

Construction

ARMY NATIONAL GUARD FACILITIES ALLOWANCES

By Order of the Secretaries of the Army and the Air Force:

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History. This is a total rewrite of NG Pam (AR) 415-12, 26 April 1990 (with various subsequent drafts), which is hereby superseded. Because the pamphlet has been extensively revised, the changed portions have not been highlighted.

Summary. This pamphlet provides guidance to the States in establishing allowances for building space and supporting items used for programming the construction of Army National Guard facilities.

Applicability. This regulation establishes standards that apply to all Federally funded Army National Guard construction.

Proponent and exception authority. The proponent of this regulation is the Chief of Installations, National Guard Bureau, Army Installations Division, NGB-ARI. The Chief of Installations has the authority to approve exceptions to this regulation that are consistent with controlling law and regulation. However, this authority may not be delegated.

Suggested Improvements. Users of this pamphlet are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to the National Guard Bureau, Army Installations Division, NGB-ARI, 111 South George Mason Drive, Arlington, VA 22204-1382.

Distribution: B

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* This pamphlet supersedes NG Pam (AR) 415-12, 26 April 1990.

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Chapter 1

General

1-1. Purpose

This pamphlet identifies the allowable space criteria for facilities supported by Federal contributions to the State, either totally or in part. It gives information on general construction standards, materials, space allowances, building circulation, and other requirements directly related to programming military construction projects. As such, it is the major reference in preparing DD Forms 1390/1391.

1-2. References

Required and related publications are listed in Appendix A.

1-3. Explanation of Abbreviations and Terms

Abbreviations and special terms used in this pamphlet are explained in the glossary.

1-4. Applicability

The formats, processes and tables of this pamphlet are designed to cover most circumstances commonly met during preparation of military construction programming documents. However, unusual project circumstances may dictate that the State justify and request an exception to criteria from the Army Installations Division (NGB-ARI). In turn, NGB-ARI will ask that the facility proponent on the NGB staff provide a recommendation on the request.

1-5. Common Standards.

States shall incorporate into programming documents construction standards identified in special DoD publications (such as antiterrorism/force protection) and all environmental protection features required by Federal, State, and local codes and regulations.

1-6. General Construction of Buildings

a. Buildings will be constructed of materials rated as non-combustible. The exterior walls may be brick with concrete masonry unit backup or other suitable systems. In certain instances pre-fabricated metal buildings may be used where economically feasible. In those cases, exterior walls may be veneered with brick when collocated with a readiness center or when justified by environmental and aesthetic considerations of the surrounding facilities and communities.

b. Roof systems should normally consist of lightweight joists, non-combustible decking, insulation above decking, and either low slope (built-up, single ply membrane or metal standing seam roof) or hip or gable type construction (metal standing seam, asphalt, or fiberglass shingles).

c. Walls and partitions may be drywall, block, or other economically suitable material that will provide a durable structure.

d. Floors normally will be concrete.

e. Mechanical ventilation may be provided for billeting, latrine, and dining facilities in accordance with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Guide and applicable codes.

f. Air conditioning requirements for comfort cooling will be evaluated and approved by the installation commander (i.e., Adjutant General) based on local conditions. The Adjutant General's justification (based on TM 5-785) shall be enclosed with the DD Forms 1390/1391. To determine the tonnage of air conditioning for programming purposes, divide the total floor area for spaces authorized cooling by 300.

g. Energy Management Control Systems. Energy Management Control Systems (EMCS) and other energy conservation systems are authorized for the primary facility. For programming purposes, enter a separate line on the DD Form 1391 and compute the requirement at 2% of the cost of the primary facility.

h. Emergency power generator pad and house connection/hook-up.

(1) For readiness centers, surface and aviation maintenance facilities, and United States Property and Fiscal Officer offices, stand-by power generator sets, an automatic transfer switch, fuel storage tank, and associated piping are authorized to provide electrical power circuits that allow continuous operation of environmental, health, and safety equipment required to support Army National Guard (ARNG) missions during a prolonged power outage. Generator sets are authorized to power the following systems: fire protection and detection, access control,

information technology, communication, lighting, elevators, administrative power, and HVAC. The generator may be installed inside the mechanical room or outside with (factory design housing).

(2) Emergency power generator pad and house connection/hook-up are authorized at all other locations. This requirement is limited to a 6-inch thick concrete mounting pad with a house connection/hook-up outlet necessary to provide temporary mission essential electricity during emergency operation of the facility. The emergency generator itself is considered portable equipment and must be supported/purchased with other than funds from the military construction appropriation.

1-7. Flexibility

The space allowance for any functional area (except the readiness center assembly hall, maintenance training workbays, indoor rifle range, training device/simulations center, general purpose and special purpose maintenance workbays, unheated storage, and hangar floor) may be increased by up to 15 percent, provided that the total allowable functional net area is not increased thereby. In order to provide the necessary off-setting reduction for these space increases, any functional area (except the workbays, indoor rifle range, training device/simulations center, unheated unit storage, and hangar floor) may be reduced by a maximum of 15 percent. Functional areas may be completely removed from a facility if they are not needed. However, in that case, the total allowable floor space must be reduced by a like amount.

1-8. Restrictions to Support by Federal Funding.

a. Real estate. Sites for the construction of readiness centers will generally be owned or leased by the State and procured without Federal reimbursement. This does not, however, preclude the construction of new readiness centers or the rehabilitation of existing buildings on Federally owned land licensed to the State for readiness center use.

b. Prewired work stations. Prewired workstations are not authorized to be funded through the military construction appropriation. They are not to be classified as installed building equipment and are to be included in the programming documents as equipment associated with the project that will be provided from other appropriations.

1-9. Design

The use of space saving, energy-saving, and other sustainable design features are encouraged.

Chapter 2

Readiness Centers

2-1. General

- a. Standards. This chapter establishes the space allowances for ARNG readiness center construction projects.
- b. Space allowances.

(1) Readiness center space allowances are based on the authorized strength(s), the numbers, occupational specialties, and job descriptions of full-time personnel, the numbers and types of equipment authorized, and special requirements of the supported units.

(2) Refer to Table 2-1. Schedule I, for common allowances.

(3) Refer to Table 2-2. Schedule II, for unit special space allowances.

(4) Table 2-3 provides facility support allowances.

(5) Table 2-4 provides the allowance for circulation.

(6) Table 2-5 provides the allowance for walls.

(7) All other space requirements not specifically indicated in the referenced tables will be treated as exceptions to criteria. The State must fully justify these and the NGB proponent must concur with them before NGB-ARI approves their inclusion in the programming documents and the final design of the project.

2-2. Common Supporting Items

In planning the functional arrangement of facilities, the State will give appropriate consideration to the existing site conditions, layout, and materials of construction in order to achieve maximum operating efficiency, cost effectiveness, and flexibility. The following exterior items are authorized Federal reimbursement for readiness center projects:

a. Site preparation. The work of clearing, grubbing, stripping, and stockpiling topsoil, excavating embankment, and rough grading required to develop the project site to subgrade levels and elevations for proper siting and drainage of facilities (including culverts, head walls, retaining walls, etc.). The State must use its own funds for the special handling/remediation/disposal of contaminated soil excavated from a non-Federal owned or leased project site.

(1) Rock excavation and/or correction of unsatisfactory soil conditions is authorized only if the State has submitted adequate supporting documentation such as an economic or master planning analysis that demonstrates that the positive impacts on readiness strongly outweigh the increased construction costs.

(2) Culverts, retaining walls (installed in lieu of sloping the ground to achieve grade differentials), drainage systems, or other similar construction required for controlling surface water runoff will be approved on an individual site basis if the State justifies these items. The State, however, must consider the cost of these items during the site selection process.

b. Fine grading and seeding.

(1) The State may program for fine grading and seeding to provide proper site drainage and control of erosion on those parts of the project site where the previously existing surface cover has been destroyed or buried beneath redistributed soil.

(2) Sodding or sprigging is authorized for critical areas subject to erosion.

(3) Importing topsoil is authorized if the natural topsoil on the site, stockpiled at the beginning of construction, is inadequate to provide a finished depth of approximately 4 inches.

c. Landscaping. This will be included as an integral part of the planning of the project to produce an aesthetically pleasing final site.

(1) The State may program up to 3 percent of the basic building cost for planting trees, shrubs, and vines (exclusive of grading and seeding or sprigging and sodding for erosion control). In those locations that are considered to have an arid climate, the State may program up to 4 percent of the basic building cost and may use xeriscaping.

(2) Additional planting for energy conserving landscaping may be authorized if the State justifies it on a life cycle cost basis.

(3) An installed watering system is authorized.

d. Military vehicle parking. Parking is authorized for 100 percent of all vehicles, trailers, and other wheeled/towed equipment, less those located elsewhere, including General Service Administration (GSA) vehicles.

(1) Rigid concrete is authorized for paving those areas designated for the parking of military vehicles. For programming purposes the concrete will be 8 inches in depth.

(2) The total area exclusive of access roads will not exceed 50 square yards for each wheeled vehicle, trailer, and other wheeled/towed equipment; 75 square yards for each tracked vehicle, engineer vehicle, and equipment over 30 feet long; 175 square yards for each fuel truck and Heavy Expanded Mobility Tactical Truck (HEMTT); and 275 square yards for each HEMTT Palletized Load System (PLS) and Heavy Equipment Transporter (HET) vehicle.

(3) For other unique equipment that must be stored within the military vehicle parking area, such as skid-mounted generators, snowmobiles, and transportable containers organic to the assigned units, the State may program an appropriate amount of space and enclose justification for its request.

(4) The parking area is to be reduced by the size of the building when enclosed or shed-type parking is provided. (Refer to paragraph 2-3 below.)

(5) The parking area is to be based on an economical layout of the parking spaces and circulation lanes. Actual design will be determined by structural calculations.

e. Fuel truck containment area. A 15 foot by 30 foot rigid concrete pad is authorized for each fuel truck. Also, a rigid concrete containment area is authorized for each fuel truck or trailer which stores Petroleum Oil Lubricants (POL) on board. In accordance with applicable environmental, safety and fire protection regulations, each containment area is to be sized so that it is capable of capturing and retaining 100% of the POL volume stored on the truck(s) parked within that area. A roof type cover may be provided, if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area.

f. Military vehicle loading ramps. Military vehicle loading ramps may be constructed to assist in loading and off-loading military vehicles (wheel and track) from equipment transporters that do not have loading ramps as an integral part of the trailer. A multi-level loading ramp not to exceed a footprint of 160 square yards is authorized.

g. Parking pad for mobile conduct of fire trainer (MCOFT) and similar simulators. Federal support is authorized for a 60 foot square rigid concrete parking pad, with electrical power and telephone service, at each NGB approved

site authorized an MCOFT or similar simulation device. Also, a roof type cover may be provided if required by local climatic conditions (e.g., excessive heat, snow, rain).

h. Turn pads. If the State justifies them, rigid concrete turn pads are authorized where frequent turning of tracked vehicles is required on flexible pavement. Pads should be 30 feet square.

i. Helipad. Federal support is authorized for construction of a helipad at the State Area Readiness Command (STARC) readiness center or at a readiness center that has an O-6 or higher level command. Constructed of reinforced concrete, the limited use pad will be 100 feet square with 25 foot wide shoulders of flexible pavement. Lighting and markings will conform to the requirements of TM 5-811-5.

j. Service and access aprons. Paved aprons may be provided adjacent to maintenance training workbay doors. Sixty square feet of rigid pavement is authorized per foot of workbay width. In addition, 150 square yards of rigid concrete paving each may be provided for access to the dumpster area, the controlled waste handling facility, and any other facility requiring outside access by forklifts or large, heavy vehicles. Finally, a rigid concrete access area of 250 square yards may be provided for access to the military vehicle loading ramp.

k. Privately owned vehicle (POV) parking. The maximum allowance is 35 square yards times 90% of the authorized strength of the assigned units required to train simultaneously. This includes an allowance for circulation lanes within the parking area but excludes any required access roads. The actual ratio to authorized strength depends on the adequacy of public transportation serving the site. For programming purposes, flexible pavement will consist of 6 inches of bituminous material placed over an installed, appropriate aggregate base. Rigid concrete or flexible pavement curbs may be installed along pavement edges to comply with the site's approved storm water management plan or to preclude soil erosion.

l. Access road and entrance throat. The primary entrances and access roads are authorized a width of 24 feet. More than one entrance may be authorized based on a demonstrated requirement to separate military and civilian vehicle traffic and/or to satisfy access requirements for fire and emergency vehicles. For programming purposes, the access road shall consist of 5000 square yards of flexible or rigid pavement, unless a greater amount is justified by a detailed site plan. However, the exact amount and type of pavement will be determined at the preliminary design review based on an economical and practical site facility layout and code considerations.

m. Curbs. Rigid or flexible pavement curbs may be installed along the edges of the roads and parking areas to comply with code, to control traffic, or to control storm water per the site's approved storm water management plan.

n. Security fencing. A security-type fence consisting of a 6 foot high chain-link-type metal fabric, with a 12 inch high anti-climber, will enclose the military vehicle parking, service and access areas, and ancillary facilities. Fencing will include vehicle and personnel gates, which may be electronically controlled. The fencing may be located approximately ten feet from the edge of the parking pavement; and the area between the edge of pavement and the fence may be seeded with grass, or a well-designed non vegetative cover (not to exceed four inches of rigid pavement) may be substituted.

o. Site Anti-Terrorism/Force Protection Measures. A separate fence, wall, passive vehicle barrier, landform, or line of vegetation will be applied along the exterior perimeter of the site to create a protective standoff and obscure vision, hinder personnel access, and hinder or prevent unauthorized vehicle access. In addition, a guard house/access control facility not to exceed 550 square feet is authorized when determined to be appropriate following completion of the AR 190-51 directed security risk assessment. Such a facility may be equipped with an environmental control system, electric service, and both voice and data communication links.

p. Sidewalks. For programming purposes, sidewalks shall be 20% of the building footprint. However, the exact amount of sidewalk area will be determined at the preliminary design review based on an economical and practical site layout of the facilities.

q. Flagpole(s). The readiness center is authorized up to two (three for projects with a general officer command) ground-set flagpoles with illumination.

r. Exterior fire protection. Consideration will be given to the size of the structure, the type of construction, and the exposure to fire hazard that it creates for or receives from nearby buildings. Except in cases of conflict with State requirements, exterior fire protection should be in conformance with National Fire Protection Association requirements. Extension of water mains for fire protection is limited to that needed to ensure that an adequate number of fire hydrants can be located between 50 and 400 feet of any building. No more than 300 linear feet of pipe per water line required by code may be outside the project property line.

s. Detached facilities sign/static display. In addition to the authorized building-mounted facilities sign, a free-standing sign is authorized identifying the facility name and type, the State, and Army National Guard. Lighting to illuminate the sign continuously during hours of darkness may be provided. Provisions may also be made at this facility for a static display(s), including a concrete slab or mounting pedestal.

t. Outside security lighting. A security lighting system that would permit ample lighting to conduct safe after hours training and one which is designed to illuminate continuously during the hours of darkness or equipped with sensors which when activated by movement within the designated area will cause the lights to illuminate is authorized. After discontinuance of movement within the designated area, the lights should remain lit for a time determined to be appropriate for the specific situation by the security manager. Vandal resistant lenses should be provided where appropriate. Wherever possible, lighting of area will be provided from building-mounted fixtures. Pole-mounted fixtures may be used to supplement the building-mounted fixtures and where building-mounted fixtures are inadequate.

u. Fuel storage and dispensing systems.

(1) Fuel storage and dispensing systems are authorized provided that all of the following conditions are met:

(a) The readiness center is not located within a mile of a surface maintenance facility with fuel storage and dispensing capability.

(b) There are at least 15 vehicles using each type of fuel assigned to the readiness center.

(c) The State's surface vehicle fuel management plan justifies the use of a fuel storage and dispensing system at this location because of a lack of nearby military facilities, an agreement with other State facilities, or local private sources (using credit/debit cards).

(2) The storage facilities will be built to nationally recognized environmental standards and in accordance with local ordinances.

(3) The capacity will not exceed the following:

<u>No. of Vehicles Using Type of Fuel</u>	<u>Capacity Per Type of Fuel</u>
0 - 14	NA
15 - 39	3,000 Gal
40 - 69	5,000 Gal
70 - 100	7,000 Gal
101- 250	10,000 Gal
Over 250	20,000 Gal

(4) A 15 foot by 45 foot rigid concrete pad (to include containment if required) is authorized at the pump island for each type fuel. The project is authorized 250 square yards of rigid or flexible paving (in addition to the readiness center access road and military vehicle parking) for access to the fuel dispensing system.

v. Wash platform.

(1) One concrete wash platform, not to exceed 115 square yards, is authorized when 10 or more motor vehicles are authorized to be physically located at the readiness center and if the readiness center will not be located within a mile of a surface maintenance facility with vehicle washing capability.

(2) The project is authorized 250 square yards of rigid or flexible paving (in addition to the readiness center access road and military vehicle parking) for access to the wash platform.

(3) A roof type cover may be provided if required by local code to prevent storm water from draining into the sanitary sewer system.

w. Utilities. All building utility service connections should be underground. The length of service for each utility is limited to the distance of the shortest run from the building to the property line adjacent to the public right-of-way providing ingress and egress for the site plus up to an additional 300 linear feet for connection to the existing utility system. Direct-burial cable for telephone, data, and electric service connections are authorized. This includes conduit where the service connection(s) must pass under a paved area. Participation in on-site water well, sanitary treatment system, and liquid petroleum gas, fuel oil or other heating system storage tank, including piping, will be authorized if respective public services are not available and the separate systems are consistent with the requirements of the local approval authority and with applicable Federal, State, and local environmental laws and regulations. A water storage cistern along with a chlorination system may be authorized, if no municipal potable water is available.

x. Storm water retention ponds. The State may program up to 3 percent of the basic building cost for retention ponds as part of a storm water pollution prevention program, if the Army Environmental Programs Division (NGB-ARE) validates the requirement. These ponds may include bioretention capabilities if required by local codes and/or best management practices.

2-3. Unheated Enclosed or Shed-Type Vehicle Storage Space

- a. Federal support for enclosed or shed-type storage is authorized in accordance with NGR 415-10.
- b. Vehicle storage space will be unheated and will not exceed 66% of the normally authorized open-air military parking area. When enclosed or shed-type storage is provided, the amount of paved area (authorized for parking of military vehicles at the site) will be reduced by the area of the covered space. The remaining paved area is to be used for circulation and access to and from the covered/enclosed storage structure.
- c. Vehicle doors at approximately 25 feet on centers are authorized at the rate of one for each 1800 square feet of floor area to provide for mass parking of vehicles without the need for internal circulation lanes.
- d. A 60 foot deep concrete apron is authorized the length of each side of the facility with vehicle entrances.

**Table 2-1. Schedule I, Readiness Center Space Allowances
(Allowance in net square feet, exclusive of interior and exterior walls)**

Functional Areas <u>2/</u>	Allowances Based on Readiness Center Capacity (Required Strength) <u>1/</u>					
	55-99	100-175	176-350	351-650	651-950	951-1,200
1. Assembly Hall	5,400	5,800	6,300	7,500	9,000	9,990
2. Classrooms <u>3/</u>	800	1,000	1,500	2,400	2,700	3,000
3. Library/Classroom	250	250	300	300	350	350
4. Learning Center	250	250	300	300	350	350
5. Distance Learning Center	4/	4/	4/	4/	4/	4/
6. Indoor Firing Range	5/	5/	5/	5/	5/	5/
7. Training Device/Simulation Center	6/	6/	6/	6/	6/	6/
8. Training Aid Storage	80	120	140	180	200	200
9. Kitchen <u>7/</u>	1,300	1,300	1,300	1,875	1,875	1,875
10. Break Room (Area)	<u>8/</u>	<u>8/</u>	<u>8/</u>	<u>8/</u>	<u>8/</u>	<u>8/</u>
11. Vending Area	75	75	100	100	150	150
12. Toilets/Shower <u>9/</u>	1,220	1,300	1,400	1,620	1,860	2,060
13. Flam Mats. Storage	100	100	150	250	350	400
14. Family Readiness Office	250	250	250	400	400	400
15. RAPIDS Office <u>10/</u>	150	150	150	150	150	150
16. Recruiting/ Retention Office	250	250	250	400	400	400
17. Audio/Visual Storage	80	100	150	200	300	350
18. Table/Chair Storage	300	375	550	850	1,150	1,400
19. Physical Fitness <u>11/</u>	600	700	800	1,000	1,225	1,600
20. Controlled Waste Handling Facility (CWHF)	12/	12/	12/	12/	12/	12/

NOTES:

1/ The required strength of a readiness center is the sum of the required strengths of all assigned units.

2/ All functional areas listed in Table 2-1 are common use areas.

3/ Classroom space is authorized using the formula 10 square feet per person based on the required strengths of those assigned unit(s) (includes units less than 55 strength) that are required to train simultaneously, plus the basic space from the table. An auditorium with inclined floor and installed seats is authorized for battalion or higher level headquarters. Auditorium space is subtracted from the authorized classroom space.

4/ Space is authorized if validated and approved by the Distributed Training and Technology Program Manager (NGB-RCS-DTTP). This space is in addition to any classroom space otherwise authorized.

5/ Indoor Small Arms Firing Ranges are not standard items and are approved on an exception basis. They are only authorized when supported by an Army National Guard Indoor Range Requirements Checklist and validated and approved by NGB-ART. In addition, the State must provide NGB-ARI a life cycle cost analysis to demonstrate the State’s awareness of the maintenance and operations costs that it will incur operating the range. Construction must comply with current Federal and State occupational safety and health standards and follow the design criteria established by the United States Army Corps of Engineers “Design Guide for Indoor Firing Ranges,” June 1990.

6/ Space is authorized if validated and approved by the Army Training Division (NGB-ART).

7/ Authorized contractor furnished and installed and government furnished kitchen equipment is listed NGB DG 415-1, Appendix B. U.S. Army Troop Support Agency approved kitchen layout drawings and equipment schedules are also provided in NGB DG 415-1, Appendix B.

8/ Basic authorizations are 200 square feet for up to 4 full-time support personnel and 400 square feet for up to 8 full-time support personnel, with an additional 20 square feet per individual for 9 to 20 full-time support personnel, 12 square feet per individual for 21 to 40 full-time support personnel, and 8 square feet per individual for full-time support personnel exceeding 40.

9/ In addition to the basic toilet area, shower space is authorized. Shower area shall be determined using the largest number of people required to train simultaneously at the readiness center. This number shall be divided by 15 (persons per shower) and the result multiplied by 40 square feet. This figure should then be added to the basic allowance in Table 2-1. The toilet/shower allowance is to be split into appropriate facilities to support both males and females. The split should account for both minimum code requirements and anticipated building usage. The basic allowance (which serves a dual purpose as a public toilet) may be increased by ten percent (10%), if the facility has two or more floors, in order to allow a toilet area to be installed on each floor. If there is no toilet located near the indoor rifle range/simulation center, 25 square feet of the toilet/shower authorization may be used to provide a toilet for personnel using the range/simulation center.

10/ Space authorized only if Real-Time Automated Personnel Identification System (RAPIDS) office assigned to the readiness center.

11/ All equipment must be obtained with other than Federal construction funds.

12/ Controlled Waste Handling Facility (CWHF).

(a) A prefabricated metal or concrete masonry building with a concrete floor or building of equivalent or less cost of a size indicated below is authorized. The below size is gross area including intracirculation. Intercirculation space has to be justified as an exception to criteria.

<u>Barrels Stored</u>	<u>Building Size (SF)</u>
1-40	300
41 or greater	500

(b) The building will be designed to allow wastes to be conveniently stored inside each cell in drums, metal boxes, or pallets, and easily loaded/unloaded using a forklift or manual means. Partitioning off of individual storage cells will be designed to provide secondary spill containment within each cell.

(c) 150 square yards of rigid concrete access paving may be provided for access.

(d) At its option the State may include this authorized space within the readiness center or another adjacent facility.

Table 2-2. Schedule II, Unit and Special Space Allowances 1/
(Allowance in net square feet, exclusive of interior and exterior walls)

Functional Area	Allowance
1. Administrative Office Space: <u>2/</u>	
a. Basic Space:	
Unit with a strength of 75 and less	400
Unit with a strength over 75	800
b. General Space	<u>3/</u>
c. Special Administrative Allowances: <u>4/</u>	
(1) Division Headquarters	5,850
(2) Armored Cavalry Regiment Headquarters	3,300
(3) Brigade and Division Artillery Headquarters	2,850
(4) Corps Artillery, Combat Support Command & Armored Cavalry Squadron (each)	2,100
(5) Group Headquarters	1,950
(6) Battalion Headquarters and Headquarters (HHC or HHD)	1,500
(7) Rear Area Operations Center (RAOC)	2,800
(8) Division Support Command	3,890
(9) Supply and Transport Battalion (Division)	2,860
(10) Support Battalion (Separate Brigade)	3,460
(11) State Headquarters (Army National Guard)	<u>5/</u>
Under 4,000 Strength	2,970
4,000 to 7,500 Strength	3,570
7,500 to 10,000 Strength	4,020
10,000 to 15,000 Strength	4,470
15,000 to 20,000 Strength	4,920
Over 20,000 Strength	5,670
(12) Troop Command	
54 or Less Strength	1,950
55 to 99	2,850
100 and Over	3,300
(13) Army Advisor's office for advisors (officers and enlisted) authorized to specific units):	130 each
(14) Personnel Services Companies/Sections	<u>6/</u>
(15) State Headquarters military record archives	<u>7/</u>
(16) Training Support Brigade (TSB) personnel authorized to specific units	130 each
2. Unit Storage Space (Including Arms Vault)	<u>8/</u>
a. Battalion Headquarters with Organic Subunits (per TOE) <u>9/</u>	1,000
b. Supply and Transportation Battalion (Division) <u>9/</u>	1,000
c. Support Battalion (Separate Brigade) <u>9/</u>	1,000
3. Locker Room Space <u>10/</u>	
a. Basic Space (one per readiness center)	200
b. Space per each individual authorized in the readiness center	18
4. Special Functions:	
a. Public Affairs Detachment (Specialized functions are allowed space for workroom, recording studio, edit studio, broadcasting studio, finishing room, print room, negative room (dark room), etc.)	1,020
b. STARC Photographic Studio <u>11/</u>	500
c. Medical Section within a Headquarters unit	400

Table 2-2. Schedule II, Unit and Special Space Allowances (contd)

Functional Area	Exams per Year			Allowance
	<u>161-320</u>	<u>321-640</u>	<u>641-1280</u>	
d. Physical Exam/Flight Surgeon Space for 10-160 Exams per Year <u>12/</u>				500
e. Physical Exam/Flight Surgeon Space: <u>13/</u>				
Reception, Waiting and Form Writing	210 square feet	280 square feet	350 square feet	
Doctor's Office (80 square feet each)	80 square feet	80 square feet	160 square feet	
Exam Room (110 square feet each) <u>15/</u>	220 square feet	330 square feet	550 square feet	
History Station	70 square feet	70 square feet	105 square feet	
Height & Weight Station	70 square feet	70 square feet	70 square feet	
Blood Pressure and Pulse Station	70 square feet	70 square feet	70 square feet	
Electronic Consult System (ECS) and Tonometry Station	in exam room	110 square feet	110 square feet	
Lab	70 square feet	70 square feet	70 square feet	
Blood Specimen Collection	70 square feet	70 square feet	70 square feet	
Specimen Toilet	36 square feet	36 square feet	60 square feet	
Vision Test	70 square feet <u>16/</u>	70 square feet <u>16/</u>	70 square feet <u>16/</u>	
Hearing Test	90 square feet	150 square feet	210 square feet	
Dental Check (100 square feet ea)	100 square feet	100 square feet	200 square feet	
Circulation	345 square feet <u>16/</u>	485 square feet <u>16/</u>	675 square feet <u>16/</u>	
Total	1501 square feet	1921 square feet	2770 square feet	
f. COMSEC Material Direct Support Activities (CMDSA)				<u>17/</u>
g. Information Technology (IT) Support Activities				<u>17/</u>
h. Support Level Maintenance Training Workbays (collocated/noncollocated)				<u>18/</u>
i. Unit Level Maintenance Training Workbays				<u>19/20/</u>
j. Air/Army National Guard Weather Flight <u>21/</u>				1,500
k. Band <u>22/</u>				
Main Rehearsal Studio <u>23/</u>				1,700
Large Group Rehearsal Studio <u>24/</u>				700
Small Rehearsal Studio <u>25/</u>				350
Music Library				500
Individual Instrument Storage <u>26/</u>				520
Recording Studio <u>27/</u>				250
Unit Supply/Storage/Instrument Cleaning and Repair <u>28/</u>				1,200
Individual Practice Rooms <u>29/</u> , <u>30/</u>				870
Administrative Area <u>31/</u>				1,025
Total				7,115

NOTES:

1/ The appropriate space for each unit is to be selected from below and subtotaled by unit per each function. Space for headquarters, special units, or other elements having special requirements not specifically established in this schedule may be submitted to NGB-ARI for approval as an exception to criteria if supported by a clearly stated justification that is backed up by actual data (if appropriate). The word unit, when not further modified, is intended to represent TOE units, TDA units, split units and detachments.

2/ The State uses the sum of total of all administrative space authorized for the units and lays out the work areas according to accepted guidelines.

3/ In addition to the basic space, all units, detachments, and split units are authorized additional space by the formula: 130 square feet times the sum of the number of administrative positions in the MTOE/TDA and of Federally-reimbursed State employees not on the MTOE/TDA who serve in administrative positions. Include a copy of each MTOE/TDA with each administrative position annotated, plus a list of all Federally-reimbursed State administrative positions for which space is being requested. Eligible positions include all commanders; leaders; chiefs of units, platoons, sections, and staffs; band group leaders; clerks; and all other clearly identifiable positions with a major administrative function. (Included are platoon leaders and platoon sergeants, but not squad leaders. Also included are unit supply and arms room positions.) The sizing formula does not mean persons get only 130 square feet of work area.

4/ Special administrative allowances include a secure planning/briefing room, conference/meeting rooms, operations center, files/supplies storage, etc.

5/ The allowance shown in the table for State headquarters space already includes the following: 100 square feet for COMSEC supplies/equipment; 120 square feet for a terminal room for the Worldwide Military Command and Control System (WWMCCS) ; and 200 square feet for the terminal room for on-line secure interactive system support.

6/ For a records storage area, you are authorized in square feet the total required strength for all assigned units divided by 20.

7/ For military records archives storage area, you are authorized in square feet the total required strength for all assigned units in the State divided by 4.

8/ Unit storage space will be computed based on authorized strength of, and cubage of the equipment (excluding vehicles/equipment provided space under military equipment parking, other items normally stored outside and provided space elsewhere, and individual clothing and equipment) authorized to the unit(s) assigned to the facility.

a. Each unit or detachment with a required strength of 55 or more is authorized:

(1) Heated storage space. A net area of 2,400 square feet within the readiness center facility for an equipment cubage of 0 to 4,000 cubic feet. This allowance includes space for a vault (300 square feet) and, if desired, a climate controlled area (maximum of 250 square feet).

(2) Unheated storage space. If total equipment cubage exceeds 4,000 cubic feet, a detached building or an equivalent area incorporated within the readiness center facility is authorized based on one of the following applicable categories:

Total Cubage In Cubic Feet	Net Square Feet (NSF) Authorized
4,001 to 8,000	$NSF = 0.6 \times (\text{Total Cubage} - 4,000)$
Exceeds 8,000	$NSF = 2,400 + 0.2 (\text{Total Cubage} - 8,000)$

b. Each unit or detachment with a required strength of less than 55 is authorized:

(1) Heated storage space. A net area (minimum of 1,000 square feet) within the readiness center facility for an equipment cubage of 0 to 4,000 cubic feet as determined by the formula listed below. The resultant allowance includes space for a vault (maximum 300 square feet) and, if desired, a climate controlled area (maximum of 250 square feet).

Heated Storage = 0.6 x Total Cubage

(2) Unheated storage space. If total cubage exceeds 4,000 cubic feet, use the appropriate applicable category referenced above in Note 8a(2).

9/ This 1,000 square feet authorized for the battalion supply area is intended for a temporary storage area of supplies in transit to and from organic subunits. Shelving for this area is authorized. Vaults or improved office space are not authorized. However, a wire cage partition may be erected to give security to more sensitive supplies. For the Supply and Transport Battalion (Divisional) and the Support Battalion (Separate Brigade) this 1,000 square feet is only authorized for units that have a fulltime functioning supply support activity (SSA) and is intended for a temporary storage area of supplies in transit to and from organic units within the Division or Separate Brigade.

10/ Space may be divided, provided that the total of the separate space allocated to men and women is within the total space authorized. Also, a part or the total area may be used as unit storage space.

11/ A photographic studio (20' x 25' with an approximate 10 foot ceiling height) is authorized in STARC readiness centers that do not have a collocated Public Affairs Detachment with a video mission.

12/ Not more than one examination facility will be authorized in a single readiness center.

13/ These facilities will not be authorized unless establishment of examination facilities has been approved by NGB-ARS. (See AR 40-61, para 4-14, and Supply Bulletin 8-75-27.) Not more than one examination facility will be authorized in a single readiness center. Sizes are based on operation of the facility at least 15 days per year.

14/ For over 1280 exams/year use space data for 641-1280 and increase the number of days per year the facility is operated.

15/ One room may be used for consulting, review of completed physical examination paperwork, weight control counseling or similar purposes.

16/ An additional 140 square feet is authorized to accommodate eye examinations if the facility is authorized to conduct flight physical examinations. The circulation space should then be increased by 20 square feet because of the additional 140 square feet for the eye examinations.

17/ This item refers to communications security and other information technology items (e.g., computer hardware) unique to specific units. Size to be determined in coordination with State Director of Information Management (DOIM) and NGB-AIS prior to the submission of programming documents.

18/ For a readiness center housing one or more support level surface equipment maintenance units, two maintenance training workbays per readiness center, unless additional workbays are justified as an exception, are authorized. They are to be 32 feet by 32 feet (unless unit needs dictate another configuration), oriented front to back to provide a 32 foot by 64 foot area. These bays are for use by wheeled vehicle and artillery repair elements of the unit. If the readiness center is not collocated with a Combined Support Maintenance Shop (CSMS) or a Maneuver and Training Equipment Site (MATES) with support, the following areas are also authorized for each qualifying unit:

- Supervisor's office: 100 square feet.
- Inspections and library: 110 square feet.
- Tool room: 400 square feet.
- Supply room: 300 square feet.
- Any other areas required by the unit's mission must be justified as exceptions to criteria.

If the readiness center is collocated with a CSMS or MATES, the following items are authorized for each qualifying unit:

- Inspections and library: 110 square feet.
- Tool room: 200 square feet.
- Any other areas required by the unit's mission and not satisfied in the collocated shop must be justified as exceptions to criteria.

19/ For a readiness center housing one or more units that have a surface maintenance section or platoon with six or more mechanics identified on the Modified Table of Organization and Equipment (MTOE), two maintenance training workbays are authorized. They are to be 32 feet by 32 feet (unless unit needs dictate another configuration). Each unit is also authorized the following items:

- Supervisor office: 100 square feet.
 - Tool room: 200 square feet.
 - Supply room: 300 square feet.*
 - Battery room: 200 square feet.
- * Additional supply and battery room space may be justified based on the number of authorized vehicles.

20/ For a readiness center which is not authorized maintenance training workbays, a single 32 foot by 32 foot workbay is authorized for vehicle operator maintenance, minor repair to Table of Organization and Equipment (TOE)/Table of Distribution and Allowances (TDA)/Common Table of Allowances (CTA) equipment, weapons cleaning, etc. No additional area is authorized.

21/ Add 200 square feet for a Representative Weather Observation Station (RWOS). See TM 5-803-7.

22/ All spaces are required in the dimensions shown. If any spaces are omitted, corresponding adjustments to other spaces will be required to accommodate personnel and equipment required for mission capability.

23/ Average ceiling height of 20 feet to 30 feet is recommended, with 18 feet as a minimum. Minimum wall length is 30 feet.

24/ Average ceiling height of 18 feet recommended, with 15 feet as a minimum. Room should not be square.

25/ Minimum wall length is 15 feet, to allow for work space and storage.

26/ Requires 65 feet of lineal storage for instrument lockers. If this space is omitted, main rehearsal studio must be increased in size by 520 net square feet.

27/ Minimum width is 10 feet. The recording studio must have visual contact by means of soundproof glass or videocamera with the main rehearsal studio. Visual contact with the large group rehearsal studio is highly desired.

28/ Smallest wall length is 16 feet, to permit movement of large equipment items. May be configured with security cages as needed to permit various levels of access to unit members.

29/ In combination of large (80-125 net square feet) and small (55-65 net square feet) individual soundproofed rooms.

30/ Commercially available soundproofed prefabricated modules may be used, particularly in cases of renovation/renewals.

31/ Recommended configuration is 200 net square feet for the commander, 150 net square feet for the first sergeant, 225 net square feet for senior staff, and 450 net square feet for administration, operations, and full-time personnel.

Table 2-3. Facility Support Space Allowances

Facility Maintenance and Storage	3% of the Total Net Area of Schedule I and II items
Mechanical/Electrical Room <u>1/</u>	5% of the Total Net Area of Schedule I and II items
Telecommunications/Information Technology <u>1/</u>	1% of the Total Net Area of Schedule I and II items

Note:

1/ Mechanical/Electrical and Telecommunications/Information Technology rooms may be increased or decreased based on actual design requirements. Mechanical space includes pipe and duct shafts and perimeter heating units. Additional mechanical equipment space is authorized for multiple story facilities to accommodate vertical duct requirements. This space is understood to include space for computerized controls and equipment for all facility related systems. The percentage indicated is intended as a planning guide. Final determination will be approved during the design review process.

Table 2-4. Circulation

Interfunctional Circulation <u>1/</u>	15 percent (22 percent for multiple-story facilities) of the total net floor area (excluding unheated unit storage, unless it is incorporated within the readiness center)
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Note:

1/ This includes corridors, staircases, entrances, and a lobby. This percentage is a planning figure, and final determination will be approved during the design review process based upon what is required for a well planned functional layout.

Table 2-5. Walls

Walls <u>1/</u>	10 percent of total net floor area, including circulation
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Note:

1/ The total floor area may be increased by 10 percent to provide for interior and exterior walls and partitions. The 10 percent figure is intended as a planning guide. Final determination will be approved during the design review process.

**Chapter 3
Logistical Facilities**

3-1. General

- a. Standards. This chapter establishes the space allowances for ARNG logistical facility construction projects.
- b. Space allowances applicable to all facility types.
 - (1) For facility support space allowances, refer to Table 3-1.
 - (2) For circulation, refer to Table 3-2.
 - (3) For walls, refer to Table 3-3.

3-2. Common Supporting Items

In planning the functional arrangement of facilities, the State will give appropriate consideration to the existing site conditions, layout, and materials of construction in order to achieve maximum operating efficiency, cost effectiveness, and flexibility. The support items that are common to all logistical facility projects are:

- a. Site preparation. The work of clearing, grubbing, stripping, and stockpiling topsoil, excavating embankment, and rough grading required to develop the project site to subgrade levels and elevations for proper siting and drainage of facilities (including culverts, head walls, retaining walls, etc.). The State must use its own funds for the

special handling/remediation/disposal of contaminated soil excavated from a non-Federal owned or leased project site.

(1) Rock excavation and/or correction of unsatisfactory soil conditions is authorized only if the State has submitted adequate supporting documentation such as an economic or master planning analysis that demonstrates that the positive impacts on readiness strongly outweigh the increased construction costs.

(2) Culverts, retaining walls (installed in lieu of sloping the ground to achieve grade differentials), drainage systems, or other similar construction required for controlling surface water runoff will be approved on an individual site basis if the State justifies these items. The State, however, must consider the cost of these items during the site selection process.

b. Fine grading and seeding.

(1) The State may program for fine grading and seeding to provide proper site drainage and control of erosion on those parts of the project site where the previously existing surface cover has been destroyed or buried beneath redistributed soil.

(2) Sodding or sprigging is authorized for critical areas subject to erosion.

(3) Importing topsoil is authorized if the natural topsoil on the site, stockpiled at the beginning of construction, is inadequate to provide a finished depth of approximately 4 inches.

c. Landscaping. This will be included as an integral part of the planning of the project to produce an aesthetically pleasing final site.

(1) The State may program up to 3 percent of the basic building cost for planting trees, shrubs, and vines (exclusive of grading and seeding or sprigging and sodding for erosion control). In those locations that are considered to have an arid climate, the State may program up to 4 percent of the basic building cost and may use xeriscaping.

(2) Additional planting for energy conserving landscaping may be authorized if the State justifies it on a life cycle cost basis.

(3) An installed watering system is authorized.

d. Military vehicle parking. Parking is authorized for all vehicles, trailers, equipment, etc. permanently assigned to logistical facilities, including GSA vehicles. This includes equipment hand received from units for exclusive facility operating requirements. Parking is also authorized at MATES, CSMS, and Field Maintenance Shop (FMS) for 10 percent of the vehicles, trailers, equipment, etc., authorized to receive maintenance at that facility but not permanently located there.

(1) Rigid concrete is authorized for paving those areas designated for the parking of military vehicles. For programming purposes the concrete will be 8 inches in depth.

(2) The total area exclusive of access roads will not exceed 50 square yards for each wheeled vehicle, trailer, and other wheeled/towed equipment; 75 square yards for each tracked vehicle, engineer vehicle, and equipment over 30 feet long; 175 square yards for each fuel truck and Heavy Expanded Mobility Tactical Truck (HEMTT); and 275 square yards for each HEMTT Palletized Load System (PLS) and Heavy Equipment Transporter (HET) vehicle.

(3) For other unique equipment that must be stored within the military vehicle parking area, such as skid-mounted generators, snowmobiles, and transportable containers organic to the assigned units, the State may program an appropriate amount of space and enclose justification for its request.

(4) The parking area is to be reduced by the size of the building when enclosed or shed-type parking is provided. (Refer to paragraph 3-6 below.)

(5) The parking area is to be based on an economical layout of the parking spaces and circulation lanes. Actual design will be determined by structural calculations.

e. Fuel truck containment area. A 15 foot by 30 foot rigid concrete pad is authorized for each fuel truck. Also, a rigid concrete containment area is authorized for each fuel truck or trailer which stores Petroleum Oil Lubricants (POL) on board. In accordance with applicable environmental, safety and fire protection regulations, each containment area is to be sized so that it is capable of capturing and retaining 100% of the POL volume stored on the truck(s) parked within that area. A roof type cover may be provided, if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area.

f. Loading Dock. A loading dock fitted with a dock leveler should be provided in the receiving and shipping area of all facilities except the USPFPO office, unheated storage buildings, and the firefinder radar maintenance facility. The dock should be of sufficient length to provide space for a minimum of three trucks loading/off-loading supplies simultaneously and should be a minimum of 15 feet in width to provide the required space for forklift

operations while loading/off-loading supplies. The dock should also have an access ramp 10 feet wide to provide forklift and customer/visitor access.

g. Military vehicle loading ramps. Military vehicle loading ramps may be constructed at logistics facilities to assist in loading and off-loading military vehicles (wheel and track) from equipment transporters that do not have loading ramps as an integral part of the trailer. A multi-level loading ramp not to exceed a footprint of 160 square yards is authorized.

h. Turn pads. If the State justifies them, rigid concrete turn pads are authorized where frequent turning of tracked vehicles is required on flexible pavement. Pads should be 30 feet square.

i. Service and access aprons. 150 square yards of rigid concrete paving each may be provided for access to the dumpster area, the controlled waste handling facility, and any other facility requiring outside access by forklifts or large, heavy vehicles. In addition, a rigid concrete access area of 250 square yards may be provided for access to the military vehicle loading ramp.

j. Privately owned vehicle (POV) parking. The allowance is 35 square yards times the required full-time staff of the facility, including contract personnel. This includes an allowance for circulation lanes within the parking area but excludes any required access roads. For programming purposes, flexible pavement will consist of 6 inches of bituminous material placed over an installed, appropriate aggregate base. Rigid concrete or flexible pavement curbs may be installed along pavement edges to comply with the site's approved storm water management plan or to preclude soil erosion.

k. Visitor/customer parking. Visitor/customer parking spaces are authorized as indicated below based on the number of required full time employees. The allowance is 35 square yards a space, which includes circulation lanes but excludes required access roads, except that 60 square yards is authorized for one handicapped parking space. (A second handicapped parking space is authorized if there are more than 50 non-handicapped parking spaces.) For programming purposes, flexible pavement will be 6 inches over an appropriate aggregate base. Rigid concrete or flexible pavement curbs may be installed around pavement edges if required to control storm water per the site's approved storm water management plan.

<u>Employees</u>	<u>Parking Spaces</u>
5-15	4
16-25	7
26 and over	9 (and one additional parking space for every 10 employees or major fraction thereof over 26)

l. Access road and entrance throat. The primary entrances and access roads are authorized a width of 24 feet. More than one entrance may be authorized based on a demonstrated requirement to separate military and civilian vehicle traffic and/or to satisfy access requirements for fire and emergency vehicles. For programming purposes, the access road shall consist of 5000 square yards of flexible or rigid pavement, unless a greater amount is justified by a detailed site plan. However, the exact amount and type of pavement will be determined at the preliminary design review based on an economical and practical site facility layout and code considerations.

m. Curbs. Rigid or flexible pavement curbs may be installed along the edges of the roads and parking areas to comply with code, to control traffic, or to control storm water per the site's approved storm water management plan.

n. Security fencing. A security-type fence consisting of a 6 foot high chain-link-type metal fabric, with a 12-inch high anti-climber, will enclose the military vehicle parking, service and access areas, and ancillary facilities. Fencing will include vehicle and personnel gates, which may be electronically controlled. The fencing may be located approximately ten feet from the edge of the parking pavement; and the area between the edge of pavement and the fence may be seeded with grass, or a well-designed non vegetative cover (not to exceed four inches of rigid pavement) may be substituted.

o. Site Anti-Terrorism/Force Protection Measures. A separate fence, wall, passive vehicle barrier, landform, or line of vegetation will be applied along the exterior perimeter of the site to create a protective standoff and obscure vision, hinder personnel access, and hinder or prevent unauthorized vehicle access. In addition, a guard house/access control facility not to exceed 550 square feet is authorized when determined to be appropriate following completion of the AR 190-51 directed security risk assessment. Such a facility may be equipped with an environmental control system, electric service, and both voice and data communication links.

p. Sidewalks. For programming purposes, sidewalks shall be 20% of the building footprint. However, the exact amount of sidewalk area will be determined at the preliminary design review based on an economical and practical site layout of the facilities.

q. Flagpole(s). Two ground-set flagpoles with illumination are authorized, unless the facility is collocated with a readiness center or another ARNG facility with flagpoles or is on a military installation that already has or will have flagpoles.

r. Exterior fire protection. Consideration will be given to the size of the structure, the type of construction, and the exposure to fire hazard that it creates for or receives from nearby buildings. Except in cases of conflict with State requirements, exterior fire protection should be in conformance with National Fire Protection Association requirements. Extension of water mains for fire protection is limited to that needed to ensure that an adequate number of fire hydrants can be located between 50 and 400 feet of any building. No more than 300 linear feet of pipe per water line required by code may be outside the project property line.

s. Detached facilities sign/static display. In addition to the authorized building-mounted facilities sign, a free-standing sign is authorized identifying the facility name and type, the State, and Army National Guard. Lighting to illuminate the sign continuously during hours of darkness may be provided. Provisions may also be made at this facility for a static display(s), including a concrete slab or mounting pedestal.

t. Outside Security lighting. Security lighting of military vehicle/equipment storage and other outside area lighting should be in keeping with minimum needs for personnel safety and security and physical security. Lighting of fuel islands is authorized. A security lighting system that would permit ample lighting to conduct safe after hour training and one which is designed to illuminate continuously during the hours of darkness or equipped with sensors which when activated by movement within the designated area will cause the lights to illuminate is authorized. After discontinuance of movement within the designated area, the lights should remain lit for a time determined to be appropriate for the specific situation by the security manager. Vandal resistant lenses should be provided where appropriate. Wherever possible, lighting of area will be provided from building-mounted fixtures. Pole-mounted fixtures may be used to supplement the building-mounted fixtures and where building-mounted fixtures are inadequate.

u. Utilities. All building utility service connections should be underground. The length of service for each utility is limited to the distance of the shortest run from the building to the property line adjacent to the public right-of-way providing ingress and egress for the site plus up to an additional 300 linear feet for connection to the existing utility system. Direct-burial cable for telephone, data, and electric service connections are authorized. This includes conduit where the service connection(s) must pass under a paved area. Participation in on-site water well, sanitary treatment system, and liquid petroleum gas, fuel oil or other heating system storage tank, including piping, will be authorized if respective public services are not available and the separate systems are consistent with the requirements of the local approval authority and with applicable Federal, State, and local environmental laws and regulations. A water storage cistern along with a chlorination system may be authorized, if no municipal potable water is available. At an FMS co-located with a readiness center, utility connections should feed from the readiness center utilities and have separate meters.

v. Storm water retention ponds. The State may program up to 3 percent of the basic building cost for retention ponds as part of a storm water pollution prevention program, if the Army Environmental Programs Division (NGB-ARE) validates the requirement. These ponds may include bioretention capabilities if required by local codes and/or best management practices.

3-3. USPFO Offices and Warehouses

a. Administrative.

(1) The allowance is 300 square feet times the total number of authorized United States Property and Fiscal Office (USPFO) employees (including Federally reimbursed State employees who work at the USPFO), but only after the number of employees is raised to the 0.9 power. For example, if there are 110 authorized USPFO employees, then the allowance for administrative space is 20,624 square feet.

(2) The number of Federally reimbursed State employees used in this calculation may be no more than 10% of the total. In addition, the following positions are accounted for elsewhere and are not be included in the number of employees used in this calculation: warehouse supply technicians, warehouse supply clerks, truck drivers, Information Technology (IT) operators, communication center operators, verifier operators, and the Construction and Facilities Management Officer.

(3) The total allowance for administrative space includes all functional space, such as administrative offices, latrine/shower/locker rooms, a classroom, a break room, a conference room, mechanical, electrical, and

telecommunications equipment rooms, storage rooms (including custodial storage), and intra-office circulation. The allowance does not include space for interfunctional circulation, such as enclosed corridors, lobby entrance ways, stairs, and walls, which is calculated separately as shown in Table 3-1.

(4) Wherever possible, administrative space will be open, with only the minimum essential number of separate offices constructed. To the maximum practical extent, offices will be joint use, with the number of exclusive offices being kept to the minimum.

b. Information Technology (IT). Space of 1900 square feet (which includes 200 square feet for a storage room and 200 square feet for a switch room) is authorized for IT equipment and operations. For each mini-computer or server, an additional 400 square feet is authorized over and above the 1900 square foot base.

c. Telecommunications Center. Additional net space of 400 square feet (with a raised floor) is authorized for telecommunications terminal equipment and operation, and another 140 square feet is authorized for a message center when the latter function is collocated with the telecommunications terminal. The allowance for the message center space increases 25 square feet for each postage meter authorized on the TDA.

d. Physical fitness area. An additional net area of 600 square feet is authorized for physical fitness equipment when there are 5 or more approved full-time technicians authorized on the TDA. For each additional approved full-time technician, the allowance increases 30 square feet. This allowance may be applied within the USPFPO or added to an existing physical fitness facility on the installation.

e. Storage.

(1) The allowance for net warehousing space (including flammable materials storage) is 12 square feet times the total number of authorized troops in the State, but only after the number of troops is raised to the 0.9 power. For example, if a State is authorized 9500 soldiers, then the allowance for warehouse space is 45,617 square feet.

(2) Although the flammable materials storage area is included in this allowance, it may not exceed 4 percent of the total net warehousing space. Space for vaults, lockers, latrines, offices, and break area (limited to 10 square feet per warehouse employee) is included in the warehousing allowance.

(3) A 15-foot wide covered loading dock with dock levelers is authorized above and beyond the allowance for warehouse space.

f. Warehouse service apron. A rigid apron limited to 60 square feet per foot of length of the building is authorized on the loading dock side of the warehouse.

3-4. Surface Equipment Maintenance Facilities

a. Space criteria applicable solely to surface maintenance shops.

(1) Refer to Table 3-4 for office, work, and personnel allowances (Schedules I items).

(2) Refer to Table 3-5 for workbay authorizations (Schedule II items).

b. Tables 3-4 and 3-5 differentiate between field maintenance and sustainment maintenance.

(1) Field maintenance refers to work that is generally only done at an FMS, FMS Subshop (FMSS), or a Unit Training and Equipment Site (UTES).

(2) Sustainment maintenance refers to work that is generally only done at a CSMS or MATES.

(3) However, for criteria purposes a MATES located on the same installation as a CSMS will receive only the allowances for field maintenance.

(4) Most types of special purpose workbays are only shown with a basic allowance. They will normally be incorporated only into the design of sustainment maintenance facilities. However, if a State elects to tailor an FMS to perform sustainment level maintenance functions, by providing it with one or more special purpose workbays, the State must provide documentation to NGB-ARI during the DD Forms 1390/1391 review process substantiating that those functions will not be duplicative of similar work performed at an existing or planned sustainment maintenance facility or that the special purpose workbay(s) will facilitate the reallocation of both workload and workforce from an existing CSMS or MATES to that FMS. In rare instances, with compelling justification, a State may request an exception to these criteria.

c. Office, personnel, and work areas.

(1) The net area in square feet allowed for each functional area is listed in Schedule I in the columns under each type of maintenance facility.

(2) If the function is designated NA, that area is not authorized for the facility unless authorized as an exception to criteria.

(3) Some area sizes are the sum of the amount in basic allowance plus an amount listed under the specific facility type.

(4) Other area sizes are the sum of what is in the row labeled “basic” and the row directly below with the same listed function.

(5) Many area sizes are determined by an amount of square feet times a factor, such as the number of general purpose maintenance workbays authorized for the shop, Federal technicians/soldiers/employees required to perform the function at the shop, total troop strength supported by the shop, or the number of combat vehicles authorized at the shop.

d. Workbays.

(1) Workbays are either general purpose or special purpose workbays. General purpose workbays are those in which mechanics repair, replace, or adjust the operational mechanisms of military vehicles. Special purpose workbays are those that support a specialized functional area and are not directly associated with vehicular maintenance. Examples of special purpose workbays are warm-up bay, lubrication bay, welding bay, and body bay.

(2) All workbays at a facility should be of the same size to facilitate design and construction and minimize construction costs.

(3) Unless specified elsewhere, the normal bay size will be 32 feet by 64 feet. Minimum work bay width will be 32 feet. This does not include safety walkways.

(4) Work bay length may be decreased only as an exception to criteria. That is, 32 feet by 32 feet workbays are generally considered an imprudent investment of Federal funds.

(5) A safety walkway (route of egress) will be provided along the perimeter of each set of two workbays. It will be four feet wide, except at the interface of the administrative core area and the first workbay adjacent to that core area, where the walkway shall be eight feet wide. Each safety walkway running parallel to the major axis of the work bays shall have a main door at either end to provide exit out of the building. The safety walkways that are perpendicular to the major axis of the work bays shall be free of any obstruction caused by a structural member or equipment support column.

(6) Each shop (any combination of two or more work bays) should be sized based on the largest vehicle requiring maintenance support.

(7) Additional bays may be justified for non-qualifying items with motors (e.g., trailers with mounted generators, snowmobiles, etc.) when the density is sufficient to require workspace.

(8) The authorized number of general purpose workbays is determined by the number of mechanics authorized or required for the site, whichever is greater. Mechanics are defined as non-supervisory personnel who work primarily in general purpose workbays. The personnel who work in special purpose work areas are not to be used in determining the number of general purpose workbays. The number of authorized general purpose workbays will be determined on the basis of one workbay for every six field or sustainment level maintenance mechanics required. Any fraction of a workbay authorizes an additional bay.

e. Lifting Devices. When the operation performed in a general purpose or special purpose workbay requires the extraction or lifting of equipment or materials exceeding 50 pounds in weight, appropriate lifting devices in the following areas are authorized as installed building equipment.

(1) General Purpose Workbays. One 15 ton overhead crane/lifting device with a hook height of not less than 17 feet is authorized for each five workbays or fraction thereof. (That is, 3 workbays are authorized 1 crane, 9 workbays are authorized 2 cranes, etc.)

(2) General Purpose Workbays (armament repair area) in support of M-1 series tanks. One 30 ton crane with a hook height of no less than 21 feet 6 inches is authorized.

(3) Welding Bay. One 7.5 ton crane with a hook height of no less than 17 feet is authorized.

(4) Body Bay. One 7.5 ton crane with a hook height not less than 17 feet is authorized. Note: if the facility design places the Welding Bay and the Body Bay adjacent to each other, the State should make every attempt to employ the same device to support both functional areas.

(5) Engine Test Cell. One 5 ton crane with a hook height of no less than 14 feet is authorized.

(6) Transmission Test Cell. One 3.5 ton crane with a hook height of no less than 14 feet is authorized.

(7) Machine Shop. One 1 ton crane with a hook height of no less than 10 feet is authorized.

(8) Radiator Shop. One 0.5 ton crane with a hook height of no less than 10 feet is authorized.

(9) Fuel and Electric Shop. One 0.5 ton crane with a hook height of no less than 10 feet is authorized.

(10) Canvas Shop. One 0.5 ton crane with a hook height of no less than 14 feet is authorized.

f. Other installed equipment. Equipment that may be installed or built into maintenance facilities is identified in the NGB Design Guide 415-2. Reference can also be made to NG Pam 415-5, Chapter 4, for more detailed explanation and guidance. State should contact NGB-ARE if considering purchase of installed pollution prevention equipment.

g. Outside support items for surface maintenance facilities. Supporting items or specialty areas that may be provided at maintenance facilities, when individually justified, are as follows:

(1) Cannibalization area. An area of rigid pavement equal to the greater of 1,000 square yards or 10% of the area authorized for military vehicle parking and enclosed with a security fence and illuminated by security lights is authorized at CSMS and MATES. If this enclosure is not adjacent to other paved areas, a 20 feet wide rigid paved access road is authorized. For programming purposes, rigid pavement will be 8 inches of concrete. Actual design will be determined by structural calculations.

(2) Maintenance Bays Access Apron. A 60 foot deep concrete apron is authorized the length of each side of the facility with workbay entrances.

(3) Fuel storage and dispensing systems.

(a) Fuel storage and dispensing systems are authorized provided that the surface maintenance facility is not located within a mile of another ARNG facility with fuel storage and dispensing capability, and the State's surface vehicle fuel management plan justifies the use of a fuel storage and dispensing system at this location because of a lack of nearby military facilities, an agreement with other State facilities, or local private sources (using credit/debit cards).

(b) The storage facilities will be built to nationally recognized environmental standards and in accordance with local ordinances.

(c) The capacity will not exceed the following:

<u>No. of Vehicles Using Type of Fuel</u>	<u>Capacity Per Type of Fuel</u>
0 - 14	NA
15 - 39	3,000 Gal
40 - 69	5,000 Gal
70 - 100	7,000 Gal
101 - 250	10,000 Gal
Over 250	20,000 Gal

(d) A 15 foot by 45 foot rigid concrete pad (to include containment if required) is authorized at the pump island for each type fuel. The project is authorized 250 square yards of rigid or flexible paving (in addition to the readiness center access road and military vehicle parking) for access to the fuel dispensing system. A roof type cover may be provided, if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area.

(4) Wash platform.

(a) One concrete wash platform, not to exceed 115 square yards, is authorized for each 100 or more vehicles or major fraction thereof at a MATES or a UTES. At a MATES the wash and steam bay is considered as one wash platform.

(b) One wash platform will be authorized at each FMS, FMSS, and CSMS.

(c) 250 square yards of rigid concrete access paving is authorized to provide for access to each wash platform.

(d) A roof type cover may be provided, if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area.

(e) One exterior wash rack may be enclosed by an unheated shed-type structure when the heating design temperature, as determined from the 97 1/2 percent column in TM 5-785, is minus (-) 10 degrees Fahrenheit or lower, or the annual snowfall exceeds 30 inches.

(f) A washing facility may be installed in one of the authorized field maintenance bays as a substitute for one exterior wash platform.

(g) If a centralized wash facility (birdbath type) can be justified, it will be programmed as an exception to criteria. The use of a closed-loop water circulation system with replenishment to make-up any water lost through evaporation is preferred as environmentally prudent.

(5) Lube and inspection rack.

- (a) One exterior lube and inspection rack is authorized per surface maintenance facility. Those facilities with 5 or more general purpose workbays are authorized a second exterior rack.
- (b) 150 square yards of rigid concrete access paving may be provided for access to each rack.
- (c) An unheated shed-type structure may be provided to enclose the rack when the heating design temperature, as determined from the 97 1/2 percent column in TM 5-785, is minus (-) 10 degrees Fahrenheit, or lower, or the annual snowfall exceeds 30 inches.
- (d) A full-length lube and inspection pit is authorized inside one of the authorized field maintenance workbays in place of one exterior lube and inspection rack.

3-5. Direct Support Logistical Facilities

- a. Space allowances are as shown in Table 3-6. These allowances are net area, including interfunctional circulation, but exclusive of walls and the access area required for circulation/transition of the vans. All references to workbays are based on all types of authorized workbays defined in paragraph 3-4d.
- b. Missile and Aviation Class IX requirements are not included in the following space allowances.
- c. Special requirements.
 - (1) Van/Trailer access.
 - (a) An enclosed access area 4 feet wide may be provided for circulation/transition between the data vans and the Combat Service Support Automation Management Office (CSSAMO) area on the rear of the van, which should be enclosed after the van is positioned next to the wall of the supporting building. Van access areas may be at ground level or at floor height (i. e., dock). An enclosed access area 15 feet wide with a concrete floor suitable for forklift truck operation may be provided between the parts vans and the inside Class IX storage operations area.
 - (b) Circulation/access is required for vans as follows:

Division CSSAMO Separate Brigade	Three data vans (35 feet long) at 10 foot to 16 foot centers with generators.
CSSAMO Main	Three data vans (35 feet long) at 10 foot to 16 foot centers with generators. One dock space at 10 foot centers authorized for each non-located DSU supported.
Main & Forward	Number of M750 Direct Support Unit (DSU) parts vans authorized by MTOE at 16 foot centers. Number of box type vans authorized by MTOE at 10 foot centers. Authorized flatbed/self-propelled (SP) Class IX trailers at 10 foot centers. (See Note 6, Table 3-4.)
Non-Divisional DSU/GSU DS4 (SSA) CSSAMO	Number of MTOE data vans at 10 to 10 foot centers.
Class IX	Number of M750 Warehouse parts vans authorized by MTOE at 16 foot centers. Number of box type vans authorized at 10 foot centers. Authorized flatbed/SP Class IX Trailers at 10 foot centers. (See Note 10, Table 3-4.)

- (2) Van support utilities. Data vans may be heated and cooled with external systems. Air-conditioning of Class IX vans is not authorized.
- (3) Van shelters.
 - (a) A roof should be provided for all authorized data vans and Class IX parts vans for protection from weather damage. The roof should be of sufficient width to cover the vans, inclusive of the towing tongue. A roof cover could be provided for the loading/off-loading dock to protect personnel and supplies during inclement weather.
 - (b) The area under and immediately surrounding the data vans and under the roof of the Class IX parts van and trailers should be surfaced with rigid concrete.
 - (c) Side walls may be added around the data vans and Class IX vans to provide an unheated type enclosure where the design temperature indicated on the 97-1/2 percent column of TM 5-785 is 15 degrees Fahrenheit or less dry bulb.
 - (4) Covered storage area. A roof cover may be provided per authorization in Table 3-4. Please note that an unheated enclosed area is authorized where the design temperature indicated on the 97-1/2 percent column of TM 5-785 is 15 degrees Fahrenheit or less dry bulb. This area is authorized rigid concrete.

(5) Security fencing. Fencing will enclose the Class IX vans, trailers and outside covered storage area. The data vans may be fenced separately. The data center vans, covered outside storage, and the Class IX vans do not require security fencing if enclosed by walls such as metal, masonry, etc.

(6) Van access and maneuver area. The area required for access, maneuvering, and parking the vans may be surfaced with flexible paving in accordance with structural calculations.

(7) Parking. If the facility is not located at a readiness center, flexible pavement may be provided for POV parking at the Class IX operations. Space for customer parking is authorized for ten vehicles at separate brigade or division forward support battalion facilities. Space for 15 vehicles is authorized at division main support battalion facilities. In both instances, 35 square yards is authorized per parking space.

(8) Additional dock space. Additional covered dock space may be authorized for MTOE flatbed supply trailers. The covered outside storage area must be reduced by a like amount.

(9) Military vehicle parking compound. If the facility is not collocated with a readiness center, a military vehicle parking compound may be constructed for the MTOE authorized vehicles organic to the unit sections with the M-Day Class IX operation mission.

3-6. Unheated Enclosed or Shed-Type Vehicle Storage Space

- a. Federal support for enclosed or shed-type storage is authorized in accordance with NGR 415-10.
- b. Vehicle storage space will be unheated and will not exceed 66% of the normally authorized open-air military parking area. When enclosed or shed-type storage is provided, the amount of paved area (authorized for parking of military vehicles at the site) will be reduced by the area of the covered space. The remaining paved area is to be used for circulation and access to and from the covered/enclosed storage structure.
- c. Vehicle doors at approximately 25 feet on centers are authorized at the rate of one for each 1800 square feet of floor area to provide for mass parking of vehicles without the need for internal circulation lanes.
- d. A 60 foot deep concrete apron is authorized the length of each side of the facility with vehicle entrances.

3-7. Firefinder Radar (AN/TPQ36/37) Facility

- a. Space criteria. Each set is authorized a 20 foot by 40 foot net floor area as a special purpose readiness bay.
- b. Location. This facility may be located either at a surface equipment maintenance facility or at a readiness center, whichever is the most cost effective and practical, but not at both. It should generally be located within a military vehicle parking area or adjacent to some other paved area.
- c. Facility criteria. For detailed design criteria for this facility refer to NGB DG 415-2. An area of flexible or rigid concrete access pavement covering 135 square yards for each vehicle door may be used for programming purposes, but the actual amount necessary should be determined at the preliminary review stage.

Table 3-1. Facility Support Space Allowances

Facility Maintenance and Storage	3% of the Total Net Area of Schedule I and II items
Mechanical/Electrical Room <u>1/</u>	5% of the Total Net Area of Schedule I and II items
Telecommunications/Information Technology <u>1/</u>	1% of the Total Net Area of Schedule I and II items

Note:

1/ Mechanical/Electrical and Telecommunications/Information Technology rooms may be increased or decreased based on actual design requirements. Mechanical space includes pipe and duct shafts and perimeter heating units. Additional mechanical equipment space is authorized for multiple story facilities to accommodate vertical duct requirements. This space is understood to include space for computerized controls and equipment for all facility related systems. The percentage indicated is intended as a planning guide. Final determination will be approved during the design review process.

Table 3-2. Circulation 1/

Facility	Circulation
USPFO Office	15% <u>2/</u>
USPFO Warehouse	None
Office/Shop Areas in Surface Maintenance Facilities	15% <u>2/</u>
Unheated Vehicle Storage Space	None
Direct Support Logistical Facilities	As required
Basic Issue Items (BII) Warehouse	None
Firefinder Radar Facility	None

NOTES:

1/ This includes corridors, staircases, entrances, and a lobby. The percentages are planning figures, based on total net floor area, and final determination will be approved during the design review process based upon what is required for a well planned functional layout.

2/ 22 percent when facility is constructed as multi-story building.

Table 3-3. Walls

Walls 1/	10 percent of total net floor area, including circulation
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Note:

1/ The total floor area may be increased by 10 percent to provide for interior and exterior walls and partitions. The 10 percent figure is intended as a planning guide. Final determination will be approved during the design review process.

Table 3-4. Schedule I, Office, Work, and Personnel Space Allowances in Surface Equipment Maintenance Shops
 (Allowance in net square feet, exclusive of interior and exterior walls)

Functional Area	Basic Allowance	Field Maintenance	Sustainment Maintenance
1. Office Area			
a. General Supervisor <u>1</u> /	150	<u>2</u> /	<u>2</u> /
b. Supervisor <u>1</u> /	100	<u>3</u> /	<u>3</u> /
c. Production Controller <u>1</u> /	150	<u>3</u> /	<u>3</u> /
d. Inspection & Library	200	<u>4</u> /	<u>4</u> /
e. Automation Clerk <u>1</u> /	200	<u>4</u> /	<u>4</u> /
f. Common IT Space	NA	<u>5</u> /	<u>5</u> /
g. IT Support Activities	NA	<u>6</u> /	<u>6</u> /
h. Classroom <u>7</u> /	500	10/Tech	10/Tech
2. Personnel Areas			
a. Latrine/Shower	250	<u>8</u> /	<u>8</u> /
b. Locker Room	125	<u>8</u> /	<u>8</u> /
c. Break Area	200	<u>9</u> /	<u>9</u> /
d. Physical Fitness Area	600	<u>10</u> /	<u>10</u> /
3. Work Area			
a. Tool Room	600	50/GPWB <u>11</u> /	50/GPWB <u>11</u> /
b. Supply Room <u>12</u> /	500	100/GPWB	100/GPWB
c. Battery Room	200	25/GPWB <u>13</u> /	25/GPWB <u>13</u> /
d. Comm/Electronic Shop <u>1</u> /	100	100/Tech	100/Tech
e. Instrument Repair Shop <u>1</u> /	350	100/Tech	100/Tech
f. Small Arms Repair Shop <u>1</u> /	125	100/Tech	100/Tech
g. Small Arms Test Room <u>1</u> /	440	NA	<u>14</u> /
h. Vault (Small Arms) <u>1</u> /	150	<u>15</u> /	<u>15</u> /
i. Vault (CBT Veh Arms) <u>1</u> /	130	<u>16</u> /	<u>16</u> /
j. Injector Test Room <u>1</u> /	300	NA	
k. Fuel and Ignition Repair Shop <u>1</u> /	525	NA	
l. BII Storage/Issue <u>1</u> /	NA	<u>17</u> /	<u>17</u> /
m. Machine Shop <u>1</u> /	1,600		
n. Carpenter Shop <u>1</u> /	1,500		
o. Lumber Storage Shed <u>1</u> /	500		
p. Canvas Shop <u>1</u> / <u>18</u> /	800	<u>19</u> /	<u>19</u> /
q. Missile Repair Shop <u>1</u> /	400	<u>20</u> /	<u>20</u> /
r. Vault (Missile) <u>1</u> /	NA	<u>21</u> /	<u>21</u> /
s. Calibration Room <u>1</u> /	400	NA	
t. Calibration Storage <u>1</u> /	400	NA	20/1000 /TR
u. Glass Repair Room <u>1</u> /	200	NA	15/GPWB > 13
v. Radiator Test and Repair Room <u>1</u> /	660	NA	
w. COMSEC Repair Room <u>1</u> /	250	NA	
x. Radiation Calibration Room <u>1</u> /	300	NA	
y. Bulk POL Stge for Lub Sys			
1 to 6 GPWB	80		
6 to 10 GPWB	176		
11 & Over GPWB	272		
z. Bulk POL Storage <u>22</u> /	200	50/GPBW >2	50/GPBW >2
aa. Controlled Waste Handling			

Facility <u>23/</u>				
1-40 barrels stored	300	NA	NA	
41 & over stored	500	NA	NA	
ab. Bulky Equipment Storage <u>24/</u>	100/GPWB	NA	NA	
ac. Flammable Materials Storage <u>25/</u>	3% of net area	NA	NA	
ad. Enclosed unheated storage <u>26/</u>	250 per WB	150/WB over 4	150/WB over 40	

Legend for Schedule I

CV - Combat vehicles

NA - Not authorized

Tech - Full time employee in technician status assigned to the function

TR - Authorized aggregate supported troop strength

GPWB - General purpose workbay

NOTES:

1/ If position or speciality is authorized.

2/ 200 square feet are authorized for the General Supervisor if the facility has a total of 62 or more employees.

3/ Add 100 square feet for each authorized position greater than one.

4/ Plus 60 square feet per authorized position over one.

5/ Each common use terminal supporting maintenance related programs (e.g. ULL-G, SAMS-1, IM3) is authorized 30 square feet and each printer 10 square feet. A copy of the Information Management Plan authorizing equipment should be included with the initial submission of the programming documents (DD Forms 1390/1391). Desktop computers, typewriters, and other pieces of single user information technology equipment are not eligible for additional floor space because they are considered part of the work area for the individual position.

6/ Size to be determined by coordination between State DOIM and NGB-AIS prior to submission of programming documents.

7/ Total classroom size may not exceed 2000 square feet.

8/ The total space authorized for the men's and women's shower and latrine areas is based on an allocation 10 square feet for each authorized person plus the basic allowance as stated in the table. The total space allocated for men's and women's locker room is 12 square feet for each authorized person plus the basic allowance as stated in the table. These allowances are to be split into separate areas for men and women that are appropriately sized and configured to meet both local code requirements and anticipated building usage.

9/ Basic authorizations are 200 square feet for up to 4 full-time support personnel and 400 square feet for up to 8 full-time support personnel, with an additional 20 square feet per individual for 9 to 20 full-time support personnel, 12 square feet per individual for 21 to 40 full-time support personnel, and 8 square feet per individual for full-time support personnel exceeding 40.

10/ The basic allowance is authorized only when there are 5 or more approved full-time technicians authorized on the TDA. For each additional approved full-time technician, the allowance increases by 30 square feet to a maximum of 1650 square feet.

11/ This additional tool room space is authorized for each authorized and programmed workbay greater than four.

12/ 100 square feet per first full-time support individual and 60 square feet for each additional full-time support individual assigned as supply assistant and/or equipment maintenance clerk may be partitioned off as office space. This office may not increase supply room authorization. A covered dock (if justified) or an apron is authorized.

13/ Total not to exceed 500 square feet.

14/ The net area of the Small Arms Test Room is comprised of a firing area 4 feet by 8 feet, a firing lane tunnel 4 feet by 82 feet, and a bullet stop area 4 feet by 20 feet for a total of 440 square feet.

15/ The Small Arms Vault at a CSMS should be sized at 20 square feet for 1,000 troops supported, but not less than 150 square feet. There is no requirement for a small arms vault at a MATES.

16/ Authorized an additional 2.5 square feet for each combat vehicle up to 460, then 1.75 square feet for each combat vehicle over 460, and 0.5 square feet for each authorized M2 (Infantry Fighting Vehicle). Double-leaf vault doors are authorized if materials handling equipment is used.

17/ BII not applicable for CSMS. Authorized 21.5 square feet per tracked vehicle and 4.0 square feet per wheeled vehicle. The combat vehicles or wheeled vehicles to be used in computing the total BII space allowance are vehicles authorized to be permanently assigned to the UTES or MATES. The BII storage may be a separate structure and the inside area may be subdivided by wire mesh partitions to unit level. A 20 foot wide concrete apron with a cover overhead may be installed on one side of the warehouse to load BII with forklifts. The length of the apron will not exceed twice the minimum building dimension. A 20 foot by 20 foot covered loading dock is authorized for BII storage.

18/ A pit (approximately 6 feet square by 3 feet deep) may be provided in the Canvas Shop to allow the sewing machine to be installed level with the floor. The pit should be enclosed by a removable protective railing. A 1000 lb. capacity lifting device with a hook height of 14 feet is authorized.

19/ An additional 200 square feet is authorized for each canvas repairman over one.

20/ The missile shop area authorization is based only on the largest unit supported, not on the sum of subordinate units supported. If the shop supports a brigade, it receives an additional 200 square feet; if it supports a division, it receives an additional 400 square feet.

21/ Vault size is 6 square feet per supported missile system as documented on equipment density listing. Vault should normally be co-located with the missile repair area.

22/ Storage may be freestanding or incorporated into the facility.

23/ Controlled Waste Handling Facility (CWHF).

a. A prefabricated metal or concrete masonry building with a concrete floor or building of equivalent or less cost of a size indicated below is authorized. The size is gross area including intracirculation. Intercirculation space has to be justified as an exception to criteria.

b. The building will be designed to allow wastes to be conveniently stored inside each cell in drums, metal boxes, or pallets, and easily loaded/unloaded using a forklift or manual means. Partitioning off of individual storage cells will be designed to provide secondary spill containment within each cell.

c. 150 square yards of rigid concrete access paving may be provided for access.

d. At its option the State may include this authorized space within the logistics facility or another adjacent facility.

24/ Additional space is authorized to accommodate bulky maintenance equipment such as tire changers, floor jacks, equipment stands, and welder equipment.

25/ Flammable materials storage. The basic allowance for flammable materials storage is 3 percent of the net area of the facility. In no case, however, will the allowance be outside the range indicated below. Detached buildings may be used, or an equivalent area may be incorporated within the facility.

<u>Type of Facility</u>	<u>Net Area</u>
FMS or FMSS	100 to 250
UTES or collocated MATES	200 to 400
CSMS or non collocated MATES	400 to 600

26/ Enclosed unheated storage. Detached buildings may be used, or an equivalent area may be incorporated within the facility to store major end items, items awaiting repair/direct exchange, and Class IX parts that are susceptible to damage from the outside elements. 150 square yards of rigid concrete access may be provided for access paving to the storage building. The storage area is determined based on the number of authorized field and support maintenance workbays.

Table 3-5 Schedule II, Workbay Authorizations for Surface Equipment Maintenance Facilities

Use	Field Maintenance	Sustainment Maintenance
1. General Purpose Workbay	<u>1</u> /	<u>1</u> /
2. Special Purpose Workbay		
a. Warm-up Bay <u>2</u> /	<u>3</u> /	<u>3</u> /
b. Welding Shop <u>4</u> /	<u>2</u> /	<u>2</u> /
c. Wash Bay <u>2</u> /	NA	<u>1</u> /
d. Paint Stripping Bay <u>5</u> /	NA	<u>2</u> /
e. Paint Preparation Bay	NA	<u>2</u> /
f. Paint Booth <u>6</u> /	NA	<u>2</u> /
g. Lubrication Bay <u>2</u> /	<u>1</u>	<u>1</u>
h. Engine/Transmission Test Cell <u>7</u> /	NA	<u>1</u>
i. Electronics Bay <u>2</u> /	<u>1</u>	<u>1</u>
j. Body Shop <u>2</u> /	<u>1</u>	<u>1</u>

NOTES:

1/ See previous para 3-4d for workbay determination.

2/ These workbays shall be the same size as the general purpose workbays.

3/ For those facilities maintaining tracked vehicles and/or heavy construction equipment, warm-up bays are authorized for geographic areas where the outside winter design temperature is 12 degrees Fahrenheit dry bulb or less designated in the 97-1/2 percent column in TM 5-785, as follows:

Number of General Purpose Workbays	Number of Warm-up Bays
1 - 6	1
7 - 11	2
12 - 16	3
17 or more	4

4/ One bay authorized if speciality technicians are authorized to the facility.

5/ The net bay size is to be 32 feet by 64 feet (exclusive of mechanical equipment). The blasting equipment may be programmed from the military construction appropriation. The bay requires its own, adjacent mechanical room of approximately 500 square feet, which is in addition to the mechanical space authorized in Table 3-1. The type of paint stripping equipment must be approved in writing by NGB-ARI prior to initiating design. NGB Industrial Hygiene must approve the design.

6/ The net bay size is to be 32 feet by 64 feet (exclusive of mechanical equipment). The paint booth may be programmed from the military construction appropriation. The bay requires its own, adjacent mechanical room of approximately 500 square feet, which is in addition to the mechanical space authorized in Table 3-1. In addition to the bay and the mechanical room, a paint kitchen and a personnel/equipment hygiene maintenance area are authorized of 180 and 200 square feet respectively. NGB Industrial Hygiene must approve the design.

7/ A total of 2500 square feet are authorized to house a transmission dynamometer test cell, an engine dynamometer test cell, and a control room for each to perform the diagnosis of transmissions and engines. (The control rooms may be collocated or separate areas.) Additional mechanical space may be provided if required and justified. Dynamometers are authorized for procurement with military construction funds as installed building equipment.

**Table 3-6. Direct Support Logistical Facility Space Allowances
(Allowance in net square feet, exclusive of interior and exterior walls)**

Functional Area	Allowance
1. Combat Services Support Automation Management Office (CSSAMO)	
a. CSSAMO Admin/Information Technology	600 <u>1/</u>
b. Computer System repair (SAMS/DS4/SSA/CHS Systems)	900
c. Storage	1300
2. Division Class IX Stock Control	
a. Admin	750 <u>2/</u>
b. Storage	300
3. Division Class IX Warehouses	
a. Admin Areas	
Main DSU	750 <u>3/</u>
Forward DSU	600 <u>4/</u>
b. Work Areas (Located in inside storage)	
(1) Main DSU	
Customer Pick-Up (per Supported Customer)	50 <u>5/</u>
Repair/Direct Exchg (RXA) Shipping & Receiving	150
Shipping & Receiving Admin	150
Shipping & Receiving Area (per Fwd DSU)	400
Tire Inspection	200
Dry Cell Battery Refrigerated Storage (per DSU) & (Main if customer support)	50 <u>5/</u>
(2) Forward DSU	
Customer Pick-Up (per Supported Facility)	50
Shipping & Receiving Admin	150
Shipping & Receiving	200
Dry Cell Battery Refrigerated Storage	50
(3) Inside Storage	
Infantry Division - Main DSU	2000 Basic <u>6/</u>
Infantry Division - Forward DSU	800 Basic <u>7/</u>
Armored or Mechanized Division - Main DSU	3000 Basic <u>8/</u>
Armored or Mechanized Division - Forward DSU	1200 Basic <u>7/</u>
(4) Covered Storage <u>9/</u>	
Infantry Division - Main DSU	2000 Basic <u>10/</u>
Infantry Division - Forward DSU	1000 Basic <u>11/</u>
Armored or Mechanized Division - Main DSU	4000 Basic <u>10/</u>
Armored or Mechanized Division - Forward DSU	1500 Basic <u>11/</u>
4. Brigade CSSAMO	
a. CSSAMO Admin	300
b. Systems Repair (SAMS/DS4 Desktop (SSA)/ Common Hardware Software (CHS) Systems)	600
c. Storage	450
5. Brigade Class IX Stock Control	
a. Admin	400
b. Storage	150

Table 3-6. Direct Support Logistical Facility Space Allowances (contd)

Functional Area	Allowance
6. Brigade Class IX Warehouse	
a. Admin	600
b. Work Area	
Customer Pick-Up (per Supported Facility)	50
RXA Shipping & Receiving	150
Shipping & Receiving Admin	150
Shipping & Receiving	200
Tire Inspection	200
Dry Cell Battery Refrigerated Storage	50
c. Inside Storage	
Infantry Brigade	1000 Basic <u>7/</u>
Armored or Mechanized Brigade	1200 Basic <u>7/</u>
d. Covered Storage <u>9/</u>	
Infantry Brigade	1000 Basic <u>11/</u>
Armored or Mechanized Brigade	1500 Basic <u>11/</u>
7. Non-Divisional DSU/GSU/SSA/Class IX	<u>12/</u>
8. Personnel Areas	
a. Latrine/Showers <u>13/</u>	200
b. Locker Room <u>13/</u>	125
c. Break Area	<u>14/</u>

NOTES:

1/ CSSAMO Administrative office based on up to six (6) personnel for DS4 (SSA) system operations. 60 square feet per person over 6 personnel is authorized. Each Direct Support Logistics common use terminal is authorized 30 square feet and each printer is authorized 10 square feet.

2/ Class IX Stock Control Administrative Office. Based on up to a 7 person operation. Consists of administrative office, customer support area, IT operations, maintenance parts library, and file retention area.

3/ Main DSU Administrative office. Based on up to 11 person operation. Consists of administrative office, customer receiving area, IT operations to receive and process requisitions, maintenance parts library, and file area. Add 200 square feet if the Main DSU has a direct customer support mission.

4/ Forward DSU Administrative Office. Based on up to a 5 person operation. Consists of administrative office, customer receiving area, and file retention area.

5/ A supported customer is defined as a facility (i.e., FMS, CSMS, UTES, MATES) receiving support directly from the main and not from a forward DSU.

6/ Add 800 square feet if Main DSU has customer support mission, plus 20 square feet per workbay supported over 40, and 600 square feet for each supported forward DSU.

7/ Basic plus 20 square feet per each authorized workbay supported.

8/ Add 1200 square feet if Main DSU has customer support mission, plus 20 square feet per workbay supported over 60 and 1,000 square feet for each supported DSU.

9/ As an option, covered space may be provided for MTOE stake and platform/flatbed trailers with a dock, but covered storage space must be reduced by a like amount.

10/ Basic, plus 50 percent of total authorized covered storage of supported DSUs, plus allowance of note 8 for directly supported customers.

11/ Basic plus the following:

- a. 80 square feet per supported FMS workbay.
- b. 100 square feet per supported CSMS workbay.
- c. 125 square feet per supported UTES/MATES workbay.

12/ The Non-Divisional DSU/GSU DS4 (SSA) Class IX should be calculated using the criteria for Brigade CSSAMO/Class IX's operations and tailored to the type units supported.

13/ The total space authorized for the men's and women's shower and latrine areas is based on an allocation 10 square feet for each authorized person plus the basic allowance as stated in the table. The total space allocated for men's and women's locker room is 12 square feet for each authorized person plus the basic allowance as stated in the table. These allowances are to be split into separate areas for men and women that are appropriately sized and configured to meet both local code requirements and anticipated building usage.

14/ 10 square feet per full-time support individual (including office personnel) is authorized, but not less than 100 square feet.

Chapter 4 Aviation Facilities

4-1. General

- a. Standards. This chapter establishes the space allowances for ARNG aviation facility construction projects.
- b. Space allowances. All allowances are in net square feet, exclusive of interior and exterior walls. All these tables except 4-4 apply to facilities supporting rotary wing aircraft or rotary and fixed wing aircraft. Only Tables 4-4 through 4-7 apply to stand-alone fixed wing facilities.
 - (1) Refer to Table 4-1 for space allowances for the hangar floor area.
 - (2) Refer to Table 4-2 for space allowances for specialized work areas.
 - (3) Refer to Table 4-3 for space allowances for the personnel support area.
 - (4) Refer to Table 4-4 for space allowances for stand-alone fixed wing facilities.
 - (5) Refer to Table 4-5 for space allowances for unheated aircraft storage.
 - (6) Refer to Table 4-6 for space allowances for facility support space.
 - (7) Table 4-7 provides the allowance for circulation.
 - (8) Table 4-8 provides the allowance for walls.
 - (9) All other space requirements not specifically indicated in the referenced tables will be treated as exceptions to criteria. The State must fully justify these and the NGB proponent must concur with them before NGB-ARI approves their inclusion in the programming documents and the final design of the project.

4-2. Common Supporting Items

In planning the functional arrangement of facilities, the State will give appropriate consideration to the existing site conditions, layout, and materials of construction in order to achieve maximum operating efficiency, cost effectiveness, and flexibility. The support items that are common to all aviation facilities projects are:

- a. Site preparation. The work of clearing, grubbing, stripping, and stockpiling topsoil, excavating embankment, and rough grading required to develop the project site to subgrade levels and elevations for proper siting and drainage of facilities (including culverts, head walls, retaining walls, etc.). The State must use its own funds for the

special handling/remediation/disposal of contaminated soil excavated from a non-Federal owned or leased project site.

(1) Rock excavation and/or correction of unsatisfactory soil conditions is authorized only if the State has submitted adequate supporting documentation such as an economic or master planning analysis that demonstrates that the positive impacts on readiness strongly outweigh the increased construction costs.

(2) Culverts, retaining walls (installed in lieu of sloping the ground to achieve grade differentials), drainage systems, or other similar construction required for controlling surface water runoff will be approved on an individual site basis if the State justifies these items. The State, however, must consider the cost of these items during the site selection process.

b. Fine grading and seeding.

(1) The State may program for fine grading and seeding to provide proper site drainage and control of erosion on those parts of the project site where the previously existing surface cover has been destroyed or buried beneath redistributed soil.

(2) Sodding or sprigging is authorized for critical areas subject to erosion.

(3) Importing topsoil is authorized if the natural topsoil on the site, stockpiled at the beginning of construction, is inadequate to provide a finished depth of approximately 4 inches.

c. Landscaping. This will be included as an integral part of the planning of the project to produce an aesthetically pleasing final site.

(1) The State may program up to 3 percent of the basic building cost for planting trees, shrubs, and vines (exclusive of grading and seeding or sprigging and sodding for erosion control). In those locations that are considered to have an arid climate, the State may program up to 4 percent of the basic building cost and may use xeriscaping.

(2) Additional planting for energy conserving landscaping may be authorized if the State justifies it on a life cycle cost basis.

(3) An installed watering system is authorized.

d. Military vehicle parking. Parking is authorized for all vehicles, trailers, equipment, etc. permanently assigned to aviation facilities, including GSA vehicles. This includes equipment hand received from units for exclusive facility operating requirements. Parking is also authorized for 10 percent of the vehicles, trailers, equipment, etc., authorized to receive maintenance but not co-located with the facility.

(1) Rigid concrete is authorized for paving those areas designated for the parking of military vehicles. For programming purposes the concrete will be 8 inches in depth.

(2) The total area exclusive of access roads will not exceed 50 square yards for each wheeled vehicle, trailer, and other wheeled/towed equipment; 75 square yards for each tracked vehicle, engineer vehicle, and equipment over 30 feet long; 175 square yards for each fuel truck and Heavy Expanded Mobility Tactical Truck (HEMTT); and 275 square yards for each HEMTT Palletized Load System (PLS) and Heavy Equipment Transporter (HET) vehicle.

(3) For other unique equipment that must be stored within the military vehicle parking area, such as skid-mounted generators, snowmobiles, and transportable containers organic to the assigned units, the State may program an appropriate amount of space and enclose justification for its request.

(4) The parking area is to be reduced by the size of the building when enclosed or shed-type parking is provided.

(5) The parking area is to be based on an economical layout of the parking spaces and circulation lanes. Actual design will be determined by structural calculations.

e. Fuel truck containment area. A 15 foot by 30 foot rigid concrete pad is authorized for each fuel truck. Also, a rigid concrete containment area is authorized for each fuel truck or trailer which stores Petroleum Oil Lubricants (POL) on board. In accordance with applicable environmental, safety and fire protection regulations, each containment area is to be sized so that it is capable of capturing and retaining 100% of the POL volume stored on the truck(s) parked within that area. A roof type cover may be provided, if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area.

f. Loading dock. A loading dock fitted with dock levelers should be provided for the receiving and shipping of parts and supplies. The dock should be of sufficient length to provide space for a minimum of two trucks loading/off-loading simultaneously and should be a minimum of 15 feet in width to provide the required space for forklift operations while loading/off-loading supplies. The dock should also have an access ramp 10 feet wide to provide forklift and individual personnel access. Rigid concrete paving 60 square feet per foot of width of the loading dock may be provided for service access.

g. Military vehicle loading ramps. Military vehicle loading ramps may be constructed to assist in loading and off-loading military vehicles from equipment transporters that do not have loading ramps as an integral part of the trailer. A multi-level loading ramp not to exceed a footprint of 160 square yards is authorized.

h. Service and access aprons.

(1) 150 square yards of rigid concrete paving each may be provided for access to the dumpster area, the controlled waste handling facility, bulk POL storage, repair parts area, accessory equipment storage, and any other facility requiring outside access by forklifts or large, heavy vehicles.

(2) Paved aprons may be provided for each access door to the crash rescue facility, ambulance facility, and the ground support equipment storage facility. 60 square feet of rigid pavement is authorized per foot of door width.

(3) A rigid concrete access area of 250 square yards may be provided for access to the military vehicle loading ramp.

i. Hangar apron. One is authorized at each hangar door, the size being the width of the hangar door by 100 feet (except 120 feet for CH-47s). Apron shall be rigid concrete.

j. Aircraft parking apron. Outside parking and tiedown spaces are authorized for 75 percent of the authorized aircraft plus one parking/tie down space for transient aircraft (size to be based on CH-47). The layout and dimensions of the aircraft parking and hoverlane/tailane area will be according to TM 5-803-7. Parking and hoverlane/taxilane facilities for aircraft will consist of rigid concrete. A 20 foot wide access road of rigid concrete is authorized to connect the aircraft parking area to other vehicular pavement and the hangar apron on the site.

k. Privately owned vehicle parking. The allowance is 35 square yards times the required full-time staff of the facility, including contract personnel, or, if larger, 35 square yards times 90% of the authorized strength of the non co-located units required to train simultaneously. This includes an allowance for circulation lanes within the parking area but excludes any required access roads. For programming purposes, flexible pavement will consist of 6 inches of bituminous material placed over an installed, appropriate aggregate base. Rigid concrete or flexible pavement curbs may be installed along pavement edges to comply with the site's approved storm water management plan or to preclude soil erosion.

l. Visitor/customer parking. Spaces for parking 16 visitors/customers are authorized. The allowance is 35 square yards a space, which includes circulation lanes but excludes required access roads, except that 60 square yards is authorized for one handicapped parking space. Rigid concrete or flexible pavement curbs may be installed around pavement edges if required to control storm water per the site's approved storm water management plan.

m. Access road and entrance throat. The primary entrances and access roads are authorized a width of 24 feet. More than one entrance may be authorized based on a demonstrated requirement to separate military and civilian vehicle traffic and/or to satisfy access requirements for fire and emergency vehicles. For programming purposes, the access road shall consist of 5000 square yards of flexible or rigid pavement, unless a greater amount is justified by a detailed site plan. However, the exact amount and type of pavement will be determined at the preliminary design review based on an economical and practical site facility layout and code considerations.

n. Curbs. Rigid or flexible pavement curbs may be installed along the edges of the roads and parking areas to comply with code, to control traffic, or to control storm water per the site's approved storm water management plan.

o. Taxiways. Taxiways of flexible pavement, 40 feet wide, are authorized. They shall be the minimum length required for a practical and economical site layout among hangar ramps, loading area, wash area, parking area, and the nearest exit point connecting to any other existing taxiway or runway system.

p. Shoulders. Shoulders of flexible pavement, where authorized in TM 5-803-7, should be constructed in accordance with NGB DG 415-3.

q. Security fencing.

(1) A security-type fence consisting of a 6 foot high chain-link-type metal fabric, with a 12 inch high anti-climber will enclose the entire operational area, which includes all buildings, military vehicle parking/storage areas, service and access to aircraft tiedown areas, and other ancillary facilities normally located within the fenced area.

(2) Additional fencing may be authorized at stand-alone facilities when approved as an exception by Army Aviation and Safety Division (NGB-AVS).

(3) The fence will be located so as to enclose the aircraft parking area and will be equipped with gates of sufficient width to permit ingress/egress from the area to existing runways, taxiways, etc., at the airport. (Air safety must be considered in the design of both fencing and security lighting).

(4) Where feasible the fence will connect to the existing airport boundary security fence, if the boundary fence meets NGB requirements.

(5) The fencing may be located approximately ten feet from the edge of the parking pavement (unless a greater distance is required for security or safety); and the area between the edge of pavement and the fence should

be seeded with grass, although a well-designed non vegetative cover (not to exceed four inches of rigid pavement) may be substituted.

r. Site Anti-Terrorism/Force Protection Measures. A separate fence, wall, passive vehicle barrier, landform, or line of vegetation will be applied along the exterior perimeter of the site to create a protective standoff and obscure vision, hinder personnel access, and hinder or prevent unauthorized vehicle access. In addition, a guard house/access control facility not to exceed 550 square feet is authorized when determined to be appropriate following completion of the AR 190-51 directed security risk assessment. Such a facility may be equipped with an environmental control system, electric service, and both voice and data communication links.

s. Sidewalks. For programming purposes, sidewalks shall be 20% of the building footprint. However, the exact amount of sidewalk area will be determined at the preliminary design review based on an economical and practical site layout of the facilities.

t. Flagpole. Two ground-set flagpoles with illumination are authorized, unless the facility is collocated with a readiness center or another ARNG facility with flagpoles or is on a military installation that already has or will have flagpoles.

u. Exterior fire protection. Consideration will be given to the size of the structure, the type of construction, and the exposure to fire hazard that it creates for or receives from nearby buildings. Except in cases of conflict with State requirements, exterior fire protection should be in conformance with National Fire Protection Association requirements. Extension of water mains for fire protection is limited to that needed to ensure that an adequate number of fire hydrants can be located between 50 and 400 feet of any building. No more than 300 linear feet of pipe per water line required by code may be outside the project property line.

v. Detached facilities sign/static display. In addition to the authorized building-mounted facilities sign, a free-standing sign is authorized identifying the facility name and type, the State, and Army National Guard. Lighting to illuminate the sign continuously during hours of darkness may be provided. Provisions may also be made at this facility for a static display(s), including a concrete slab or mounting pedestal.

w. Outside security lighting. Security lighting of military vehicle/equipment storage and other outside area lighting should be in keeping with minimum needs for personnel safety and security and physical security. Lighting of fuel islands is authorized. A security lighting system that would permit ample lighting to conduct safe after hour training and one which is designed to illuminate continuously during the hours of darkness or equipped with sensors which when activated by movement within the designated area will cause the lights to illuminate is authorized. After discontinuance of movement within the designated area, the lights should remain lit for a time determined to be appropriate for the specific situation by the security manager. Vandal resistant lenses should be provided where appropriate. Wherever possible, lighting of area will be provided from building-mounted fixtures. Pole-mounted fixtures may be used to supplement the building-mounted fixtures and where building-mounted fixtures are inadequate.

x. Fuel storage and dispensing systems.

(1) An aircraft fuel storage and dispensing system is authorized in accordance with TM 5-803-7, with direct fuel truck access to the aircraft parking apron.

(2) The storage facilities will be built to nationally recognized environmental standards and in accordance with local ordinances.

(3) A 15 foot by 45 foot rigid concrete pad (to include containment if required) is authorized at the pump island for each type fuel. The project is authorized 250 square yards of rigid or flexible paving (in addition to the readiness center access road and military vehicle parking) for access to the fuel dispensing system.

(4) A roof type cover may be provided, if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area.

y. Aircraft wash area.

(1) One aircraft washing apron, category code 11370, is authorized at each aviation facility, to be constructed of rigid concrete according to TM 5-803-7. Maximum allowance is 118 feet by 74 feet (140 feet by 110 feet for CH-47s). A roof type cover may be provided if required by local code to prevent storm water from draining into the sanitary sewer system.

(2) An exterior wash rack may be enclosed by an unheated shed-type structure when the heating design temperature, as determined from the 97 1/2 percent column in TM 5-785, is minus (-) 10 degrees Fahrenheit or lower, or the annual snowfall exceeds 30 inches.

z. Utilities. All building utility service connections should be underground. The length of service for each utility is limited to the distance of the shortest run from the building to the property line adjacent to the public right-

of-way providing ingress and egress for the site plus up to an additional 300 linear feet for connection to the existing utility system. Direct-burial cable for telephone, data, and electric service connections are authorized. This includes conduit where the service connection(s) must pass under a paved area. Participation in on-site water well, sanitary treatment system, and liquid petroleum gas, fuel oil or other heating system storage tank, including piping, will be authorized if respective public services are not available and the separate systems are consistent with the requirements of the local approval authority and with applicable Federal, State, and local environmental laws and regulations. A water storage cistern along with a chlorination system may be authorized, if no municipal potable water is available. At facilities co-located with a readiness center, utility connections should feed from the readiness center utilities and have separate meters.

aa. Storm water retention ponds. The State may program up to 3 percent of the basic building cost for retention ponds as part of a storm water pollution prevention program, if the Army Environmental Programs Division (NGB-ARE) validates the requirement. These ponds may include bioretention capabilities if required by local codes and/or best management practices.

4-3. Special Aviation Items.

Supporting items or facilities that may be provided at aviation facilities, when individually justified, include the following:

a. Aircraft Rescue and Firefighting Facility (ARFF).

(1) One station capable of accommodating apparatus and personnel is authorized when justified as an exception to criteria. This functional area may be located in a separate building or included in the layout of the main building, but is to be readily accessible to the flight line and aircraft parking area.

(2) A basic allowance of 800 square feet net area is allowed for the associated administrative and storage functions. An additional allowance of 800 square feet net area is authorized for each type ARFF vehicle authorized.

b. Ground support equipment (GSE) storage/maintenance area.

(1) Unheated enclosed or shed-type storage is authorized for GSE. A basic allowance of 1200 square feet net area is allowed for 16 or less authorized aircraft. For more than 16 authorized aircraft, an allowance computed at 20 square feet per aircraft over 16 is authorized in addition to the basic allowance.

(2) A heated area of 320 square feet (within the total allowance) may be provided for maintenance of GSE when the heating design temperature at the site.

c. Open storage. Open storage may be provided on a basis of 150 square feet per aircraft authorized. The area may be of rigid concrete and provided with a roof cover and a security fence enclosure if required. An unheated enclosed structure is authorized if the average snowfall exceeds 30 inches.

d. Airfield lighting. Pavement marking lights for runways, taxiways, hoverlanes/taxilanes, and aircraft tiedown area will conform to requirements of TM 5-811-5 (except that, in cases of conflict with Federal Aviation Administration (FAA) guidance, the latter will govern where the facility is located at a commercial airfield).

e. Miscellaneous. Additional special aviation items must be justified on an individual basis as essential features, necessary for complete and safe operation of the aviation facility.

f. Special requirements for airfields. Runways, taxiways, aprons, navigational and approach aids, airfield lighting, and other related airfield requirements for aviation facilities non-collocated with active airfields will be coordinated with and approved by NGB-AVS prior to submission of programming documents. Refer to TM 5-803-7 for possible requirements.

4-4. Unheated Enclosed or Shed-Type Storage Space.

a. Federal support is authorized for enclosed or shed type storage of military aircraft authorized at an Army Aviation Support Facility (AASF). Refer to Table 4-5 for appropriate allowances. The number of military aircraft for which enclosed storage may be provided will not exceed allowances provided by the applicable TOE/TDA, less those located elsewhere and those aircraft used to determine main hangar floor sizing. Allowances in this paragraph are in addition to the allowances for aircraft parking as stated in paragraph 4-2j.

b. Federal support for enclosed or shed-type storage is authorized for wheeled vehicles and equipment.

c. Vehicle storage space will be unheated and will not exceed 66% of the normally authorized open-air military parking area. When enclosed or shed-type storage is provided, the amount of paved area (authorized for parking of military vehicles at the site) will be reduced by the area of the covered space. The remaining paved area is to be used for circulation and access to and from the covered/enclosed storage structure.

d. Vehicle doors at approximately 25 feet on centers are authorized at the rate of one for each 1800 square feet of floor area to provide for mass parking of vehicles without the need for internal circulation lanes.

- e. A 60 foot deep concrete apron is authorized the length of each side of the facility with vehicle entrances.

4-5. Security.

Aviation facilities are mandated to comply with the requirements of AR 190-51 and DA PAM 190-51 concerning the protection of aviation resources. Reference to these regulations is required to determine appropriate security measures.

Table 4-1
Space Allowances for Hangar Floor Area 1/

AIRCRAFT TYPE	HANGAR BAY FACTOR	HANGAR ENVELOPE (per authorized bay)		
		Length 2/	Width 2/	Allowance 3/
UV-18 4	.20	70	62	4,340
C-12, C-26	.20	70	62	4,340
C-23	.20	70	80	5,600
UC-35	1.00	70	62	4,300
OH-58 (4 Blades)	.40	70	41	2,870
UH-1, OH 58 (2 Blades)	.30	70	30	2,100
AH-1	.40	70	30	2,100
AH-64, UH-60	.40	70	60	4,200
CH-47	.40	105	66	6,930

NOTES:

1/ Hangar floor size in feet and square feet.

a. The hangar floor net area will be calculated by first multiplying the number of each type aircraft times the hangar factor (average of aircraft expected to be in the hangar for maintenance at a given time) for each aircraft type, rounded up to the next whole number. This will determine the required number of hangar envelopes for each type aircraft to be provided for within the hangar area. Actual square footage of the hangar will be based on logical layout of the aircraft envelopes with appropriate circulation.

b. The actual dimensions of the hangar floor will be based on the smallest rectangular area required to enclose the envelopes of the various type aircraft (with the envelopes arranged for movement of the aircraft in the same direction). In addition, the dimensions of the hangar floor will include a perimeter wall and door clearance of 5 feet from the aircraft envelopes. A single-line drawing of the floor plans will be drawn to scale on a DD Form 1391C and submitted with the programming documents.

2/ Hangar envelope dimensions include aircraft dimensions plus a minimum 5 foot working clearance and egress clearance required between aircraft. Envelope length for rotary wing aircraft (except CH-47) is based on UH-60 length plus 5-foot working clearance.

3/ Allowance in net square feet, exclusive of minor and exterior walls and perimeter circulation.

4/ Sizing is approximate only. Contact NGB-AVS for updated information.

Table 4-2
Space Allowances for Specialized Work Areas 1/

Functional Areas	Basic Allowance	OH-58	AH-1/64 UH-1/60	CH-47
1. Allied Shops				
a. Propeller/ Rotor <u>2/</u>	750	NA	NA	NA
b. Airframe /Welding /Structural <u>3/</u>	1650	NA	NA	NA
c. Paint <u>3/ 4/</u>	540	NA	NA	NA
d. Avionics/Instrument <u>5/</u>	600	NA	NA	NA
e. COMSEC Storage <u>6/</u>	140	NA	NA	NA
f. Pneudraulics <u>7/</u>	NA	200	300	300
g. Electrical <u>7/</u>	100	200	250	250
h. Engine Inspection/ Repair <u>7/</u>	600	NA	<u>8/</u>	<u>9/</u>
i. Battery Room (nickel-cadmium) <u>10/</u>	200	NA	NA	NA
j. Armament Subsystem <u>11/</u>	600	NA	NA	NA
k. Non-Destructive Inspection	200	NA	NA	NA
l. Component Cleaning Area	100	NA	NA	NA
m. Night Vision Device	200	NA	NA	NA
2. Special Tools Room <u>12/</u>	300	100	200	200
3. Repair Parts Room <u>12/</u>	400	100	200	200
4. Accessory Equipment				
TOE/TDA Storage <u>13/</u>	NA	20 <u>14/</u>	80	80
5. Arms Vault <u>15/</u>	300	NA	NA	NA
6. Bulk POL Storage <u>16/ 17/</u>	150	NA	NA	NA
7. Contractor Shop/Storage <u>18/</u>	NA	NA	NA	NA
8. Flammable/Combustible Storage	<u>16/</u>	NA	NA	NA
9. Controlled Waste Handling Facility	<u>19</u>	NA	NA	NA

NOTES:

1/ Allowances are in net square feet, exclusive of interior and exterior walls. The amount of the basic allowance is added to the amount for the type of aircraft supported at the facility. If there is more than one type of aircraft supported, sum the allowances for each type of aircraft authorized to be supported at the site.

2/ Room size (15 feet by 50 feet) is based upon largest rotor blade authorized. A 1000 pound electric hoist on a monorail with trolley assembly extending across the width of the room is authorized.

3/ Not Authorized for Limited Army Aviation Support Facility (LAASF).

4/ The paint room is authorized for component parts, not complete aircraft. A paint booth (approximately 3 foot by 5 foot with an opening for exhaust) is authorized to be installed in the paint room for painting of small parts.

5/ Basic allowance is for 1 to 30 aircraft. You are authorized 15 square feet for each additional aircraft between 31 and 70 and 10 square feet for each additional aircraft above 70 (up to a maximum of 2,450 square feet). The LAASF avionics/instrument shop and avionics float equipment is authorized a combined total of 300 square feet.

6/ Basic allowance is for 1 to 16 aircraft. You are authorized an additional allowance of 3 square feet per aircraft for each aircraft over 16. The LAASF avionics/instrument shop and avionics float equipment is authorized a combined total of 300 square feet.

7/ Requires a minimum of two aircraft for space to be authorized. The aircraft assigned to any LAASF are to be included in computing the allowance for the supporting AASF. A separate allowance for this space is not authorized at any LAASF.

8/ 150 square feet authorized for each increment of 16 aircraft authorized at the site.

9/ 200 square feet authorized for each increment of 7 aircraft authorized at the site.

10/ Aviation facilities will not be provided with a lead-acid battery room unless it is specifically requested and justified.

11/ Applies only if OH-58D, AH-1, or AH-64 type aircraft are authorized to be supported at the site.

12/ Actual allowance is the basic allowance plus the allowance for each aircraft type. Even though there is only one column for UH-1, UH-60, etc., each listed aircraft is considered a separate type. Office space may be partitioned off for tool and parts attendant(s). However, this office must come out of the existing allowance.

13/ Figure shown represents only the per authorized aircraft figure.

14/ Increase allowance to 40 square feet per aircraft for OH-58D only.

15/ Additional space will be authorized on an individual basis. A single-line drawing of the floor plan and wall elevations showing the proposed lay-out of the authorized weapons systems, without mounts, will be drawn to scale on DD Form 1391C and submitted with programming documents. An intrusion detection system is required. Proponent for approval is NGB-AVS.

16/ A detached prefabricated metal or masonry building of equivalent size may be used if this area is not incorporated into the facility. The allowance is 3% of total net area but no less than 100 square feet and no more than 600 square feet.

17/ Increase the allowance 5 square feet for each aircraft authorized to be supported at the site.

18/ Per contractor, when authorized contract maintenance. Size to be determined in coordination with NGB-AVS prior to submission of programming documents.

19/ Controlled Waste Handling Facility (CWHF).

a. A prefabricated metal or concrete masonry building with a concrete floor or building of equivalent or less cost of a size indicated below is authorized. The below size is gross area including intracirculation. Intercirculation space has to be justified as an exception to criteria.

<u>Barrels Stored</u>	<u>Building Size (SF)</u>
1-40	300
41 or greater	500

b. The building will be designed to allow wastes to be conveniently stored inside each cell in drums, metal boxes, or pallets, and easily loaded/unloaded using a forklift or manual means. Partitioning off of individual storage cells will be designed to provide secondary spill containment within each cell.

c. 150 square yards of rigid concrete access paving may be provided for access.

d. At its option the State may include this authorized space within the aviation facility or another adjacent facility.

Table 4-3
Space Allowances for Personnel Support Areas

Functional Areas	Allowance <u>1/</u>
1. Administrative Area	
a. Supervisory Aircraft Pilot	250
b. Secretary	200
c. Supervisory Instructor Pilot	200
d. Flight Instructor (Safety) <u>2/</u>	175
e. Flight Instructors (Aircraft) <u>2/</u>	175 each
f. Flight Operations Specialist <u>3/</u>	150
g. Flight Engineers (SI/FI)	175 each
h. Supervisory Maintenance Test Pilot	200
i. Aircraft Maintenance Supervisors	150 per person
j. Production Controller <u>3/</u>	150
k. Aircraft Automation Clerk/Clerk Typist	100
l. Supervisory Supply Technician	150
m. Maintenance Test Pilots	150 per person
n. Aircraft Inspectors	125 per person
o. Technical Publications <u>4/</u> (Includes Publications and Log Book Work Area)	400
p. Safety, Briefing and Examination Room <u>5/</u>	400
q. Flight Planning	600
r. Administrative Support Area	220
s. Common IT Space	<u>6/</u>
t. IT Support Activities	<u>7/</u>
u. Flight Surgeon Administration/Examination Area	200
2. Aviation Life Support Equipment (ALSE) Shop	
a. ALSE Administration Area	150
b. ALSE Maintenance Support	1000
c. ALSE Storage	<u>8/</u>
3. Locker Room (Men's and Women's) <u>9/</u>	400
4. Break/Assembly Area <u>10/</u>	400
5. Toilets/Showers <u>11/</u>	500
6. Operations <u>12/</u>	1400
7. Physical Fitness Area	13/
8. Simulation Training Area	
a. Learning Center <u>14/</u>	300
b. Audio/Visual Storage	100
c. Library/Classroom	400
d. Simulation Devices <u>15/</u>	240

NOTES:

1/ Allowance is in net square feet, exclusive of interior and exterior walls.

2/ Basic allowance is for full-time support personnel. An additional 150 square feet is authorized for every two TOE/TDA instructor pilot authorizations required to drill simultaneously.

3/ An additional 100 square feet is authorized for every authorized position over one.

4/ For each aircraft greater than 16 authorized to be supported at the site, an additional 10 square feet is authorized.

5/ You are authorized an additional 12 square feet per authorized crewmember greater than 20 for the authorized crewmember strength of the largest single aviation element supported. This allowance may be split into separate areas as required to accommodate the listed functions.

6/ Each common use terminal is authorized 30 square feet and each printer 10 square feet. A copy of the Information Management Plan authorizing equipment should be included with the initial submission of the programming documents (DD Forms 1390/1391). Desktop computers, typewriters, and other pieces of single user information technology equipment are not eligible for additional floor space because they are considered part of the work area for the individual position.

7/ Size to be determined by coordination with NGB-AIS prior to submission of programming documents.

8/ Space authorized for ALSE storage for the particular facility in question is computed using the guidelines below. However, this is a maximum authorization. Actual authorization must be established for each case based on anticipated usage (i.e., how many of each of these are items actually to be stored, inspected, and repaired at the facility in question).

a. Storage of Helmet, Vest and Gloves: 4 square feet per crewmember in addition to the 10 square feet per person authorized for a locker room for storage of personal flight gear.

b. Storage of individual life preservers: 8 square feet for every 8 individuals (crew members and passengers) who can be accommodated on board the authorized aircraft. Storage should be in conventional wall lockers at least 5 feet high.

c. Storage of Individual Overwater Survival Kits: 8 square feet for every 8 individuals (crew members and passengers) who can be accommodated on board the authorized aircraft at a location where flight of 30 minutes or more over water might be required. This is generally applicable to facilities located along the East, West and Gulf Coasts, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. Storage should be in conventional wall lockers at least 5 feet high.

d. Storage of Individual Hot Climate Survival Kits: 8 square feet for every 8 individuals (crew members and passengers) who can be accommodated on board the authorized aircraft at locations in the southwestern U.S., Hawaii, Puerto Rico, and the Virgin Islands. Storage should be in conventional wall lockers at least 5 feet high.

e. Storage of Individual Cold Climate Survival Kits: 8 square feet for every 8 individuals (crew members and passengers) who can be accommodated on board the authorized aircraft at locations in Alaska and the northern tier of States. Storage should be in conventional wall lockers at least 5 feet high.

f. Storage of 7-Man Life Rafts: To be determined on an individual basis, depending on the equipment actually on hand for utility and cargo aircraft assigned to facilities along the East, West, and Gulf Coasts, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. Four cubic feet of storage volume is required for each raft.

g. Storage of Group Survival Kits: To be determined on an individual basis depending on the equipment actually on hand at a given site.

9/ Aviation facility locker space is above and beyond readiness center locker space. In addition to the basic allowance in the table, you are authorized 12 square feet per individual based on the sum of the total authorized number of crew members and authorized full-time support personnel who are not crew members. This allowance is

to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

10/ An additional 20 square feet per person is authorized for 9 to 20 full-time support personnel, an additional 12 square feet per person is authorized for 21 to 40 full-time support personnel, and an additional 8 square feet per person is authorized for full-time support personnel exceeding 40.

11/ In addition to the basic allowance, you are authorized 10 square feet per person for whichever is greater: the largest contingent of authorized crew members training simultaneously, or the sum of the authorized full-time support and contract personnel. This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

12/ Allowance is based on 8 or more authorized aircraft. Decrease allowance to 800 square feet when fewer than 7 aircraft are authorized.

13/ An additional net area of 600 square feet is authorized for physical fitness equipment when there are 5 or more approved full-time technicians authorized on the TDA. For each additional approved full-time technician, the allowance increases 30 square feet to a maximum of 1,650 square feet. This allowance may be applied within the aviation facility or added to an existing physical fitness facility on the installation.

14/ Basic allowance is for up to 50 crew members. An additional allowance of 4 square feet for each crew member above 50 is authorized.

15/ An additional 80 square feet is authorized for each authorized training device over 2.

Table 4-4. Aviation Space Allowances for Fixed Wing Facilities

Functional Area	Basic Allowance ^{1/}
1. Hangar Floor ^{2/}	5950
2. Contractor Shop/Storage ^{3/}	800
3. Common IT Space	<u>4/</u>
4. IT Support Activities	<u>5/</u>
5. Aircraft Pilot/COR ^{6/}	175
6. Aircraft Pilot ^{7/}	150
7. Flight Operations Specialist	200
8. Passenger Waiting Area ^{8/}	400
9. Break/Assy Area	<u>9/</u>
10. ALSE Storage	<u>10/</u>
11. Locker Room ^{11/}	200
12. Toilets/Showers ^{12/}	250

NOTES:

^{1/} Allowances are in net square feet, exclusive of interior and exterior walls.

^{2/} Actual square footage will be layout specific. However, minimum allowance is based on a maintenance area of 60' by 75' plus a 5' safety clearance area between the aircraft and walls. This allowance is only for a single aircraft. If you desire space for multiple aircraft, you must coordinate with NGB-AVS in advance of submitting your programming documents.

^{3/} Per contractor, when authorized contract maintenance. Locations with multiple aircraft of the same type will be authorized 125 square feet per each additional authorized aircraft over 1.

^{4/} Each common use terminal is authorized 30 square feet and each printer 10 square feet. A copy of the Information Management Plan authorizing equipment should be included with the initial submission of the programming documents (DD Forms 1390/1391). Desktop computers, typewriters, and other pieces of single user information technology equipment are not eligible for additional floor space because they are considered part of the work area for the individual position.

^{5/} Size to be determined by coordination with state DOIM and NGB-AIS prior to submission of programming documents.

^{6/} Contracting Officer's Representative (COR) for aircraft maintenance contractor.

^{7/} Per each authorized full-time support personnel position for the facility.

8/ Authorized for stand alone operational aircraft facilities only; space for other aviation facilities shall be derived from authorized circulation space.

9/ 20 square feet per authorized full-time support and contract personnel position, but not less than 200 square feet.

10/ Refer to ALSE Storage, Table 4-3, Note 8, for space allowance.

11/ In addition to the basic allowance in the table, you are authorized 12 square feet per individual based on the sum of the total authorized number of crew members and authorized full-time support personnel who are not crew members. This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

12/ In addition to the basic allowance, you are authorized 10 square feet per person for whichever is greater: the largest contingent of authorized crew members training simultaneously, or the sum of the authorized full-time support and contract personnel. This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

Table 4-5. Unheated Aircraft Storage Allowances

Type Aircraft	Length	Width	Allowance
UV-18	59	69	4071
C-12D/F/R	50	58	2900
C-12J	64	58	3712
C-23	64	78	4992
C-26	66	60	3960
OH-58	47	11	517
OH-58D	43	28	1204
UH-1	63	13	819
AH-1	63	13	819
AH-64	57	37	2109
UH-60	63	41	2583
CH-47	105	55	5775

NOTES: Allowances are net and exclude all walls. In addition, the above dimensions include six feet additional length and three feet additional width, which provide for handling safety clearance zones of three feet between each individual aircraft and hangar walls and doors.

Table 4-6. Facility Support Space Allowances

Facility Maintenance and Storage	3% of the Total Net Area
Mechanical/Electrical Room <u>1/</u>	5% of the Total Net Area
Telecommunications/Information Technology <u>1/</u>	1% of the Total Net Area

Note:

1/ Mechanical/Electrical and Telecommunications/Information Technology rooms may be increased or decreased based on actual design requirements. Mechanical space includes pipe and duct shafts and perimeter heating units. Additional mechanical equipment space is authorized for multiple story facilities to accommodate vertical duct requirements. This space is understood to include space for computerized controls and equipment for all facility related systems. The percentage indicated is intended as a planning guide. Final determination will be approved during the design review process.

Table 4-7. Circulation

Interfunctional Circulation <u>1/</u>	15 percent (22 percent for multiple-story facilities) of the total net floor area (excluding unheated unit storage, unless it is incorporated within the readiness center)
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Note:

1/ This includes corridors, staircases, entrances, and a lobby. This percentage is a planning figure, and final determination will be approved during the design review process based upon what is required for a well planned functional layout.

Table 4-8. Walls

Walls <u>1/</u>	10 percent of total net floor area, including circulation
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Note:

1/ The total floor area may be increased by 10 percent to provide for interior and exterior walls and partitions. The 10 percent figure is intended as a planning guide. Final determination will be approved during the design review process.

**Chapter 5
Training Center Facilities**

5-1. General

a. General

b. Standards. This chapter establishes the space allowances at ARNG training centers, exclusive of space associated with educational facilities. Allowances are based on NGB-ART’s classification of the training center, which may be one of the following.

(1) Local Training Areas (LTA). LTAs support individual and unit training at or near home station. No full-time support or cantonment facilities are authorized. This means that at most NGB-ARI would support the construction of small arms ranges by special exception. For construction standards see para 5-4 below. Please note that except for para 5-4, the allowances and standards of this chapter do not apply to LTAs, but only to the five types of training centers.

(2) Local Training Centers (LTC). LTCs support individual and unit training at or near home station, and make the maximum use of training aids, devices and simulations systems (TADSS). Full-time support and minimal cantonment facilities are authorized. Construction will generally be limited to the requirements to support two companies simultaneously.

(3) Intermediate Training Center (ITC). ITCs are designed to support individual and collective training from

squad through company level. Full-time support and limited cantonment facilities are authorized. ITCs will include limited small arms ranges and maneuver space. Training facilities are focused on individual through platoon weapons proficiency and company Army Training and Evaluation Program (ARTEP) maneuver. Construction will generally be limited to the requirements to support three companies simultaneously.

(4) Collective Training Center (CTC). CTCs are designed to support individual and collective training up to battalion level. Full-time support and cantonment facilities are authorized. CTCs include small arms ranges and maneuver areas for company force on force training. Construction will generally be limited to the requirements to support one battalion or equivalent simultaneously.

(5) Maneuver Training Center-Light (MTC-L). A maneuver training center designed to support individual and collective training for battalion and higher units. Full-time support and cantonment facilities are authorized. MTC-Ls will include ranges and cantonment facilities, and must have sufficient maneuver area to support using units. An MTC-L has sufficient ranges and training land to support collective live fire proficiency, combined arms live fire exercises and annual battalion training evaluations. Construction will generally be limited to the requirements to support two brigades simultaneously.

(6) Maneuver Training Center-Heavy (MTC-H). A maneuver training center which focuses on multiple battalions and above task force level training, using a combination of live fire ranges and maneuver training land. An MTC-H must have sufficient land to doctrinally accommodate fire and maneuver training using multiple scenarios over varied terrain. Full-time support and cantonment facilities are authorized. The MTC-H includes ranges and cantonment facilities, and must have sufficient land for combined arms maneuver. Construction will generally be limited to the requirements to support a division equivalent simultaneously.

c. Space allowances.

(1) Training center facility space allowances are based on the classification of the center as verified and set by NGB-ART. The classification drives the number and mix of facilities, which in and of themselves are of standard size. A project may consolidate some or all of these facilities into a single complex.

(2) Prior to submittal of DD Forms 1390/91 for a training center project, States should contact NGB-ART to validate the current classification of the training center, any requested ranges, and any requested deviations from the standard training center package. All such deviations must be processed as exceptions to criteria.

(3) Refer to Table 5-1 for the mix of facilities.

(4) Refer to Table 5-2 for the authorized size by type facility.

(5) Refer to Table 5-3 for space allowances for troop medical clinics.

(6) Refer to Table 5-4 for billeting allowances.

(7) Table 5-5 provides allowances for range support elements. The ranges themselves are governed by Department of the Army criteria.

(8) Table 5-6 provides facility support space allowances.

(9) Table 5-7 provides the allowance for circulation.

(10) Table 5-8 provides the allowance for walls.

(11) All other space requirements not specifically indicated in the referenced tables will be treated as exceptions to criteria. The State must fully justify these and the NGB proponent must concur with them before NGB-ARI approves their inclusion in the programming documents and the final design of the project.

5-2. Common Supporting Items

In planning the functional arrangement of facilities, the State will give appropriate consideration to the existing site conditions, layout, and materials of construction in order to achieve maximum operating efficiency, cost effectiveness, and flexibility. The following exterior items are authorized Federal reimbursement for training center projects:

a. Site preparation. The work of clearing, grubbing, stripping, and stockpiling topsoil, excavating embankment, and rough grading required to develop the project site to subgrade levels and elevations for proper siting and drainage of facilities (including culverts, head walls, retaining walls, etc.). The State must use its own funds for the special handling/remediation/disposal of contaminated soil excavated from a non-Federal owned or leased project site.

(1) Rock excavation and/or correction of unsatisfactory soil conditions is authorized only if the State has submitted adequate supporting documentation such as an economic or master planning analysis that demonstrates that the positive impacts on readiness strongly outweigh the increased construction costs.

(2) Culverts, retaining walls (installed in lieu of sloping the ground to achieve grade differentials), drainage systems, or other similar construction required for controlling surface water runoff will be approved on an individual

site basis if the State justifies these items. The State, however, must consider the cost of these items during the site selection process.

b. Fine grading and seeding.

(1) The State may program for fine grading and seeding to provide proper site drainage and control of erosion on those parts of the project site where the previously existing surface cover has been destroyed or buried beneath redistributed soil.

(2) Sodding or sprigging is authorized for critical areas subject to erosion.

(3) Importing topsoil is authorized if the natural topsoil on the site, stockpiled at the beginning of construction, is inadequate to provide a finished depth of approximately 4 inches.

c. Landscaping. This will be included as an integral part of the planning of the project to produce an aesthetically pleasing final site.

(1) The State may program up to 3 percent of the basic building cost for planting trees, shrubs, and vines (exclusive of grading and seeding or sprigging and sodding for erosion control). In those locations that are considered to have an arid climate, the State may program up to 4 percent of the basic building cost and may use xeriscaping.

(2) Additional planting for energy conserving landscaping may be authorized if the State justifies it on a life cycle cost basis.

(3) An installed watering system is authorized.

d. Military vehicle parking. Parking is authorized for 100 percent of all vehicles, trailers, and other wheeled/towed equipment documented on training center TDA and the additional amount authorized in Table 5-2.

(1) Rigid concrete is authorized for paving those areas designated for the parking of military vehicles, including General Service Administration (GSA) vehicles. For programming purposes the concrete will be 8 inches in depth.

(2) The total area exclusive of access roads will not exceed 50 square yards for each wheeled vehicle, trailer, and other wheeled/towed equipment, 75 square yards for each tracked vehicle and equipment over 30 feet long, 175 square yards for each fuel truck and M977 series HEMTT, and 275 square yards for each HEMTT PLS and HET vehicle.

(3) For other unique equipment that must be stored within the military vehicle parking area, such as skid-mounted generators and snowmobiles, the State may program an appropriate amount of space and enclose justification for its request.

(4) The parking area is to be based on an economical layout of the parking spaces and circulation lanes. Actual design will be determined by structural calculations. Federal funding support is generally limited to pavement in accordance with NGB DG 415-4.

e. Fuel truck containment area. A 15 foot by 30 foot rigid concrete pad is authorized for each fuel truck. Also, a rigid concrete containment area is authorized for each fuel truck or trailer which stores Petroleum Oil Lubricants (POL) on board. In accordance with applicable environmental, safety and fire protection regulations, each containment area is to be sized so that it is capable of capturing and retaining 100% of the POL volume stored on the truck(s) parked within that area. A roof type cover may be provided, if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area.

f. Military vehicle loading ramps. Military vehicle loading ramps may be constructed to assist in loading and off-loading military vehicles (wheel and track) from equipment transporters that do not have loading ramps as an integral part of the trailer. A multi-level loading ramp not to exceed a footprint of 160 square yards is authorized.

g. Parking pad for mobile conduct of fire trainer (MCOFT) and similar simulators. Federal support is authorized for a 60 foot square rigid concrete parking pad, with electrical power and telephone service, at each NGB approved site authorized an MCOFT or similar simulation device.

h. Turn pads. If the State justifies them, rigid concrete turn pads are authorized where frequent turning of tracked vehicles is required on flexible pavement. Pads should be 30 feet square.

i. Service and access aprons. 150 square yards of rigid concrete paving each may be provided for access to the dumpster area, the controlled waste handling facility, and any other facility requiring outside access by forklifts or large, heavy vehicles. In addition, a rigid concrete access area of 250 square yards may be provided for access to the military vehicle loading ramp.

j. Privately owned vehicle (POV) parking. The allowance is 35 square yards times the sum of the full-time staff (including permanently assigned Federally reimbursed State employees) and 25 percent of the billeting capacity of the training center. This includes an allowance for circulation lanes within the parking area but excludes any

required access roads. For programming purposes, flexible pavement will consist of 6 inches of bituminous material placed over an installed, appropriate aggregate base. Rigid concrete or flexible pavement curbs may be installed along pavement edges to comply with the site’s approved storm water management plan or to preclude soil erosion.

k. Visitor/ customer parking. Visitor parking spaces are authorized as indicated below based on the number of required full time employees (including permanently assigned Federally reimbursed State employees). The allowance is 35 square yards a space, which includes circulation lanes but excludes required access roads, except that 60 square yards is authorized for one handicapped parking space. (A second handicapped parking space is authorized if there are more than 50 non-handicapped parking spaces.) Pavement will be constructed in accordance with NGB DG 415-4. Rigid concrete or flexible pavement curbs may be installed around pavement edges if required to control storm water per the site’s approved storm water management plan.

<u>Employees</u>	<u>Parking Spaces</u>
5-15	4
16-25	7
26 and over	9 (and one additional parking space for every 10 employees or major fraction thereof over 26)

l. Roads. Allowance for roads will be as indicated on the approved State Real Property Development Plan and as indicated below.

(1) Cantonment area. Main roads will be 24 feet wide. Construction will be flexible pavement.

(2) Tank trails. Main tank trails will be 30 feet wide, secondary tank trails will be 20 feet wide. Construction may be stabilized hardstand.

(3) Other roads. Flexible pavement surface on other roads will be justified on an individual basis.

(4) NGB-ARI will determine the exact amount and type of pavement at the preliminary design review based on an economical and practical site facility layout.

m. Curbs. Rigid or flexible pavement curbs may be installed along the edges of the roads and parking areas to comply with code, to control traffic, or to control storm water per the site’s approved storm water management plan.

n. Security fencing. A security-type fence consisting of a 6 foot high chain-link-type metal fabric, with a 12 inch high anti-climber, will enclose the military vehicle parking, service and access areas, ancillary facilities, and other critical facilities, if the State Anti-Terrorism/Force Protection Officer validates a security requirement for such protection. Fencing will include vehicle and personnel gates, which may be electronically controlled. The fencing may be located approximately ten feet from the edge of the parking pavement; and the area between the edge of pavement and the fence may be seeded with grass, or a well-designed non vegetative cover (not to exceed four inches of rigid pavement) may be substituted.

o. Site Anti-Terrorism/Force Protection Measures. A separate fence, wall, passive vehicle barrier, landform, or line of vegetation will be applied along the exterior perimeter of the site to create a protective standoff and obscure vision, hinder personnel access, and hinder or prevent unauthorized vehicle access. In addition, a guard house/access control facility not to exceed 550 square feet is authorized when determined to be appropriate following completion of the AR 190-51 directed security risk assessment. Such a facility may be equipped with an environmental control system, electric service, and both voice and data communication links.

p. Sidewalks. For programming purposes, sidewalks shall be 20% of the building footprint. However, the exact amount of sidewalk area will be determined at the preliminary design review based on an economical and practical site layout of the facilities.

q. Flagpole(s). The training center is authorized two ground-set flagpoles with illumination.

r. Exterior fire protection. Consideration will be given to the size of the structure, the type of construction, and the exposure to fire hazard that it creates for or receives from nearby buildings. Except in cases of conflict with State requirements, exterior fire protection should be in conformance with National Fire Protection Association requirements. Extension of water mains for fire protection is limited to that needed to ensure that an adequate number of fire hydrants can be located between 50 and 400 feet of any building. No more than 300 linear feet of pipe per water line required by code may be outside the project property line.

s. Detached facilities sign/static display. In addition to the authorized building-mounted facilities sign, a free-standing sign is authorized identifying the name of the training center, the State, and Army National Guard. Lighting to illuminate the sign continuously during hours of darkness may be provided. Provisions may also be made at this facility for a static display(s), including a concrete slab or mounting pedestal.

t. Outside security lighting. A security lighting system that would permit ample lighting to conduct safe after hours training and one which is designed to illuminate continuously during the hours of darkness or equipped with sensors which when activated by movement within the designated area will cause the lights to illuminate is authorized. After discontinuance of movement within the designated area, the lights should remain lit for a time determined to be appropriate for the specific situation by the security manager. Vandal resistant lenses should be provided where appropriate. Wherever possible, lighting of area will be provided from building-mounted fixtures. Pole-mounted fixtures may be used to supplement the building-mounted fixtures and where building-mounted fixtures are inadequate.

u. Fuel storage and dispensing systems.

(1) Fuel storage and dispensing systems are authorized at an amount not to exceed a 15 day supply based on the largest 15 day requirement during the training year.

(2) The storage facilities will be built to nationally recognized environmental standards and in accordance with local ordinances.

(3) A 15 foot by 45 foot rigid concrete pad (to include containment if required) is authorized at the pump island for each type fuel. The project is authorized 250 square yards of rigid or flexible paving (in addition to the readiness center access road and military vehicle parking) for access to the fuel dispensing system.

v. Vehicle wash platforms.

(1) The number of wash platforms authorized at a training center is in addition to those authorized for a MATES or UTES located on the installation but does include any wash platforms at other DoD component facilities on the installation that are available for ARNG use.

(2) The total number of wash platforms will be based on the average number and types of motor vehicles programmed by NGB-ART to use the site annually based on customary training relationships.

(3) Each wash platform is authorized 115 square yards of rigid pavement and will be provided with two yard hydrants (or hose bibbs) for connection of hoses.

(4) The number of hydrants or hose bibbs should be calculated as the larger of the number required to provide a 2.5-hour wash time for the average number of vehicles used for a weekend training period, or the number required to provide a 16-hour wash time for the average number of vehicles used for an annual training period. The following wash times will be used to calculate the total number of hydrants/bibbs required. This figure must then be divided by 2 to determine the number of authorized wash platforms:

Trucks 1 1/2 ton and less	15 min.
Trucks 2 1/2 ton and greater, materials handling equip, carriers, self-propelled guns and howitzers, and most engineer equipment.	30 min.
Tanks, launchers, Armored Vehicle Launched Bridge (AVLB), and combat engineer vehicles, engineer cranes (10 ton or more), recovery vehicles, etc.	45 min.

(5) Other environmental features required by Federal, State and local codes will be included. Central birdbath wash facilities must be justified on a case-by-case basis.

(6) Water supply must be sufficient to provide a flow of 40 gpm at 40 psi at each hose bibb.

(7) An exterior wash rack may be enclosed by an unheated shed-type structure when the heating design temperature, as determined from the 97 1/2 percent column in TM 5-785, is minus (-) 10 degrees Fahrenheit or lower, or the annual snowfall exceeds 30 inches.

w. Utilities. Utility service runs will be based on an economical layout of the requirements for the installation. All building utility service connections should be underground. The length of service for each utility is limited to the distance of the shortest run from the building to the property line adjacent to the public right-of-way providing ingress and egress for the site plus up to an additional 300 linear feet for connection to the existing utility system. Direct-burial cable for telephone, data, and electric service connections are authorized. This includes conduit where the service connection(s) must pass under a paved area. Participation in on-site water well, sanitary treatment

system, and liquid petroleum gas, fuel oil or other heating system storage tank, including piping, will be authorized if respective public services are not available and the separate systems are consistent with the requirements of the local approval authority and with applicable Federal, State, and local environmental laws and regulations. A water storage cistern along with a chlorination system may be authorized, if no municipal potable water is available.

x. Storm water retention ponds. The State may program up to 3 percent of the basic building cost for retention ponds as part of a storm water pollution prevention program, if the Army Environmental Programs Division (NGB-ARE) validates the requirement. These ponds may include bioretention capabilities if required by local codes and/or best management practices.

5-3. Special Training Center Facilities

a. Aviation facilities.

(1) A helipad (rigid concrete and unlighted according to TM 5-803-7) is authorized at training sites that are used more than 30 days per year by a major aviation unit.

(2) Tiedown pad layout and dimensions of aircraft parking and maneuver area will be according to TM 5-803-7. Parking facilities will be rigid concrete. Pads will be authorized when justified by usage for a minimum of 30 days per year or two Annual Training cycles can be substantiated. Unlighted reflective hoverlane markers are authorized in conjunction with the pads.

(3) An aircraft maintenance area may be provided in conjunction with the tiedown pads. It shall be rigid paving, 75 feet by 75 feet.

(4) Hardstand for vehicular access to the maintenance area and for maneuvering of refueling and service vehicles may be provided in conjunction with the tiedown pads/maintenance area. A 15 foot by 45 foot covered curbed rigid concrete pad is authorized for parking of each refueling vehicle.

(5) For each established aerial gunnery range four firing/harmonization points are authorized. They shall be rigid paving, 40 feet by 40 feet.

(6) For each established aerial gunnery range two rearming/refueling points are authorized. They shall be rigid paving, 75 feet by 75 feet. A hardstand service road may be provided for access by ammunition and fuel trucks.

(7) A grounding connection should be provided at each refueling pad.

b. Ammunition storage. An ammunition storage area is authorized at training sites, when justified and approved by the Department of Defense Explosive Safety Board (DDESB).

(1) Ammunition storage projects and projects close to those type facilities will not receive approval to go beyond conceptual design until the Construction and Facilities Management Officer (CFMO) gets DDESB approval of the preliminary site plan. Such plan must be prepared to comply with the AR 385-64, TM 9-1300-206, USATCESP 385-02, "Site and General Construction Plan Developer's Guide," and other appropriate documents.

(2) Storage will be according to AR 385-64, TM 9-1300-206, and other appropriate publications of the Department of the Army. Army Corps of Engineers (ACOE) Standard Drawings 33-15-65 and 421-80-01 should be used as the standard design for earth covered steel arch magazines; if the size and/or number of magazines to be constructed simultaneously at one location is substantial, the possible use of a poured concrete arch or box design (ACOE Standard Drawing 33-15-74 or 422-15-01) should be investigated for cost effectiveness. A limited or small quantity of ammunition may be stored in an above ground concrete block structure if approved by the Defense Explosive Safety Board.

(3) Besides meeting all safety and structural requirements, ammunition storage projects should include fencing, security lighting and intrusion detection systems.

(4) A covered loading dock fitted with a dock leveler is authorized. The dock should be of sufficient length to provide space for a minimum of three trucks loading/off-loading ammunition simultaneously and should be a minimum of 15 feet in width to provide required space for forklift operations while loading/off-loading supplies. The dock should have an access ramp 10 feet wide to provide forklift and customer/visitor access.

c. Ranges. Ranges are authorized at training sites when validated and approved by NGB-ART, provided that NGB-AVS validates the surface danger zone (SDZ).

(1) NGB DG 415-4 should be used to determine the recommended types of materials and other design and construction criteria to aid in estimating the cost of a complete range.

(2) The supporting facilities selected for a range will be based on the type/size of range authorized and the space allowance will normally be limited to those in Table 5-5. These allowances are gross area, including walls and circulation.

(3) Allowances are for ranges such as 16-lane Modified Record Fire Ranges, Known Distance (KD) Ranges, 15-lane Combat Pistol Qualification Courses and other ranges with comparable usage rates. Ranges that have lower

usage rates should have the support facilities scaled down or eliminated so that only those facilities necessary to render a complete and usable range are included in the project.

d. Other supporting/ancillary facilities. Supporting or ancillary facilities for training centers such as airfields, warehouses, offices, etc., may be authorized if adequately justified on an individual basis. These facilities will be justified for each training center based on demonstrable need at the installation in question and the troop occupancy for Annual Training (AT) and Inactive Duty Training (IDT).

5-4. Local Training Areas

- a. General. Facilities may be of a type consistent with training in a field environment.
- b. Field kitchens. Construction of field kitchens shall consist of a concrete floor and lightweight wood or metal roof structure, with 4 foot high siding and screens above. Wood shutters may be provided to cover the screens.
- c. Mess shelter. Construction of mess shelters will consist of a concrete floor and lightweight wood or metal roof structure. Screening or siding may be authorized if justified.
- d. Latrines. Latrines will consist of a concrete floor, lightweight wood or metal roof structure and wood, metal, or concrete block walls. Ventilation openings will be screened and shuttered. No windows are authorized. Unless an existing sanitary system is available at the site, concrete holding tanks/pits will be provided in accordance with applicable Federal, State, and local environmental laws and regulations.
- e. Vehicle wash platform. A wash platform may be authorized, if justified.

Table 5-1. Type and Number of Cantonment Facilities

Facility	LTC	ITC	CTC	MTC-L	MTC-H
1. Billets <u>1/</u>	380 spaces	570 spaces	1,000 spaces	10,000 spaces	15,000 spaces
2. Dining Facility	2 200 person	3 200 person	3 200 person 1 400 person	<u>2/</u>	<u>2/</u>
3. Div. Headquarters	NA	NA	NA	NA	1
4. Bde. Headquarters	NA	NA	NA	2	6
5. Bn Headquarters	NA	NA	1	12	36
6. Co. Supply/Admin.	2	3	6 <u>3/</u>	72 <u>3/</u>	216 <u>3/</u>
7. TC Headquarters	NA	<u>4/</u>	<u>4/</u>	<u>4/</u>	<u>4/</u>
8. Physical Fitness Area	NA	NA	NA	1	1
9. Bn Sup/Rat Breakdown	NA	NA	1	12	36
10. Cleaning/Maint Bldg <u>5/</u>	760 sq. ft.	1,140 sq. ft.	3,000 sq. ft.	30,000 sq. ft.	45,000 sq. ft.
11. Battalion Maint Shelter	NA	NA	1	12	36
12. Troop Medical Clinic	NA	NA	1	1	1
13. Troop Issue Subsistence Activity (TISA)	NA	NA	<u>6/</u>	<u>6/</u>	<u>6/</u>
14. Vending Machine/ Public Telephone Shelter	NA	NA	1	12	36
15. Training Device/ Simulation Center	<u>7/</u>	<u>7/</u>	<u>7/</u>	<u>7/</u>	<u>7/</u>
16. Distance Learning Center	<u>8/</u>	<u>8/</u>	<u>8/</u>	<u>8/</u>	<u>8/</u>

NOTES:

1/ States will have to justify their allocation of spaces among barracks and BOQs/BEQs based on makeup of units with a customary training relationship with the training center.

2/ Dining hall allowance equals billeting spaces authorized. Up to one-half of the allowance may be company-sized mess halls; the remainder should be served by 400 or 800 person sized dining facilities.

3/ Plus one building per battalion for a support element headquarters. For unheated storage, detached buildings may be used, or an equivalent area may be incorporated within the facility.

4/ Net floor area is 2000 square feet plus 100 square feet per authorized full-time employee, including assigned Federally reimbursed State employees. This allowance includes storage for the facilities engineering operation and other training center staff elements. The allowance also includes latrines, which are to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

5/ This allowance is for buildings in which units clean and maintain weapons and basic initial issue equipment. For MTC-Ls and MTC-Hs, there shall normally be one per authorized battalion headquarters. For ITCs, and LTCs, there shall normally be one per authorized company supply/admin building. For CTCs, the State may choose between one consolidated building or one per authorized company supply/admin building.

6/ A TISA is only authorized at locations where commercial supplies are not available within a reasonable distance. Prior to submitting DD Forms 1390/91 programming documentation for the establishment and construction of a TISA States should contact Army Logistics Division (NGB-ARL) to determine if a facility is authorized and to obtain guidance on justification and space allowances. Any requested TISA will be considered an exception to criteria.

7/ Space is authorized if validated and approved by NGB-ART.

8/ Space is authorized if validated and approved by NGB-RCS-DTTP. This space is in addition to any classroom space otherwise authorized.

Table 5-2. Training Center Facility and Parking Space Allowances

Standard Facility <u>1/</u>	Net Square Feet	Admin. Vehicles Parking (sq yd)
1. Division Headquarters	3,150	900
2. Brigade Headquarters	3,150	600
3. Battalion Headquarters	3,150	400
4. Battalion Supply/Ration Breakdown	2,200	400
5. Company Supply and Administration	1,450	200
6. Dining Facilities		
a. 200 Person	4,100	200
b. 400 Person	10,700	300
c. 800 Person	14,900	400
7. Troop Medical Clinic	<u>2/</u>	500
8. Battalion Maintenance Shelter <u>3/</u>	2,000	
9. Vending Machine/Public Telephone Shelter	200	
10. Physical Fitness Area <u>4/</u>	2,050	400
11. Motor Pool (per battalion size element) <u>5/</u>		8,000
12. Ranges		
a. Admin/Basic		150
b. Wheeled Vehicles		No. firing lanes x 50 divided by 2
c. Tracked Vehicles		Estimated number of tracked vehic- les to be on range times 75

NOTES:

1/ Allowance is per facility/area as authorized in Table 5-1.

2/ The Troop Medical Clinic will provide a scope of care designated by Health Services Command to eligible military personnel. Sizing will be based on Table 5-3.

3/ The shelter should be an open-shed type enclosed on three sides with 6-inch rigid concrete floor and up to 400 square feet may be enclosed for an office and latrine. The shelter may be enclosed on four sides and heated if located geographically where the outside design temperature is 15 degrees Fahrenheit dry bulb or less designated in the 97 1/2% column in TM 5-785 or the annual snowfall exceeds 30-inches as designated in TM 5-785; and, the shelter is required to be used for winter annual training/IDT. Construction of open-shed type space is authorized, but must be deducted from the authorization for battalion headquarters space at the rate of 1 square feet for every 2 square feet of shelter.

4/ An additional 22 square feet per TDA full time position is authorized for shower/locker/latrine space. 450 square feet of the basic allowance is also for this purpose. This portion of the allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage. If there are readiness centers, educational facilities, logistics facilities, and aviation facilities located on the training center, they are not authorized a separate physical fitness area. Instead, the TDA full-time authorizations for all activities on the training center should be combined and multiplied by 22 to get the additional allowance for shower/locker/latrine space.

5/ Where more than one motor pool is to be constructed, they should be contiguous to accommodate varying sizes of battalions. This area may be fenced.

Table 5-3. Troop Medical Clinics - Space Allowances in Net Square Feet

	MTC -L	MTC-H
1. Functional Areas <u>1/</u>		
a. Overnight Holding Area w/toilet (Male) <u>2/</u>	785	990
b. Overnight Holding Area w/toilet (Female) <u>2/</u>	295	590
c. Tub Room	100	100
d. Isolation Room w/ toilet <u>2/</u>	400	400
e. Nurse's Station	100	100
f. X-Ray Room	180	180
g. Darkroom	80	80
h. Emergency Treatment Room	300	300
i. Pharmacy (Requires Intrusion Detection System)	100	100
j. Laboratory	100	100
k. Medical Examination Rooms (100 square feet each)	400	400
l. Doctor's Offices (65 square feet each)	130	195
m. EKG Room <u>3/</u>	130	130
n. Dental Exam Room (115 square feet each, one shielded for X-Ray)	230	230
o. Administration	170	170
p. Waiting Room/Reception Area	260	325
q. Admin/Charge of Quarters	150	200
r. Medical Supply Room	150	150
s. Soiled Utility Room (Linen/Misc. Storage)	120	120
t. Toilet, Male	60	80
u. Toilet, Female	60	80
v. Medical Evacuation (MEDEVAC) Ready Room <u>4/</u>	240 <u>5/</u>	240 <u>5/</u>
w. Panorex Room (Mobilization Stations only)	36	36
x. Audiometric Room	90	90
y. Initial Screen/Vital Signs Room	60	120
z. Janitorial Storage	<u>50</u>	<u>60</u>
2. Total Net Square Feet	4,776	5,556

NOTES:

1/ Request room layout and facility spatial relationships from NGB-ARS and refer to NGB DG 415-4 during design.

2/ Authorized only if overnight patient observation capability is approved by NGB-ARS. Submit letter of justification to NGB-ARS. Include request and approval letter as attachment to programming document for construction funds, if required.

3/ Electrocardiogram (EKG) in Exam Room.

4/ Authorized only if MEDEVAC capability is to be located on the training site with crew stationed in the Troop Medical Clinic. Requires approval by NGB-ARS. Submit MEDEVAC concept plan to NGB-ARS.

5/ Includes latrine with shower.

Table 5-4. Space Allowances for Training Center Billeting (Net Square Feet) 1/

Pay Grade	Open Bay <u>2/</u>	1 + 1 <u>3/</u>	Private <u>4/</u>
E4 and below	72 square feet/person	90 square feet /person	NA
E5 and E6	72 square feet/person	135 square feet /person	NA
E7 through E9	NA	250 square feet /person	250 square feet
W01, CW2, 01, 02	NA	250 square feet /person	NA
CW3-CW5, O3-O6	NA	250 square feet /person	250 square feet
General Officer	NA	NA	430 square feet
Lounge	10 square feet/room	10 square feet/room	10 square feet/room
Laundry	144 square feet/20 rooms	144 square feet/20 rooms	144 square feet/20 rooms

NOTES:

1/ Allowance is in net square feet, exclusive of interior and exterior walls and of a 20 square foot closet in each 1+1 and private room. States must justify the split among the three configurations of rooms and the number/location of separate buildings.

2/ No more than 20 persons per room with an additional allowance of 10 square feet per person for a latrine (including showers).

3/ One individual per room sharing bath/service area of 100 square feet (not included in the allowance shown above).

4/ One individual per room with a private bath/service area of 100 square feet (not included in the allowance shown above).

Table 5-5. Range Facilities Space Allowances

Facility	Gross Square Feet
1. Range Control Tower	100, 144 or 256 <u>1/</u>
2. Target Operations and Storage Building	800 <u>2/</u>
3. Ammunition Breakdown Building	240 <u>3/</u>
4. Latrines	200 <u>4/</u>
5. Concurrent Training Building (Bleacher Building)	600 or 800 <u>5/</u>
6. Mess Shelter	800 <u>6/</u>
7. Vehicle Parking	<u>7/</u>
8. Fencing	<u>8/</u>
9. Road Width	<u>9/</u>
10. Foxholes-Firing Positions	<u>10/</u>
11. Walks	<u>11/</u>
12. Range Flag/Safety Barriers	<u>12/</u>

NOTES:

1/ The range control tower is authorized 100 square feet for non-Automated Target System (ATS) ranges, 144 square feet for small arms ATS ranges and 256 square feet for ATS-equipped tank ranges. For non-ATS ranges, the construction will be an open platform on either steel or wood pole supports. The height will be 5 to 18 feet contingent upon the topography of the range. For ATS ranges, the tower will follow the Army Corps of Engineers standard plans.

2/ The target operations/storage building should be divided into two separate areas by means of a partition. The target operations area will be authorized lighting, windows, heating and insulation. The storage area will be authorized gravity-type ventilation and lighting.

3/ The ammunition breakdown facility will consist of 120 square feet of enclosed space. A lean-to of up to 120 square feet covering the issue counter, but which may also be used for a weapons cleaning area, is recommended.

4/ The latrine waste disposal method of choice is the aerated vault system. Other systems (including water-borne systems) may be used if documented as more cost effective.

5/ The concurrent training facility (CTF) may consist of a bleacher enclosure (enclosed on three sides) of 600 square feet. With NGB-ART authorization as an exception to criteria, an 800 square foot general instruction (GI) building may be constructed in lieu of the CTF. The two situations which support a GI Building are when required training typically coincides with severe weather conditions at the training site and to accommodate special training requirements for ranges such as the Military Operations on Urbanized Terrain (MOUT) assault course and combat lanes training courses.

6/ The Mess Shelter shall be a walled facility complete with a roof and permanently attached tables (up to three rows).

7/ The formula for vehicle parking area is as shown in Table 5-2 above.

8/ Fencing will be authorized to enclose the impact areas of M79/M203 and Hand Grenade Familiarization (high explosive live fire) ranges. Fencing may also be authorized for ranges with unusual security requirements. Validation for this must be provided by the State Antiterrorist/Force Protection/Safety Officer and validated by NGB-ART as required to meet documented security requirements. A security, chain link fence, when authorized, will be designed as explained in NGB DG 415-4, Volume I, Chapter 2. Otherwise, a three strand barbed wire fence attached to wood or metal posts 101-011 on center with the appropriate precautionary signage is to be erected instead of a chain link fence on the outside of the boundary of a danger/restricted area.

9/ Road widths in excess of 12 feet will be authorized for those sections of road which normally experience frequent bidirectional vehicular traffic. Roads which will support tank traffic will be authorized a width of 15 feet for lengths which normally support unidirectional traffic and 30 feet for those areas in which bidirectional traffic is high frequency or required.

10/ Foxholes at firing positions shall consist of a 40 inch to 48 inch diameter reinforced concrete pipe installed vertically in the ground about 4 feet deep with a wood or metal cover.

11/ Walks constructed of a 4-inch layer of sand and/or gravel are authorized to connect the support facilities and the firing line.

12/ Support is authorized for a 20-foot to 30-foot wood, steel or aluminum range flag pole. Range safety barriers may be constructed of two wooden posts to which a chain and cautionary signage can be attached. This chain should traverse each access road to the range impact area to prevent vehicular traffic from entering the surface danger zone during firing.

Table 5-6. Facility Support Space Allowances

Facility Maintenance and Storage	3% of the Total Net Area of Schedule I and II items
Mechanical/Electrical Room <u>1/</u>	5% of the Total Net Area of Schedule I and II items exclusive of facility maintenance and storage space allocation.
Telecommunications/Information Technology <u>1/</u>	1% of the Total Net Area of Schedule I and II items exclusive of facility maintenance and storage space allocation.

Note:

1/ Mechanical/Electrical and Telecommunications/Information Technology rooms may be increased or decreased based on actual design requirements. Mechanical space includes pipe and duct shafts and perimeter heating units. Additional mechanical equipment space is authorized for multiple story facilities to accommodate vertical duct requirements. This space is understood to include space for computerized controls and equipment for all facility related systems. The percentage indicated is intended as a planning guide. Final determination will be approved during the design review process.

Table 5-7. Circulation

Interfunctional Circulation <u>1/</u>	15 percent (22 percent for multiple-story facilities) of the total net floor area (excluding unheated unit storage, unless it is incorporated within heated buildings) <u>2/</u>
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Notes:

1/ This includes corridors, staircases, entrances, and a lobby. This percentage is a planning figure, and final determination will be approved during the design review process based upon what is required for a well planned functional layout.

2/ Circulation is 22 percent (27 percent for multiple story buildings) for billeting facilities.

Table 5-8. Walls

Walls <u>1/</u>	10 percent of total net floor area, including circulation
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Note:

1/ The total floor area may be increased by 10 percent to provide for interior and exterior walls and partitions. The 10 percent figure is intended as a planning guide. Final determination will be approved during the design review process.

**Chapter 6
Educational Facilities**

6-1. General

a. Standards. This chapter establishes the space allowances for ARNG educational facilities (and educational support facilities) that are part of the The Army School System (TASS).

b. Space allowances.

(1) TASS facility space allowances are based on the student load as verified and set by NGB-ART, the authorized strength(s) of the staff as documented on the TDA, and other manning documents showing full-time personnel, the numbers and types of equipment authorized, and special requirements of the supported units.

(2) Prior to submittal of DD Forms 1390/91 for an educational facility, States should contact NGB-ART to determine if an educational facility is authorized and to obtain sizing guidance for space allowances.

(3) Refer to Table 6-1 for common allowances.

(4) Refer to Table 6-2 for billeting allowances.

(5) Table 6-3 provides facility support space allowances.

- (6) Table 6-4 provides the allowance for circulation.
- (7) Table 6-5 provides the allowance for walls.
- (8) All other space requirements not specifically indicated in the referenced tables will be treated as exceptions to criteria. The State must fully justify these and NGB-ART must concur with them before NGB-ARI approves their inclusion in the programming documents and the final design of the project.
- (9) If there are any conflicts between the criteria in this pamphlet and those of Training and Doctrine Command (TRADOC) for an educational facility teaching the same Program of Instruction (POI), the TRADOC criteria will take precedence. However, the State must include documentation of this criteria as part of its request for exception to criteria.

6-2. Common Supporting Items

In planning the functional arrangement of facilities, the State will give appropriate consideration to the existing site conditions, layout, and materials of construction in order to achieve maximum operating efficiency, cost effectiveness, and flexibility. The following exterior items are authorized Federal reimbursement for educational facility projects:

a. Site preparation. The work of clearing, grubbing, stripping, and stockpiling topsoil, excavating embankment, and rough grading required to develop the project site to subgrade levels and elevations for proper siting and drainage of facilities (including culverts, head walls, retaining walls, etc.). The State must use its own funds for the special handling/remediation/disposal of contaminated soil excavated from a non-Federal owned or leased project site.

(1) Rock excavation and/or correction of unsatisfactory soil conditions is authorized only if the State has submitted adequate supporting documentation such as an economic or master planning analysis that demonstrates that the positive impacts on readiness strongly outweigh the increased construction costs.

(2) Culverts, retaining walls (installed in lieu of sloping the ground to achieve grade differentials), drainage systems, or other similar construction required for controlling surface water runoff will be approved on an individual site basis if the State justifies these items. The State, however, must consider the cost of these items during the site selection process.

b. Fine grading and seeding.

(1) The State may program for fine grading and seeding to provide proper site drainage and control of erosion on those parts of the project site where the previously existing surface cover has been destroyed or buried beneath redistributed soil.

(2) Sodding or sprigging is authorized for critical areas subject to erosion.

(3) Importing topsoil is authorized if the natural topsoil on the site, stockpiled at the beginning of construction, is inadequate to provide a finished depth of approximately 4 inches.

c. Landscaping. This will be included as an integral part of the planning of the project to produce an aesthetically pleasing final site.

(1) The State may program up to 3 percent of the basic building cost for planting trees, shrubs, and vines (exclusive of grading and seeding or sprigging and sodding for erosion control). In those locations that are considered to have an arid climate, the State may program up to 4 percent of the basic building cost and may use xeriscaping.

(2) Additional planting for energy conserving landscaping may be authorized if the State justifies it on a life cycle cost basis.

(3) An installed watering system is authorized.

d. Military vehicle parking. Parking is authorized for 100 percent of all vehicles, trailers, and other wheeled/towed equipment documented on facility TDA or required in support of a valid TRADOC POI required to be taught.

(1) Rigid concrete is authorized for paving those areas designated for the parking of military vehicles, including General Service Administration (GSA) vehicles. For programming purposes the concrete will be 8 inches in depth.

(2) The total area exclusive of access roads will not exceed 50 square yards for each wheeled vehicle, trailer, and other wheeled/towed equipment, 75 square yards for each tracked vehicle and equipment over 30 feet long, 175 square yards for each fuel truck and M977 series HEMTT, and 275 square yards for each HEMTT PLS and HET vehicle.

(3) For other unique equipment that must be stored within the military vehicle parking area, such as skid-mounted generators and snowmobiles, the State may program an appropriate amount of space and enclose justification for its request.

(4) The parking area is to be based on an economical layout of the parking spaces and circulation lanes. Actual design will be determined by structural calculations. Federal funding support is generally limited to pavement in accordance with NGB DG 415-4.

e. Fuel truck containment area. A 15 foot by 30 foot rigid concrete pad is authorized for each fuel truck. Also, a rigid concrete containment area is authorized for each fuel truck or trailer which stores Petroleum Oil Lubricants (POL) on board. In accordance with applicable environmental, safety and fire protection regulations, each containment area is to be sized so that it is capable of capturing and retaining 100% of the POL volume stored on the truck(s) parked within that area. A roof type cover may be provided, if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area.

f. Military vehicle loading ramps. Military vehicle loading ramps may be constructed to assist in loading and off-loading military vehicles (wheel and track) from equipment transporters that do not have loading ramps as an integral part of the trailer. A multi-level loading ramp not to exceed a footprint of 160 square yards is authorized. A rigid concrete access area of 250 square yards may be provided for access to the loading ramp.

g. Parking pad for mobile conduct of fire trainer (MCOFT) and similar simulators. Federal support is authorized for a 60 foot square rigid concrete parking pad, with electrical power and telephone service, at each NGB approved site authorized an MCOFT or similar simulation device.

h. Turn pads. If the State justifies them, rigid concrete turn pads are authorized where frequent turning of tracked vehicles is required on flexible pavement. Pads should be 30 feet square.

i. Service and access aprons.

(1) 150 square yards of rigid concrete paving each may be provided for access to the dumpster area, the controlled waste handling facility, and any other facility requiring outside access by forklifts or large, heavy vehicles.

(2) A rigid concrete access area of 250 square yards may be provided for access to the military vehicle loading ramp.

(3) Paved aprons may be provided adjacent to maintenance training workbay doors, if the POI calls for this type item. Sixty square feet of rigid pavement is authorized per foot of workbay width.

j. Privately owned vehicle (POV) parking. The allowance is 35 square yards times the sum of the NGB-ART validated student load and full-time staff (including instructors). This includes an allowance for circulation lanes within the parking area but excludes any required access roads. For programming purposes, flexible pavement will consist of 6 inches of bituminous material placed over an installed, appropriate aggregate base. Rigid concrete or flexible pavement curbs may be installed along pavement edges to comply with the site's approved storm water management plan or to preclude soil erosion.

k. Visitor/ customer parking. Visitor parking spaces are authorized as indicated below based on the number of required full time employees (including permanently assigned Federally reimbursed State employees). The allowance is 35 square yards a space, which includes circulation lanes but excludes required access roads, except that 60 square yards is authorized for one handicapped parking space. (A second handicapped parking space is authorized if there are more than 50 non-handicapped parking spaces.) Pavement will be constructed in accordance with NGB DG 415-4. Rigid concrete or flexible pavement curbs may be installed around parking pavement edges if required to control storm water per the site's approved storm water management plan.

<u>Employees</u>	<u>Parking Spaces</u>
5-15	4
16-25	7
26 and over	9 (and one additional parking space for every 10 employees or major fraction thereof over 26)

l. Access road and entrance throat. The primary entrances and access roads are authorized a width of 24 feet. More than one entrance may be authorized based on a demonstrated requirement to separate military and civilian vehicle traffic and/or to satisfy access requirements for fire and emergency vehicles. For programming purposes, the access road shall consist of 5000 square yards of flexible or rigid pavement, unless a greater amount is justified by a detailed site plan. However, the exact amount and type of pavement will be determined at the preliminary design review based on an economical and practical site facility layout and code considerations.

m. Curbs. Rigid or flexible pavement curbs may be installed along the edges of the roads and parking areas to comply with code, to control traffic, or to control storm water per the site's approved storm water management plan.

n. Security fencing. A security-type fence consisting of a 6 foot high chain-link-type metal fabric, with a 12 inch high anti-climber, will enclose the military vehicle parking, service and access areas, and ancillary facilities. Fencing will include vehicle and personnel gates, which may be electronically controlled. The fencing may be located approximately ten feet from the edge of the parking pavement; and the area between the edge of pavement and the fence may be seeded with grass, or a well-designed non vegetative cover (not to exceed four inches of rigid pavement) may be substituted.

o. Site Anti-Terrorism/Force Protection Measures. A separate fence, wall, passive vehicle barrier, landform, or line of vegetation will be applied along the exterior perimeter of the site to create a protective standoff and obscure vision, hinder personnel access, and hinder or prevent unauthorized vehicle access. In addition, a guard house/access control facility not to exceed 550 square feet is authorized when determined to be appropriate following completion of the AR 190-51 directed security risk assessment. Such a facility may be equipped with an environmental control system, electric service, and both voice and data communication links.

p. Sidewalks. For programming purposes, sidewalks shall be 20% of the building footprint. However, the exact amount of sidewalk area will be determined at the preliminary design review based on an economical and practical site layout of the facilities.

q. Flagpole(s). The educational complex is authorized two ground-set flagpoles with illumination, but only if the installation on which it is located does not already have one.

r. Exterior fire protection. Consideration will be given to the size of the structure, the type of construction, and the exposure to fire hazard that it creates for or receives from nearby buildings. Except in cases of conflict with State requirements, exterior fire protection should be in conformance with National Fire Protection Association requirements. Extension of water mains for fire protection is limited to that needed to ensure that an adequate number of fire hydrants can be located between 50 and 400 feet of any building. No more than 300 linear feet of pipe per water line required by code may be outside the project property line.

s. Detached facilities sign/static display. In addition to the authorized building-mounted facilities sign, a free-standing sign is authorized identifying the facility name and type, the State, and Army National Guard. Lighting to illuminate the sign continuously during hours of darkness may be provided. Provisions may also be made at this facility for a static display(s), including a concrete slab or mounting pedestal.

t. Outside security lighting. A security lighting system that would permit ample lighting to conduct safe after hours training and one which is designed to illuminate continuously during the hours of darkness or equipped with sensors which when activated by movement within the designated area will cause the lights to illuminate is authorized. After discontinuance of movement within the designated area, the lights should remain lit for a time determined to be appropriate for the specific situation by the security manager. Vandal resistant lenses should be provided where appropriate. Wherever possible, lighting of area will be provided from building-mounted fixtures. Pole-mounted fixtures may be used to supplement the building-mounted fixtures and where building-mounted fixtures are inadequate.

u. Fuel storage and dispensing systems.

(1) Fuel storage and dispensing systems are authorized provided that all of following conditions are met:

(a) The educational facilities are not located within a mile of a surface maintenance facility with fuel storage and dispensing capability.

(b) There are at least 15 vehicles using each type of fuel assigned to the complex.

(c) The State’s surface vehicle fuel management plan justifies the use of a fuel storage and dispensing system at this location because of a lack of nearby military facilities, an agreement with other State facilities, or local private sources (using credit/debit cards).

(2) The storage facilities will be built to nationally recognized environmental standards and in accordance with local ordinances.

(3) The capacity will not exceed the following:

<u>No. of Vehicles Using Type of Fuel</u>	<u>Capacity Per Type of Fuel</u>
0 - 14	NA
15 - 39	1,500 Gal
40 - 69	3,000 Gal
70 - 100	5,000 Gal
over 100	7,000 Gal

(4) A 15 foot by 45 foot rigid concrete pad (to include containment if required) is authorized at the pump island for each type fuel. The project is authorized 250 square yards of rigid or flexible paving (in addition to the readiness center access road and military vehicle parking) for access to the fuel dispensing system.

v. Wash platform.

(1) One concrete wash platform, not to exceed 115 square yards, is authorized when 10 or more motor vehicles are authorized to be physically located at the educational complex and if the educational complex will not be located within a mile of a surface maintenance facility with vehicle washing capability.

(2) The project is authorized 250 square yards of rigid or flexible paving (in addition to the readiness center access road and military vehicle parking) for access to the wash platform.

(3) A roof type cover may be provided if required by local code to prevent storm water from draining into the sanitary sewer system.

(4) An exterior wash rack may be enclosed by an unheated shed-type structure when the heating design temperature, as determined from the 97 1/2 percent column in TM 5-785, is minus (-) 10 degrees Fahrenheit or lower, or the annual snowfall exceeds 30 inches.

w. Utilities. Utility service runs will be based on an economical layout of the requirements for the installation. All building utility service connections should be underground. The length of service for each utility is limited to the distance of the shortest run from the building to the property line adjacent to the public right-of-way providing ingress and egress for the site plus up to an additional 300 linear feet for connection to the existing utility system. Direct-burial cable for telephone, data, and electric service connections are authorized. This includes conduit where the service connection(s) must pass under a paved area. Participation in on-site water well, sanitary treatment system, and liquid petroleum gas, fuel oil or other heating system storage tank, including piping, will be authorized if respective public services are not available and the separate systems are consistent with the requirements of the local approval authority and with applicable Federal, State, and local environmental laws and regulations. A water storage cistern along with a chlorination system may be authorized, if no municipal potable water is available.

x. Storm water retention ponds. The State may program up to 3 percent of the basic building cost for retention ponds as part of a storm water pollution prevention program, if the Army Environmental Programs Division (NGB-ARE) validates the requirement. These ponds may include bioretention capabilities if required by local codes and/or best management practices.

Table 6-1. Educational Facility Allowances 1/

Functional Areas	Basic Allowance	Student Load		
		Below 100	100-199	Over 199
1. Administration				
a. General Administration	130 square feet /TDA position	1500	2000	2500
b. Medical/Aid Station	NA	400	400	400
c. Supply <u>2/</u>	NA	2400	2400	2400
d. Publication Storage	5 square feet/student	500	500	500
e. Material Reproduction/ Mail Center	NA	400	500	600
f. Weapons/Ammunition storage	NA	250	250	250
g. Toilets/Showers/Lockers <u>3/</u>	22 square feet/TDA position	300	300	300
2. Education <u>4/</u>				
a. Classrooms	35 square feet/student	800	1000	1500
b. Instructor Preparation/ Counseling	NA	500	800	1000
c. Multi-Purpose Training Area	NA	5400	5800	6300
d. Auditorium	NA	2000	2500	3000
e. Library	NA	600	600	600
f. Learning Center	NA	300	550	800
g. Distance Learning Center	NA	5/	5/	5/
h. Training Device/Simulation Center	NA	6/	6/	6/
i. Training Aid Storage	NA	300	600	900
j. Audio Visual Storage	NA	300	600	900
k. Test Control Storage	NA	100	100	100
l. Break Area	5 square feet/student	250	250	250
m. Physical Fitness Area <u>7/</u>	NA	1000	1225	1600
n. Toilets <u>8/</u>	3 square feet/student	300	400	500
3. Dining Facility				
a. Dining Area & Kitchen <u>9/</u>	NA	4100	4100	4100

NOTES:

1/ All allowances are in net square feet exclusive of interior and exterior walls. Total allowance for an item is the sum of the basic allowance and the allowance for the student load the educational facility is authorized. Per student in the basic allowance refers to the maximum number of students authorized to be at the TASS complex at any point during a training year.

2/ This allowance includes space for a vault (300 square feet) and, if desired, a climate controlled area (maximum of 250 square feet). For unheated storage, detached buildings may be used, or an equivalent area may be incorporated within the facility.

3/ This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

4/ If there are any conflicts between the criteria in this pamphlet and those of TRADOC for an educational facility teaching the same POI, the TRADOC criteria will take precedence.

5/ Space is authorized if validated and approved by NGB-RCS-DTTP. This space is in addition to any classroom space otherwise authorized.

6/ Space is authorized if validated and approved by NGB-ART.

7/ All equipment must be obtained with other than Federal construction funds.

8/ This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

9/ Based on 200 person standard design to include all supporting functional areas. Dining facility authorized only if adequate dining facility is not otherwise available on the training center. Requires exception to criteria and NGB-ART approval.

Table 6-2. Space Allowances for Educational Facility Billeting. 1/

Pay Grade	Open Bay <u>2/</u>	2 + 2 <u>3/</u>	1 + 1 <u>4/</u>	Private <u>5/</u>
E4 and below	90 square feet/person	90 square feet/person	90 square feet/person	NA
E5 and E6	NA	135 square feet/person	135 square feet/person	NA
E7 through E9	NA	250 square feet/person	250 square feet/person	250 square feet
W01, CW2, 01, 02	NA	NA	250 square feet/person	NA
CW3-CW5, O3-O6	NA	NA	NA	250 square feet
Lounge	10 square feet/room	10 square feet/room	10 square feet/room	10 square feet/room
Laundry	144 square feet/20 rooms	144 square feet/20 rooms	144 square feet/20 rooms	144 square feet/20 rooms

NOTES:

1/ Allowance is in net square feet, exclusive of interior and exterior walls and of a 20 square foot closet (2 closets in the 2+2 rooms). An educational complex is authorized to billet as many people as are shown on the approved student load plus the authorized TDA positions, including any authorized instructors not on the TASS TDA. States must justify the split among the three configurations of rooms and the construction of more than a single building containing billets.

2/ No more than ten persons per room/bay, all sharing a latrine of 500 square feet (not included in the allowance shown above).

3/ Two individuals per room sharing private bath/service area of 100 square feet (not included in the allowance shown above).

4/ One individual per room sharing bath/service area of 100 square feet (not included in the allowance shown above).

5/ One individual per room with a private bath/service area of 100 square feet (not included in the allowance shown above).

Table 6-3. Facility Support Space Allowances

Facility Maintenance and Storage	3% of the Total Net Area of Schedule I and II items
Mechanical/Electrical Room <u>1/</u>	5% of the Total Net Area of Schedule I and II items exclusive of facility maintenance and storage space allocation.
Telecommunications/Information Technology <u>1/</u>	1% of the Total Net Area of Schedule I and II items exclusive of facility maintenance and storage space allocation.

Note:

1/ Mechanical/Electrical and Telecommunications/Information Technology rooms may be increased or decreased based on actual design requirements. Mechanical space includes pipe and duct shafts and perimeter heating units. Additional mechanical equipment space is authorized for multiple story facilities to accommodate vertical duct requirements. This space is understood to include space for computerized controls and equipment for all facility related systems. The percentage indicated is intended as a planning guide. Final determination will be approved during the design review process.

Table 6-4. Circulation

Interfunctional Circulation <u>1/</u>	22 percent (29 percent for multiple-story facilities) of the total net floor area (excluding unheated unit storage, unless it is incorporated within heated buildings) <u>2/</u>
---------------------------------------	--

Note:

1/ This includes corridors, staircases, entrances, and a lobby. This percentage is a planning figure, and final determination will be approved during the design review process based upon what is required for a well planned functional layout.

2/ Circulation is 29 percent (36 percent for multiple story buildings) for billeting facilities.

Table 6-5. Walls

Walls <u>1/</u>	10 percent of total net floor area, including circulation
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Note:

1/ The total floor area may be increased by 10 percent to provide for interior and exterior walls and partitions. The 10 percent figure is intended as a planning guide. Final determination will be approved during the design review process.

Appendix A References

Most of these references are available electronically as listed below:

1. United States Code:
www4.law.cornell.edu/uscode/ or
www.access.gpo.gov/congress/cong013.html or
<http://uscode.house.gov/usc.htm>.
2. Code of Federal Regulations: www.access.gpo.gov/nara/cfr/cfr-retrieve.html#page1.
3. Executive Orders: www.nara.gov/fedreg/eo.html. However, this reference, except for recent executive orders, only provides a summary and citations to the Federal Register. The address of the Federal Register is www.access.gpo.gov/nara/index.html.
4. Office of Management and Budget Circulars: www.whitehouse.gov/omb/circulars/.
5. Acquisition Regulations:
www.arnet.gov/far/ or
www.acq.osd.mil/dp/dars/dfars.html or
<http://acqnet.sarda.army.mil/library/zpafar.htm>.
6. Department of Defense Publications: www.dtic.mil/whs/directives/.
7. Department of Defense Financial Management Regulation: www.dtic.mil/comptroller/fmr/.
8. DFAS Publications:
www.asafm.army.mil/secretariat/document/dfas37-100/dfas37-100.asp and
<https://dfas4dod.dfas.mil/centers/dfasin/library/ar37-1/>.
9. Army Regulations and Pamphlets: www.usapa.army.mil/.
10. Technical Manuals: www.usace.army.mil/inet/usace-docs/armymtm/.
11. U.S. Army Technical Center for Explosive Safety; Site and General Construction Plan Developers Guide, www.dac.army.mil.
12. National Guard Regulations and Pamphlets: www.ngbpd.c.ngb.army.mil/.

Section I Required Publications

AR 40-61

Medical Logistics Policy and Procedures. (Cited in Table 2-2 (Note 13).)

AR 190-51

Security of Unclassified Army Property (Sensitive and Non-Sensitive). (Cited in paras 2-2o, 3-2o, 4-2r, 4-6, 5-2o, and 6-2o.)

AR 385-64

U.S. Army Explosives Safety Program. (Cited in para 5-3b(1).)

NGB DG 415-1

Design Guide for Readiness Centers. (Cited in paras 2-2e, and Table 2-1 (Note 4).)

NGB DG 415-2

Design Guide for Logistics Facilities. (Cited in paras 3-3d(6), 3-3e 3-3f, 3-3o, 3-5e, and 3-8c.)

NGB DG 415-3

Design Guide for Aviation Facilities. (Cited in paras 4-2g, 4-3d(5), 4-3e, -3f, 4-3o, and 4-4e.)

NGB DG 415-4

Design Guide for Training Center Facilities. (Cited in paras 5-2d(5), 5-2e, 5-2f, 5-3y(1), Table 5-3 (Note 1), Table 5-7 (Note 8), 6-3d(5), and 6-3f.)

NG Pam 415-5

Army National Guard Military Construction Program Execution. (Cited in para 3-5e.)

NGR 415-10

Army National Guard Facilities Construction. (Cited in para 3-7a.)

TM 5-785

Engineering Weather Data. (Cited in paras 1-6f, 3-4g(4)(e), 3-4g(5)(c), 3-5c(3)(c), 3-5c(4), Table 3-5 (Note 3), 4-2y(2), 5-2v(7), Table 5-2 (Note 3), and 6-2v(4).)

TM 5-803-7

Civil Engineering Programming Airfield and Heliport Planning Criteria. (Cited in paras Table 2-2 (Note 21), 4-4b(1), 4-4c, 4-4e, 4-4j(1), 4-4n, and 5-3w(1).)

TM 5-811-5

Army Aviation Lighting. (Cited in paras 2-2i and 4-3d.)

TM 9-1300-206

Ammunition and Explosive Standards. (Cited in para 5-3b(1).)

USATCESP 385-02

Site and General Construction Plan Developers Guide. (Cited in para 5-3b(1).)

Section II

Related Publications

AR 11-27

Army Energy Program

AR 18-7

Army, Automatic Data Processing Activity Management, Procedures, and Standards

AR 40-5

Preventive Medicine

AR 55-80

Highways for National Defense

AR 190-13

The Army Physical Security Program

AR 200-1

Environmental Protection and Enhancement

AR 200-2

Environmental Effects of Army Actions

AR 200-3

Natural Resources

AR 200-4

Cultural Resources Management

AR 200-5

Pest Management

AR 385-10

The Army Safety Program

AR 385-16

System Safety Engineering and Management

AR 385-63

Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat

AR 420-49

Utilities Services

29 CFR Part 1900 et seq

Occupational Safety and Health Administration, Department of Labor

36 CFR Part 800

Protection of Historic Properties

DA Pam 190-51

Risk Analysis for Army Property

DA Pam 385-64

Ammunition and Explosive Safety Standards

DA Pam 420-7

Natural Resources - Land, Forest, and Wildlife Management

DoD 6055.9-STD

DOD Ammunition and Explosives Safety Standards

DoDD 1225.7

Reserve Component Facilities Programs and Unit Stationing.

DoDD 4270.5

Military Construction Responsibilities

DoDD 6055.9

DoD Explosives Safety Board (DDESB) And DoD Component Explosives Safety Responsibilities

DoDI 1225.8

Programs and Procedures for Reserve Component Facilities Programs and Unit Stationing

Engineer Technical Letter 1110-3-491

Sustainable Design for Military Facilities

Executive Order 11988

Flood Plain Management

Executive Order 11990

Protection of Wetlands

Executive Order 12056

Federal Compliance with Pollution Prevention and Emergency Planning-Community Right to Know Acts

Executive Order 12873

Federal Acquisition, Recycling, and Waste Prevention

Executive Order 13007

Indian Sacred Sites

Executive Order 13045

Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13123

Greening the Government Through Efficient Energy Management

JCS Pub 22

Worldwide Military Command and Control System (WWMCCS) ADP System Security Manual.

MIL-STD-3007

Standard Practice For Unified Facilities Criteria And Unified Facilities Guide Specifications

NG Pam 25-1

Training Site General Information

NGR 5-3

ARNG Training Centers

NGR 11-27

ARNG Energy Conservation Plan

NGR 190-11

Military Police, Physical Security of Arms, Ammunition and Explosives.

NGR (AR) 200-3

State and Federal Environmental Responsibilities

NGR 415-5

Army National Guard Military Construction Program Development and Execution

Sustainable Project Rating Tool (Army Corps of Engineers)

TM 5-683

Electrical Interior Facilities

TM 5-684

Electrical Exterior Facilities

TM 5-803-14

Site Planning and Design

TM 5-815-2

Utility Monitoring and Control Systems

TM 5-853-1

Security Engineering: Project Development

TM 5-1300

Structures to Resist the Effects of Accidental Explosions

Uniform Building Code

10 U.S.C. §172

Ammunition Storage Board

10 U.S.C. Chapter 159

Real Property

10 U.S.C. Chapter 169

Military Construction and Military Family Housing

10 U.S.C. Chapter 1803

Facilities for Reserve Components

15 U.S.C. §§2601-2692

Toxic Substances Control Act

16 U.S.C. § 470 et. seq.

National Historic Preservation

16 U.S.C. §§1271-1287

Wild and Scenic Rivers Act. (Cited in para 5-5j.)

16 U.S.C. §§1531-1544

Endangered Species Act.

18 U.S.C §1001

Fraud and False Statements

33 U.S.C. §466 et. seq.

Clean Water Act

40 U.S.C. §541 et seq

Selection of Architects and Engineers

42 U.S.C. §300f et. seq.

Safe Drinking Water Act

42 U.S.C. §1996

American Indian Religious Freedom Act

42 U.S.C. §§4151-4157

Architectural Barriers Act of 1968

42 U.S.C. §§4321-4370a

National Environmental Policy Act

42 U.S.C. §§6901-6992

Resource Conservation and Recovery Act

42 U.S.C. §§7401-7661

Clean Air Act

42 U.S.C. §§9601-9657

Comprehensive Environmental Response, Compensation and Liability Act

**Section III
Prescribed Forms**

This section contains no entries.

**Section IV
Referenced Forms**

DD Form 1390

FY__ Military Construction Program.

DD Form 1391

FY __ Military Construction Project Data.

Glossary

**Section I
Abbreviations**

AASF

Army Aviation Support Facility

ACOE

Army Corps of Engineers

ALSE

Aviation Life Support Equipment

AR

Army Regulation

ARFF

Aircraft Rescue and Firefighting Facility

ARNG

Army National Guard

ARTEP

Army Training and Evaluation Program

ASHRAE

American Society of Heating, Refrigerating, and Air Conditioning Engineers

AT

Annual Training

ATS

Automated Target System

AVLB

Armored Vehicle Launched Bridge

Bde
Brigade

BII
Basic Issue Items

Bn
Battalion

CFMO
Construction and Facilities Management Officer

CHS
Common Hardware Software

CMDSA
COMSEC Material Direct Support Activities

CMU
Concrete Masonry Unit

COMSEC
Communication security

COR
Contracting Officer's Representative

CSMS
Combined Support Maintenance Shop

CSSAMO
Combat Service Support Automation Management Office

CTA
Common Table of Allowances

CTC
Collective Training Center

CTF
Concurrent Training Facility

CV
Combat vehicles

CWHF
Controlled Waste Handling Facility

DA
Department of the Army

DD
Department of Defense

DDESB

Department of Defense Explosives Safety Board

DG

Design Guide

Div

Division

DoD

Department of Defense

DoDD

Department of Defense Directive

DoDI

Department of Defense Instruction

DOIM

Director of Information Management

DS4

Direct Support Unit Standard Supply System

DSU

Direct Support Unit

ECS

Electronic Consult System

EKG

Electrocardiogram

EMCS

Energy Management Control System

FAA

Federal Aviation Administration

FISP

Federal Inventory and Support Plan

FMS

Field Maintenance Shop

FMSS

Field Maintenance Sub-Shop

GI

General Instruction

GPM

Gallons per Minute

GSA

General Services Administration

GSE

Ground support equipment

GSU

General Support Unit

HEMTT

Heavy Expanded Mobility Tactical Truck

HET

Heavy Equipment Transporter

HHC

Headquarters and Headquarters Company

HHD

Headquarters and Headquarters Detachment

IDT

Inactive duty for training

IT

Information Technology

ITC

Intermediate Training Center

KD

Known Distance

LAASF

Limited Army Aviation Support Facility

LTA

Local Training Area

LTC

Local Training Center

MATES

Maneuver and Training Equipment Site

MCNG

The Army National Guard Military Construction appropriation

MCOFT

Mobile Conduct of Fire Trainer

MEDEVAC

Medical evacuation

MOUT

Military Operations on Urbanized Terrain

MTC-H

Maneuver Training Center - Heavy

MTC-L

Maneuver Training Center - Light

MTOE

Modified Table of Organization and Equipment

NA

Not Authorized

NG

National Guard

NGB

National Guard Bureau

NGB-AIS

Army Information Systems Division

NGB-ARE

Army Environmental Programs Division

NGB-ARI

Army Installations Division

NGB-ARL

Army Logistics Division

NGB-ARS

Office of the Chief Surgeon

NGB-ART

Army Training Division

NGB-AVS

Army Aviation and Safety Division

NGB-RCS-DTTP

Distributed Training and Technology Program Manager

NGR

National Guard Regulation

NSF

Net Square Feet

OSHA

Occupational Safety and Health Act

Pam

Pamphlet

PLS

Palletized Load System

POI

Program of Instruction

POL

Petroleum Oil Lubricants

POV

Privately owned vehicle

PSI

Pounds per square inch

RAOC

Rear Area Operations Center

RAPIDS

Real-Time Automated Personnel Identification System

RWOS

Representative Weather Observation Station

RXA

Repair/Direct Exchange

SAMS

Standard Army Maintenance System

SDZ

Surface Danger Zone

SF

Square Feet

SMM

Surface Maintenance Manager

SP

Self-propelled

SQ YD

Square Yard

SSA

Supply Support Activity

STARC

State Area Readiness Command

TADSS

Training Aids, Devices, and Simulations Systems

TASS

The Army School System

TC

Training Center

TDA

Table of Distribution and Allowances

Tech

Military Technician

TISA

Troop Issue Subsistence Activity

TM

Technical Manual

TOE

Table of Organization and Equipment

TOW

Tube Launched, Optically Tracked, Wire Guided Missile

TRADOC

U.S. Army Training and Doctrine Command

USATCESP

U.S. Army Technical Center for Explosives Safety Publication

U.S.C.

United States Code

USPFO

United States Property and Fiscal Office

UTES

Unit Training and Equipment Site

WB

General maintenance workbay

WWMCCS

Worldwide Military Command and Control System

Section II

Terms

Collocated Facilities

ARNG facilities are considered to be collocated if they have at least one adjacent land-use area boundary in common or are separated only by the width of the vehicle thoroughfare.

Combat Vehicle

For the purpose of this regulation, the term combat vehicles includes tanks, armored personnel carriers, tracked command and reconnaissance vehicles, combat engineer vehicles, self-propelled artillery, tank retrievers and other like type vehicles.

Construction

The erection, installation, or assembly of a new facility; the relocation of a facility; the complete replacement of an existing facility; or the addition, expansion, extension, alteration, or conversion (to a new type use) of an existing facility. This includes installed building equipment and related site preparation, excavation, filling and landscaping or other land improvements. It also includes increases in components of facilities for functional reasons when a facility is not being repaired and the components are not required to meet current standards, and it includes the extension of utilities to areas not previously served. Construction is an activity that may be a part of either the restoration or modernization program.

Construction Specifications Institute (CSI)

A non-profit organization dedicated to the advancement of construction technology through communication, education, research and service. CSI serves the interest of architects, engineers, contractors, product manufacturers and others in the construction industry.

Facility

A separate and individual building, structure, utility system, or other real property improvement. It includes supporting elements for structures, such as sidewalks, fire hydrants, gasoline and diesel fuel dispensing systems, flammable materials buildings, roads, fencing, and hard stand.

Federal Funds

The terms "Federal funds" or "Federal costs" refers to funds appropriated for the Army National Guard Military Construction (MCNG) program. It does not include appropriations funding the non-construction aspects of the project. However, in the case of a joint use facility, it may include construction appropriation funds contributed by the other reserve component(s). Also, in the case of projects that fall within the statutory limits of operations and maintenance construction, it refers to the Operations and Maintenance National Guard appropriation (but only that portion supporting the construction aspects of the project).

Floodplain

Floodplains are the lowland and relatively flat areas next to inland and coastal waters including flood prone areas of offshore islands. This includes, at a minimum, that area with a one percent or greater chance of flooding in any given year (the "100 year flood"). For critical facilities where evacuation would be difficult, such as hazardous chemical storage or hospitals, the floodplain will be that area subject to a 0.2 percent or greater chance of flooding in any given year (the "500 year flood").

General Maintenance Workbay

These workbays include organization and support workbays, but exclude special purpose bays.

Hardstand

This is an area constructed of crushed stone, gravel, slag, shale, or similar materials. These materials are shaped and compacted into position without the addition of any binder materials.

Installation

An aggregation of contiguous or near contiguous, common mission-supporting real property holdings under the jurisdiction of the State, the District of Columbia, territory, or commonwealth controlled by and at which an ARNG unit or activity is permanently assigned. For the purpose of Installation Status Report reporting and the calculation of programming inventory, each State shall be considered a separate installation. However, for real property inventory reporting, each entity with a FISP installation number will be reported as an installation.

Life Cycle Cost Analysis

An economic assessment of an item, system, feature, or facility by considering all significant costs of ownership over an economic life, expressed in terms of equivalent costs. Such an analysis of economic results in a determination as to whether any increase in initial construction cost due to inclusion of the feature or system would be recouped during its lifetime by decreases in operating and/or maintenance costs, when calculated in discounted dollars and using documentable current local fuel cost and escalation forecasts as prepared by the Office of the Secretary of Defense.

Military Vehicles

Any motorized or towed-vehicles, wheeled or track, authorized to units by TOE, MTOE, or TDA.

Motor Vehicle

Motor vehicles are self-propelled military equipment, including amphibious equipment, classed as 1/4-ton or over in size.

Pre-Wired Workstations

A workstation which should include posts, panels, partitions, wiring for electricity and communications, task lighting, and partition-hung components to support individual and group efforts. Both panel-to-panel and post-to-panel systems are acceptable. Additional system components are ambient lighting and partition supported files. A pre-wired workstation should, at a minimum, provide for the following functions: (1) An acoustically treated enclosure defining the limits of an individual or a shared use workstation. (2) Adequate work surfaces to accommodate the individual's equipment, writing, and work layout needs. (3) Storage space for individual files and supplies. (4) Task lighting and electrical and communications outlets to support the individual's equipment. Pre-wired workstations do not include movable furniture and furnishings such as chairs, stand alone file cabinets, coat hooks or racks, name tags, in and out file trays, and other similar accouterments.

Replacement

Reconstruction of a real property facility destroyed or damaged beyond the point at which it may be economically repaired. Complete replacement is classified as construction.

Site Preparation

Clearing; grubbing; demolition of existing structures; removing existing utilities, excavation and embankment earth work, drainage channels or systems, and retaining walls; the grading/compaction of site soils to proposed subgrade elevations; and necessary environmental compliance actions.

Surface Danger Zone (SDZ)

The statistical area in which a particular round fired from a particular weapon at a particular point toward a particular target will impact if there are no physical barriers to impede its path.

Sustainable Design and Development

The systematic consideration of current and future impacts of an activity, product, or decision on the environment, energy use, natural resources, the economy, and quality of life. In terms of military construction, it is also the design, construction, operation, and reuse/removal of the built environment (infrastructure and buildings) in an environmentally and energy efficient manner.

Wetlands

Wetlands are those areas flooded or inundated by surface or ground waters often enough to support aquatic life or vegetation. Wetlands generally include swamps, marshes, bogs, and similar areas, such as sloughs, open or wet meadows, river outflows, mud flats, natural ponds, wet forests, potholes, and riparian areas. They may or may not be located in flood plains.

Section III**Special Abbreviations and Terms**

This section contains no entries.