore movement and within an objective area (CH-53).



HML (Helicopter Marine Light) - Mission of the HML is to provide utility combat helicopter support to the landing force in the ship-to-shore movement and in subsequent operations ashore (UH-1N).

HMA (Helicopter Marine Attack) - Mission of the HMA is to provide close-in fire support and fire support coordinating in aerial and ground escort operations during the ship-to-shore movement and within an objective area (AH-1J) (AH-1T) (AH-1W).

VMO (Marine Observation Squadron) - The mission of the VMO is to support fixed wing and helicopter operations. The VMO also performs aerial reconnaissance, observation, and forward air control operations in support of ground troops (OV-10).

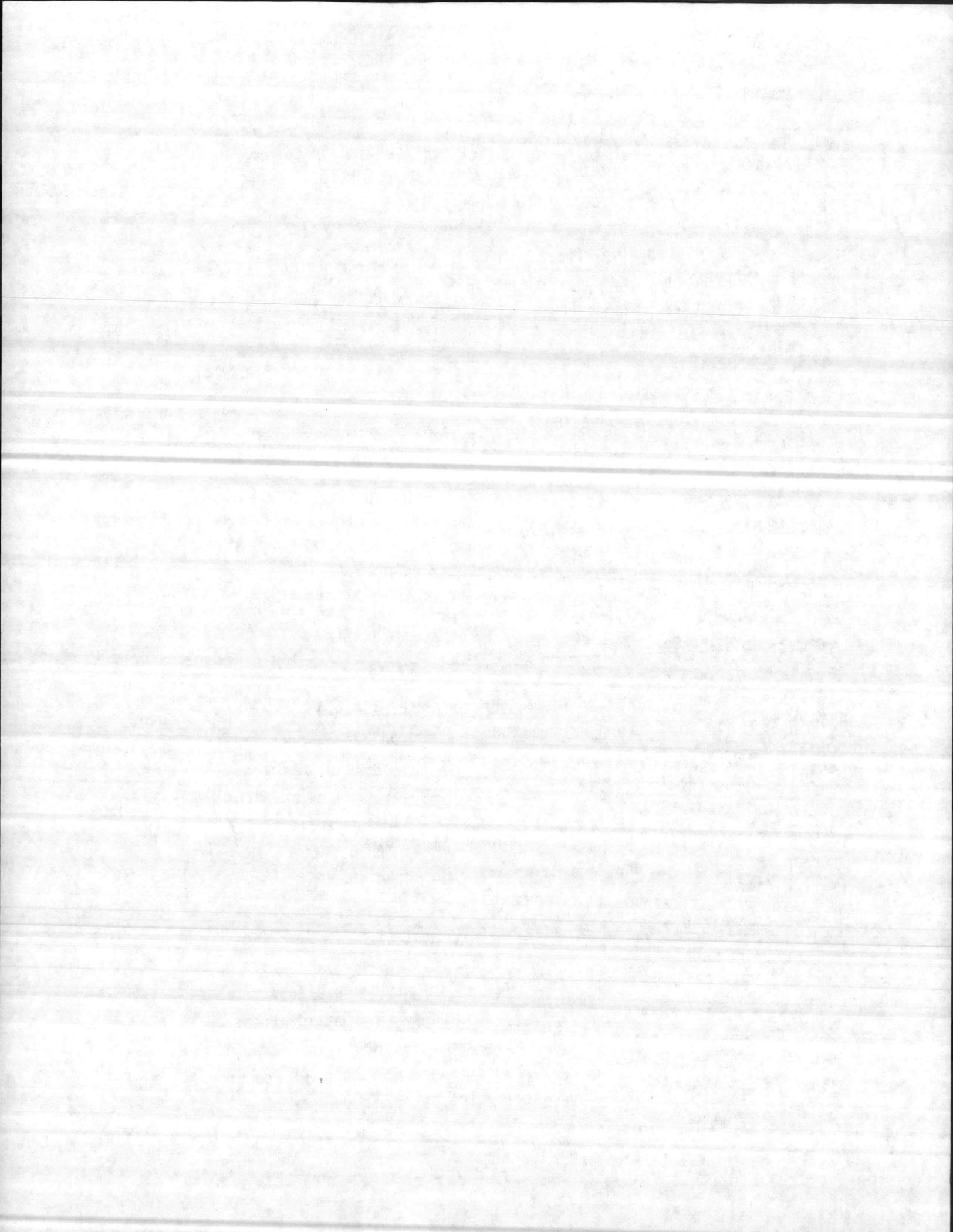
HMT (Helicopter Marine Training) - The mission of the HMT is to provide flight training in specific type aircraft, supplying qualified pilots to tactical operating squadrons.

3.1.2 Support Environment Overview

Support of operations is provided through a three-level maintenance concept, with two levels of maintenance being provided on base. Organizational maintenance is accomplished by the squadron organizational maintenance activities (OMA). If a repair is categorized as IMA repairable or, when the OMA does not have the resources to effect repair of an item, it must be forwarded to the intermediate maintenance activity (IMA). The IMA is part of the Marine Air Group (MAG) Headquarters and Maintenance Squadron (H&MS).

3.1.3 Organizational Maintenance Activity (OMA)

The OMA work centers are equipped to perform on-aircraft inspection, servicing, and repair/replacement tasks. In addition, a limited off-aircraft airframe component repair capability exists. At New River, the squadrons possess hangars, however, most maintenance is accomplished outside on the flight line. Electrical power is supplied by the on-board APU or a mobile electric



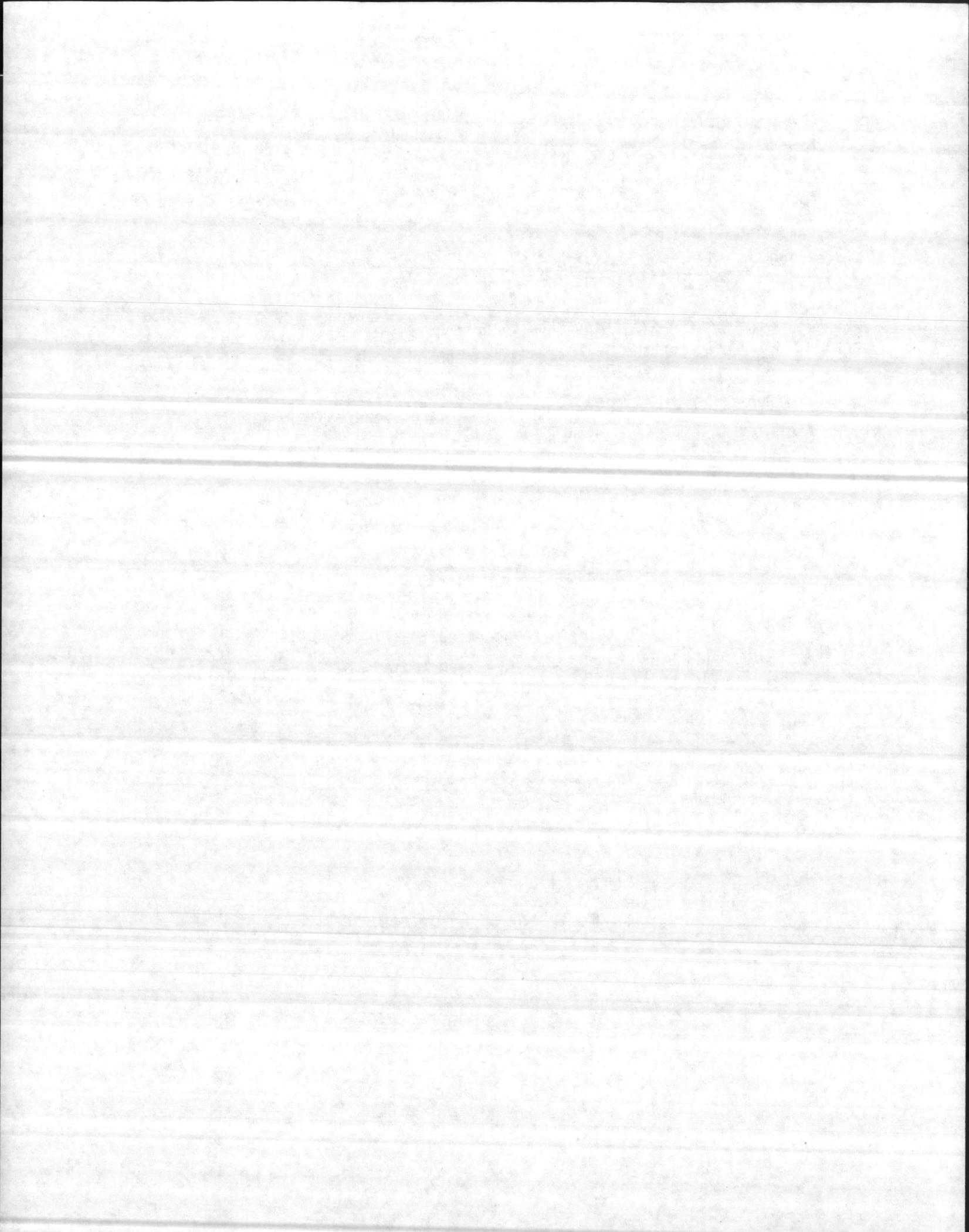
power plant for line maintenance. The mechanics have no personal tools and there is no standard USMC general-purpose tool box. Instead the squadron's tool room maintains tool boxes, pouches and/or cabinets for various maintenance tasks.

3.1.4 Intermediate Maintenance Activity (IMA)

The IMA work centers are tasked to perform maintenance determined to be beyond the capability of the OMA. IMA maintenance includes:

- Repair of aircraft and support equipment repairable components, including overhaul of selected items.
- Test and check of aircraft and support equipment components with the use of test stands/cells not available to the OMA.
- Manufacture of replacement fluid lines.

The IMA is also responsible for conducting training to qualify personnel in the use of support equipment and squadrons to perform assigned missions.



4.0 SQUADRON HANGAR ASSIGNMENTS

4.1 MAG-26

This is not correct

When is this done?

MAG-26 currently maintains a 104 aircraft inventory which will grow to 130 aircraft by 1996. In order to support this inventory growth and alleviate overcrowded conditions which are present in the operational hangars, additional hangar space will be required to adequately support the assigned aircraft. (As discussed in paragraph 2.0, three (3) Type 1 hangars or a three module equivalent is required at MAG-26.) The squadrons may be assigned to these facilities in any combination. The following provides three possible alternatives:

This does not eliminate the problem - is also a MA 26 problem

1. New Three Module Hangar - three (3) operational V-22 squadrons
 Bldg. 504 - HMT-204 FRS with FRAMP *Still a 1 SAON deficiency*
 Bldg. 515 - HMH-362, HMH-461, and HML/A-167 *HMT 464 would not have a home*
2. New Three Module Hangar - HMT-204 FRS, FRAMP, and one (1) V-22-A 53E squadron *SAON (HMT 464) must go in this hangar*
 Bldg. 504 - Two (2) V-22 squadrons
 Bldg. 515 - HMH-362, HMH-461, and HML/A-167 *BARREL not deep enough for "E" type A/C*
3. New Three Module Hangar - HMH-362, HMH-461, and HML/A-167 *HMT 464 here*
 Bldg. 504 - HMT-204 with FRAMP *HANGAR needs 3rd SAON*
 Bldg. 515 - three (3) V-22 squadrons *MAYBE 167*

Under all alternatives, MAG-26 Headquarters will remain in its present location. *Project already underway to move HQ to A-217 this statement is meaningless*

4.2 MAG-29

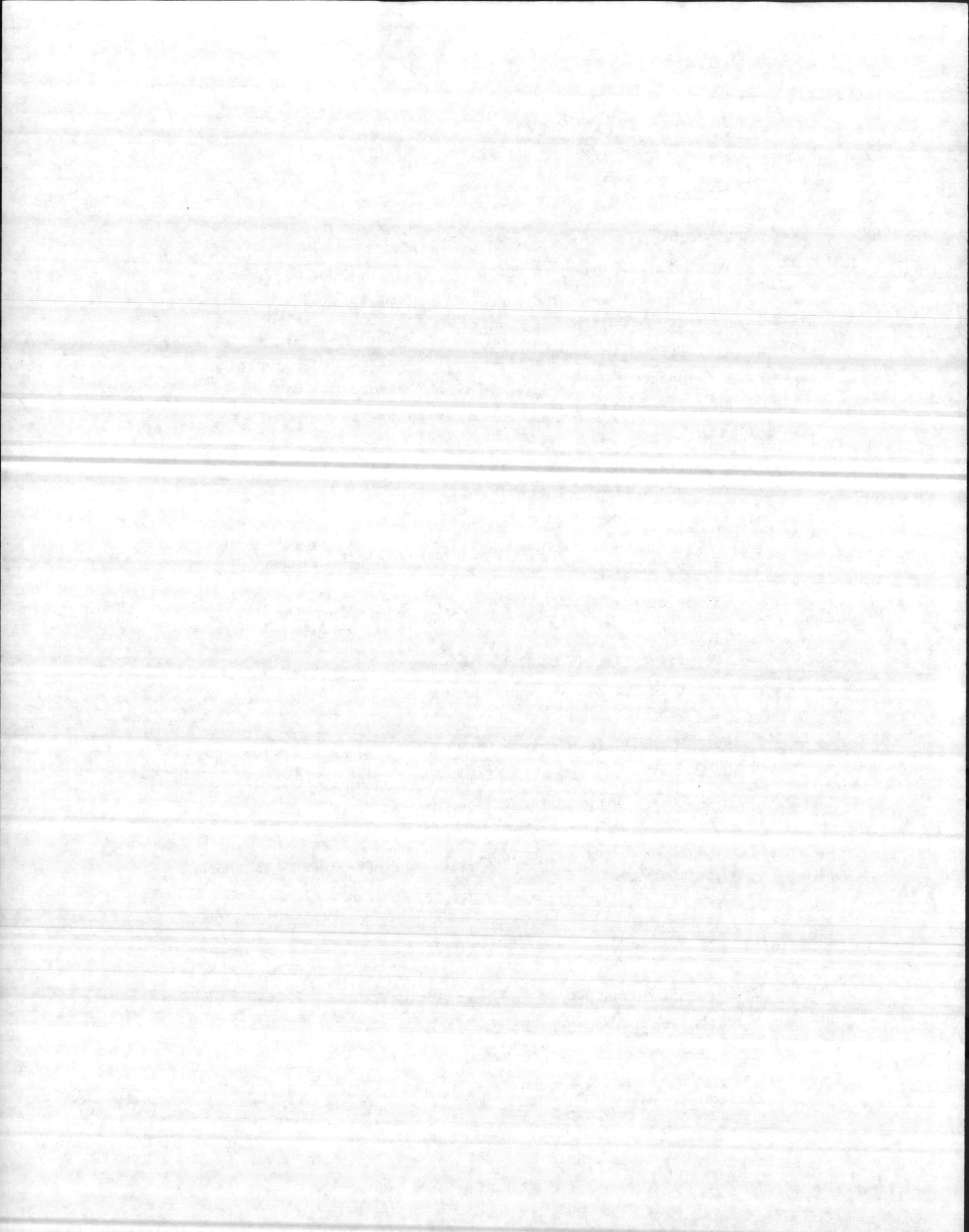
These numbers are wrong

The MAG-29 aircraft inventory is currently 79 with plans for 88 by 1996.

Building 4108 currently houses five operational squadrons consisting of 55 aircraft. To alleviate this overcrowded condition, one (1) Type 1 hangar must

- 4108 - 3 SAON
- 4100 - 1 SAON
- 2404 - 1 SAON

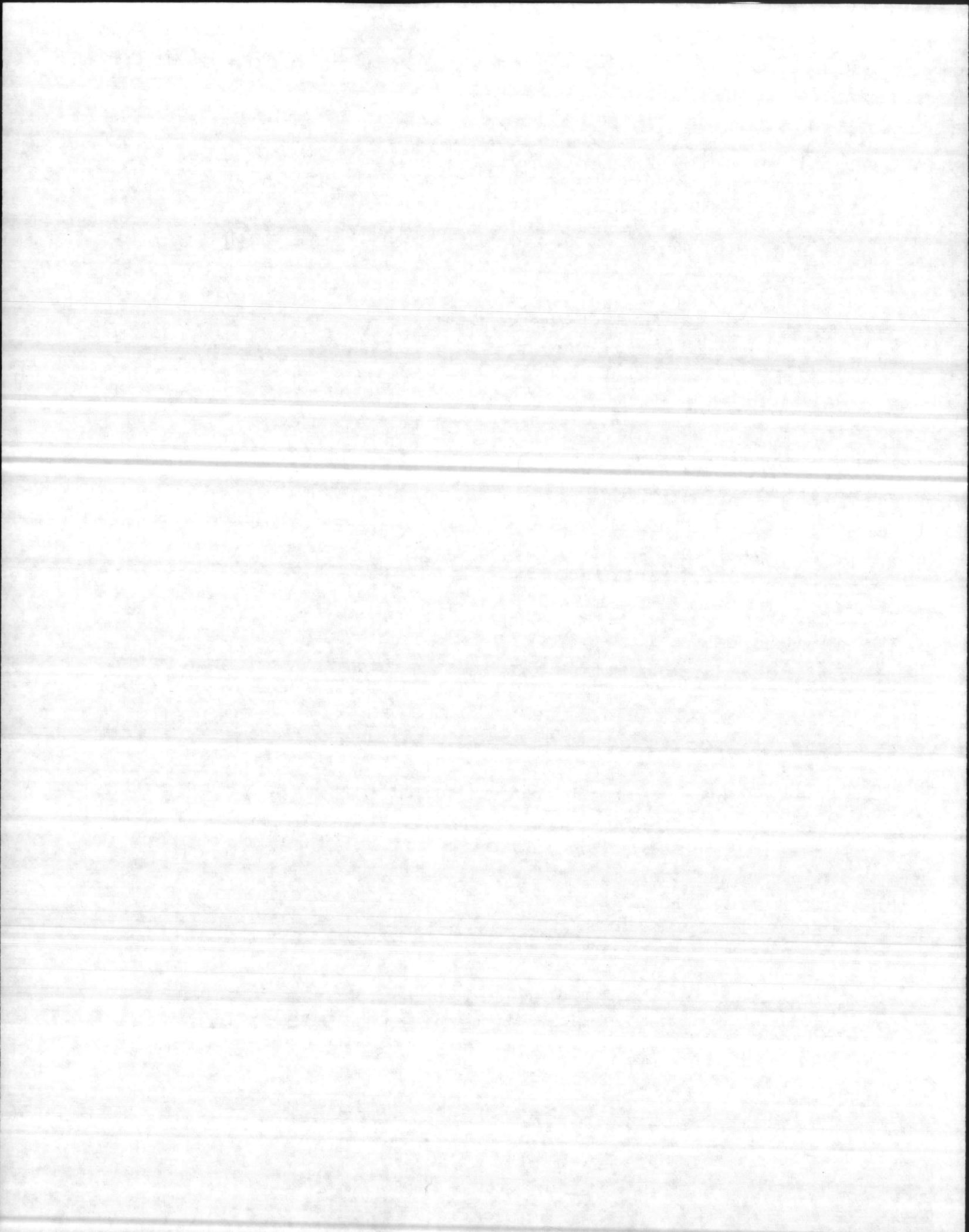
ONE SAON (26 or 24) deployed continuously - ONE SPACON non diss not WAR space (space not space)



be constructed at MAG-29. With a new hangar, three (3) V-22 squadrons may be located in Bldg. 4108 with HML/A-269 and VMO-1 moving to the new facility.

Assessments and recommendations for the existing facilities at MAG-29 and MAG-26 are discussed in subsequent sections of this report.

Section 4 is not relevant to the study. They have some significant errors



5.0 FACILITIES

5.1 Flight Line Facilities

5.1.1 111 15 Runways/Rotary Wing

Runways/Rotary wing are prepared surfaces for the landing and takeoff of helicopters. Helicopter landing/takeoff surfaces greater than 400 feet in length shall be considered a runway in accordance with NAVFAC P-80.

Assessment:

The two (2) runways supporting flight operations for MAG-26 and MAG-29 are each 5,000 feet long and 150 feet wide.

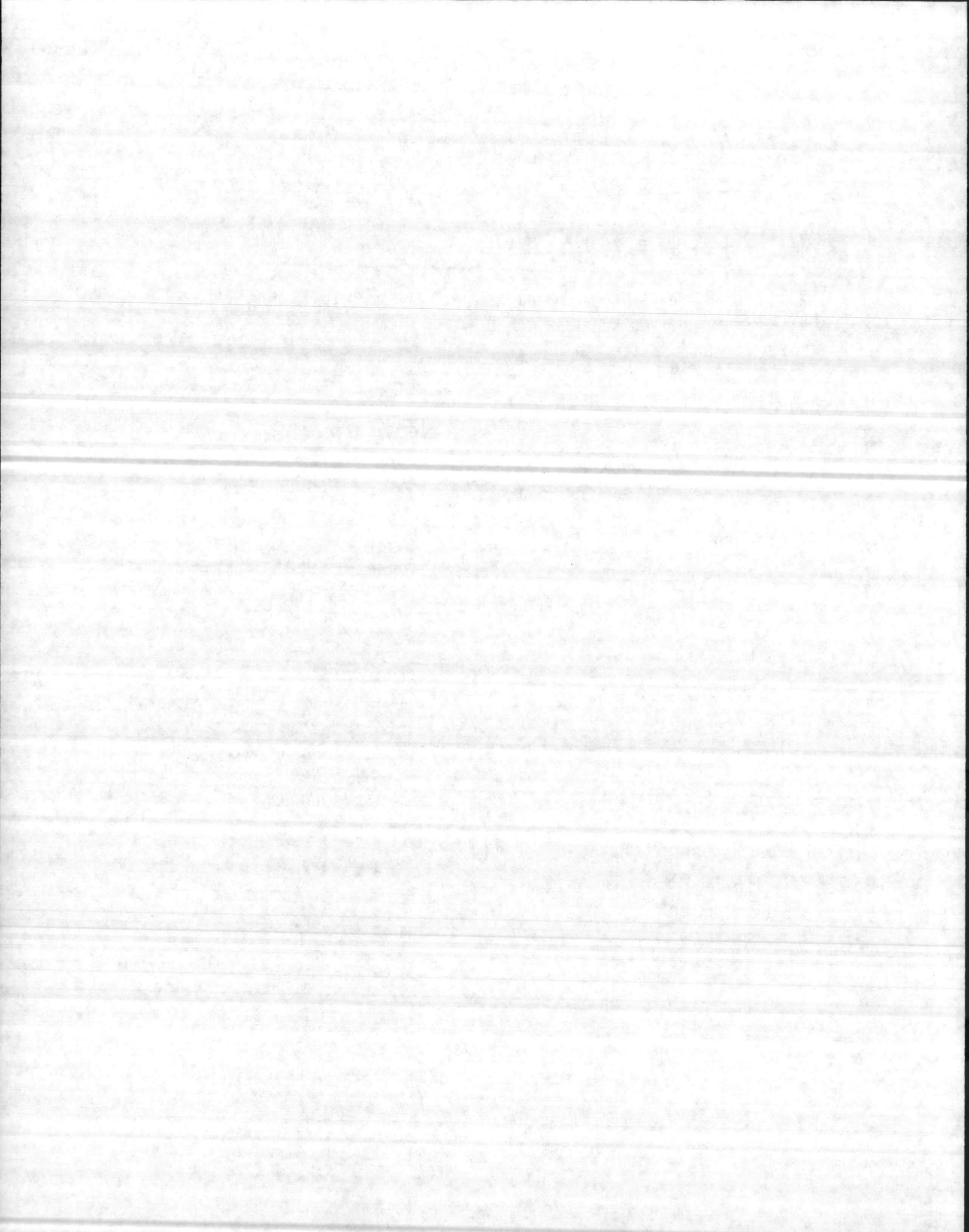
<u>Functional Use</u>	<u>Runway</u>	<u>Length (Ft.)</u>	<u>Width (Ft.)</u>	<u>Surface</u>
Primary Military Departure/Landing	5/23 Instrument	5,000 ft.	150 ft.	Asphalt- Concrete
Primary Military Departure/Landing	18/36	5,000 ft.	150 ft.	Asphalt- Concrete

The runway lengths will support normal operations of the V-22 aircraft.

Recommendation:

The existing two (2) runways at MCAS(H) New River, NC are adequate for takeoff and landing of the V-22 aircraft. There are no recommendations at this time.

What about engine heat & effects of high speed turnup



5.1.2 112 10 Taxiways

Functional Requirements:

Taxiway(s) are paved surfaces on which aircraft move under their own power to and from the landing, parking and service areas. They are designed to achieve a smooth flow of aircraft traffic taxiing at maximum practical speeds.

Taxiways are normally 40 feet wide with shoulders provided. Taxiways at New River are 75 feet wide without shoulders. The width and surface treatment is dependent upon principal use by fixed wing aircraft. Runway exits are part of the taxiway system and include end, normal, and high speed turn-offs as required.

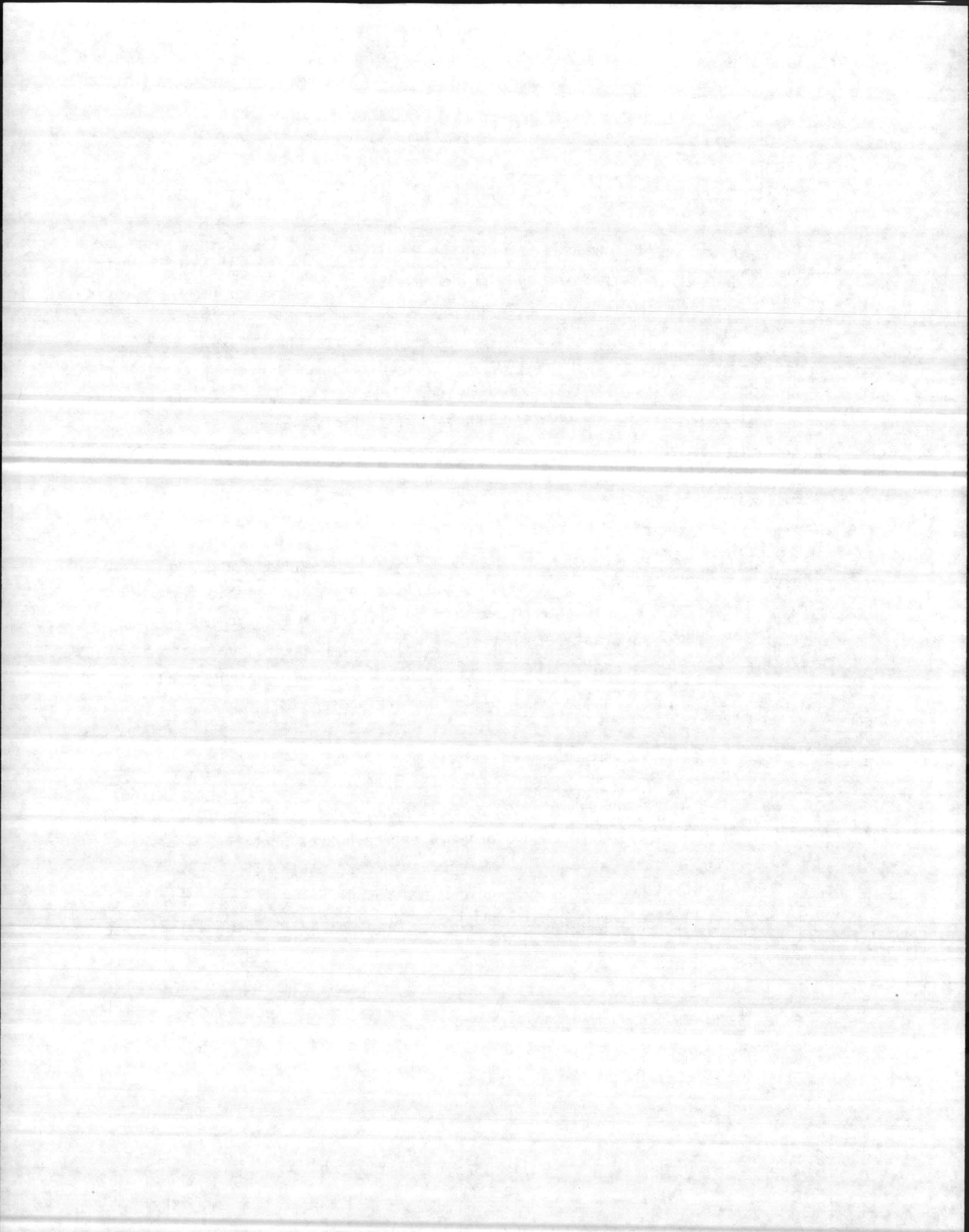
** For Runways which support only class "A" runway traffic. New River has a large amount of class "B" traffic.*

Facility Evaluation:

The existing taxiways provide for a smooth flow of aircraft to and from runways and service areas. All taxiway surfaces appeared suitable for aircraft taxi operations. The CH-53 operates from the taxiways and the maximum load for the CH-53 is greater than that of the V-22; however, the width of the V-22 from rotor tip to rotor tip is 85' and could present a potential FOD hazard from rotor downwash. *How about weight?*

Recommended Corrective Action:

- a. General - Provide 15' wide asphalt concrete shoulders to each side of the existing 75' wide taxiways extending the protected surface to a total of 105'. The extended shoulders would reduce the potential FOD hazard and would not be used for taxiing the aircraft. The shoulders should be marked to prevent aircraft from taxiing onto them.



5.1.3 113 20 Aircraft Parking Apron

Functional Requirements:

The aircraft parking apron consists of paved areas in close proximity to the aircraft maintenance hangars. The aircraft parking apron is required for parking, servicing and flight line maintenance of the aircraft. In addition to aircraft parking spaces, the apron must contain sufficient space for both interior and peripheral taxilanes to support aircraft taxiing/towing. A minimum 338,949 square yards is required to park 117 V-22 aircraft. (Approximately 2,897 square yards for each aircraft).

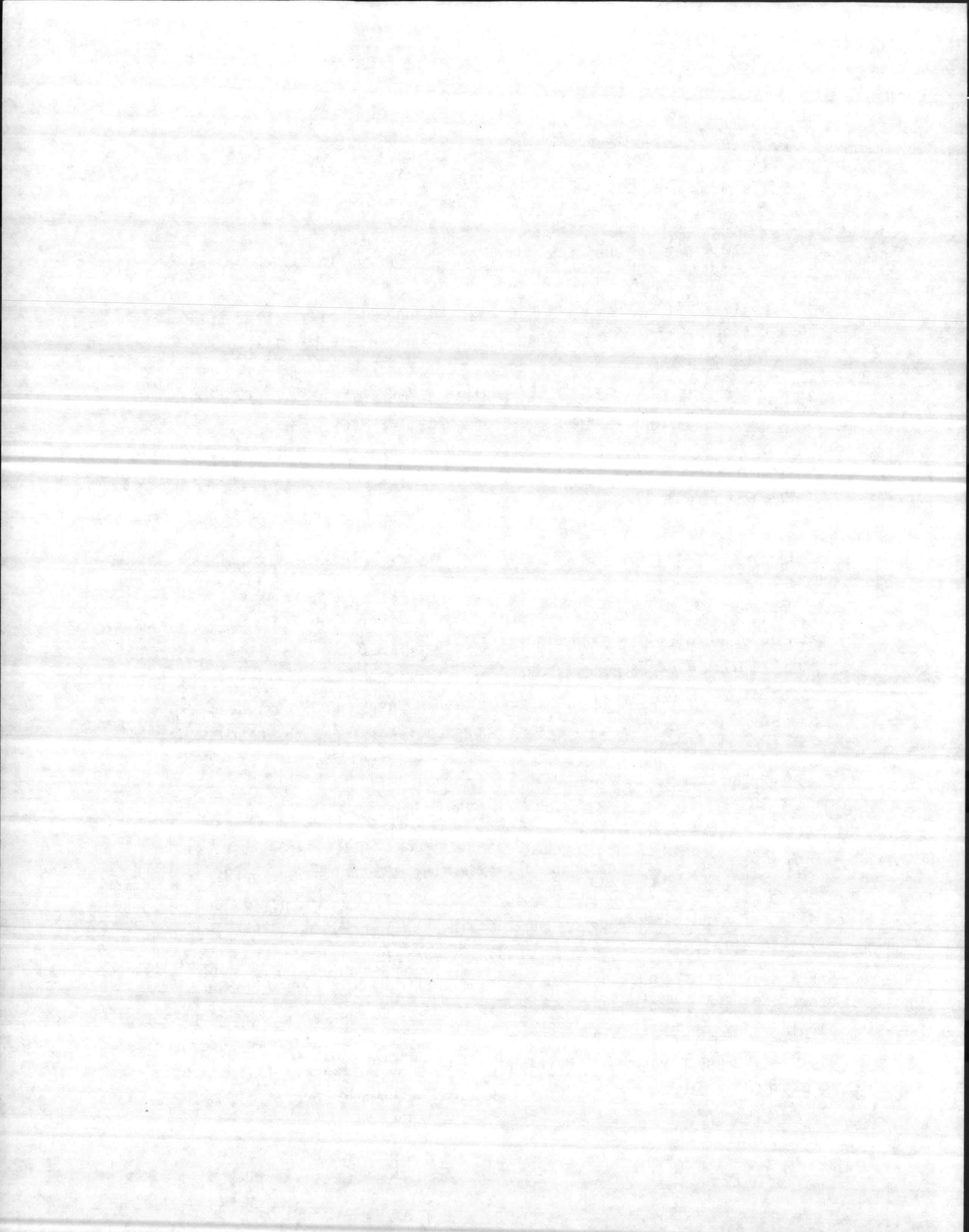
The minimum space required to park 102 V-22 aircraft is approximately 295,494 square yards. This assumes one (1) squadron will be deployed at all times.

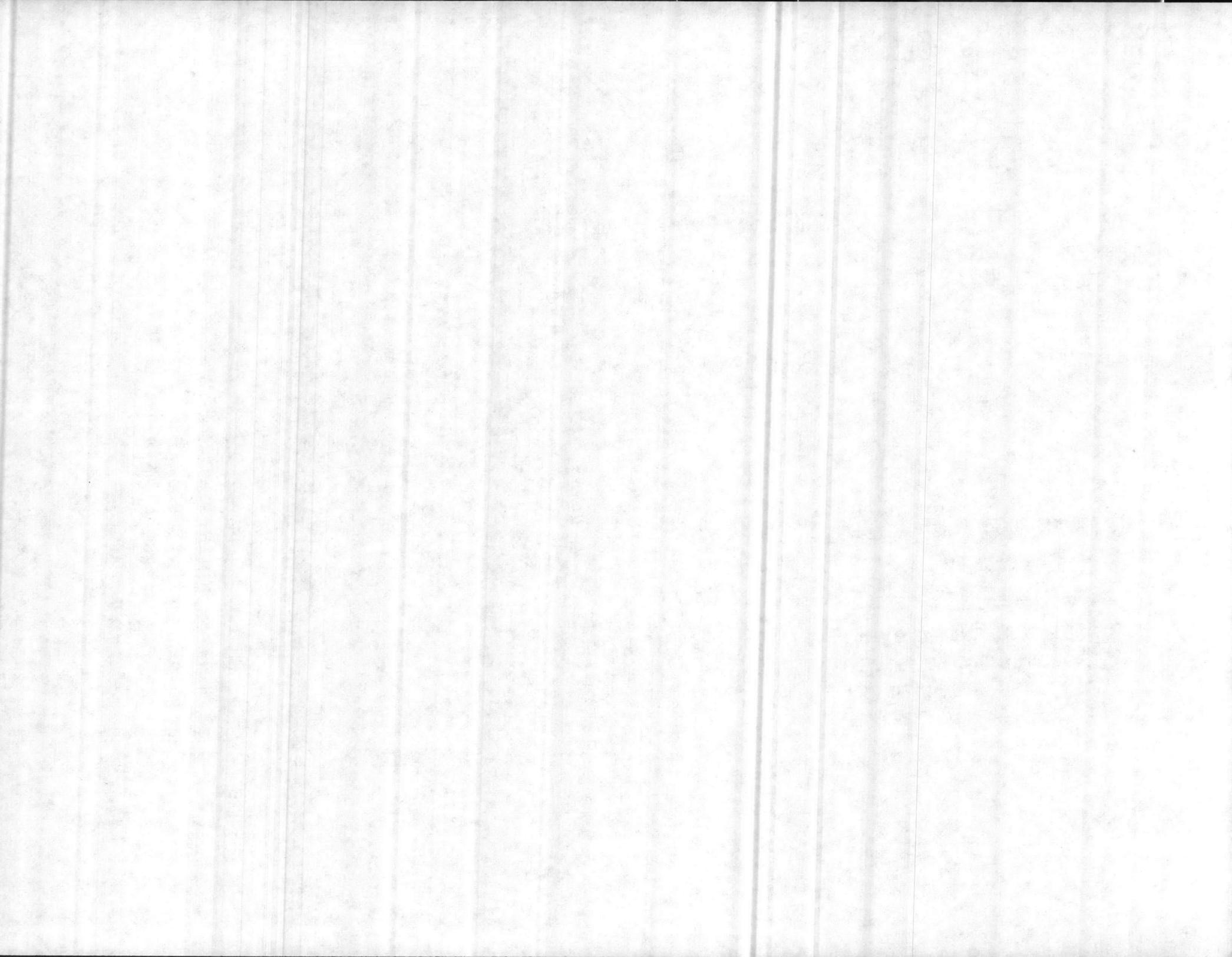
Facility Evaluation:

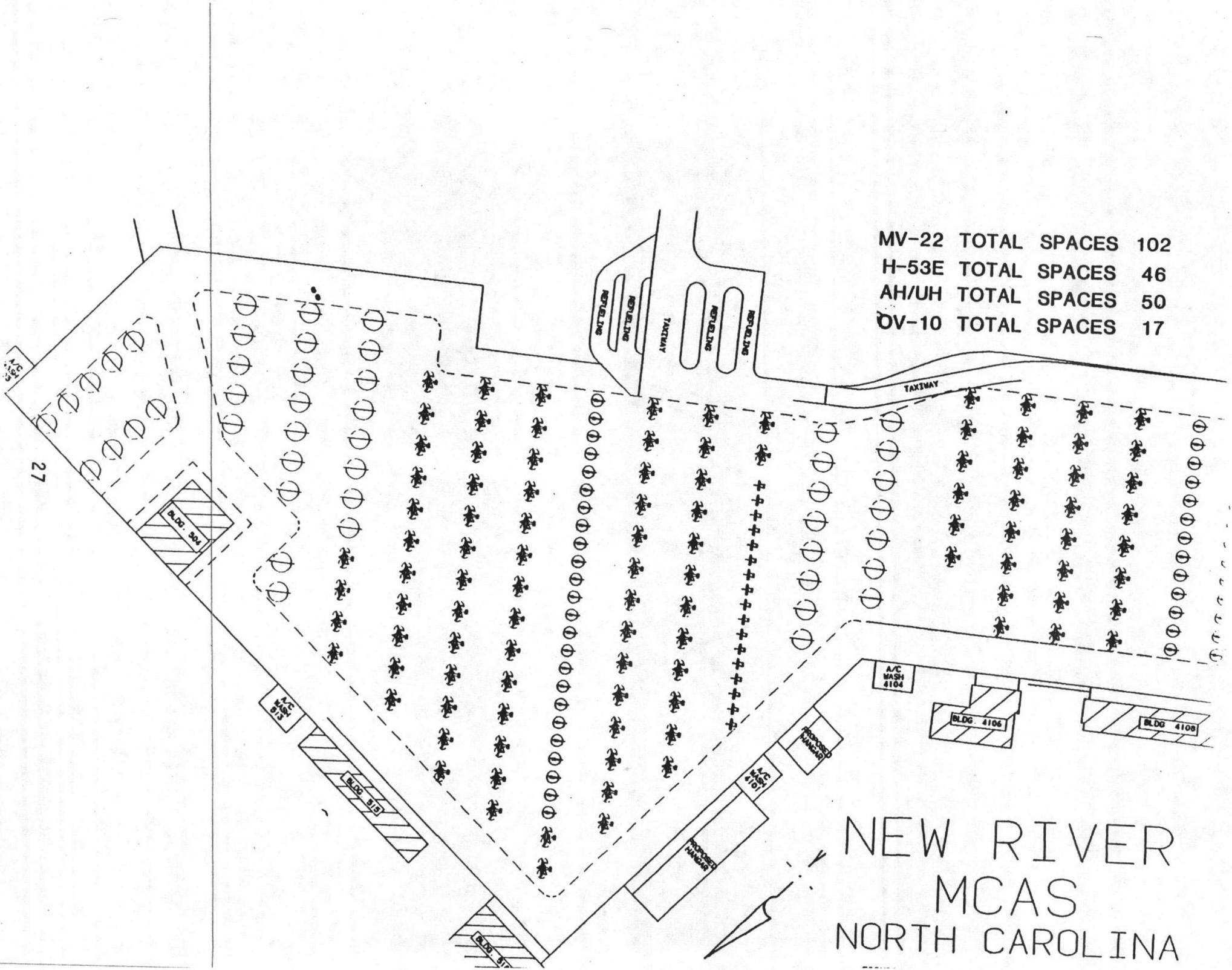
The general location of the aircraft parking apron is ^{South} north of a line from A/C wash 505 to Bldg. 504, from Bldg. 504 to Bldg. 518 then northwest of a line from A/C wash 4104 to Bldg. 4108. Total parking pavement comprises an area of approximately 500,000 square yards (excluding peripheral taxiways) which is compatible for parking each aircraft presently assigned to MCAS(H) New River. SE

Recommended Corrective Action:

As the CH-46 Aircraft are phased out and the V-22 phases in, there will be a requirement for construction of approximately 100,000 square yards of additional parking apron (if all 102 V-22s on station are parked on the apron) due to the size difference of the two aircraft and increase in number of aircraft. This assumes one (1) squadron is deployed at all times. In the event 117 aircraft are on site, overflow parking would be available in areas other than the existing parking apron. Figures 2 and 3 are two (2) potential parking schemes compatible with the preceding recommendation for construction of 100,000 square yards of additional parking apron space. This may be accomplished by paving the two (2) grassy areas shown in Figure 4.

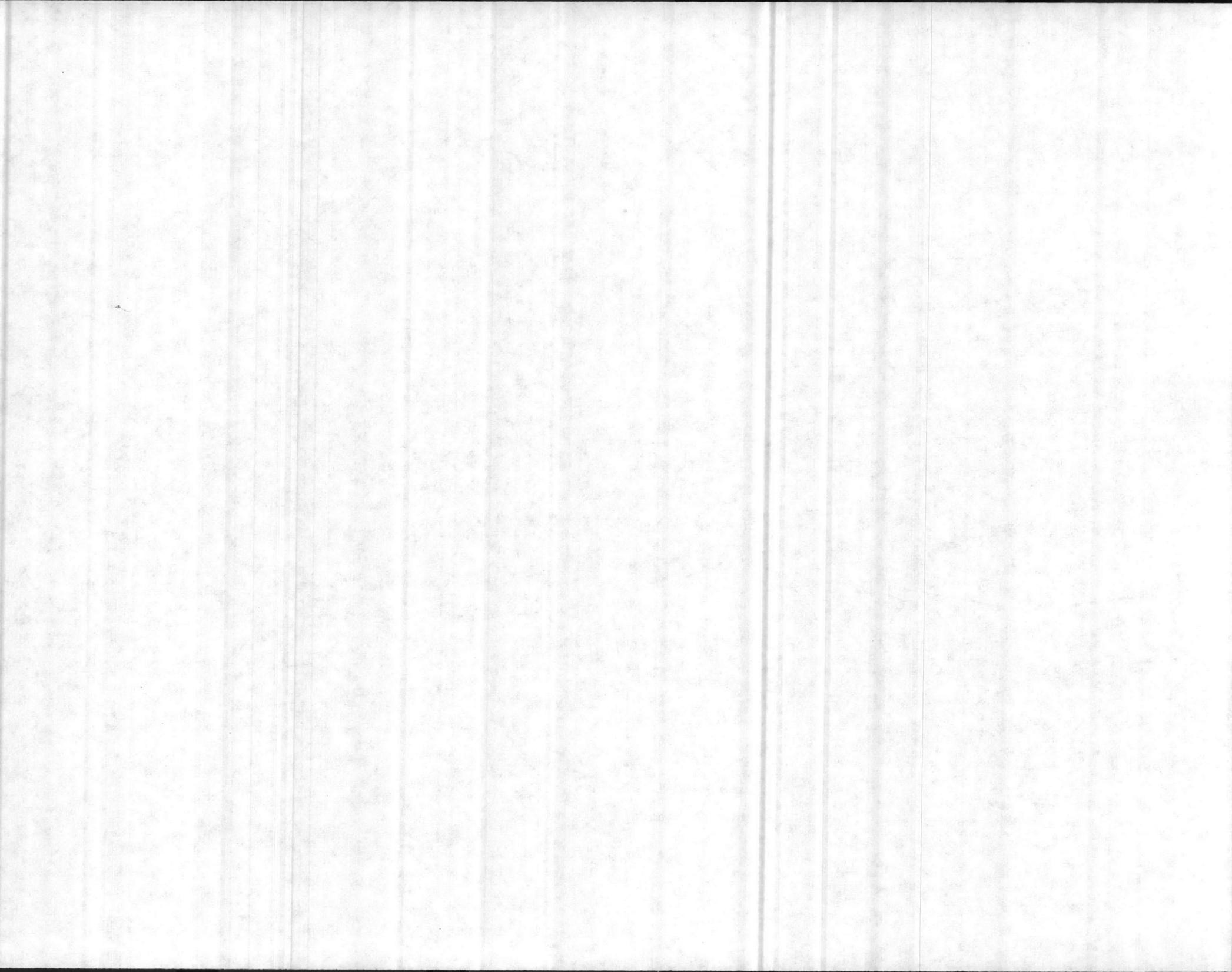


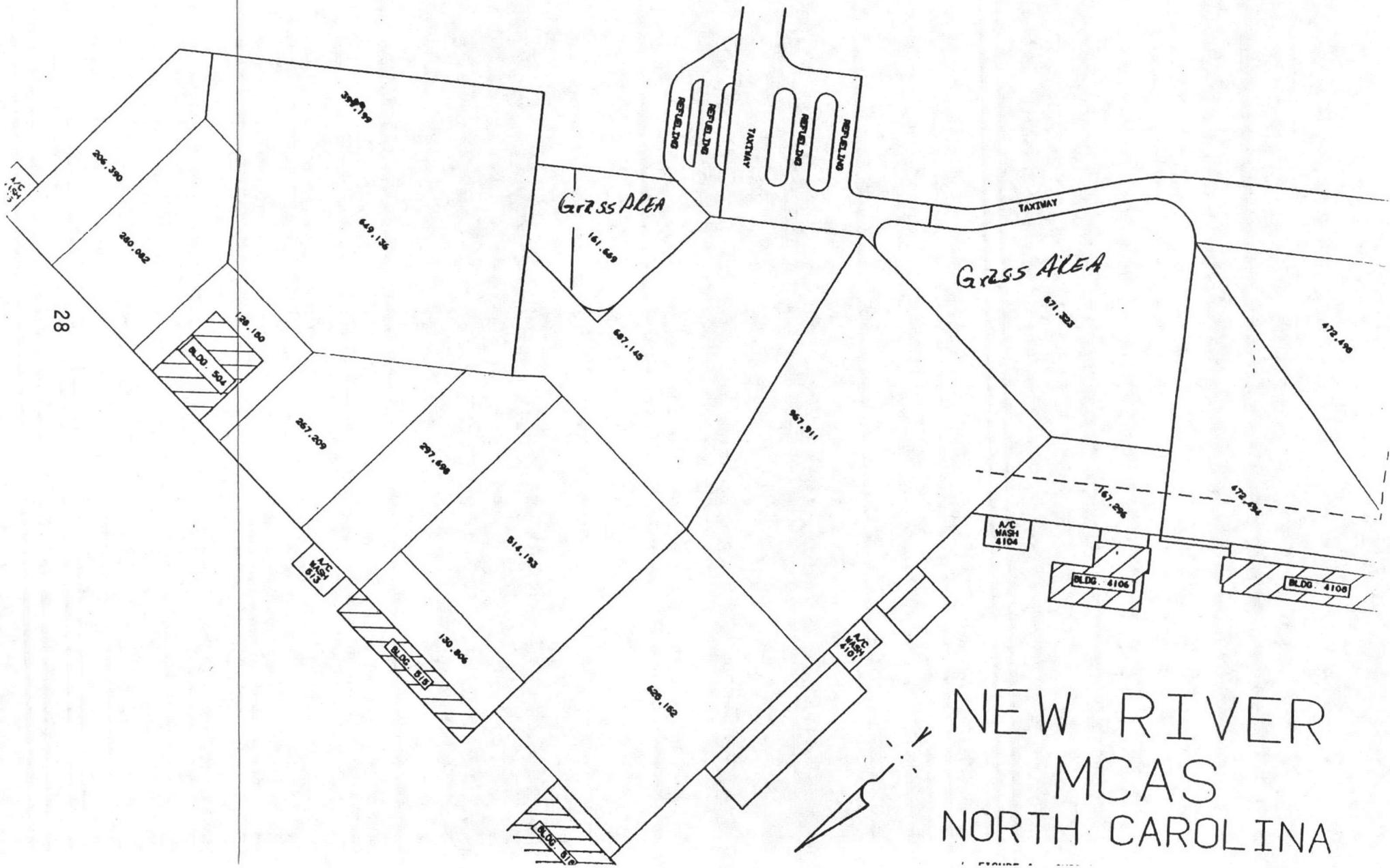




MV-22	TOTAL SPACES	102
H-53E	TOTAL SPACES	46
AH/UH	TOTAL SPACES	50
OV-10	TOTAL SPACES	17

NEW RIVER
 MCAS
 NORTH CAROLINA



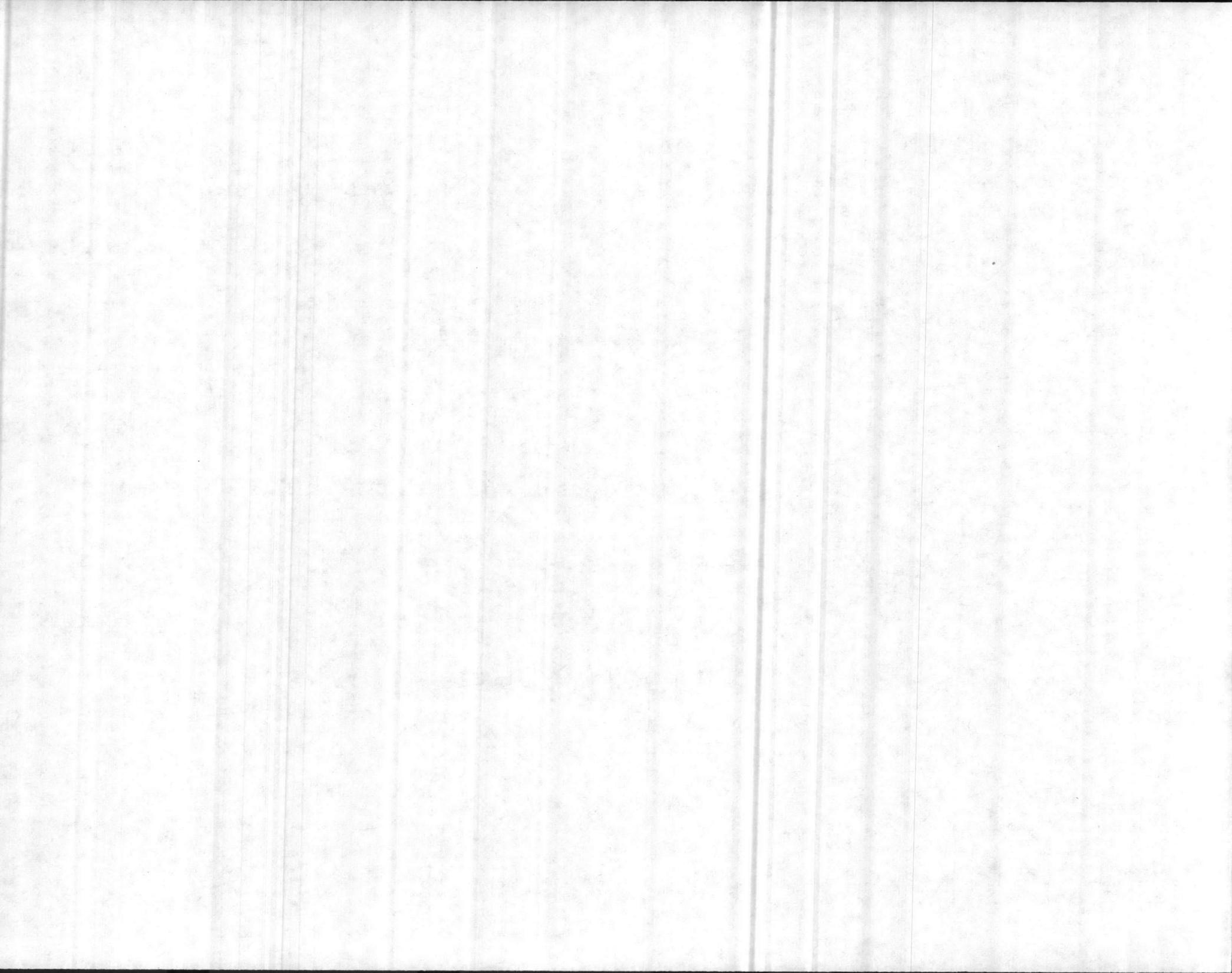


28

Grass AREA

Grass AREA

NEW RIVER
MCAS
NORTH CAROLINA



Note: This is a minimum space requirement and will increase due to peripheral taxi lanes as the number of separated parking locations increases.

5.1.3.1 Padeyes - Tiedown Equipment

Assessment:

Cargo straps, (5,000 pound capacity) in lieu of tiedown chains, (P/N 61A101D) are used throughout the parking aprons. The V-22 aircraft will require use of the P/N 61A101D 10,000 pound capacity chain assemblies. The existing tiedown arrangements for aircraft at MAG-26/29, consist of securing one (1) tiedown strap to a single padeye located at the parking apron.

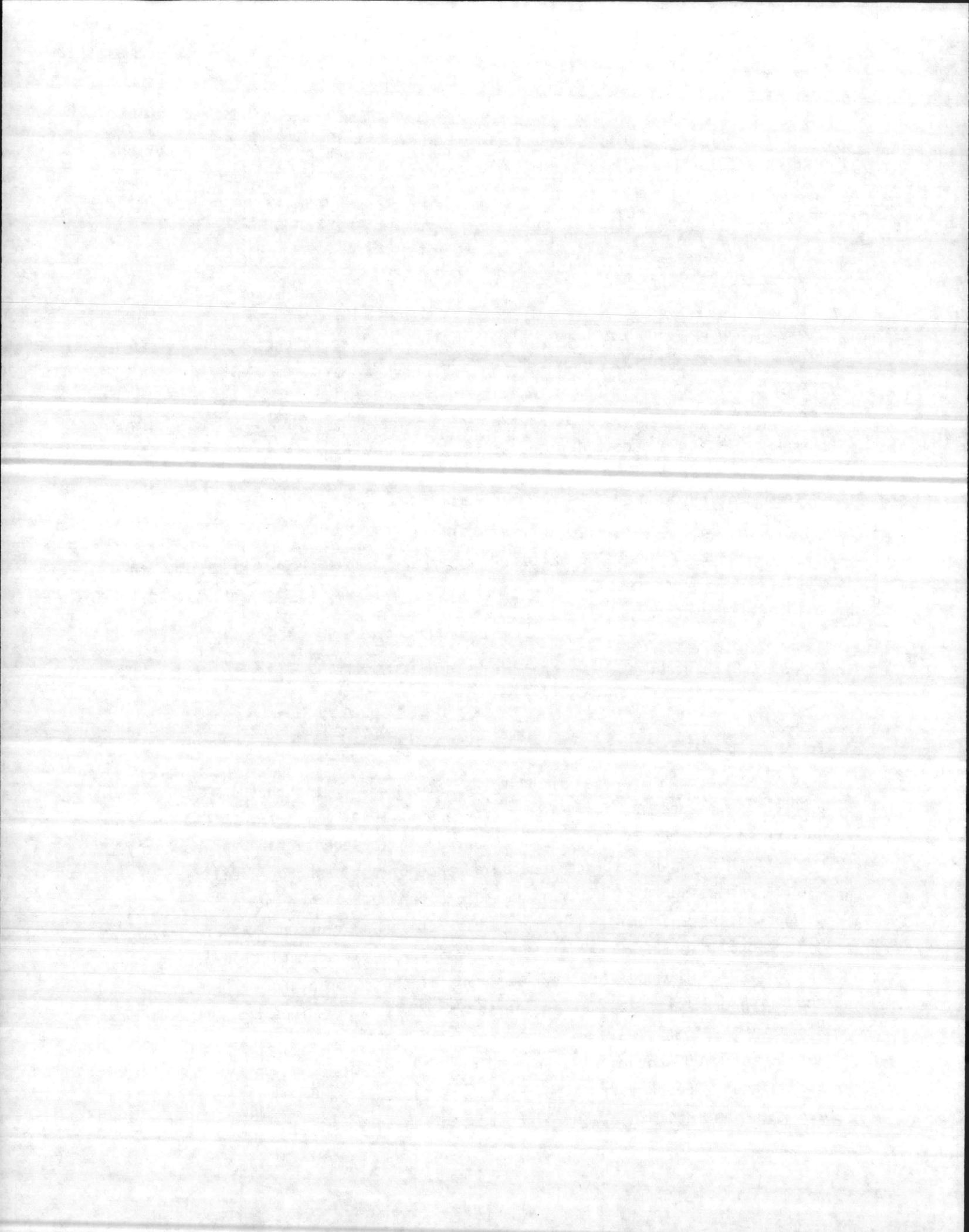
Recommendation:

Existing padeyes should be validated to ensure they are capable of withstanding a 10,000 pound tension working load if heavy weather tiedown of V-22 aircraft is necessary.

5.1.4 116 10 Washracks

Assessment:

Five (5) washracks are available at MAG-26 and MAG-29. Four (4) of the washracks are adequate for V-22 washdown; because of its size, the washrack located in the area of Hangar 4106 (MAG-29) is inadequate for washing the V-22 aircraft. The wash stations located at each of the washrack facilities provide for washdown of aircraft using a cleaning solution which is applied using standard equipment such as brushes, etc., and rinsing. Water, steam and air are provided at several of the washracks. Water and solution mixing tanks are available at all washracks. Washdown of the rotor blades will be accomplished with the blades in the spread position. A Type B-2 maintenance stand, P/N 48J20090, which has a height range of 13-20 feet and static load capacity of 1,000 pounds will be required for reaching the top surface of the rotor blades. Each washrack pavement area includes padeyes with the same 12.5 feet x 15 feet pattern as the aircraft parking aprons.



Recommendation:

None

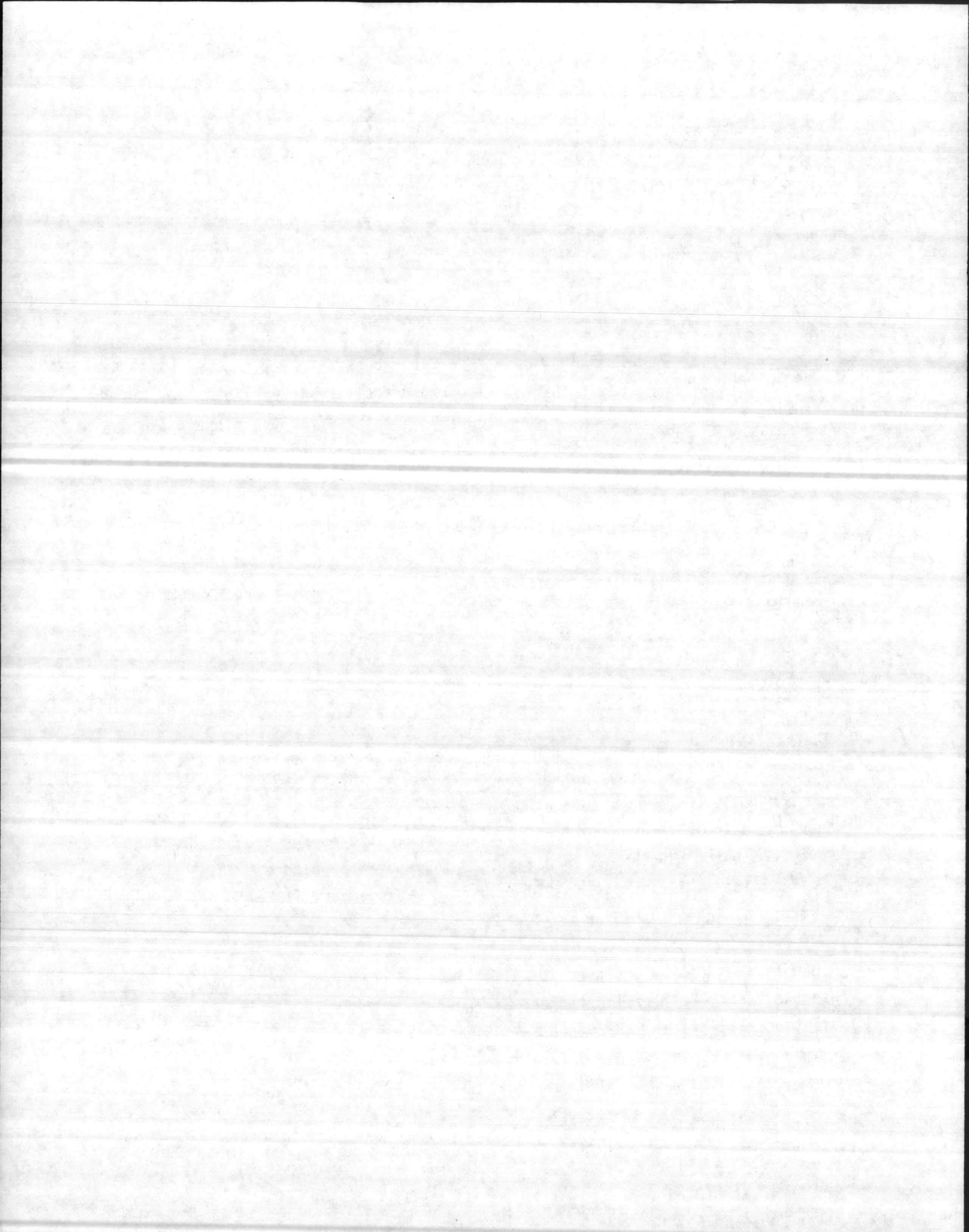
5.1.5 116 15 Rinse FacilityAssessment:

One (1) rinse facility is located at New River between Bldg. 504 and Bldg. 515 at MAG-26. Observation of the existing rinse facility in operation for rinsing a CH-46 aircraft while taxiing indicated an effective rinse would not be applied to the top surface of the wing and blade of the V-22 aircraft. The rinse demonstration showed that the upper section of the aft pylon and rotor head remained dry. The water pressure was insufficient for rinsing the rotor blades. The downwash of the blades appeared to suppress the water spray. In addition to an ineffective rinse, the two (2) rows of nozzles which are located at each end of the nozzle enclosure, located within the ground, do not provide for adequate clearance to eliminate entrance of water into the V-22's engine exhaust.

Recommendation:

Modification of the existing rinse facility is required to include the addition of nozzles at selected locations, rearrangement of existing nozzles, and controlled pressures to the center group of nozzles for rinsing of the fuselage using a fine spray, and outer group of nozzles for producing a jet spray and water cluster for rinsing the wing and rotor blades. This modification will also provide for enhanced rinse capability of the existing aircraft assigned to MAG-26 and MAG-29.

A new rinse facility designed for effective and efficient rinsing of the V-22 airframe, with nozzles located and arranged to also satisfy rinsing of the existing aircraft at MAG-26 and MAG-29, is required to satisfy high frequency and on-demand usage of rinse facilities. The new rinse facility should include controlled water volume and pressure to the nozzles. Adequate water



volume and pressure should be available at all times to eliminate the occurrence of pressure-drop during peak base water useage periods.

5.1.6 116 20 Compass Calibration Pad

Assessment:

The compass rose is used to support MAG-26 and MAG-29. The basic construction consists of a concrete pavement with azimuth markings spaced 15 degrees apart, and a 48 inch diameter turntable located at the center of a 120 foot diameter pad as measured from tip-to-tip of the azimuth markings. A compass rose swing is accomplished by placing one of the main landing gear wheel assemblies on the turntable, aligning the aircraft with the north-south azimuth orientation, and rotating the aircraft using a towbar and towtractor for checking azimuth readings every 15 degrees through a 360 degree range. The compass rose facility is also used for aligning the aircraft with the north-south azimuth orientation when using the MC-2 compass calibration unit which allows for compass calibration without rotating the aircraft. North-south lines are marked on the paved areas of old runways for use as alternate compass calibration sites for compass calibration using the MC-2 compass calibration unit. The existing compass rose and dedicated paved areas with north-south lines for compass calibration using the MC-2 Compass Calibration Unit are adequate for the V-22.

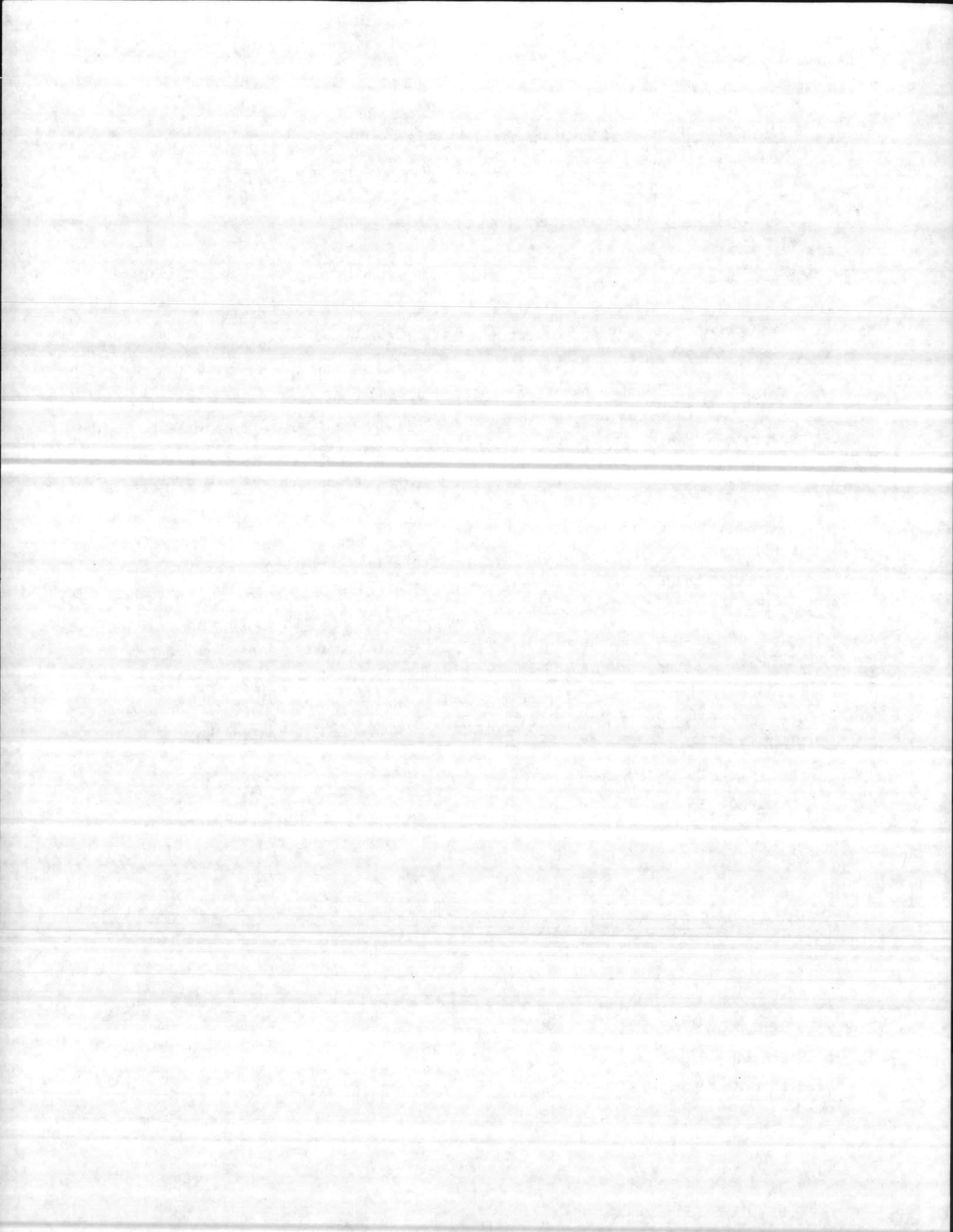
Recommendation:

None

5.1.7 116 45 Line Vehicle Parking

Assessment:

The squadron activities in both MAG-26 and MAG-29 provide space outside their respective hangar areas for parking line vehicles such as tow tractors, mobile electric power plants, and hydraulic servicing unit. The space is very



limited since other GSE such as work stands and hydraulic jacks are also stored on the hangar apron area.

Recommendation:

Additional space (approximately 250 sq. yds.) will be required for line vehicle parking. The V-22 requires units, i.e. mobile electric power plant, B-1 maintenance stands, and a gas turbine compressor, above and beyond the standard equipment supporting the CH-46 at New River.

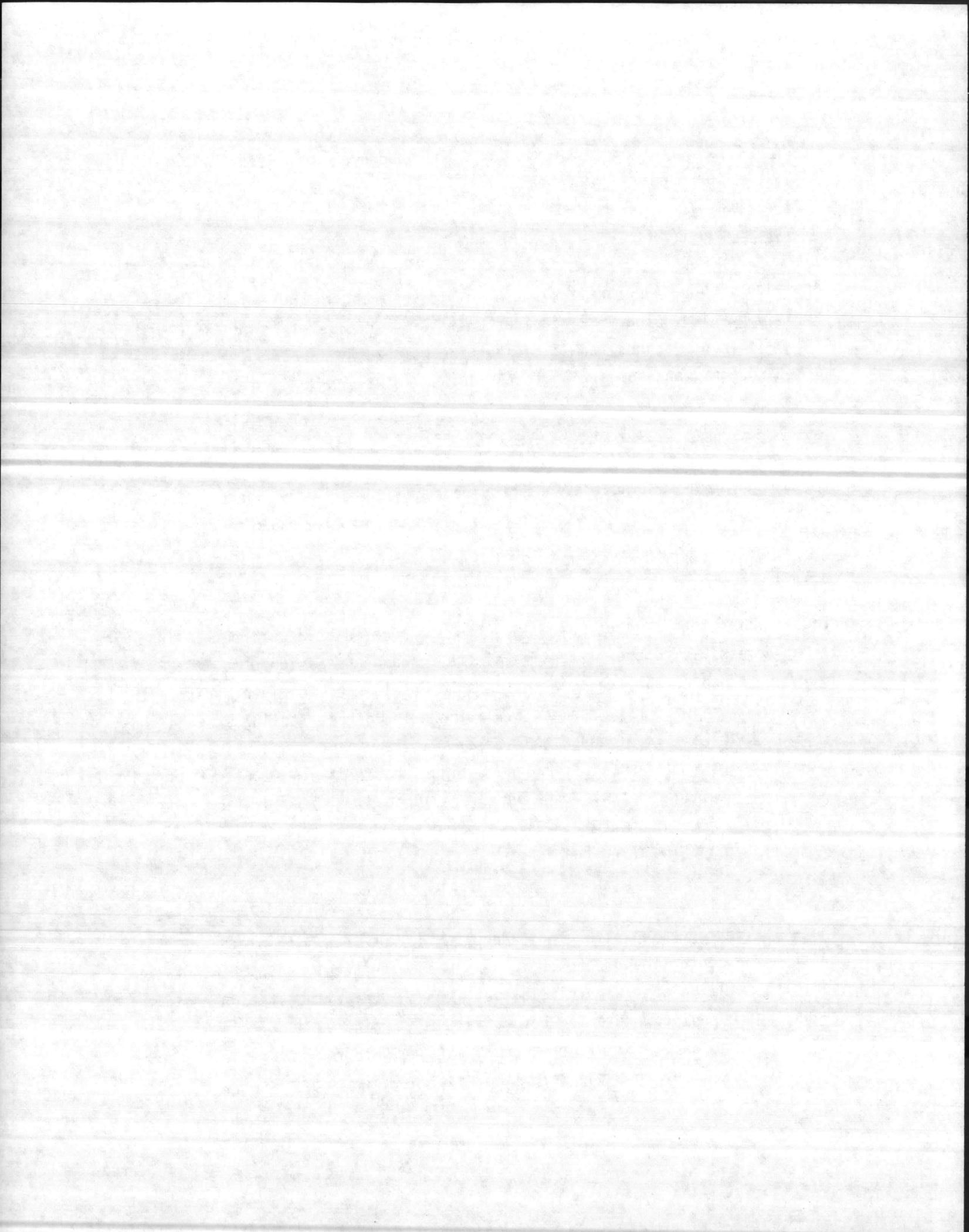
5.1.8 121 10 Aircraft Direct Fueling Station

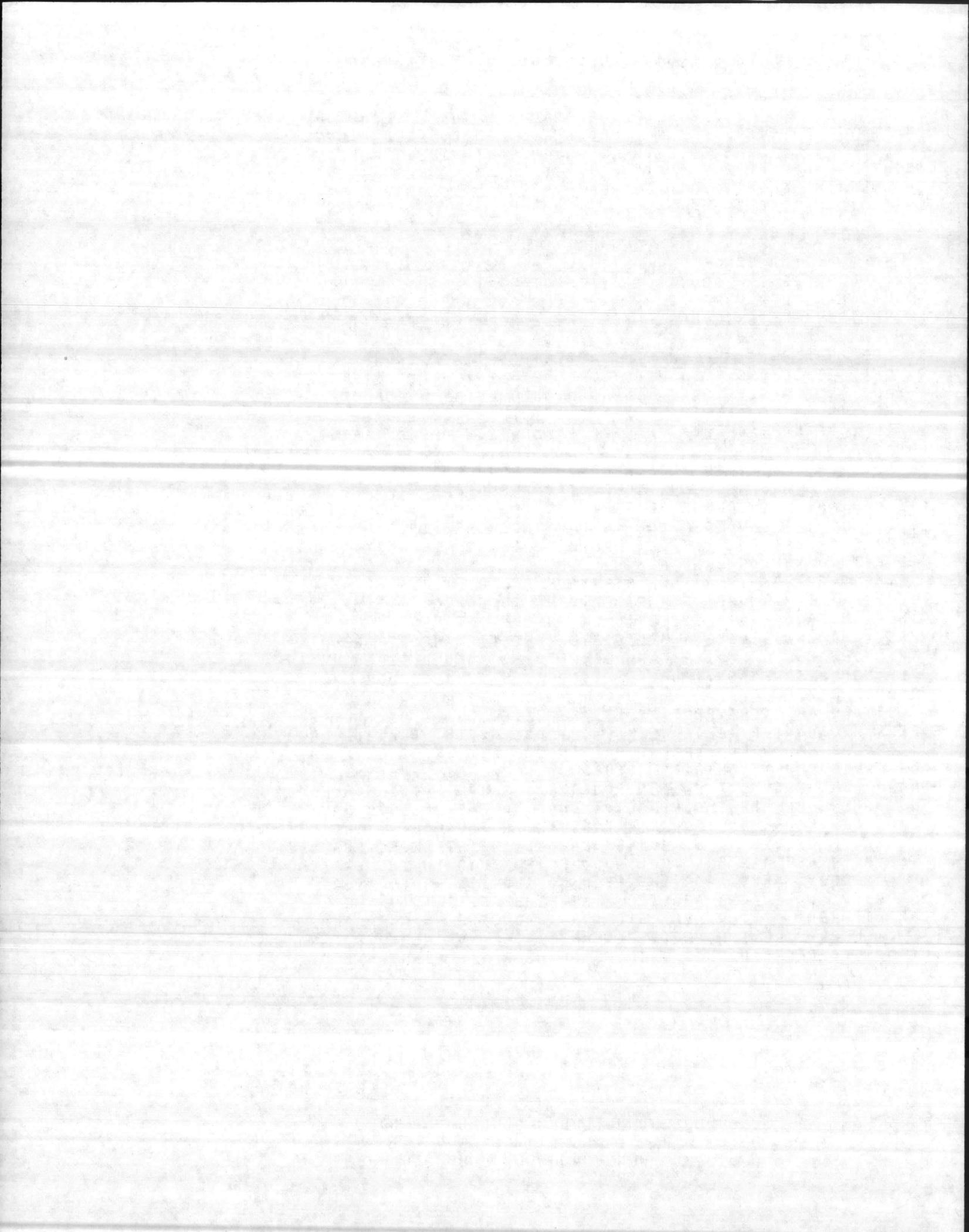
Aircraft direct fueling stations provide outlets where aircraft can be fueled from a closed circuit fuel system as opposed to refueler trucks.

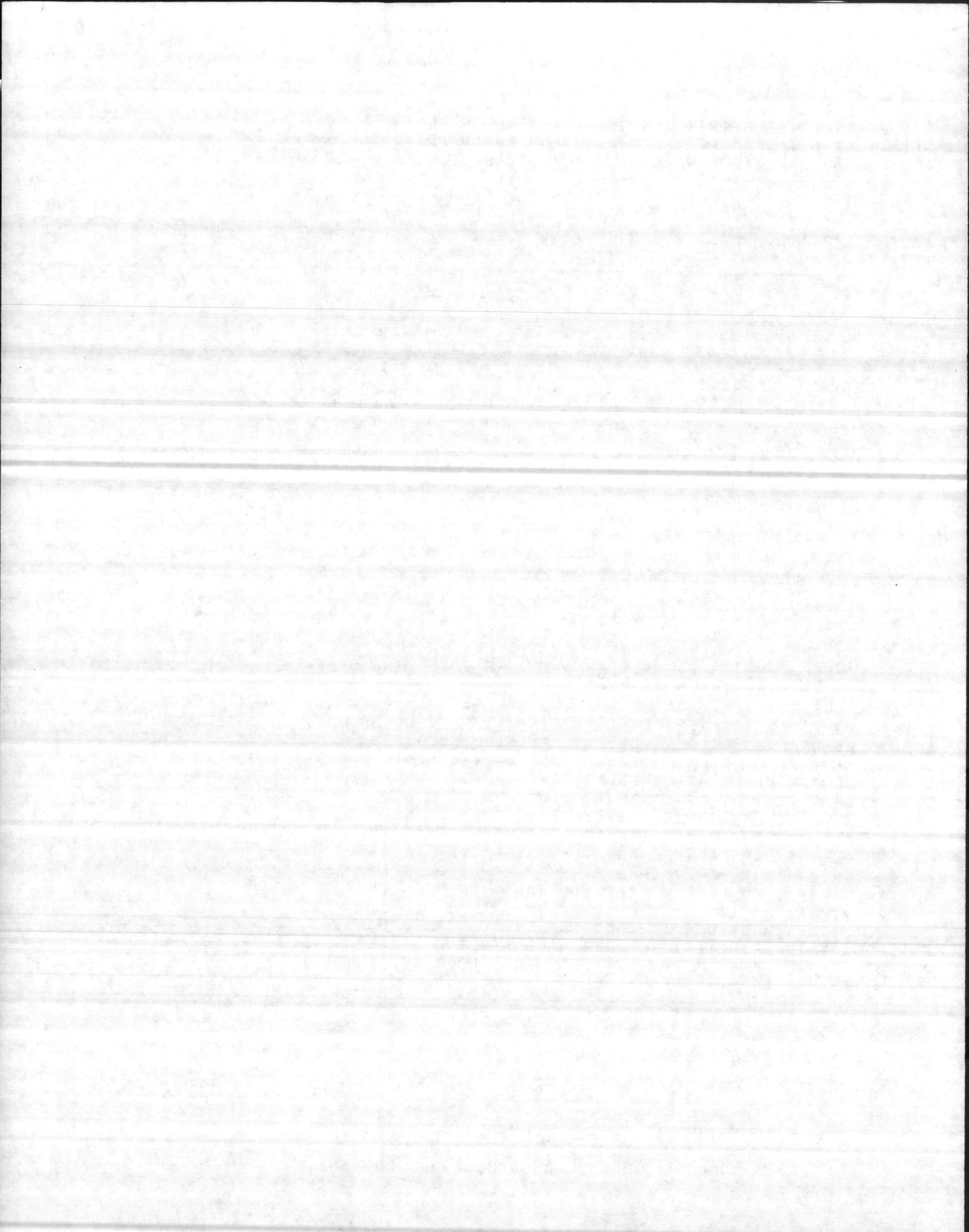
Assessment:

The existing four (4) hot refueling pits are located at a designated field site, accessible to the respective aircraft squadrons assigned to MAG-26 and MAG-29. A pantograph fuel station arrangement is used for interfacing with CH-46 and CH-53 aircraft for hot refueling. The direct fueling station consist of four (4) taxi lanes with two (2) multi-arm pantograph closed circuit type nozzle assemblies per taxi lane making a total of eight (8) fueling outlets. Direct fueling stations A and B are located on the southeast side of the main taxiway and C and D are located on the northwest side. The taxi lanes are 75 ft. wide and the length of each taxi lane is approximately 342 ft. S W

The existing refueling pits are inadequate for hot refueling of the V-22 aircraft. The centerline of the engine exhaust, with nacelles in the vertical position, will be approximately 15 feet from the refueling station equipment/tanks, which may be unsafe for hot refueling. Engine exhaust locations of existing CH-46 and CH-53 aircraft are a safe height from ground level, approximately 25 feet from the refueling station equipment/tanks.







Notes on Bell-Basing site evaluation report

Section 4 contains many errors

1. Aircraft nos. (current & proposed are wrong)
2. All feasible alternatives shown will leave New River / OMA space short
3. HMH-464 must be considered in MAG-26 planning - 4100 is too small ^{AS PRG 515} ~~Existing~~ ₄₁₀₈
4. Why present any alternative with the MAG-26 ~~at its present location~~ when a MEON is already approved to move it?
5. ~~If hangars are proposed - they should evaluate siting & supporting facilities.~~

Section 3

This is classified also in this section.

Section 5

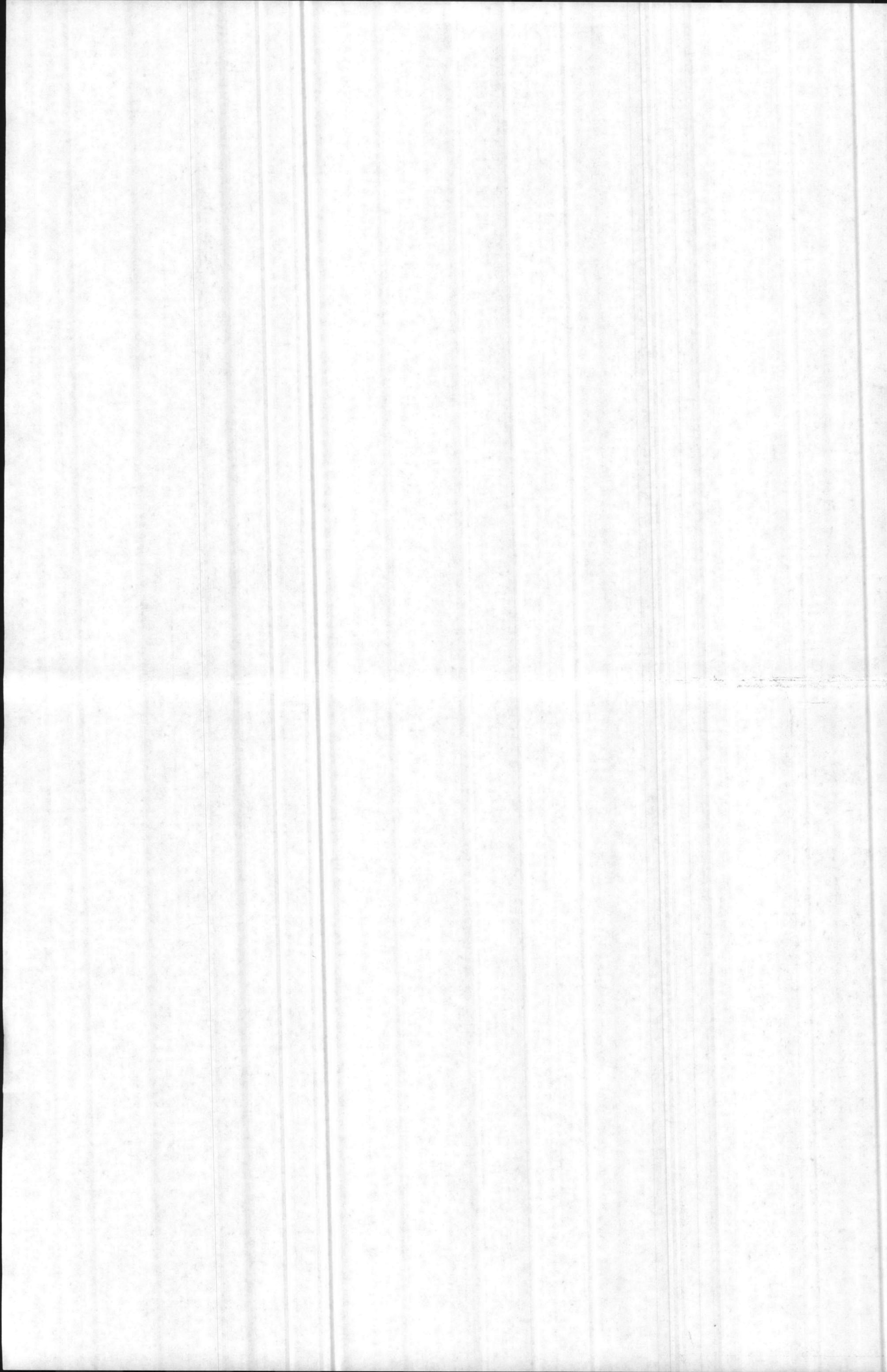
Recommendation on Runways indicates no problems. What happened to concerns over exhaust temperatures on asphalt?

Taxiways: Study should deal with pavement evaluation. Will all taxiways carry a fully loaded U-22? Can lighting be left in present location?

parking aprons: This section needs more detail. Needs to show square yardage and for C-46's. What overflow parking? How about a time line showing parking of all aircraft during various stages of delivery?

Washracks: Are there enough washracks? The assessment should note adequacies of number & location of washracks to support the U-22 in conjunction with other aircraft.

AIRCRAFT Direct Fueling Station: The recommendation should also show how aircraft will be fueled & parking spot layout in relation to fueling equipment to insure safe operation. Will equipment operators be in line with exhaust? What are the fueling problems?



Do we require exhaust deflectors or pits? How much fuel will each aircraft hold for normal training? Is our current day tank sizing adequate? Will different safety criteria have to be applied because of rotating nacelles & proximity to ground personnel?

Aircraft Truck Fueling Facility & Vehicles:

Do the four (4) reducers apply only to supply of U-22? If so, is it a proper quantity if all U-22's were refueled by truck in addition to aircraft now being refueled by truck.

Defueling: Same comments as Refueling

PARA 5.2.1.1 Bldg 504: The ^{Recommendation} discussion should have taken into account the fact that 3 systems would have to go into 504.

Page 42 indicates the lighting in the OH portion is inadequate. Was that based on a lighting study or opinion?

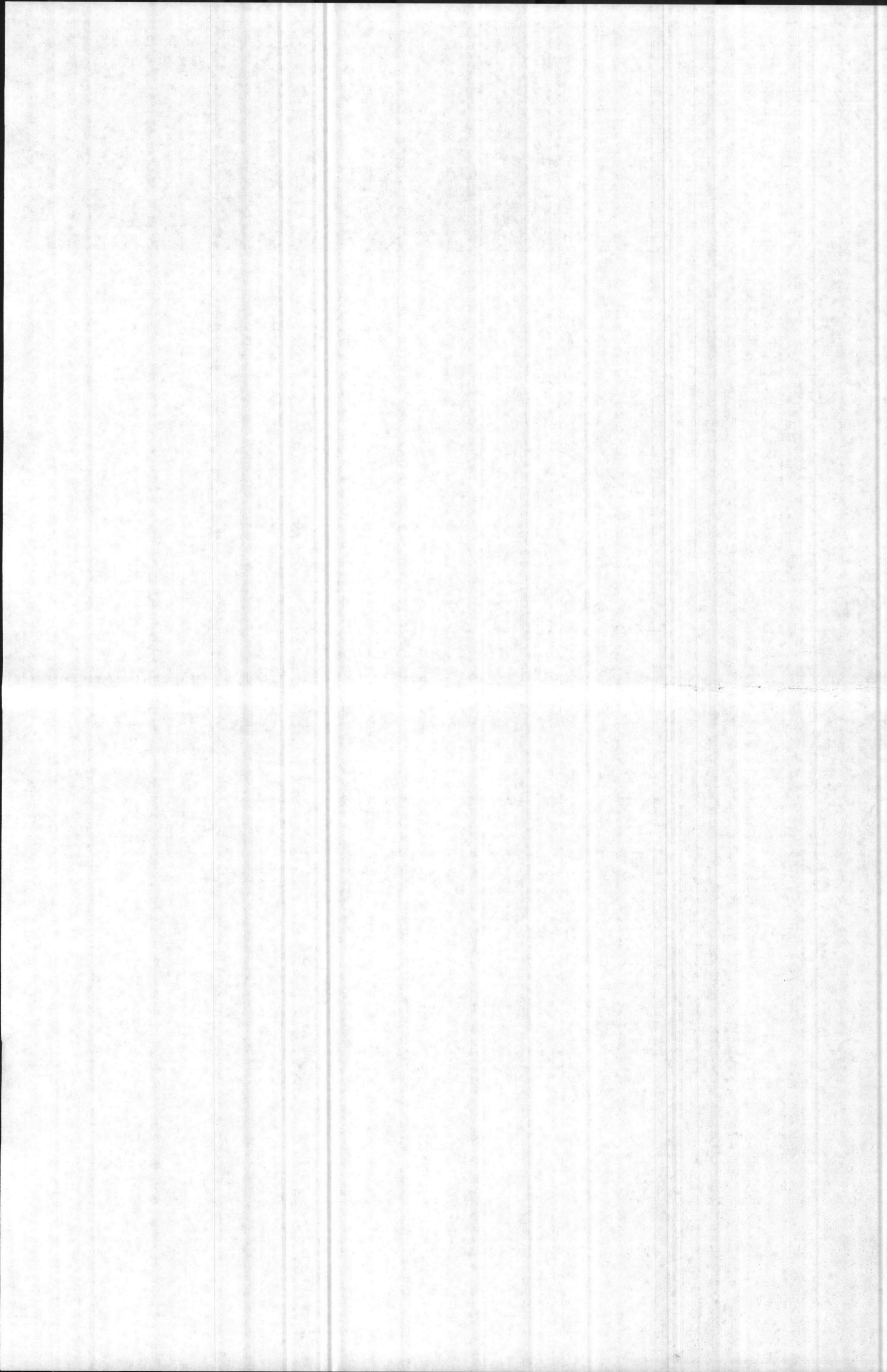
Page 42: Calls for a 1-ton (minimum) hoist to be installed. There is a 3-ton bridge crane already in place.

Page 42: There are no trench drain grates in 504. We do plan to install some under project P-507 which will be connected to an oil/water separator.

Page 42 - Planning considerations: Work in the OH spaces are included in P-507

Page 44 - Electrical Service: This recommendation does not appear to be feasible. Under this recommendation of only 4mt-20x & 5AMP being in this hangar that would mean 45% of the aircraft assigned. We normally plan for only 10% in the hangar at any one time.

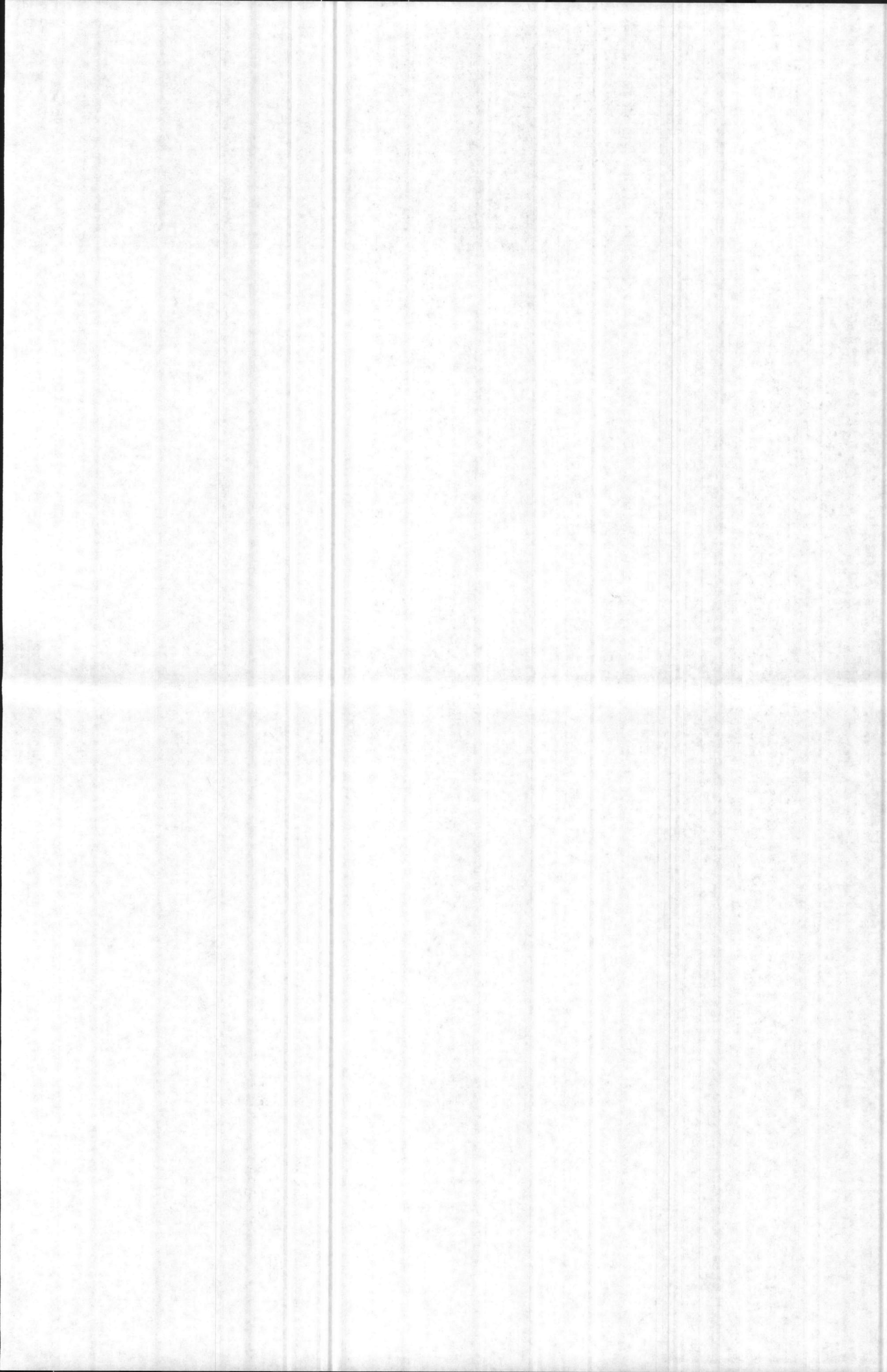
Would like to see a sketch of how they would visualize 12 aircraft & 12 service points arranged in 504.



Page 44, Para 5.2.1.2 Bldg 515

Assessment: Numbers for UH-1N/AH-1T
squadron appear incorrect unless composite
squadrons are being considered.

Page 45; ECAMS: Are we getting ECAMS?
One per squadron? Could an alternative be
to provide one to each A&MS? ~~If one per
squadron is required~~



Planning Considerations:

Current planning is to construct four (4) direct refuel stations on the southeast side of the main taxiway in the general area where refuel stations A and B are located. The new refuel stations planned are 100' wide by 100' long with taxi lanes connecting them with the main taxiway.

Recommendation:

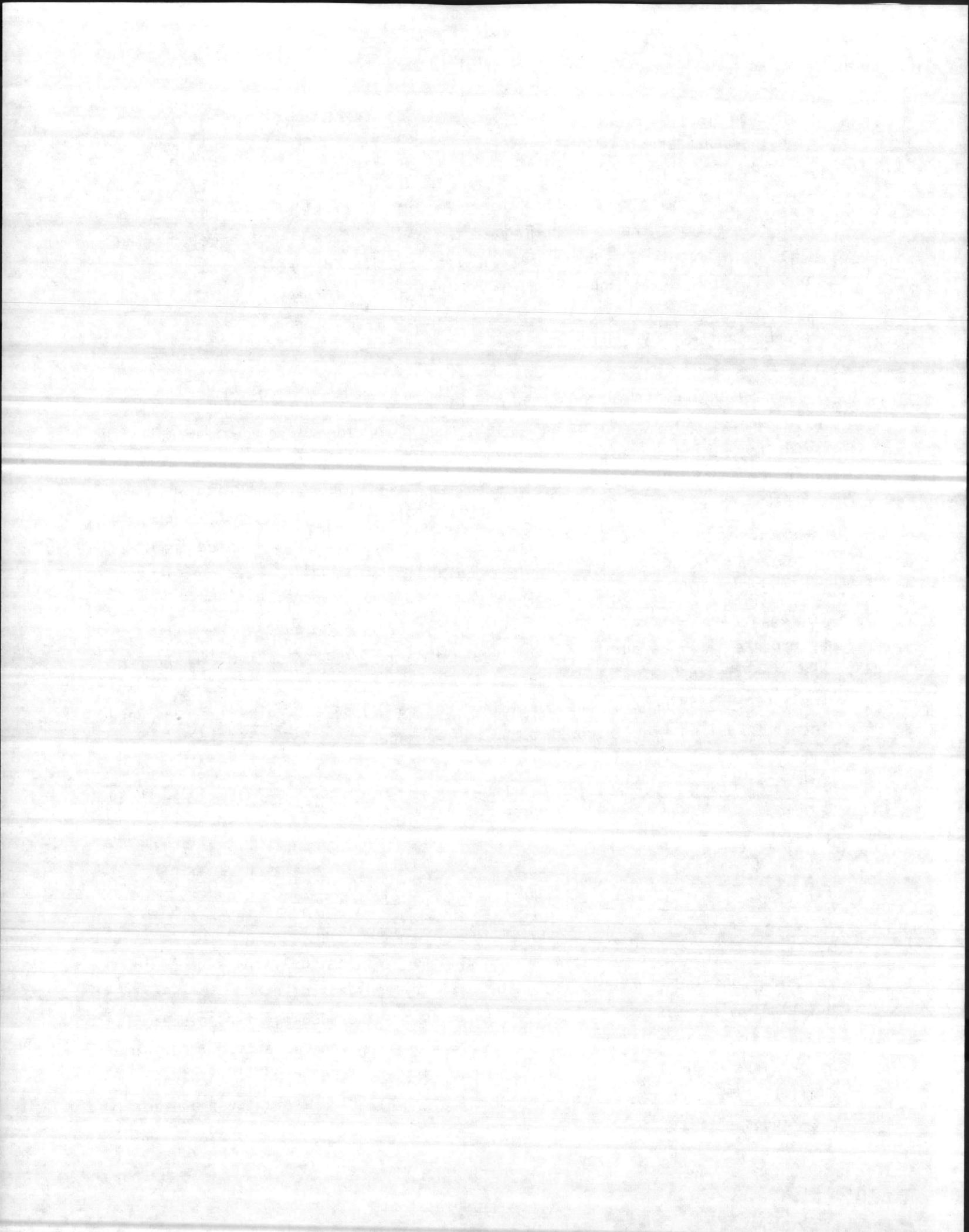
Current planning for four (4) new hot refueling pits, 100 ft. wide pavements with new refueling stations/equipment, should consider V-22 requirements. The refueling stations/equipment should be a minimum of 15 feet from the paved surface and located so that maximum safety is provided to the refueling crew and refueling station/equipment relative to the engine location/temperature. Pavements will require marking so that the aircraft will be located and orientated in a position with relationship to the refueling station/equipment so that maximum safety is provide to the refueling crew, refueling station/equipment, and aircraft. Area should be marked showing hazard areas and entrance/exit areas during fueling operations. When marking the fueling area, the aircraft should be positioned so the engine exhaust is as far away from the fuel arm and controls as possible. Ensure all safety rules are considered when the fueling area is constructed and marked.

5.1.9 Aircraft Truck Fueling Facility

5.1.9.1 121 20 Fueling

Functional Requirements

An aircraft truck fueling facility is used to transfer fuel from storage to refueler vehicles (tank trucks). The facility consists of one or more loading outlets for servicing bottom-loading tank trucks and required fuel plumbing, electrical controls, lighting, fire protection, and vehicle access. A minimum of one loading outlet is required for each grade of fuel handled. The facilities are located as close to the using facilities as land use and safety clearances permit.



Assessment:

Adequate aircraft truck fueling is provided with four (4) refueler vehicles (tank trucks) available. Current planning is to increase administrative office space which should include considerations required for support of the V-22 Weapon System.

Recommendation:

Since the primary fueling method for the V-22 aircraft is direct fueling there should be no effect on truck fueling. Expansion or remodeling plans should be completed as currently planned.

5.1.9.2 121 20 DefuelingFunctional Requirements:

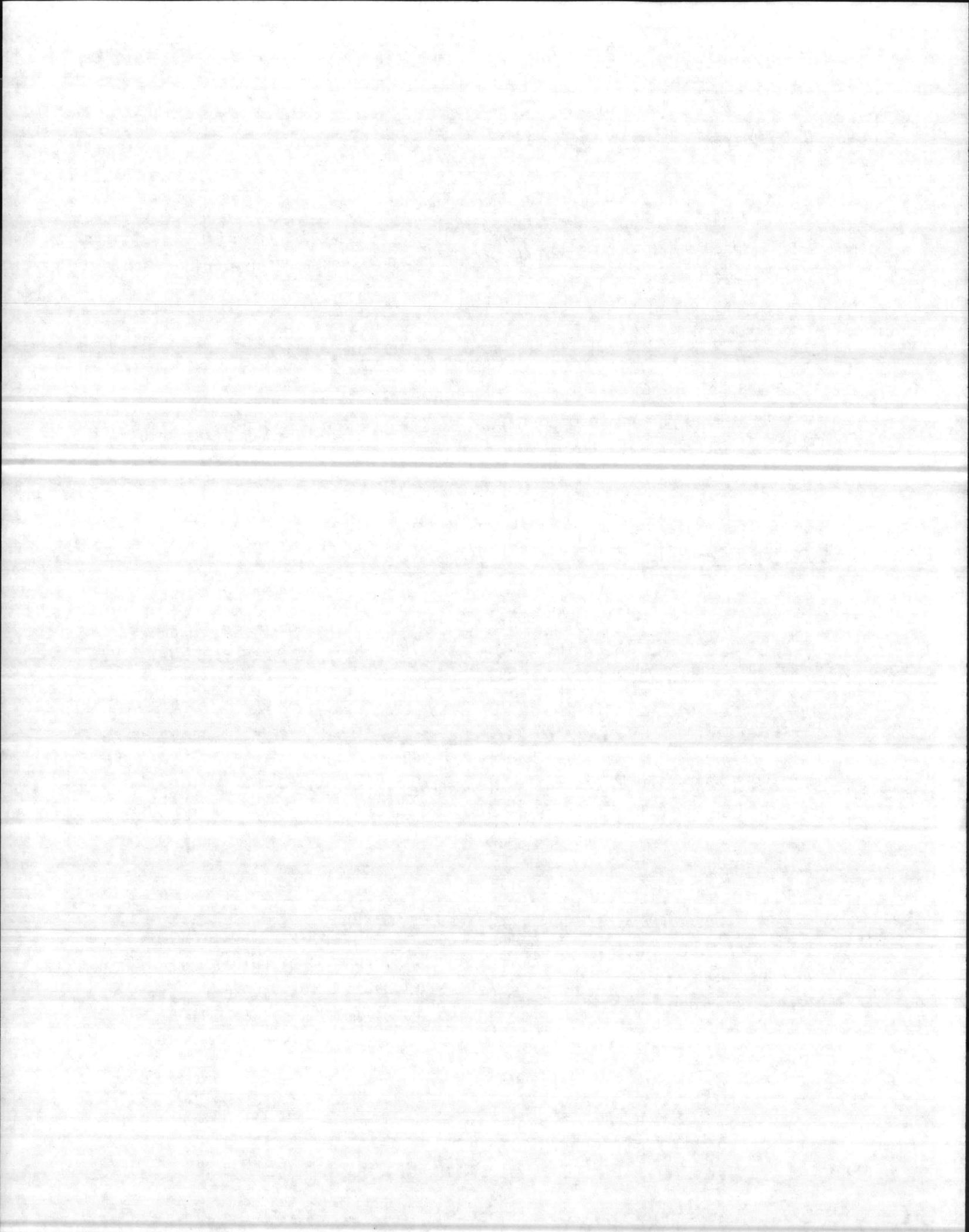
Criteria for this facility is not available for this category code in NAVFAC P-80; however, there is a requirement for defueling aircraft to facilitate maintenance and to remove contaminated fuel.

Assessment:

Defueling of aircraft is accomplished by defueling trucks. New River currently has one (1) truck designated as a defuel truck.

Recommendation:

Since the method for defueling the aircraft for maintenance and removal of contaminated fuel is with a defuel truck, one (1) additional defuel truck is recommended as a minimum. Ensure that the designated defueling area meets minimum requirements specified by National Fire Protection Association.



5.1.10 124 30 Aircraft Ready Fuel Storage

Functional Requirements:

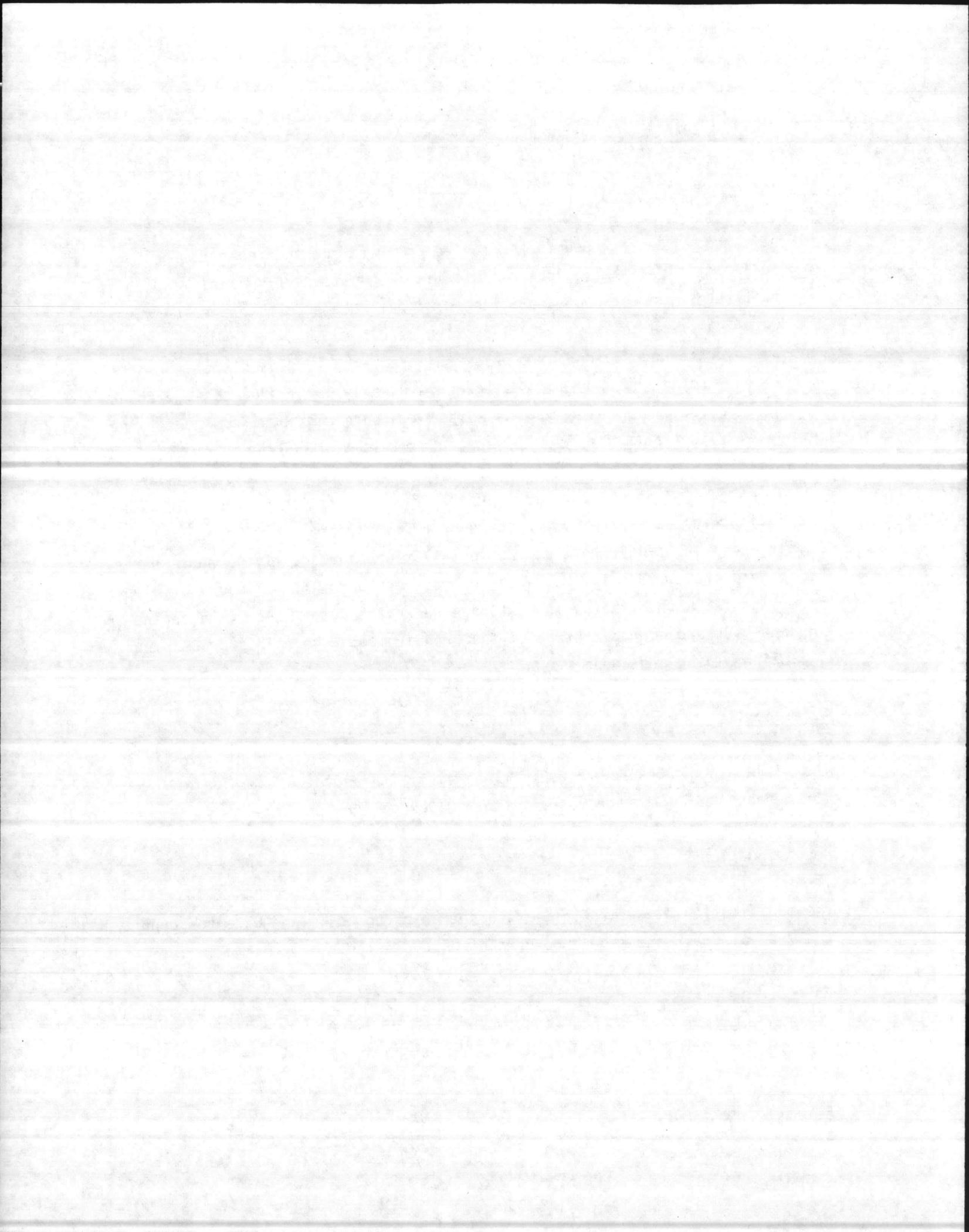
Aircraft ready fuel storage tanks provide an operating and reserve supply of jet fuel. At air installations all aviation fuel storage is considered to be aircraft ready fuel storage and is not considered as depot storage. Aircraft ready fuel storage tanks may be classified as either local or remote storage and then further subdivided by type of fuel stored. Local storage is near the dispensing facilities and remote storage is usually in an area designated as the station fuel farm. The fuel is sited at a safe distance from power lines, low level flight patterns, and is located a minimum of 200 feet from a habitable station structure, heavily traveled roadways, or the station boundary. The volume of fuel storage of each type consists of a 10 day supply at installations inside of the U.S. Fuel storage requirements are based on the number and types of aircraft at the installation, average flying hours per month, and the average fuel consumption rate per aircraft. The number, type, size, and location of ready fuel storage tanks are determined by an engineering analysis and economic study of fuel requirements, terrain and equipment including piping and pumps.

Assessment:

The air station now has 575,000 gallons aircraft ready fuel storage with plans to increase their storage capacity to 900,000 gallons.

Recommendation:

The modification of aircraft fuel storage as proposed is adequate to support the V-22 aircraft and should be completed as planned.



5.1.11 Lighting

5.1.11.1 136 10 Approach Lighting

Assessment:

Approach lighting enhances the pilots ability to acquire the runway environment visually when making an approach for landing during periods of reduced visibility.

Approach lighting at MCAS (H) New River, provided for primary instrument approach runways, is located at the south-west end of runway 5 and is adequate for V-22 operations.

Recommendation:

None

5.1.11.2 136 20 Parking and Servicing Area

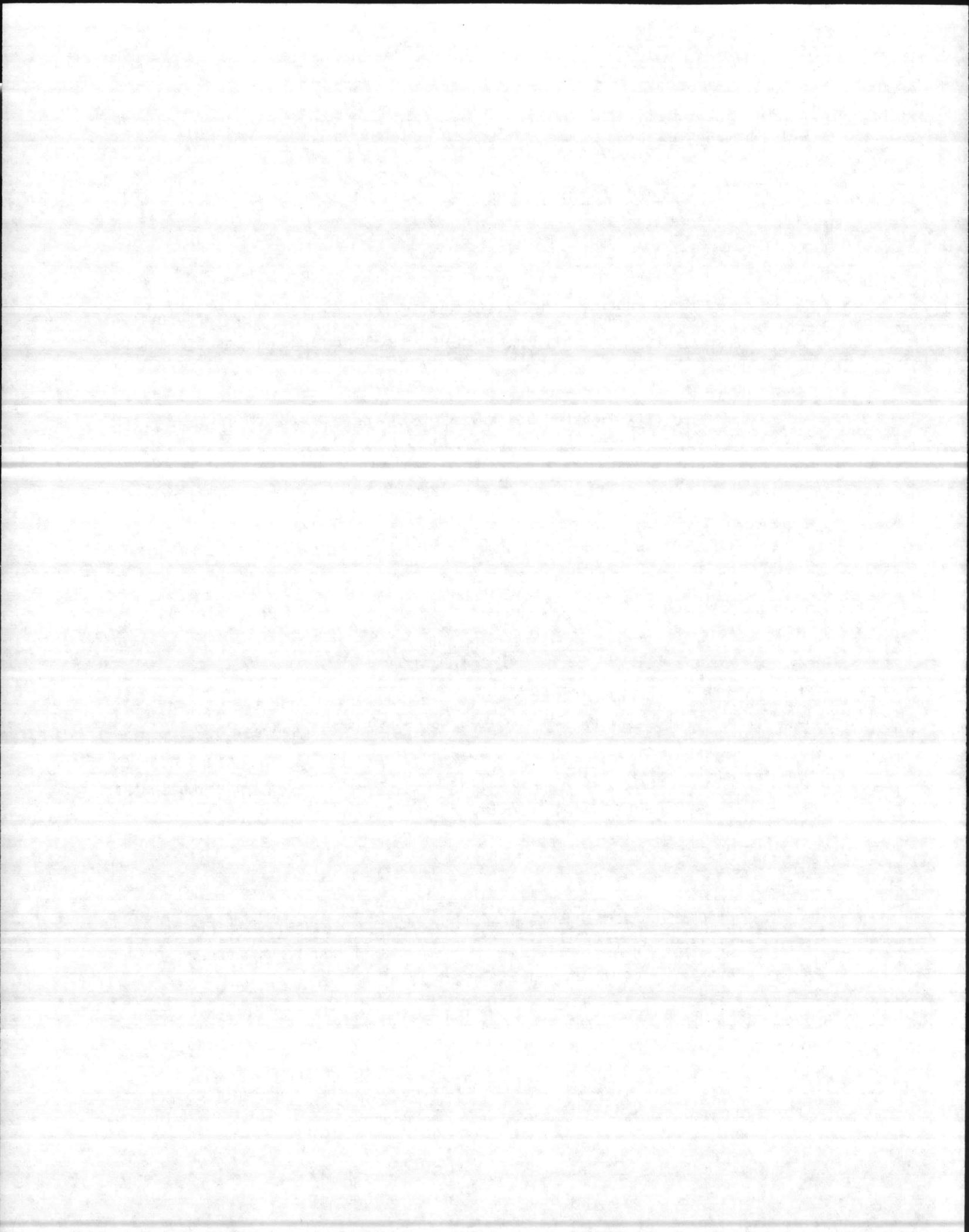
Parking and service area lighting is required to illuminate the parking apron and other aircraft service area. The lighting enables movement of aircraft, fueling, maintenance, loading and unloading of aircraft during night operations. Lighting of the parking area may be accomplished by a combination of high and surface mounted flood lights.

Assessment:

The existing parking and service area lighting is adequate. Parking and service area lighting is provided by roof mounted flood lamps and portable flood light assemblies which support night maintenance operations.

Recommendation:

Ensure any new hanger construction is equipped with roof mounted flood lights to light the area in close proximity of the hangar.



5.1.11.3 136 30 Runway Edge Lighting

Runway edge lighting is a system of lights defining the lateral limits of the useable runway surface. Runway edge lights are white lights on each side of the runway at nominal 200 ft. intervals. Runway edge lighting is planned for all-weather and night operations.

Assessment:

The existing runway edge lighting is adequate for support of the V-22 aircraft.

Recommendation:

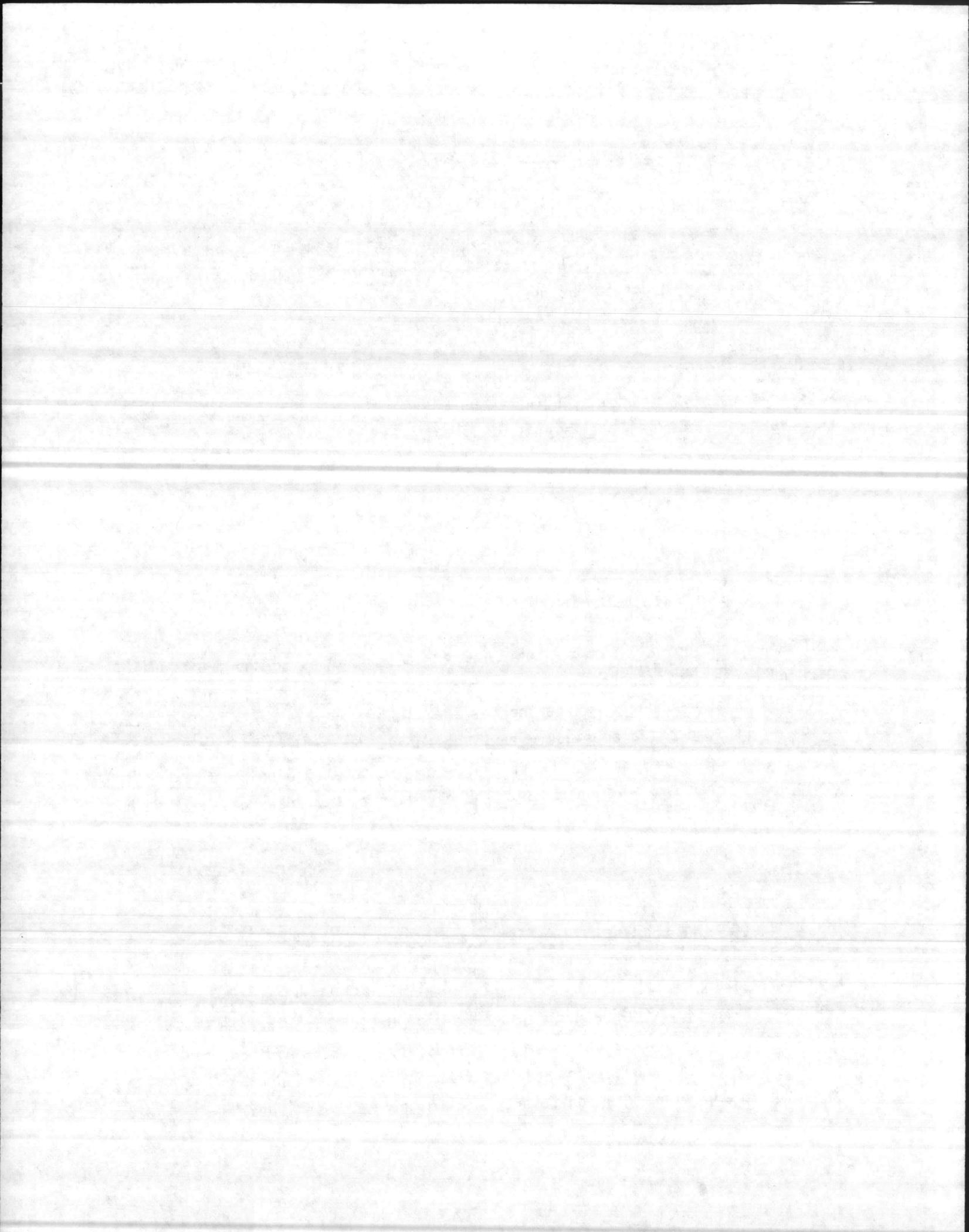
None.

5.1.11.4 136 50 Taxilane Lighting

Taxilane lighting outlines the taxilanes and marks routes to and from runways, parking areas, maintenance areas, and fueling areas. Taxilane lighting includes taxilane edge lighting, centerline lights, high speed exit lights, hold lights, and guidance signs. Taxilane edge lighting consists of a line of blue lights on both sides of the taxilane and are located a uniform distance apart - preferably 2 feet outside of the paved or marked edges of the taxilane.

Assessment:

Taxilane lighting at MCAS(H) New River consists of taxilane side lighting which New River personnel indicated existence of operating problems. The lighting system layout, as it exists, is adequate for V-22 operations; however, if taxilanes are expanded per the recommendation of paragraph 5.1.2, relocation of taxilane lighting will be necessary. Addition of directional lighting may be desirable, though not a V-22 operational requirement, due to expansion of the parking apron to accommodate the increased total number of aircraft.



Recommendation:

Operating deficiencies in the lighting system should be corrected. If taxilane expansion is approved, relocating the lighting system is required and, at that time, any deficiencies should be corrected. In concert with development of the layout of the parking apron, the government may wish to evaluate the desirability of directional lighting.

5.1.12 211 03 Corrosion Control HangarAssessment:

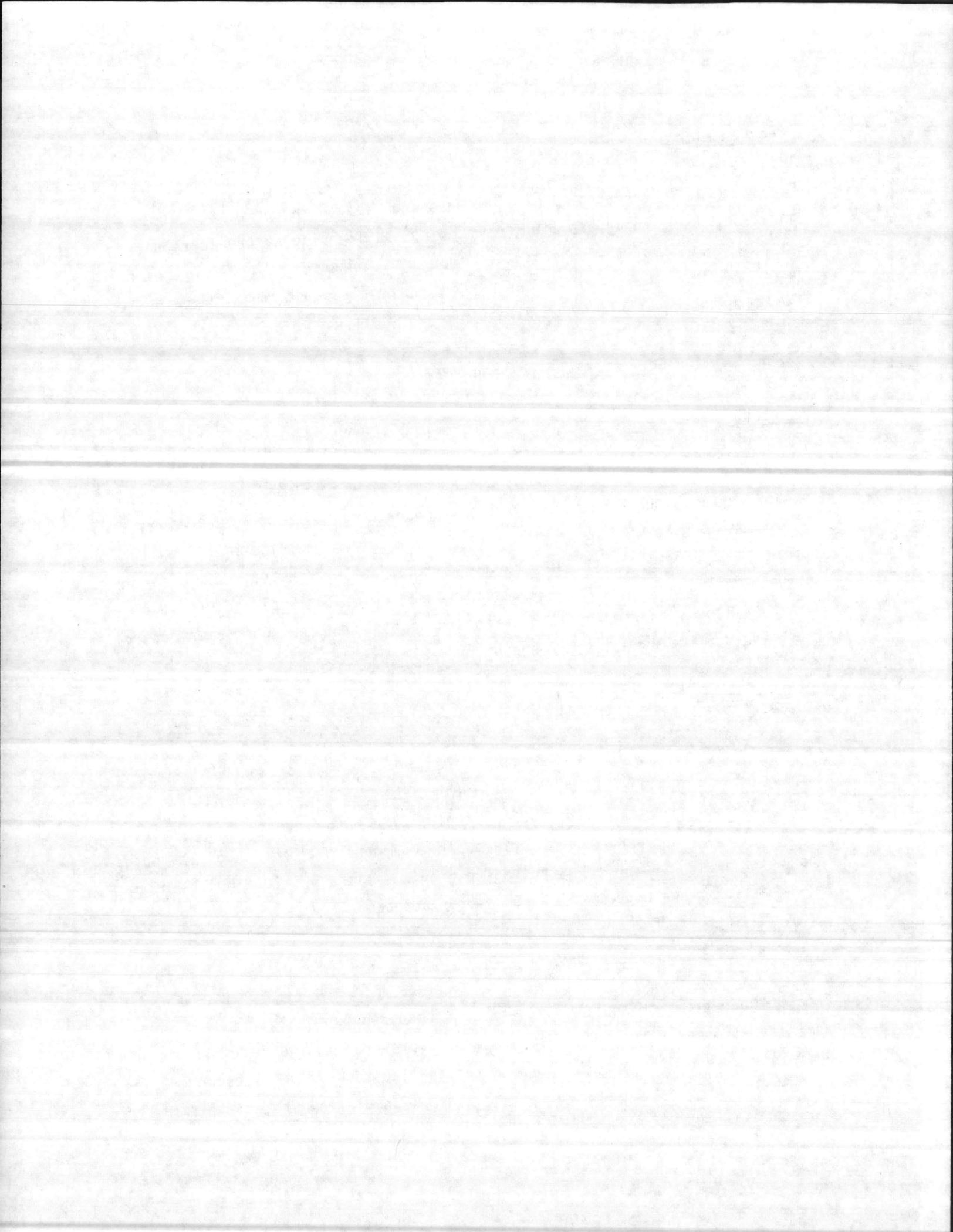
Planning for a new corrosion control hangar (Project No. P-433 for 11,152 square feet) at the MAG-26 IMA, which is inadequate to support an aircraft the dimensions of the V-22, should consider the requirements of the V-22 aircraft. Material degradation/corrosion control for composite structures used in construction of the V-22 and metal structures of current MAG-26 and MAG-29 aircraft will be supported by this corrosion control hangar. Corrosion control will include the use of x-ray equipment.

Recommendation:

Project No. P-433 should be changed to identify a corrosion control hangar, Type B in accordance with NAVFAC P-272 and Dwg. #1403809, which should be compatible for support of the V-22 aircraft. The hangar should provide for storage of corrosion control materials and equipment. A section of the hangar should be designated and constructed to provide a lead shielded bulkhead for on aircraft x-ray inspection of structures/components.

5.1.13 143 75 POL Operations/Sampling/Testing Building

The POL Operations building provides space required for quality control and administration of a fuel activity. Space is provided in the building for an administrative office and for a fuels testing laboratory. Physical operation and control of the fuel system will be accomplished elsewhere; for example, in a pumphouse.



Assessment:

The POL operations building is located on White Street with the fuel farm on the opposite side of the street. Plans have been developed to increase the size of the POL operations building and construct a flight line building in close proximity of the direct refuel stations.

Recommendations:

None.

5.1.14 143 78 Operational Hazardous/Flammable StorageAssessment:

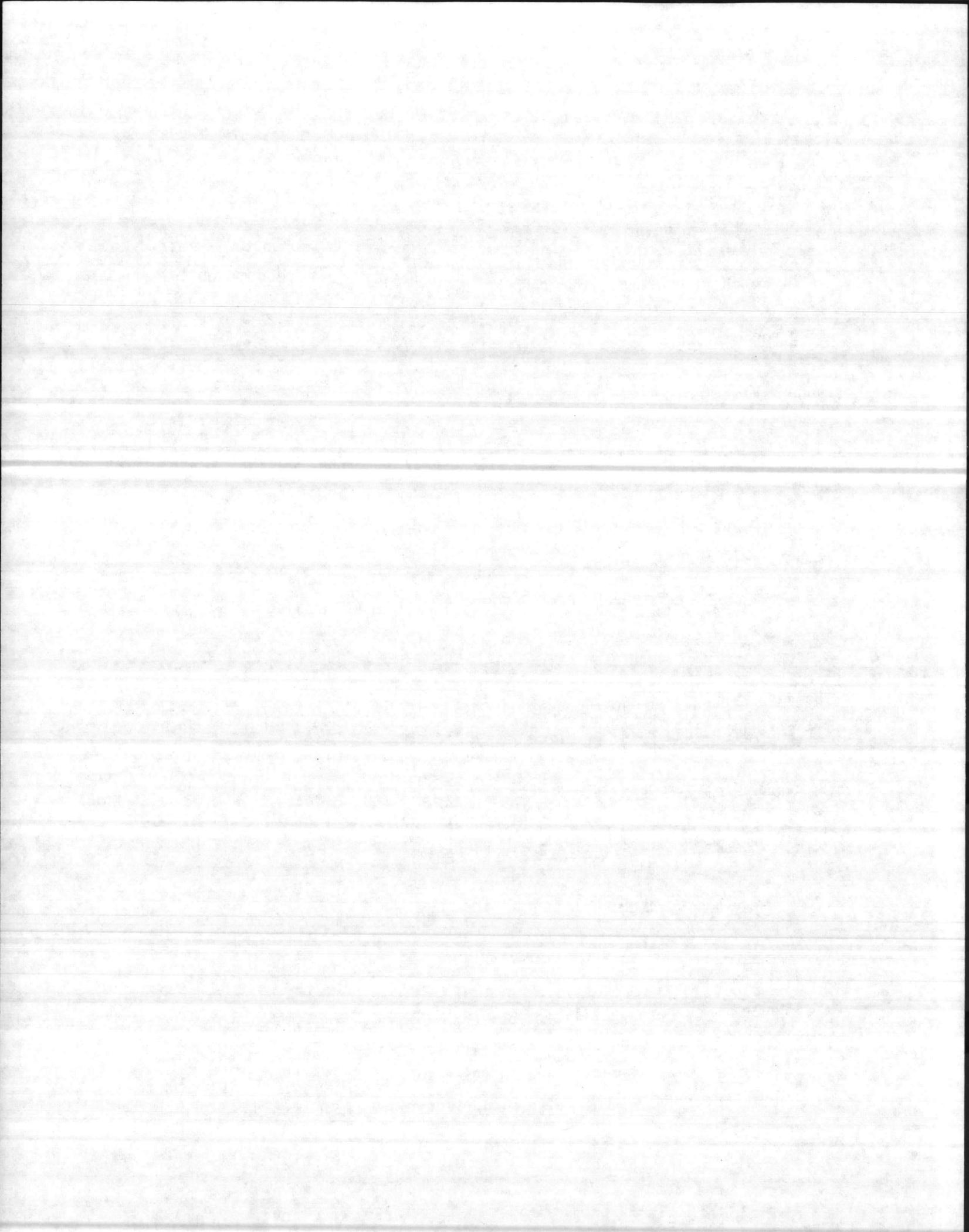
MAG-26 and 29 at New River both presently have dedicated storage areas, separated from the hangar for hazardous/flammable materials.

Recommendations:

The V-22 presents no unique requirements. The present capabilities at New River will be adequate.

5.2 Marine Air Group - 265.2.1 Operational Maintenance Activity Facilities5.2.1.1 BLDG 504 (MAG-26)Assessment:

This hangar is currently utilized for support of two (2) CH-53 operational squadrons. Each squadron consists of fifteen (15) aircraft. The HMT-204 training squadron is also assigned to this hangar. The HMT-204 serves as the fleet readiness squadron (FRS) to train fleet-ready CH-46 and CH-53 pilots;



ten (10) CH-46 and ten (10) CH-53 aircraft are currently assigned to HMT-204. A total of fifty (50) aircraft are currently supported by this OMA hangar.

The OH space is located in the center of the hangar bordered by (2) two separate 01 and 02 spaces which support HMM-362 (CH-53) and HMT-204 (CH-46E/CH-53D) squadrons on one (1) side of the hangar and HMM-461, MAG-26 Headquarters, and maintenance shops at the other side of the hangar.

Planning for major renovation of Building 504 should consider the existing OH, 01, and 02 spaces as candidates for a V-22 complex which would include the HMT-204 Fleet Readiness Squadron and MAG-26 Headquarters Offices.

Building 504 measures approximately 300 ft. long x 240 ft. wide. Particulars pertaining to the OH, 01, and 02 spaces are as follows:

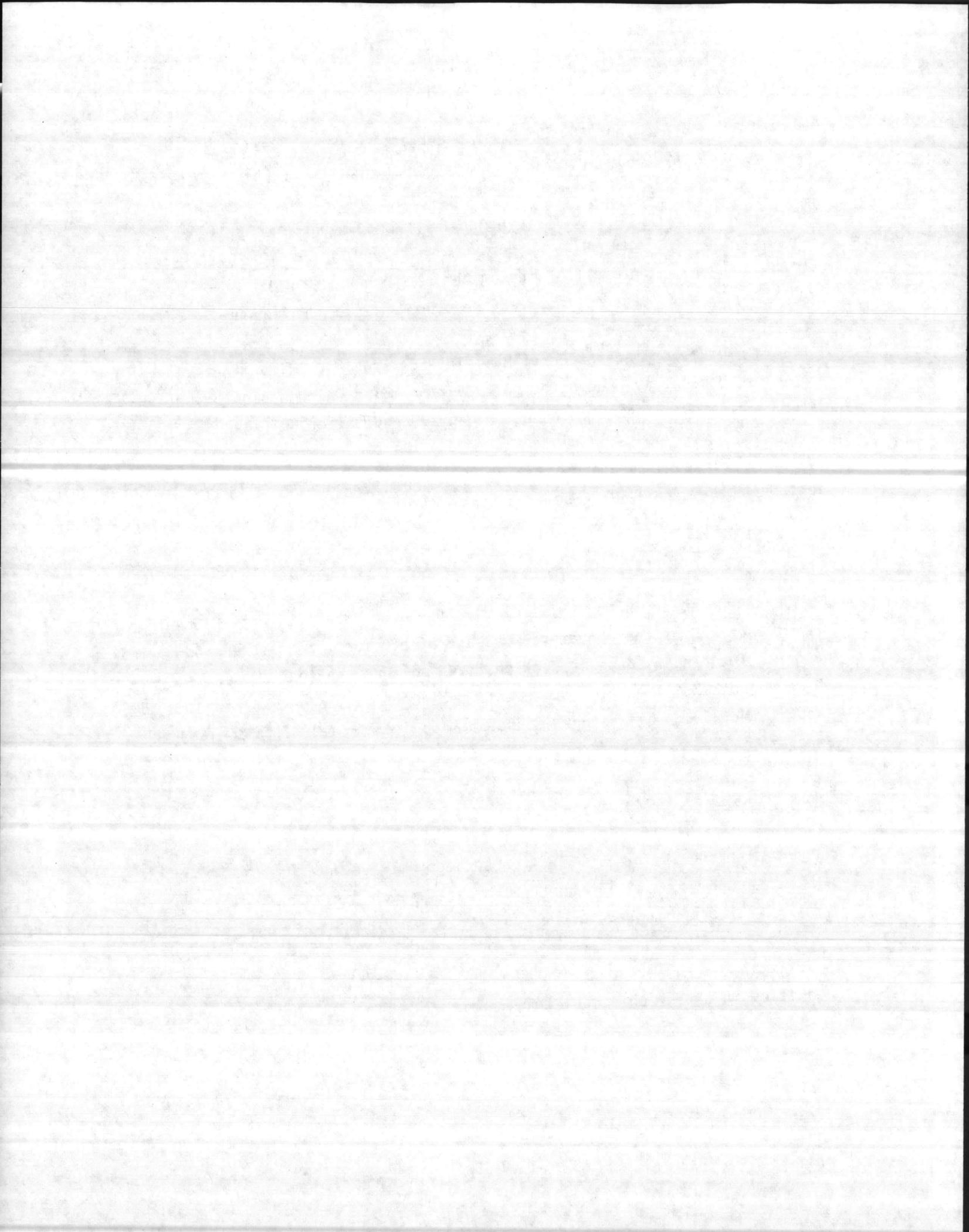
OH Space (Hangar):

The OH hangar space is approximately 160 ft. long x 240 ft. wide. Openings are at each end of the hangar for passage of aircraft from either end of the hangar. The hangar space is sectionalized so that one end is used to support HMT-204 and HMM-461 and the other end, facing IMA building 518, is used to support HMM-362. This hangar is used to support a total of fifty (50) aircraft. 38,400 SF

Recommendations:

Current planning is for 27 V-22 Aircraft for HMT-204 and three (3) operational squadrons consisting of fifteen (15) aircraft each for a total of seventy-two (72) V-22 aircraft to be assigned to MAG-26.

The existing OH hangar space is adequate for support of three (3) alternatives identified in paragraph 4.1 of this report.



01 and 02 Space (Street Side):

This 01/02 module is approximately 100 ft. long x 240 ft. wide. The section of the module facing building 518 is the 01 and 02 spaces which support HMH-362. The section of the module which faces the aircraft parking apron is used to support all 01 space requirements for HMT-204 and the 02 space is divided in half for support of HMT-204 and HMH-461.

Recommendation:

This 01/02 work center module may require major renovation whereby existing partitions would be replaced with new partitions for maximum utilization and efficiency of operations if Bldg. 504 is selected as the home for HMT-204 FRS with FRAMP.

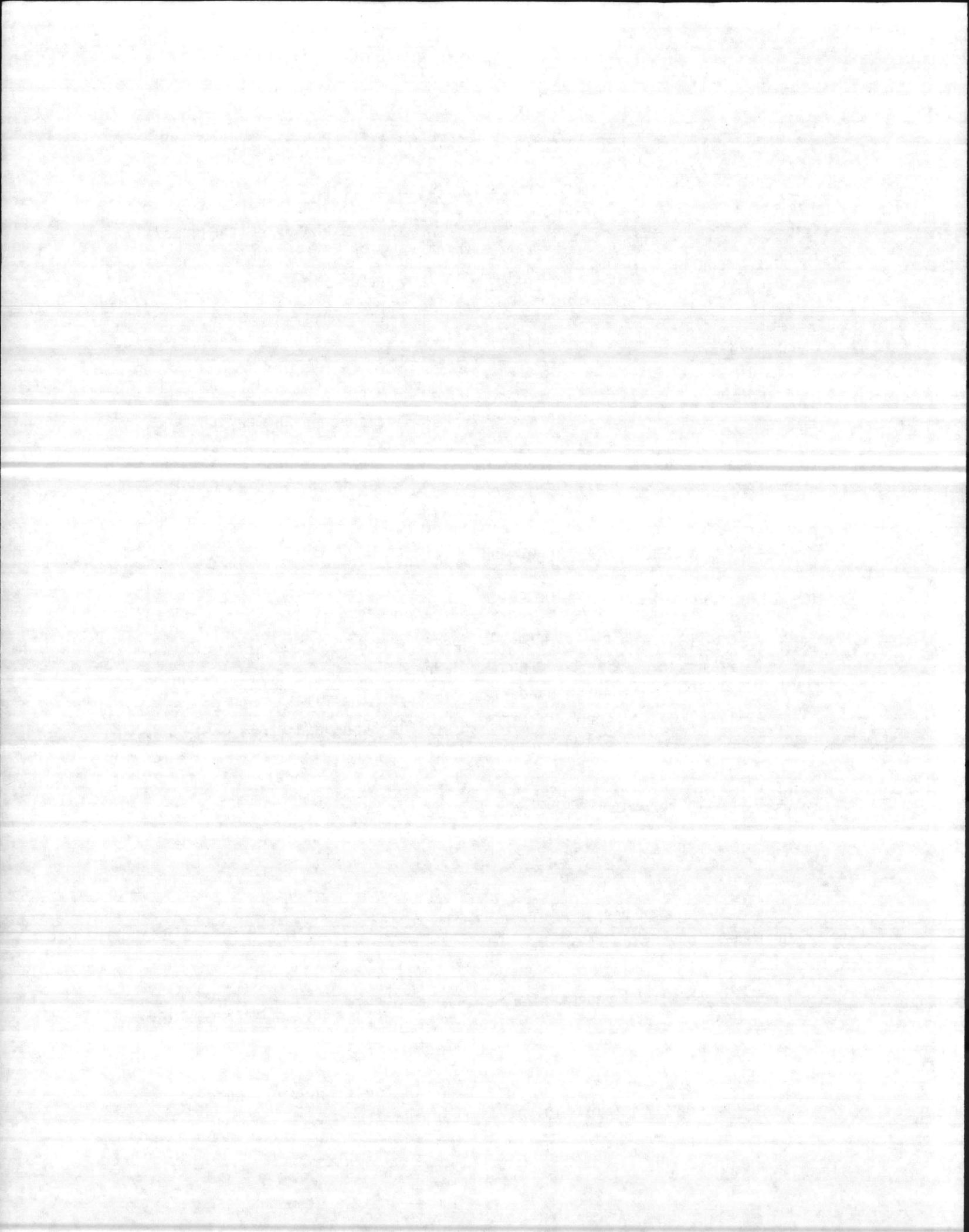
01 and 02 Space (MAG-26 Headquarters):

This 01/02 module is approximately 40 ft. long x 240 ft. wide. The 01 space is used to support HMH-461 and the 02 space is MAG-26 headquarters. A section of the 01 space is also used as an IMA Hydraulic Shop and Survival Equipment Shop. Depending on squadron hangar assignments, the first floor 01 spaces may require alteration to support HMT-204 while MAG-26 headquarters would remain intact.

MAG-26 HQ to 60 h
AS-217

Particulars - OH Space Category Code 211-05

- 160 ft. wide x 240 ft. long (working space).
- Height of hangar openings are suitable for passage of the V-22 with nacelles in vertical position.
- Electric power and receptacles not available for hook-up of electrical driven GSE.
- Air supply and connectors are not adequate for support of the V-22 aircraft. A minimum of 110 psi is required.



- ✖ Overhead monorail/hoist arrangement not available. Pettibone, 8½ ton ^{3 for} crane used for removal/replacement of major components. *Blades crane*
- ✖ • Lighting system within the OH hangar is inadequate. ?

- Function:

This maintenance hangar is required to provide a weather protected shelter for inspection, servicing, and maintenance of aircraft assigned to the squadrons.

- Planning Considerations:

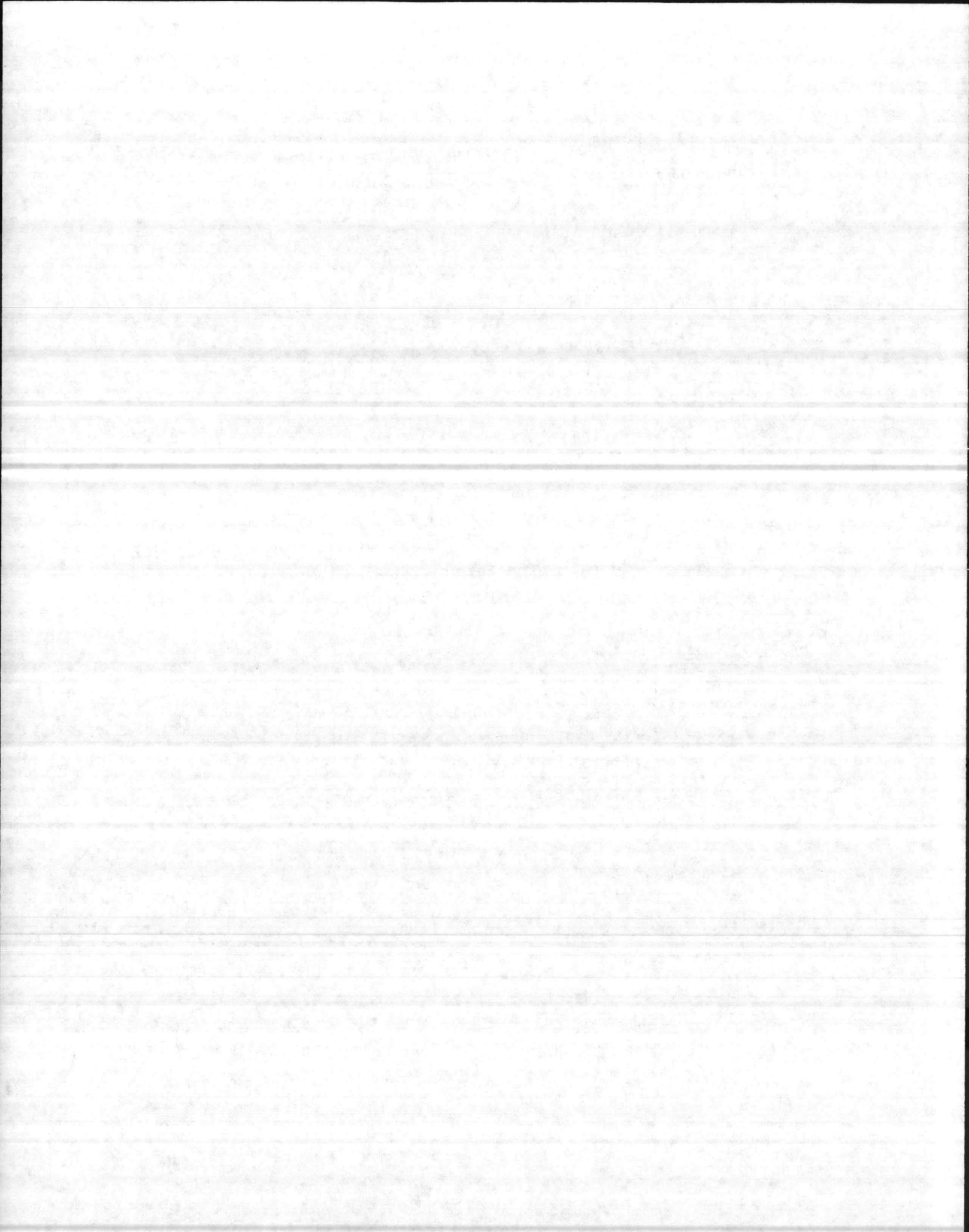
Current plans for modifying Bldg. 504 are for the 01 and 02 spaces only (Project No. P-507). Planning should be initiated for modification of the OH area of the building with the following items requiring consideration: *P-507 in-cludes off space also*

- Structural:

- Monorail/Hoist: Overhead monorail/hoist arrangement, minimum 2000 pound capacity, installed to run entire length of hangar similar to those installed within hangars at MAG-29. This will allow for expedient and safe removal of all major components. Removal of the rotorhead and three (3) rotorblades as a unit (approx. 1850 pounds) is the criteria used for a minimum 2000 pound monorail/hoist arrangement. *this is in error - 3 for hoist already included*

- Floor Loads: The hangar floor and trench drain grates shall be capable of supporting wheel loadings of the V-22 Weapon System. *traverse drain requires*

- Clear Heights: A minimum clear height of 20 feet is required for maintenance while the aircraft is on jacks with nacelles in a horizontal position and blades folded.



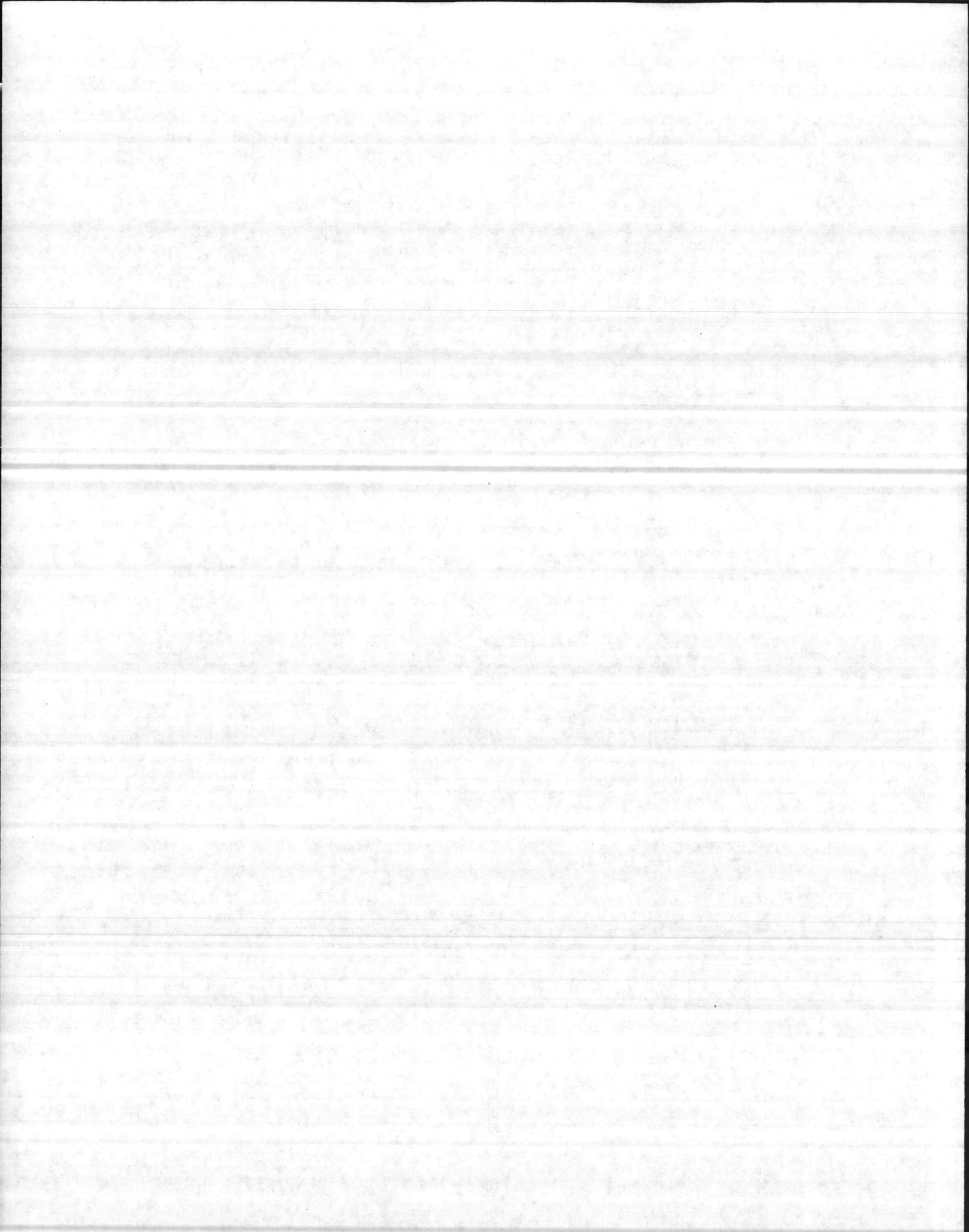
- Architectural:
 - Wall and Floor Finishes: Reflective floor and wall finishes shall be used for improved under aircraft illumination. The recommended floor coating is a catalytically cured, high abrasion-resistant, chemical resistant urethane (CRU). Walls may be painted with Federal Specification TT-E-489, White Alkyd Enamel, to an elevation of twelve (12) feet above the hangar deck.

- Mechanical:
 - Special Piping System: Standard shop air, minimum 110 psi, shall be provided throughout the OH hangar area.
 - Plumbing System: A minimum of one (1) deluge shower and eyewash station, with connected cold water, and floor drain shall be provided.
 - Waste Disposal: Waste water collection, treatment and disposal shall be provided as defined in NAVFAC DM-5.
 - Light Intensities: A light intensity of 50 footcandles, measured 12 feet above the hangar floor (approximately top of wing surface), shall be provided.

- Utility Requirements: The following types and quantities of utilities are required in the OH Space:
 - Compressed Air:

Standard shop air at 110 psi minimum shall be supplied throughout the hangar.

- Fire Protection: A foam water sprinkler system, using standard water sprinkler heads, shall be provided in the OH hangar space.



The discharge rate should be a minimum of 0.16 gallons of the air-foam solution per minute per square foot area. A supplementary manually operated foam system shall be provided in the hangar area in accordance with NAVFAC DM-8.

- Environmental Control: The temperature and humidity within this facility shall be controlled for personnel comfort only.
- Electrical Service/Distribution:
 - Service and distribution as defined in NAVFAC DM-28.1 will be used the hangar to serve 12 V-22 Aircraft. Each aircraft position will have available:
 - 115/200V, 3 Ph, 400 Hz, 60 KVA
 - 480V, 3 Ph, 60 Hz, 100 amps.
 - 28V (DC), 50 Amp.

*How will
it fit in hangar*

The twelve (12) Power Service Points (PSP) shall be mounted in accordance with National Electric Code (Article 513-10) and will not operate in hazardous locations.

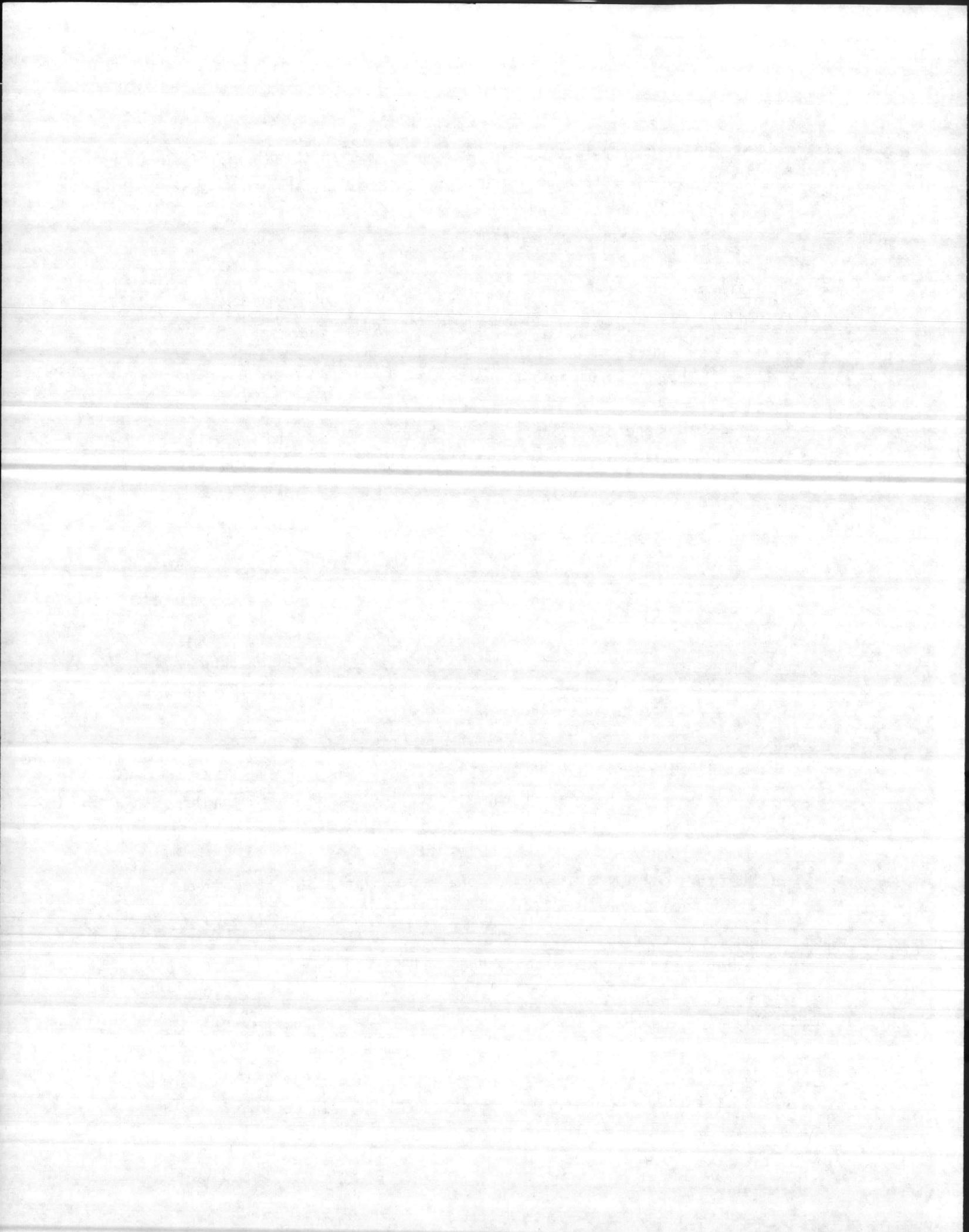
Need sketch showing placement

- Power Transmission: 400 Hz power supplied to the PSP shall be provided by a motor generator, MG1 or equivalent, located in the Mechanical Equipment Room.
- Grounding: Provide a minimum of one flush type static grounding receptacle for each aircraft position in the hangar.

5.2.1.2 Bldg. 515 (MAG-26) Category Code 211-05, OH Space

Assessment:

This hangar is currently utilized for support of three (3) CH-46 squadrons, consisting of twelve (12) aircraft per squadron, one (1) squadron consisting

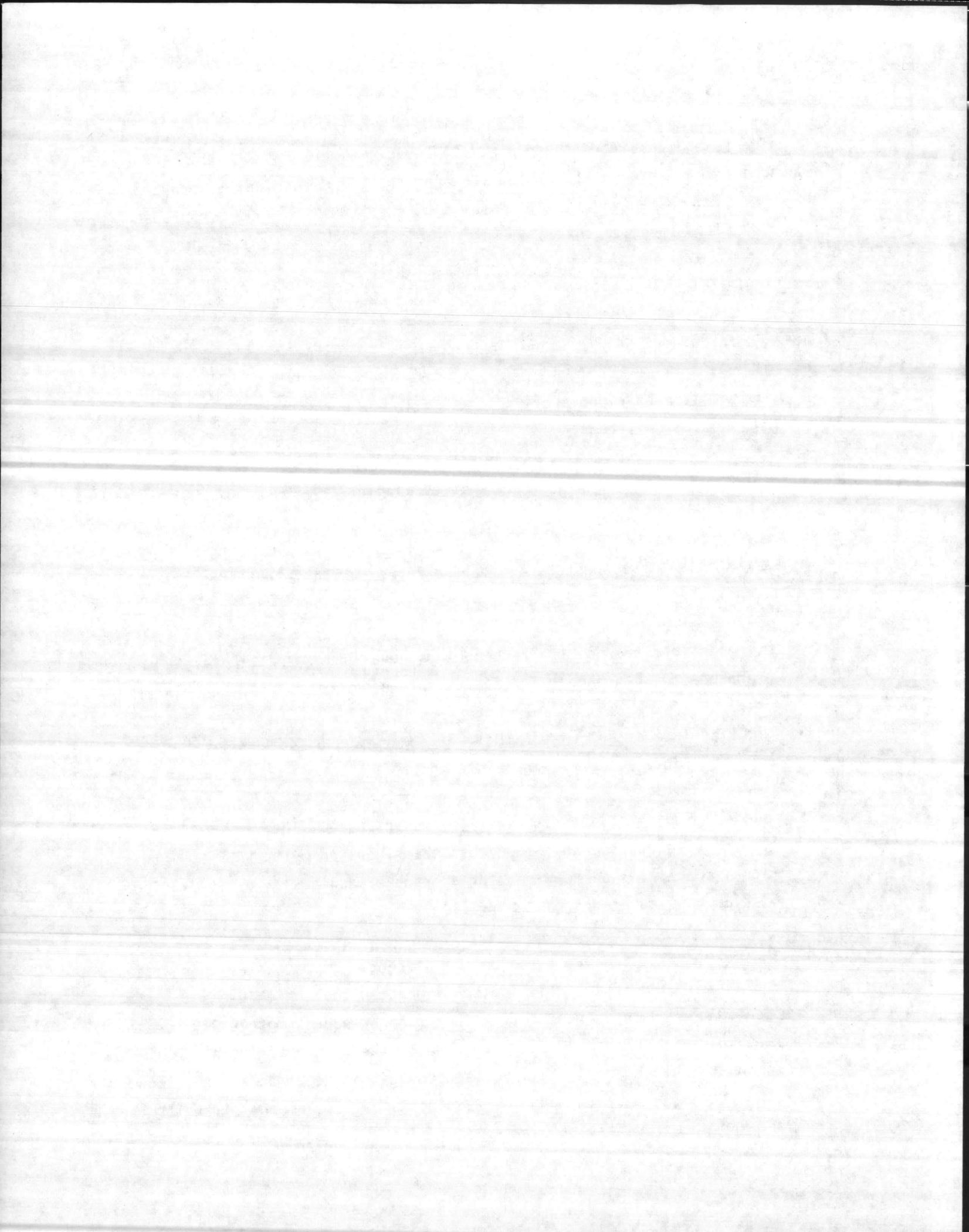


of nine (9) UH-1N aircraft and nine (9) AH-1J/T aircraft. A total of four (4) squadrons consisting of fifty-four (54) aircraft are currently supported by the OMA hangar. This building contains 0H (hangar space), 01 (shop space), and 02 (administrative space).

Particulars:

- 78 ft. wide x 643 ft. long (OH space).
- height of hangar doors are suitable for passage of the V-22 with nacelles in vertical position.
- Electric power and receptacles not available for hook-up of electrical driven GSE. *Project not under way*
- Air supply and connectors are marked 75 psi which is not adequate for support of the V-22 aircraft. A minimum of 110 psi is required. *Check P-451*
- Overhead monorail/hoist arrangement not available. Pettibone, 8½ ton crane used within hangar for removal of major components. *P-451*
- Lighting intensities within this OH hanger (30-40 footcandles) not adequate for V-22 servicing/maintenance.
- Survival Equipment shop is very limited in space. The V-22 will require greater support from this shop than that required by the CH-46. Additional space will be required for storage of equipment for the various mission configurations of the V-22. *Check P-451 see need to space*
- The V-22 will introduce a system not presently supported by this activity - ECAMS. ECAMS is a sophisticated diagnostic tool which needs to be located near Maintenance Control in a room of approximately 320 square feet which is maintained below 85°F while the system is operating. A second room of approximately 600 square feet is required for a second ECAMS for pre-programming the V-22 digital map system and aircraft mission computer. These requirements apply to each squadron. *2 rooms per squadron. Ask P-451*

Are we to get this system?



- Function:

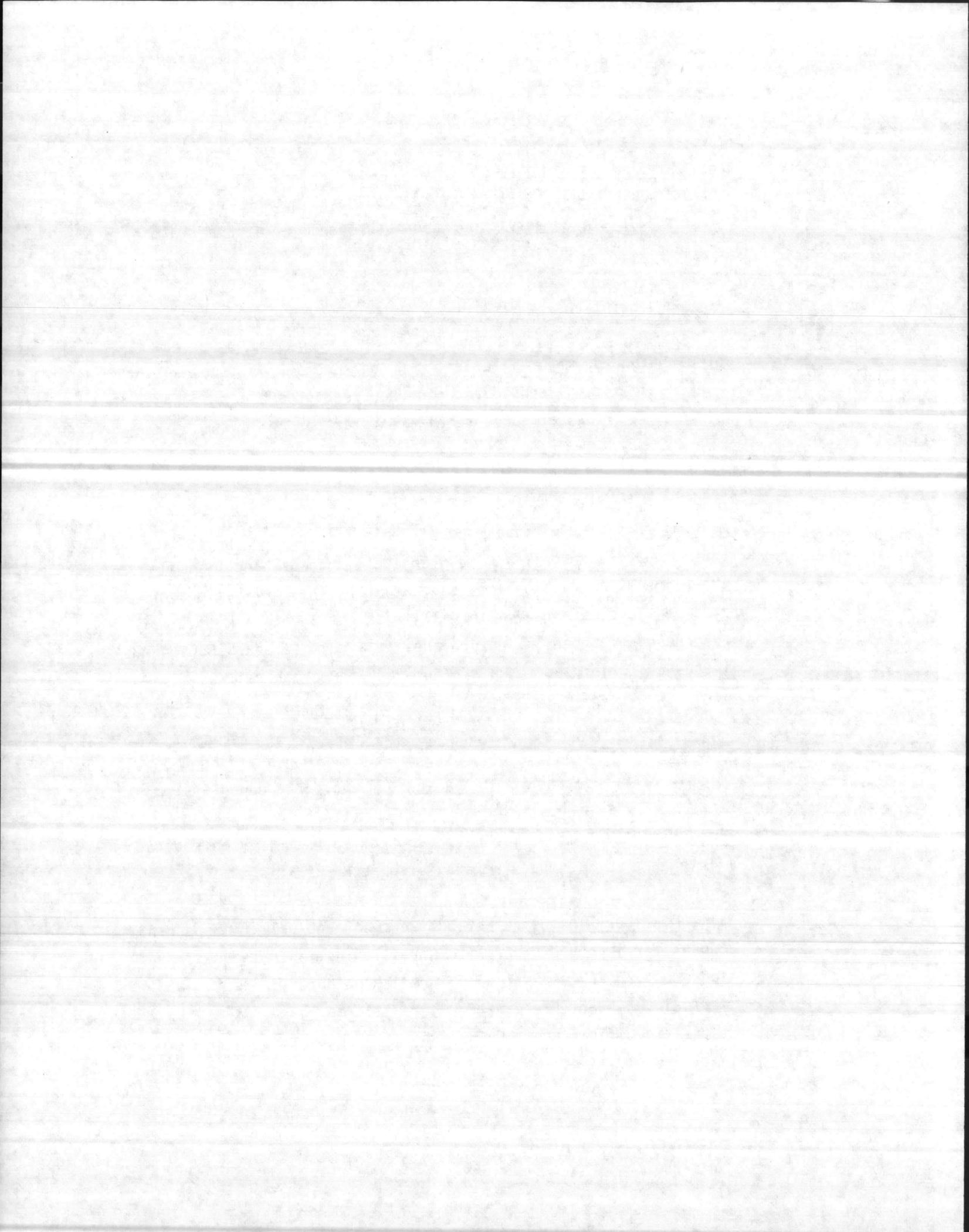
This maintenance hangar is required to provide a weather protected shelter for inspection, servicing, and maintenance of aircraft assigned to the squadrons.

- Planning Considerations:

Current planning for major alterations (Project No. P-451) to Hangar 515 OH Space should include considerations required for support of the V-22 Weapon System. OH Hangar Space requirements are as follows:

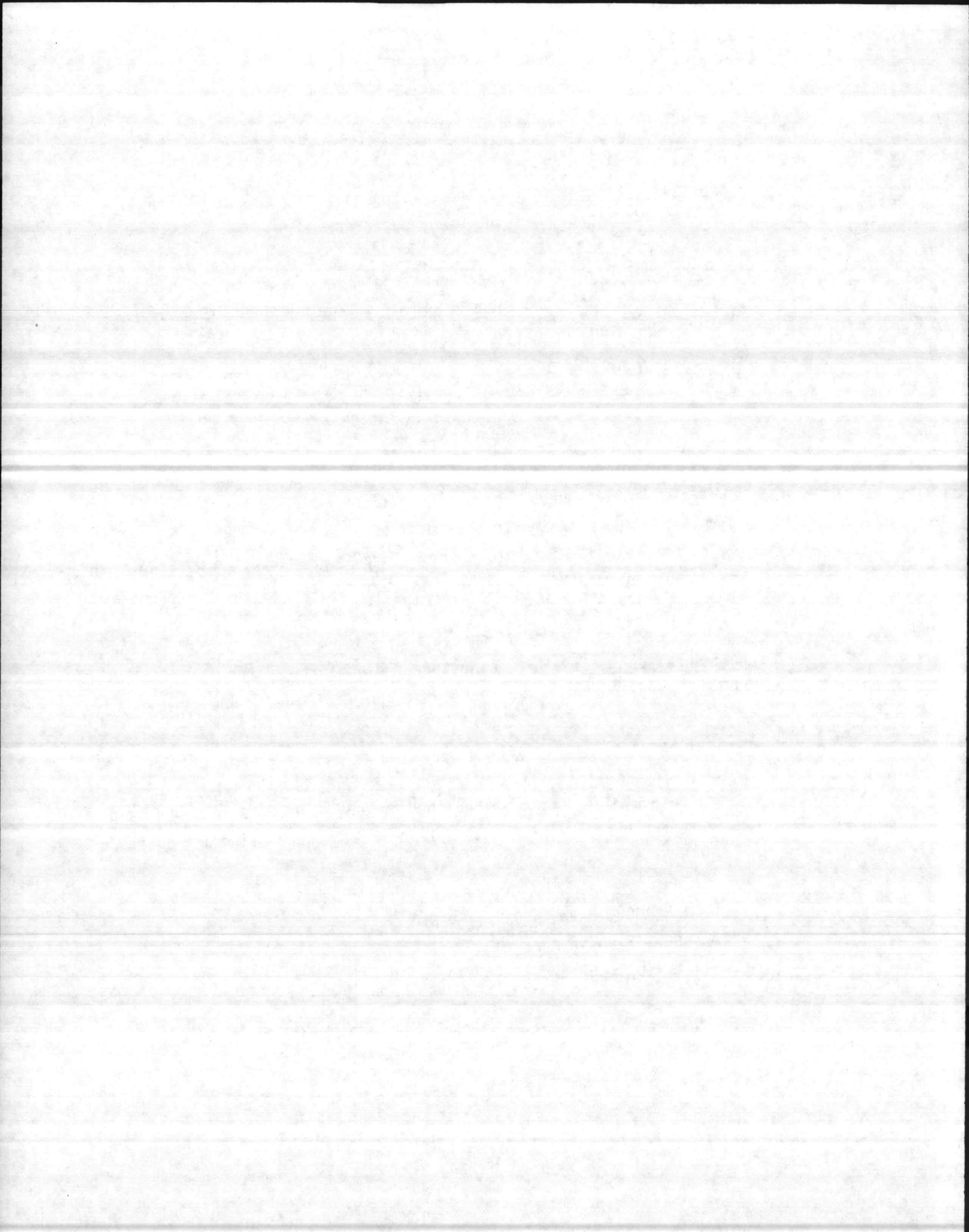
- Structural:

- Monorail/Hoist: Overload Monorail/Hoist arrangement, minimum 2000 pound capacity installed to run entire length of hangar similar to those installed within hangars at MAG-29. This will allow for expedient and safe removal of all major components. Removal of the rotorhead and three (3) rotorblades as a unit (approx. 1850 pounds) is the criteria used for a minimum 2000 pound monorail/hoist arrangement. *or*
- Floor Loads: The hangar floor and trench drain grates shall be capable of supporting wheel loadings of the V-22 Weapon System. *or*
- Clear Heights: A minimum clear height of 20 feet is required for maintenance, while the aircraft is on jacks. *oh*
- Wall and Floor Finishes: Reflective floor and wall finishes shall be used for improved under aircraft illumination. The recommended floor coating is catalytically cured, high abrasion-resistant, chemical resistant urethane (CRU). Walls may be painted with Federal Specification TT-E-489, White Alkyd Enamel, to an elevation of twelve (12) feet above the hangar deck.



- Mechanical:
 - Special Piping System: Standard shop air, minimum 110 psi shall be provided throughout the OH hangar area.
 - Plumbing System: A deluge shower and eyewash station, with connected cold water and floor drain, shall be provided in accordance with OSHA requirements.
 - Waste Disposal: Waste water collection, treatment and disposal shall be provided as defined in NAVFAC DM-5.
 - Fire Protection: A foam water sprinkler system, using standard water sprinkler heads, shall be provided in the OH hangar space. The discharge rate should be a minimum of 0.16 gallons of the air-foam solution per minute per square foot area. A supplementary manually operated foam system shall be provided in the hangar area, according to NAVFAC DM-8.
- Environmental Control: The temperature and humidity within this facility shall be controlled for personnel comfort only.
- Electrical Service/Distribution:
 - Service and distribution as defined in NAVFAC DM-28.1, will be used within the hangar to serve 12 V-22 Aircraft. Each aircraft position will have available:
 - 115/200V, 3 Ph, 400 Hz, 60 KVA
 - 480V, 3 Ph, 60 Hz, 100 amps.
 - 28V (DC), 50 amp.

The twelve (12) Power Service Points (PSP) shall be mounted in accordance with National Electric Code (Article 513-10) and will not operate in hazardous locations.



- Power Transmission: 400 Hz power supplied to the PSP shall be provided by a motor generator, MG1 or equivalent, located in the Mechanical Equipment Room.
- Grounding: Provide a minimum of one flush type static grounding receptacle for each aircraft position in the hangar.

5.2.2 Intermediate Maintenance Facilities

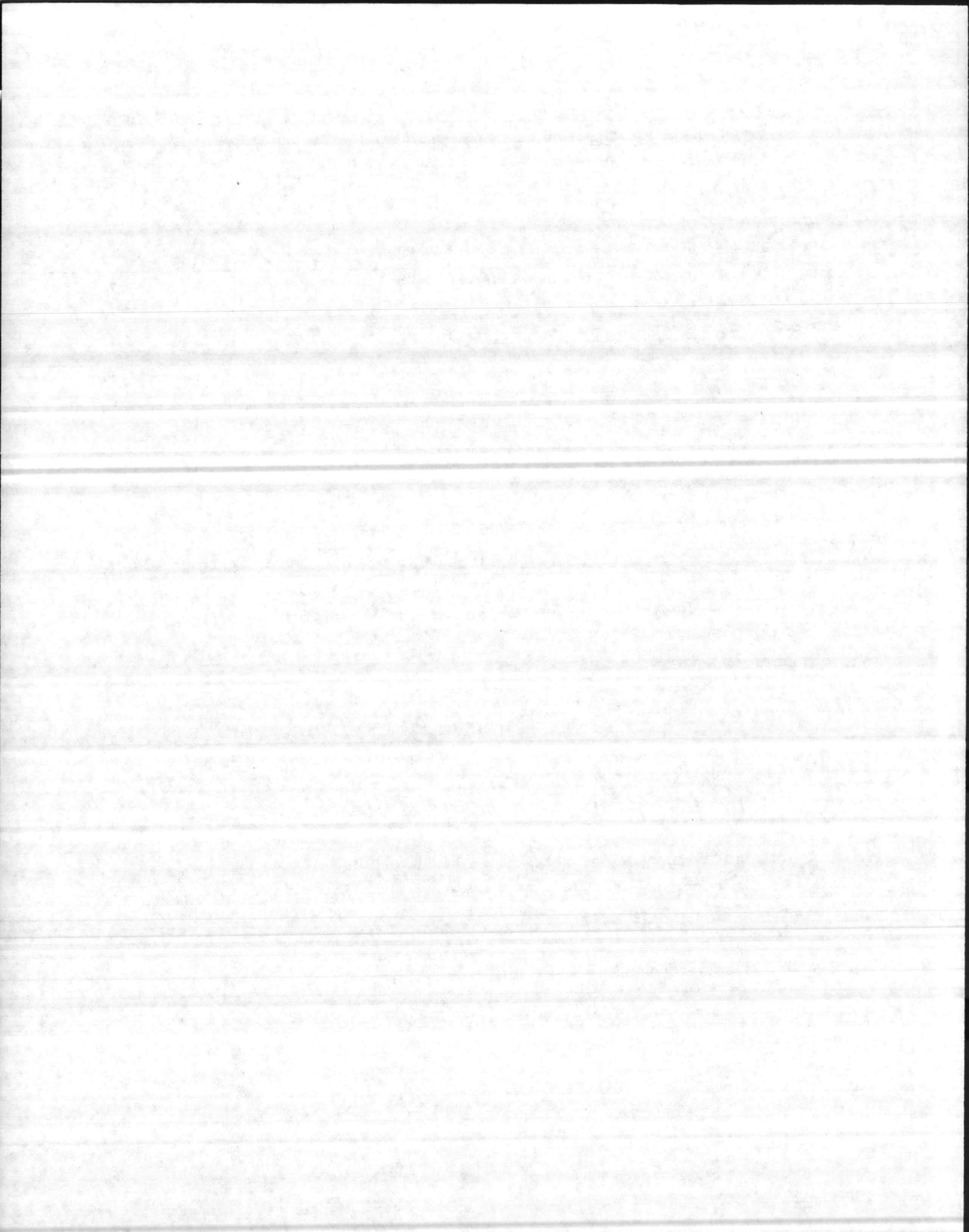
5.2.2.1 Bldg. 518 (MAG-26)

Assessment:

This building consists of an OH space, 01 shops/spaces, and 02 administrative offices/spaces for support of all MAG-26 Squadrons including HMT-204. The OH space is used primarily for IMA maintenance of aircraft assigned to MAG-26. The 01 Space includes airframe, engine/APU, parachute and survival equipment and avionics work centers. The 02 space is for administrative offices.

OH Space

- 76 feet wide x 325 feet long (working space).
 - Height of existing hangar doors are suitable for passage of the V-22 Aircraft with nacelles in the vertical position. ✓
 - Electrical connections not available for hook-up of GSE, MMG-1A mobile electric power unit, and AHT-63 hydraulic cart for ground maintenance of the V-22 aircraft. *See work*
 - Air supply connections available but not in service.
-
- Open hangar doors are used for ventilation.
 - Overhead heaters available.



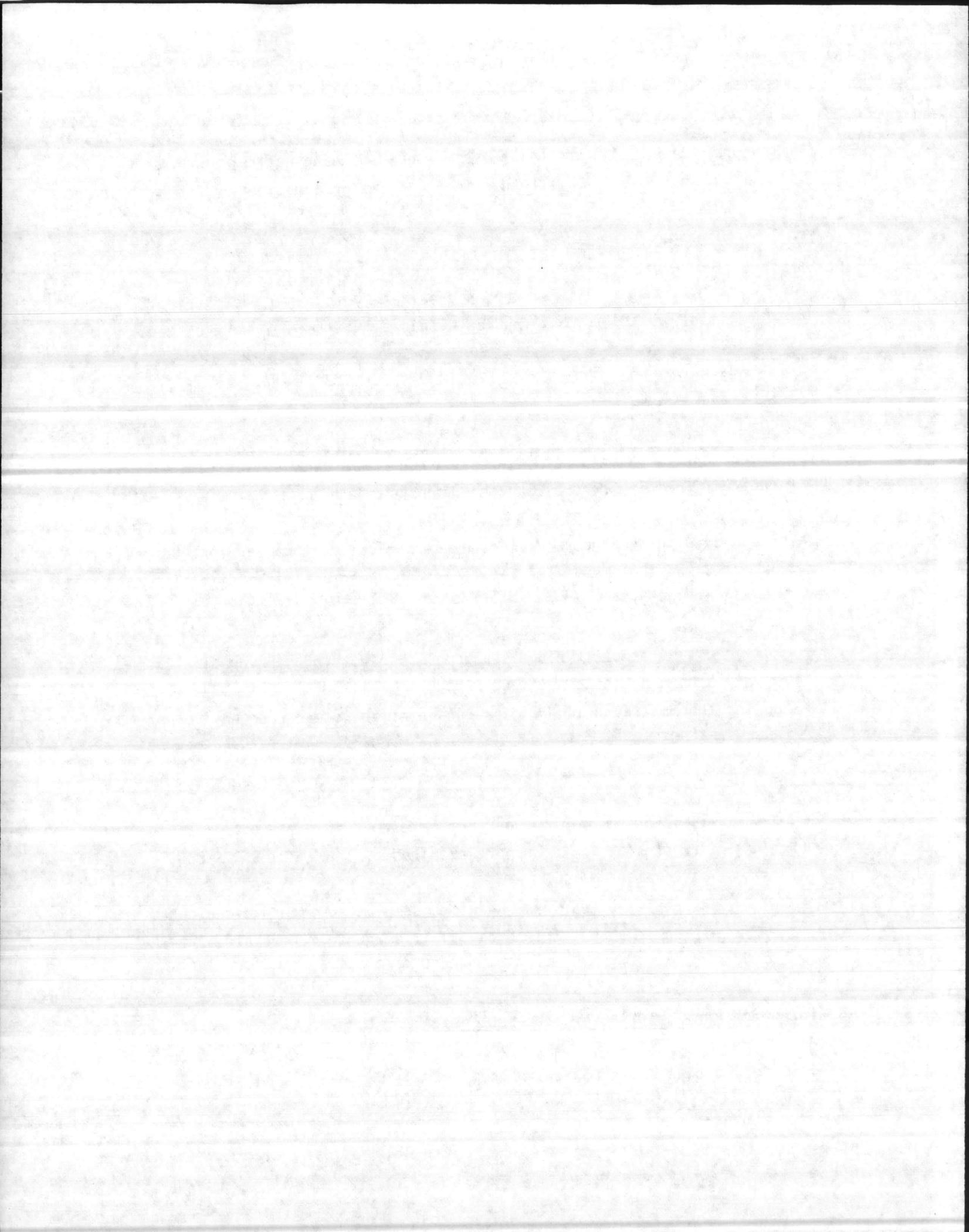
- Monorail and 4000 pound hoist arrangement spanning entire length of hangar available for overhead hoisting of major components.

Maintenance Hangar (01 Space-Shops)

- The light intensity as measured approximately four (4) feet from ground level measured 30-40 foot candles within all of the IMA work centers. *Is this adequate?*
- An overhead monorail/hoist system is available with the airframes shop but is not used.
- The paint/corrosion control shop space does not provide for temperature control, humidity control and adequate ventilation.
- The hydraulic shop does not include electrical receptacles for 400 VAC, 60 Hz, 3 Ph, 100 AMPS. The facilities equipment is wired directly into the junction box.
- Hose and tube manufacturing is accomplished within the hydraulic shop area. Contamination resulting from cutting, sanding, drilling, etc., during the manufacturing process can enter the clean room environments where the HCT-10 test fixture and/or hose burst test fixtures are located.
- The Survival Equipment shop does not have the capability of providing the oxygen-nitrogen ($O_2 \cdot N_2$) support required by the V-22 OBIGGS/OBOGS unit.
- Fiberglass repair of various WRAs is accomplished within a dedicated area of the airframes shop. This area is not adequate for repair of the V-22 airframe composites.

Maintenance Hangar (02 Space - Operations)

- Office spaces are adequate for support of the V-22 Weapon System.



Recommendations:• Planning Considerations:

Current planning for major alterations to Hangar 518 should include considerations required for support of the V-22 Weapon System. OH Hangar Space requirements are as follows:

• Structural:

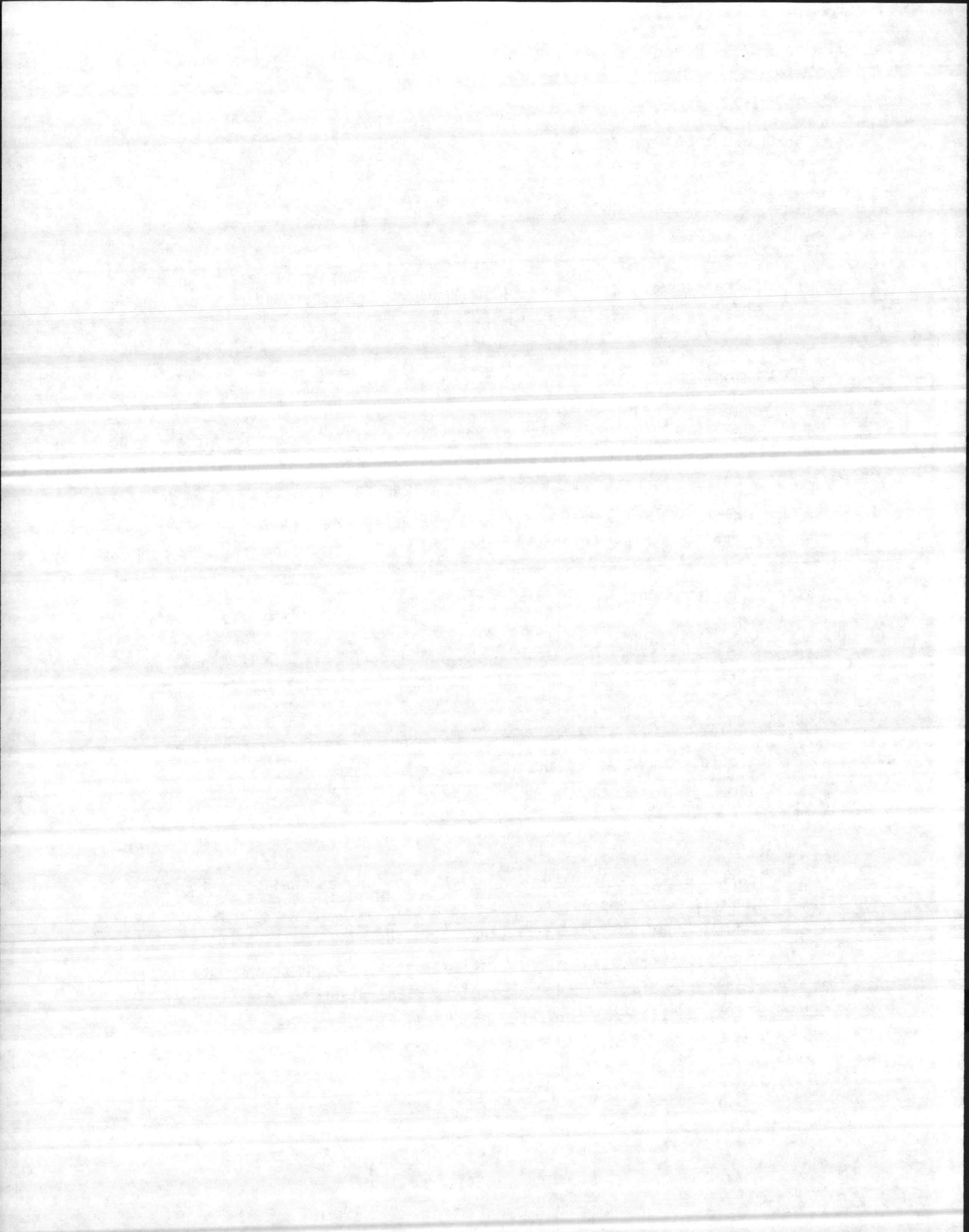
- Monorail/Hoist: Overhead monorail/hoist arrangement, minimum 2000 pound capacity installed to run entire length of hangar similar to those installed within hangars at MAG-29. This will allow for expedient and safe removal of all major components. Removal of the rotorhead and three (3) rotorblades as a unit (approx. 1850 pounds) is the criteria used for a minimum 2000 pound monorail/hoist arrangement.

- Floor Loads: The hangar floor and trench drain grates shall be capable of supporting wheel loadings of the V-22 Weapon System.

- Clear Heights: A minimum clear height of 20 feet is required for maintenance, while the aircraft is on jacks.

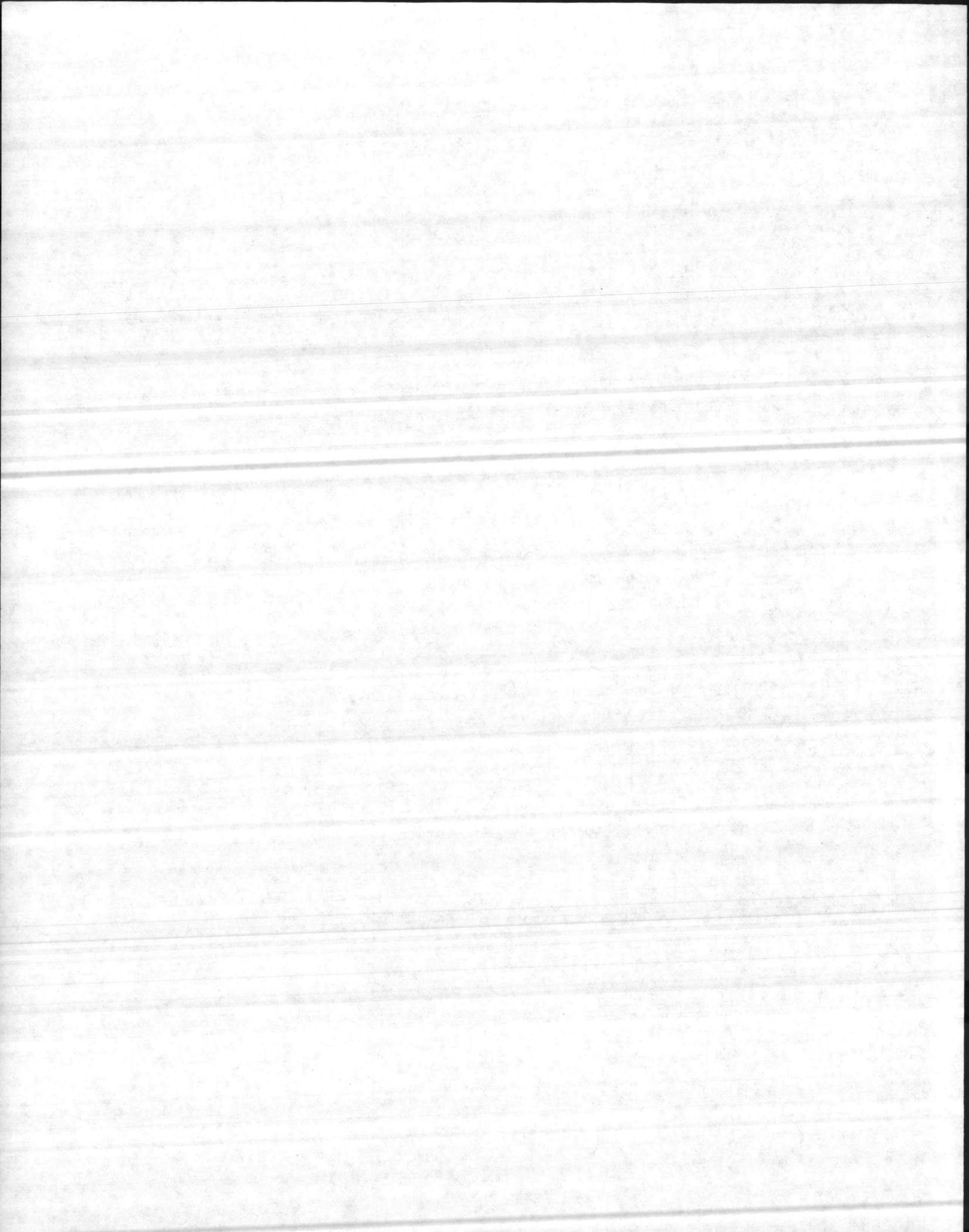
• Architectural:

- Wall and Floor Finishes: Reflective floor and wall finishes shall be used for improved under aircraft illumination. The recommended floor coating is a catalytically cured, high abrasion-resistant, chemical resistant (CRU). Walls may be painted with Federal Specification TT-E-489, White Alkyd Enamel, to an elevation of twelve (12) feet above the hangar deck.



- Mechanical:
 - Special Piping System: Standard shop air, minimum 110 psi, shall be provided throughout the OH hangar area.
 - Plumbing System: A minimum of one (1) deluge shower and eyewash station, with connected cold water, and floor drain shall be provided.
 - Waste Disposal: Waste water collection, treatment and disposal shall be provided as defined in NAVFAC DM-5.
 - Fire Protection: A foam water sprinkler system, using standard water sprinkler heads, shall be provided in the OH hangar space. The discharge rate should be a minimum of 0.16 gallons of the air-foam solution per minute per square foot area. A supplementary manually operated foam system shall be provided in the hangar area in accordance with NAVFAC DM-8.
- Environmental Control: The temperature and humidity within this facility shall be controlled for personnel comfort only.
- Electrical Service/Distribution:
 - Service and distribution as defined in NAVFAC DM-28.1, will be used in the hangar to serve V-22 Aircraft. Each aircraft position will have available:
 - 115/200V, 30, 400 Hz, 60 KVA.
 - 480V, 30, 60 Hz, 100 amps.
 - 28V (DC), 50 amp.

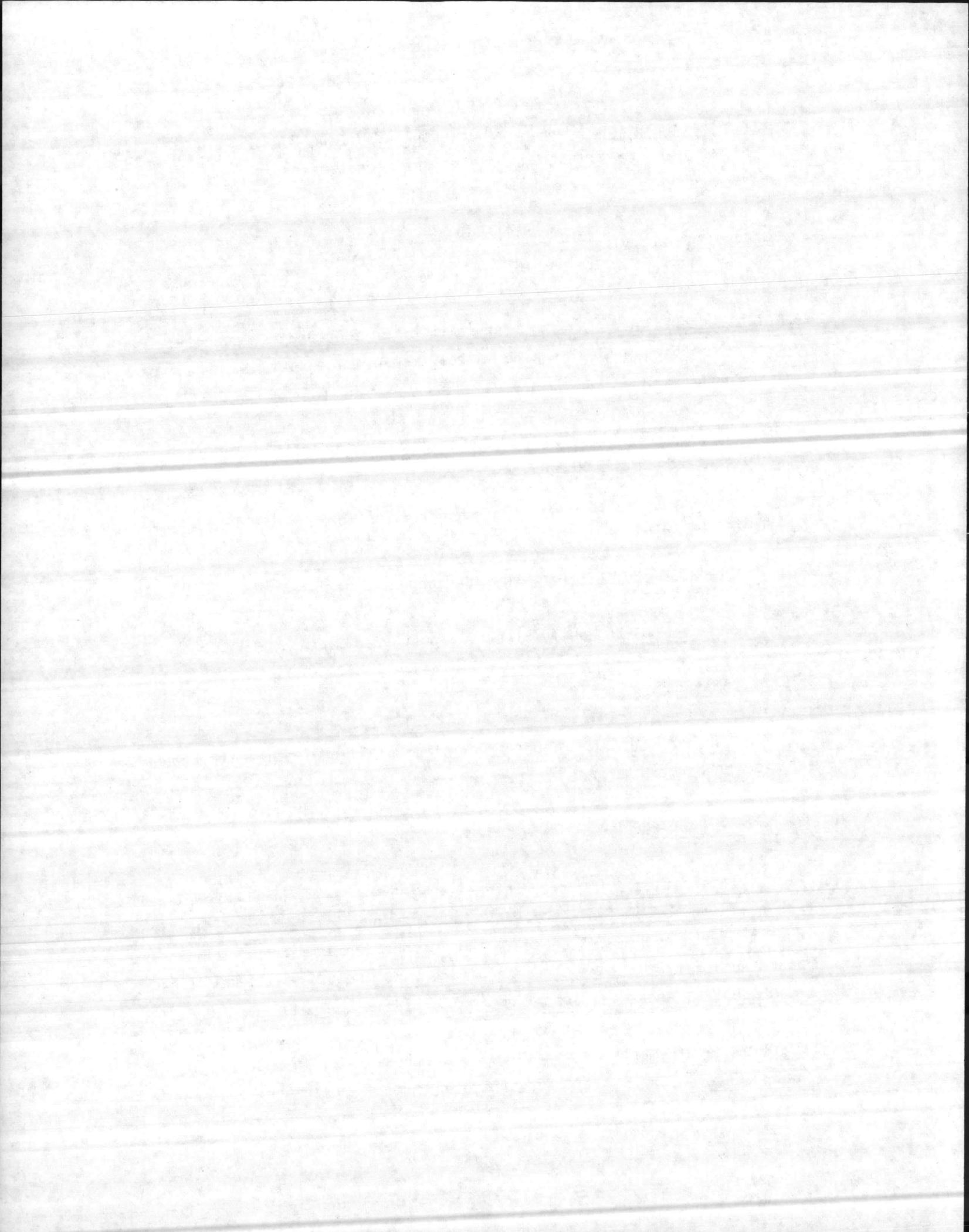
The twelve (12) Power Service Points (PSP) shall be mounted in accordance with National Electric Code (Article 513-10) and will not operate in hazardous locations.



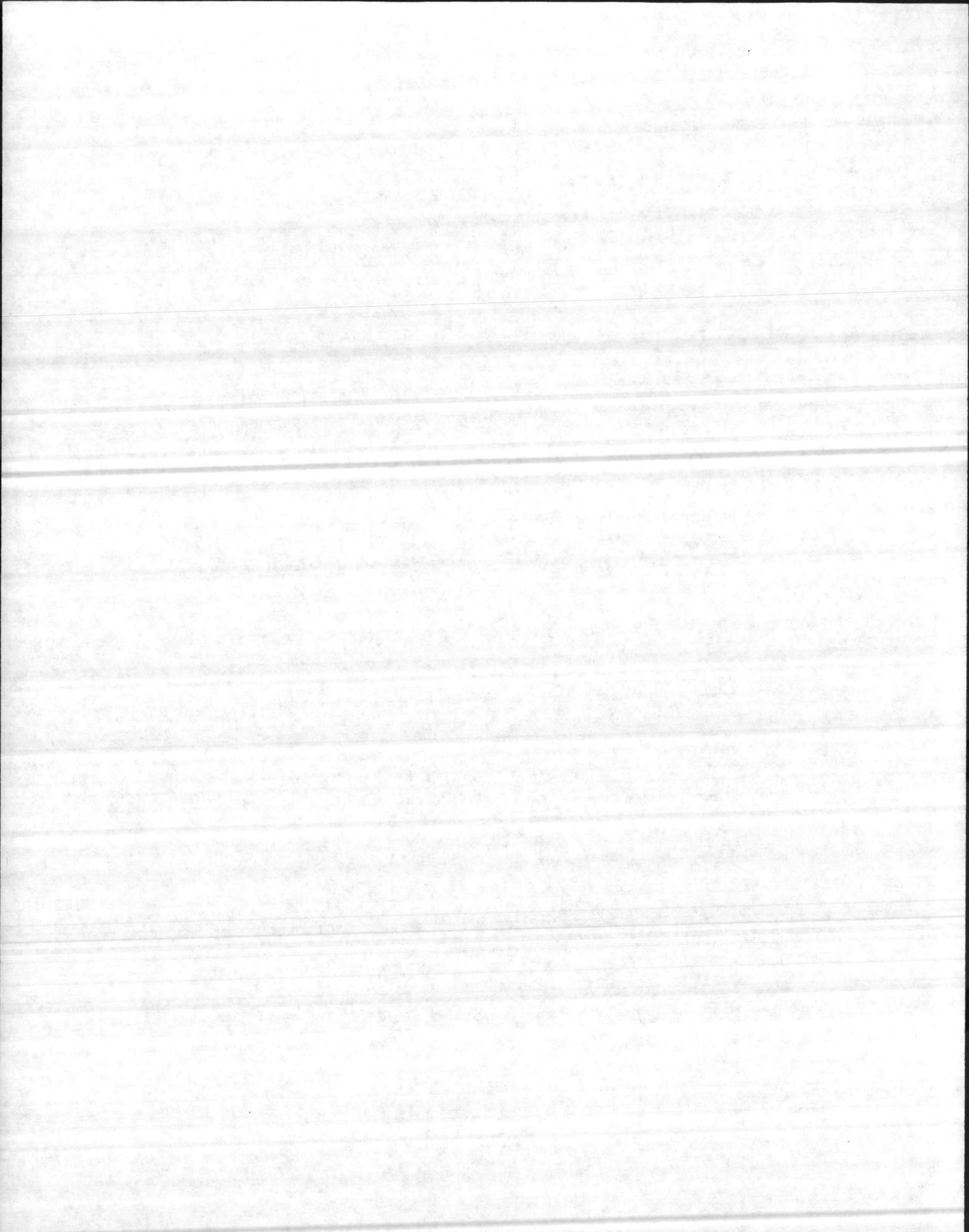
- Power Transmission: 400 Hz power supplied to the PSP shall be provided by a motor generator, MG1 or equivalent, located in the Mechanical Equipment Room.
- Grounding: Provide a minimum of one flush type static grounding receptacle for each aircraft position in the hangar.
- Light Intensities: A light intensity of 50 footcandles, measured 12 feet above the hangar floor (approximately top of wing surface), shall be provided.
- Utility Requirements: The following types and quantities of utilities are required in the OH Space:
 - Electrical:
 115/200V, 30, 400 Hz (TBD) KVA connected load
 440V, 60 Hz, 3 Ph, 100 amps connected load. This load is based on one (1) MMG-1A Mobile Electric Power Plant.
 - Compressed Air:
 Standard shop air at 110 psi minimum shall be supplied throughout the hangar.

01 Space/Work Centers

- Light Intensities: Lighting intensity within the OH work centers shall be a minimum of 50 footcandles as measured four (4) feet from the floor surface within the work centers, and 70 footcandles within the Maintenance Administration, Maintenance office, and Quality Assurance/Maintenance Control Areas, as specified in MIL-STD-1472.
-
- Utility Requirements: The following utilities will be required in the 01 work centers for operation of office equipment and support equipment.



- Electrical:
 - 120V, 60 Hz, 1 Ph (TBD) KVA connected load.
 - 240V, 60 Hz, 1 Ph (TBD) KVA connected load.
 - 115/220V, 400 Hz, 3 Ph (TBD) KVA connected load.
 - 28V, (TBD) Kw connected load.
- Compressed Air:
 - Standard shop air, minimum 110 psi, shall be supplied throughout the O1 space maintenance work centers.
- Architectural:
 - Walls/Doors: The wall separating the OH/O1 Spaces shall have a fire rating of not less than one (1) hour with openings protected by approved Class C doors.
- Structural:
 - Clear Ceiling Heights: Clear ceiling height of ten (10) feet will be standard throughout the O1 space.
 - Floor Loads: Floors throughout the O1 space will be designed to withstand 100 PSF loading.
- Mechanical:
 - Special Piping System: Standard shop air, minimum 110 psi shall be supplied to all maintenance work centers.
 - Waste Disposal: Floor drains are required in locker rooms, toilets, and mechanical equipment room in accordance with NAVFAC DM-28.



5.2.2.2 211 08 Airframe Shop

5.2.2.2.1 Tire and Wheel Shop

Assessment:

Existing tire and wheel maintenance at MAG-26 is performed within the hydraulic shop and the RFI tire and wheel assemblies are stored in racks located in the passageways of the IMA facility. Tire and wheel maintenance equipment includes a bead breaker, safety tire cage, stowage racks, tire inflation equipment, and hand tools.

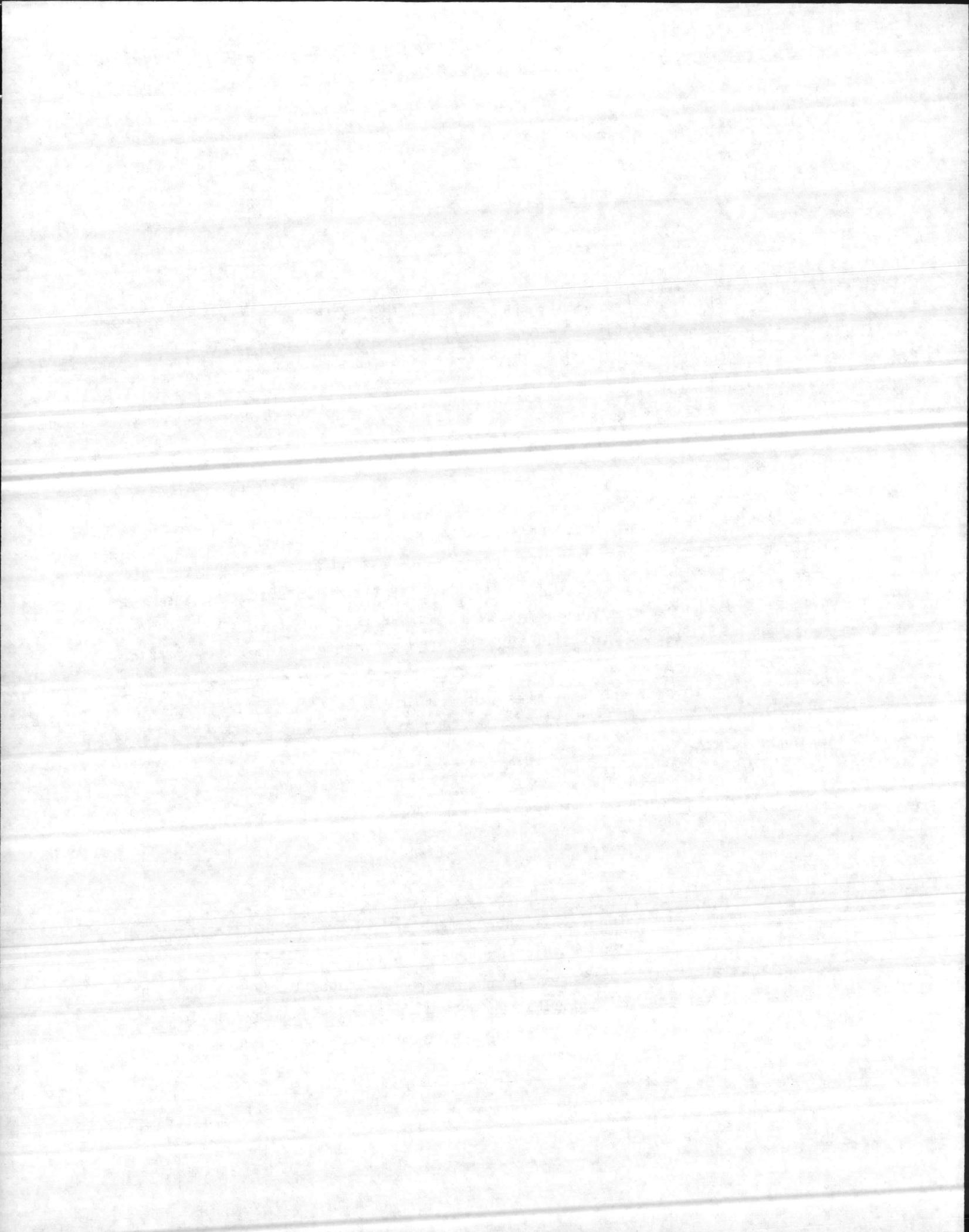
Recommendation:

In accordance with NAVAIR 01-1A-17, a dedicated tire and wheel shop/area is required at MAG-26 for servicing, repair, and testing of the V-22 tire and wheel assemblies. The tire and wheel shop/area should be sized for installation of a bead breaker, safety tire cage, stowage racks, tire inflation equipment, and hand tools. This shop will require a clean environment, electrical and pneumatic receptacles, and a space measuring 10 ft. high x 30 ft. wide x 40 ft. long with door openings measuring a minimum of four (4) feet wide to enable passage of the tire and wheel assemblies of the V-22 and other aircraft assigned to MAG-26.

5.2.2.2.2 Hydraulic Hose and Tube Assembly Shop

Assessment:

Existing cutting tools for repair and/or manufacturing of hydraulic hose and tube assemblies are located within the hydraulic shop at MAG-26. During the cutting operations, dust, metal chips, etc., are not controlled and have the tendency to enter the environmentally controlled areas of the hydraulic shop where the HCT-10 test stand and hose pressure test fixtures are located.



Recommendation:

A dedicated shop/area should be considered for cutting raw stock materials such as aluminum, CRES, titanium, and rubber. The shop/area should be located in close proximity to the hydraulic shop where the testing is accomplished. The shop/areas should include provisions for connecting of pneumatic equipment which require 90 PSI for operation, 220V, 60 Hz, 3 Ph. for operation of floor mounted equipment such as drill presses, grinding and sanding equipment, radial saw and bandsaw. The shop/area space for cutting, bending, and manufacturing of tube and hose assemblies should be a minimum of 20 ft. wide x 40 ft. long. This space includes provisions for installation of a floor mounted tube bending fixture which is currently scheduled for FY 1989 at MAG-26.

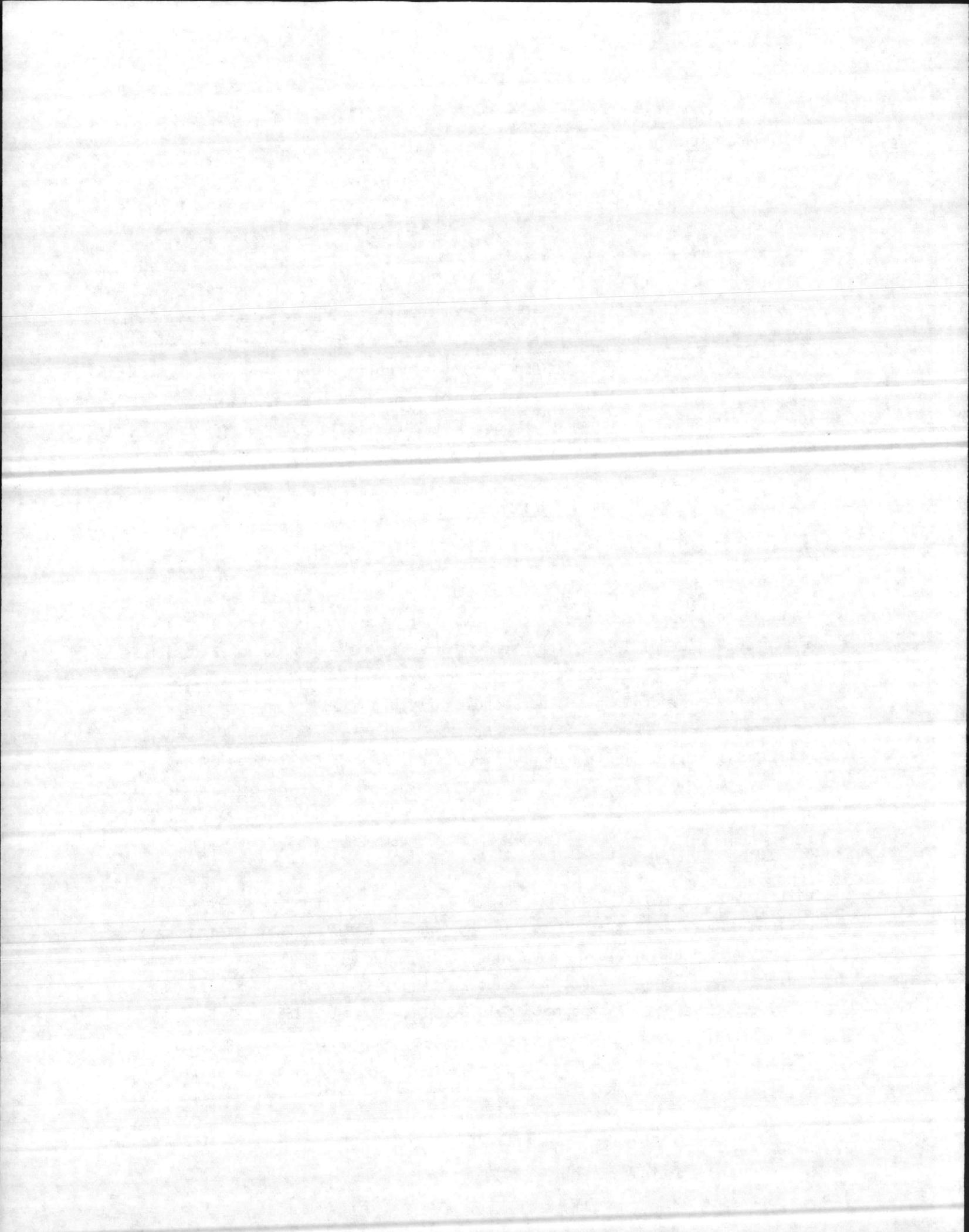
5.2.2.2.2.1 Floor Mounted Tube Bending FixtureAssessment:

Planning for installation of a floor mounted tube bending fixture at MAG-26 is scheduled for FY 1989. The requirements for tube bending of titanium tubing for the V-22 aircraft includes checking for 3 percent ovality. Selection of the floor mounted tube bending fixture should consider the V-22 requirements which are more stringent than that for existing tube bending of Type 304, 1/8 hard CRES tubing required for support of existing aircraft located at MAG-26.

*NAVAIR furnished
equipment*

Recommendation:

Criteria and/or specifications pertaining to the proposed floor mounted tube bending fixture be forwarded to Bell-Boeing for analysis and determination of adequacy for bending titanium tubing within 3 percent ovality to meet the V-22 requirements. The floor mounted tube bending fixture should provide the capability for bending all type materials such as aluminum, CRES (21-6-9) and titanium within specified tolerances. Verification of the bending fixture should be accomplished at the selected vendor facility prior to shipment to MAG-26.



5.2.2.3 211 21 Engine Maintenance Shop

To be provided by NAVAIR/Allison.

5.2.2.4 211 45 Avionics Shop

Avionics shop facilities requirements have not yet been defined for support of the V-22. Intermediate avionic maintenance LSA task analyses have not begun; GFE support equipment and CFE support equipment concept space requirements have been analyzed on a preliminary basis only. More detailed avionics IMA space requirements evaluations are scheduled to begin January 1987 with the conclusions to be incorporated into the first formal FRD scheduled for release in the spring of 1987.

Site survey and FRD space requirements analysis will consider the V-22 Modular Electronic Test System (METS) for all avionic CFE support. The number of METS sets per IMA is yet to be determined. For planning purposes, an estimated three (3) complete METS baseline systems will be required for each IMA. The METS baseline system is comprised of the following units: a Computer-Control-Memory Unit (CCMU); a Signal Generator-Converter (SGC); a Personality Module Mainframe (PMMF); and 20 to 30 Plug-In Module Adapters (PIMAs). The CCMU, SGC, and PMMF are stackable with each unit measuring 20.5 in. x 30.5 in. x 12.5 in. The PIMA unit plugs into the PMMF and varies in size.

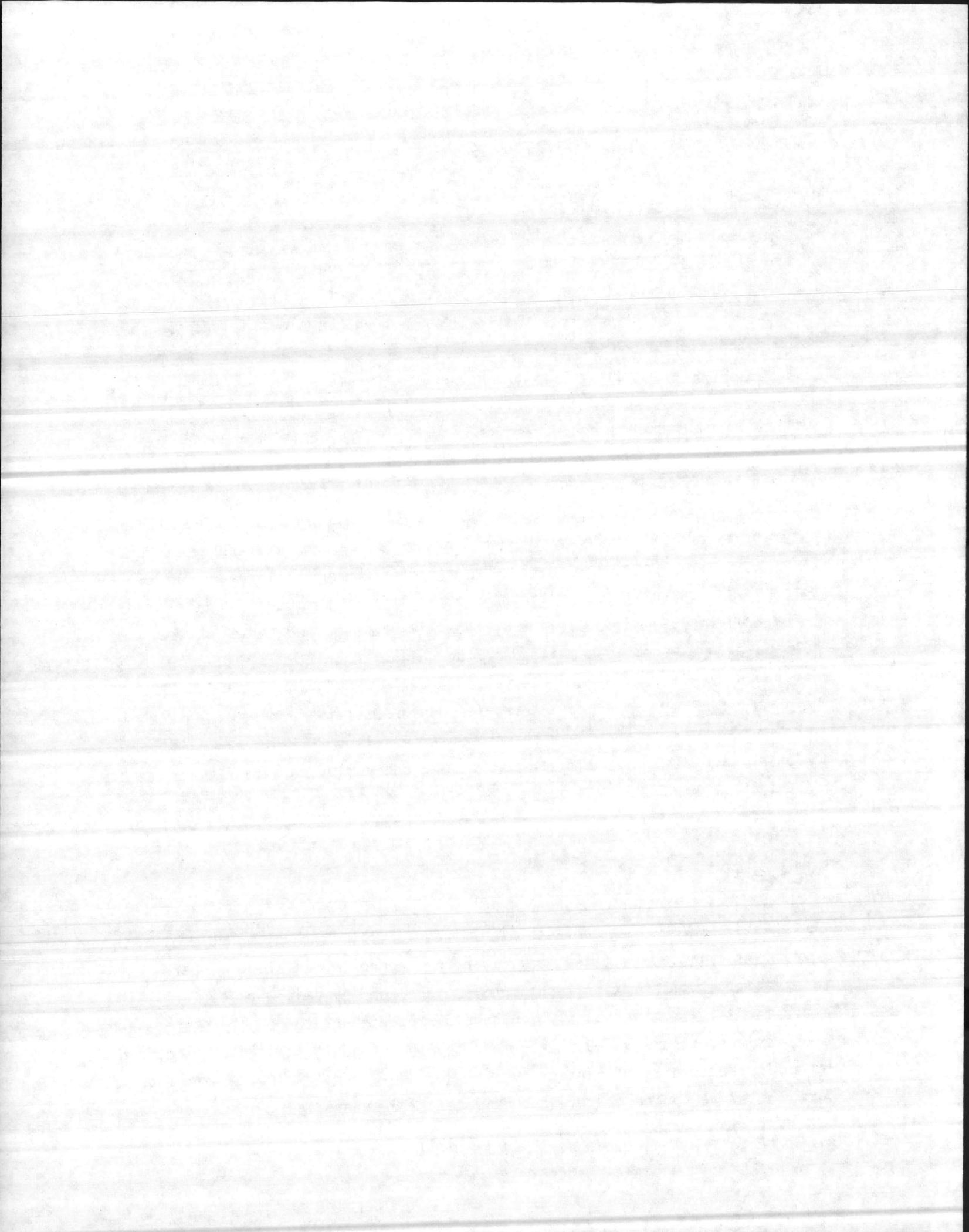
5.2.2.4.1 Fixed Facility

Assessment:

The existing MAG-26 IMA consists of a fixed facility with attached mobile facilities (MFs). The fixed facility covers approximately 7,000 square feet of area for administration, equipment storage, and avionic work centers. The fixed facility is the hub to which several MFs are attached. The storage area measures approximately 900 square feet. With the additional WRAs introduced by an increased aircraft inventory, the storage area may require expansion. Administrative spaces measure approximately 230 square feet. Additional area

*This is only for
summary is for*

A5-44



may be required to support the additional work load on the avionics work centers. The crypto rooms measures approximately 130 square feet and is adequate for supporting the V-22. The fixed facility also houses a nickel-cadmium battery storage area. The V-22 battery is a lead-acid battery so no support will be required from this shop.

Recommendations:

Storage and administrative areas may require expansion to adequately support the burden placed on the avionics work centers by the increased number of aircraft at MAG-26.

determined to be per 5.2.2.4 pass

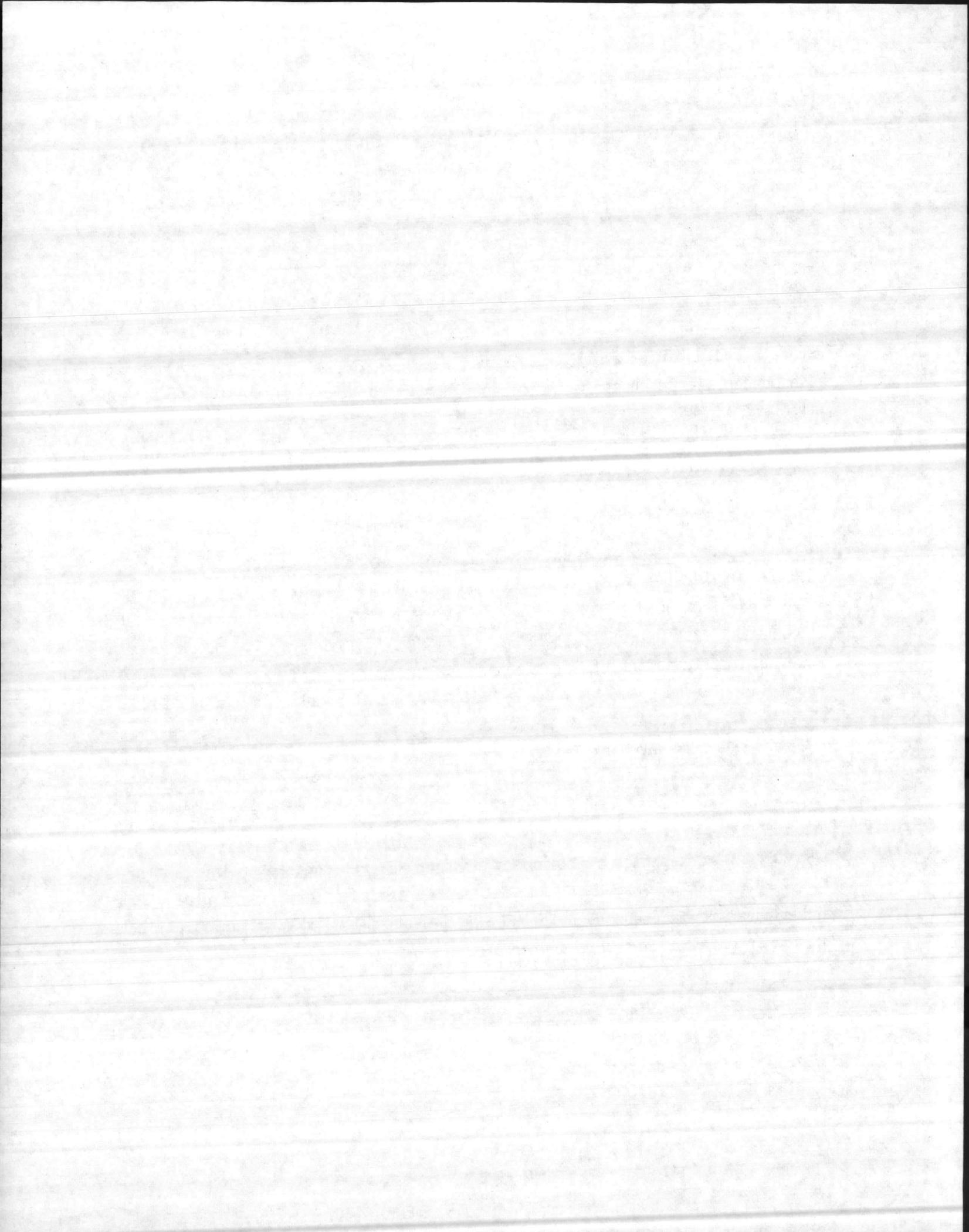
5.2.2.4.2 Mobile Facilities

Attached to the fixed facility are standard NAVAIR mobile facilities which measure 20 ft. x 8 ft. x 8 ft. Two (2) types of MFs, an integration unit (INU) and basic, are used to build an integrated MF complex. The INU physically and electrically connects a maximum of 6 MFs. Power input to the INU is 120/208 VAC, 200 amp, 60 Hz, 3 Ph and 120/208 VAC, 100 amp, 400 Hz, 3 Ph. Power available to the MF work centers is as follows: 28 VDC (transformer/rectifiers in MFs); 115 VAC, 60 Hz; 115 VAC, 400 Hz; 220 VAC; and 440 VAC.

5.2.2.4.2.1 COM/NAV Work Center

Assessment:

The COM/NAV work center is comprised of four MFs attached to an INU. Maintenance actions performed in the work center are functional testing of WRAs and removal/replacement down to the SRA. Shown below is a system comparison of support provided at this center:



	CH-46E	V-22
HF Comm	AN/ARC 94 Radio Set	AN/ARC-199 HF Radio
UHF/VHF Comm	AN/ARC 54 Radio Set or AN/ARC 131 VHF/FM Radio AN/ARC 51 Radio Set AN/ARC 52 Radio Set	AN/ARC 182(V) VHF/UHF Radio FM Homing Module
Interphone	AN/AIC 14 Intercom Set	AN/AIC 30(V) Intercom
IFF	AN/APX 72 Transp. Set	AN/APX-100(V)3 Transp.
Radio Nav	AN/ARN 52(V) TACAN Nav. AN/ARN 59 Direc. Finder	AN/ARN 147 VOR/ILS/MB AN/ARN-118 TACAN QA-8697 VHF/UHF ADF
Radar Nav	AN/APN 154 Radar Beacon AN/APN 171 Elec Alt	AN/APN 217A Nav Set AN/APN 194(V) Alt Set, Elec

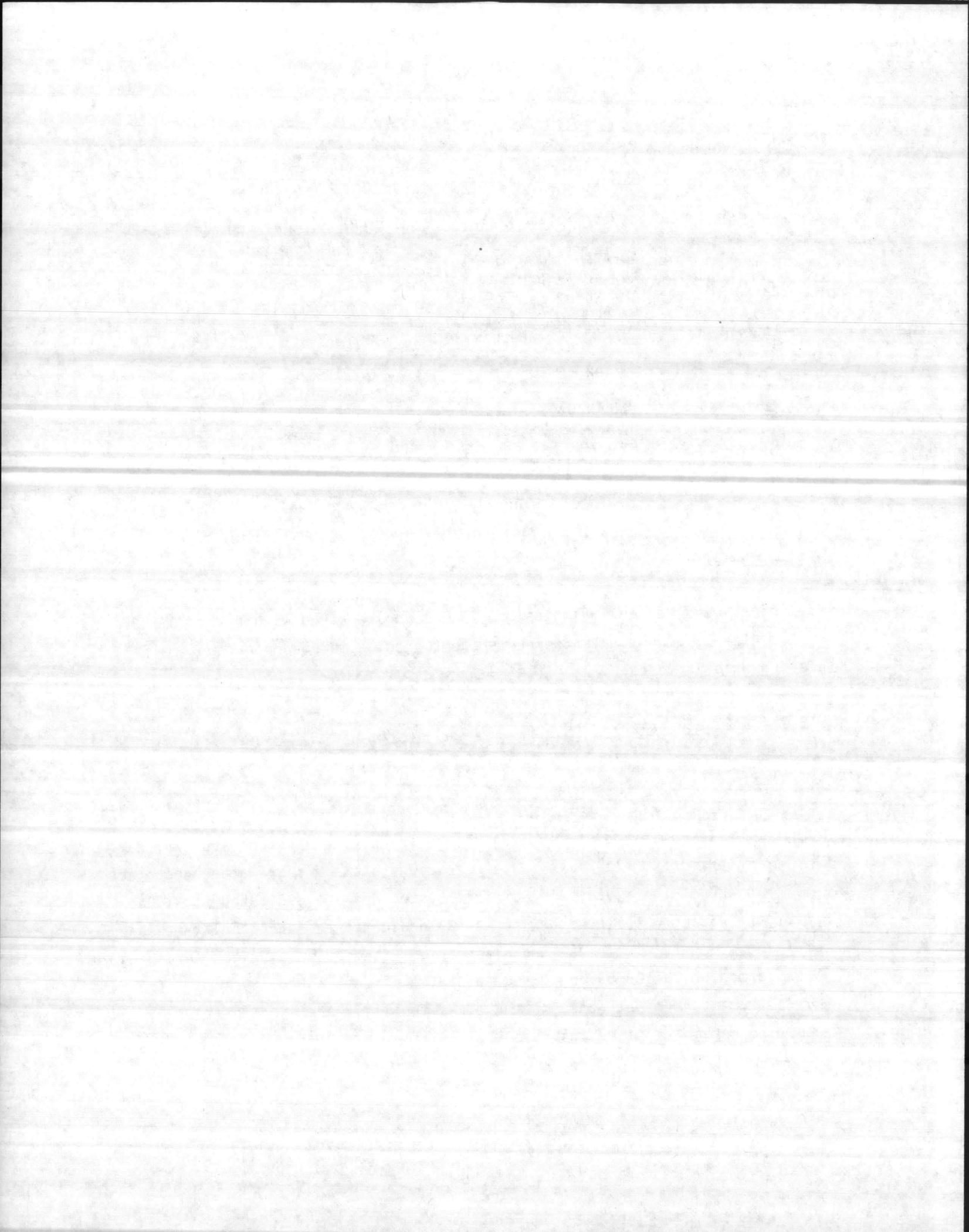
Recommendations:

Preliminary evaluation indicates growth will be required within the COM/NAV work center to accommodate the new systems and the more complex systems replacing existing ones.

5.2.2.4.2.2 Electrical Work Centers

Assessment:

This center is comprised of five (5) MFs for electrical systems and two (2) MFs for instruments. The five (5) electrical systems MFs are attached to an INU. Two (2) of the five (5) electrical system MFs are dedicated to Ni-Cad battery servicing with the other three (3) dedicated to functional testing and servicing of other electrical and electronic systems. Testing and servicing is performed on the CH-53 and CH-46 Automatic Flight Control Systems. The two (2) instruments MFs, attached to the fixed facility, are used for testing and repairing barometric type instruments.



Recommendations:

Additional space will be required to support V-22 requirements. Functional areas of the V-22 which will require support are as follows: Flight Controls - 14 WRAs; Displays - 10 WRAs; FLIR - 2 WRAs; and miscellaneous avionics - 20 WRAs. A detailed listing of these WRAs is available in the V-22 FRD. The electrical work center will experience the greatest growth of all avionic work centers. The magnitude of growth will be determined as discussed in paragraph 5.2.2.4. The V-22 METS concept will support flight controls maintenance efforts with two (2) to three (3) PIMAs, interface cables, and ancillary support equipment. Test and repair of displays and the FLIR will also be accomplished using the METS with the FLIR requiring a dedicated METS and possibly its own MF. METS will support test and repair of the miscellaneous avionics; however, the number of PIMAs is yet to be determined.

5.2.2.4.2.3 Miniature Component Work CenterAssessment:

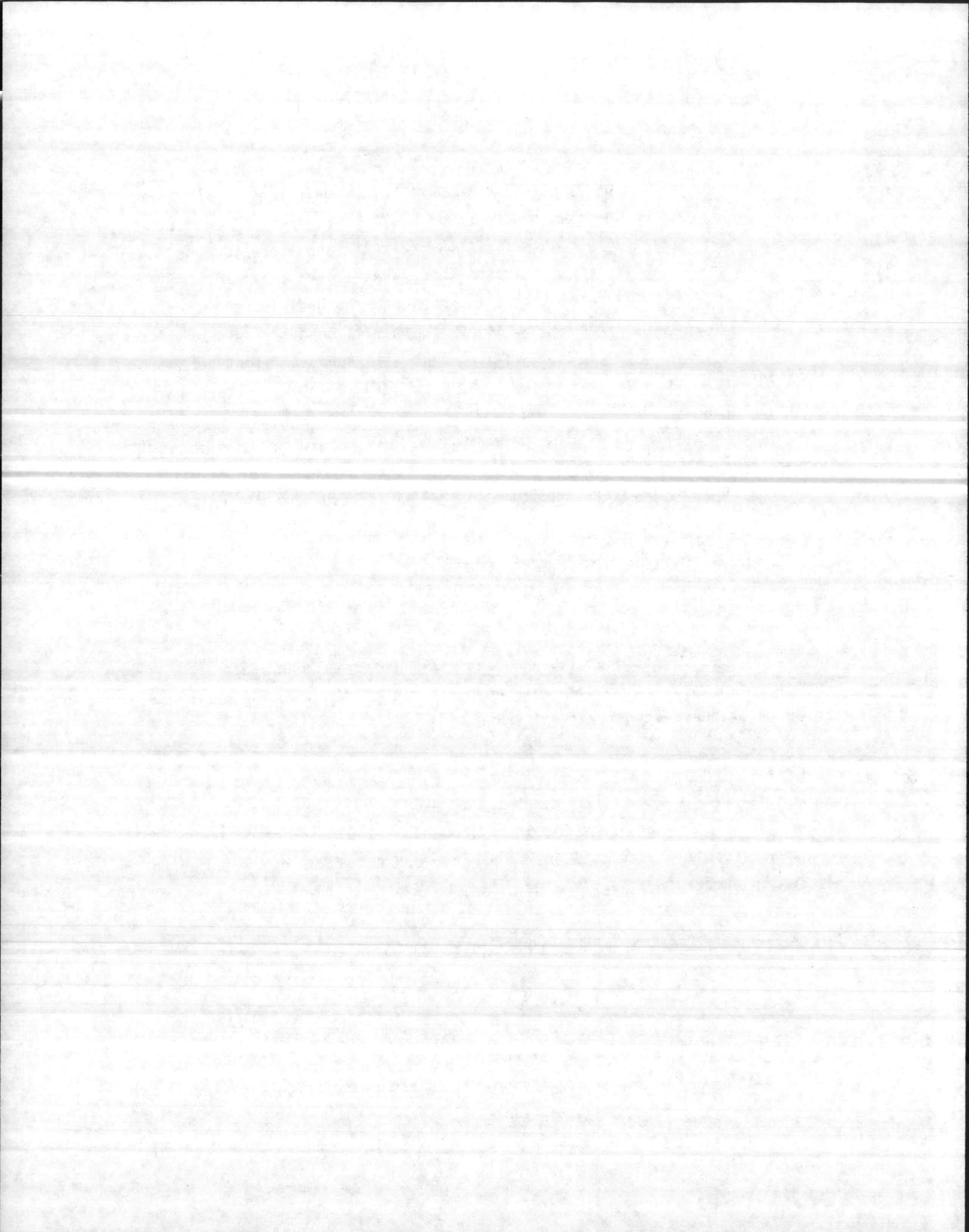
Two (2) MFs attached to an INU encompass the mini-comp work center. This work center performs all mini-comp maintenance for the IMA including micro-circuit board maintenance and silver soldering.

Recommendations:

Based on the current V-22 maintenance concept of fault isolation to the SRA and depot repair of faulty SRAs, some minor growth may be required due to the increased number of aircraft.

5.2.2.4.2.4 Corrosion Control Work CenterAssessment:

The Corrosion Control work center occupies two (2) MFs connected to an INU. The interiors of these MFs are customized to accommodate the tasks performed



within them. Included are vented storage cabinets for storing flammable and toxic materials. A water solvent spray booth, wash booth, and 110 psi air compressor are available for corrosion control for small WRAs. This work center should be adequate for supporting V-22 requirements; however, several WRAs are located in non-environmentally controlled areas of the aircraft which may impact the demand on this work center.

Recommendations:

None

5.2.2.4.2.5 Electronic Warfare Work Center

Assessment:

The electronic warfare work center performs functional testing and repairing of electronic countermeasures and secure voice equipment inside two (2) MFs attached to the fixed facility. Introduction of the V-22 aircraft will increase the workload on this center due to the increased aircraft inventory and introduction of new, additional systems.

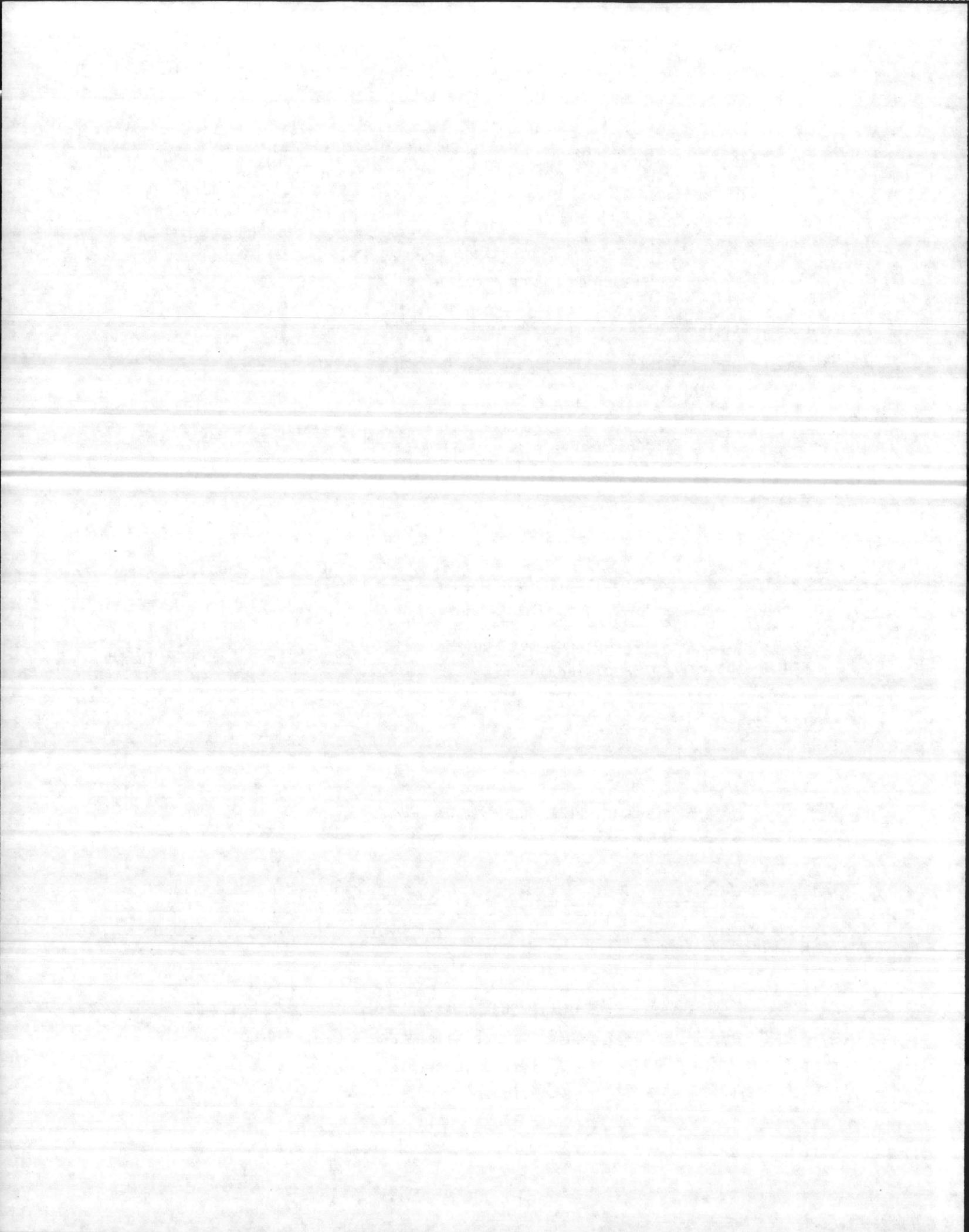
Recommendations:

Preliminary evaluation indicates growth will be required within this work center. The magnitude of this change will be developed as discussed in paragraph 5.2.2.4.

5.2.2.4.2.6 Calibration Work Center

Assessment:

Similar to the EW work center, the Calibration Work Center comprises two (2) MFs attached to the fixed facility. This work center calibrates electronic test equipment and mechanical instruments within its maintenance capability. The introduction of V-22 unique avionics will place increased demands on this



facility. The number and types of different METS and PIMAs required to support the V-22 has not been determined and space requirements are difficult to quantify.

Recommendations:

None pending further analysis.

5.2.2.5 211 75 Survival Equipment Shop

Assessment:

The HM&S-26 survival equipment shop currently has no requirement to support oxygen/nitrogen servicing. Oxygen/nitrogen servicing will be required for the V-22 OBIGGS/OBOGS, aircrew oxygen bottles, and related equipment.

Recommendations:

Provide additional space for oxygen/nitrogen servicing support of the V-22. The survival equipment shop at HM&S-29 is adequate and should be used as a guide for alteration planning of the HM&S-26 survival equipment shop.

5.2.2.6 218 50 Battery Shop

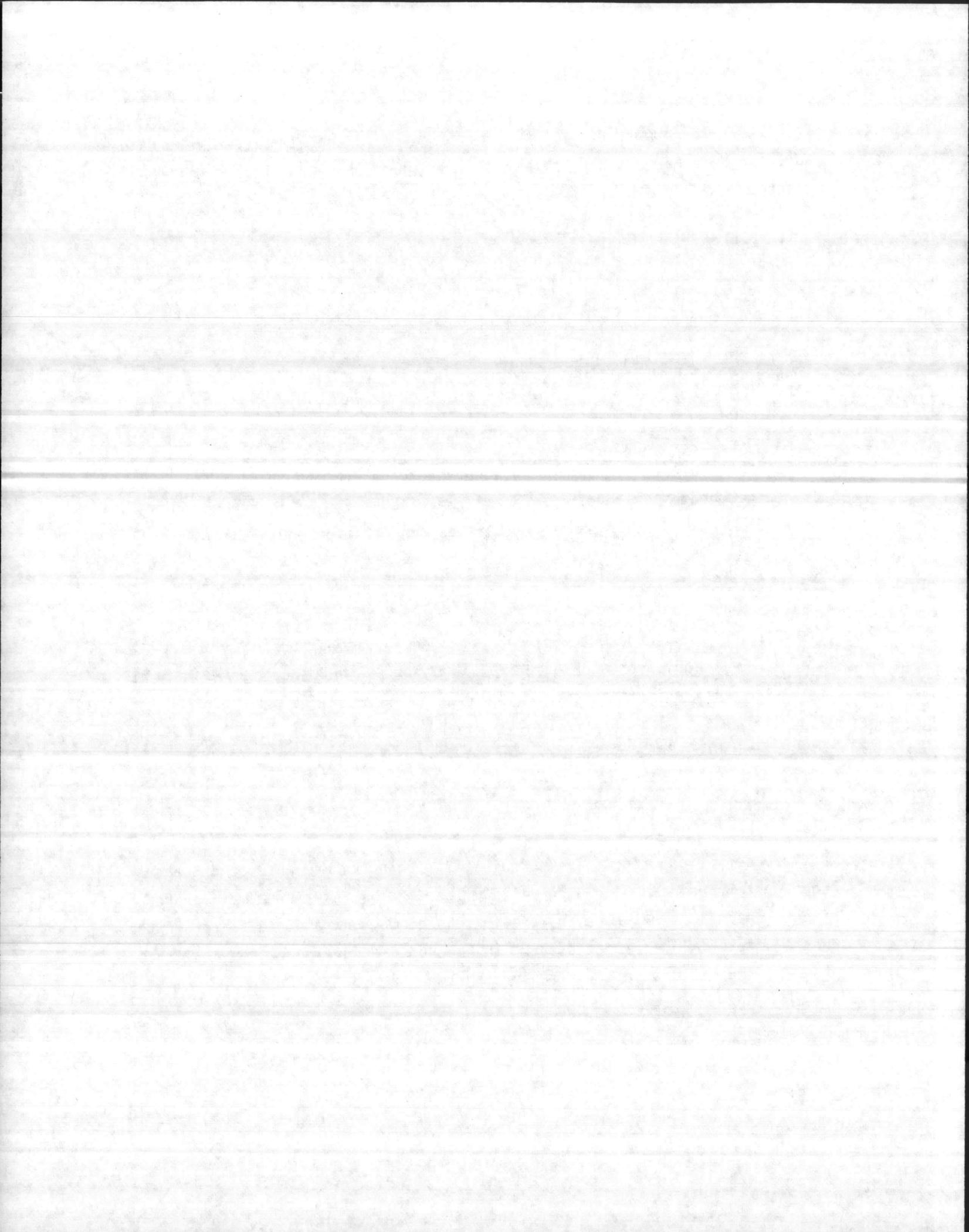
Assessment:

Battery servicing efforts are coordinated within the MAG-26 Ground Support Equipment Shop located in Bldg. 4146. The V-22 battery is a "maintenance free" lead-acid type; however, a quick charge may be required to return the battery to a fully charged state. The method of charging batteries within the GSE shop is adequate for supporting the V-22.

charging to done at GSEs

Recommendations:

None.



5.2.2.7 218 60 GSE Shop (IMA)Assessment:

The existing MAG-26 shop space located in Bldg. 4146 is inadequate for support of the existing aircraft. Due to the increased number of aircraft and the addition of electric driven MMG-1A MEPPs and electric driven hydraulic carts in lieu of the diesel driven units currently used within the hangars for servicing/maintenance, there will be an increase in the quantities of GSE assigned to MAG-26.

MAG-26 will each support additional maintenance requirements of the following GSE:

<u>Part/Model</u>	<u>Nomen.</u>	<u>H</u>	<u>W</u>	<u>L</u>	<u>Qty/Sqdrn</u>	<u>Total</u>
MMG-1A	MEPP	42 in	50 in	94 in	5	25
AHT-63	Hyd Cart	48 in	48 in	82 in	2	10
B-1	Maint. Stand	36 in	48 in	132 in	2	10

High frequency usage will result in the requirement for performing maintenance on the above GSE units within the GSE shop.

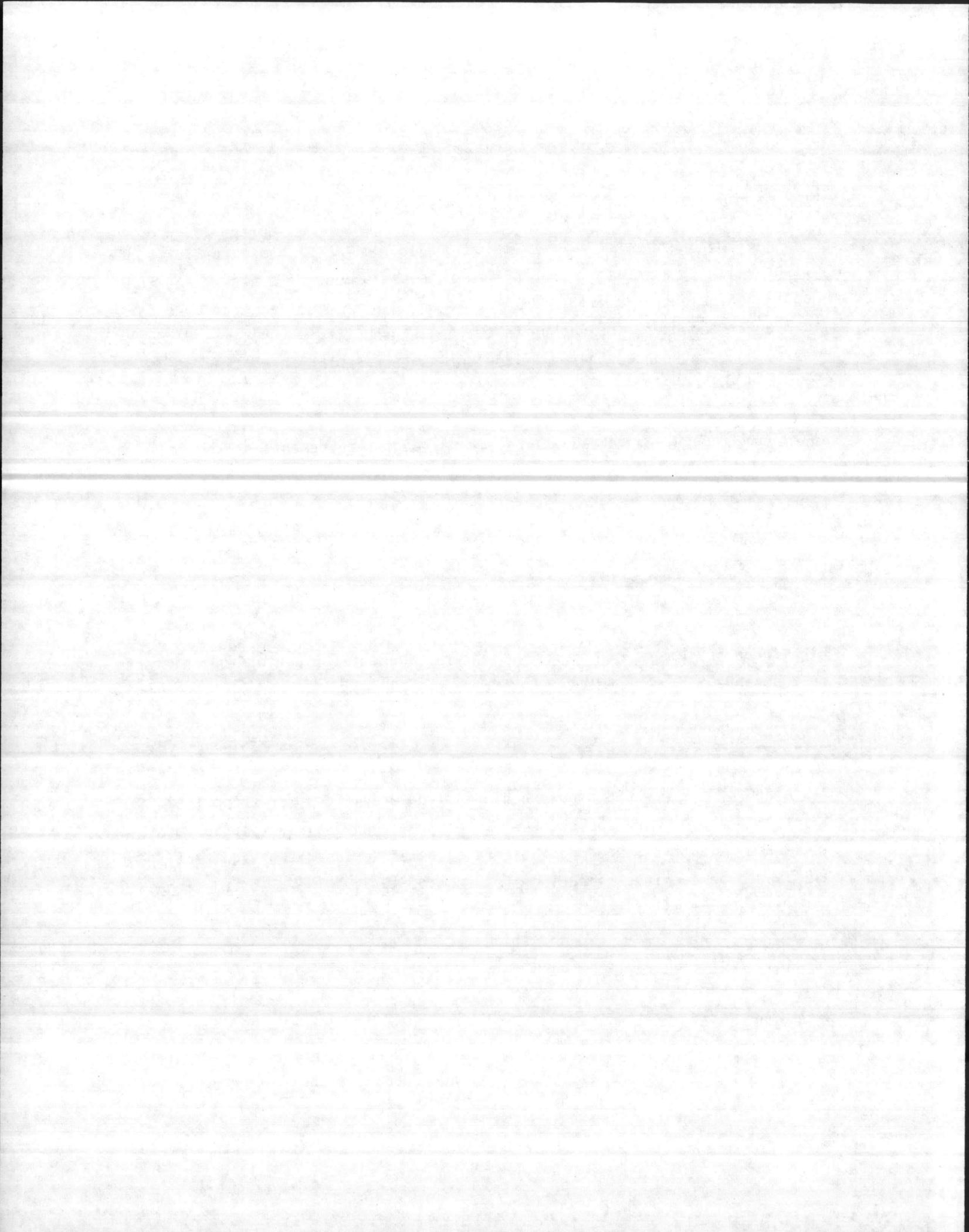
Recommendation:

Planning for the new GSE shops should include provisions for support of CSE identified above. The GSE shops will require mechanical ventilation and blower system, electrical and pneumatic receptacles for operation and testing of GSE, and door openings measuring a minimum of 10 ft. wide x 15 ft. high to enable passage of all GSE including maintenance stands.

*New BFEEL
RARN*

5.2.2.8 218 61 GSE Holding ShedAssessment:

MAG-26 will each require additional storage space for the following GSE:



- Two (2) power plant units per squadron (Qty 10)
- Two (2) hydraulic jennies per squadron (Qty 10)
- Two (2) maintenance stands per squadron (Qty 10)
- One (1) PSE aircraft sling per MAG (Qty 1)
(approx. 72 in H x 90 in W x 120 in L)

Recommendation:

An upgraded IMA GSE shed is required at MAG-26. The upgraded GSE shed should be of adequate size to compensate for the addition of electric driven GSE, MMG-1A mobile electric power plants, AHT-63 hydraulic carts, and B-1 maintenance stands. The GSE shed should also include a dedicated area for stowage of oxygen and nitrogen bottles. Current planning for new GSE sheds at MAG-26 should include the addition of all V-22 weapon system requirements.

New shed requirement

5.2.2.9 Composite Repair Shop (IMA)

Assessment:

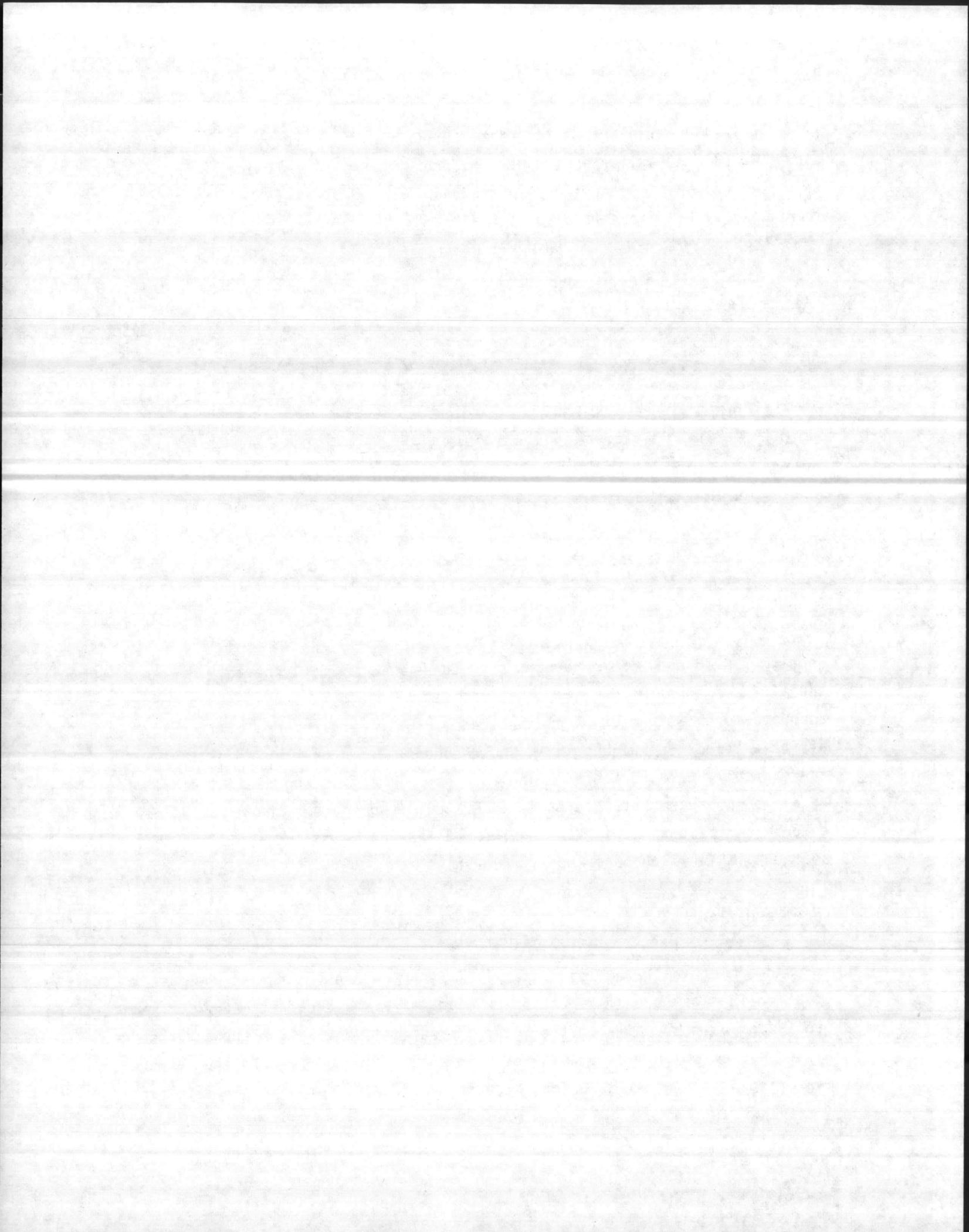
Repair of H-46 and H-53 honeycomb structures are currently performed within the airframe shops at MAG-26. The ventilation and exhaust systems are inadequate to satisfy mechanical and bonded repair requirements of the V-22 airframe structure. The primary and secondary structures/skins of the V-22 are basically constructed of Graphite/Epoxy. The existing dedicated area for repair of honeycomb structures is adequate for support of the H-53. A new composite repair shop will be required at MAG-26 IMA for repair of primary and secondary WRAs which are readily removable.

Recommendation:

This is a good study.

It is recommended that a composite repair shop be constructed at a suitable location in close proximity to the existing airframe shops at MAG-26 to expedite composite repairs of the V-22. Mechanical ventilation and a mechanical blower system which will provide six (6) air changes per minute and a space measuring 30 x 40 feet x 10 feet high is required to satisfy composite repair

possibly over AS-57 by M over all graphite



of the V-22 aircraft. A 110 psi minimum air supply, two (2) 220V/60 Hz/3 PH and four (4) 115V/60 Hz/1 PH electrical receptacles will be required for operation of floor mounted, bench mounted, and portable hand type equipment. The door opening should be a minimum of six (6) feet wide to enable passage of larger size components such as the wing-to-fuselage fairings, landing gear doors, rotor blades, and vertical stabilizer.

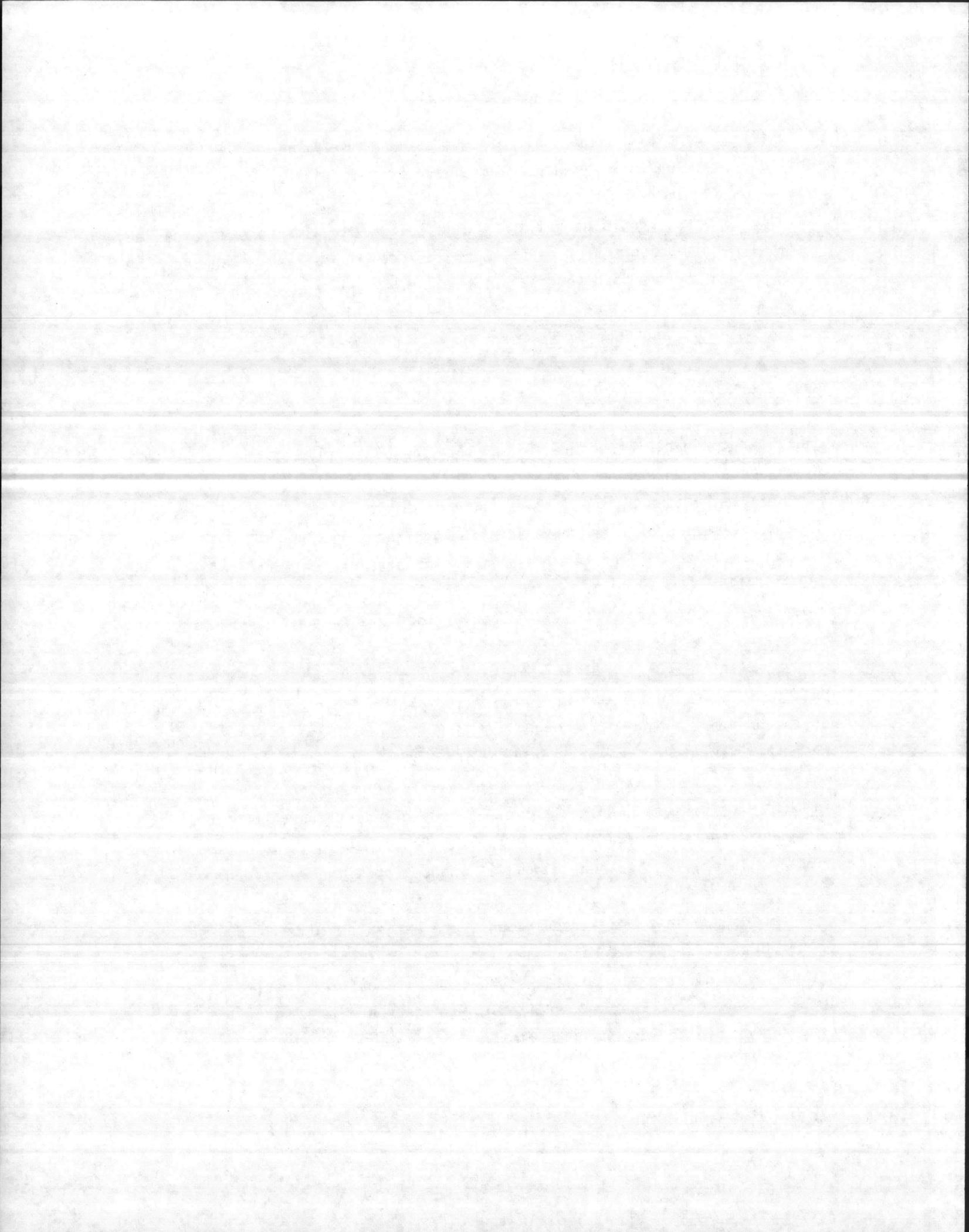
5.2.3 441 10 Group Supply Warehouse

Assessment

MAG-26 Group Supply Warehouse (Bldg. 424) possesses 40,000 square feet of floor space of which one-fourth is dedicated to non-aviation supply material. Stock is segregated by repairables and consumables with no consideration for type/model/series of aircraft. Shipping and receiving docks are located in one corner of the warehouse with an adjacent area dedicated to CSP build-up and breakdown (80' x 40'). Typical storage consists of 3-high racks, multi-shelf cabinets (stacked), and bulk floor area space. Inside storage area is filled to capacity.

Outside storage consists of a 15 foot wide platform dock running the length of the building on both the front and back sides. These areas are shielded from the elements by an overhanging roof. Hazardous materials stored in open wood cabinets, bulk material, wood crates, and reusable containers are stored in this area. Blade, engine, and other reusable containers are stored in an open, unprotected area adjacent to the warehouse. A 30' x 30' x 20' cinder block building, located near Bldg. 424, houses undefined hazardous materials.

V-22 inside spares storage requirements are estimated to be 10,800 square feet. Current supply storage space is filled to capacity and unable to support V-22 requirements. Outside storage requirements are estimated to be 10,675 square feet. Current available outside space is also filled to capacity and unable to support V-22 requirements.



Recommendations

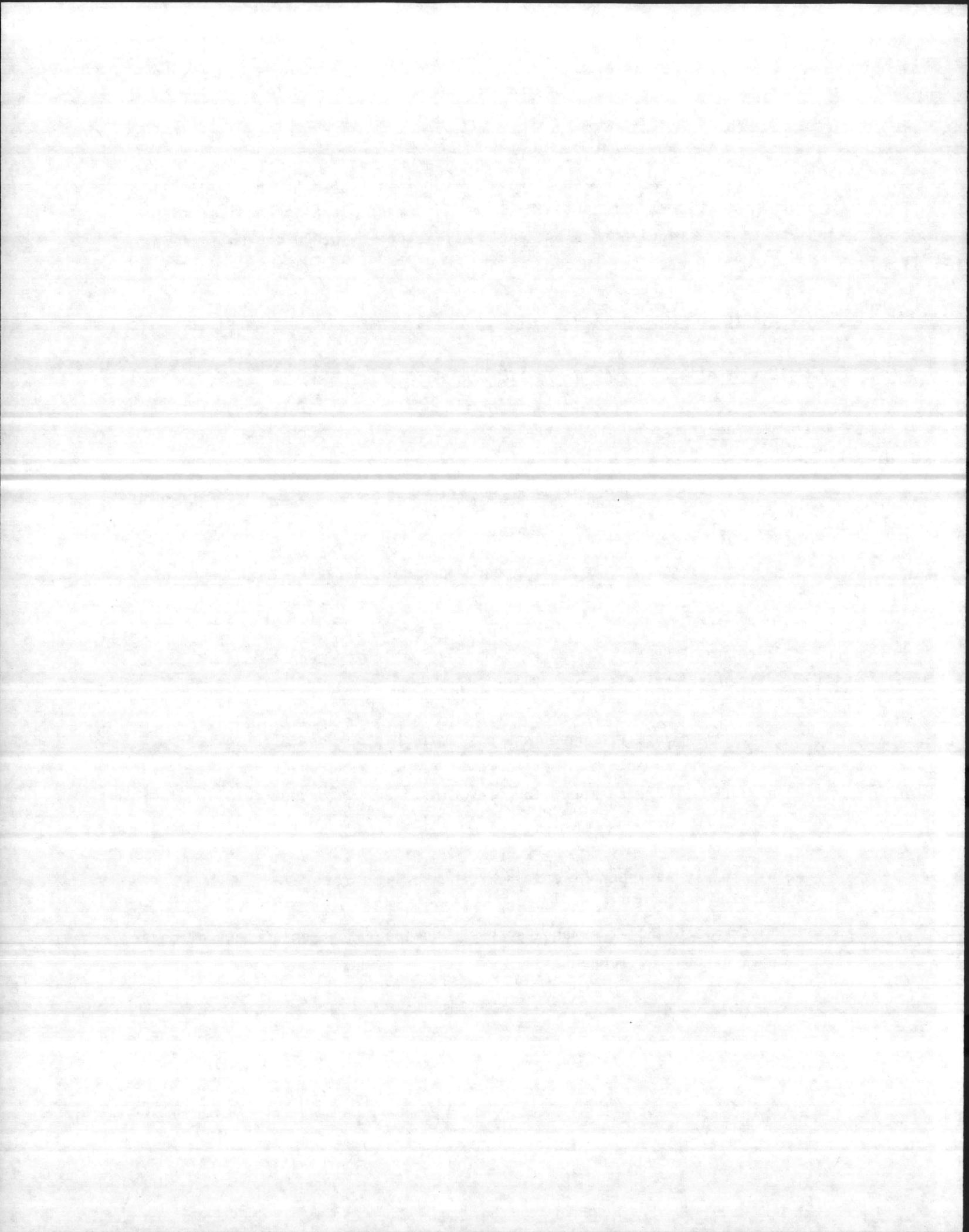
Current facilities planning (Project No. P-185) forecasts the completion of a 60,000 square feet warehouse in 1989. Recommend planning consideration be given to V-22 requirements presently estimated at 10,800 square feet inside and 10,675 square feet outside.

5.3 Marine Air Group - 29

5.3.1 Operational Maintenance Activity Facilities

General Comments

- All of the existing OH spaces currently used by operation squadrons are adequate for support of the V-22 Weapon System provided a Type 1 hangar is built to alleviate the overcrowded conditions found in Bldg. 4108. Hanger design should be in accordance with NAVFAC P272, Drawing No. 1291710.
- Electrical supply and connections available for connecting the electric driven hydraulic stand, AHT-63 which requires 440V, 60 Hz, 3 Ph, 50 KVA.
- Electrical supply/connections not available for operation of the electric driven MMG-1A Mobile Electric Power Plant (MEPP) which requires 440V, 60 Hz, 3 Ph, 100 amps input for providing a 60 KVA output for ground testing/maintenance of the V-22 Avionics/Flight Control Systems.
- Air supply and connections are adequate.
- Monorail and hoist arrangements are adequate for replacement of major V-22 aircraft components.



5.3.1.1 Bldg. 4100Assessment:

- This building is a standard Type I Maintenance Hangar, in accordance with NAVFAC P272, Drawing No. 1291710.
- The OH Space is 100 ft. wide x 192 ft. long.
- This building is currently used for support of HMH 464 Squadron which consists of 15 CH-53E Aircraft.

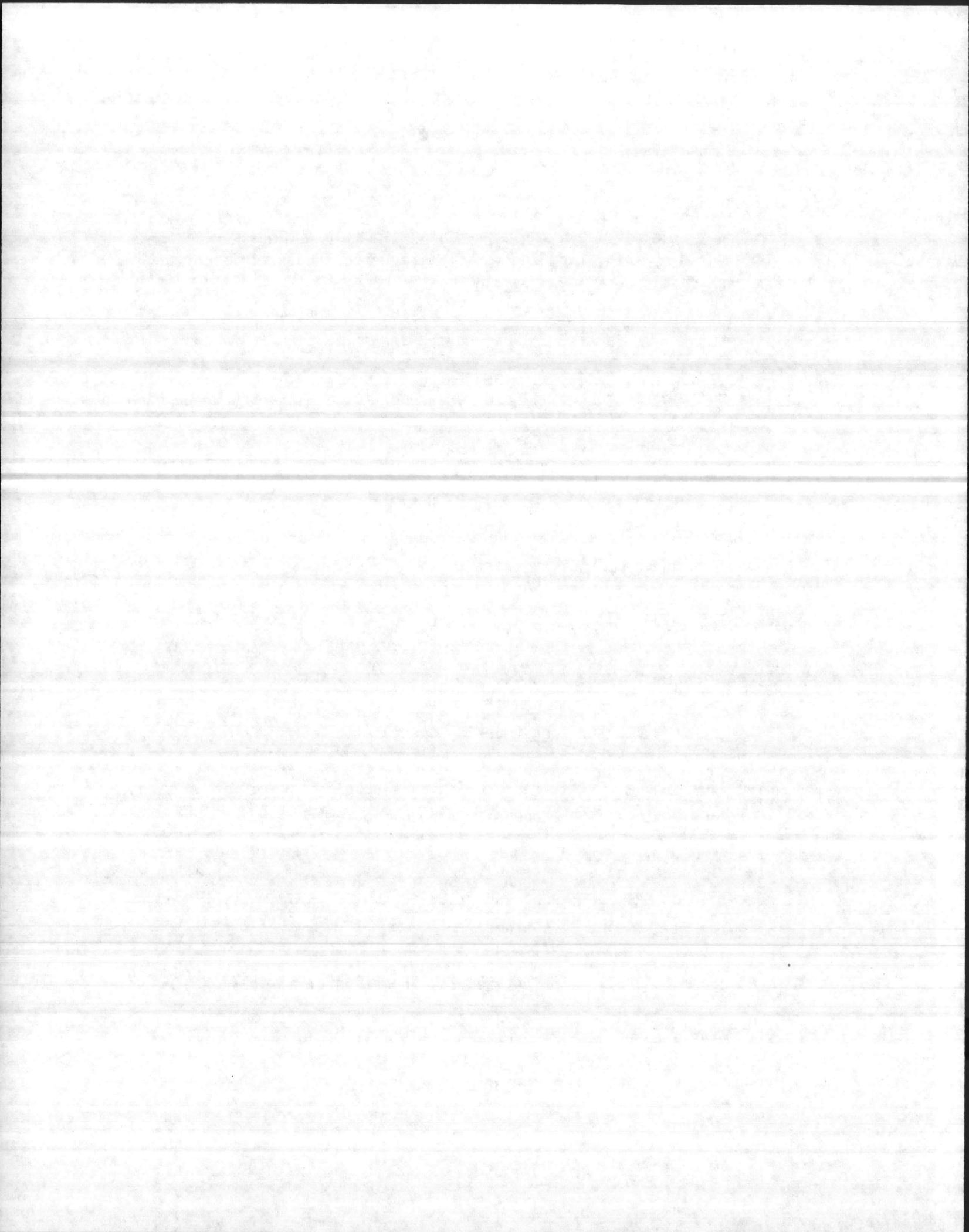
Recommendations:

This building should be considered a candidate for support of one (1) operational squadron of V-22 Aircraft.

JMO

5.3.1.2 Bldg. 4108Assessment

- 90 ft. wide x 645 ft. long (working space).
 - Electrical and pneumatic receptacles available for operation of hand tools and equipment for composite bonded repairs.
 - Electric power/connectors, 440V, 60 Hz, 3 Ph, 100 AMPS not available for operation of MMG-1A MEPP at an output 60 KVA for ground testing of Avionics/Flight Control Systems.
 - 4000 pound monorail with four separate hoists available.
-
- Height of hangar doors and hoist hooks compatible with nacelles in vertical position.



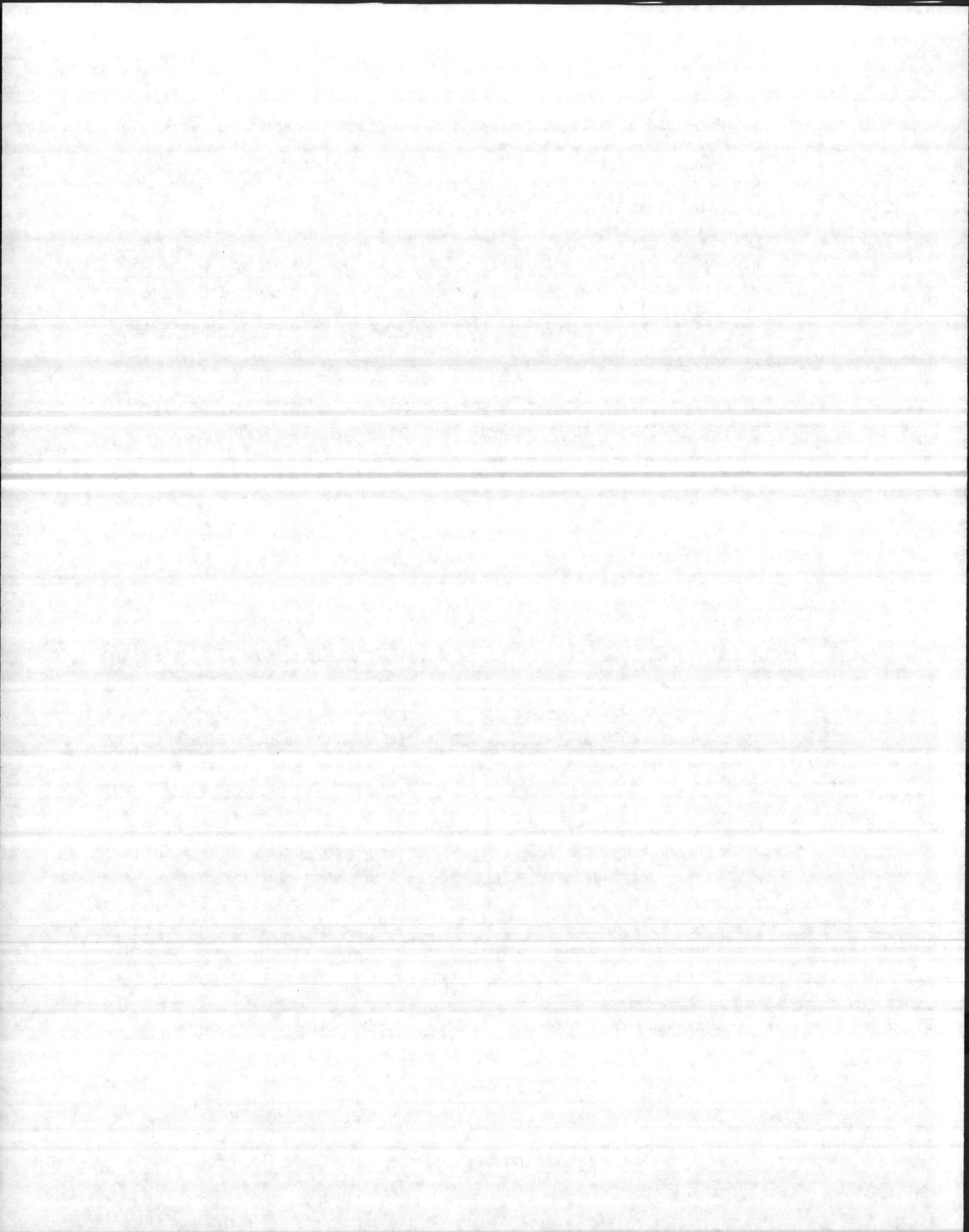
- 25 OHM grounding receptacles embedded in concrete deck.
- Height of hangar doors and hook height of hoists compatible with nacelles in the vertical position.
- This building is currently used beyond capacity for support of HMM-162, HMM-263, HMM-365, HMA-269, and VMO-1. A total of thirty-six (36) CH-46, nine (9) UH-1N, nine (9) AH-1J/T, and ten (10) OV-10 aircraft are supported by the 0H, 01, and 02 spaces of this building.
- Due to shop and storage space constraints at the organizational level, HMM-263 has the men's head serving collateral duty as the Survival Equipment Shop and storage area.
- Space is not available to support ECAMS as discussed in paragraph 5.2.1.2 under "Particulars:".

Recommendations:

- This building should be considered a prime candidate for support of three (3) V-22 operational squadrons.
- Construct a new Type 1 Maintenance Hangar in accordance with NAVFAC P272, Drawing No. 1291710.
- Provide electric supply/connections, 440V, 60 Hz, 3 Ph, 100 AMPS, for connecting/operation of GSE MMG-1A MEPP at 60 KVA output for ground testing the V-22 Avionics/Flight Control Systems.
- Provide dedicated area for Survival Equipment Shop and storage area.

There are only 3 V-22 spaces in MA 6-24. They have already proposed for

*P-404
P-12, 17A*

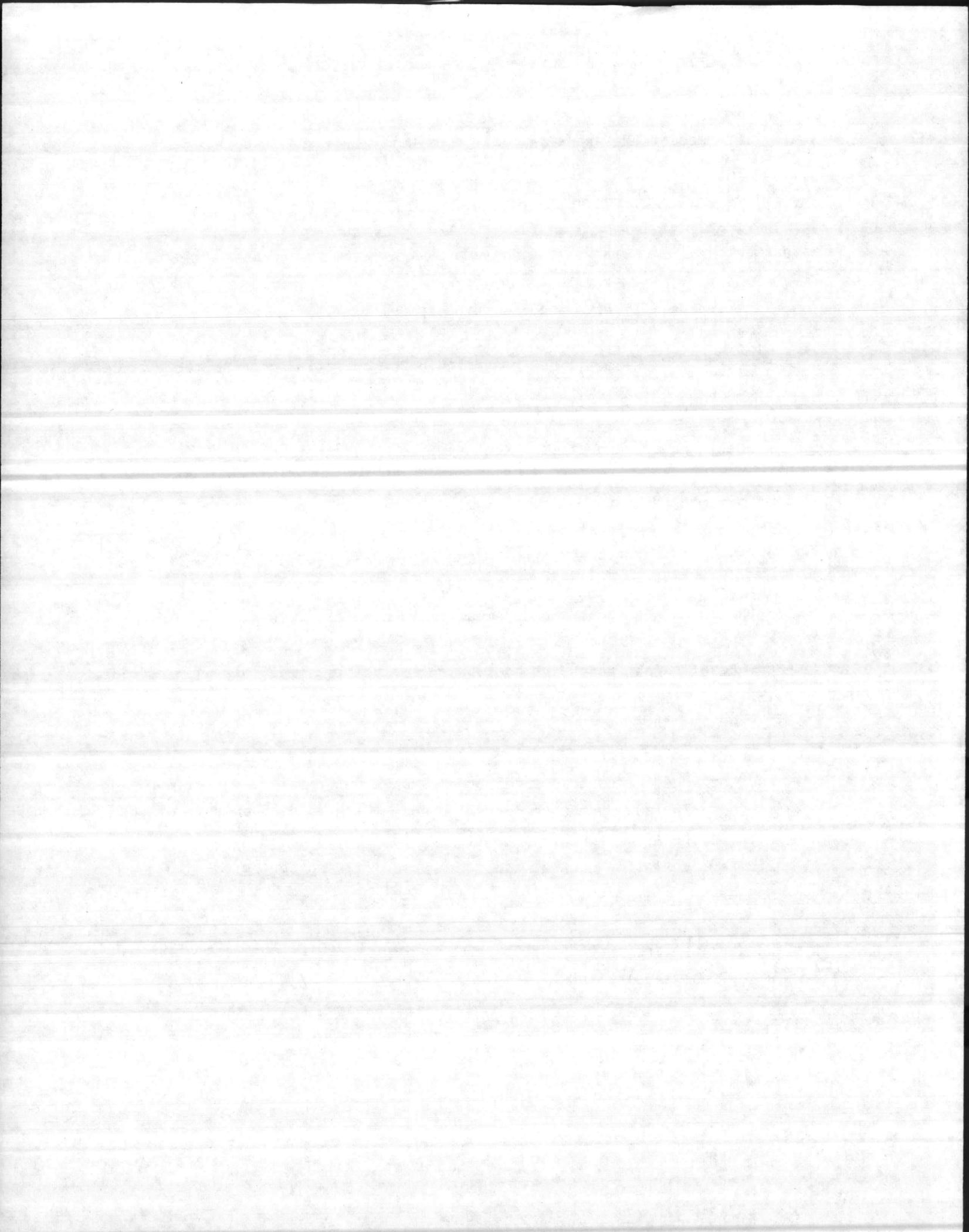


5.3.2 Intermediate Maintenance Facilities Activity

5.3.2.1 Bldg. 4106 IMA Hangar

Assessment:

- 91 ft. wide x 161 ft. long (working space)
 - Electric and pneumatic power available for operation of hand tools and equipment for composite repair.
 - Electric power/connectors output 440V, 60 Hz, 3 Ph, 100 AMPS, not available for operation of MMG-1A MEPP, 60 KVA output for ground testing of avionics/flight control systems.
 - Monorail with four (4) hoists, 4000 pound capacity is available.
 - 25 OHM grounding receptacles embedded in concrete deck.
 - Height of hangar doors and hook height of hoists compatible with nacelles in the vertical position.
 - 01 Work Centers are adequate for support of IMA requirements excepts for lack of a dedicated composite repair shop and corrosion control work center. The new corrosion control hangar which is planned for construction in the area of H&MS-26, Building 518, should be adequate for on-aircraft corrosion control and/or x-ray NDI for support of MAG-26 and MAG-29.
 - 02 Work Centers are adequate for support of V-22 IMA administrative and ready room requirements.
-



Recommendations:

The building, except for a lack of electrical power/connectors, a composite repair shop, and a corrosion control hangar, is adequate for IMA support of the V-22 Weapon System.

5.3.2.2 211 08 Airframe Shop5.3.2.2.1 Tire and Wheel ShopAssessment:

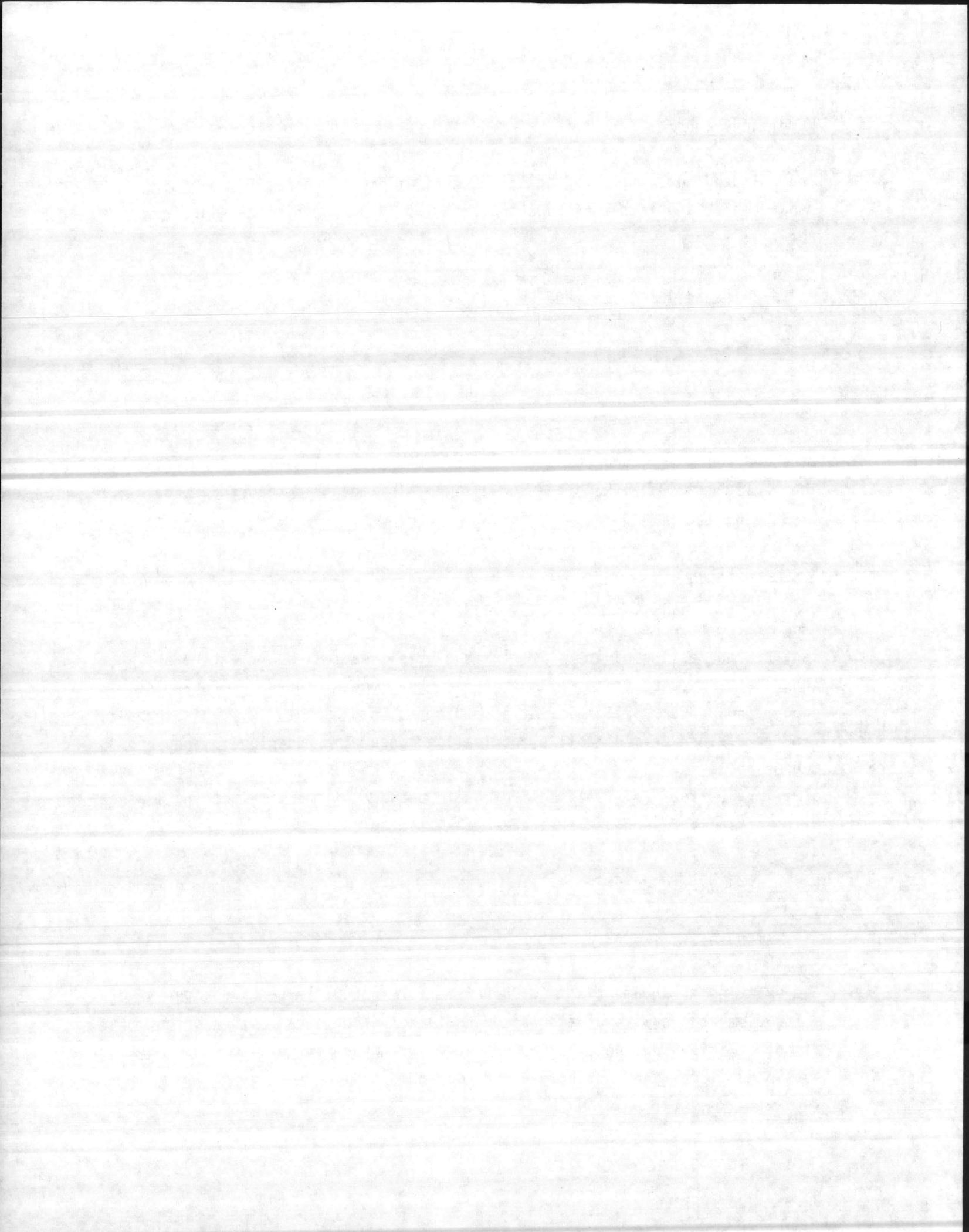
Tire and wheel maintenance at MAG-29 is performed in an area of the airframe shop. Tire and wheel maintenance equipment includes a bead breaker, safety tire cage, stowage racks, tire inflation equipment, and hand tools.

Recommendation:

A dedicated tire and wheel shop/area is required at MAG-29 for servicing, repair, and testing of the V-22 tire and wheel assemblies. The tire and wheel shop/area should be sized for installation of a bead breaker, safety tire cage, stowage racks, tire inflation equipment, and hand tools. This shop will require a clean environment, electrical and pneumatic receptacles, and a space measuring 10 ft. high x 30 ft. wide x 40 ft. long with door openings measuring a minimum of four (4) feet wide to enable passage of the tire and wheel assemblies of the V-22 and other aircraft assigned to MAG-29.

5.3.2.2.2 NDI ShopAssessment:

The existing arrangement at MAG-29 for performing NDI testing and storage of NDI equipment consists of a shop and equipment storage van. This arrangement is not efficient and requires excessive maintenance manhours for equipment set-up and local handling between the van and shop.



Recommendation:

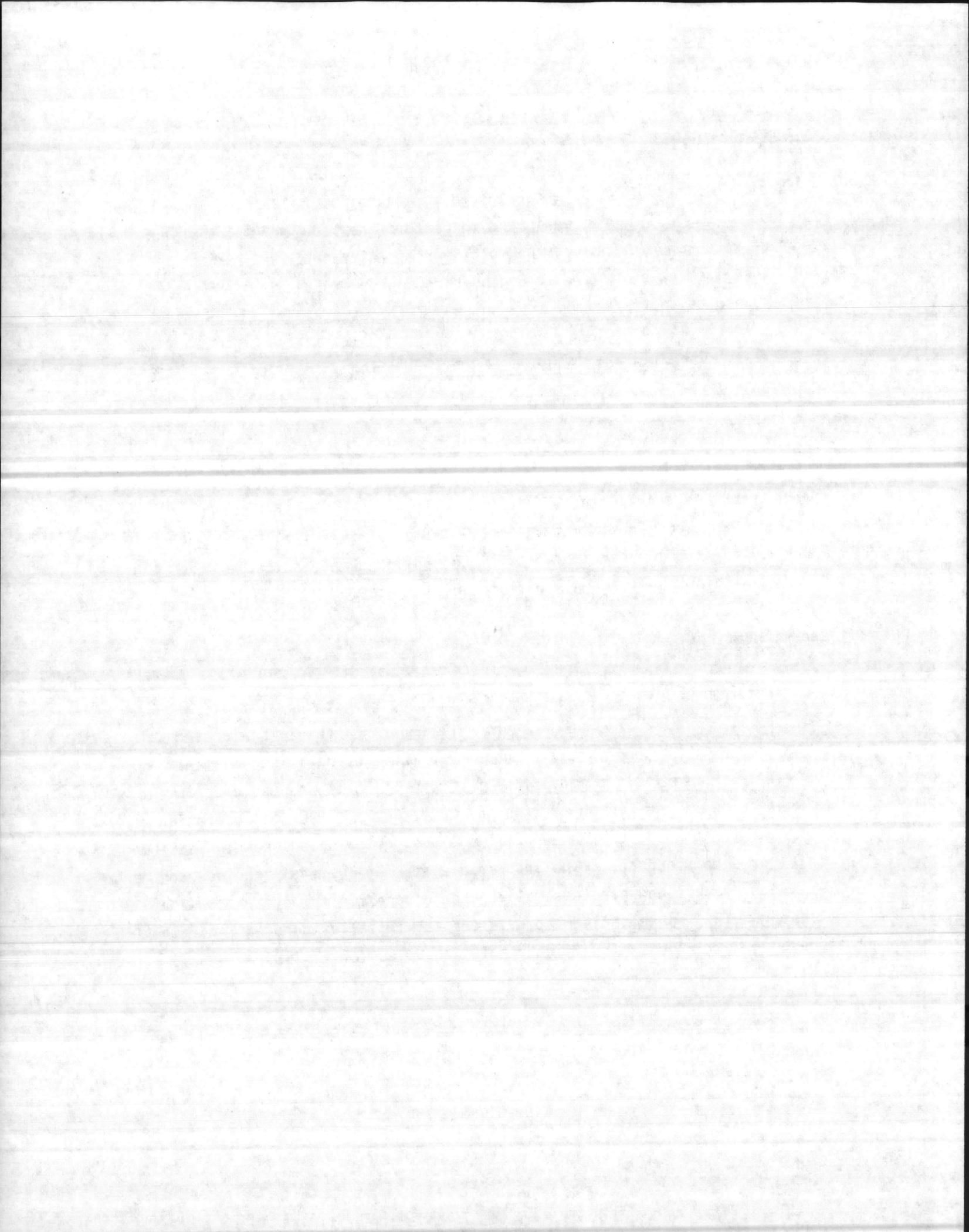
Expansion of the NDI shop be considered to include storage of equipment and on-demand availability of equipment to perform the required NDI testing. The storage space should include the multi-purpose ultrasonic equipment currently under development by Naval Air Engineering Center (NAEC), Lakehurst, N.J., which measures approximately 2 ft. high x 2 ft. wide x 3 ft. long.

5.3.2.2.3 Hydraulic Hose and Tube Assembly ShopAssessment:

Existing cutting tools for repair and/or manufacturing of hydraulic hose and tube assemblies are located within the airframe shop at MAG-29. During the cutting operations, dust, metal chips, etc. are not controlled and have the tendency to enter the environmentally controlled paint enclosure which is located within the airframe shop located at MAG-29.

Recommendation:

A dedicated shop/area be considered for cutting raw stock materials such as aluminum, CRES, titanium, and rubber. The shop/area should be located in close proximity to the hydraulic shop where the testing is accomplished. The shop/areas should include provisions for connecting of pneumatic equipment which require 110 psi for operation and 220V, 60 Hz, 3 Ph. for operation of floor mounted equipment such as drill presses, grinding and sanding equipment, radial saws and bandsaws. The shop/area space for cutting, bending, and manufacturing of tube and hose assemblies should be a minimum of 20 ft. wide x 40 ft. long. This space includes provisions for installation of a floor mounted tube bending fixture which is currently scheduled for FY 1989 at MAG-29.



5.3.2.2.4 Floor Mounted Tube Bending Fixture

Assessment:

Planning for installation of a floor mounted tube bending fixture at MAG-26 and MAG-29 is scheduled for FY 1989. The requirements for tube bending of titanium tubing for the V-22 aircraft includes checking for 3 percent ovality. Selection of the floor mounted tube bending fixture should consider the V-22 requirements which are more stringent than that for existing tube bending of Type 304, 1/8 hard CRES tubing required for support of existing aircraft located at MAG-29.

Recommendation:

Criteria and/or specifications pertaining to the proposed floor mounted tube bending fixture be forwarded to Bell-Boeing for analysis and determination of adequacy for bending titanium tubing within 3 percent ovality to meet the V-22 requirements. The floor mounted tube bending fixture should provide the capability for bending all type materials such as aluminum, CRES (21-6-9) and titanium within specified tolerances. Verification of the bending fixture should be accomplished at the selected vendor facility prior to shipment to MAG-29.

5.3.2.3 211 21 Engine Maintenance Shop

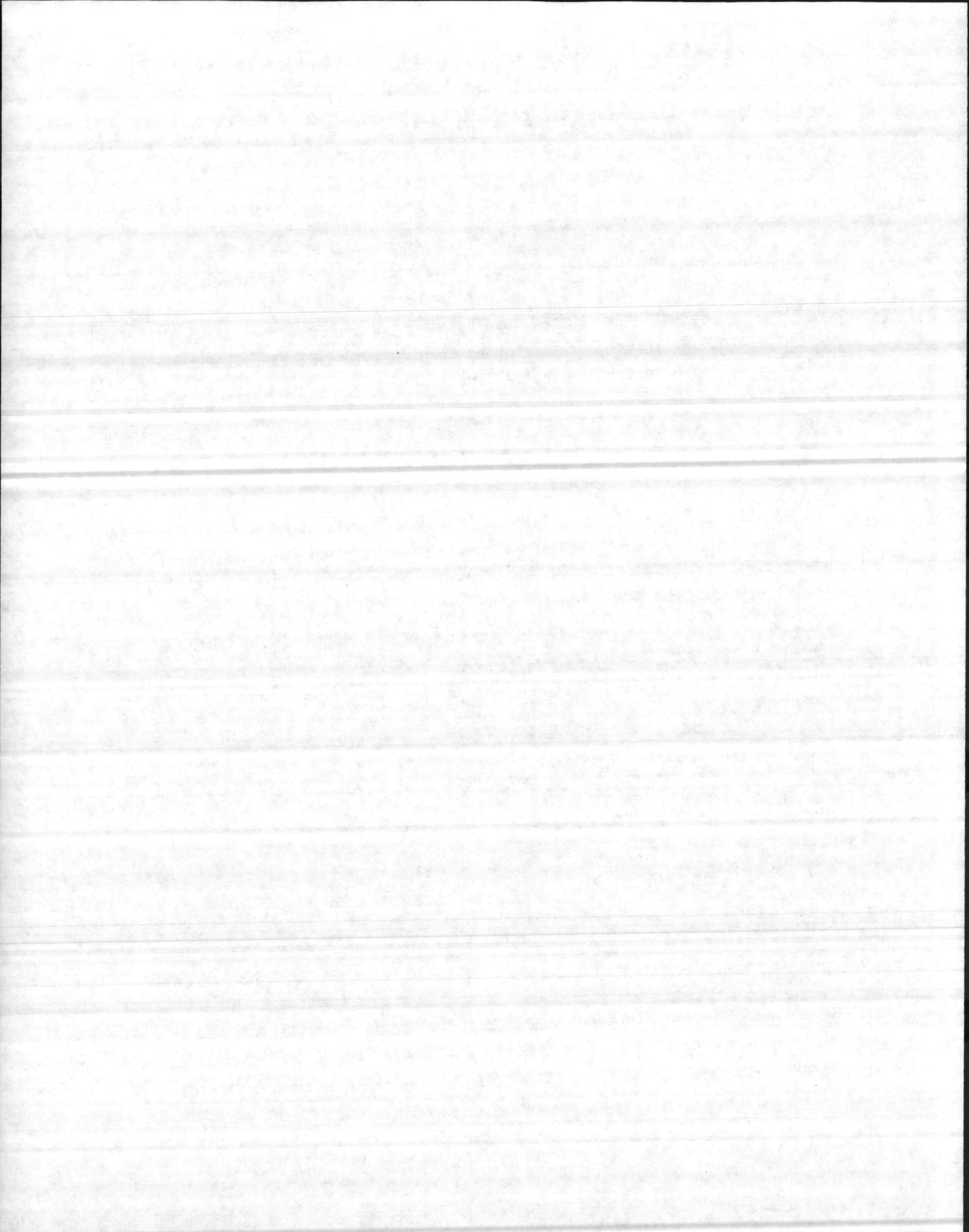
To be provided by NAVAIR/Allison.

5.3.2.4 211 45 Avionics Shop

Assessment:

The MAG-29 Avionics Shop supports essentially the same requirements as MAG-26 with the following exceptions: (1) there is no fixed facility at MAG-29, all MFs are interconnected to form one MF complex; (2) the MAG-29 complex contains a double wide mobile facility (DWMF) for the AAS-36 FLIR used on the OV-10;

there is a fixed facility in 4106. Also P-45 avionics space



(3) all secure voice and ECW maintenance and storage is conducted within the MF complex at MAG-29; (4) one MAG-29 MF is dedicated for the Hughes TOW missile ATE station; and (5) the COM/NAV Work Center and a fenced in area for test and calibration equipment storage is located within the HM&S-29 01 spaces.

Recommendations:

The analysis of the MAG-26 IMA Avionics Shop, provided in paragraphs 5.2.2.4 thru 5.2.2.4.2.6, should be used for MAG-29.

5.3.2.5 211 75 Survival Equipment Shop

Assessment:

The survival equipment shop covers approximately 2700 square feet (56 ft. x 31 ft.) of shop space with two (2) 10 ft. x 10.5 ft. doors. A second room (25 ft. x 18 ft.) contains support equipment such as a N₂ recharger, O₂ regulator test stand, and halogen fire bottle recharges. These shop spaces with attendant utilities are adequate for supporting the V-22.

P-451 HM 21166. modify survival shop

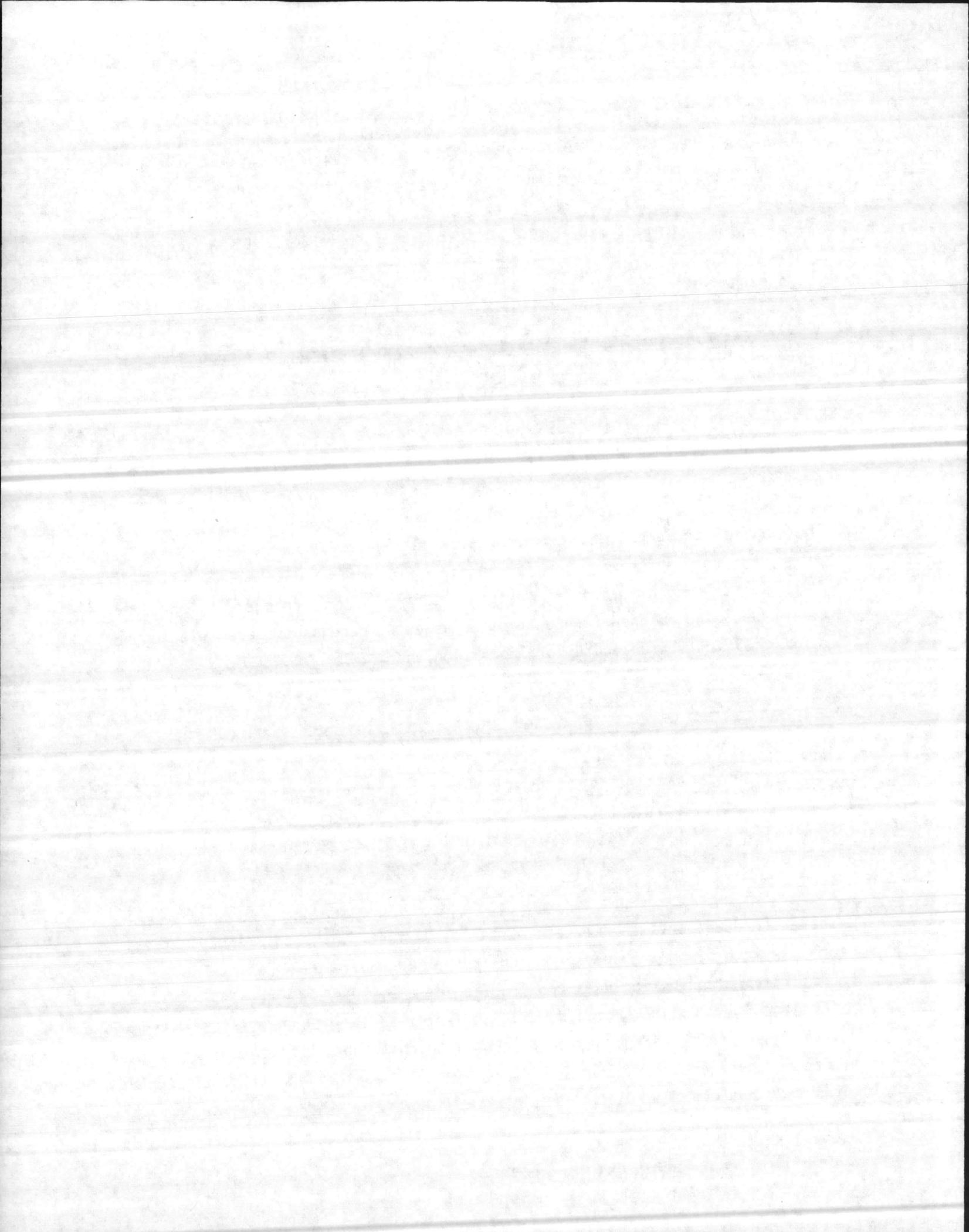
Recommendations:

None

5.3.2.6 218 50 Battery Shop:

Assessment:

Whereas MAG-26 services aircraft batteries in their GSE shed, MAG-29 batteries are serviced by HM&S-29 personnel due to the lack of a GSE shed at MAG-29. Facilities planning includes construction of a 9,400 square feet GSE Facility (Project Nu. P-211). Since the V-22 battery is a "maintenance free" lead-acid type only a quick charge may be necessary to fully charge batteries which have been in storage for any length of time. MAG-29 has the capability to support the V-22 battery.



Recommendation:

In so far that MAG-29 and MAG-26 are considered mirror images it is recommended that Project No. P-211 include a dedicated area for aircraft battery servicing.

5.3.2.7 218 60 GSE Shop (IMA)

Assessment:

MAG-29 does not have a dedicated shop for GSE maintenance. Due to the increased number of aircraft and the addition of electric driven MMG-1A MEPPs and electric driven hydraulic carts in lieu of the diesel driven units currently used within the hangars for servicing/maintenance, there will be an increase in the quantities of GSE to support V-22 aircraft which will be assigned to MAG-29.

MAG-29 will each support additional maintenance requirements of the following GSE:

<u>Part/Model</u>	<u>Nomen.</u>	<u>H</u>	<u>W</u>	<u>L</u>	<u>Qty/Sqdrn</u>	<u>Total</u>
MMG-1A	MEPP	42 in	50 in	94 in	5	15
AHT-63	Hyd Cart	48 in	48 in	82 in	2	6
B-1	Maint. Stand	36 in	48 in	132 in	2	6

High frequency usage will result in the requirement for performing maintenance on the above GSE units within the GSE shop.

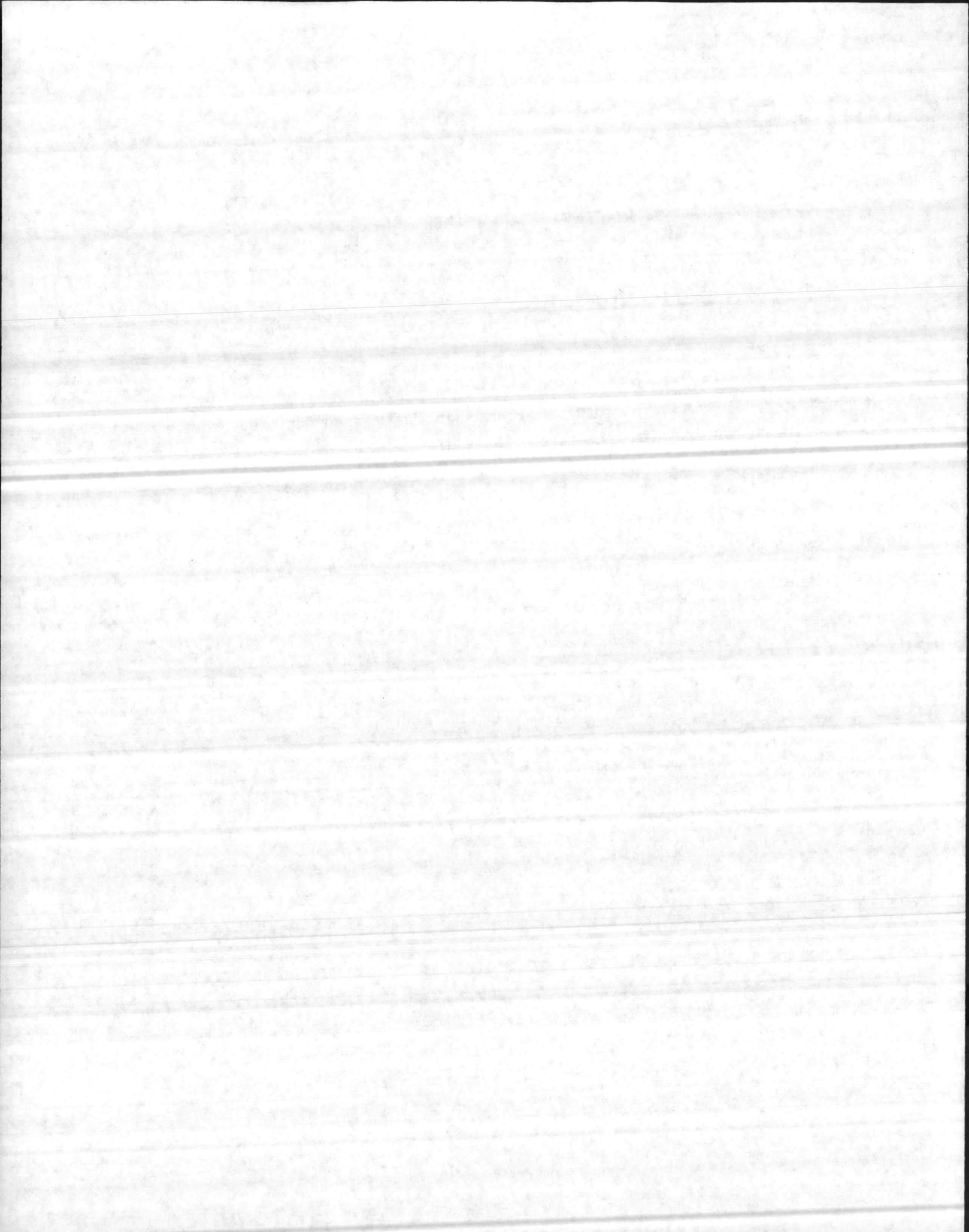
Recommendation: ..

Planning for the new GSE facility (Project No. P-211) should include provisions for support of CSE identified above. The GSE facility will require mechanical ventilation and blower system, electrical and pneumatic receptacles for operation and testing of GSE, and door openings measuring a minimum of 10 ft. wide x 15 ft. high to enable passage of all GSE, including maintenance stands.

P-211

what is happening to the GSE Equip

*highest item of pd-
actional support is
only 45 ft high.
what do they
base be
15' door on.*



5.3.2.8 218 61 GSE Holding Shed

Assessment:

Premium space is currently occupied for storage of Ground Support Equipment within the OMA hangars located at MAG-29. The primary function of OH hangar space is to provide a weather protected shelter for inspection, servicing, and maintenance of aircraft assigned to the squadron. In addition to the above, MAG-29 will each require additional storage space for the following GSE:

- Two (2) power plant units per squadron (Qty 6)
- Two (2) hydraulic jennies per squadron (Qty 6)
- Two (2) maintenance stands per squadron (Qty 6)
- One (1) PSE aircraft sling per MAG (Qty 1)
(approx. 72 in H x 90 in W x 120 in L)

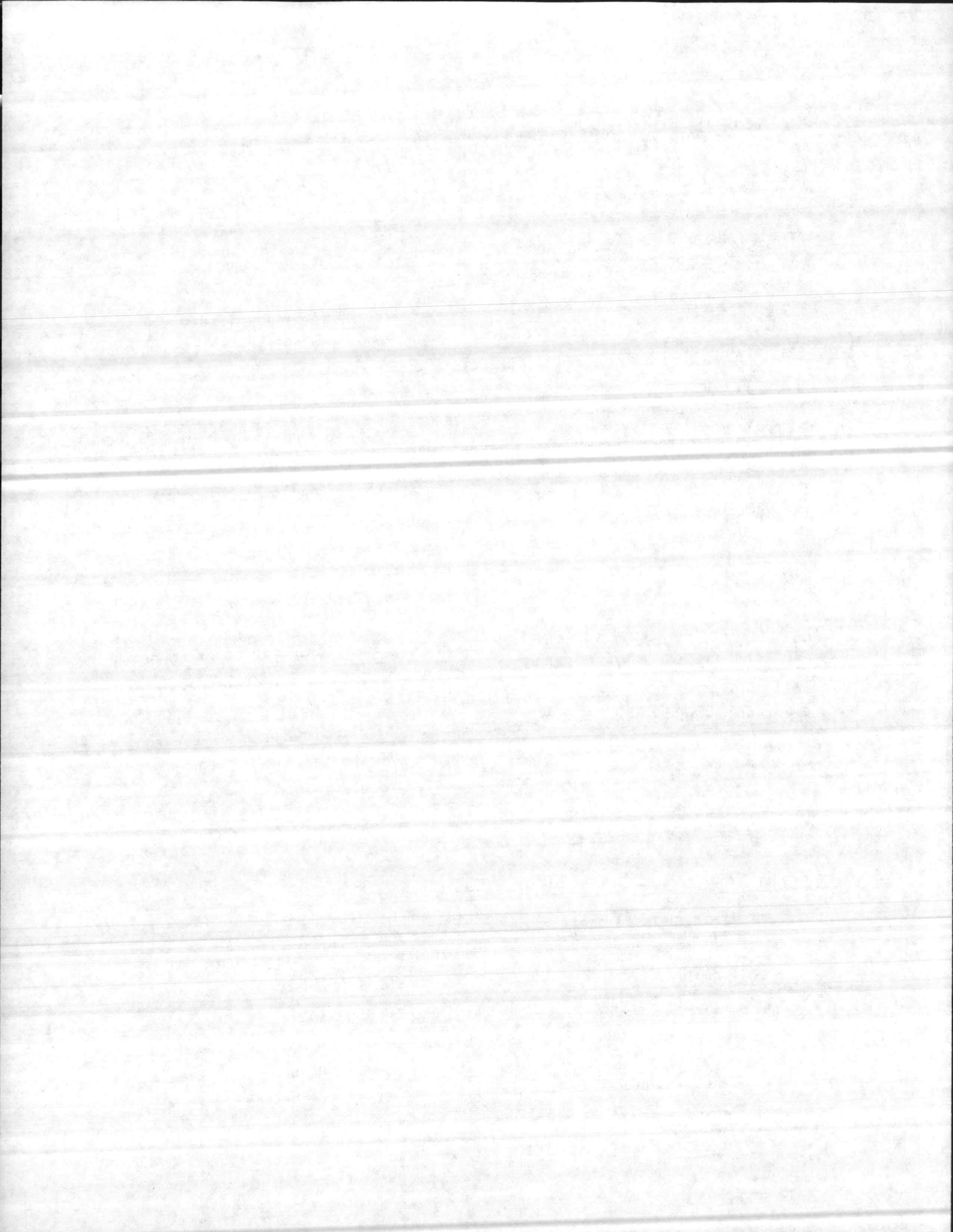
Recommendation:

A new GSE shed is required at MAG-29. The new GSE shed should be of adequate size to compensate for the addition of electric driven GSE, MMG-1A mobile electric power plants, AHT-63 hydraulic carts, and B-1 maintenance stands. The GSE shed should also include a dedicated area for stowage of oxygen and nitrogen bottles. Current planning for a new GSE shed at MAG-29 should include the addition of all V-22 weapon system requirements.

5.3.2.9 Composite Repair Shop (IMA)

Assessment:

Repair of H-46 and H-53 honeycomb structures are currently performed within the airframe shops at MAG-29. The ventilation and exhaust systems are inadequate to satisfy mechanical and bonded repair requirements of the V-22 airframe structure. The primary and secondary structures/skins of the V-22 are basically constructed of Graphite/Epoxy. The existing dedicated area for repair of honeycomb structures is adequate for support of the H-53. A new



composite repair shop will be required at MAG-29 IMA for repair of primary and secondary WRAs which are readily removable.

Recommendation:

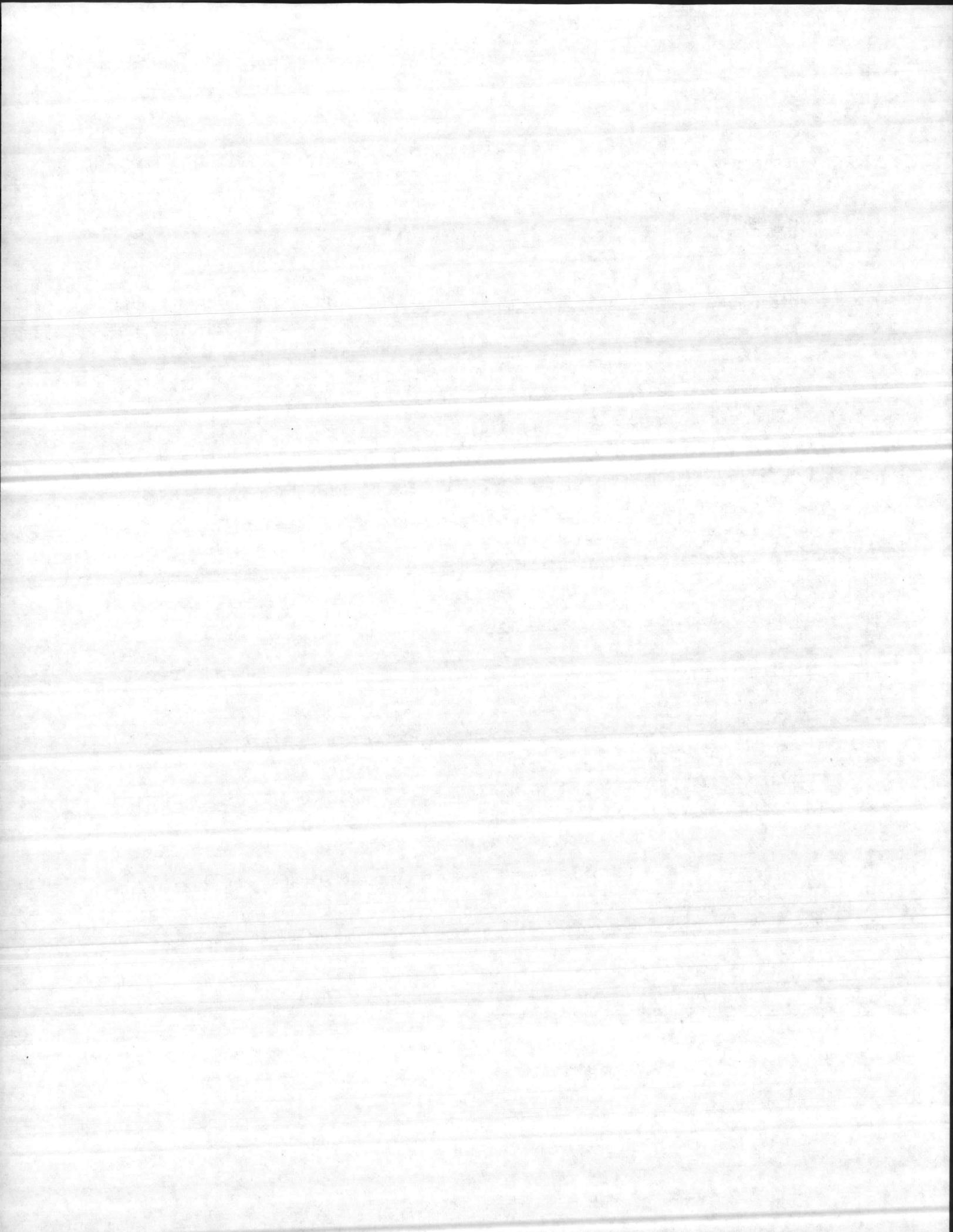
It is recommended that a composite repair shop be constructed at a suitable location in close proximity to the existing airframe shops at MAG-29 to expedite composite repairs of the V-22. Mechanical ventilation and a mechanical blower system which will provide six (6) air changes per minute, and a space measuring 30 x 40 feet, 10 feet high, is required to satisfy composite repair of the V-22 aircraft. A minimum 110 psi air supply, two (2) 220V/60 Hz/3 PH and four (4) 115V/60 Hz/1 PH electrical receptacles will be required for operation of floor mounted, bench mounted, and portable hand type equipment. The door opening should be a minimum of six (6) feet wide to enable passage of large size components such as the wing-to-fuselage fairings, landing gear doors, rotor blades, and vertical stabilizer.

5.3.3 441 10 Group Supply Warehouse

Assessment:

The MAG-29 Group Supply Warehouse covers 24,000 square feet of interior space and 600 square feet of exterior space. Availability of storage space is similar to that prevailing at MAG-26 (ref. para. 5.2.3) and is inadequate for support of the V-22.

Storage requirements for V-22 spares is approximately 8,400 square feet inside and 6,300 square feet outside. Current facilities planning projects a 1989 completion of a 30,000 square feet Aviation Supply Warehouse (Project No. P-357).



Recommendations:

Recommend execution of Project No. P-357 and consideration of V-22 requirements when allocating storage space.

5.4 Trainer and Training Facilities5.4.1 Operator and Maintenance Trainers Facilities

The following narrative identifies operator trainer (OT) and maintenance trainer (MT) facilities requirements for MCAS(H) New River. The V-22 requirements as discussed herein are conceptual in nature and will be refined as the V-22 Training program progresses (i.e. Task & Skill Analysis which defines Trainer requirements); however, the requirements and developed recommendations are adequate for facilities planning purposes.

5.4.1.1 Operator Trainers (OT)

The OT facility at MCAS(H) New River does not satisfy operator flight trainer (OFT) requirements. The facility houses CH-53D, CH-53E, and CH-46E OFTs and covers 11,303 square feet as shown in Table 1. V-22 operator trainer facility requirements are: 1 OFT - 27,533 square feet; 2 OFTs - 29,953 square feet and 3 OFTs - 32,373. A decision has not been made by the appropriate NAVAIR and Bell-Boeing personnel as to how many OFTs will be sited at New River. Further analysis of operator trainer requirements is required; however, assuming worst case (3 OFTs) a deficiency of approximately 21,070 square feet exists and, at best (1 OFT), there is a deficiency of approximately 16,230 square feet.

Is this correct?

Recommendations:

Construction of a new facility to house V-22 operator flight trainers is required to facilitate effective and efficient training of operator personnel. Recommended sizing of a new facility is provided in Table 2.

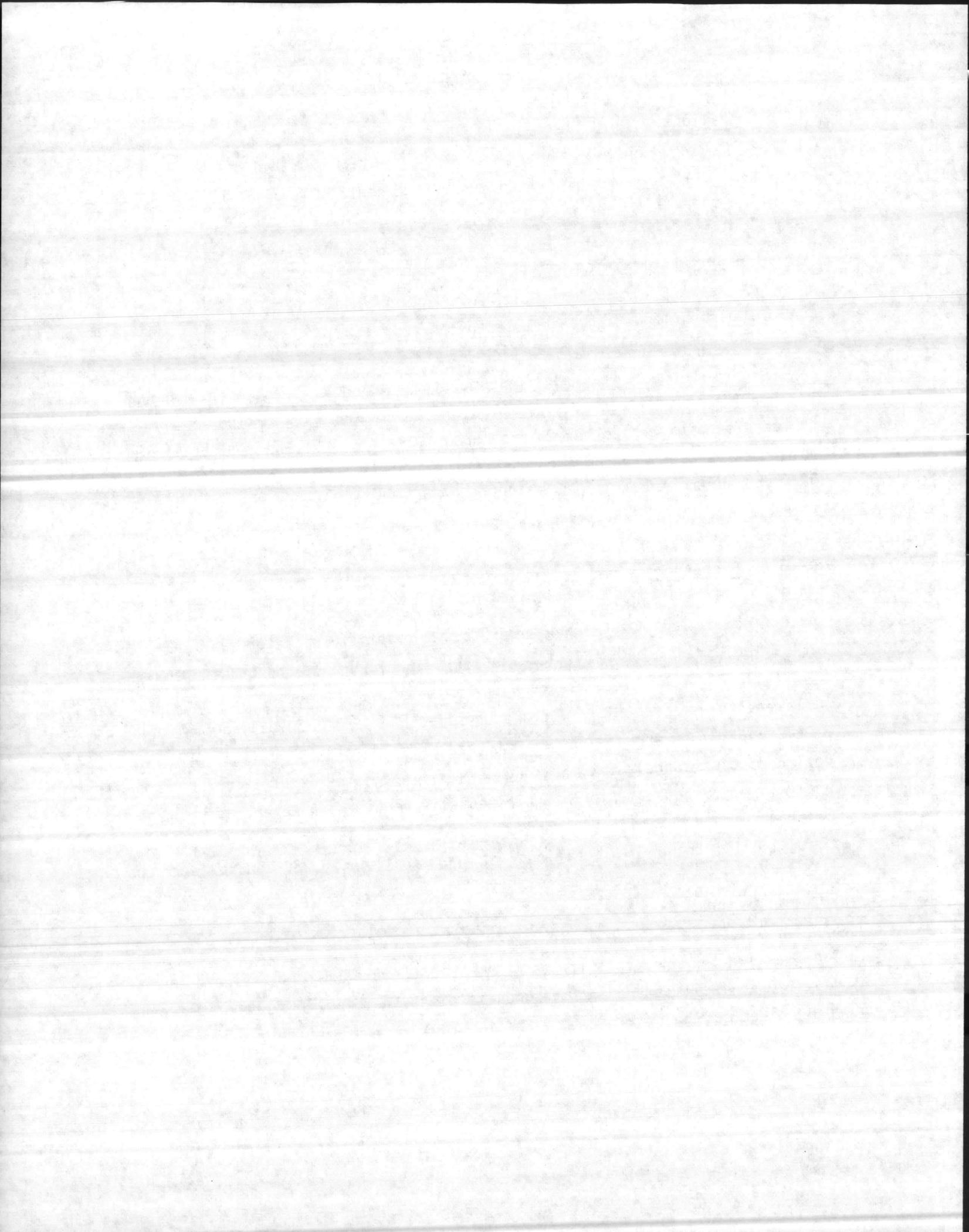


TABLE 1
OFT FACILITY AT MCAS NEW RIVER

OFFICE SPACE

OFFICE #	(FT ²)
1	100
2	100
3	160
4	252
TOTAL	612

MISC SPACE

ROOM	(FT ²)
HALLWAYS	676
UNUSEABLE SPACE	662
TOTAL	1,338

SUPPORT SPACE

ROOM	(FT ²)
SUPPLY <i>too small</i>	480 - 1000
TOOL <i>too small</i>	112 - 400
TECH. LIBRARY <i>will not support 3-OFTS</i>	254 - 1000
COFFEE MESS	380
INSTRUCTOR LOUNGE	176
HEADS/SHOWER <i>too small note/round</i>	238
ELECTRICAL MAINTENANCE OFFICE <i>Too's small</i>	336
ELECTRICAL MECHANICAL ROOM	416
HYDRAULICS ROOM	720
TOTAL	3,112

SIMULATOR BAYS

ROOM	(FT ²)
CH-53D/CH46E	2,310
CH-53E	1,596
TOTAL	3,906

COMPUTER SPACE

ROOM	(FT ²)
COMPUTER ROOM #1	1,575
COMPUTER ROOM #2	760
TOTAL	2,335

TOTAL SQUARE FOOTAGE FOR
OFT BUILDING - 11,303 FT²

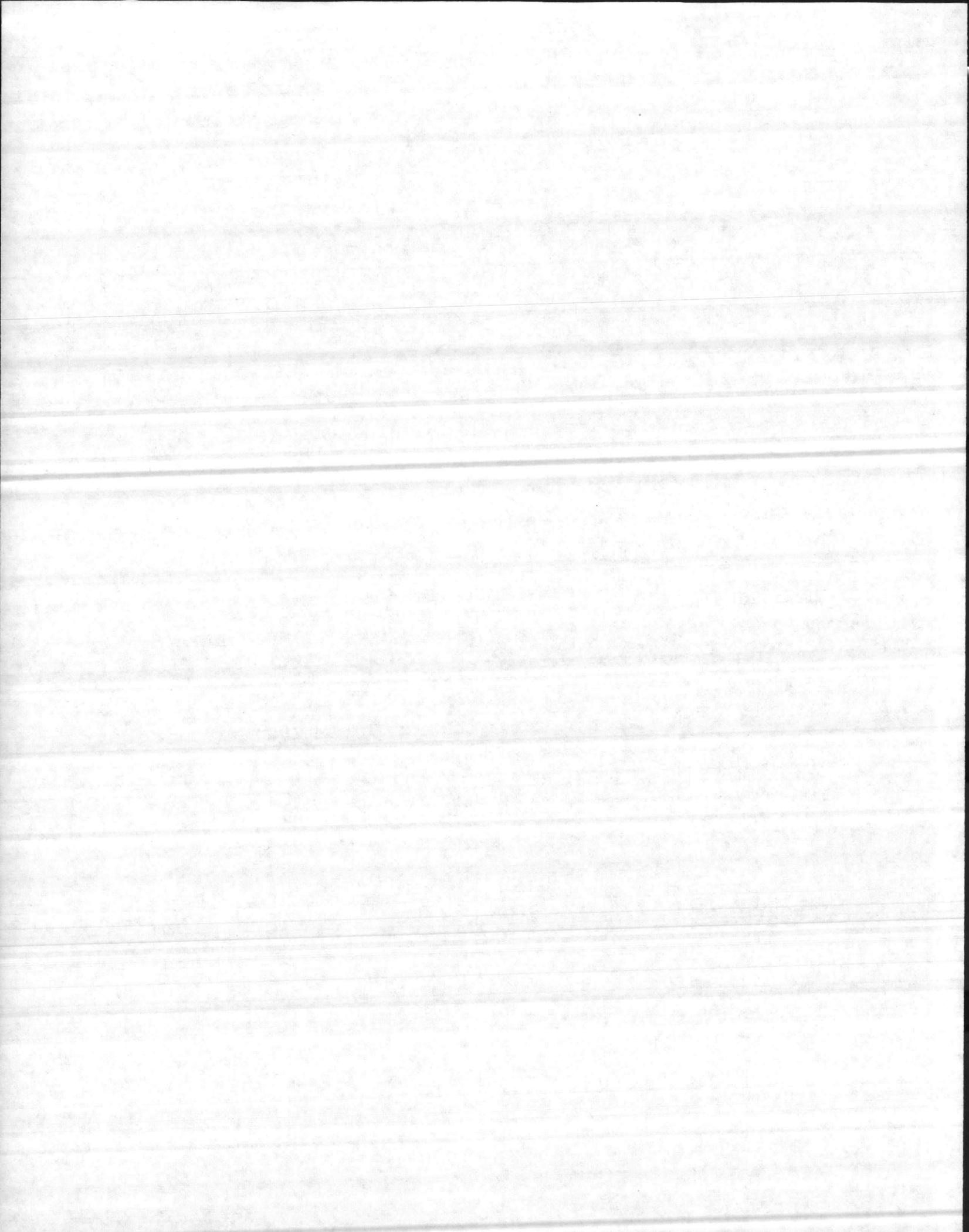


TABLE 2

ESTIMATED V-22 OPERATOR TRAINER FACILITY REQUIREMENTS

<u>OFFICE SPACES</u>	<u>SQ. FT</u>	<u>SUPPORT SPACES</u>	<u>SQ. FT.</u>
Director	250	Publications	1000
Assistant Director	200	Supply/Spares	1000
Director of Maintenance	200	Clean Room	400
Instructor #1	150	Tools/Test Equipment	400
Instructor #2	150	Mechanical Repair Room	336
Instructor #3	150	Electrical Repair Room	336
Brief/Debrief #1	100	Lounge/Instructor's	600
Brief/Debrief #2 OFT	100	Lounge/Student's	800
Brief/Debrief #3	100	Restroom/Shower/Locker	
Brief/Debrief CPT	100	Facilities	500
Administrative Office	250	Misc. Storage	500
NTEC Field Office	200	Hallways, Heating, A.C.	<u>7471</u>
		(Based on 30% of Total	
		SQ FT)	
		Total Support Space	<u>13,343</u>
Total Office Space	<u>1,950</u>		

COURSEWARE DEVELOPMENT (LEARNING/ISD CENTER)

	<u>SQ. FT.</u>
Instructional Systems Development	5,000
Computer Software Development/Maintenance	<u>3,000</u>
	<u>8,000</u>

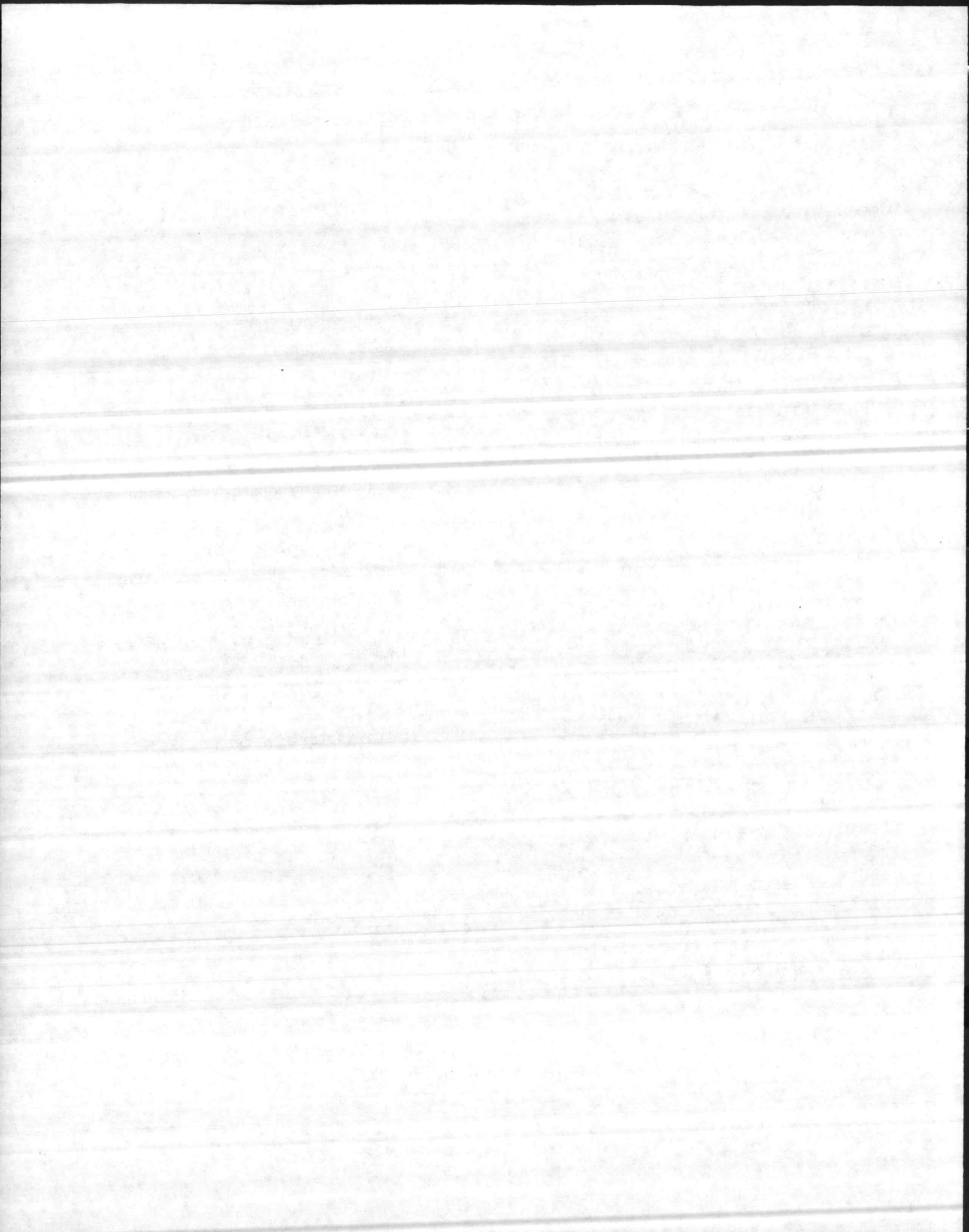
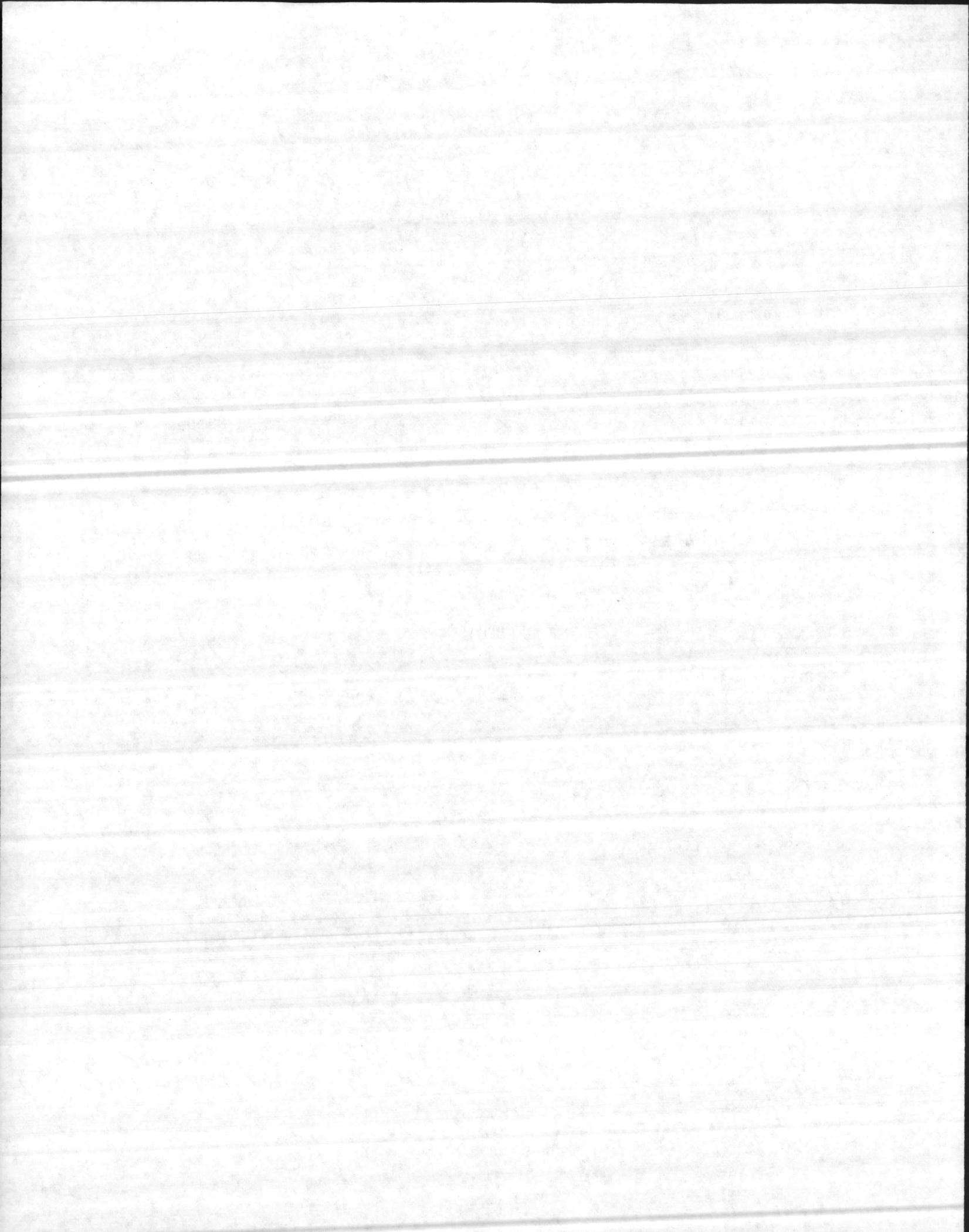


TABLE 2

FACILITY REQUIREMENTS (CONT.)

<u>SIMULATOR AREA (SQ. FT.)</u>	<u>1 OFT</u>	<u>2 OFT</u>	<u>3 OFT</u>
Simulator Bay (40 x 40)	1600	3200	4800
Electrical Power Room	160	320	480
Hydraulic Power Room	160	320	480
Computer Room	500	1000	1500
	<u>2420</u>	<u>4840</u>	<u>7260</u>
Cockpit Proc. Trainer	1000		
Electrical Power Room	160		
Hydraulic Power Room	160		
Computer Room	<u>500</u>		
	1820	<u>1820</u>	<u>1820</u>
Total	<u>4240</u>	<u>6660</u>	<u>9080</u>
SUMMARY			
Office Spaces	1950	1950	1950
Support Spaces	13343	13343	13343
Courseware Development	8000	8000	8000
Simulator Area	<u>4240</u>	<u>6660</u>	<u>9080</u>
	<u>27,533</u>	<u>29,953</u>	<u>32,373</u>



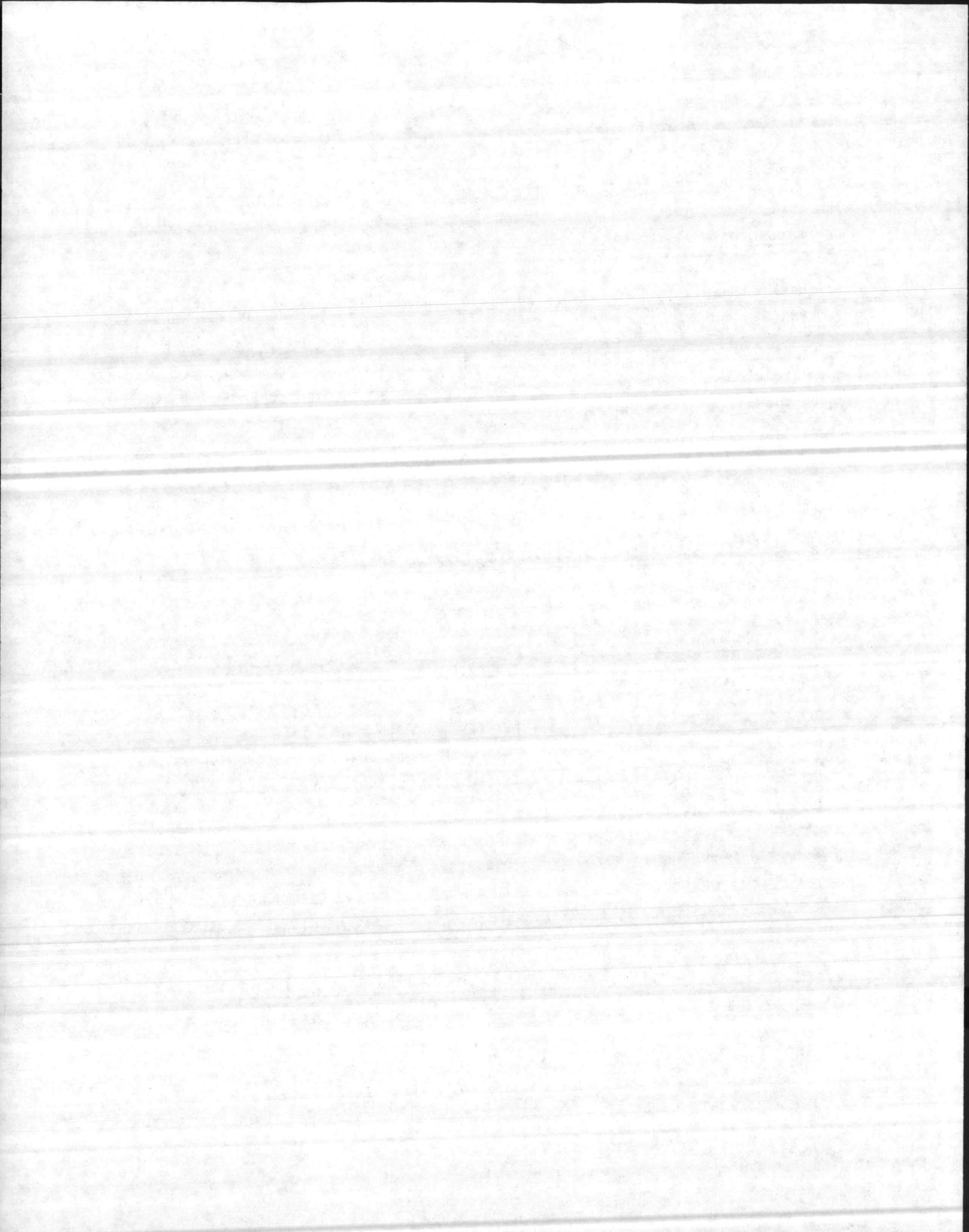
5.4.1.2 Maintenance Trainers

5.4.1.2.1 Composite Maintenance Trainer

Assessment:

This trainer will approximate the V-22 aircraft in size and an allowance has been made in the square footage assessment to allow an actual aircraft to replace the trainer should the need arise during scheduled rework at NARF or unexpected maintenance. This area includes enough space to remove components in the helicopter mode.

- The room that houses the composite maintenance trainer for the CH-46E is 1,350 sq. ft.
- This room is inadequate in the following areas:
 - There is no intercom system throughout the entire building.
 - The room is not large enough for the average class size of 4 to 6 students.
 - The room does not have acceptable heating/air conditioning for the average seasonal day. There are many malfunctions and periods of inoperation.
 - The overhead hoist is inadequate. The chain fall does not work and is hazardous and has been inoperable for two (2) years. A 2,000 lb. capacity hoist to lift the proprotor head and blades is needed.
 - Ceiling is not high enough to accomplish all required remove and replace tasks.
- There are no permanent eye wash stations or showers for safety purposes. The existing eye wash stations are of plastic bottle variety.



- This room is inadequate in size for the CH-46E composite trainer. There is not a 10 ft. walkaround for students and instructors to comfortably maneuver and work.
- Approximate space required to house the V-22 composite maintenance trainer is 8,519 sq. ft.
- This estimate is based on the following assumptions:
 - The blades are folded with the wings stowed for maximum length.
 - The blades were fully extended to give the maximum width.
 - Availability of a ten (10) ft. walkaround area.

Recommendations:

Approximately 6,000 sq. ft. of additional space is needed to house the V-22 composite maintenance trainer.

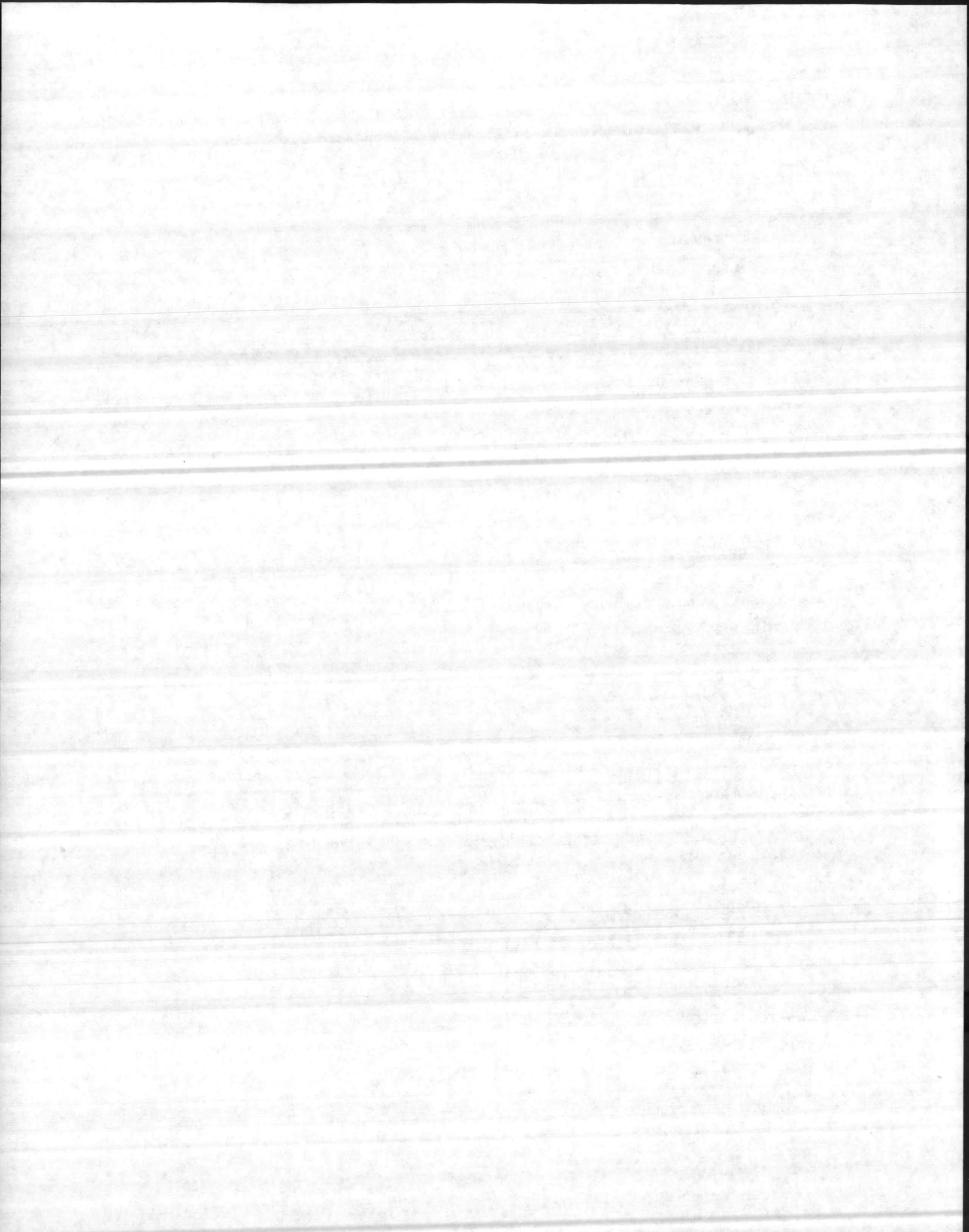
5.4.1.2.2 Power Train Trainer

Assessment:

The Power Train trainer displays the entire power train less the engine. The trainer size could be reduced by eliminating the drive train on one side. This trainer includes:

- 10 ft. walkaround
- 30 ft. floor to crane rail elevation
- 6 ft. blades would replace full blades

Presently, a Power Train trainer for the CH-46E does not exist at MCAS (H), New River.



Recommendations:

An additional 3,318 sq. ft. would be required to house the V-22 Power Train trainer.

5.4.1.2.3 Fuel Systems TrainerAssessment:

For planning purposes, this trainer will be a "panel" trainer. Similar panel trainers occupy approximately 600 sq. ft. A Fuel Systems Trainer does not exist for the CH-46E at MCAS New River.

Recommendations:

Additional space required to house a Fuel Systems Trainer for the V-22 is 600 sq. ft.

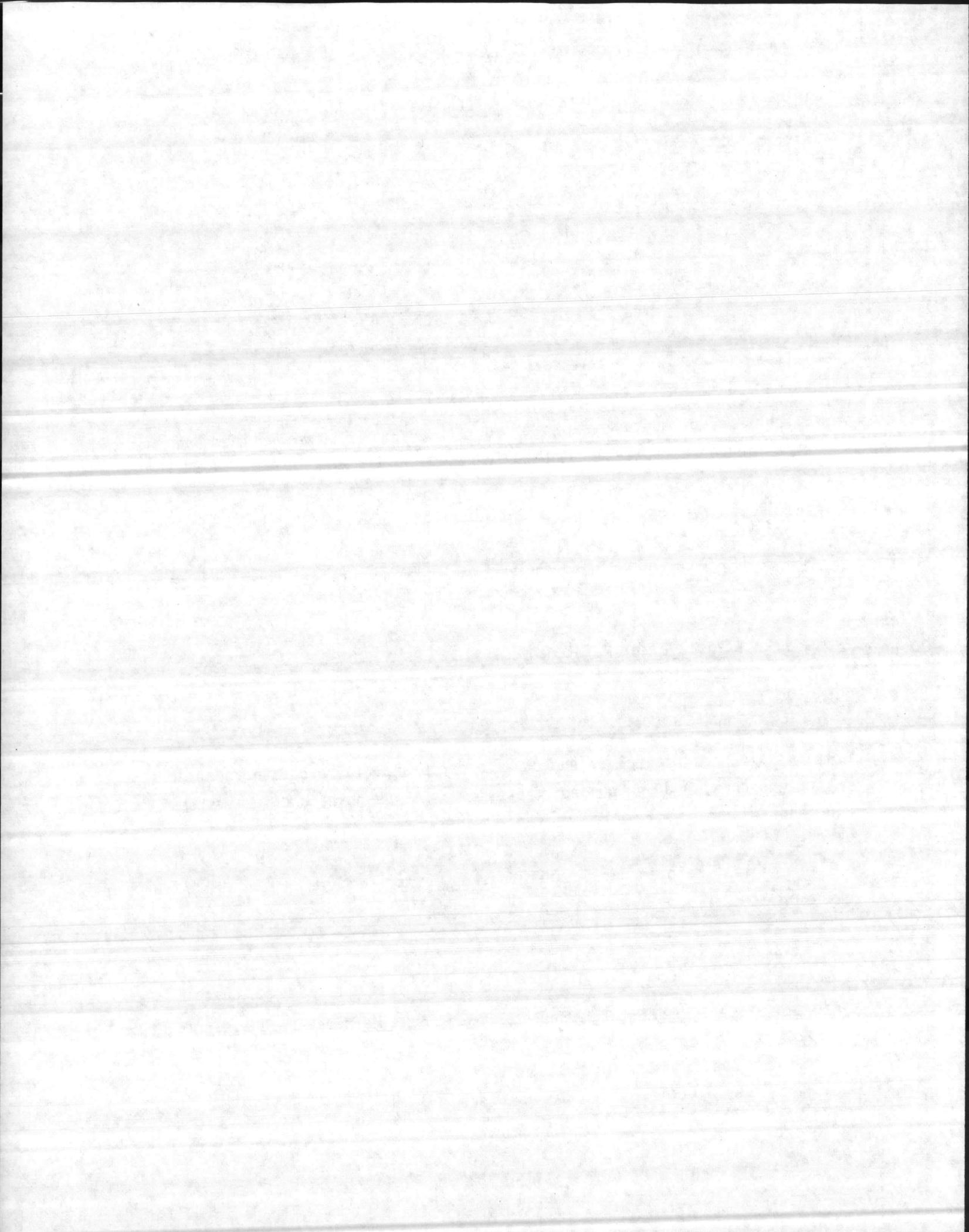
5.4.1.2.4 Power Plant Maintenance TrainerAssessment:

This trainer might include an actual power plant plus propotor gear box, mid wing gear box, APU and a load compressor. All associated drive systems could be abbreviated.

A Power Plant Maintenance Trainer does not exist for the CH-46E at MCAS New River.

Recommendations:

Additional space required to house a Power Plant Maintenance Trainer for the V-22 is 900 sq. ft.



5.4.1.2.5 Flight Control Systems/AFCS

Assessment:

A flight control systems trainer must have representation of all flight surfaces; i.e. proprotor blades, proprotor, swashplates, all controls, amplifiers, computers, and surfaces. It could be conceived like the wing fold trainer and presented in a like area.

The space allocated for the AFCS trainer for CH-46E located at MCAS(H), New River is 840 sq. ft. The space required to house the AFCS trainer for the V-22, as identified in the FRD, is approximately 3,600 sq. ft.

Recommendations:

An additional 2,760 sq. ft. is required to house the AFCS trainer for other V-22.

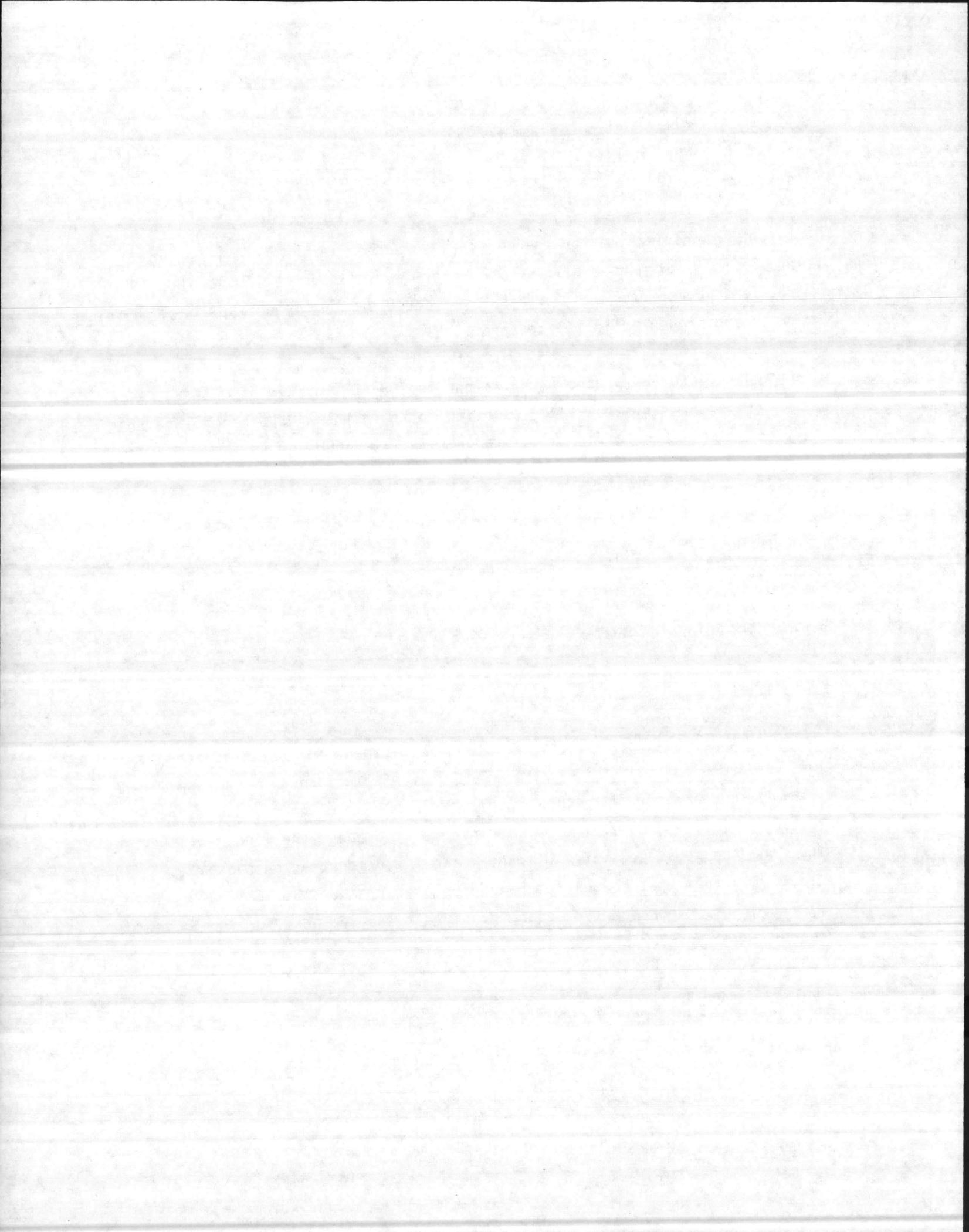
5.4.1.2.6 Fold/Stow Systems Trainer

Assessment:

The need for this trainer would dictate a requirement for the proprotor blades to fold, nacelles to tilt, and the wing to stow. This could be accomplished by using actual aircraft components in some areas, i.e. nacelles, gearboxes, proprotor, etc. and by shortening the proprotor blades, the length of the wing, and the fuselage system without loss of a demonstration capability. The area of the room that houses rotors and related trainers at MCAS(H) New River is 777 sq. ft. The amount of space required to house the Fold/Stow Systems Trainer for the V-22 is 3,600 sq. ft.

Recommendations:

An additional 2,823 sq. ft. is required to house this trainer for the V-22.



5.4.1.2.7 Hydraulic/Landing Gear System Maintenance Trainer

Assessment:

The amount of space allocated for this trainer at MCAS New River is 480 sq. ft. The amount of space required to house the V-22 Hydraulic/Landing Gear trainer is 600 sq. ft.

Recommendations:

An additional 120 sq. ft. is required to house the trainer.

5.4.1.2.8 Electrical Systems Trainer

Assessment:

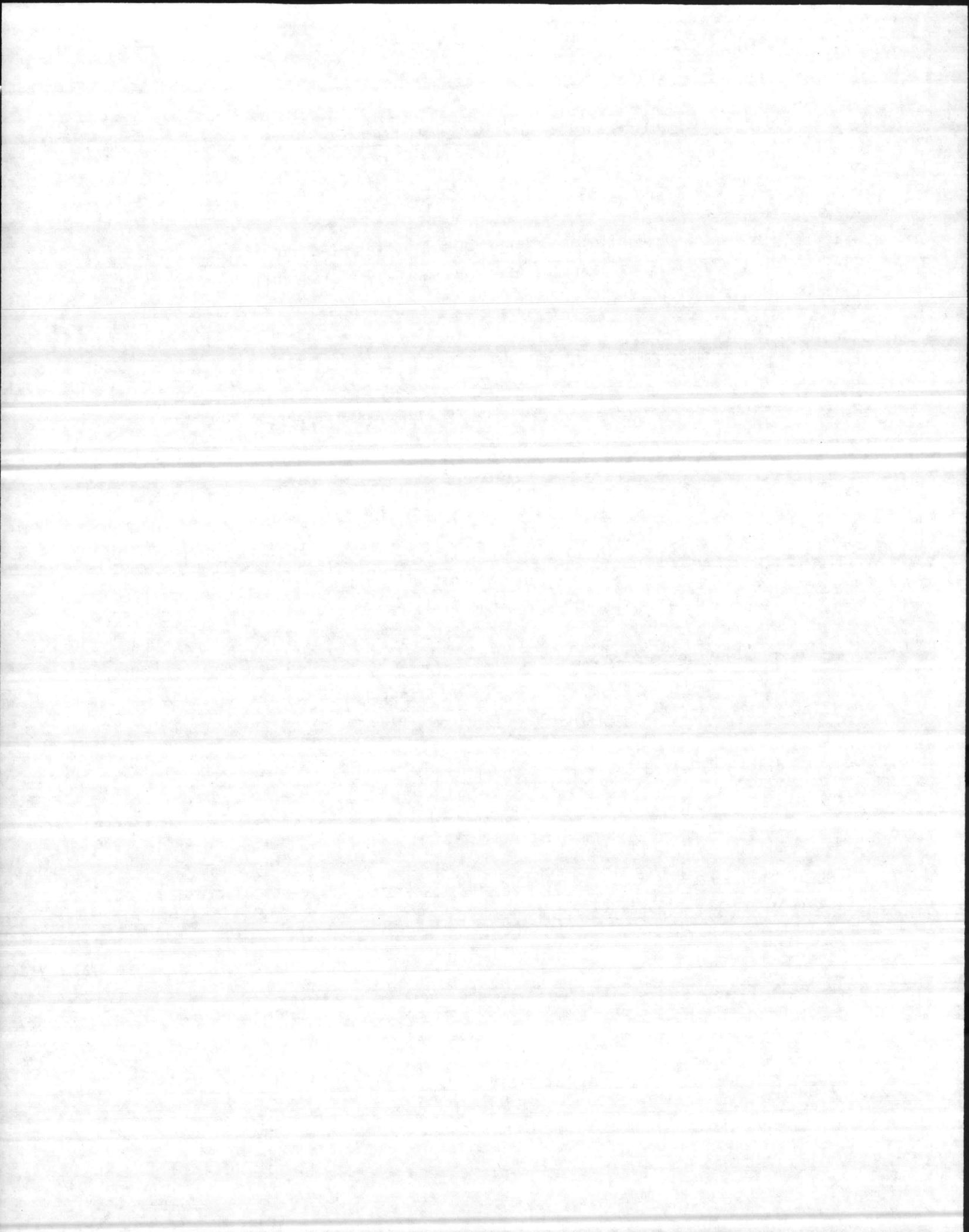
This trainer should include a full cockpit with all switches and controls and an abbreviated fuselage, wing, and nacelles.

The amount of space allocated for this trainer at MCAS (H) New River is 640 sq. ft. Assuming a stubby version could be reduced 60% of the actual aircraft size, a conceptual size for this trainer would be:

$$8715 - (60\% \times 8715) = 3,486 \text{ sq. ft.}$$

Recommendations:

An additional 2,846 sq. ft. is required in order to house the Electrical Systems Trainer for the V-22.



5.4.1.2.9 Environmental Systems Trainer

Assessment:

A conceptual trainer for the V-22 ECS could be a "panel" type. An Environmental Systems Trainer does not exist at MCAS, New River. V-22 requirements for an ECS trainer is approximately 600 square feet.

Recommendations:

Approximately 600 sq. ft. is required to house the V-22 trainer.

5.4.1.2.10 Comm/Nav/Ident/CMDS System Trainer

Though not yet defined, this trainer will most probably be an actual cockpit supported by computer simulation equipment. The amount of space allocated for the CH-46E Comm/Nav/Ident/CMDS System Trainer is 560 sq. ft. The amount of space estimated for the Comm/Nav/Ident/CMDS System Trainer for the V-22 is approximately 900 sq. ft.

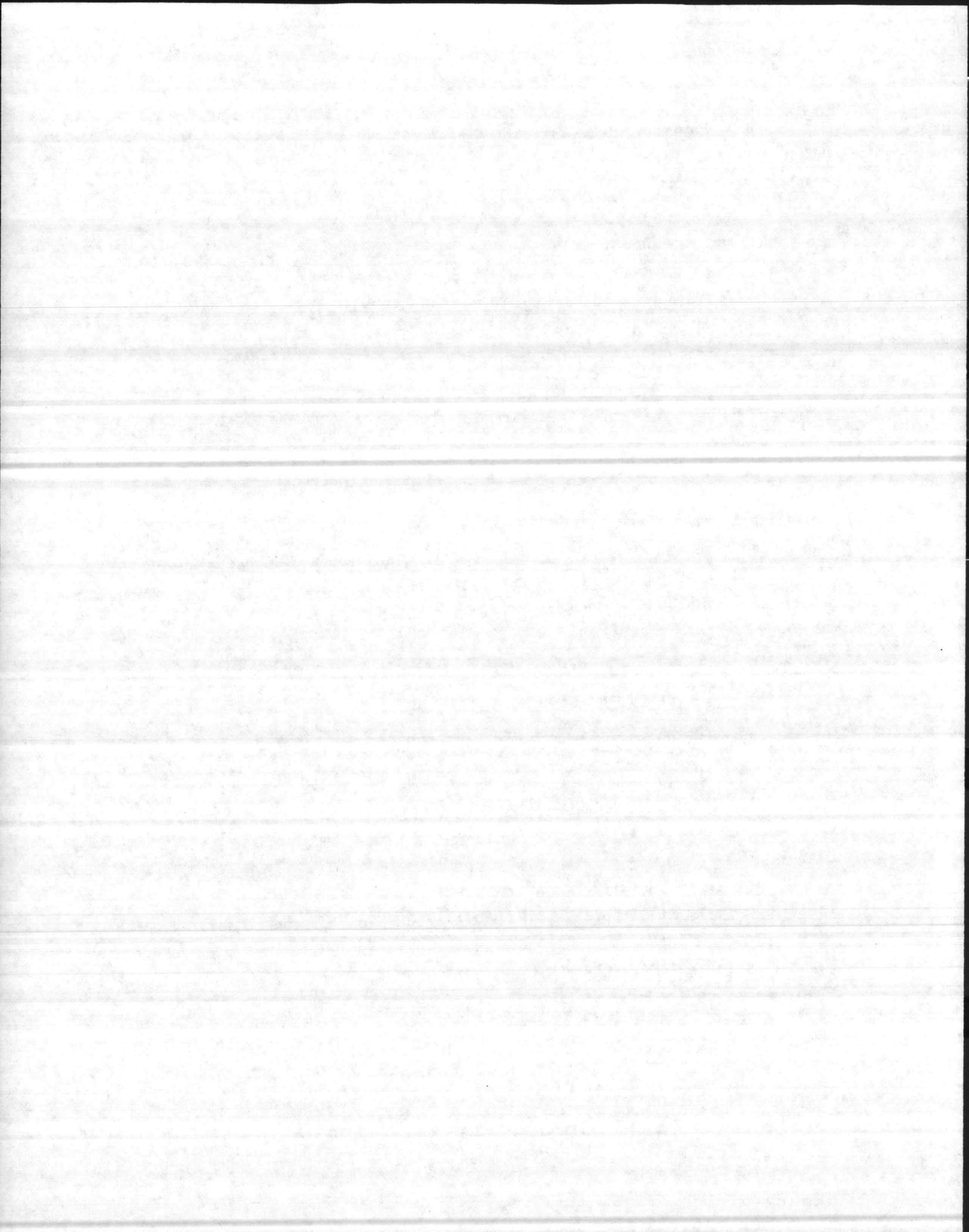
Recommendations:

An additional 340 sq. ft. is required in order to house this V-22 trainer.

5.4.1.2.11 Radar/FLIR/ECM/Night Vision System

Assessment:

The V-22 aircraft will possess a Radar/FLIR/ECM/Night Vision capability which could require maintenance training not available at New River. Space requirements for a RADAR/FLIR/ECM/NIGHT VISION Trainer is approximately 1,600 square feet.

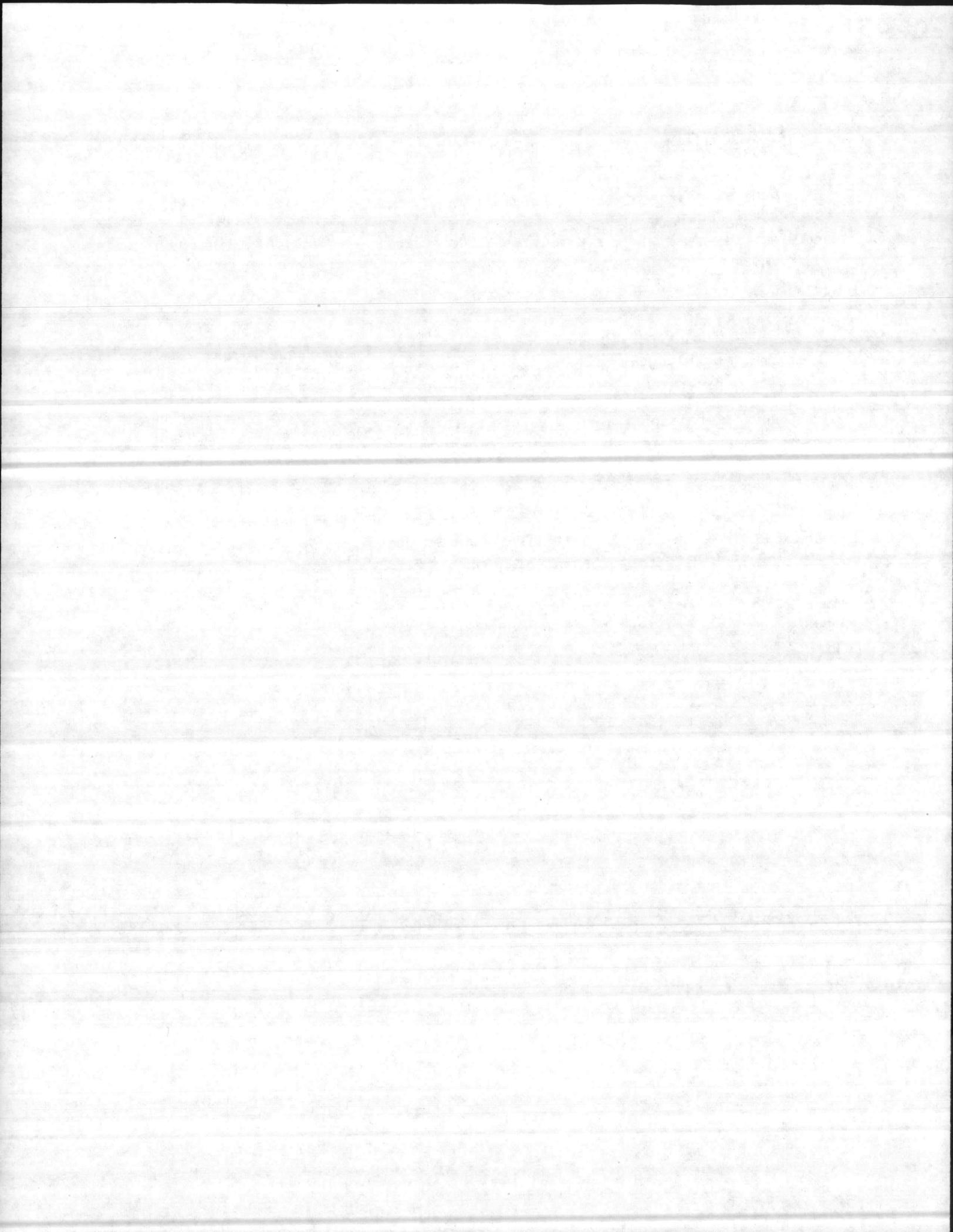


Recommendations:

A dedicated area of approximately 1,600 square feet may be required to house and conduct training on a V-22 RADAR/FLIR/ECM/NIGHT VISION Trainer.

5.4.1.2.12 Summary

Based on the preceding analysis, an additional 27,673 square feet (approx.) is required for V-22 maintenance trainer support. Total V-22 maintenance trainer space required is approximately 45,000 square feet. Due to the need for additional space to house the V-22 maintenance trainers, a new facility should be constructed to accommodate the V-22 requirements. This number is subject to change depending on the resource requirements developed via the Logistic Support Analysis (LSA) process; however, these numbers should be adequate for facilities resources requirements planning. The new facility design should correct the deficiencies cited in paragraph 5.4.1.2.1.



6.0 SUMMARY

Current Situation: MAG-26

MAG-26 currently supports the following: three (3) CH-46 operational squadrons, each squadron consisting of twelve (12) aircraft; the trainer squadron (HMT-204) consisting of ten (10) CH-46 and ten (10) CH-53 aircraft; two (2) CH-53 operational squadrons, each squadron consisting of fifteen (15) aircraft; and one Huey/Cobra squadron consisting of nine (9) UH-1N and nine (9) AH-1J/T aircraft. A total of 104 aircraft are currently assigned to MAG-26.

Current planning includes replacement of the CH-46 operational squadrons with three (3) V-22 operational squadrons, consisting of fifteen (15) aircraft. Ten (10) CH-46 trainer aircraft will be replaced with twenty-seven (27) V-22 trainer aircraft while retaining the existing ten (10) CH-53 trainer aircraft. Two (2) CH-53 operational squadrons consisting of thirty (30) aircraft and one (1) operational squadron consisting of nine (9) each UH-1N and AH-1J/T aircraft will remain at MAG-26.

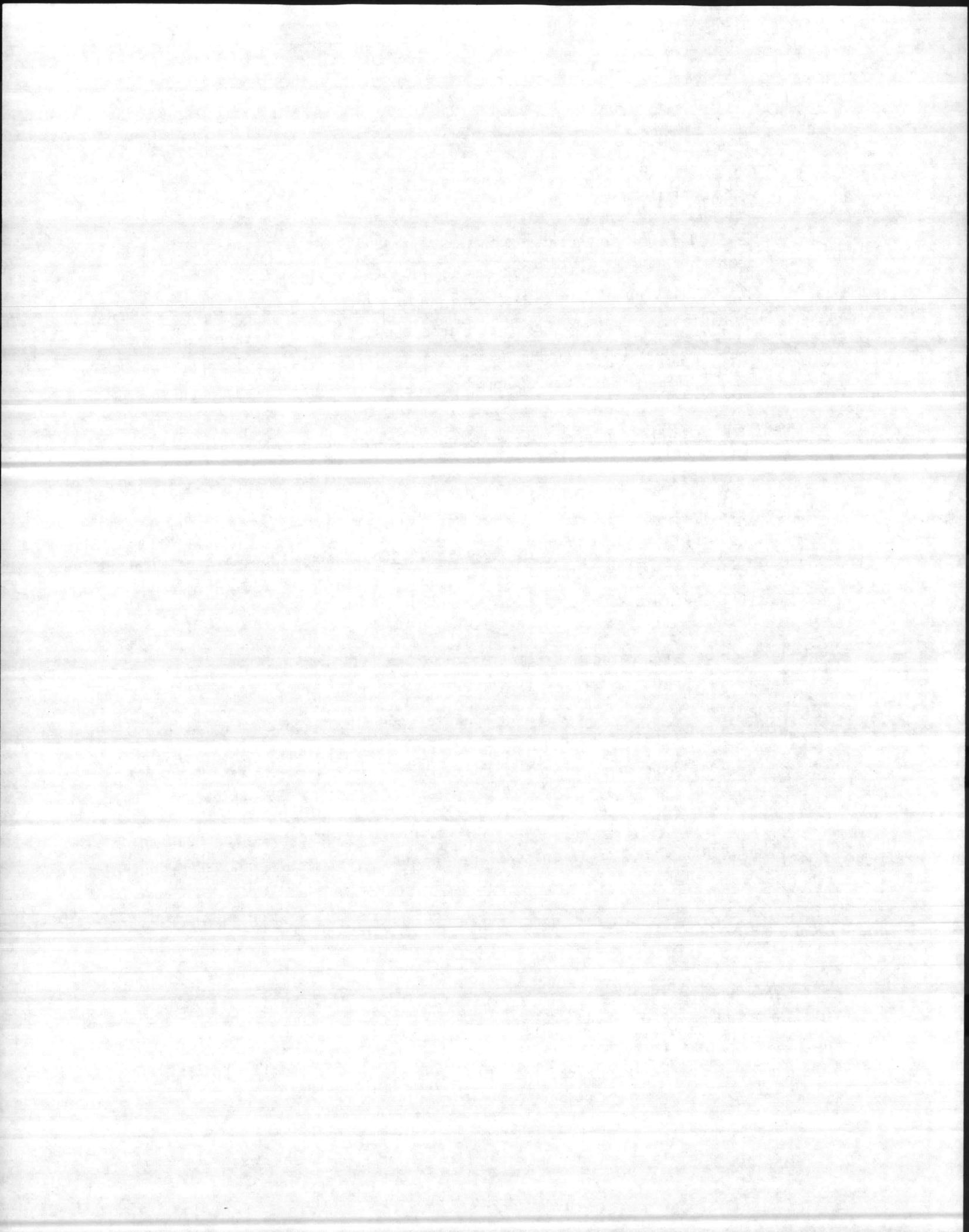
MAG-26 will be supporting a total of 130 (CH-53, UH-1N, AH-1J/T, and V-22) aircraft in lieu of the existing 104. Space requirements for the V-22 aircraft are considerably greater than that for the CH-46 and are compatible with the CH-53E using criteria of NAVFAC P-80 for hangar, parking, interior and peripheral taxi-lane requirements.

Space is not available in the existing electrical/avionics maintenance facility to satisfy the V-22 avionics/flight control systems WRA and SRA requirements.

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Impact If Changes Not Provided:

Overcrowding of existing hangars will result in reduced morale, efficiency, ability to adequately train new personnel, and adverse effects on operations and mission flexibility. Safety to aircraft and maintenance personnel will be jeopardized if the proposed changes are not implemented.



Space requirements for hangars, parking, interior and peripheral taxi-lanes should be considered mandatory for planning of modifications/alterations and new facilities for MAG-26.

Current Situation: MAG-29

MAG-29 is currently supporting the following: three (3) CH-46 operational squadrons, each squadron consisting of twelve (12) aircraft; one (1) squadron of nine (9) UH-1N and nine (9) AH-1J/T aircraft; one (1) squadron of ten (10) OV-10 aircraft; and one (1) squadron of CH-53 aircraft, consisting of fifteen (15) aircraft for a total of seventy-nine (79) aircraft.

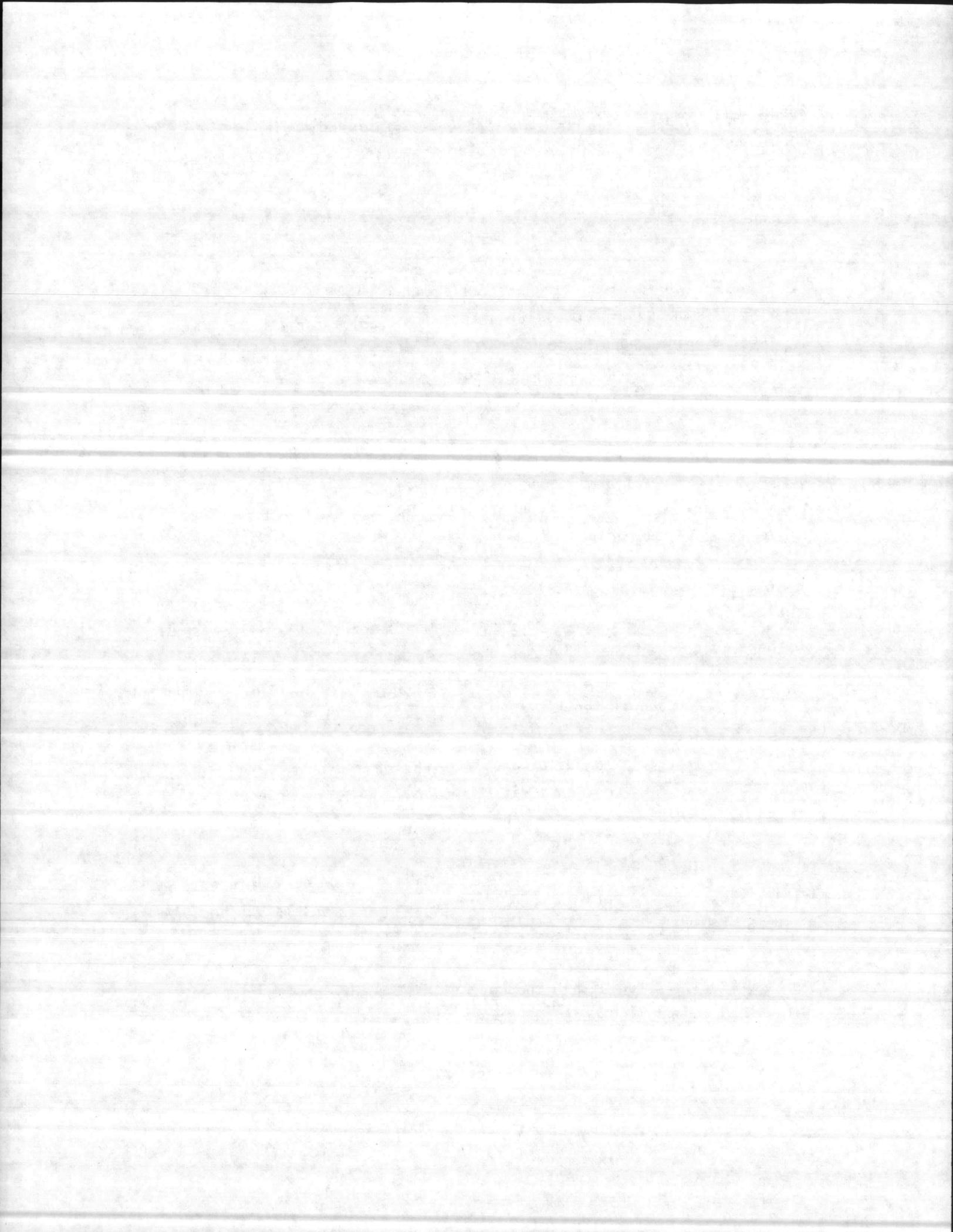
Current planning includes replacement of the CH-46 operational squadrons with three (3) V-22 operational squadrons, each squadron consisting of fifteen (15) aircraft. The existing CH-53, UH-1N, AH-1J/T, and OV-10 aircraft squadrons will be retained at MAG-29.

MAG-29 will be supporting a total of eighty-eight (88) aircraft vice the existing seventy-nine (79). Space requirements for the V-22 aircraft are considerably greater than that for the CH-46 and are compatible with the CH-53E using criteria of NAVFAC P-80 for hangar, parking, interior and peripheral taxi-lane requirements.

Space is not available in building 4106 IMA facility for construction of a composite repair work center to satisfy requirements for the V-22 composite airframe.

Space is not available in the existing electrical/avionics maintenance facility to satisfy the V-22 avionics/flight control systems WRA and SRA requirements.

GSE is currently stored within the operational hangars due to lack of a holding shed and/or inadequate GSE storage space.

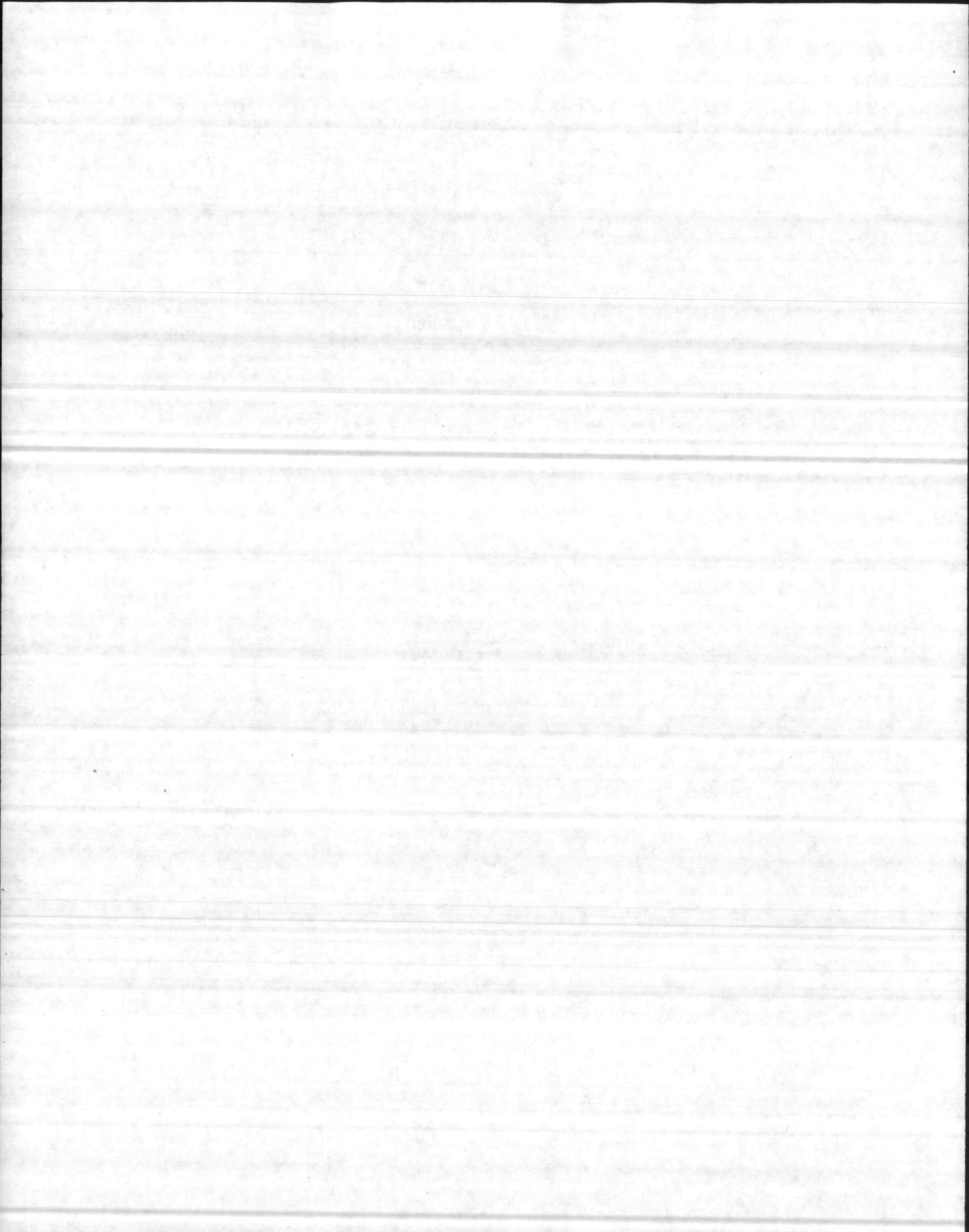


Buildings 4108 and 4106 (IMA) do not provide electrical supply and connections, 440V, 60 Hz, 3 Ph, 100 AMPS, for operation of the MMG-1A MEPP at 60 KVA output for ground testing of the V-22 avionics/flight control systems.

Impact If Changes Not Provided:

Overcrowding of existing hangars will result in reduced morale and efficiency and adversely effect operations and mission flexibility. Safety to aircraft and maintenance personnel will be jeopardized if the proposed changes are not implemented.

Space requirements for hangars, parking, interior and peripheral taxi-lanes should be considered mandatory for planning of modifications/alterations and new facilities for MAG-29.



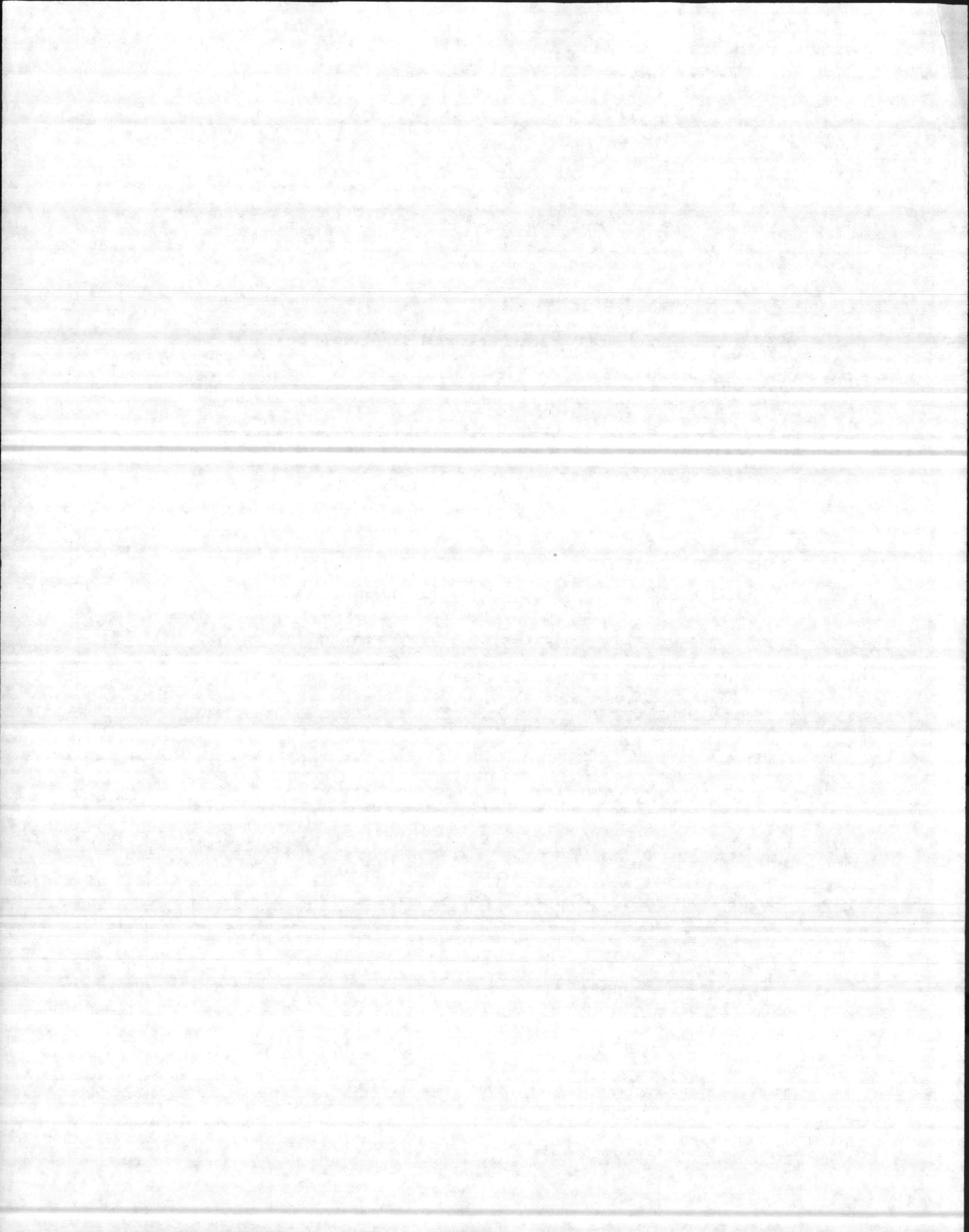
CMC (LFF-1) Comments

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1. The Draft Bell-Boeing Site Evaluation Report for MCAS New River, NC is well detailed. It is evident that a great amount of effort went into completing the report. There are some problem areas in the report that will have to be corrected and updated. The Real Property Facilities Manual, Volume II, MCO P11000.12C and the Facilities Planning Criteria for Navy and Marine Corps Installations, NAVFAC P-80 should be utilized to make the necessary changes.

2. The most important of these changes deals with the types and numbers of aircraft at MCAS New River. The MV-22 has the correct number of aircraft per squadron. The other squadrons have incorrect data on the numbers of aircraft. The CH-53 squadrons all have 16 aircraft per squadron. The HML/A squadrons have 12 UH-1's and 12 AH-1's per squadron. The VMD squadron has 18 OV-10's with 3 continuously deployed. The training squadron, HMT-204, will lose all of its CH-53 assets prior to the introduction of the MV-22. The total number of aircraft assigned to MCAS New River has to be updated. It should also be noted that the number of aircraft per squadron at New River with the model designation may make the site survey a classified document.

3. Other planning factures involving the MCAS New River Site Survey include updating the total numbers of aircraft by aircraft group. The total aircraft at MCAS New River by 1996 will be 228. Currently MCAS New River maintains 198 aircraft of which 24 are constantly deployed. MAG-26 has 107 aircraft and will increase to 128 by 1996. MAG-29 has 91 aircraft and will increase to 100 by 1996.



4. Finally, there are some minor changes that should be reflected in the updated survey. MCAS New River no longer carries the helicopter designation. Page 17 of the survey reflects frequent flights over salt water but should read frequent flights near salt water. HMT-204 does not have a FRAMP but will include a FRAMP with the introduction of the MV-22. The summary of the survey must be changed to show all the changes described above to make the site survey a valid and viable document.

