ARMY NATIONAL GUARD
DG 415-3
AVIATION FACILITIES
DESIGN GUIDE

NATIONAL GUARD BUREAU
INSTALLATIONS DIVISION
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FOREWORD

This Aviation Facilities Design Guide (DG 415-3) was published by the National Guard Bureau, Army Installations Division (NGB-ARI). DG 415-3 applies to all projects for new construction (including additions) as well as alterations to and rehabilitation and conversion of existing facilities. It is intended to assist the States, Territories, the District of Columbia and design professionals in gaining an understanding of the functions and the unique environmental considerations to address in the construction documents development. This design guide does not contain criteria but refers readers to sources of criteria in other publications that relate directly to the specific technical design requirements.

This Aviation Facilities Design Guide should be used in conjunction with the General Facilities Information Design Guide (DG 415-5) to develop the final project design.

Distribution is limited. However, authorized users of the NGB Guard Knowledge Online (GKO) can obtain an electronic copy at (gkoportal.ngb.army.mil/C12/Installations) Design Guide Library site. All users are encouraged to submit comments and suggestions to improve this document by completing DA Form 2028, “Recommended Changes to Publications and Blank Forms,” and sending it directly to:

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CHAPTER 1

GENERAL INFORMATION

1-1 PURPOSE: PERFORMANCE DESIGN GUIDE

This Aviation Facilities Design Guide (DG 415-3) sets forth general functional guidance for the design architect-engineer (A-E) to use in developing the design and the construction documents for Army National Guard (ARNG) Aviation Support Facilities projects that qualify for support, totally or in part, from Federal funds. The guidance herein is applicable to all construction projects, including new construction as well as alterations to and rehabilitation and conversion of existing facilities. All ARNG facilities must be designed and constructed applying the principles and practices of sustainable design and development using U.S. Green Building Council LEED-NC Version 2.2 Green Building Rating System to achieve a “Silver” rating.

DG 415-3 addresses the unique functional design requirements for specific types of buildings and site features. To aid the reader in using this design guide, the following are included:

- Appendix A, Unique References, lists reference documents that pertain specifically to this building type; other references cited in this design guide are included in the References in DG 415-5.
- Appendix B, Glossary, defines the acronyms and abbreviations used in this design guide as well as specialized terms that are unique to this design guide.
- Appendix C contains several tables of requirements.
- Appendix D contains the figures that illustrate the explanations in the text.

1-2 FUNCTIONS AND OPERATIONS OF AVIATION FACILITIES

This design guide pertains to the following types of ARNG aviation facilities:

- Army National Guard Army Aviation Support Facility (AASF)
- Limited Army Aviation Support Facility (LAASF)
- Army Aviation Operating Facility (AAOF)

All of the Army aviation facilities are used to maintain aircraft in a readiness state for training exercises, natural disaster relief, and combat. The AASF, LAASF, AAOF, and the combination readiness center and AASF/LAASF provide aviation unit maintenance for fixed- and rotary-winged aircraft. These facilities are also used for flight operations as well as proficiency training of Army aviators, crew members, and flight safety professionals.

The difference between an AASF and a LAASF is the number of aircraft authorized in the table of organization and equipment (TOE)/table of distribution and allowances (TDA). An AAOF supports operational and logistical activities at a location and must be justified as an exception to general requirements.

CHAPTER 2

ARMY AVIATION SUPPORT FACILITY FUNCTIONAL DESIGN GUIDANCE

2-1 FUNCTIONAL PLANNING RELATIONSHIPS

2-1.1 Basic Components

The basic components of a typical AASF, which is the typical facility constructed to support the ARNG, include the following (asterisks indicate components listed in NG PAM 415-12, Chapter 4 Aviation Facilities:

- Office environment
  - Administrative and training areas*
  - Staff support areas*
- Maintenance shops and support
  - Allied shops (conditioned and non-conditioned)*
  - Maintenance support areas*
  - Unheated equipment storage*
- Aircraft hangars
  - Maintenance workbays*
  - Unheated aircraft storage*

The greatest potential for future expansion may occur in the number of allied shops, maintenance workbays, and related support areas, plus the need for unheated aircraft storage.

2-1.2 Arrangement of Basic Components

Figure 1 in Appendix D illustrates the basic site components of a typical aviation facility and their relationships to one another. Figure 2 is a space relationship diagram of the typical functions for a medium-sized facility, listed in NG PAM 415-12, Chapter 4. Figures 3 and 4 represent alternate geometric configurations for the basic components listed above. (All figures are included in Appendix D.)

These arrangements take into account economic and functional efficiency considerations related to acoustic compatibility, heating, ventilation, and air conditioning (HVAC) requirements, proximity for overall staff use, flexibility, and expansion. Although fundamental functional planning relationships are provided herein, optional component configurations are feasible because of the need to adapt to site constraints.

2-1.3 Types of Shops

The three types of shops are as follows:

- Systems
- Repair
- Moving parts

The propeller/rotor, avionics/instrument, pneudraulics, electrical, engine inspection/repair, armament subsystem, and night vision device shops require air-conditioned space because of the precision of the labor and the sensitivity of calibrating and monitoring equipment. Shops that have a critical need for close proximity to one another are indicated in Table 1, Appendix C.

2-2 DESIGN GUIDANCE FOR PROGRAM SPACES

2-2.1 General Information

The AASF may include aircraft maintenance hangars, allied shops, aircraft storage hangars, an administrative support area, training facilities, and support facilities. The AASF is generally located adjacent to a civilian airport. Aviation safety personnel, aviators, and crew members use the AASF proper for flight training, controls utilization, and operation of assigned aircraft as well as for performing inspection, maintenance, repair, and modifications on fixed- and rotary-winged aircraft.

Whether support function structures are attached to or separate from the main AASF building is a State or unit decision. Where there is a conflict, the Federal Aviation Administration (FAA) criteria (when the facility is a tenant at a commercial airfield); the provisions of this document or other NGB publications; or the requirements of an applicable State or local code take precedence. The layout and location of supporting facilities are to conform to safety clearances prescribed by TM 5-803-4 or the FAA criteria, or both, as appropriate.

2-2.2 Main Entrance and Lobby

The main entrance and lobby provide an entryway and reception area for unit personnel and visitors. As the primary public entrance to the AASF, the entry should be readily identifiable from the parking lot and pedestrian access routes. The lobby area should be adjacent to a permanently staffed office because there is no receptionist. The design should provide an orderly, warm, friendly invitation to the public. Clearance should be provided to accommodate circulation, traffic patterns, and space for congregating. Graphic displays may include unit plaques, trophies, and awards.

2-2.3 Aircraft Maintenance Hangar

The aircraft maintenance hangar is an enclosed, environmentally controlled work area for the inspection, maintenance, repair, and modification of fixed- and rotary-winged aircraft.

2-2.3.1 Aircraft Maintenance Workbays

The maintenance workbays should be adjacent to the allied shops, and the hangar apron should connect directly to the flight line and taxiways. Layout of the hangar is primarily based on the size and type of aircraft and the number of aircraft workbays authorized. The aircraft workbays should be organized to best facilitate use of the hangar doors from the hangar apron. The workbays should be located directly beneath the overhead bridge crane assembly. Space between the aircraft workbays and the adjacent allied shops should be adequate to facilitate movement of component workstands into and out of the shops. Provision should be made for adequate hot and cold water to service the maintenance areas. The space requires a dedicated heating/ventilation (H/V) system at 1.50 CFM/SF and a fire protection applying aqueous film-forming foam (AFFF) system.

2-2.3.2 Column-Free Space

The entire hangar space should be free of columns. The structure is required to support the overhead bridge crane assembly that will run between maintenance bays. The hangar should include a catwalk system for access to hangar lights and the overhead bridge crane assembly. Roof access is required by either an exterior fixed ladder or access door from the catwalk. A walkway that has safety railings and leads to a designated area for radio antenna mounting on the roof is also required.

2-2.4 Allied Shops

The allied shops are designated for all types of aircraft maintenance operations.

2-2.4.1 Propeller/Rotor Shop

The storage and repair of rotor assemblies require an overhead crane to move the heavy components. Therefore, this shop should be at least 50 ft long and have work benches on either side, allowing the crane to position the assembly or part at the appropriate work area.

2-2.4.2 Airfame/Welding/Structural Shop

The airframe/welding/structural shop provides for metal fabrication, composite material repair, and component welding. The shop should be isolated because the operation is very noisy. Refer to ACGIH Industrial Ventilation Manual for exhaust hood design.

2-2.4.3 Paint Shop

The paint shop provides for spray booth operations for painting small parts. Ventilation and exhaust system hood must be interlocked with spray booth operations. Refer to ACGIH Industrial Ventilation Manual for exhaust hood design.

2-2.4.4 Avionics/Instrument Shop

The avionics/instrument shop provides space for the supervision, administration, and repair of aircraft electronic equipment. Controlled access to communication security (COMSEC) and avionics float equipment storage areas is required. The workshop area should be located on an outer wall to provide access to unit avionics vans. Emergency power disconnect is needed for outlets. The following should also be provided:

- Harris AN/PRC-117F radio with secure, interoperable ground/air communications and Have quick capabilities and a minimum of three frequencies: UHF, VHF, and VHF-FM

- An automation data port

- Intercom service

- Two-way voice communications with a frequency range of 30.0 through 87.979 MHz, 116.0 through 151.975 MHz, 108.0 through 115.95 MHz (receive only) UHF-AM

- Two-way voice communications with a frequency range of 225.0 through 399.975 MHz

2-2.4.5 **COMSEC and Avionics Float Equipment Storage**
The workshop area and storage for COMSEC and avionics float equipment need to be away from exterior walls and accessible only from the avionics/instrument shop. The COMSEC room requires double-barrier protection (AR 190-51) and a shunt from the armament shop intrusion detection system (IDS).

2-2.4.6 **Pneudraulics Shop**
The pneudraulics shop provides for repair, testing, and fabrication of pneudraulic components and systems. The floor is required to be oil and fuel resistant and skid free. Double-door access to the maintenance hangar workbay area is required.

2-2.4.7 **Electrical Shop**
The electrical shop provides for maintenance of aircraft electrical components.

2-2.4.8 **Engine Inspection/Repair Shop**
The engine inspection/repair shop provides for inspection, repair, disassembly, and assembly of gas turbine engines. The shop requires an electrically operated 1-ton hoist with a beam extension of 4 ft into the maintenance hangar and 4 ft onto the loading dock and with an 8-ft hook height. The floor is required to be oil and fuel resistant and skid free.

2-2.4.9 **Battery Room**
The functions of the battery room include charging, maintenance, and storage of aircraft nickel-cadmium batteries. The minimum ventilation should be 2 cfm per ft^2 of floor area. Use of the shower or eyewash must automatically activate the emergency alarm. The following are required:

- A manual alarm device

- A ventilation hood over and activated by the battery charging area

- Urethane flooring

- A chemical- and acid-resistant sink and bench top
- A deluge shower with alarm
- Emergency power cutoff for the battery charger, with secondary cutoff outside of the battery room
- Introduction of makeup air at floor level and exhaust to the exterior
- A battery charger
- Self-contained battery compartments with a ventilation system

2-2.4.10 **Armament Subsystem Shop**
The armament subsystem shop provides for maintenance and storage of aircraft weapons systems, including cannons, missile systems, and on-board computer systems. This shop controls access to the storage area and vault. It requires the following:

- Acoustical ceiling and static-free rubber flooring
- Metal double doors of 16-gauge steel, with 14-gauge frames, non-removable pins, and series 86 locks
- A vault intrusion detection system that is integrated into the design

2-2.4.11 **Non-Destructive Inspection**
This functional area accommodates aircraft component inspection and analysis, testing for cracks and failure. Test equipment, normally includes, X-ray equipment, and magnaflux test system, a dark room and workbench. It should be located adjacent to the phase/inspection bay and other workbays and accessible to the Avionics, Pneudraulics, Electrical, Engine Repair and Armament Subsystem shops.

2-2.4.12 **Component Cleaning Area**
The component cleaning area provides for the cleaning of aircraft parts with the use of solvents. It requires an outside air makeup system with a three-slotted side-draft exhaust hood at the solvents-cleaning tank. The room should be maintained under negative pressure with respect to other spaces.

2-2.4.13 **Night Vision Device Shop**
The storage, inspection, maintenance, and security area for all night vision devices (NVDs) and test equipment must be located close to this shop to allow effective maintenance and accountability of NVDs. The shop should be located in the interior of the facility, as far from the exterior as possible. The room must be completely dark when the light fixtures are switched off. There must be an unobstructed viewing distance of 8 to 10 ft from the distortion check grid patterns (refer to TM 11-5855-263-23P). A nitrogen storage tank should be provided for support.

2-2.5 Special Tools Room

The special tools room provides secure storage and control of special tools associated with the maintenance of aircraft and components. It should be located adjacent to the repair parts room and have direct access to the workbays in the maintenance hangar.

2-2.6 Repair Parts Room

The repair parts room contains secure and controlled aircraft repair parts and supplies. It also includes a shipping and receiving area. The room should be located adjacent to the special tools room and have direct access from the workbays and direct access to the loading dock.

2-2.7 Accessory Equipment TOE/TDA Storage

This functional area provides space for storage, shipping and receiving, and distribution of aircraft equipment, components, and parts. It includes administrative space for automated record keeping, ordering and distribution of controlled or expendable aircraft components and parts. It should have direct access to the loading dock, repair parts room, and workbays and shops where maintenance is to be performed.

2-2.8 Arms Vault

Refer to vault design discussed in DG 415-5, Chapter 6, 13030.

2-2.9 Bulk POL Storage

Refer to the bulk petroleum, oils, and lubricants (POL) storage discussion in DG 415-5, Chapter 4 Common Functional Site Design Guidelines.

2-2.10 Contractor Shop/Storage

This functional area provides administrative workspace and limited storage space for civilian contract maintenance operators. It should be adjacent to other maintenance oriented administrative areas.

2-2.11 Flammable/Combustible Storage

Refer to the flammable materials storage building discussion in DG 415-5.

2-2.12 Controlled Waste-Handling Facility

Refer to the controlled waste-handling facility discussion in DG 415-5, Chapter 4.

2-2.13 Administrative Area

2-2.13.1 Supervisory Aircraft Pilot

The supervisory aircraft pilot office is a private office for the facility commander, who holds frequent staff meetings within the office area.

2-2.13.2 Secretary

The secretary provides clerical and secretarial support for the facility. The secretary should be located in an open area adjacent to the facility commander's office and may be located adjacent to a reception area at the entrance to the facility.

2-2.13.3 **Supervisory Instructor Pilot**
This office for the supervisor of all personnel working in flight operations should include a small conference area. The office should be located in the vicinity of the flight operation specialist's office and the flight instructor offices. It should provide an exterior view of the flight line operations.

2-2.13.4 **Flight Instructor (Safety)**
The activities of the flight instructor (safety) consist of briefing and debriefing one or more crew members.

2-2.13.5 **Flight Instructors (Aircraft)**
The activities of the flight instructor (aircraft) consist of briefing and debriefing one or more crew members.

2-2.13.6 **Flight Operations Specialist**
The flight operations specialist's office should be located adjacent to the flight operations briefing and communications areas.

2-2.13.7 **Flight Engineers**
The activities of the flight engineers consist of briefing and testing. The work area should accommodate a minimum of two people and should be located in the vicinity of the flight operations administration area.

2-2.13.8 **Supervisory Maintenance Test Pilot**
The supervisory maintenance test pilot's office should be located in the vicinity of maintenance hangar, aircraft maintenance supervisor's offices, and production control. An exterior view to flight line operations is required.

2-2.13.9 **Aircraft Maintenance Supervisors**
Semi-private office space for Aircraft Maintenance Supervisors overseeing hangar operations and personnel, production functions, parts procurement, and maintenance quality control functions. This area should be located near the hanger and the other maintenance administrative areas, to include production control, technical publications and test pilot offices.

2-2.13.10 **Production Controller**
Semi-private office for maintenance activity assignment, monitoring status, and tracking work orders using automated and manual systems. This area provides an operational repository for maintenance records and should be located in close proximity to the inspection section and be accessible to Technical Publications, ULLS-A Workspace, and Test Pilot offices.

2-2.13.11 **Aircraft Automation Clerk**
The aircraft automation clerk inputs data into aircraft maintenance records and functions as the administrative assistant to the supervisory maintenance test pilot.

2-2.13.12 **Supervisory Supply Technician**
The supervisory supply technician directs the supply function of the logistics and aircraft maintenance operations.

2-2.13.13 **Maintenance Test Pilots**
The maintenance test pilot's functions include study of the aircraft systems, training and evaluating of test pilots, and supervision of the quality control section of aircraft maintenance.

2-2.13.14 **Aircraft Inspectors**
The aircraft inspectors administer technical inspection for aircraft maintenance and the aircraft log book maintenance program. They should be located in an open office environment with direct access to the technical publications area.

2-2.13.15 **Technical Publications**
Library for technical publications including electronic and printed media covering maintenance procedures and execution and other data, for all aircraft and equipment supported by the facility. This functional area may have an amount of storage shelving surface equal to the net floor of the storage room included in the design. The shelving should be made of wood or metal and attached to the floor. The Technical Publications area should be located adjacent to the phase/inspection workbay and other workbays, ULLS-A workspace and Production Control.

2-2.13.16 **Unit Level Logistics System – Aviation (ULLS-A) Workspace**
Open office workspace for crewchiefs to perform ULLS-A laptop maintenance record data input. May be incorporated in or adjacent to Technical Publications and/or Production Control functional areas.

2-2.13.17 **Safety, Briefing, and Examination Room**
The safety, briefing, and examination room should be designed as a seminar-type meeting room for mission briefings, instructional classes, meetings and group or individual testing.

2-2.13.18 **Flight Planning**
The flight planners determine the route based on flight restrictions, weather, and aircraft performance data and fill out the required forms. This office should be located close to flight operations, safety briefing and examination room, the aviation life support equipment (ALSE) shop, and the main circulation within the administrative area. The equipment in the flight planning room includes wall-mounted planning maps (on multiple horizontal sliding panels), planning tables, a computer station, a weatherization data center (with a computer and printer), storage for publications, a work counter, a bulletin board, and shelving for manuals.

2-2.13.19 **Administrative Support Area**
The administrative support area functions as an internal mail distribution center. It also accommodates storage of administrative and office supplies, a copy machine, and common use of an automated data processing (ADP) terminal and printer.

2-2.13.20 **Common Information Technology Space**
The common information technology (IT) space functions as the central hub for all telecommunication and data processing and wiring requirements. This hub supports the analog and digital phone lines, coaxial cable, and fiber optic wiring. The space accommodates those functions not supported by the facility telecommunications systems.

The common IT space should be located near the center of facility and should not be placed near the facility mechanical room. The maximum line and drop length should not exceed 300 ft. The pan rail for the trunk lines should exit from the ceiling. Standard 120-VAC outlets must be co-located with communication drops. Wiring must conform to the Telecommunications Industry Association and Electronic Industries Alliance requirements. All conduits for communications and data wiring must be a minimum of 3/4 in. throughout the building.

2-2.13.21 **Information Technology Support Activities**
The IT support activities space houses servers, routers, concentrators, telecommunications equipment, amplifiers, relays, uninterrupted power supplies, and other related equipment.

2-2.13.22 **Flight Surgeon Administration/Examination Area**
This area functions as an examination room for the flight surgeon and must have proximity to the toilets. It also supports flight physical requirements and evaluations.

2-2.14 **Aviation Life Support Equipment Shop**
The aviation life support equipment (ALSE) shop includes:

- Administration and training
- A secure area for inspection and maintenance
- Storage of ALSE and related equipment

The shop must be close to the locker rooms, flight operations, classroom, and the main building circulation. Utility support should include a fixed or portable vacuum source and low-pressure, high-volume compressed air (moisture and oil free) if flotation devices are authorized. Equipment requirements include built-in cabinets, lockers, shelving, and work tables. The tables should be free from rough or abrasive materials and should have a nonporous surface.

2-2.15 **Locker Rooms (Men and Women)**
The locker room area functions as storage for the flight gear and personal effects of the AASF staff and flight crew. The number of lockers must be determined based on the size of the units. The locker room area should be adjacent to the toilets and near physical fitness areas and should have access to circulation from both the administrative and workshop areas. Fixed benches are required, along with full-height lockers mounted on a base at least 4 in. above the floor. The split between the number

of lockers in the male and female locker rooms is based on code requirements and anticipated building usage. Each room must have a minimum of 10 lockers.

2-2.16 Break and Assembly Area

The break and assembly area should be provided at a central location and should have a kitchen counter, sink with garbage disposal, kitchen cabinets, and built-in storage.

2-2.17 **Toilets/Showers**
Refer to NG PAM 415-12, Chapter 4, for size requirements and DG 415-5, Chapter 5, Common Functional Planning and Building Design Guidelines, for design guidance.

2-2.18 **Physical Fitness Area**
Refer to DG 415-5, Chapter 5.

2-2.19 **Operations**
This area is the operations center for all flight-related activities, including working with pilots, flight and ground crews, and passengers, whether the aircraft are on the ground or in flight. Another function of this area is to dispense flight literature, goggles, radios, and other flight-related gear prior to all flights. In addition, this area provides facility security, particularly during the off hours.

The operations area must have direct access and visual contact with the flight operations specialist, exterior aircraft parking, taxiways, and storage hangar. It must also be in close proximity to the supervisory flight instructor, ALSE, and main circulation from the administrative area. The area requires a view of the flight line and aircraft takeoff and landing areas. It should include a separate room for storage of authorized communications equipment. Other provisions include cabinet work, windows, a tackboard, and a security key safe. The facility safe may also be located here or in a similar secure and accessible area. Provisions for installing UHF, VHF, FM radio and weather equipment should be considered. A vestibule is authorized at the entry if dictated.

2-2.20 **Simulation Training Area**
The simulation training area provides for individual study, instruction, and storage of AV instructional materials. Circulation access to both the facility administrative and workshop areas is required. The simulation training area consists of the following, which should be located adjacent to one another:

- **A Learning Center** – This space should be equipped with individual pre-wired study carrels for military occupational skills (MOS) training, built-in shelving or racks, a chalkboard, and electrical outlets to accommodate AV equipment in the study carrels. It should be adjacent to, or combined with, the library/classroom.

- **Storage Rooms for Audio/Visual (AV) Equipment and Training Aids** – The AV storage rooms should be designed to maximize wall space and should each have built-in shelving or racks, or both. This space should be adjacent to, and preferably have direct access to, the learning center and the library/classroom.

- **A Library/Classroom –** This area functions as an administrative area for reading, study, testing, and instruction. It also stores books, manuals, and regulations. Access should be provided from both the facility administrative and workshop areas.

- **A Simulation Devices Area –** This area functions as a secure training room for cockpit flight, weapons, and procedure simulation and training devices. The primary simulator Aviation Combined Arms Tactical Trainer-Aviation Reconfigurable Manned Simulator system is a dynamic complete with support facilities. The number and layout of simulation devices should be coordinated. The designer must review vender data for required utilities prior to planning space.

2-2.21 Facility Maintenance and Custodial Area

Refer to DG 415-5, Chapter 8.

2-2.22 Mechanical, Electrical, and Telecommunications Room(s)

Refer to DG 415-5, Chapter 5.

2-2.23 General Design Requirements

The facility administrative area must be close to the flight instructors and have access to the main building circulation. It requires a Class V security cabinet that is designed to resist covert, surreptitious, and forced entry and is approved for the storage of all levels of classified information, funds, and other valuables. Secure and controlled access to the facility administrative area is required, along with visual privacy.

2-3 SPECIAL SITE REQUIREMENTS

2-3.1 Airfield Lighting

TM 5-811-5 provides design criteria for the types of lighting fixtures and the colors, spacing, controlling, and location of lights; however, it does not provide a drawing for parking, hoverlane, and taxi lane lighting. If a facility is located at a municipal airport, the FAA regulation and design guidance will take precedence when it conflicts with TM 5-811-5. A light dimmer system for airfield lighting may be provided at a location where training with night vision goggles is a requirement for all aircraft traffic at the airfield. Hazard lighting as required by TM 5-803-4 and TM 5-811-5 is authorized.

2-3.2 Pavement and Markings

The aviation facility pavement and markings, except as stated below, are to be designed using TM 5-803-4, TM 5-823-4, and TM 5-811-5.

2-3.3 Hangar Access Ramp

The Hanger Access Ramp provides additional space in front of the hangar doors for towing aircraft to and from the hangar and clearance from the hangar to the centerline of the taxiway in front of the hangar to allow aircraft to taxi (with blades turning) in front of the hangar. For the Hanger Access Ramp concrete and other details, reference UFC 3-260-2, Pavement Design For Airfields; and UFC 3-260-1 which supersedes TM 5-803-7, Airfield and Heliport Planning and Design; and TM 5-803-4, Planning of Army Aviation Facilities.

2-3.4 Aircraft Parking Pads and Mooring Tie-Downs

The entire parking pad for aircraft should be rigid concrete, with the thickness, strength, aggregate and reinforcing, and steel as stated above for the ramp. The sizes of the

parking pad for fixed- and rotary-winged aircraft can be obtained from the NGB-ARI approved program documents or TM 5-803-4. The parking pads should be designed and laid out using TM 5-803-4 as a guide to determine the maximum and minimum pavement slopes as well as the type of arrangement that will provide the least amount of area for hoverlanes, taxiways, and access road to the maintenance and storage hangar and still meet all safety, security, and functional requirements. All helicopter parking pads should be planned to handle wheeled helicopters and provide pull-through rather than parallel parking adjacent to the hoverlanes; the exception is that the CH-47 may be pull-through or parallel parked adjacent to the hoverlane, whichever results in the least construction cost.

The parking pads are to have bimetallic copper-covered steel tie-down anchors. Another acceptable type of mooring tie-down is shown in reference 28 ETL 1110-3-430, which also shows mooring tie-downs in existing pavement or for unpaved areas.

2-3.5 Hoverlanes

A hoverlane is pavement adjacent to aircraft parking pads on which the aircraft will taxi. Hoverlanes may be either flexible pavement or rigid concrete. If flexible pavement is selected, the hoverlane may not be less than 140 ft wide for helicopters; for the CH-47, the minimum width should be 160 ft. If rigid concrete is selected, the minimum width is 120 ft for all helicopters except the UH-60 and AH-64, for which the minimum width is 140 ft, and the CH-47, for which it is 160 ft.

2-3.6 Taxiway(s)

Taxiways are to be 40 ft wide, and the minimum length should be as required for a practical and economical site layout between the hangar ramp, loading area, wash area, parking pads, and nearest exit point connecting to an existing taxiway or runway system. Refer to TM 5-803-4 for layout examples, pavement slopes, and minimum safety clearances.

2-3.7 Shoulders (Aprons)

Shoulders 25 ft wide may be incorporated at all aircraft operational pavement edges, including taxiways or hoverlanes and aircraft parking pads. Refer to TM 5-803-4 for examples of shoulder layout, slopes, and minimum safety clearances.

2-3.8 Markings

TM 5-823-4, with supplements, provides design guidance for marking and painting aircraft operational pavements and obstructions.

2-3.9 Wash Platform

The size, layout, and additional design guidance for a wash platform may be obtained from the approved program documents. The wash platform should be located adjacent to the maintenance and storage hangars because the aircraft is generally washed before being taken into the hangar. Sufficient area should be provided around the platform for use of equipment, maneuvering of aircraft, and movement of vehicles.

The effluent removal is to comply with the National Pollutant Discharge Elimination System (NPDES) and State and local discharge requirements, which may include

measures such as containment curbing and overhead cover to prevent storm water runoff. At a minimum, the effluent from washing aircraft and related equipment should pass through a sediment, oil, and grease separator before being discharged. The State Department of Environmental Quality or similar agency charged with environmental protection may require a detention pond prior to discharge into the storm drain line. Where a pollution control facility requirement is identified and documented, appropriate wastewater treatment facilities would be supportable. An NPDES discharge permit is also required.

2-3.10 Waste Oil Storage Tanks

Waste oil should be stored above ground in drums or tanks. If tanks are used, the maximum tank capacity is 1,000 gallons. The tank should be located close to and adjacent to the hangar, and there should be a pipe running from a convenient point in the maintenance hangar to drain waste oils directly to the tank. A standard connection should be provided on the tank for removing the waste oil from the tank.

2-3.11 Wind Sock

A lighted wind sock, lighted tetrahedron, or lighted tee should be provided at aviation flight facilities (unless one exists elsewhere at the supporting airfield). The location preferably should be adjacent to the runway or the approach-departure zone, in line with the centerline of the runway or approach-departure zone but outside the safety clearance zones specified in TM 5-803-4. A rotating beacon should be located on top of the hangar building unless one exists elsewhere at the supporting airfield.

2-3.12 Flammable Materials Storage

Refer to DG 415-5, Chapter 4.

2-3.13 Crash Rescue Vehicle Storage

The heated enclosure for storing the crash rescue vehicle and component equipment must be readily accessible to the flight line and the aircraft area. It may be located in a separate prefabricated metal or concrete masonry building or included in the main building. If this functional area is part of the main building, exterior and interior personnel doors should be provided for easy access to the rescue equipment. The vehicle door should be a minimum of 16 ft wide by 12 ft high. The height may have to be increased if the crash rescue vehicle requires it. The door is to be equipped with an automatic, quick-opening device with a manual backup system.

2-3.14 Fuel Storage and Dispensing Facility

The aircraft fuel storage and dispensing facility, with direct fuel truck access to the aircraft parking aprons, should be provided in accordance with the approved program documents. The fuel-dispensing system must be equipped for bottom loading of tank trucks or trailers and meet applicable Federal, State, and EPA standards as contained in 40 CFR 112 and 40 CFR 280.

Questions related to fuel-dispensing systems can be answered by calling STRGP-FT at DSN 977-6445/6053. Fixed facilities should be marked for identification of liquid petroleum products according to MIL-STD-161F. The electrical equipment should be designed and installed in accordance with TM 5-678, TM 5-681, and TM 5-848-2. All

fuel-loading and -unloading points should be equipped with bonding and grounding points. Refer to DG 415-5, Chapter 4, for additional information.

2-3.15 Ground Support Equipment Storage

All storage-type buildings should be designed and constructed in accordance with DG 415-5, Chapter 4.

CHAPTER 3

UNIQUE ARCHITECTURAL AND ENGINEERING TECHNICAL REQUIREMENTS

3-1 UNIQUE AASF BUILDING AND SYSTEMS REQUIREMENTS

3-1.1 The Army Aviation Maintenance Facilities are predominately located on or near military airfields or civil airports. This requirement is for small fixed wing and rotary aircraft (helicopters) used by the Army National Guard. The designer must prepared to coordinate with the Federal Aviation Administration and local civil authorities on site.

Building Exterior Aesthetics: The facility should blend into the existing architecture of the surrounding Army Airfield or the civil aviation authority facilities.

3-1.2 **Hangar Doors**

The hangar doors for aircraft access maybe sectional insulated steel framed, steel bottom rolling type with pre-finished on all exposed surfaces with motorized operators manual or automatic controlled. An electrical heat tracing system is required in cold climates to prevent door trench freezing.

An overhead vertical lift stacking fabric hangar door with electrical door operators meeting the local wind loads required for steel type doors maybe provided.

3-2 HEATING/VENTILATION SYSTEM

The Maintenance Hangar heating/ventilation (H/V) system must be designed to provide year-around filtered (35% efficiency) supply air to the space at 1.50 CFM/SF of outside air. H/V Unit installation support mezzanine may be required to access the units for maintenance purposes. Exhaust air inlet grilles should be located within 3.0 feet from the hangar floor.

3-3 FIRE PROTECTION SYSTEM

The hangar fire protection system must be designed to meet NFPA 409, Aircraft Hangars, UFC 3-600-01, ETL 1110-3-411, Aircraft Hangar Fire Protection Systems and ETL 1110-3-485, Fire Protection for Helicopter Hangars. The Fire Suppression medium can be water at the highest ceiling level per NFPA 13 and Aqueous Film-Forming Foam (AFFF) or a High Expansive Foam System at the aircraft level. If an AFFF system application is used the designer must provide for containment and disposal of the solution as specified in ETL 1110-3-481, Containment and Disposal of AFFF Solution, dated 23 May 1997.

CHAPTER 4

UNIQUE SUBMISSION REQUIREMENTS

(To Be Determined And Developed As Required)

CHAPTER 5

UNIQUE DESIGN REVIEW DIRECTIVES

(To Be Determined And Developed As Required)

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APPENDIX A

UNIQUE REFERENCES

The following lists criteria in the form of regulations and industry standards that are to be used to design ARNG aviation facilities and are not included in the References in DG 415-5. The design A-E should use the current applicable edition of all references.

GOVERNMENT PUBLICATIONS:

1. Department of the Air Force	ETL 02-15, Fire Protection Engineering Criteria – New Aircraft Facilities.
2. Department of the Army	ETL 1110-3-430, Design of US Army Airfield Aircraft Mooring and Grounding Points for Rotary Wing Aircraft.
	ETL 1110-3-481, Containment and Disposal of Aqueous Film – Forming Foam Solution.
	ETL 1110-3-485, Engineering and Design Fire Protection for Helicopter Hangars.
	TM 5-678, Repairs and Utilities: Petroleum, Oils, and Lubricants (POL).
	TM 5-681, Repairs and Utilities Preventive Maintenance for Electrical Facilities.
	TM 5-803-4, Planning of Army Aviation Facilities.
	TM 5-811-5, Army Aviation Lighting.
	TM 5-823-4, Marking of Army Airfield-Heliport Operation and Maintenance Facilities.
	TM 5-848-2, Handling of Aircraft and Automotive Fuels.
	TM 11-5855-263-23P.
	TM 55-1680-317-25P
	MIL-STD-161F, Identification Methods for Bulk Petroleum Products Systems Including Hydrocarbon Missile Fuels.

2. Environmental Protection Agency (EPA)	40 CFR 112, Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities.
3. Unified Facilities Criteria (UFC)	UFC 3-260-01, Airfield and Heliport Planning and Design.
	UFC 3-260-02, Pavement Designs for Airfields.

NON-GOVERNMENT PUBLICATIONS:

APPENDIX B

GLOSSARY

B-1 ACRONYMS AND ABBREVIATIONS

AAOF	Army Aviation Operating Facility
AASF	Army National Guard Aviation Support Facility
ADP	automated data processing
A-E	architect-engineer
AH	attack helicopter
ALSE	aviation life support equipment
AR	Army Regulation
ARNG	U.S. Army National Guard
AV	audio/visual
CBR	California Bearing Ratio
cfm	cubic feet per minute
CH	cargo helicopter
COMSEC	communication security
DG	design guide
EPA	U.S. Environmental Protection Agency
ETL	Engineering Technical Letter
FAA	Federal Aviation Administration
FM	frequency modulation
ft	foot/feet
HVAC	heating, ventilation, and air conditioning
IDS	intrusion detection system
in.	inch(es)

IT	information technology
LAASF	Limited Army Aviation Support Facility
MHz	megahertz
MOS	military occupational skills
NGB-ARI	National Guard Bureau, Installations Division
NPDES	National Pollutant Discharge Elimination System
NVD	night vision devices
POL	petroleum, oils, and lubricants
TDA	table of distribution and allowances
TM	technical manual
TOE	table of organization and equipment
UH	utility helicopter
UHF-AM	ultra-high frequency-amplitude modulation
VAC	volt alternating current
VHF	very high frequency

B-2 UNIQUE SPECIALIZED TERMS

hoverlane	Pavement adjacent to aircraft parking pads on which aircraft taxi

APPENDIX C
TABLES

Table 1. Proximity Requirements for Aviation Facility Specialized Work Areas

Table 2. Special Requirements for Maintenance Functions

Table 3. Proximity Requirements for Personnel Support Areas

Table 4. Architectural Interior Finishes

Table 5. Doors, Hardware, Storage, and Shelving

Table 6. Mechanical Requirements – Part 1

Table 7. Mechanical Requirements – Part 2

Table 8. Electrical Requirements

Table 9. Special Equipment and Ceiling Heights

Table 1. Proximity Requirements for Aviation Facility Specialized Work Areas

	Propeller / Rotor	Airframe / Welding / Structural	Paint	Avionics / Instrument	COMSEC Storage	Pneudraulics	Electrical	Engine Inspection / Repair	Battery Room	Armament Subsystem	Non-Destructive Inspection	Component Cleaning Area	Night Vision Device	Special Tool Room	Repair Parts Room	Accessory Equipment (TOE/TDA)	Arms Vault	Bulk POL Storage	Contractor Shop / Storage	Flammable / Combustible Storage	Controlled Waste Handling	Maintenance Work Areas
Propeller / Rotor		1	N	2	N	2	2	2	N	N	N	2	3	2	2	2	N	3	N	3	3	1
Airframe / Welding / Structural	1		1	N	N	2	N	N	N	N	3	2	3	2	2	2	N	3	N	3	3	1
Paint	2	2		N	3	2	N	N	3	N	N	2	N	2	N	N	N	3	N	3	3	2
Avionics / Instrument	2	2	3		1	2	2	2	N	2	2	3	2	2	3	N	N	3	N	3	3	2
COMSEC Storage	3	3	3	1		N	N	N	N	N	N	N	N	N	N	2	2	3	N	3	3	2
Pneudraulics	N	N	N	2	N		2	2	N	N	2	N	N	2	2	N	N	3	N	3	3	1
Electrical	N	N	3	1	2	2		2	1	1	2	3	2	2	N	N	N	3	N	3	3	1
Engine Inspection / Repair	2	2	N	N	N	2	2		2	N	2	1	3	2	2	2	N	2	2	2	2	1
Battery Room	N	N	N	2	2	2	1	2		N	N	3	2	N	N	N	N	N	N	2	2	2
Armament Subsystem	3	3	3	1	N	2	1	2	N		2	3	2	2	2	2	1	3	N	3	3	2
Non-Destructive Inspection	2	2	N	2	N	2	2	2	N	2		N	N	2	2	N	N	3	N	3	3	1
Component Cleaning Area	2	2	2	3	N	2	N	2	N	N	N		3	N	N	N	N	3	N	3	3	2
Night Vision Device	3	3	3	2	2	2	2	3	N	2	N	3		N	3	N	2	3	N	3	3	2
Special Tool Rooms	2	2	N	2	2	2	2	2	N	2	N	N	2		1	2	N	3	N	3	3	1
Repair Parts Room	2	2	N	2	2	2	2	2	N	2	N	N	N	1		N	N	3	N	3	3	1
Accessory Equip. (TOE/TDA)	2	2	2	2	N	2	2	2	2	2	N	N	N	N	1		N	3	N	3	3	2
Arms Vault	N	N	N	2	2	2	2	N	N	1	N	N	2	N	N	N		3	N	3	3	3
Bulk POL Storage	3	3	3	3	3	3	3	N	3	3	N	N	3	N	N	N	N		N	2	2	3
Contractor Shop /Storage	N	N	N	N	2	N	N	N	N	N	N	N	N	2	2	2	N	3		3	3	2
Flammable / Combustable Stor.	N	N	2	N	N	N	N	N	N	N	N	N	2	N	N	N	N	2	3		1	3
Controlled Waste Handling	N	N	2	N	N	N	N	N	N	N	N	N	2	N	N	N	N	1	3	1		3
Maintenance Work Areas	1	1	2	2	2	1	1	1	2	2	1	2	2	1	1	2	3	3	2	3	3	

Functional Relationship Requirements: 1 **Immediate** 2 Close 3 Isolated N Neutral

All designated areas are from NG PAM 415-12, Table 4-2.

Table 2. Special Requirements for Maintenance Functions

		Overhead Crane Requirements	Immediate Adjacency to Loading Dock	Noise and Vibration Isolation Required	Locate Directly Off Workbays														
Allied Shop Areas	Prop / Rotor	Y	Y	N	Y														
	Airframe / Welding / Structural	Y	Y	N	Y														
	Paint	N	N	N	Y														
	Avionics / Instrument	N	N	Y	Y														
	COMSEC Storage	N	Y	N	N														
	Pneudraulics	N	Y	N	Y														
	Electrical	N	N	Y	Y														
	Engine Inspection / Repair	Y	Y	N	Y														
	Battery Room	N	N	N	Y														
	Armament Subsystem	N	N	Y	N														
	Non-Destructive Inspection	N	N	Y	Y														
	Component Cleaning Area	N	N	N	Y														
	Night Vision Device	N	N	Y	N														
Special Tool Rooms		N	Y	N	Y														
Repair Parts Room		N	Y	N	Y														
Accessory Equip. (TOE/TDA)		N	Y	N	N														
Arms Vault		N	N	N	N														
Bulk POL Storage		N	N	N	Y														
Contractor Shop /Storage		N	Y	N	Y														
Flammable / Combustable Stor.		N	N	N	Y														
Controlled Waste Handling		N	N	N	Y														

Y = Yes N = No

Table 3. Proximity Requirements for Personnel Support Areas

	Supervisory Aircraft Pilot	Secretary	Supervisory Instructor Pilot	Flight Instructor (Safety)	Flight Instructor (Aircraft)	Flight Operations Specialist	Flight Engineers (SI/FI)	Supervisory Maintence Test Pilot	Aircraft Maintenance Supervisors	Production Controller	Aircraft Automation Clerk	Supervisory Supply Technician	Maintenance Test Pilot	Aircraft Inspectors	Techanical Publications	Safety, Briefing, Exam Room	Flight Planning	Administrative Support Area	Common IT Space	IT Support Activities	Flight Surgeon Admin. / Exam.	Maintenance Work Areas	ALSE	Operations	Learning Center*	Audio/Visual Storage*	Library/Classroom*	Simulation Devices*
Supervisory Aircraft Pilot		1	2	2	2	2	N	N	3	3	N	3	3	3	N	2	2	2	N	N	2	3	2	2	N	N	N	N
Secretary	1		2	2	2	2	N	3	3	3	N	3	3	3	N	N	N	2	2	2	2	3	3	2	N	N	N	N
Supervisory Instructor Pilot	1	2		1	1	1	N	3	3	3	N	3	3	3	N	2	1	2	N	N	2	3	1	2	2	N	1	2
Flight Instructor (Safety)	2	2	1		1	1	2	3	3	3	N	3	3	3	N	2	1	2	N	N	2	3	1	1	2	N	1	2
Flight Instructor (Aircraft)	2	2	1	1		1	2	3	3	3	N	3	3	3	N	2	1	2	N	N	2	3	1	2	2	N	1	2
Flight Operations Specialist	1	2	1	1	1		2	3	3	3	N	3	3	3	N	2	1	2	N	N	2	3	1	2	2	N	1	2
Flight Engineers (SI/FI)	2	N	2	2	2	1		3	3	3	N	3	3	3	N	2	1	1	N	N	N	3	1	1	2	N	1	N
Supervisory Maint. Test Pilot	3	3	3	3	3	3	3		1	1	1	N	1	1	2	3	3	3	N	N	2	1	2	3	2	N	1	2
Aircraft Maint. Supervisors	3	3	3	3	3	3	3	1		2	1	N	1	1	2	3	3	3	2	N	2	2	3	3	2	N	1	2
Production Controller	3	3	3	3	3	3	3	1	2		2	2	2	2	N	N	N	N	N	N	N	2	N	N	N	N	N	N
Aircraft Automation Clerk	3	3	3	3	3	3	3	2	2	2		2	2	2	2	N	N	N	2	2	N	N	N	2	N	N	N	N
Supervisory Supply Tech.	3	3	3	3	3	3	3	3	2	2	2		N	N	2	N	N	N	N	N	N	1	N	N	3	3	3	3
Maintenance Test Pilot	3	3	3	3	3	3	3	1	1	2	2	N		1	1	2	N	N	2	N	2	2	2	N	2	N	2	N
Aircraft Inspectors	3	3	3	3	3	3	3	1	1	2	2	N	1		1	2	N	N	2	N	2	1	N	N	N	N	1	N
Techanical Publications	3	3	3	3	3	3	3	2	1	2	2	1	2	1		2	N	N	2	N	N	2	2	N	2	N	2	N
Safety, Briefing, Exam Room	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3		2	N	N	N	N	3	N	2	N	1	N	N
Flight Planning	1	N	1	1	1	1	1	2	3	3	3	3	2	3	3	2		N	2	N	N	3	N	1	N	N	N	N
Administrative Support Area	2	2	2	2	2	2	2	N	N	N	N	N	2	3	3	N	N		2	2	N	3	2	2	N	N	N	N
Common IT Space	3	N	3	3	3	3	3	N	N	2	2	N	N	2	2	N	N	2		1	N	3	2	2	N	N	N	N
IT Support Activities	3	N	3	3	3	3	3	N	N	2	2	N	N	2	2	N	N	2	1		N	3	2	2	N	N	N	N
Flight Surgeon Admin/Exam	N	N	N	N	N	N	N	N	N	N	N	N	2	2	N	N	N	N	N	N		3	N	N	N	N	N	N
Maintenance Work Areas	3	3	3	3	3	3	3	2	2	2	2	2	2	1	2	3	3	3	3	3	3		3	3	3	3	3	3
ALSE	3	3	3	3	3	3	3	N	N	N	N	N	N	N	N	N	N	N	N	N	2	3		3	3	3	3	3
Operations	2	2	2	2	2	2	2	N	N	N	N	3	N	3	3	2	1	2	2	2	N	3	N		N	N	N	N
Learning Center *	3	3	3	3	3	3	3	2	2	2	2	N	2	2	1	N	N	N	2	2	N	3	N	N		2	2	2
Audio/Visual Storage*	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	N	N	N	N	N	N	N	N	N		1	N
Library/Classroom*	3	3	3	3	3	3	3	2	2	N	N	N	2	2	2	N	N	3	N	N	N	3	N	3	2	2		2
Simulation Devices*	3	3	3	3	3	3	3	2	2	N	N	N	2	2	N	N	N	N	N	N	N	3	N	N	2	2	2	

Functional Relationship Requirements: 1 **Immediate** 2 Close 3 Isolated N Neutral

All designated areas are from NG Pam 415-12 Table 4-3

* Within the simulation training area.

Locker rooms; break/assembly area; toilets/showers and physical fitness areas are required but not indicated on this table.

Table 4. Architectural Interior Finishes

	FUNCTIONAL AREA	FLOOR	BASE	WAINSCOT	WALLS	CEILING*
Maintenance Hangar		CONC/H	GSU	none	EXP/P (Note 1)	EXP/P
Allied Shops						
1	Propeller/Rotor	CONC/H	GSU	none	EXP/P	EXP/P
2	Airframe/Welding/Structural	CONC/H	GSU	none	EXP/P	EXP/P
3	Paint	CONC/H	GSU	none	EXP/P	EXP/P
4	Avionics/Instrument	RT	GSU	none	EXP/P	ACST/GWB
5	COMSEC Storage	CONC/H	GSU	none	EXP/P	EXP/P
6	Pneudraulics	CONC/H	GSU	none	EXP/P	EXP/P
7	Electrical	CONC/H	GSU	none	EXP/P	ACST/GWB
8	Engine Inspection/Repair	CONC/H	GSU	none	EXP/P	EXP/P
9	Battery Room	CONC/H	GSU	none	EPOXY (NOTE 2)	EXP/P
10	Armament Subsystem	CONC/H	GSU	none	EXP/P	EXP/P
11	Non-Destructive Inspection	CONC/H	GSU	none	EXP/P	EXP/P
12	Component Cleaning Area	CONC/H	GSU	none	EXP/P	EXP/P
13	Night Vision Device	CRT/RT	GSU	none	EXP/P	ACST/GWB
Special Tools Room		CONC/H	GSU	none	EXP/P	EXP/P
Repair Parts Room		CONC/H	GSU	none	EXP/P	EXP/P
Accessory Equipment (TOE/TDA Storage)		CONC/H	GSU	none	EXP/P	EXP/P
Arms Vault		CONC/H	GSU	none	EXP/P	EXP/P
Bulk POL Storage		CONC/H	GSU	none	EXP/P	EXP/P
Contractor Shop/Storage		CONC/H	GSU	none	EXP/P	EXP/P
Flammable/Combustible Storage		CONC/H	GSU	none	EXP/P	EXP/P (NOTE 7)
Controlled Waste Handling		CONC/H	GSU	none	EXP/P	EXP/P
Administrative Area						
1	Supervisory Aircraft Pilot	CPT	GSU	none	EXP/P/BB	ACST
2	Secretary	CPT	GSU	none	EXP/P/BB	ACST
3	Supervisory Instructor Pilot	CPT	GSU	none	EXP/P/BB	ACST
4	Flight Instructor (Safety)	VCT	GSU	none	EXP/P/BB	ACST
5	Flight Instructors (Aircraft)	VCT	GSU	none	EXP/P/BB	ACST
6	Flight Operations Specialist	VCT	GSU	none	EXP/P/BB	ACST
7	Flight Engineers	VCT	GSU	none	EXP/P/BB	ACST

***Ceiling heights are indicated in Table 9.**

Table 4. Architectural Interior Finishes (Continued)

	FUNCTIONAL AREA	FLOOR	BASE	WAINSCOT	WALLS	CEILING*
8	Supervisory Maintenance Test Pilot	VCT	GSU	none	EXP/P/BB	ACST
9	Aircraft Maintenance Supervisors	VCT	GSU	none	EXP/P/BB	ACST
10	Production Controller	VCT	GSU	none	EXP/P/BB	ACST
11	Aircraft Automation Clerk	CPT	GSU	none	EXP/P/BB	ACST
12	Supervisory Supply Technician	VCT	GSU	none	EXP/P/BB	ACST
13	Maintenance Test Pilots	VCT	GSU	none	EXP/P/BB	ACST
14	Aircraft Inspectors	VCT	GSU	none	EXP/P/BB	ACST
15	Technical Publications	CPT	GSU/RB	none	EXP/P/BB	ACST
16	Safety, Briefing, and Examination Room	VCT	GSU/RB	none	EXP/P/BB	ACST
17	Flight Planning	VCT	GSU/RB	Epoxy	EXP/P/BB	ACST
18	Administrative Support Area	CPT	GSU/RB	none	EXP/P/BB	ACST
19	Common IT Space	CPT	GSU	none	EXP/P/BB	ACST
20	IT Support Activities	CPT	GSU	none	EXP/P/BB	ACST
21	Flight Surgeon Admin./Examination Area	VCT	GSU	none	EXP/P/BB	ACST
22	**Aviation Life Support Equipment (ALSE)**					
a.	ALSE Administrative Area	VCT	GSU	none	EXP/P	ACST
b.	ALSE Maintenance Support	VCT	GSU	none	EXP/P	ACST/EXP/P
c.	ALSE Storage	CONC/H	GSU	none	EXP/P	EXP/P
23	**Locker Rooms**	VCT	GSU/RB	GSU/Epoxy	EXP/P	EXP/P/GWB/P
24	**Break and Assembly**	VCT	GSU/RB	Epoxy/BB	EXP/BB	ACST/GWB/P
25	**Toilets/Showers**	CT/QT	GSU/RB	none	GSU/CT	GWB/P
26	**Physical Fitness Area**	(Note 14)	GSU/RB (Note 12)	(Note 5)	EXP/P (Note 10)	ACST (Note 11)
27	**Operations**	VCT	GSU/CT	Epoxy/BB	EXP/P/BB	ACST/GWB/P
28	**Simulation Training Area**					
a.	Learning Center	CPT	GSU	none	EXP/P	ACST/GWB
b.	Audio/Visual Storage	CONC/H	GSU	none	EXP/P	EXP/P
c.	Library/Classroom	CPT	GSU	none	EXP/P/BB	ACST/GWB
d.	Simulation Devices	CONC/H	GSU	none	EXP/P	ACST/GWB

TABLE 4 – ABBREVIATIONS

ACST	acoustical suspended tile, 2 ft by 4 ft or 2 ft by 2 ft
BB	burnished block
CONC/H	clear liquid hardener/sealer finish over exposed concrete floor
CPT	carpet – A 26 to 28 oz. (face weight), permanent static-free (2.5 kV or less), cut or loop pile nylon or acrylic commercial-grade (direct glue down without cushion) carpet is authorized. (Carpet tile is preferred to roll stock.)
CT	ceramic tile (thick or thin set) and ceramic or marble threshold
Exp/P	exposed construction, painted **(**using enamel, latex, or paint of an equivalent cost)
GSU	glazed structural units (without cove on base units defined as prefaced concrete masonry unit, Federal Specification SS-C-621b, Form B)
GWB/P	gypsum wallboard, painted **(**using enamel, latex, or paint of an equivalent cost)
QT	quarry tile
RB	resilient base
RT	rubber tile, static dissipative with a static generation of less than 20 volt at 70 °F, 20 % RH.
VCT	vinyl composition tile – VCT with a thickness of 3/16 in. or less on monolithic concrete finish and with a final wax coat, if recommended by the tile manufacturer, is authorized.

TABLE 4 – NOTES

1. Exposed construction (one coat of paint is authorized for corrosion protection of exposed ungalvanized metal only, and touch-up of factory prime coat is authorized on ungalvanized metal not exposed to public view).

2. Epoxy is the base paint. The coating should not exceed a two-application system.

3. Unless ceiling is required for fire protection.

4. RB or GSU is authorized on other than masonry construction when required to prevent damage.

5. Wainscot to be 5 ft high where authorized. In metal buildings, wainscot paneling 8 ft high is authorized to cover exposed insulation.

6. Acoustic treatment is authorized to keep noise levels in the remainder of the facility below 85 decibels, A-weighted (dBA) and 140 decibels, related to a sound pressure of 1 Pascal (dBP). Noise management techniques such as equipment isolation, vibration mounts, and exhaust noise control should be used to the extent possible in conjunction with the acoustic treatment.

7. Seamless epoxy floor, base, and walls may be substituted for CT, QT, or GSU.

8. Epoxy base paint may be a substitute.

9. Concrete with a chemical/acid-resistant urethane finish is authorized instead of a clear liquid hardener/sealer. For workbays, any substance designed to prevent track damage may be used.

10. Mirror walls, 1 ft above floor to 6 ft 6 in. high by 3 ft 4 in. wide should be installed in front of each machine that faces the wall. A 4-ft double door and a second exit as a standard double door should be provided.

11. Dropped ceiling height should be approximately 9 ft or more if obtainable when complying with the 10-ft structure height requirement.

12. A kickboard to 1 ft above floor may be provided. The rug may be extended 1 ft up the wall instead.

13. Acoustic treatment may be used to meet noise attenuation requirements of the Occupational Safety and Health Administration (OSHA).

14. Rubberized athletic flooring with flexible strength meeting OSHA recommendations of 0.5 standard coefficient of friction per ASTM D-2047.

Table 5. Doors, Hardware, Storage, and Shelving

	FUNCTIONAL AREA	DOORS	HARDWARE	STORAGE/SHELVING
Maintenance Hangar				
Allied Shops				
1	Propeller/Rotor	hollow metal	commercial/keyed	built in storage
2	Airframe/Welding/Structural	hollow metal	commercial/keyed	CA storage
3	Paint	hollow metal	commercial/keyed	storage cabinets
4	Avionics/Instrument	hollow metal	commercial/keyed	N/A
5	COMSEC Storage	hollow metal	commercial/keyed	full-length shelving
6	Pneudraulics	hollow metal	commercial/keyed	N/A
7	Electrical	hollow metal	commercial/keyed	storage cabinet
8	Engine Inspection/Repair	hollow metal	commercial/keyed	storage cabinet
9	Battery Room	hollow metal	commercial/keyed	*TBD*
10	Armament Subsystem	special	Series 86	storage cabinet
11	Non-Destructive Inspection	hollow metal	commercial/keyed	N/A
12	Component Cleaning Area	hollow metal	commercial/keyed	N/A
13	Night Vision Device	hollow metal	commercial/keyed	full-length shelving
Special Tools Room		hollow metal	commercial/keyed	shelving, cabinets and countertop
Repair Parts Room		hollow metal	commercial/keyed	shelving, cabinets and countertop
Accessory Equipment (TOE/TDA Storage)		hollow metal	commercial/keyed	shelving and cabinets
Arms Vault		special	Series 86	N/A
Bulk POL Storage		hollow metal	commercial/keyed	shelving
Contractor Shop/Storage		hollow metal	commercial/keyed	shelving
Flammable/Combustible Storage		hollow metal	commercial/keyed	shelving
Controlled Waste Handling		hollow metal	commercial/keyed	shelving
Administrative Area				
1	Supervisory Aircraft Pilot	solid core wood	commercial/keyed	N/A
2	Secretary	N/A	N/A	N/A
3	Supervisory Instructor Pilot	solid core wood	commercial/keyed	N/A
4	Flight Instructors (Safety)	solid core wood	commercial/keyed	full-length shelving
5	Flight Instructor (Aircraft)	solid core wood	commercial/Keyed	full-length shelving
6	Flight Operations Specialist	solid core wood	commercial/Keyed	N/A
7	Flight Engineers	solid core wood	commercial/Keyed	N/A

Table 5. Doors, Hardware, Storage, and Shelving (Continued)

	FUNCTIONAL AREA	DOORS	HARDWARE	STORAGE/SHELVING
8	Supervisory Maintenance Test Pilot	solid core wood	commercial/keyed	N/A
9	Aircraft Maintenance Supervisors	hollow metal	commercial/keyed	N/A
10	Production Controller	hollow metal	commercial/keyed	N/A
11	Aircraft Automation Clerk	hollow metal	commercial/keyed	N/A
12	Supervisory Supply Technician	hollow metal	commercial/keyed	shelving/cabinets
13	Maintenance Test Pilots	hollow metal	commercial/keyed	N/A
14	Aircraft Inspectors	hollow metal	commercial/keyed	N/A
15	Technical Publications	solid core wood	commercial/keyed	shelving/cabinets
16	Safety, Briefing, and Examination Room	solid core wood	commercial/keyed	N/A
17	Flight Planning	solid core wood	commercial/keyed	N/A
18	Administrative Support Area	N/A	N/A	shelving/cabinets
19	Common IT Space	N/A	N/A	N/A
20	IT Support Activities	solid core Wood	commercial/keyed	shelving/cabinets
21	Flight Surgeon Administration/ Examination Area	solid core Wood	commercial/keyed	shelving/cabinets
22	**Aviation Life Support Equipment (ALSE)**			
a.	ALSE Administrative Area	hollow metal	commercial/keyed	N/A
b.	ALSE Maintenance Support	hollow metal	commercial/keyed	shelving/cabinets
c.	ALSE Storage	hollow metal	commercial/keyed	shelving/cabinets
23	**Locker Rooms**	hollow metal	N/A	N/A
24	**Break and Assembly**	N/A	N/A	N/A
25	**Toilets/Showers**	hollow metal	N/A	N/A
26	**Physical Fitness Area**	solid core wood	N/A	N/A
27	**Operations**	solid core wood	commercial/keyed	shelving/cabinets
28	**Simulation Training Area**			
a.	Learning Center	solid core wood	commercial/keyed	shelving/cabinets
b.	Audio/Visual Storage	solid core wood	commercial/keyed	shelving/cabinets
c.	Library/Classroom	solid core wood	commercial/keyed	shelving/cabinets
d.	Simulation Devices	solid core wood	commercial/keyed	shelving/cabinets

Table 6. Mechanical Requirements – Part 1

	FUNCTIONAL AREA	H/O	H/U	C/O	C/U	OA VENTILATION	NCB
Maintenance Hangar		55	55	-	-	1.5 cfm/ft^2	50
Allied Shops							
1	Propeller/Rotor	68	55	-	-	8.0 AC/hr	<45
2	Airframe/Welding/Structural	68	55	-	-	100%EA w/Hood	<45
3	Paint	68	55	-	-	100% EA w/Hood	<50
4	Avionics/Instrument	68	55	78	85	20 cfm/person	<45
5	COMSEC Storage	68	55	78	85	1.0 AC/hr	-
6	Pneudraulics	68	55	-	-	8.0 AC/hr	<45
7	Electrical	68	55	78	85	1.0 AC/hr	<45
8	Engine Inspection/Repair	68	55	78	85	25 cfm/person w/ 100% EA	<45
9	Battery Room	68	55	-	-	2.0 cfm/ft^2	<45
10	Armament Subsystem	68	55	78	85	20 cfm/person	<45
11	Non-Destructive Inspection	68	55	78	85	20 cfm/person	<45
12	Component Cleaning Area	68	55	-	-	8.0 AC/hr w/100% EA w/ EXH Hood	<45
13	Night Vision Device	68	55	78	85	20 cfm/person	<45
Special Tools Room		68	55	-	-	6.0 AC/hr	<45
Repair Parts Room		68	55	78	85	1.0 AC/hr	<45
Accessory Equipment (TOE/TDA Storage)		55	55	-	-	3.0 AC/hr	-
Arms Vault		68	-	78	-	0.25 cfm/ft^2	-
Bulk POL Storage		55	55	-	-	4.0 AC/hr	-
Contractor Shop/Storage		68	55	-	-	6.0 AC/hr	-
Flammable/Combustible Storage		55	55	-	-	6.0 AC/hr w/ EA	-
Controlled Waste Handling		55	55	-	-	3.0 AC/hr, EA	-
Administrative Area							
1	Supervisory Aircraft Pilot	68	55	78	85	10 cfm/person	<35
2	Secretary	68	55	78	85	10 cfm/person	<35
3	Supervisory Instructor Pilot	68	55	78	85	10 cfm/person	<35
4	Flight Instructor (Safety)	68	55	78	85	10 cfm/person	<35
5	Flight Instructors(Aircraft)	68	55	78	85	10 cfm/person	<35
6	Flight Operations Specialist	68	55	78	85	10 cfm/person	<35
7	Flight Engineers	68	55	78	85	10 cfm/person	<35

Table 6. Mechanical Requirements – Part 1 (Continued)

	FUNCTIONAL AREA	H/O	H/U	C/O	C/U	OA VENTILATION	NOISE
8	Supervisory Maintenance Test Pilots	68	55	78	85	15 cfm/person	<35
9	Aircraft Maintenance Supervisor	68	55	78	85	15 cfm/person	<35
10	Production Controller	68	55	78	85	15 cfm/person	<35
11	Aircraft Automation Clerk	68	55	78	85	10 cfm/person	<35
12	Supervisory Supply Technician	68	55	78	85	10 cfm/person	<35
13	Maintenance Test Pilots	68	55	78	85	15 cfm/person	<35
14	Aircraft Inspectors	68	55	78	85	15 cfm/person	<35
15	Technical Publications	68	55	78	85	10 cfm/person	<35
16	Safety, Briefing, and Examination Room	68	55	78	85	15 cfm/person	<35
17	Flight Planning	68	55	78	85	10 cfm/person	<30
18	Administrative Support Area	68	55	78	85	10 cfm/person	<40
19	Common IT Space	68	55	78	85	10 cfm/person	<40
20	IT Support Activities	68	55	78	85	10 cfm/person	<35
21	Flight Surgeon Administration/ Examination Area	68	55	78	85	15 cfm/person	<35
22	**Aviation Life Support Equipment (ALSE)**						
a.	ALSE Administrative Area	68	55	78	85	10 cfm/person	<40
b.	ALSE Maintenance Support	68	55	78	85	20 cfm/person	<45
c.	ALSE Storage	68	55	78	85	1.0 AC/hr	-
23	Locker Rooms	68	55	78	85	0.50 cfm per ft^2	<40
24	Break and Assembly	68	55	78	85	10 cfm/person	<40
25	Toilets/Showers	68	55	78	85	50 cfm/WC & UR, or 1.0 cfm/ft^2	<40
26	Physical Fitness Area	55	55	78	85	20 cfm/person	<45
27	Operations	68	55	78	85	15 cfm/person	<30
28	**Simulation Training Area**						
a.	Learning Center	68	55	78	85	10 cfm/person	<35
b.	Audio/Visual Storage	68	55	78	85	1.0 AC/hr	-
c.	Library/Classroom	68	55	78	85	10 cfm/person	<35
d.	Simulation Devices	68	55	-	-	6.0 AC/hr	<40

TABLE 6 – ABBREVIATIONS:

AC/hr	air changes per hour
cfm	cubic feet per minute
C/O	cooling/occupied, °F
C/U	cooling/unoccupied, °F
EA	exhaust air (100%)
EXH	exhaust air system
fpm	feet per minute
H/O	heating/occupied, °F
H/U	heating/unoccupied, °F
NCB	balanced noise criterion
OA	outside air

TABLE 6 – GENERAL NOTES

1. Outside Air Ventilation rates are based on ANSI/ASHRAE Standard 62.1-2004 where the supply and return air distribution devices are ceiling mounted. If the distribution devices are located in the occupied zone reduce the air quantity by 50%. Regardless of where the air distribution devices are located the outside air quantity must be at least 15% of the total air circulated within the HVAC controlled spaces.

2. NCB curves specify noise criteria in various activity areas due to the space itself and all other sources of normal interior and exterior noise due to human occupation. This includes the operation of HVAC systems, the noise produced from equipment and work activities within each area, and noise levels outside the facility.

3. Exhaust Systems for special work processes that require an exhaust hood to capture particles being transported by the air stream must be designed in accordance with the American Conference of Governmental Industrial Hygienists (ACGIH) Industrial Ventilation Manual and ASHRAE Handbooks of Fundamentals and HVAC Applications.

Table 7. Mechanical Requirements – Part 2

	FUNCTIONAL AREA	HVAC	PIPED SERVICE	PLUMBING	OTHER
Maintenance Hangar		H/V	CA/CW/CWT/HW	TD/ES/SK/OWS	
Allied Shops					
1	Propeller/Rotor	HV	CA/CW/CWT/HW	SK/ EW	
2	Airframe/Welding/Structural	HV	CA/CWT/CW/HW	EW/SK	EA Hood
3	Paint	H/V	CA/HW/CWT	SK/EW/ES	EA Hood
4	Avionics/Instrument	HVAC	CA/VAC/CWT/HW	SK/EW	
5	COMSEC Storage	HVAC	CA		
6	Pneudraulics	HV	CA/VAC/CWT/HW	SK/EW	
7	Electrical	HVAC	CA/VAC		
8	Engine Inspection/Repair	HV	CA/VAC/HW/CW	CWT/SK/ EW	EA Hood
9	Battery Room	HV	CA/CWT	EW/ES	EA Hood
10	Armament Subsystem	HVAC	CA/VAC/CW/HW	HB	
11	Non-Destructive Inspection	HVAC	CA/VAC		
12	Component Cleaning Area	H/V	CA/ES/CW/HW	CWT/SK	EA Hood
13	Night Vision Device	HVAC	CA/CW/HW	SK	
Special Tools Room		HV			
Repair Parts Room		HV			
Accessory Equipment (TOE/TDA Storage)		H/V			
Arms Vault		HVAC/DEH	FD (ext)		<40% humidity

Bulk POL Storage	H/V	CWT	EW	

Table 7. Mechanical Requirements – Part 2 (Continued)

	FUNCTIONAL AREA	HVAC	PIPED SERVICE	PLUMBING	OTHER
Contractor Shop/Storage		H/V	CA/VAC/CW/HW	SK	
Flammable/ Combustible Storage		H/V	CWT	ES	
Controlled Waste Handling		H/V	CWT	ES	
Administrative Area					
1	Supervisory Aircraft Pilot	HVAC			
2	Secretary	HVAC			
3	Supervisory Instructor Pilot	HVAC			
4	Flight Instructor (Safety)	H VAC			
5	Flight Instructors (Aircraft)	HVAC			
6	Flight Operations Specialist	HVAC			
7	Flight Engineers	HVAC			
8	Supervisory Maintenance Test Pilot	HVAC			
9	Aircraft Maintenance Supervisors	HVAC			
10	Production Controller	HVAC			
11	Aircraft Automation Clerk	HVAC			
12	Supervisory Supply Technician	HVAC			
13	Maintenance Test Pilots	HVAC			
14	Aircraft Inspectors	HVAC			
15	Technical Publications	HVAC			
16	Safety, Briefing, and Examination Room	HVAC			
17	Flight Planning	HVAC			
18	Administrative Support Area	HVAC	FD/CW	EDF	
19	Common IT Space	HVAC			
20	IT Support Activities	HVAC			
21	Flight Surgeon Administration/Examination	HVAC	CW/HW	SK	

Table 7. Mechanical Requirements – Part 2 (Continued)

	FUNCTIONAL AREA	HVAC	PIPED SERVICE	PLUMBING	OTHER
22	**Aviation Life Support Equipment (ALSE)**				
a.	ALSE Administrative Area	HVAC	VAC/CA/CW /HW	SK	
b.	ALSE Maintenance Support	HVAC	VAC/CA/CW /HW	SK	
c.	ALSE Storage	HVAC			
23	Locker Rooms	HVAC	CW/FD	EDF	
24	Break / Assembly	HVAC	FD/HW/CW	EDF/SK	
25	Toilets/Showers	HVAC	CW/HW/FD		
26	Physical Fitness Area	HVAC	FD/CW	EDF	
27	Operations	HVAC			
28	Simulation Training Area				
a.	Learning Center	HVAC			
b.	Audio/Visual Storage	HVAC			
c.	Library/Classroom	HVAC			
d.	Simulation Devices	HV			

TABLE 7 – ABBREVIATIONS

A/C	Air Conditioning
CA	compressed air
CW	Cold Water
CWT	Cold Water Tempered (ES/EW) service
EA	Exhaust Air System/Hood
ES	emergency shower
EDF	Electric Drinking Fountain
EW	eye wash
FD	floor drain
H	heating
HB	hose bibb
HV	Heating/Ventilation
HW	Hot Water
OWS	Oily Water Separator
SK	Sink
TD	Trench Drain
VAC	Vacuum
V	ventilation

Table 8. Electrical Requirements

	FUNCTIONAL AREA	POWER SERVICE	LIGHT. FC	GROUNDING	OUTLETS
Maintenance Hangar		28 vdc 110 VAC 220 VAC	50	two floor static	
Allied Shops					
1	Propeller/Rotor		50	Bay	
2	Airframe/Welding/Structural		50	per code	
3	Paint		50	per code	
4	Avionics/Instrument		70	N/A	
5	COMSEC Storage		30		
6	Pneudraulics		70		
7	Electrical	for planned equipment	70		
8	Engine Inspection/Repair		70	grounding strip	
9	Battery Room		50		
10	Armament Subsystem		50	grounding strip	
11	Non-Destructive Inspection		70	grounding strip	
12	Component Cleaning Area		50	grounding strip	
13	Night Vision Device		50		
Special Tools Room			40		
Repair Parts Room			40		
Accessory Equipment (TOE/TDA Storage)			30		
Arms Vault			40		
Bulk POL Storage			30		
Contractor Shop/Storage			40		
Flammable/Combustible Storage			30		
Controlled Waste Handling			30		

Table 8. Electrical Requirements (Continued)

	FUNCTIONAL AREA	POWER SERVICE	LIGHTING	GROUNDING	OUTLETS
Administrative Area					
1	Supervisory Aircraft Pilot		50		
2	Secretary		50		
3	Supervisory Instructor Pilot		50		
4	Flight Instructor (Safety)		50		
5	Flight Instructors (Aircraft)		50		
6	Flight Operations Specialist		50		
7	Flight Engineers		50		
8	Supervisory Maintenance Test Pilot		50		
9	Aircraft Maintenance Supervisors		50		
10	Production Controller		50		
11	Aircraft Automation Clerk		50		
12	Supervisory Supply Technician		50		
13	Maintenance Test Pilots		50		
14	Aircraft Inspectors		50		
15	Technical Publications		50		
16	Safety, Briefing, and Examination Room		50		
17	Flight Planning		50		
18	Administrative Support Area		50		
19	Common IT Space		50		
20	IT Support Activities				
21	Flight Surgeon Administration/ Examination Area		70		
22	**Aviation Life Support Equipment (ALSE)**				
a.	ALSE Administrative Area		70		
b.	ALSE Maintenance Support		50		
c.	ALSE Storage		30		
23	Locker Rooms		30		
24	Break and Assembly		50		
25	Toilets/Showers		30		
26	Physical Fitness Area		50		
27	Operations		50		

Table 8. Electrical Requirements (Continued)

	FUNCTIONAL AREA	POWER SERVICE	LIGHTING	GROUNDING	OUTLETS
28	**Simulation Training Area**				
a.	Learning Center		50		
b.	Audio/Visual Storage		30		
c.	Library/Classroom		70		
d.	Simulation Devices		50		

TABLE 8 – ABBREVIATIONS

FL	fluorescent lighting
GFCI	ground fault circuit interrupter
IC	incandescent lighting
MH	metal halide
N/A	not applicable
VAC	volt alternating current
VDC	volt direct current
XPRF	explosion-proof fixtures/outlets

TABLE 8 – NOTE

1. 28 virtual document exchange (VDX), 110 VAC, 220 VAC access at each aircraft workbay (in floor), and 110-VAC wall-mounted outlets on maintenance hangar perimeter walls.

2. Electrical power supply outlets in spaces must be designed and installed in accordance NFPA 70, National Electrical Code and actual equipment layout.

3. Lighting Systems must be design in accordance with IESNA Lighting Handbook. The Lighting Power Densities in Watts/SF input must be in accordance with ANSI/ASHRAE/IESNA Standard 90.1-2004, Energy Standard for Buildings Except Low-Rise Residential Building.

Table 9. Special Equipment and Ceiling Heights

	FUNCTIONAL AREA	SPECIAL EQUIPMENT	CEILING HT max
Maintenance Hangar		HW/CW/CA/ES/EW/TD/	35 ft
Allied Shops			
1	Propeller/Rotor	Work surface	10 ft
2	Airframe/Welding/Structural	Weld bench, continuous workbench and CA reels, EA Hood per ACGIH	10 ft
3	Paint	EA Hood per ACGIH Vent. Manual	10 ft
4	Avionics/Instrument	Wireway on two walls at 4 ft above the floor for antenna system and cables	10 ft
5	COMSEC Storage	Avionics equipment storage, full-length shelving, safe, and class V map	10 ft
6	Pneudraulics	Built-in counter, workbench, pipe wall hangar, and PLL and CA storage	10 ft
7	Electrical	Workbench with electrical service	10 ft
8	Engine Inspection/Repair	Pre-wired bench	10 ft
9	Battery Room	Overhead hoist (Note 2) (minimum capacity 100 lb)	10 ft
10	Armament Subsystem	Workbench and weapons storage (locked)	10 ft
11	Non-Destructive Inspection	N/A	10 ft
12	Component Cleaning Area	Exhaust Hood per ACGIH Vent. Manual	10 ft
13	Night Vision Device	Class V storage, full-height lockers, and a test table	10 ft
Special Tools Room		Secure storage and tool boards	10 ft
Repair Parts Room		N/A	10 ft
Accessory Equipment (TOE/TDA Storage)		Keyed entry	10 ft
Arms Vault		N/A	8 ft
Bulk POL Storage		Keyed entry	8 ft
Contractor Shop/Storage			10 ft
Flammable/Combustible Storage		N/A	8 ft
Controlled Waste Handling		Metal cage separation as required	8 ft
Administrative Area			
1	Supervisory Aircraft Pilot	Keyed entry (Note 3)	9 ft
2	Secretary	Two areas; one office and one reception desk	9 ft
3	Supervisory Instructor Pilot	Keyed entry (Note 3)	9 ft
4	Flight Instructor (Safety)	Keyed entry	9 ft

Table 9. Special Equipment and Ceiling Heights (Continued)

	FUNCTIONAL AREA	SPECIAL EQUIPMENT	CEILING HEIGHT*
5	Flight Instructors (Aircraft)	Keyed entry and full-length storage cabinet	9 ft
6	Flight Operations Specialist	N/A	9 ft
7	Flight Engineers	Full-height bookshelves and locker	9 ft
8	Supervisory Maintenance Test Pilot	Keyed entry, full-height bookshelves, and locker	9 ft
9	Aircraft Maintenance Supervisors	Full-height bookshelves and locker	9 ft
10	Production Controller	N/A	9 ft
11	Aircraft Automation Clerk	N/A	9 ft
12	Supervisory Supply Technician	N/A	9 ft
13	Maintenance Test Pilots	Full-height bookshelves and locker	9 ft
14	Aircraft Inspectors	N/A	9 ft
15	Technical Publications	N/A	9 ft
16	Safety, Briefing, and Examination Room	N/A	9 ft
17	Flight Planning	ADA access	9 ft
18	Administrative Support Area	Keyed entry	9 ft
19	Common IT Space	N/A	9 ft
20	IT Support Activities	Equipment Racks	9 ft
21	Flight Surgeon Administration/ Examination	N/A	9 ft
22	**Aviation Life Support Equipment (ALSE)**	Keyed entry for all	
a.	ALSE Administrative Area	Convection oven and floors sealed and coated	10 ft
b.	ALSE Maintenance Support		10 ft
c.	ALSE Storage	N/A	10 ft
23	**Locker Rooms**	N/A	8 ft
24	**Break and Assembly**	N/A	8 ft
25	**Toilets/Showers**	Visual privacy from corridors, ADA access, and floor- and wall-mounted toilet and urinal partitions	8 ft
26	**Physical Fitness Area**	N/A	10 ft
27	**Operations**	Keyed entry, ADA access, vestibule, video and audio surveillance, and remote monitoring from Flight Operations	9 ft
28	**Simulation Training Area**		
a.	Learning Center	Map holder and marker and chalk boards	9 ft
b.	Audio/Visual Storage	Moveable steel shelving	9 ft
c.	Library/Classroom	Library shelving and marker board	9 ft
d.	Simulation Devices	Class V security cabinet and secure access	14ft

TABLE 9 – ABBREVIATIONS

ADA	Americans with Disabilities Act
N/A	not applicable

TABLE 9 – NOTES

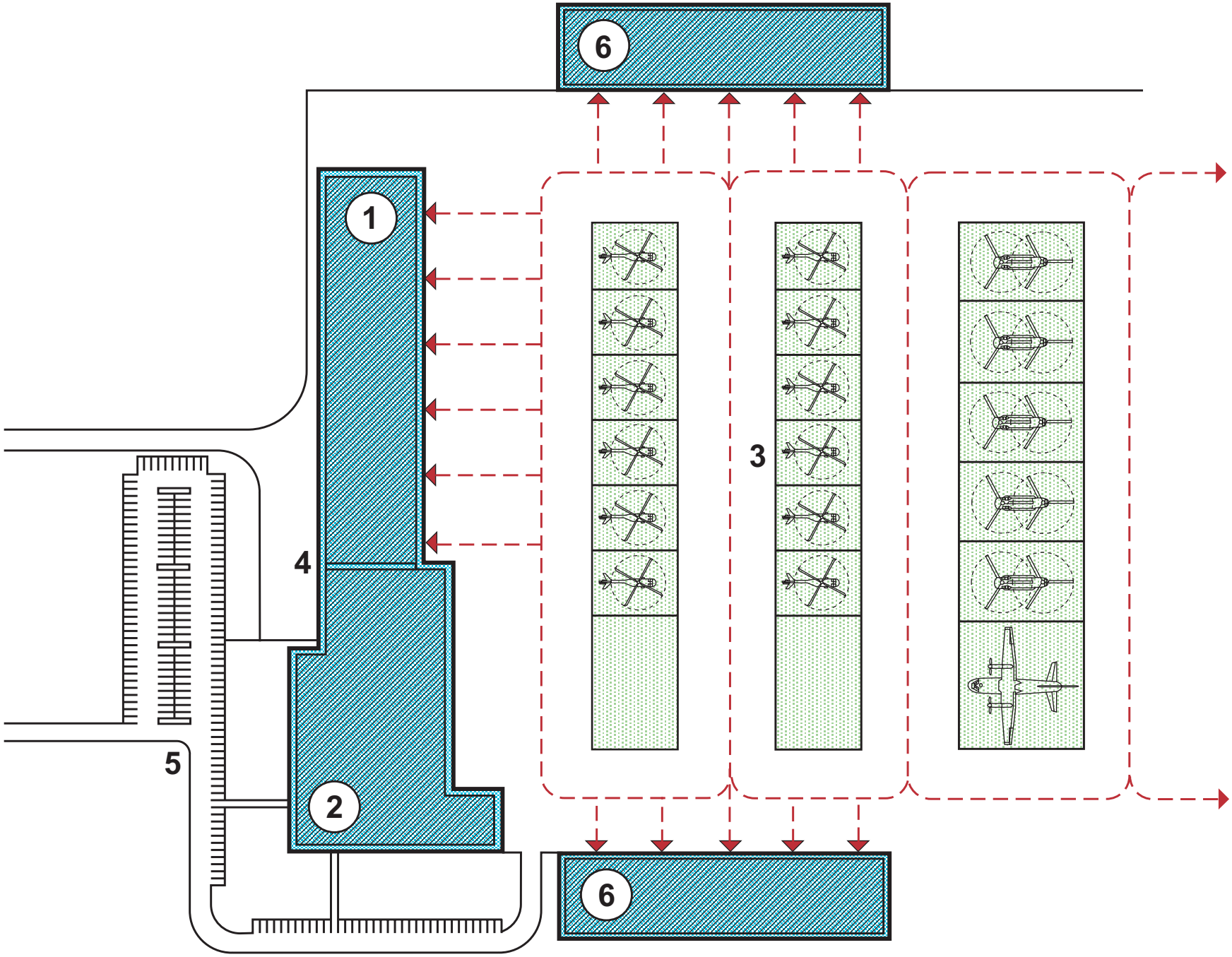
1. Ceiling or underside of exposed structure.

2. Urethane floor finish, ventilation hood over battery charging area (activated by battery charger circuit), chemical/acid-resistant sink and bench top with exhaust and intake fans, deluge shower with alarm, and emergency power cutoff for battery charger with secondary cutoff outside battery room. Makeup air should be introduced at floor level and exhaust exterior/battery charger (self-contained battery compartment with ventilation system).

3. Cabinetry may include wall locker, work surfaces, book shelving, storage cabinets, etc.

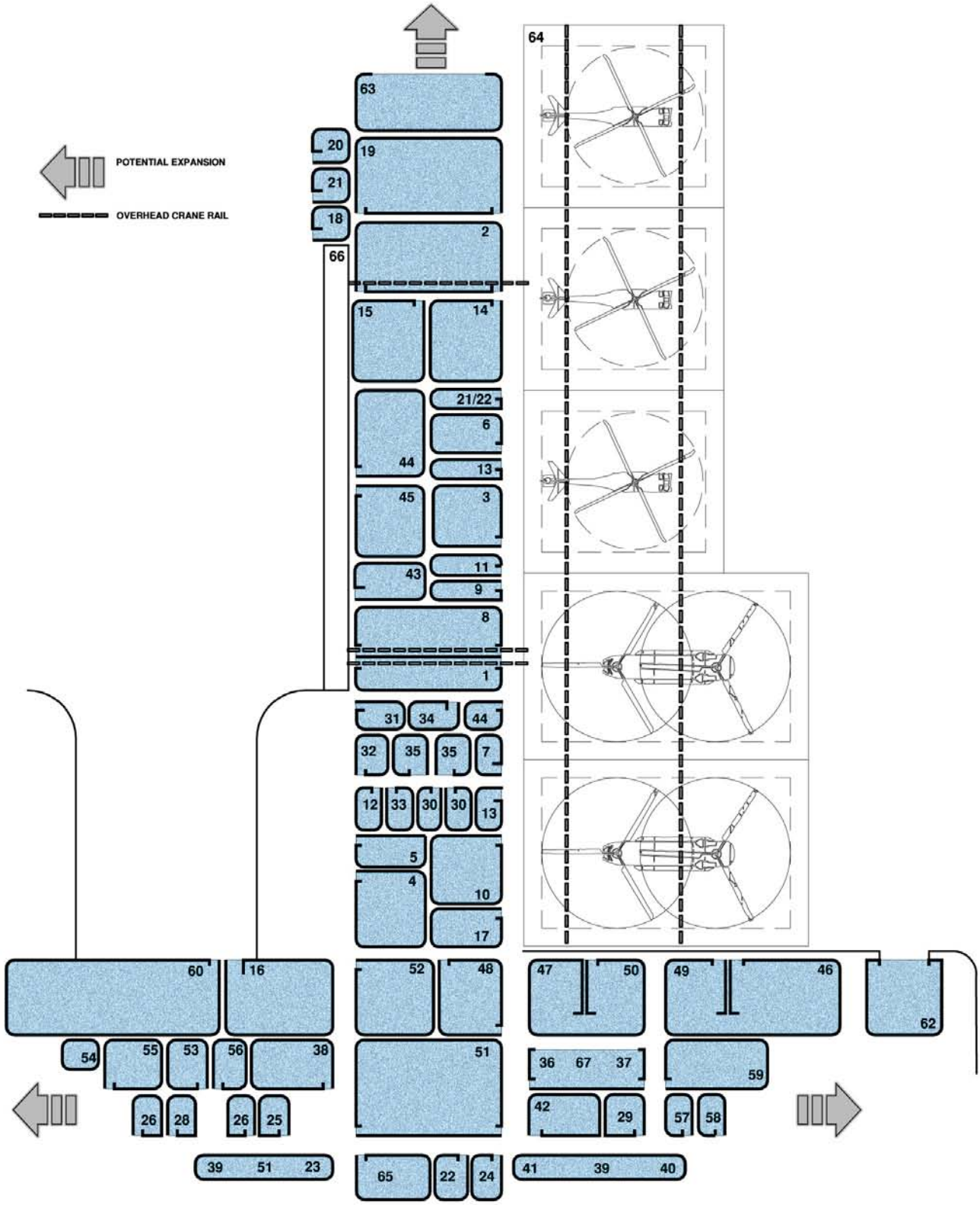
APPENDIX D
FIGURES

Figure 1. Site Components
Figure 2. Basic Program Functional Relationships
Figure 3. Alternate Configuration for Basic Components
Figure 4. Alternate Configuration for Basic Components



1 Maintenance Workbays
2 Administration & Support
3 Aircraft Parking
4 Service Docks
5 Staff & Visitor Parking
6 Covered Unheated Aircraft Storage

Figure 1. Site Components



1 Prop / Rotor Shop
2 Airframe / Welding / Struct. Shop
3 Paint Shop
4 Avionics / Instrument Shop
5 Comsec Storage
6 Pneudraulics
7 Electrical Shop
8 Engine Inspection / Repair Shop
9 Battery Room
10 Armament Subsystem Shop
11 Non-Destructive Inspection
12 Component Cleaning
13 Night Vision Device Shop
14 Special Tools Room
15 Repair Parts Room
16 Accessory Equip. TOE / TDA Stg.
17 Arms Vault
18 Bulk Pol Storage
19 Contractor Shop/Stg.
20 Flammable/Combustible Stg.
21 Controlled Waste Handling
22 Supervisory Aircraft Pilot
23 Secretary
24 Supervisory Instructor Pilot
25 Flight Instructors (Safety)
26 Flight Instructors (Aircraft)
27 Flight Operations Specialist
28 Flight Engineers
29 Supervisory Maint. Test Pilot
30 Aircraft Maint. Supervisors
31 Production Controller
32 Aircraft Automation Clerk
33 Supervisory Supply Tech.
34 Maintenance Test Pilots
35 Aircraft Inspectors
36 Technical Publications
37 Safety Briefing And Examination
38 Flight Planning
39 Administration Support Area
40 Common IT Space
41 IT Support Activities
42 Flight Surgeon Administration / Examination Area
43 ALSE Administration
44 Alse Maintenance Support
45 Alse Storage
46 Locker Room (Male)
47 Locker Room (Female)
48 Break Area
49 Toilets / Showers (Male)
50 Toilets / Showers (Female)
51 Operations
52 Physical Fitness
53 Learning Center
54 Audio / Visual Equipment Stg.
55 Library / Classroom
56 Simulation Devices
57 Aircraft Pilot
58 Flight Operations Specialist
59 Telecommunications
60 Facility Maintenance / Stg.
61 Mechanical / Electrical Room on mezz.
62 Aircraft Rescue
63 Ground Support Equipment Stg.
64 Hanger Bay (Helicopter)
65 Passenger Waiting Area
66 Loading Dock Area
67 Unit Level Logistics System

Figure 2. Basic Program Functional Relationships

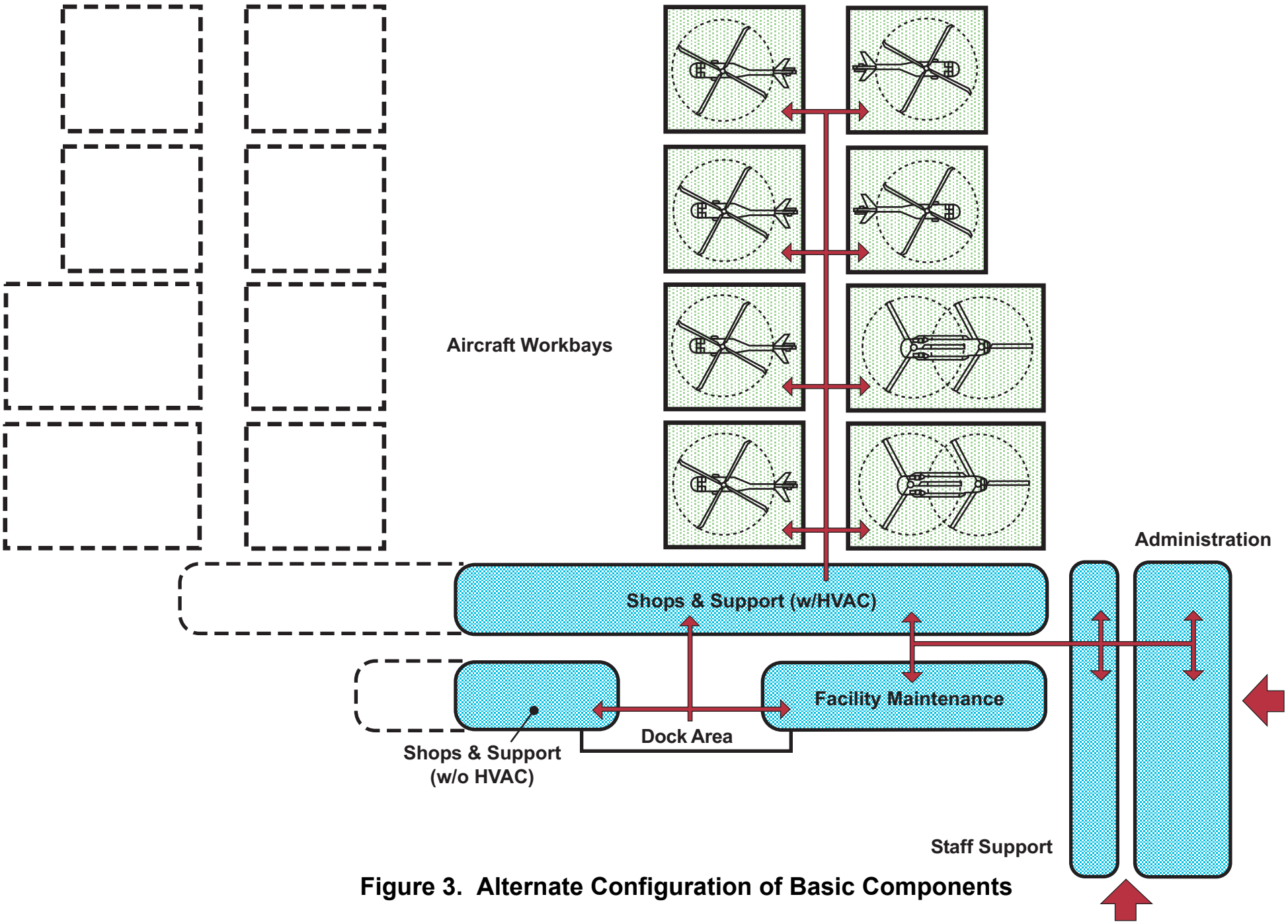


Figure 3. Alternate Configuration of Basic Components

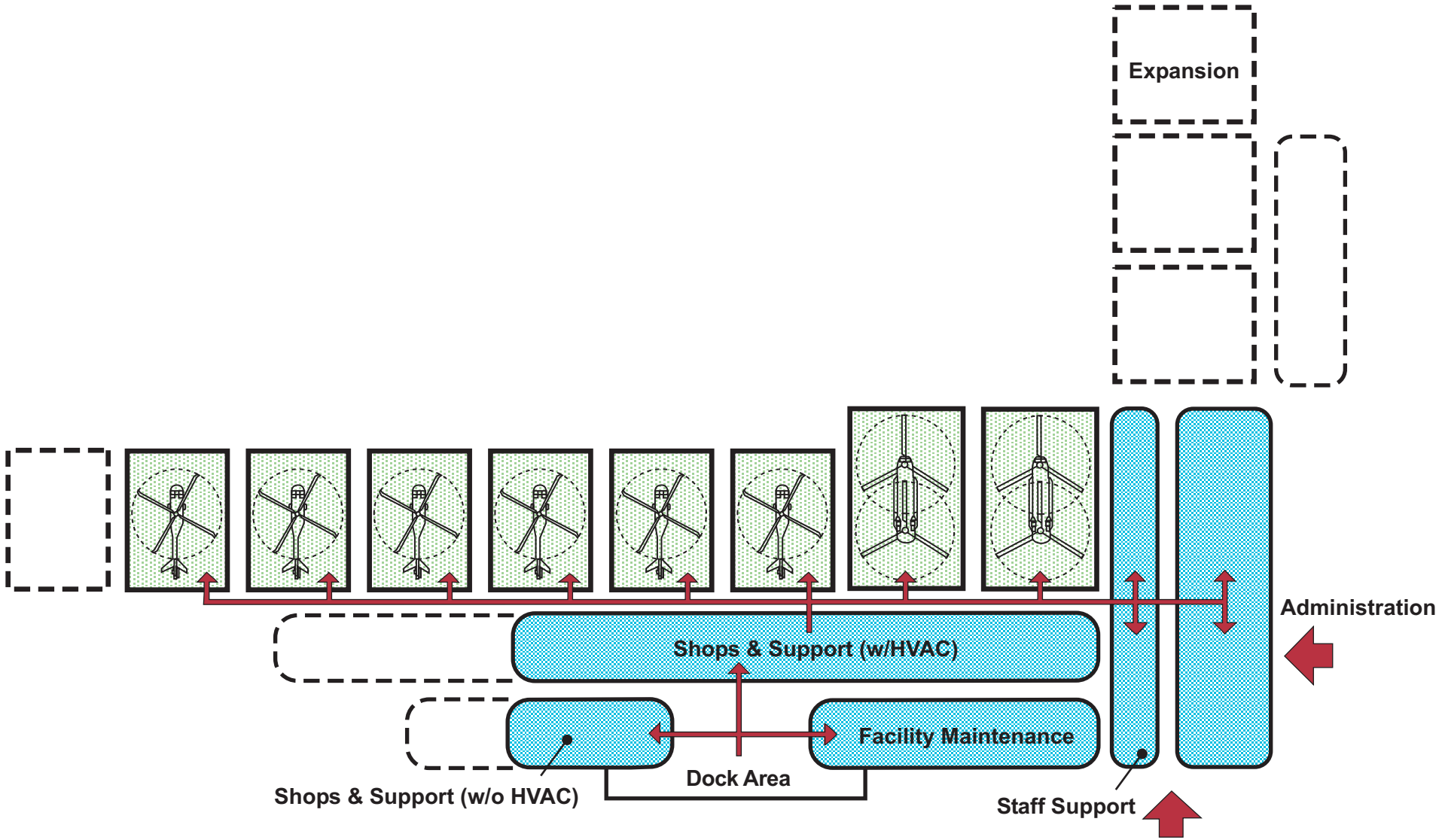


Figure 4. Alternate Configuration for Basic Components