

# UNIFIED FACILITIES CRITERIA (UFC)

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## **DRAFT** **ARMORIES AND ARMS ROOMS**



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## UNIFIED FACILITIES CRITERIA (UFC)

### ARMORIES AND ARMS ROOMS

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U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING COMMAND (Preparing Activity)

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

Record of Changes (changes are indicated by \1\ ... /1/)

Change No.	Date	Location

## FOREWORD

The Unified Facilities Criteria (UFC) system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with [USD \(AT&L\) Memorandum](#) dated 29 May 2002. UFC will be used for all DoD projects and work for other customers where appropriate. All construction outside of the United States is also governed by Status of forces Agreements (SOFA), Host Nation Funded Construction Agreements (HNFA), and in some instances, Bilateral Infrastructure Agreements (BIA.) Therefore, the acquisition team must ensure compliance with the more stringent of the UFC, the SOFA, the HNFA, and the BIA, as applicable.

UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Services' responsibility for providing technical criteria for military construction. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Command (NAVFAC), and Air Force Civil Engineer Support Agency (AFCESA) are responsible for administration of the UFC system. Defense agencies should contact the preparing service for document interpretation and improvements. Technical content of UFC is the responsibility of the cognizant DoD working group. Recommended changes with supporting rationale should be sent to the respective service proponent office by the following electronic form: [Criteria Change Request \(CCR\)](#). The form is also accessible from the Internet sites listed below.

UFC are effective upon issuance and are distributed only in electronic media from the following source:

- Whole Building Design Guide web site <http://dod.wbdg.org/>.

Hard copies of UFC printed from electronic media should be checked against the current electronic version prior to use to ensure that they are current.

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## UNIFIED FACILITIES CRITERIA (UFC) NEW DOCUMENT SUMMARY SHEET

**Subject:** UFC 4-215-01, *Armories and Arms Rooms*

**Cancel:** This is a new Joint-Service document. This is to be used in conjunction with other Tri-Service UFC documents in the development of Armories and Arms Rooms. A listing of documents is in Appendix A - References

**Description:** The UFC 4-215-01, *Armories and Arms Rooms*, represents another step in the joint Services effort to bring uniformity to the planning, design and construction of military facilities. The document requires the use of the latest building codes including the latest version of the International Building Code.

New military requirements were incorporated and improved references to other documents have been identified for energy conservation, sustainable development, and antiterrorism standards.

This is the first joint Service criteria document to be published for this building type.

**Reason for Creating this Document:** The existing guidance was inadequate for the following reasons:

The Services are currently using their own individual criteria documents, ex. AF Guides, NAVFAC Instructions, Army Technical Instructions, and Marines P-numbered management manuals. This document promotes criteria uniformity, and reduces current reliance upon individual Service specific documents.

The existing Service-specific guidance did not properly reference and identify recently updated and published joint Service documents.

**Impact:** The following direct benefits will result with the new UFC 4-215-01, *Armories and Arms Rooms*. Creation of a single source for common DoD Armory criteria and an accurate reference to individual Service-specific documents.

Eliminates misinterpretation and ambiguities that could lead to design and construction conflicts.

Facilitates updates and revisions and promotes agreement and uniformity of design and construction between the Services.

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## CHAPTER 1 INTRODUCTION

### 1-1 SCOPE OF DOCUMENT.

This UFC provides guidelines for evaluating, planning, programming, and designing Armories and Arms Rooms. The information in this UFC applies to the design of all new construction projects, to include additions, alterations, and renovation projects in the continental United States (CONUS) and outside the continental United States (OCONUS). It also applies to the procurement of design-build services for the above-noted projects. Alteration and renovation projects should update existing facilities to meet the guidance and criteria within budgetary constraints. This UFC is not intended as a substitution for thorough review by individual Program Managers and Operations Staff in the appropriate Service.

### 1-2 USERS OF THIS DOCUMENT.

This UFC is intended to be a source of basic architectural and engineering information for all individuals involved in the planning, design, or evaluation of Armories and Arms Rooms. Specific users of the UFC include the following.

#### 1-2.1 Architects and Engineering.

Architects and Engineers (A/Es) who provide design services under the direction of the individual design agencies, including the Army Corps of Engineers (COE), Naval Facilities Engineering Command (NAVFAC), Commander, Navy Installations Command (CNIC), and the Air Force Major Command Civil Engineers.

#### 1-2.2 Planning Personnel.

Planning personnel will use this UFC along with other documents for programming new or replacement facilities, pre-design planning, or assessing the extent of improvements required in existing Armories and Arms Rooms in order to achieve the standard established herein.

#### 1-2.3 Additional Users.

Additional users include the following:

- Headquarters staff and field operating agencies,
- Major command staff/regions,
- Installation commanders,
- Installation facilities management,
- Installation technical proponents, and

- Facility/program operations staff.

### 1-3 **ACQUISITION METHODOLOGY.**

There are two primary acquisition methodologies for Government construction: design-bid-build and design-build. Service personnel involved with project development should understand the acquisition methodology as it affects how and when they can influence the resulting facility design.

#### 1-3.1 **Design-Bid-Build.**

The design-bid-build acquisition methodology is characterized by separation between the designer of record and the construction contractor. An internal or Government-contracted architect or engineer designs the facility, and the Government separately contracts for construction. Service personnel have the opportunity to interface with the designer of record and influence the design at several predefined points in the design process.

#### 1-3.2 **Design-Build.**

The design-build acquisition methodology is characterized by the combination of design and construction services under one contract. The Government contracts with one entity to prepare the design and to construct the facility based on the requirements outlined in a request for proposal (RFP). Service personnel have the opportunity to influence the design during the development of the RFP and during the design-build contractor selection process. Any reviews that occur post contract award are limited to ensure compliance with the RFP and the contractor's proposal. Government-initiated design changes, particularly those that impact cost and schedule, typically cannot occur after award without a contract modification.

### 1-4 **REFERENCES.**

1-4.1 Appendix A contains a list of references used in this UFC. The publication date of the code or standard is not included in this UFC. In general, the latest available issuance of the reference was used.

## CHAPTER 2 PLANNING CRITERIA

### 2-1 PHYSICAL SECURITY.

Physical security is that part of security concerned with physical measures designed to safeguard personnel; to prevent unauthorized access to equipment, installations, material, and documents; and to safeguard them against espionage, sabotage, damage, and theft.

For an Armory, the physical measures would include intrusion detection systems, material selection, and construction methods for the exterior envelope of the facility.

See DoD Military Handbook 1013/1A, Section 2 and DoD 5100.76-M, *Physical Security of Sensitive Conventional Arms, Ammunition, and Explosives* for pre-design considerations. For Army projects, see Army Regulation (AR) 190-11 *Physical Security for Arms, Ammunition, and Explosives*. For Air Force projects, see Air Force Instruction (AFI) 31-101, *The Air Force Installation Security Program (FOUO)*. Include representatives from the intended facility users, as well as the designated military installation intelligence officers, operational officers, security and law enforcement officials, and engineering and planning personnel in the design process.

#### 2-1.1 Threat Assessment.

Generally, arms storage structures are designed according to the physical security regulations and instructions listed above. Local threat considerations need to be taken into consideration and the "design basis threat" can be established using UFC 4-020-01, the DoD Security Engineering Facilities Planning Manual.

### 2-2 SCOPE OF FACILITY.

Comply with DoD 5200.76M, *Physical Security of Sensitive Conventional Arms, Ammunition, and Explosives*. Armory facility functional design is driven by inventory control, storage, equipment repair and maintenance, delivery, management methodologies, and any additional functions accommodated in the specific facility. These functions and how they drive the design of the facility are described in greater detail herein.

#### 2-2.1 Armories and Arms Rooms.

##### 2-2.1.1 Armory.

"Armory" is the Navy and Marine Corps term defining a facility, usually free-standing, containing one or more separate weapon storage and distribution spaces. Armories are defined in UFC 2-000-05N, *Facility Planning Criteria for Navy/Marine Corps Shore Installations*, Category Code 143 45. An armory for Fleet Marine Force air and ground units provides humidity controlled, air conditioned and secure space for storing and maintaining weapons assigned to personnel. In planning for a Marine Corps armory,

the method is to build the space requirements by weapon and ammunition count. The weapons/equipment within the armory is typically stored within cabinets, gun racks, shelving, boxes, or wall boards. In most cases, this method of storage allows some stacking of the weapons/equipment which can reduce floor space requirements. To calculate space requirements, the space allocation for a Marine Corps armory can be determined by using the UFC 2-000-05N, *Facility Planning Criteria for Navy/Marine Corps Shore Installations* space planning tool on the NAVFAC portal. Adjustments can be made for units that do not conform to infantry battalion model, such as squadron or logistics battalion. Comply with OPNAVINST 5530.13C, *Physical Security Instruction for Conventional Arms, Ammunitions, and Explosives*. Additional policy and guidance can be found in MCO 5530.14A. Navy and Marine Corps Armories store only small quantities of ammunition for personal use weapons in a safe in the facility. The Army also has large free-standing weapons storage facilities in specialized circumstances (identification of which shall be FOUO). The Army more typically stores weapons in an Arms Room within another facility. See Table 2-1 from UFC 2-000-05N for space allowance.

**Table 2-1 Navy Shore Armory Gross Areas**

Installation Military Strength	Building Gross Area (SF)	Building Gross Area (SM)
up to 2,000	576	53.5
2,001 - 4,000	880	81.75
4,001 - 7,500	1,200	111.5
7,501 - 10,000	1,508	140.1
Over 10,000	Add 0.1 sq ft per person	Add 0.001 sm per person

The space above provides for an armory and small arms shop supporting only the weapons and personnel assigned to that installation.

**2-2.1.1.1 Portable Armory.**

An armory constructed and designed to be relocatable. They are a custom fabrication built in accordance with Naval Surface Warfare Specification 3046-93.2. Relocatable Armories are not permanent Armory solutions.

**2-2.1.2 Arms Rooms.**

Army arms rooms are constructed according to the requirements of Army Regulation (AR) 190-11; these are facilities, similar in function to the weapons storage spaces of armories, with very limited maintenance and repair facilities. Standard Army practice is to have an arms room built inside or adjacent to each line company headquarters building. Arms rooms are also located inside military police buildings, special operations centers, reserve training facilities, and other installations. If required, add space for a small amount of ammunition storage. Air Force arms rooms are governed by Air Force Instruction (AFI) 31-101, *The Air Force Installation Security Program*

(FOUO). Air Force weapons repair and maintenance facilities are normally located in a Combat Arms Facility.

### 2-2.1.3 **Modular Arms Room.**

Governed by Federal Specification (Fed. Spec.) AA-V-2737, Modular Vault systems. Modular arms rooms' construction is placed inside a building during new construction, is inserted inside an existing building, or is an addition to an existing structure. It may be a free-standing arms room, constructed of precast concrete or steel plate. The physical security requirements for a modular arms room are the same as for an armory building. These are not to be confused with portable armories.

### 2-2.2 **Facility Operations Schedule.**

The facility schedule and duration affect the program of the facility. The operations schedule will vary by Service, region, Installation, and operational status. The projected operations schedule shall be considered as part of the planning process.

## 2-3 **ARMORY PLANNING DETERMINATIONS.**

Planning the size and layout of armory facilities depends upon the following determinations.

### 2-3.1 **Inventory and Number of Personnel to be Serviced.**

The facility inventory, number of workers, and number of personnel to be serviced drives the overall size of the facility. Individual service space planning criteria and user input shall be used to determine specific needs. This size will be provided by the DoD Form 1391 for the project.

### 2-3.2 **Weapons Distribution Protocols.**

The weapons distribution protocol affects the layout of the facility.

In most armories the weapons are distributed through Issue Ports. The design of the Issue Ports is a determinant of the types of weapons that can be issued. Issue Port size is regulated by Physical Security requirements. See Issue Port details in Appendix C.

Larger weapons and accessories may require special distribution procedures that mandate that weapons and accessories be distributed through the facility doorways. The protocol for these issues will be established by the facility user.

### 2-3.3 **Weapons Cleaning Stations.**

The type, number, and arrangement of weapons cleaning station worktables and accessories are an integral part of the building planning. This process will take place in a covered area – outside in temperate climates and inside in harsh climates. Infrared heating may be necessary at the temperate climate outside cleaning areas.

#### 2-3.3.1 **Location.**

The location of the weapons cleaning areas will impact the DoD Form 1391 square footage requirement. Outside covered areas will be scheduled at one-half square footage.

#### 2-3.3.2 **Harsh Climate.**

If a harsh climate demands that the weapons cleaning tables be in an indoor area, the space will be scheduled at full square footage.

#### 2-3.3.3 **Interior Location.**

For interior locations, the type, number, and arrangement of weapons cleaning and repair worktables and accessories will be designed as an integral part of the building interior.

### 2-4 **STAFFING AND OFFICE MANAGEMENT.**

Determine staffing requirements prior to design and use the requirements to size the administrative areas, staff lockers, and toilets, in accordance with the individual service's space criteria.

### 2-5 **OTHER FACILITY FUNCTIONS.**

For the armory to accommodate one or more of the following additional functions, specialized areas will be required. These spaces should be outside of the secure perimeter of the armory.

2-5.1 Personnel training functions - classrooms.

2-5.2 Non-Standard weapons inventory, servicing, and/or fabrication functions – machine shops, wood shop, indoor firing range.

2-5.3 Category Code 215 10 is a small arms shop contained in a Navy or Marine Corps Armory or for a small arms shop in support of multiple facilities.

## 2-6 SPACE ASSESSMENT.

See the Functional Data Sheets in Chapter 4 for additional information on the space types and their relationships to each other.

### 2-6.1 Other Functions.

If the program calls for it, add a gunsmith shop for weapon construction and maintenance. Air Force weapons repair and maintenance are normally provided in a Combat Arms Facility. Add other functions defined by the program.

### 2-6.2 Mess.

Areas as required for, recycling bins space, and coffee machine, microwave oven and refrigerator.

### 2-6.3 Loading Considerations.

If a loading dock is necessary to accommodate material transfer in and out of the facility, coordinate it with storage requirements. Provide grade-level access to the major entrances, without steps, or curbs, for wheeled carts and dollies. Doors at loading areas shall be 8 feet (2.4 meters) tall to accommodate oversized equipment.

### 2-6.4 Support Areas.

2-6.4.1 Accommodate staff needs such as offices and administrative tasks, toilets, lockers, showers, and janitor closets. The areas are determined by the staffing requirements. These spaces can be located outside of the secure perimeter of the armory.

2-6.4.2 **Building Services Areas.** These spaces accommodate building services such as mechanical, electrical, and communications. Provide separate Mechanical and Electrical Equipment rooms, sized according to the size of the facility, with direct access to the exterior only. The Mechanical and Electrical rooms are not required to be within the secure perimeter. Doors for the Mechanical and Electrical rooms shall be lockable. Interior access is prohibited.

2-6.4.3 At training armories in remote locations where other toilet facilities are not nearby, provide toilet facilities accessed from the exterior of the building as part of the building program, in addition to interior toilets.

2-6.4.4 **Trash & Garbage Removal and Recycling.** Garbage storage, removal and recycling systems will be determined prior to design, based on installation requirements.

2-6.4.5 **Other Facility Functions.** These spaces will be determined by the specific facility requirements and the individual service's space planning criteria.

## 2-7 **BUILDING SITE PLANNING.**

The armory facility will be a critical mission in any installation. Consider the following factors in the site selection and planning.

### 2-7.1 **Location.**

2-7.1.1 In locating the facility, the first consideration is physical security. Separate vehicular and pedestrian circulation patterns to the maximum extent possible, and integrate new to existing vehicular and pedestrian circulation. Comply with antiterrorism (AT) requirements. The entrance to the facility shall have a clear, unobstructed view of the clear zone.

2-7.1.2 Provide adequate parking as close to the facility as possible within antiterrorism (AT) requirements. Per DoD 5100.76-M, clear zones shall be established and shall extend a minimum of 12 feet (3.66 m) on the outside and 30 feet (9.14 m) on the inside of fence, if a fence is provided. DoD 5100.76-M does not require fencing for armories. If the armory is enclosed within a fence, the clear zones do apply.

2-7.1.3 Site selection must take into account the requirement that an armed response force must be able to respond on-site to the armory location within 15 minutes of an alarm or report of intrusion, in accordance with DoD 5100.76-M.

2-7.1.4 For Marine Corps Armories, another important siting consideration is locating it in close proximity of the regiment, battalion, or company's other operational facilities and living quarters when possible.

### 2-7.2 **Separate Service Functions.**

Separate service functions such as loading docks, maintenance yards, trash container, on-grade mechanical equipment, and staff parking from the rest of the site by architectural screening, fences, or grading.

### 2-7.3 **Pedestrian and Vehicle Circulation.**

Personnel arrive from many directions. Identify the various access points, both pedestrian and vehicular, and channel circulation to the entrance of the building. Encourage smooth circulation by fencing and paving complementary to the building. Entry circulation begins as the patron enters the site and continues through the interior of the facility. See Chapter 3 for further criteria requirements.

### 2-7.4 **Parking.**

Provide sufficient parking outside of clear zone for arriving and departing personnel and visitors.

### 2-7.5 **Dumpster Enclosure.**

Provide enclosure for trash container to match the building material published in accordance with Installation Architectural Standard. If the building meets the inhabited building criteria from UFC 4-010-01 the enclosure shall be located in accordance with unobstructed space requirements. Also, it will generally be limited to 2 sides unless it is covered.

### 2-7.6 **Fencing.**

2-7.6.1 When required by the installation/base commander, provide security fencing around the perimeter of the entire building site. The ground inside the fence shall be surfaced with grass, sand, gravel, bituminous paving, concrete. Paved surface or gravel are preferred.

2-7.6.2 If fencing is provided around Category II armories (and possibly III and IV depending upon the local design threat) the minimum height of the fence will be 6-feet (2-meters) not including the outrigger. Local conditions such as the proximity of adjacent buildings require a higher fence. Additional requirements for the fencing and signage are found in DoD 5100.76-M C.3.1.5 and UFC 4-022-03, *Fences, Gates, and Guard Facilities*.

## CHAPTER 3 GENERAL DESIGN CRITERIA

### 3-1 GENERAL.

References within this UFC to applicable criteria and codes are intended to assist the designer in compiling the required statutes. These references are not intended to identify all those that may apply. It is the responsibility of the designer of record to identify and comply with all required statutes.

Use UFC 1-200-01, *General Building Requirements*, for guidance on the use of model building codes for design and construction of DoD facilities.

#### 3-1.1 Accessibility.

Provide barrier-free design in accordance with the requirements of the Deputy Secretary of Defense (DEPSECDEF) Memorandum "Access for People with Disabilities" dated Oct 31, 2008. The memorandum updates the DoD standards for making facilities accessible to people with disabilities. The US Access Board issued an update of the accessibility guidelines which the DEPSECDEF Memorandum implements with military unique requirements specified in the memorandum attachment. The new DoD, "ABA (Architectural Barriers Act) Accessibility Standard" and the DEPSECDEF Memorandum are located at <http://www.access-board.gov/ada%2Daba/aba-standards-dod.cfm> .

#### 3-1.2 Antiterrorism and Security.

UFC 4-020-01 DoD Security Engineering Facilities Planning Manual supports the planning of DoD facilities that include requirements for security and antiterrorism. Use in conjunction with UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings, to establish the security and antiterrorism design criteria that will be the basis for DoD facility designs.

UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings establishes the standards that provide minimum levels of protection against terrorist attacks for the occupants of all DoD inhabited buildings. Incorporate the minimum standards into the design of all new construction and major renovations of inhabited DoD buildings.

#### 3-1.3 Sustainability.

Design and construct the facility to comply with UFC 4-030-01, *Sustainable Development*.

#### 3-1.4 Commissioning.

All projects which include new building systems or equipment require LEED Fundamental Commissioning as a minimum. Provide Commissioning to meet the requirements of the latest version of *USGBC LEED Rating System*. At a minimum, commission the following systems: HVAC systems and controls, lighting controls, and if

provided, day lighting controls, refrigeration systems and controls, renewable energy systems, and domestic hot water systems. The designated Commissioning Authority shall meet the requirements of the latest version of *USGBC LEED Rating System*, and shall report results, recommendations, and findings directly to the Government.

### 3-2 **SITE WORK.**

Site work shall comply with the appropriate Service and base installation standards (ex., Base Exterior Architectural Plan or BEAP, Installation Design Guide or IDG).

For Navy projects, comply with UFC 3-200-10N, *Civil Engineering*.

#### 3-2.1 **Landscape.**

In general, the fenced area will comprise the entire building site. The ground inside the fence shall be surfaced with gravel, bituminous paving, concrete, or other hard surface material. Comply with UFC 3-201-02, *Landscape Architecture* and the local Installation landscape standards. For Air Force, also refer to the USAF Landscape Guide and any Major Command standards. Due to security reasons, planting (trees and shrubs) is not required.

#### 3-2.2 **Parking, Access Drives.**

Comply with UFC 3-210-02, *POV Site Circulation and Parking*.

### 3-3 **ARCHITECTURE AND INTERIOR DESIGN.**

#### 3-3.1 **General.**

See Appendix C drawing of a Prototypical Free-Standing Armory Facility. Windows and skylights are prohibited into the secured perimeter. All entrances into the secured perimeter (the Weapons Storage Areas) shall be through GSA approve Class 5 Vault Door or other approved door as allowed by DoD 5100.76M. Primary entrance doors to armories shall be limited to one. Due to life safety, additional emergency exit door(s) may be required. Armory emergency exit doors shall meet the same requirements as the primary entrance door with no exterior hardware. Emergency exit doors should be equipped with a local enunciator in order to alert people working in the armory that someone is attempting to exit the facility through an emergency exit door.

General guidance for architectural and interior design is provided in the following documents:

- UFC 3-100-10, *Architecture*
- UFC 3-120-10, *Interior Design*

- Army uses the local Installation Design Guide and MILCON transformation RFP Guidelines
- Air Force uses AFI 32-1024, *Standard Facility Requirements*, Air Force Facility Excellence Guide (AFSCO), and Air Force Installation Protection Guide.

### 3-3.2 **The Building Interior.**

The weapons storage area is the principal facility function. Issues of particular importance are as follows:

#### 3-3.2.1 **Corridor Walls.**

Corridor walls which form the office, toilets, mechanical or electrical rooms shall be constructed of CMU or concrete. Expanded metal partitions which form part of the weapons storage areas can also be used for corridor walls.

#### 3-3.2.2 **Corridor Doors.**

Inventory unit (platoon, company) doors from the corridor and office doors shall be designed for the provision of card readers with key pads.

#### 3-3.2.3 **Space Division.**

Design armory areas so that they are capable of being subdivided in plan with partitions to separate inventory units ( platoons, companies, etc). Accomplish this with wire mesh partitions, chain link fencing, or other secure methods. Subdividing partitions shall extend from floor to concrete ceiling above, full height.

#### 3-3.2.4 **Visual Separation for Infrared.**

Visually separate Inventory units to a height of 10 feet (3.05 m) to enable the infrared Intrusion Detection System to operate. Use 22 gauge brite galvanized corrugated sheet metal or gypsum board and metal studs for this purpose.

#### 3-3.2.5 **Signage.**

Provide a comprehensive signage design for the facility that addresses both way-finding and information, as well as warning for hazardous materials, perimeter of fenced area if provided, restricted areas, and intrusion detection systems (IDS).

### 3-3.3 **Weapons Repair and Maintenance Area.**

In the Furniture, Fixtures & Equipment (FF&E) Package, provide user-approved workbenches for the armory staff and gunsmiths.

Workspace areas must have adequate electrical service for task lighting, pull-down cord reels, and pull-down compressed air reels (50 psi and 15 scfm, however, verify requirements during design).

### 3-3.4 **Furniture, Fixtures, and Equipment (FF&E).**

A Furniture, Fixtures, and Equipment (FF&E) package will be developed as an integral part of the design of the facility. See the UFC 3-120-10, *Interior Design*.

### 3-3.5 **Acoustics.**

Design the facility to provide a comfortable acoustical environment and provide comprehensive sound isolation and sound absorption measures for individual spaces as appropriate. Provide acoustical design to prevent sound from noisy spaces such as corridors, toilets, elevator machine rooms, and mechanical rooms from having negative impact on the adjacent spaces.

At a minimum, provide the required sound transmission coefficient (STC) ratings identified in Chapter 4, Functional Data Sheets, for individual spaces. Use the "Suggested Design Values" STC ratings in UFC 3-450-01, *Noise and Vibration Control* as the basis for the sound design of partition, door and window assemblies for the facility. Utilize gypsum board wall "Improvements" to increase the STC of gypsum board "Stud Type" partitions to achieve the project sound requirements. Unless noted otherwise extend partitions and seal to the structure above around rooms that have a noise source such as but not limited to corridors, toilets, elevator machine rooms, gymnasiums, classrooms, training rooms, maintenance rooms, activity rooms, and mechanical rooms. Unless indicated in Chapter 4, STC ratings do not need to be field verified.

### 3-3.6 **Service Areas**

Service areas include receiving, storage, and cleaning areas.

3-3.6.1 Loading Dock. Confirm loading platform heights with the majority of trucks servicing the facility. Doors from a loading area into the building shall be 8 feet (2.4 meters) to accommodate oversized equipment.

3-3.6.2 Provide dock to accommodate varying truck platform heights.

3-3.6.3 Provide bumpers at the dock to prevent impact damage. In locations with extreme weather conditions, enclose the loading dock.

3-3.6.4 Provide cart stops and the edge of the dock to prevent rolloff.

3-3.6.5 Provide level access or a shallow ramp to connect loading areas with the building interior to facilitate the use of hand trucks/carts.

### 3-3.7 **Staff Facilities.**

3-3.7.1 Staff Toilets. Both Government and contract personnel use staff toilets. Designer shall consult with the local command to determine staffing figures and shift population.

3-3.7.2 Staff Lockers, when required, shall be provided for male and female personnel. Locate locker facilities adjacent to the toilets. Equip locker rooms with showers, lockers, benches, and coat hooks to facilitate the changing of clothes. The number of lockers scheduled for each space shall be based on the number of workers. Make a portion of the lockers freestanding so that they can be shifted from space to space as the male and female balance changes. All lockers must have sloped tops.

3-3.7.3 Army shall follow MILCON Transformation Model RFP guidelines. Lockers are not for showering or changing, only for storage of personal items. Male and female lockers need not be separate and may be combined with a break area. Adjacency with staff toilets is encouraged.

3-3.7.4 Janitor Facilities. Include a Janitor's Closet with a floor mop sink, a mop rack, and shelving for cleaning products.

### 3-4 **ELECTRICAL DESIGN.**

Provide site electrical utilities, interior distribution systems, communications and security, and site lighting according to UFC 3-500-10, *Electrical Engineering* and the latest installation design requirements.

- Site Electrical Utilities includes equipment, overhead power distribution, underground electrical systems, grounding, metering, and exterior site lighting systems.
- Interior distribution systems includes service entrance and distribution equipment, TVSS, dry type transformers, wiring devices, raceways, conductors, interior lighting systems, emergency power systems, lightning protection systems, hazardous locations, and systems furniture.
- Communications and security includes telecommunications systems, television systems, electronic security systems (ESS), and intercommunication systems.

In addition to the criteria identified above, comply with the following Armories and Arms Rooms specific criteria.

#### 3-4.1 **Agency – Specific Guidance.**

Comply with the following agency specific guidance:

#### 3-4.1.1 **Army Design Criteria.**

Apply the following criteria as basis for the design criteria:

- Installation Information Infrastructure Modernization Program (I3MP)
- Technical Guide For Installation Information Infrastructure Architecture (I3A)
- United States Army Information Systems Engineering Command Worldwide Outside Plant Design And Performance Requirements.
- UFC 3-580-01 *Telecommunications Building Cabling Systems Planning and Design*

#### 3-4.1.2 **Air Force Design Criteria.**

Apply the following criteria as basis for the design criteria:

- a. The Air Force (JTA-AF) Fixed Base Technical Architecture (FBTA)

#### 3-4.2 **Power.**

Locate overload protection and control panels at the equipment. Provide ceiling-mounted power cord reels in weapons maintenance areas. Floor mounted flush receptacles and conduit stub-ups are not permitted.

#### 3-4.3 **Lighting and Power.**

Provide lamp breakage protection for lighting fixtures in rooms as required in room requirements in Chapter 4. If fencing is required according to DoD 5100.76M, site perimeter security lighting is not required unless dictated by the Installation Commanding Officer. Provide exterior lighting to allow observation of people (a minimal 0.2 foot candles) at exterior doors and human-passable openings. Emergency lighting and standby power are not required for exterior lighting, but should be considered when threat and vulnerability warrant. Utilize recessed, full cut off, or fully shielded fixtures mounted above all exterior doors and human-passable openings. Exterior lighting shall be photocell controlled and light switches must not be accessible to unauthorized personnel.

#### 3-4.4 **Emergency Power.**

If required by the Installation Commanding Officer due to the value of weapons stored, provide emergency power generator to maintain air-conditioning/humidity control in weapons storage areas.

### 3-4.5 **Electronic Security Systems (ESS).**

Electronic Security System (ESS) is the integrated electronic system that encompasses interior and exterior Intrusion Detection Systems (IDS), Closed Circuit Television (CCTV) systems for assessment of alarm conditions, Automated Access Control Systems (ACS), Data Transmission Media (DTM), and alarm reporting systems for monitoring, control, and display. Provide an Intrusion Detection System (IDS) when required by DoD 5100.76-M and OPNAVINST 5530.13C. Comply with UFC 4-021-02NF, *Security Engineering: Electronic Security Systems* and UFC 4-020-04A, *Electronic Security Systems: Security Engineering*. Provide a duress alarm (panic button) at each issue port.

3-4.5. 1 IDS shall include point sensors on doors, other “human-passable openings” (96 square inches (619 square centimeters) per DoD 5100.76-M, and interior motion or vibration sensors. Since armories have a significant amount of shelving and gun racks, care must be taken to ensure IDS components are not rendered useless by blocked line of sight.

3-4.5. 2 IDS transmission lines shall have line supervision (DoD 5100.76-M C2.2.1) or, if line security is unavailable, two independent means of alarm signal transmission (DoD 5100.76-M C2.2.6).

3-4.5. 3 The IDS must report to a central control station where alarms will sound and from which a response force can be dispatched. An alarm bell located only at the protected location is not acceptable.

3-4.5. 4 Coordinate ESS requirements with the local authority and the individual service’s centrally managed program (i.e. Army, Air Force and Marine Corps will be empty conduit, Navy MCON equipment will be identified as an option and provided by the MCON Contractor utilizing OPN funding).

3-4.5.5 When required, provide card reader with keypads at entry to building and separate (unit-based) interior storage areas.

3-4.5.6 The camera system portion of ESS used for surveillance is not a requirement; however, it may be a user request to be funded. Wiring, conduit, routing devices, and equipment must be provided by local command. Determine if the installation of these items is to be a part of the project.

### 3-5 **STRUCTURAL DESIGN.**

In addition to the criteria in paragraph 3-1, refer to UFC 3-310-01, *Structural Load Data*. For Navy projects; also comply with UFC 3-300-10N, *Structural Engineering*. In the near future, all DoD projects shall comply with UFC 3-300-01, *Structural Engineering*.

### 3-6 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) DESIGN.

In addition to the criteria established in Section 3-1, comply with the following in the design of the mechanical system:

- UFC 3-400-02, *Engineering Weather Data* provides local climatic design conditions
- UFC 3-410-01FA, *Heating, Ventilating, and Air Conditioning*
- UFC 3-410-02A, *Heating, Ventilating, and Air Conditioning (HVAC) Control Systems*
- UFC 3-410-02N, *Heating, Ventilating, Air Conditioning and Dehumidifying Systems*
- UFC 3-410-04N, *Industrial Ventilation*
- UFC 3-430-01FA, *Heating and Cooling Distribution Systems*

#### 3-6.1 Controls.

Specify direct digital control (DDC) system per UFGS 23 09 23.13 20, *BACnet Direct Digital Control Systems for HVAC* or UFGS 23 09 23, *Direct Digital Control for HVAC and other Local Building Systems*. Coordinate DDC specification to ensure proper interface to existing or planned base-wide DDC/EMCS system.

### 3-7 PLUMBING DESIGN.

In addition to the criteria established in Section 3-1, comply with following in the design of the plumbing system:

For Army projects, use TI-800-01, Design Criteria

- UFC 3-420-01, *Plumbing Systems*
- UFC 3-420-02FA, *Compressed Air*

#### 3-7.1 Systems.

Give special consideration to the following requirements:

- a. Provide hose bibbs at exterior weapons cleaning areas. These shall be freeze proof hydrants where the climate demands.
- b. Provide outdoor rated compressed air system, mounted on a slab, for the weapons cleaning stations and the indoor weapons service areas.

Compressed air outlets shall be at the worktables. Inside compressed air outlets shall be equipped with ceiling hung cord reels.

**3-8 FIRE PROTECTION.**

**3-8.1 Requirements.**

Provide Fire Protection Systems for the building as required by UFC 3-600-01, *Fire Protection Engineering for Facilities*, and the following:

- a. Provide sprinkler protection for armories 5,000 square feet (464.5 sq.m.) or greater. Sprinkler protection shall be provided throughout the facility and for the outdoor weapons cleaning areas.
- b. Provide a Fire Alarm System for armories of 5,000 square feet or greater.
- c. When required for an inhabited building, provide mass notification system in accordance with UFC 4-021-04, *Design and O&M: Mass Notification Systems*.
- d. Fire Alarm Systems are not required for portable armories, except on Air Force projects, provide fire alarm system for all portable armories.

## CHAPTER 4 SPECIFIC DESIGN CRITERIA

### 4-1 INTRODUCTION.

This chapter identifies the specific design needs for each functional area as outlined in the space program. Tables 4-1 through 4-12 provide this data in a standard Functional Data Sheet format.

These Data Sheets are available as a Microsoft<sup>®</sup> Word<sup>®</sup> file for use during project execution. The file is downloadable from the Whole Building Design Guide Web site ([www.wbdg.org](http://www.wbdg.org)) under the DoD page, Tools section.

Armory planning determinations, along with other basic building design and operation determinations, establish the size, layout, and design of the facility functional spaces. The various components below may apply to an armory or an arms room project.

### 4-2 ISSUE PORTS.

The issue port accommodates distribution of weapons to authorized personnel. For the Navy and Marines, OPNAVINST 5530.13C allows Navy and Marines (Marine Corps Order MCO 5530.14A) to have openings “not to exceed 190 in-sq when open; and when not in use will be secured with material comparable to that forming the adjacent walls.” (NOTE: 5100.76-M requires IDS point sensors on any “human passable openings,” which is defined as 96 sq in (0.06 square meters). Provide one issue port at each caged or separate unit arms room.

See **Appendix C – Drawings** for Issue Port drawings.

TABLE 4-1 ENTRY CANOPY

<b>Description/Usage</b>	At the main entrance to the facility, a canopy or enclosure for patrons who must wait at the facility entrance. Column supported canopy. The entry control portal is the main entrance to the facility. Determine the size by the number of personnel to be served, arrival and departure considerations, and the procedure followed. Provide a canopy or enclosure for patrons who must wait at the facility entrance.
<b>Ceiling Ht.</b>	11' – 4" min
<b>Finishes</b>	Floor: Concrete Base: N/A Walls: N/A Ceiling: Painted or prefinished
<b>Plumbing</b>	None
<b>HVAC</b>	None
<b>Fire Protection</b>	None
<b>Power</b>	None
<b>Lighting</b>	Provide per Chapter 3
<b>Communication</b>	None
<b>Acoustics</b>	None
<b>Casework/Built-in Equipment</b>	None
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	None
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-2 VESTIBULE

<b>Description/Usage</b>	A vestibule is appropriate to prevent major heat loss and gain, and to screen and protect visitors prior to entry into the facility proper. When a vestibule is provided, use hollow metal doors with half glass for the outside door(s). The inside door must be GSA-approved Class 5 Armory Vault Door. At the inside of the vault door, provide a day gate for added security.
<b>Ceiling Ht.</b>	11' – 4" min
<b>Finishes</b>	Floor: Concrete Base: Resilient Walls: Epoxy on CMU or concrete. Provide wall guard protection at locations subject to cart traffic. Ceiling: Painted concrete
<b>Plumbing</b>	None
<b>HVAC</b>	Provide per Chapter 3
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3. Provide lamp protection.
<b>Communication</b>	Provide per Chapter 3
<b>Acoustics</b>	None
<b>Casework/Built-in Equipment</b>	None
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	None
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-3 CORRIDOR

<b>Description/Usage</b>	Circulation. The semi-public areas of the facility allow for circulation to other functions.
<b>Ceiling Ht.</b>	11' – 4" min
<b>Finishes</b>	Floor: Concrete Base: Resilient Walls: Epoxy on CMU or concrete/expanded metal. Provide wall guard protection at locations subject to cart traffic. Ceiling: Painted concrete
<b>Plumbing</b>	None
<b>HVAC</b>	Provide per Chapter 3
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3. Provide lamp protection.
<b>Communication</b>	Provide per Chapter 3
<b>Acoustics</b>	None
<b>Casework/Built-in Equipment</b>	None
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	None
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-4 DUTY OFFICE

<b>Description/Usage</b>	Administrative office
<b>Ceiling Ht.</b>	8' – 0" min
<b>Finishes</b>	Floor: Resilient tile Base: Resilient Walls: Painted CMU or concrete walls. Ceiling: Acoustical panel
<b>Plumbing</b>	None
<b>HVAC</b>	Provide per Chapter 3
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3
<b>Communication</b>	Provide per Chapter 3
<b>Acoustics</b>	Provide per Chapter 3
<b>Casework/Built-in Equipment</b>	None
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	Office furniture
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-5 MECHANICAL ROOM

<b>Description/Usage</b>	Mechanical equipment housed here.
<b>Ceiling Ht.</b>	11' – 4" min.
<b>Finishes</b>	Floor: Concrete Base: Resilient Walls: Painted CMU or concrete Ceiling: Painted concrete
<b>Plumbing</b>	Provide per Chapter 3
<b>HVAC</b>	Provide per Chapter 3
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3
<b>Communication</b>	Provide per Chapter 3
<b>Acoustics</b>	None
<b>Casework/Built-in Equipment</b>	None
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	None
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-6 STAFF TOILETS/SHOWERS

<b>Description/Usage</b>	Male and female toilets and shower facilities.
<b>Ceiling Ht.</b>	8' – 0" min
<b>Finishes</b>	Floor: Ceramic tile Base: Ceramic tile Walls: Ceramic tile wainscot 48" high except, full height ceramic tile or solid surface material in showers. Painted CMU or concrete walls. Ceiling: Moisture resistant acoustical panel ceiling or mold-resistant gypsum board.
<b>Plumbing</b>	Lavatories, urinals, water closets, showers
<b>HVAC</b>	Provide per Chapter 3
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3
<b>Communication</b>	Provide per Chapter 3
<b>Acoustics</b>	No special requirements
<b>Casework/Built-in Equipment</b>	Vanity cabinets for lavatories. Toilet accessories.
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	Lockers and benches if required
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-7 ELECTRICAL CLOSET

<b>Description/Usage</b>	Electrical panels and other equipment
<b>Ceiling Ht.</b>	11' – 4" min
<b>Finishes</b>	Floor: Concrete Base: Resilient Walls: Painted CMU or concrete Ceiling: Painted concrete
<b>Plumbing</b>	Provide per Chapter 3
<b>HVAC</b>	Provide per Chapter 3
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3
<b>Communication</b>	Provide per Chapter 3
<b>Acoustics</b>	None
<b>Casework/Built-in Equipment</b>	None
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	None
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-8 COMMUNICATIONS ROOM

<b>Description/Usage</b>	Communications equipment housed here.
<b>Ceiling Ht.</b>	11' – 4" min.
<b>Finishes</b>	Floor: Concrete Base: Resilient Walls: Painted CMU or concrete Ceiling: Painted concrete
<b>Plumbing</b>	None
<b>HVAC</b>	Provide per Chapter 3
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3
<b>Communication</b>	Provide per Chapter 3
<b>Acoustics</b>	None
<b>Casework/Built-in Equipment</b>	Communications racks
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	None
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-9 JANITORS CLOSET

<b>Description/Usage</b>	Cleaning supplies and equipment storage.
<b>Ceiling Ht.</b>	8' – 0" min
<b>Finishes</b>	Floor: Concrete Base: Resilient Walls: Painted CMU or concrete Ceiling: Acoustical panel ceiling.
<b>Plumbing</b>	Mop sink
<b>HVAC</b>	Provide per Chapter 3
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3
<b>Communication</b>	None
<b>Acoustics</b>	None
<b>Casework/Built-in Equipment</b>	Storage shelving for cleaning supplies and equipment
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	None
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-10 COVERED CLEANING AREA

<b>Description/Usage</b>	Exterior column supported canopy. Determine the size by the number of personnel to be served, arrival and departure considerations, and the procedure followed. Provide space for weapons cleaning tables, cleaning equipment, and clearing of weapons.
<b>Ceiling Ht.</b>	11' – 4" min
<b>Finishes</b>	Floor: Concrete Base: N/A Walls: N/A Ceiling: Painted ceiling.
<b>Plumbing</b>	Hose bibbs, Compressed air drops at tables
<b>HVAC</b>	Provide radiant heating. Coordinate the type of heating allowed with fire protection requirements where solvent vats are provided.
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3
<b>Communication</b>	None
<b>Acoustics</b>	None
<b>Casework/Built-in Equipment</b>	Weapons cleaning tables
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	Weapons cleaning equipment
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-11 WEAPONS REPAIR AND MAINTENANCE WORKSHOPS

<b>Description/Usage</b>	Weapons repair and regular maintenance. The square footage of repair and maintenance workspace areas will be determined by the program. In some armories this space may have secondary functions as a training space.
<b>Ceiling Ht.</b>	11' – 4" min
<b>Finishes</b>	Floor: Concrete Base: Resilient Walls: Epoxy on CMU or concrete. Ceiling: Painted concrete
<b>Plumbing</b>	Compressed air hose reels
<b>HVAC</b>	Provide humidity control to limit the relative humidity to no greater than 40% at 80 degrees Fahrenheit.
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3. Provide lamp protection. Provide power reels.
<b>Communication</b>	Provide per Chapter 3. Provide panic button at each issue port.
<b>Acoustics</b>	None
<b>Casework/Built-in Equipment</b>	None
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	Weapons maintenance tables, stools, and parts cabinets
<b>User-Provided Equip. (GF&amp;GI)</b>	Tools and Parts
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

TABLE 4-12 UNIT ARMS ROOMS/WEAPONS STORAGE AREA

<b>Description/Usage</b>	The weapons and equipment within the armory are typically stored within cabinets, gun racks, shelving, boxes, or wall boards. In most cases, this method of storage allows some stacking of the weapons/equipment which can reduce floor space requirements. Provide storage space for gun cases, ammunition cases, etc. The areas are determined by analysis of the need, the number of personnel to be served, and the defined delivery cycles. A Marine armory will have multiple cages, each for a company-sized unit (approximately 105 marines), with weapons racks, locking cage door with a key / pushbutton lock. Provide issue port for each caged area. Provide space for weapon clearing.
<b>Ceiling Ht.</b>	11' – 4" clear to underside of concrete
<b>Finishes</b>	Floor: Concrete Base: Resilient Walls: Epoxy on CMU or concrete. Ceiling: Painted concrete ceiling.
<b>Plumbing</b>	None
<b>HVAC</b>	Provide humidity control to limit the relative humidity to no greater than 40% at 80 degrees Fahrenheit.
<b>Fire Protection</b>	Provide per Chapter 3
<b>Power</b>	Provide per Chapter 3
<b>Lighting</b>	Provide per Chapter 3. Provide lamp protection.
<b>Communication</b>	Provide per Chapter 3. Provide panic button at each issue port.
<b>Acoustics</b>	No special requirements
<b>Casework/Built-in Equipment</b>	Equipment cages of woven wire mesh partitions, shelving, and wallboards
<b>Furnishings Fixtures &amp; Equip. (FF&amp;E)</b>	Weapons racks and cabinets
<b>User-Provided Equip. (GF&amp;GI)</b>	None
<b>For use during project execution by the appropriate Service agency</b>	
<b>Occupancy</b>	
<b>Min. net m<sup>2</sup> (ft<sup>2</sup>)</b>	

## APPENDIX A REFERENCES

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UFC 3-600-10, *Fire Protection Engineering for Facilities*, Department of Defense (DoD),  
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## **APPENDIX B BEST PRACTICES**

The following material identifies current good design practices for each functional area as outlined in the space program. The designer is expected to interpret this guidance and configure the functional areas according to the needs of the project.

### **B-1 Architectural Design.**

The following Items require especially careful consideration in the architectural design:

Consider an access control device (such as a card reader or biometric device) on doors from corridors to each unit arms room.

### **B-2 Coordination.**

The following Items require especially careful coordination with the architectural design:

Requirements for floor drains, wall recesses, stub walls, and any pads or piers needed for equipment.

All roof, ceiling, floor, and wall penetrations for ducts, control lines, condensates, etc.

Slab elevation and slope requirements to ensure proper drainage of water in wet areas.

### **B-3 Functional Planning.**

The relationship among the various inventory control, storage, equipment repair and maintenance, delivery, and management methodologies, and any additional functions accommodated in the specific facility must be carefully studied to provide the maximum flow and efficiency. Keep travel distances short and minimize crossover of circulation paths. It is critical for security to maintain sight lines as open as possible. Plan for inventory strategies for each separate facility.

#### **B-3.1 Design for Flexibility.**

Recognize that future renovations, additions and expansions of the facility are likely. Utilize mobile or movable equipment for flexibility. Provide utility connections for mobile or movable equipment.

#### **B-3.2 Aesthetics and Architectural Character.**

The armory building will be a significant structure at every installation. The design of the building and its surroundings shall take into account the requirements and recommendations of the Installation Design Guide (or BEAP). Although an armory is generally considered to be a utilitarian function, the building itself must be integrated into the aesthetic fabric of the installation.

**B-3.3 Glazing and Natural Light.**

Armories will not have windows. Windows can be provided in an administrative space adjacent to the armory that is not within the secured perimeter of the armory. Issue ports and some entrance doors include glazing. This feature is to provide secure identification for security and in weapons sign-out transactions, not to provide natural light. At those locations, direct sunshine can be uncomfortable and distracting. Consider overhangs and other building features to prevent direct sunlight on issue ports.

**B-3.4 Quality Work Environment.**

Ensure quality building systems, adequate employee facilities, easily accessible safety devices, and prevention of entry by vermin and insects.

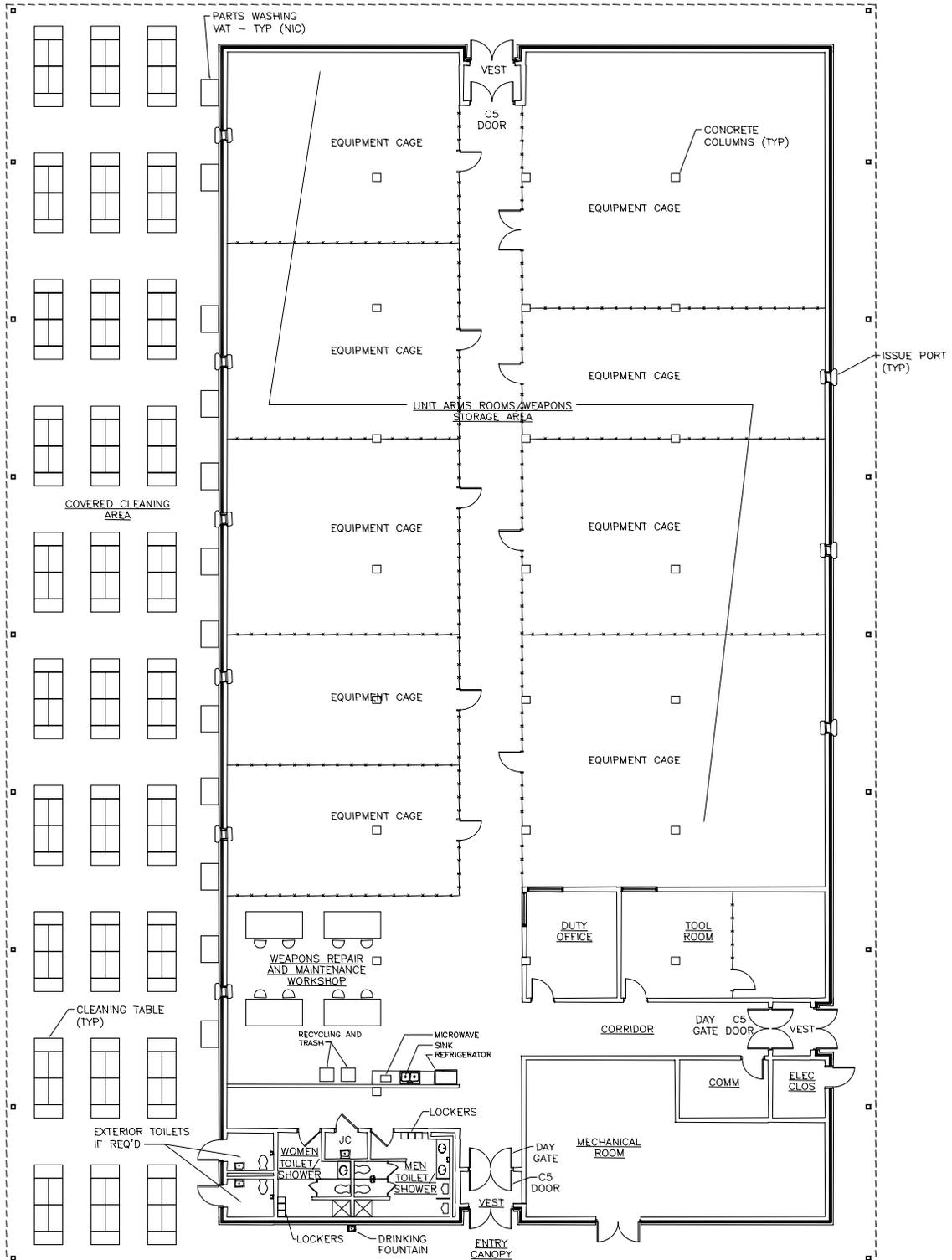
**B-3.5 Design for Durability and Maintainability.**

In budgeting for the project, accommodate the materials shown in Table B-1. They have proven to be the most durable. Design to accommodate access for cleaning and maintenance.

### APPENDIX C DRAWINGS

#### C-1 A PROTOTYPE ARMORY.

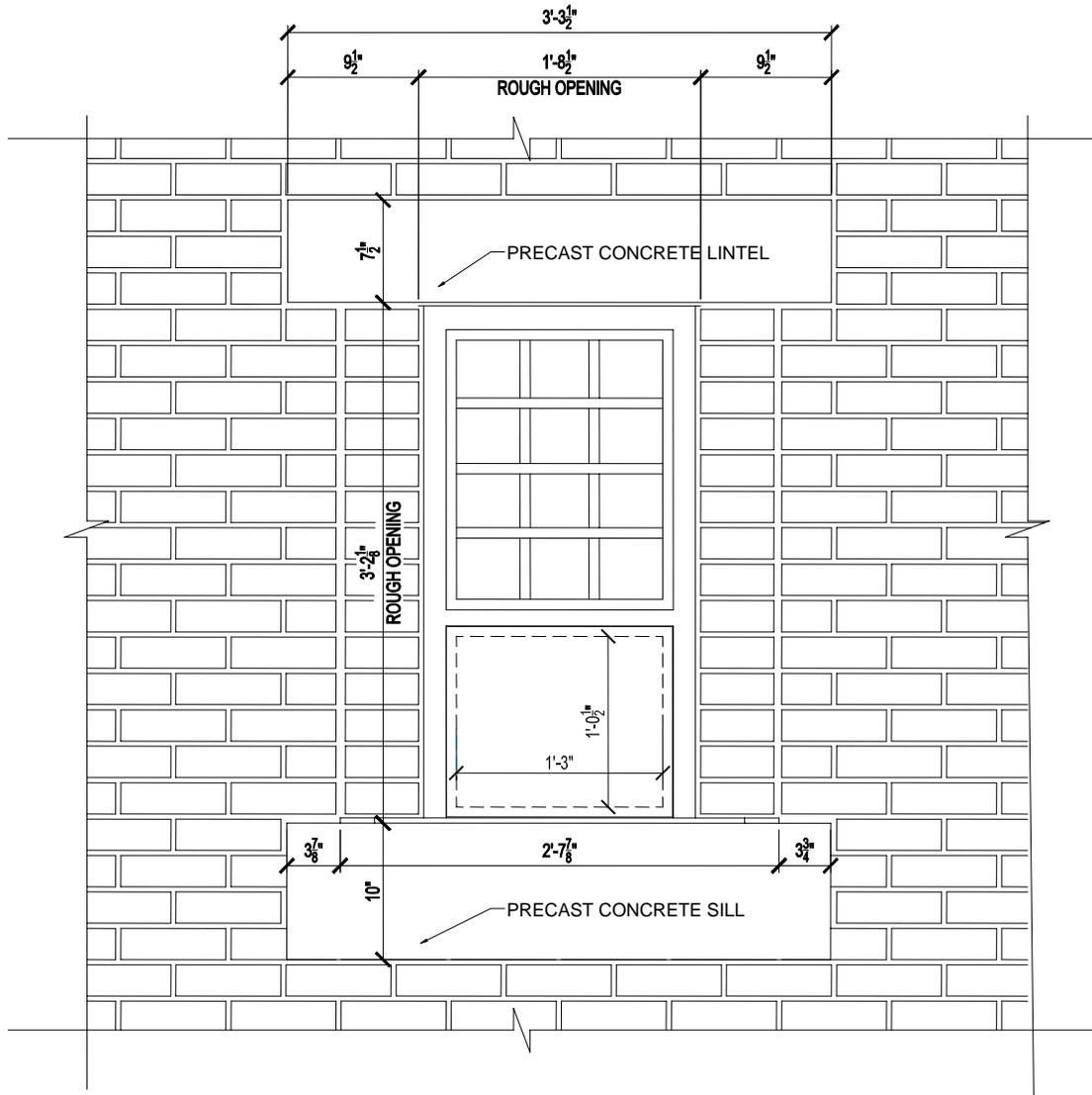
The plan below is a prototype armory plan.



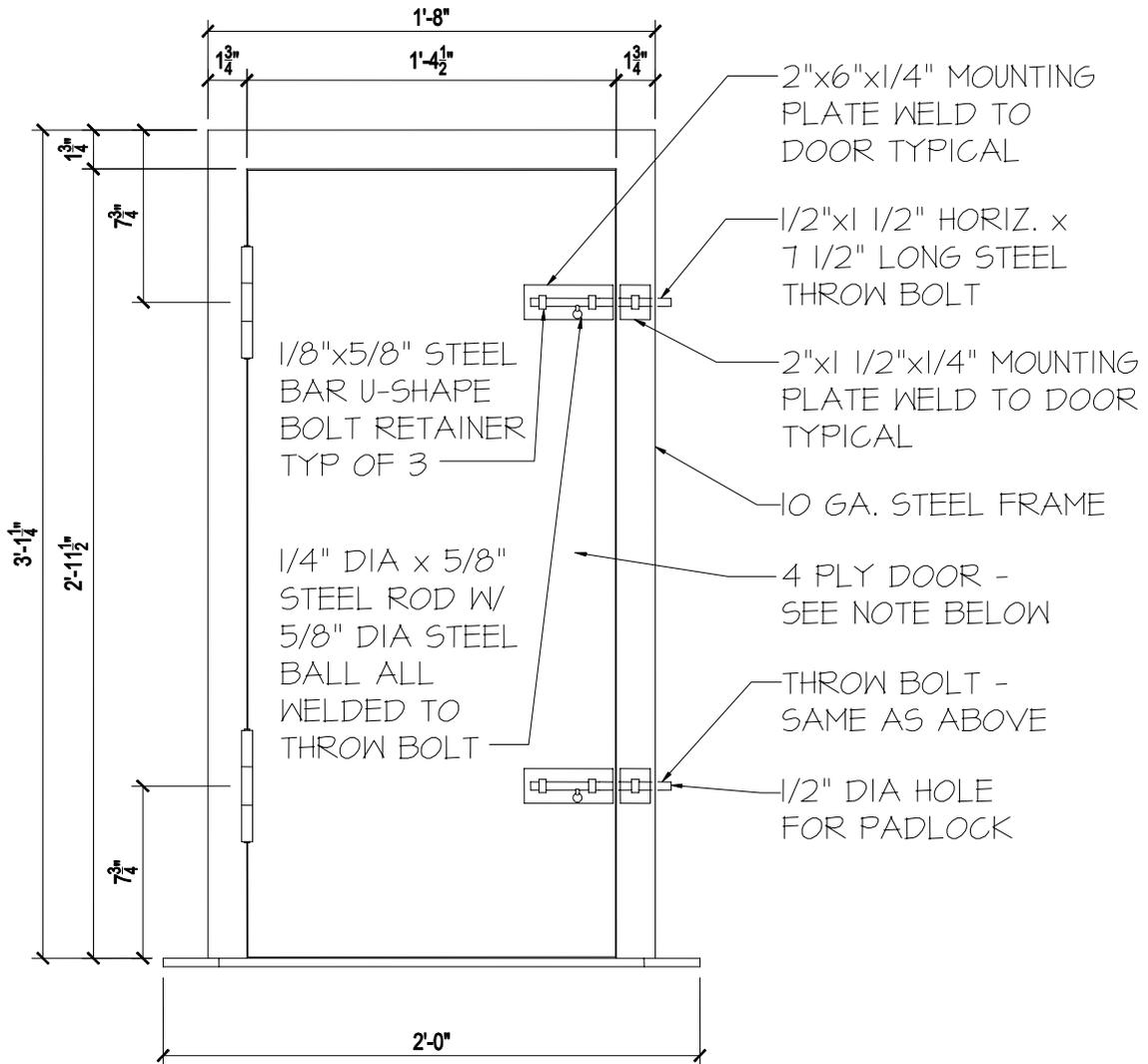


### A. Exterior Wall Elevation of Issue Port

The issue port maximum opening is 190 square inches (15" x 12.5" = 187.5 sq in).



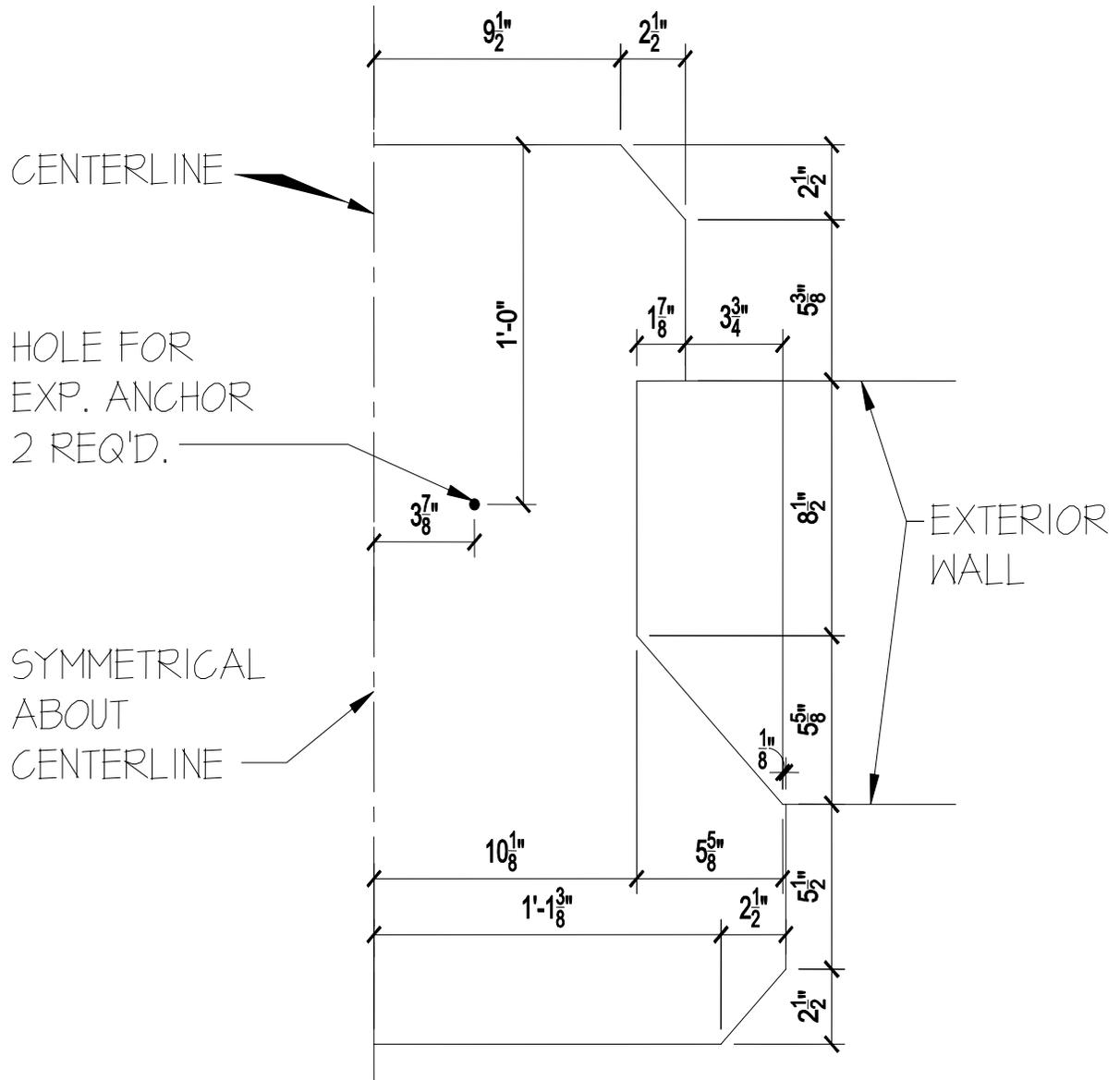
**B. Inside Issue Port Door Elevation**



NOTE: 4-PLY DOOR CONSISTS OF 3/16" STEEL PLATE ON THE INSIDE OVER 1/4" POLYCARBONATE SHEET OVER 1 3/4" SOLID CORE WOOD WITH 10 GA. STEEL SHEET FACE PLATE AND EDGES



**C. Issue port Half Plate Plan**



## APPENDIX D THE SPACE PROGRAMMING TOOL

D-1 In order to develop a DoD Form 1391 space program for Navy and Marine Corps armory buildings, use the space programming tool “NAVFAC P-80, CCN 143-45 Fleet Marine Force Armory Spreadsheet” in Microsoft Excel. This is a criteria model that allocates the net space requirements for the typical units found within battalion level or regimental level armory.

D-2 Data Input. The criteria for space allocation are the equipment to be inventoried in the facility. Each unit has a tab in the spreadsheet for determining the equipment that will be used in that unit.

A unit for the Headquarters & Support Company (H&S)

A unit for one Line Company. The Regiment Summary is a summary for the entire battalion or regiment. Here is where the user can account for identical line companies within a battalion by entering the number if identical companies.

A unit for a Weapons Company

A unit for a Headquarters Regiment

A unit for Battalion Maintenance

Each unit has two worksheets – one for data input and one for data output. Users enter weapon quantities for each Table of Authorization Number (TAM#) taken from the Table of Equipment into the H&S company input sheet.

D-3 Adjustments. Adjustment the model for regiments with more or fewer units.

3-3.3 Output Data. Output data includes square foot requirements as well as quantities of lockers, cabinets, or racks requirements. This information will need to be taken into account in the Furniture, Fixtures, and Equipment package.

3-3.4 The Cleaning Area. The Weapons Cleaning area size shall be individually justified and based on the number of personnel routinely cleaning weapons throughout the year. Company size cleaning areas (100 to 130 troops) would be expected to be the norm for ground units. Calculate the gross cleaning area as the number of personnel served x 10 GSF. This is shown in the “Regiment Summary” worksheet.

### 3-3.5 Net-to-Gross Area.

Gross allowable area (GSF) is defined in the P-80 UFC 2-000-05N document by the Net Square Footage developed in the spreadsheet multiplied by a factor of 1.28.

Programmers and designers must justify additional programmatic factors that affect the net-to-gross factor.